THE MOBILE HOME **HOW TO DO IT** BOOK

$1.98

Mobile Home MANUAL

HOW TO PULL

HOW TO PARK

HOW TO REMODEL

HOW TO FURNISH

HOW TO BUY

HOW TO INSURE

HOW TO TRAVEL

HOW TO REPAIR

The Mobile Home Manual

PREPARED BY

The Trail-R-Club of America

MOBILE HOME MANUAL

A REFERENCE BOOK FOR ALL MOBILE HOME OWNERS

A PUBLICATION OF

THE TRAIL-R-CLUB OF AMERICA

FORWARD

This is a reference book for all mobile home owners.

It has been specifically prepared to answer questions about every aspect of mobile home ownership and living.

The idea of publishing this book was conceived in January 1953. As it goes to press in June 1954, we look back on seventeen months of preparation. Our purpose was a book to answer the questions of prospective mobile home owners as well as those of new or experienced owners. We started our project with an analysis of the thousands of questions received by the Trail-R-Club of America from members and non-members who sought information about mobile homes. With this comprehensive list of questions, we set out to collect the authoritative data required to give an unbiased answer to them. This book is built around the answers to these questions.

We have tried to present a tremendous amount of information in a minimum of space. Our text is, therefore, concise, meaty, and unembellished.

We wish to express our thanks to the literally hundreds of persons and firms in the mobile home industry, far too many to mention individually, whose assistance has made this publication possible. Our requests for assistance, technical information, and authoritative data were enthusiastically received by literally hundreds of firms in the mobile home industry who contributed substantially to the contents of this book. You will find the names of many of these contributors beneath pictures used throughout the book.

We would like to specifically express our appreciation to Hub Industries, and Mr. Haven H. LaBohn, Director of Engineering for Hub Industries, who wrote almost the entire section on the mobile home electrical system for us, and contributed all pictures used in that section.

M. D. NULSEN
President, Trail-R-Club of America

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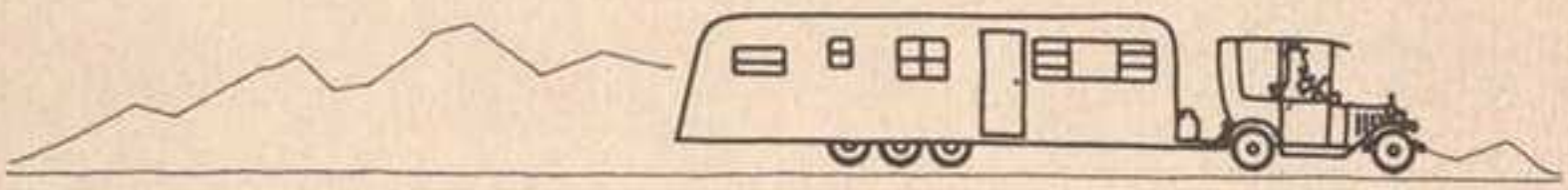
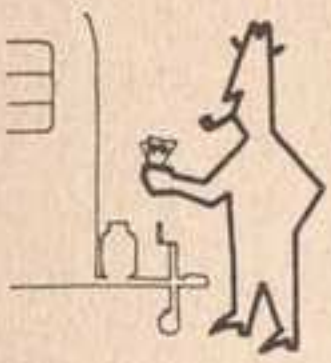


CHAPTER I

HOW TO BUY A MOBILE HOME



The smart buyer gathers information before he invests. It takes a lot of your hard earned money to purchase a mobile home. A mobile home is a complicated and elaborate home. The more you investigate before you invest the more chance you have of making the right decisions. Don't rush into the purchase of a mobile home. Take your time. Gather all the facts and information you can. You will find it profitable to read and study the information given on every page in this Manual, as well as the information contained in publications referred to in the Manual. We can't cover the entire field in this amount of space, but you will be acquainted with the necessary facts for the intelligent purchase of a mobile home.

No one can tell you what home you should buy. To a large extent the selection of a mobile home is determined by your personal preferences. *Your* personal likes and dislikes are the determining factors in selecting a mobile home. Just as there are many types, sizes and kinds of houses, mountain cabins, beach or lake homes, so there are many, many makes, models and kinds of mobile homes.To buy intelligently, you need to know what is available, something about acceptable construction standards, and where to buy.

How To Find Out What You Can Buy

Collect as much information about all of the mobile homes on the market as you can possibly assemble. In another section of this Manual you will find a chapter entitled "Publications of Interest to Mobile Home Owners". Many of these publications carry information about various makes and models. Magazines are especially helpful since they carry advertisements placed by manufacturers. These publications will tell you a lot about what is available, but you will need even more information. Use this information to make a list of mobile home manufacturers. You'll find a partial list of manufacturers of mobile homes at the end of this Manual. Send a 2¢ post card to each, requesting information on the various models. These post cards will bring you a veritable flood of information. You will get a million ideas from this literature but don't buy until you have read *all* of this information. You will then know what suits your needs best.

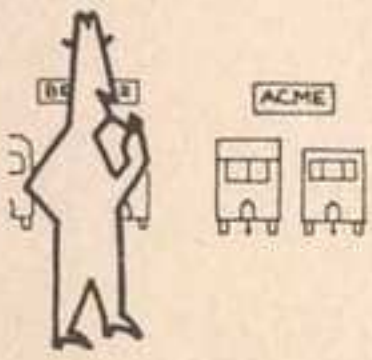
Decide Why You Are Buying

At first you will be confused by the seemingly endless number of models from which you can choose, but when you ask yourself the questions, "*Why* do I need this mobile home and *how* much can I afford to pay", you immediately eliminate a vast number of the models available. People buy a mobile home because: (1) they prefer it as permanent housing; (2) it is desirable housing for transient workers; (3) it is excellent housing for people with fixed incomes – especially those who have retired, for they are free to move to any locality, plus

having an economic way of living and few household responsibilities; (4) it is an inexpensive way for a family to take a vacation; (5) it makes a trip more pleasant for the sportsman; (6) it makes traveling less expensive and more comfortable.

Buying because you are looking for permanent housing? If you don't plan to move often, your only considerations are the cost and the amount of space and facilities you desire. Transient workers must give consideration to size because they will be *pulling* the mobile home. Travelers must give careful consideration to a minimum size to eliminate as many pulling problems as possible; try to stay under 27 feet. If you are in the vacation or sportsman group, you will probably prefer a 12 to 18 ft. camper.

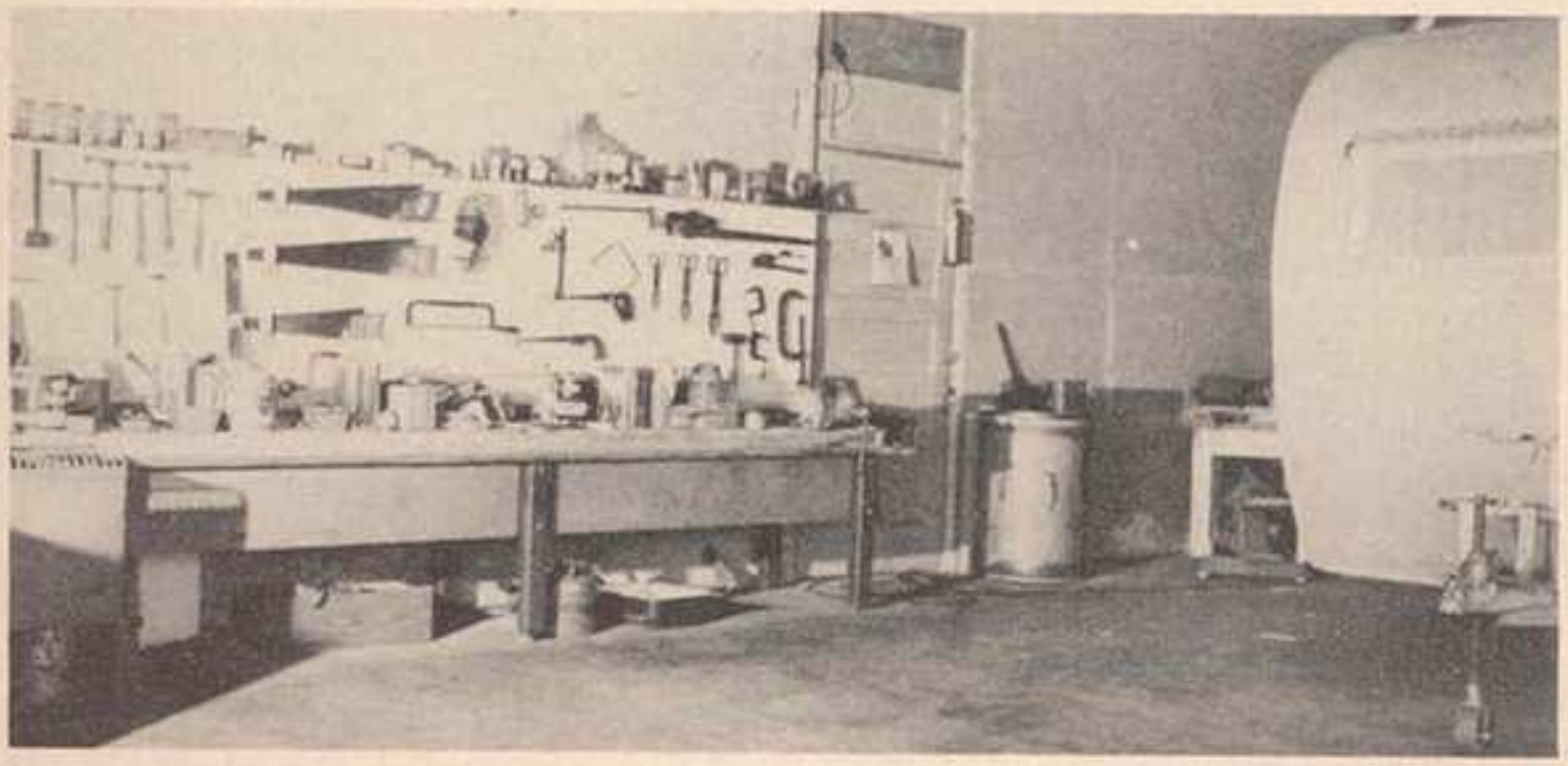
How To Select A Manufacturer and Dealer



Buy from a reputable, established manufacturer and investigate that manufacturer before you buy. Your banker can obtain information on the manufacturer of the mobile home you prefer. Buy from a firm that looks like it is going to stay in business – one that is financially sound. Such manufacturers will be interested in seeing that you are happy with your purchase so you will recommend them to your friends. Visit the mobile home parks in your area. Find the owners of the same make mobile home you plan to buy. They will be delighted to talk to you and tell you what they think of the manufacturer. Just go up and knock on the door. Mobile home people are friendly. You will find that you're more than welcome.

The Trailer Coach Association in Los Angeles and the Mobile Home Manufacturers Association in Chicago have specifications and building requirements their members must meet in order to carry their seal of approval. To purchase a mobile home with either of these seals is good insurance it is built to certain specified standards. However, the lack of this seal is not necessarily a sign that another mobile home does not meet, or even better these standards. Some fine manufacturers put out an excellent product even though they are not members of these associations. Write these two associations (you will find their addresses in the chapter entitled "Publications of Interest to Mobile Home Owners") and obtain a copy of their standards. Use these standards in judging mobile homes that do not carry the seals of approval.

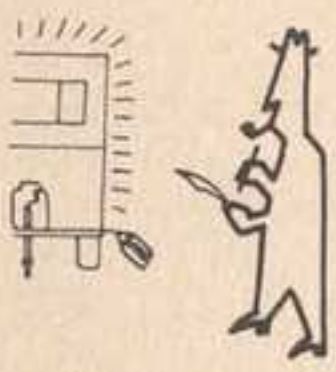
Your best protection when you buy is the reputation of the dealer. Have your banker investigate the financial stability of the dealer. Find the dealer who looks like he's going to stay in business. Find one who has a big stake in the mobile home industry. Look for dealers with a big inventory, with well kept lots, offices and merchandise. Many dealers have extensive service facilities at their place of business. Others, even though they do not have service facilities of their own, use the service facilities of established repair firms. Make sure the dealer is ready and able to render service. A mobile home is an elaborate mechanism. Even though the dealer carefully checks the



Buy from a dealer with a substantial investment in the mobile home industry. Dealer should have facilities for (1) Sales; (2) Parts; (3) Service.

mobile home before he delivers it to you, it is possible that it will need additional service just like a new car. Make sure the dealer is prepared to give it. Ask the dealer for a list of the names and addresses of people who have purchased coaches from him. Go and see those people and ask them how the dealer treated them. Beware of dealer organizations that use high pressure and make exhorbitant promises. Remember, you're making a big investment. *Be careful.* One of the biggest complaints of mobile home buyers is the treatment they receive from dealers and manufacturers. Caution will save you many a headache.

Check List For New Mobile Home Buyers



Here are some of the things you should do and consider before buying a new mobile home.

✓ **1.** Decide why you are buying and how much you can pay so you can select that which fits your need and pocketbook.

✓ **2.** Investigate the manufacturer and dealer. Have your bank check their finances. Ask for references (other buyers). Take the trouble to follow-up those references carefully.

✓ **3.** Collect all information you can on all that is available to fit your requirements.

✓ **4.** Obtain copies of the standards established by the two manufacturers associations and also the standards published by the National Fire Protection Association. (See our chapter on "Publications")

✓ **5.** Find out about tires and wheels and make sure you're getting what you require.

✓ **6.** Get the facts about mobile home heating systems and evaluate the heating system.

✓ **7.** Undercoating is especially desirable on mobile homes. It not only protects the frame but seals all cracks and openings through which insects, dust, and other foreign materials can enter the mobile home.

✓ **8.** Get the facts on mobile home brakes and make sure your selection is properly equipped.

✓ **9.** Investigate mobile home insulation and find out exactly how the the coach you plan to purchase is insulated.

✓ **10.** A roof that is covered with mastic is preferable to a roof that is not. This applies to metal or any other type roof.

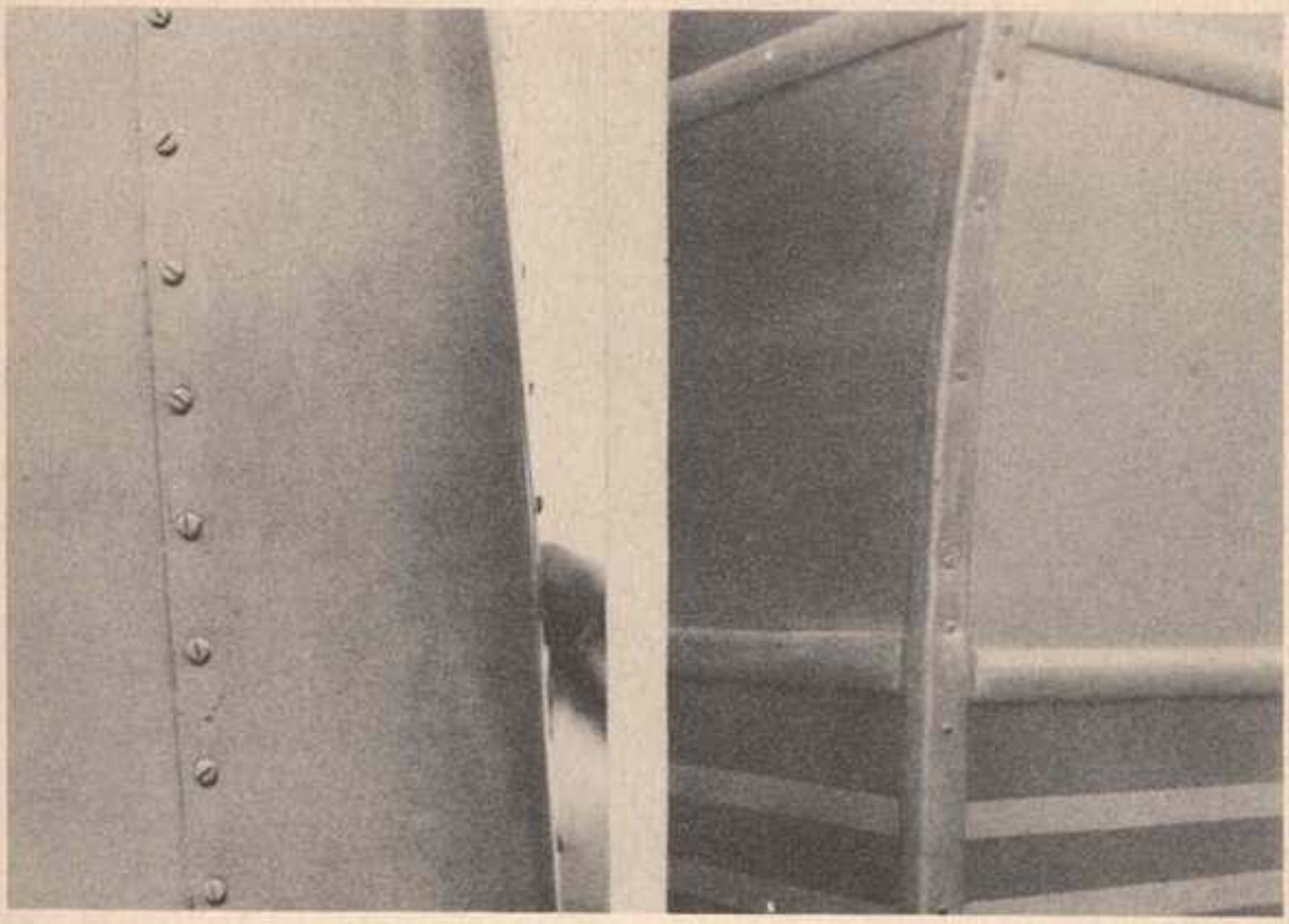
✓ **11.** Check all cabinet work. Make sure doors fit and are well constructed; that the interior paint finish, as well as the exterior, is well applied.

✓ **12.** Make sure exterior doors and screens fit well.

✓ **13.** Consider depreciation. The purchase of a coach of a well established manufacturer will ordinarily decrease depreciation loss. Depreciation loss can also be minimized by purchasing a mobile home that is up-to-date and modern in design.

✓ **14.** Get the facts about water heaters and make sure your mobile home is properly equipped.

✓ **15.** Make sure linoleum is inlaid.
✓ **16.** Make sure mobile home is put together with *screws*, not nails or screw nails.



Seam at left held by screws. Molding at right held by screw nails. Screw type construction is always better. Screw nails can be identified by lack of slot in head.

✓ **17.** A mobile home should be equipped with appliances manufactured by reputable manufacturers. The dealer and manufacturer ordinarily do not guarantee appliances. If you have difficulty, you will be referred to the manufacturer of the appliance. Make sure the appliance manufacturers are reliable and stand behind their products.
✓ **18.** Get a written guarantee from both dealer *and* manufacturer.
✓ **19.** Make sure you know where you are going to park the mobile home. In many areas, desirable parks are filled to capacity. If you're buying for housing, the finest mobile home in an undesirable park will not satisfy you. Should you have difficulty locating a parking place that suits you, ask your dealer's assistance.
✓ **20.** Find out all you can about mobile home furniture. Because of the limited area in a mobile home, furniture receives more wear than it would in a house. Therefore, it should be of the best construction. Consider the desirability of island beds. Consider whether you want a divan or love seat arrangement.
✓ **21.** Have the dealer explain to you exactly what is included with the mobile home. Most dealers add various nick-nacks to give display models eye appeal. Find out whether the curtains are yours, whether the bed spreads are yours, etc. Ask the dealer to furnish a water line to connect the mobile home to the park water outlet. Find out whether

a sewage line comes with the mobile home. Find out whether you are going to be furnished with a line to connect your electrical system to the park's electrical outlet.

✓22. Before you move the mobile home off the dealer's lot, make sure that all insurance you plan to purchase is in effect.

✓23. If you're financing your purchase, you can usually get a lower rate on the unpaid balance through a bank. Beware of finance company loans involving high interest rates.

✓24. Make absolutely sure dealer is licensed and bonded. Require him to include on bill of sale all license fees as well as insurance costs *if* you are buying it through the dealer.

✓25. Before you buy insurance, carefully investigate various policies so that you can get the coverage you require at the best possible rate, consistent with reasonable settlement of claims. Buy insurance for one year....never more. Your mobile home will be worth less each year, so premiums will go down. Don't buy insurance for two or three years based on new value. If you do, you are paying much too much.

Much of what we say in the section below regarding the purchase of used mobile homes will also be of interest to new buyers.

Check List For Buyers Of Used Mobile Homes

Many of the points mentioned above for buyers of new mobile homes are of interest to purchasers of used mobile homes also. Therefore, it will be of benefit to buyers of used mobile homes to use the new as well as the list given below.

Because used mobile homes may have been subjected to severe wear, it is extremely important that care be given to your selection. Of course it's almost impossible to find a perfect used mobile home. The same is true of a new one, however. This list is given to you for the purpose of pointing out the specific things you should know so that you will have the facts regarding the condition of the used mobile home.

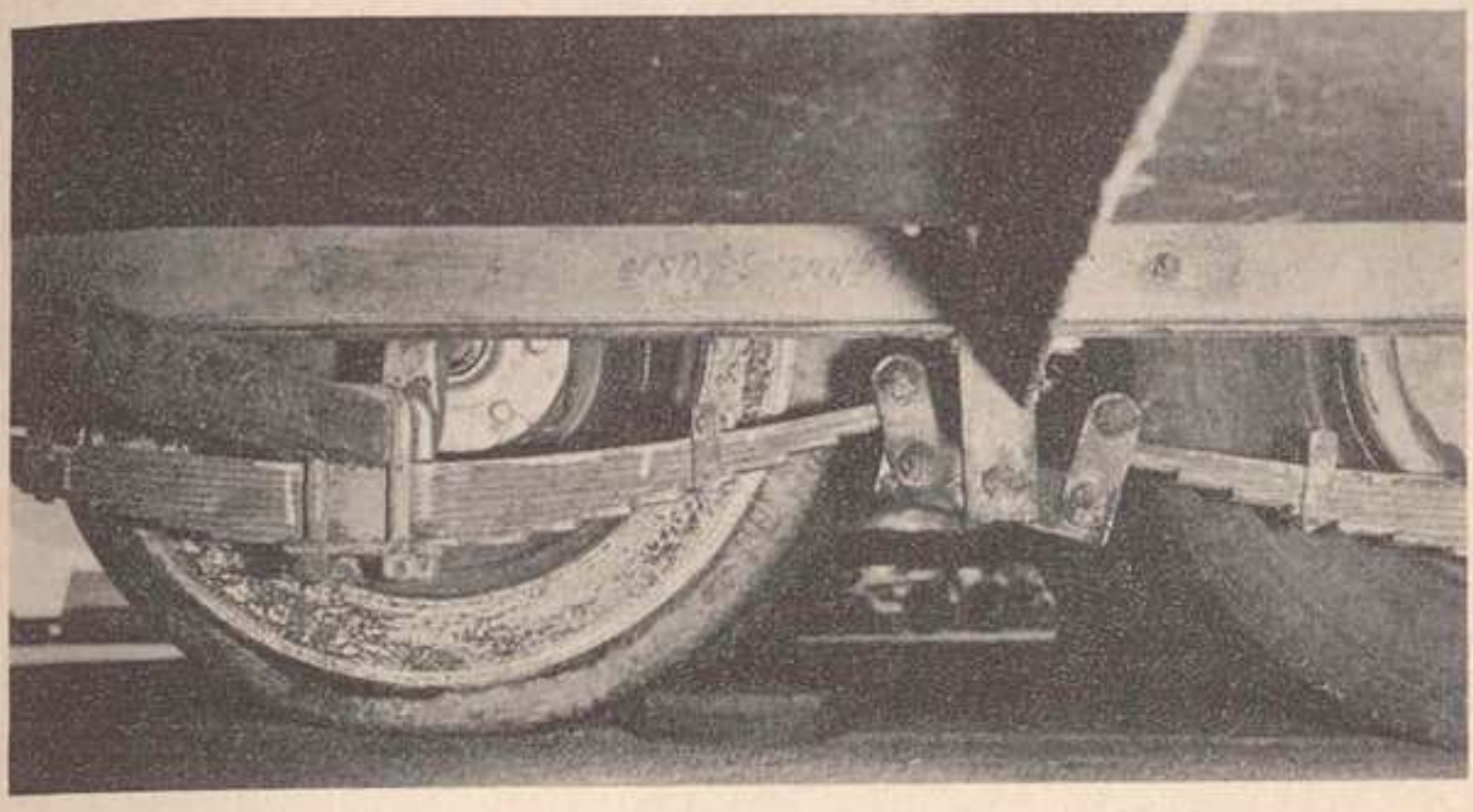
✓1. Check tires for correct size. Check for wear which might indicate misalignment. Note degree of deterioration.

✓2. Have dealer hook wiring in mobile home to power so you can check all appliances and fixtures to determine whether they are working. Your dealer probably won't guarantee appliances, so it is very important to determine for yourself their condition.

✓3. Have dealer give you a written guarantee that brakes are in operating condition, or test them yourself. *(See illustration next page.)*

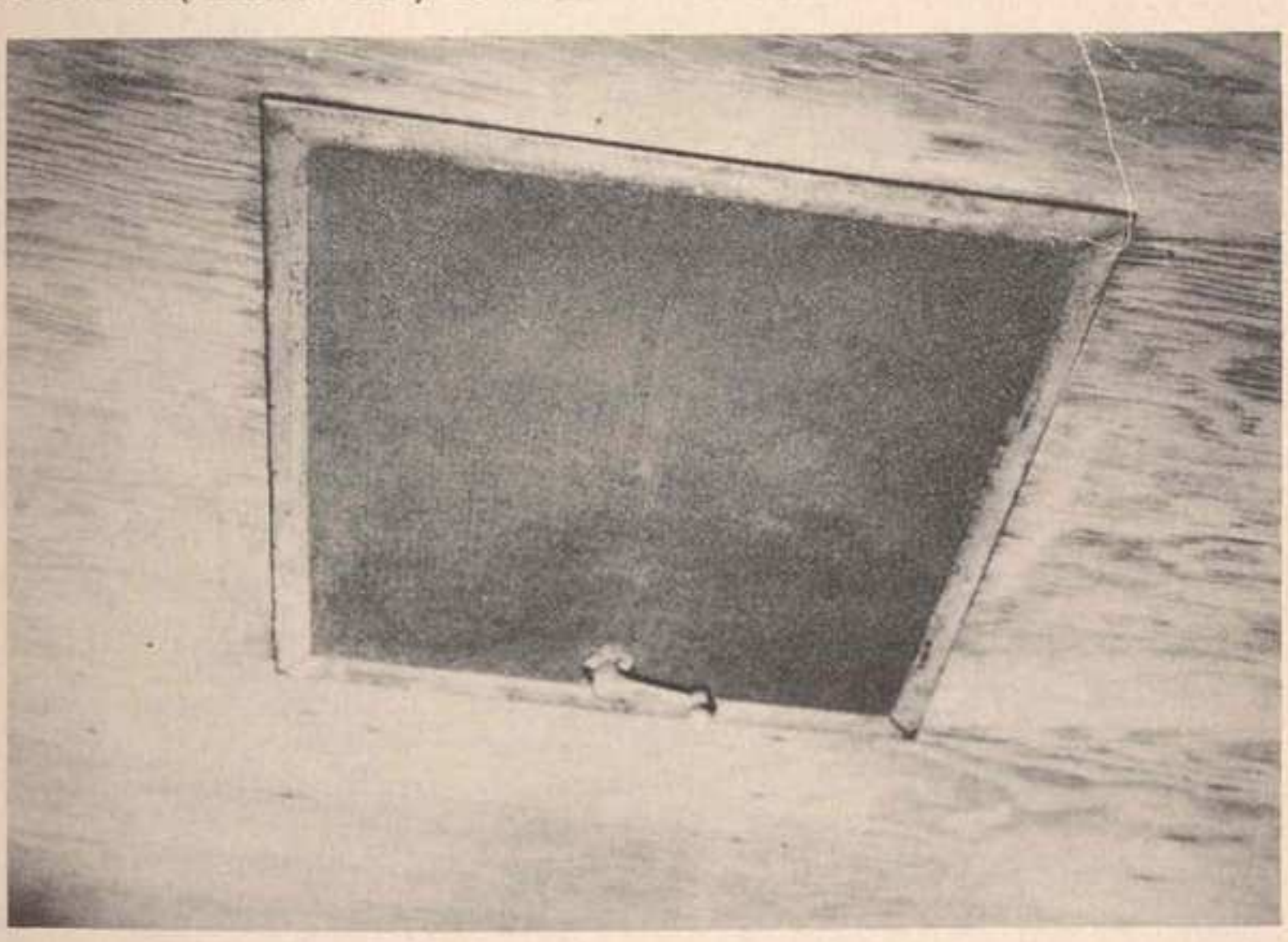
✓4. Inspect frame to make sure it is straight and not out of alignment. Check springs underneath mobile home for broken leafs.

✓5. Inspect all plumbing. Have dealer guarantee in writing that it is in good working order, or have water hooked up to the mobile home and test the plumbing yourself. If purchasing a mobile home with a toilet, make sure plumbing meets standards. If it does not, require dealer to change it. Toilet should be vented and have at least 3 inch sewer line.



Look at inside of wheels to see if mobile home has brakes. Axle at right has brakes. You see backing plate that holds brake shoes. Axle at left has no brakes but axle does have flange to which brakes can be attached. You see part of flange in photo (light semi-disc). It costs less to install brakes when axle has brake flange already attached.

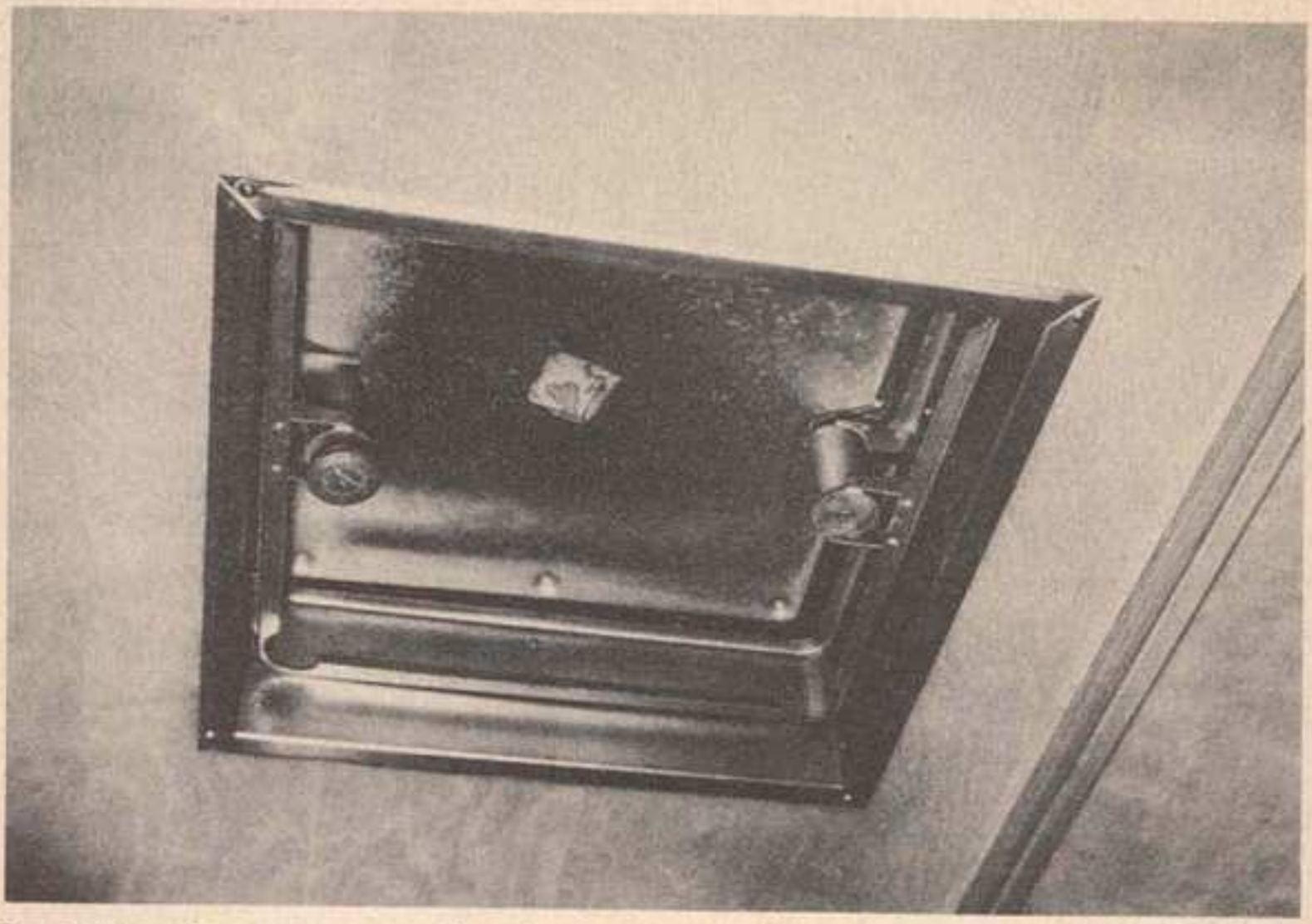
✓6. Examine all screens. You will find them on windows, vents, and doors. Inspect how they fit and their condition.



This dirt-clogged vent screen is typical of screens found in used mobile homes. Ask dealer to clean and repaint all clogged screens.

✓7. Operate all windows to make sure they open correctly. Examine window frames for signs of deterioration. Are they warped?

✓8. Operate all roof ventilators. Do they open properly? Do they fit tightly? Examine them and roof stacks for signs of deterioration.



Test all roof vent operators. Note broken operator on right side of vent shown above.

✓9. Have dealer guarantee water heater to be in working condition, or test it out to make sure that it functions properly.

✓10. Make sure jack and hitch do not show signs of damage. Operate jack screw to make sure it works.

✓11. Give careful consideration to the resale value of the used mobile home.

✓12. Examine floor. What is condition of linoleum? Look for squeaks or possible rotted floor boards. Also, look for holes through which insects or foreign material may enter the mobile home. Look especially in inobvious places, such as inside closets and underneath cabinets. *(See illustration on next page.)*

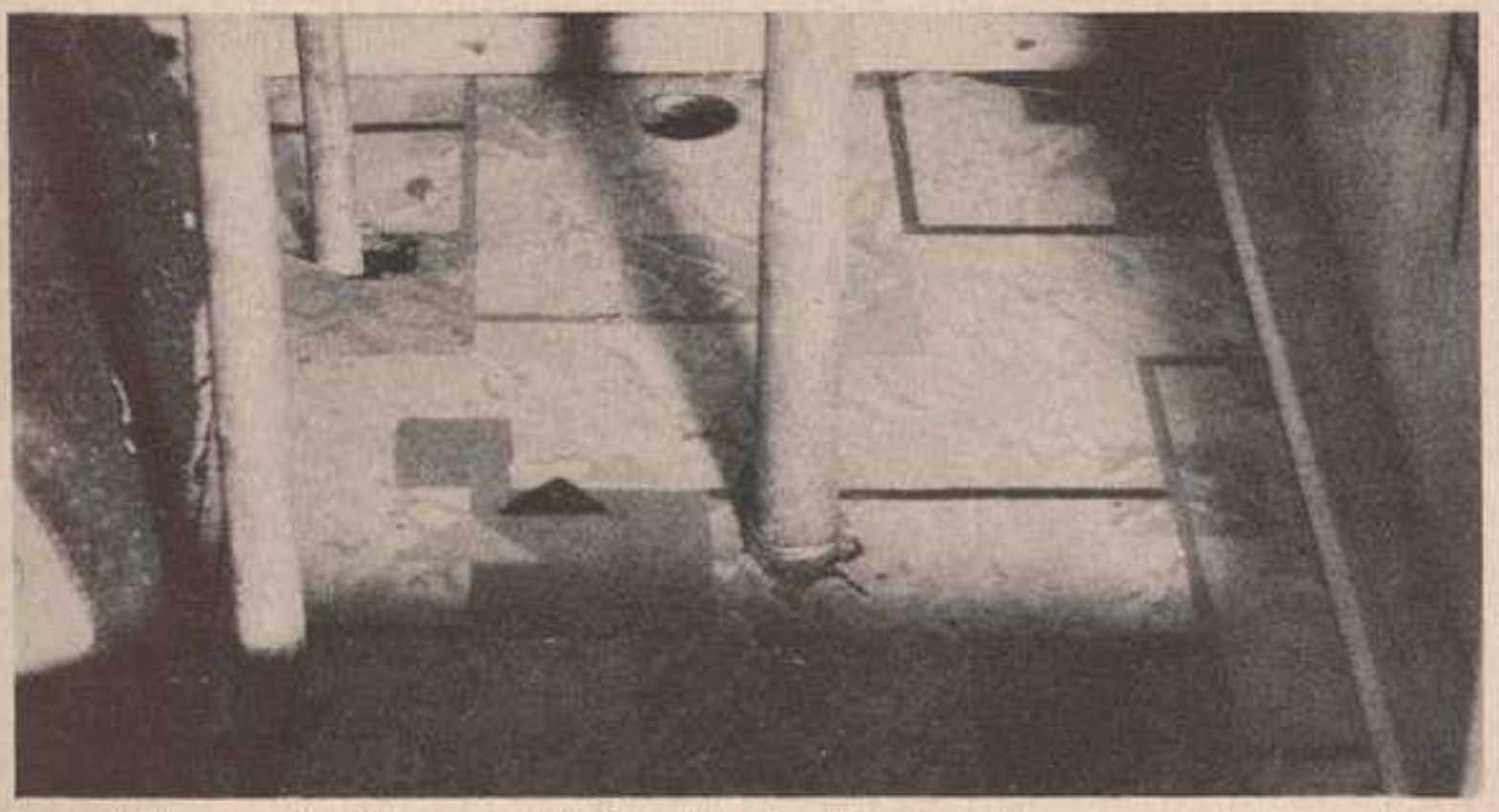
✓13. Test all cupboard doors to make sure they close and lock firmly.

✓14. Are exterior moldings deteriorated or in need or recalking? *(See illustration on next page.)*

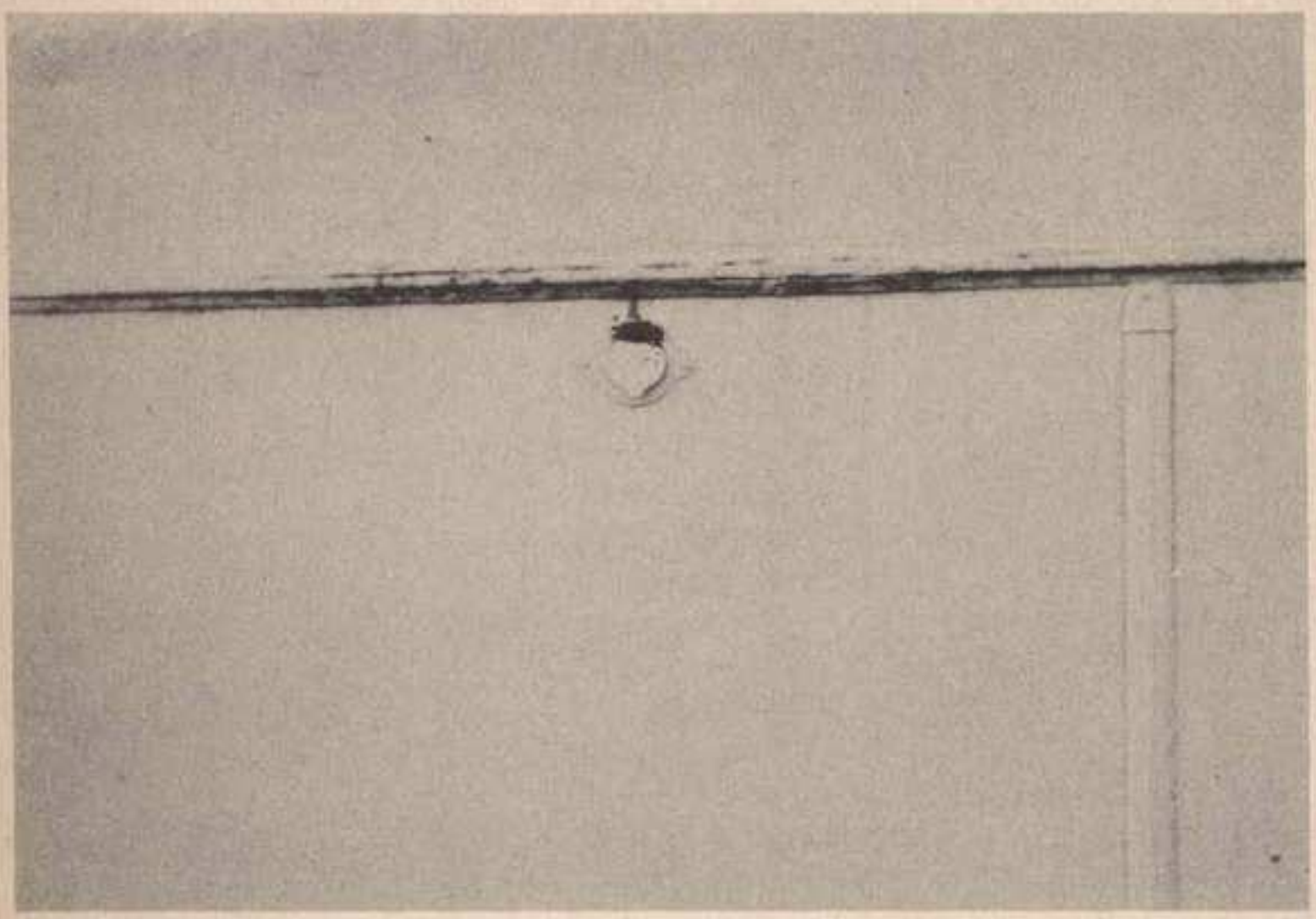
✓15. Check exterior and interior paint for signs of the need for reconditioning. If exterior paint shows signs of peeling or chipping, require dealer to repaint. *(See illustration on following pages.)*

✓16. Check all interior wood paneling for signs of water damage that would indicate a leaking roof.

✓17. Examine stove, refrigerator, and heating equipment. Use a flashlight to determine condition. Dealer should be required to clean excessively dirty appliances.



Especially examine floors inside floor level cabinets. Unnecessary holes and oversize holes around plumbing going through floor invite insects into mobile home.

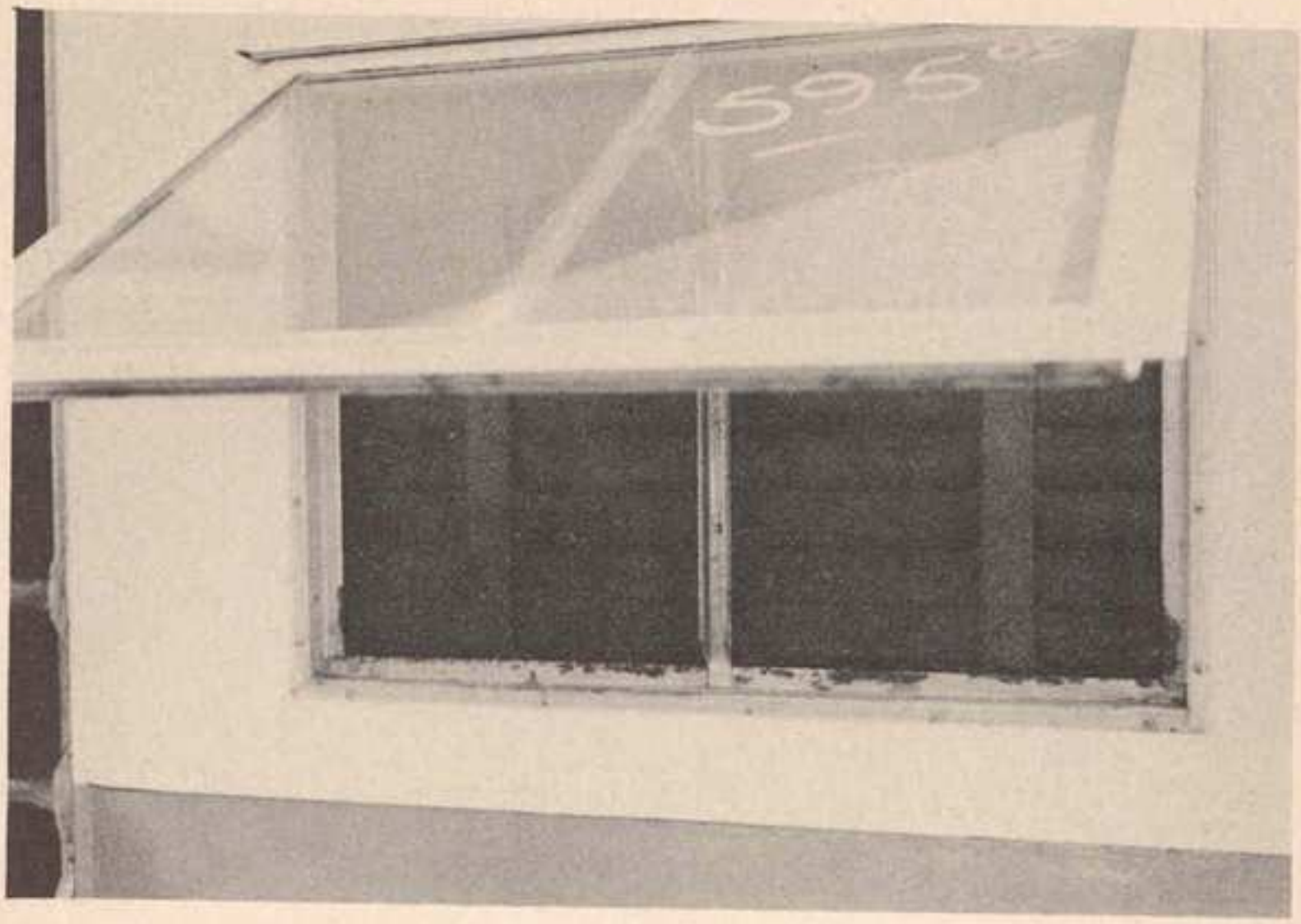


Note badly deteriorated molding on this mobile home side wall. Require dealer to replace any bad molding.

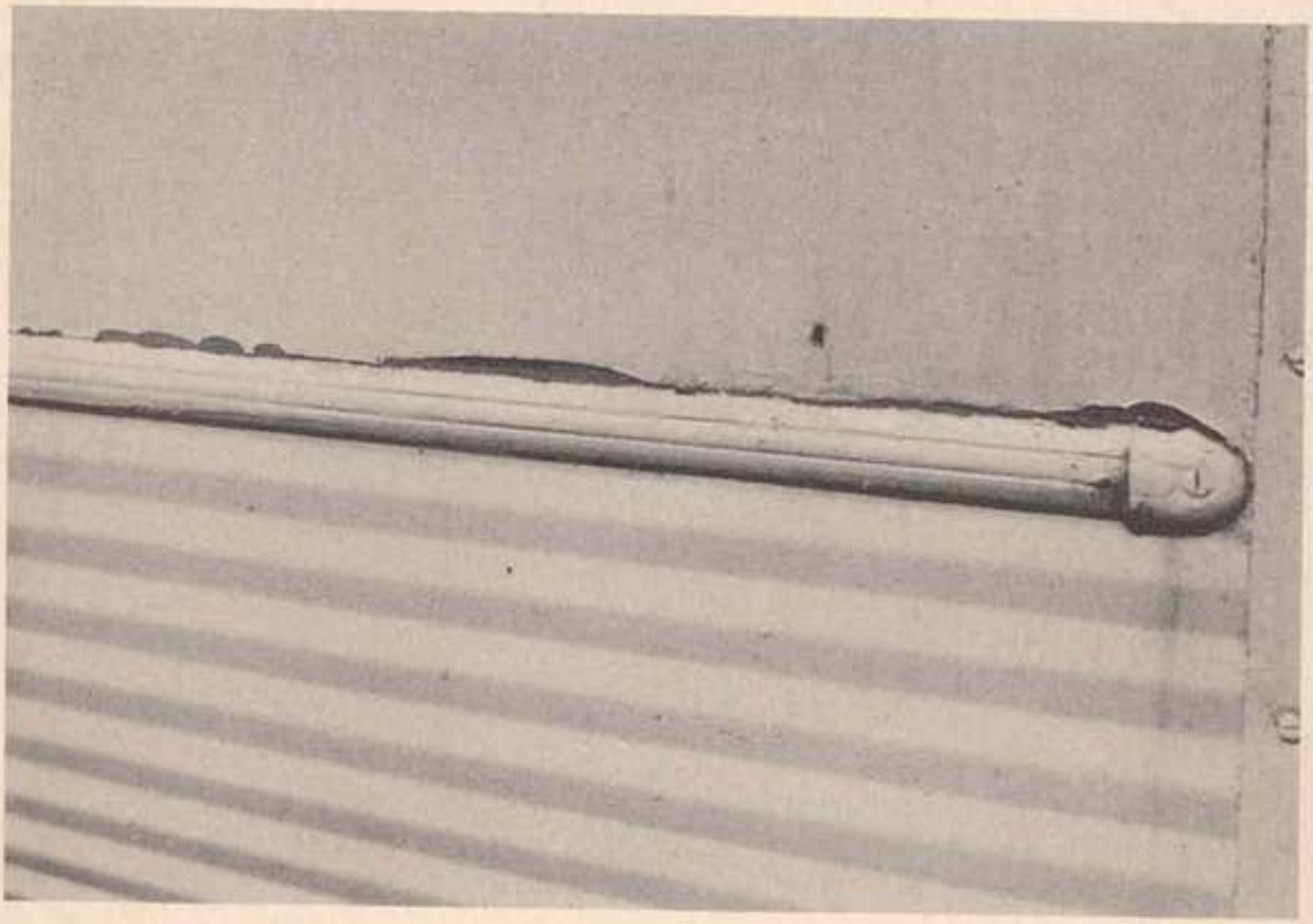
✓ **18.** Operate all gas appliances to make sure that tank, regulator, and all gas lines are functioning. Require dealer to guarantee all gas lines to be free of leaks.

✓ **19.** Check oil heaters to make sure they are working.

✓ **20.** Require specific information from dealer regarding nature of insulation.



Open all windows. Look for signs of rust. Badly rusted windows must be replaced. Jab rusted spots with a screw driver to make sure metal not completely deteriorated. If metal is O.K., have dealer clean off rust and repaint.



First signs of need for repainting usually appear at moldings. Pay close attention to these points when inspecting mobile home for condition of paint.

Never buy used coaches without checking roof. Ask dealer for a ladder. Metal roof shown in top photo has been sealed with mastic. Vents and stacks are in good condition. Roof in lower picture requires reconditioning.

✓**21.** Check condition of furniture and bedding.
✓**22.** Particular attention should be given to mobile homes with masonite exteriors. Look for signs of warping and note condition of paint.
✓**23.** Check locks in all doors to make sure they work. Do doors close tightly?
✓**24.** Check all exterior seams and joints. Are they properly caulked to prevent water seepage?
✓**25.** Inspect roof. Request dealer to give you a ladder. Climb up and look at it yourself. Roof must be in good condition. *(See illustration on foregoing page.)*
✓**26.** If you are buying from a private party rather than a licensed bonded dealer, make sure that ownership certificate is in good order. Beware of fictitious titles and liens. Require seller to accompany you to motor vehicle department to make sure that title is properly transferred and that you are aware of all license fees and/or liens that must be paid before ownership can be transferred.

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What You Need To Know About Mobile Home Insulation

When you purchase a mobile home or sports trailer, don't ask the dealer, "Is it insulated?" It's too easy for him to answer, "Yes", and be "technically" correct. The dealer may answer your question in the affirmative on the grounds that some type of insulation is used, or on the grounds that the manufacturer has represented the unit to be insulated. The important question for you to ask is, "*How* is the unit insulated?" This may be a tough question for the dealer to answer. In many cases factory literature will explain the type of insulation used. Bear this in mind. Your dealer is probably not an insulation engineer. He is not expected to understand thoroughly the technicalities of this important subject. Remember this, too. If you're negotiating for the purchase of the product of a reliable manufacturer, it's probably adequately insulated. When in doubt, you should make detailed inquiries.

You can usually find out for yourself what type of insulation you are buying by investigating holes in the ceiling, floor, or side wall that have been made for the purpose of installing various types of accessories. For instance, you can usually get a look at the side wall insulation by removing a light fixture. You'll find holes in the floor for plumbing, floor heaters, oil heaters, etc. In the roof you will find stove stacks and ventilation stacks. Frequently by removing any of these accessories from the mobike home, it is possible to inspect construction not readily seen by the naked eye to determine the nature of the insulation. To inspect the mobile home for insulation it is necessary for you to know what you are looking for. Here's what you

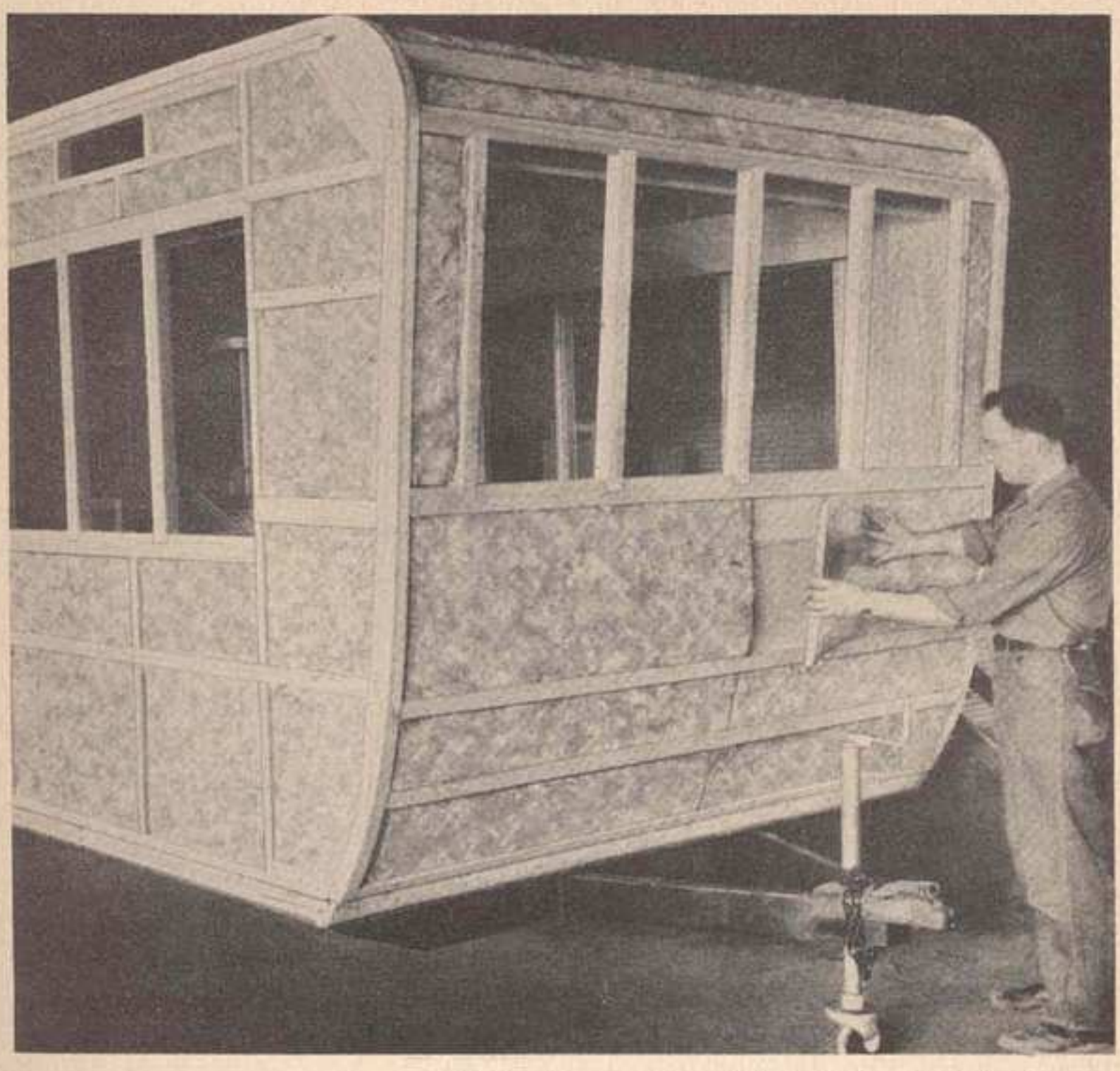


Illustration courtesy of the Armstrong Cork Company

need to know.

The purpose of insulation is to keep heat *out* in the summer and heat *in* in the winter time. The fundamental purpose is your comfort and a reduction in the cost of heating. In the long run, the comfort insulation provides is free. The cost of the insulation is returned to you many times in reduced heating costs. To understand how insulation keeps heat in or out, it's necessary to examine briefly the causes of heat gains or losses.

Heat travels in three ways: (1) *Conduction.* This is the way heat travels through any solid material. Each particle of the solid passes some of its heat along to adjacent particles until the whole solid has been heated. A typical example is a spoon in a cup of hot coffee. The coffee heats the lower part of the spoon and before long, by conduction, the upper part of the spoon is hot even though it is not in contact with the heated liquid. (2) *Convection.* This is the way heat travels through liquids or gases. This is exemplified by the way the interior of your mobile home is heated. The air near the floor is heated by the heater and rises to the ceiling. The colder air in the ceiling which is heavier than hot air falls to the floor and in turn is

heated. This air circulation distributes the heat from the heater throughout the whole of the interior of your mobile home. (3) *Radiation.* This is the way heat moves through space. The heat of the sun heats the earth in this manner. As these heat rays move through space, they heat any solid object they contact.

Your mobile home wall, floor, or ceiling, consists of an inner wall, an outer wall, and a space between these two walls. Part of this space is taken up by the studs used to hold these two walls in place. When you heat the interior of your mobile home, a large amount of this heat escapes through the walls. The interior wall is heated. By conduction, this heat is transferred to the studs and then to the outer wall. The heat of the inner wall is also transferred to the outer wall across the air space between the two walls, mostly by radiation, but also by the process of convection.

There is no way to stop this heat travel completely. The purpose of insulation is to slow it up. Air that is motionless is the best known insulator. However, air is practically never motionless, and the purpose of some types of insulation is to keep it as quiet as possible. If the air is motionless, convection ends.

The insulation engineer tries to stop heat movement by: (1) Using materials that are poor conductors of heat to stop conduction; (2) dividing side wall air into small pockets so that it can't move to stop convection; (3) using reflective surfaces to bounce heat back to its source of origin to stop heat loss by radiation.

At this point the problem of vapor enters into the insulation question. Vapor is a problem to the insulation engineer. We have stated above that dead quiet air is the best insulator known. But, if this dead air becomes laden with vapor, it is no longer a good insulator. So, the insulation engineer strives to keep vapor laden air out of the dead air space between the mobile home walls. This is accomplished by using a vapor barrier.

When you inspect a mobile home for insulation, this is what you are looking for. A well insulated mobile home will provide protection against heat losses or gains due to convection and radiation. A vapor barrier must also be provided. Heat losses or gains through conduction must also be given consideration in engineering the mobile home.

Here's specifically what is done to stop heat losses or gains through conduction, convection, and radiation and to provide a vapor barrier.

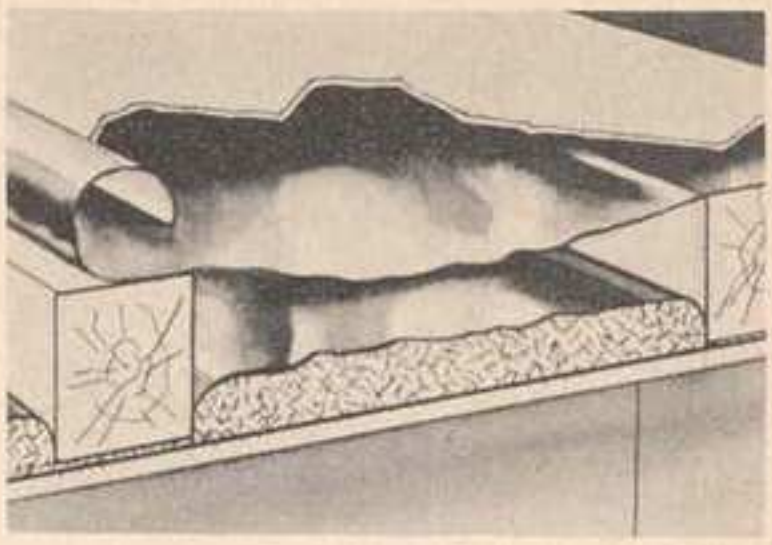
To stop conduction, walls, ceilings, and floors, including wheel houses, should be made in such a way that they will insure as little contact as possible with the exterior metal surfaces. In inspecting a mobile home there is not much you can do to determine whether or not consideration has been given to this factor in construction. This is an engineering matter involving the use of sufficient studding to provide necessary strength, yet allowing a minimum of contact between inner and outer walls through studding.

Protection against convection is accomplished by breaking up the large dead air space between the inner and outer walls. When the large air mass between the walls is broken down into minute air

pockets, the air is kept as still as possible. By using various types of fibrous materials the large air space between the walls is broken down into small segments. Familiar materials used for this purpose are cork board, laminated fibrous wood sheets, spun glass, etc.

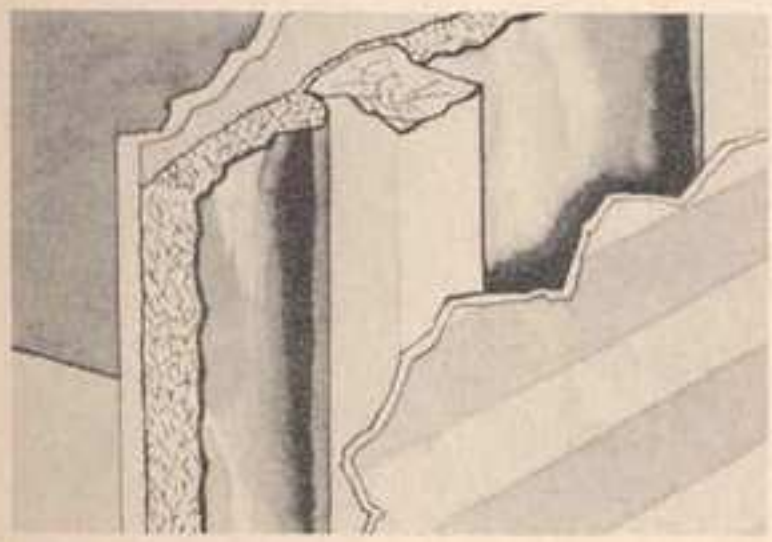
To prevent heat gains or losses due to radiation, various reflective materials are used. The largest amount of heat gains or losses are effected through radiation. The most frequently used insulation reflective material is thin paper coated with aluminum flakes or aluminum foil.

A vapor barrier is normally a sheet of asphalt impregnated insulating board, or paper coated with aluminum foil.

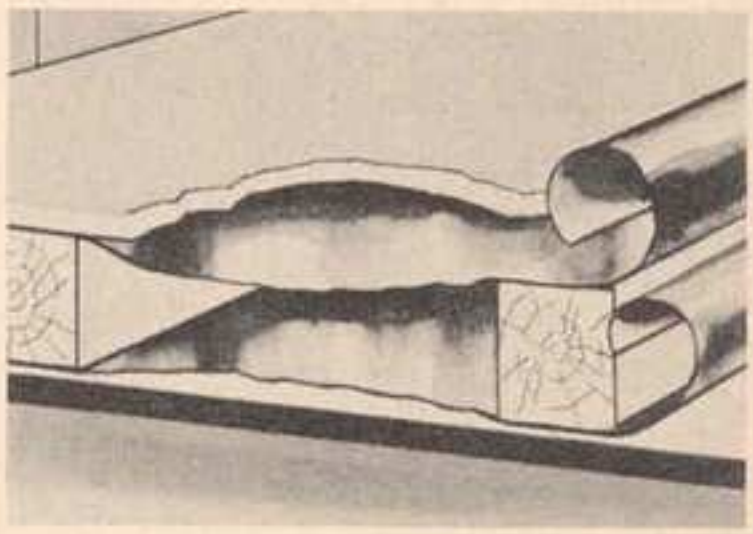


Courtesy Silvercote Products, Inc.
Ceiling insulation shown here controls heat travel by conduction, convection and radiation. Just below roof is a reflective sheet coated two sides. Next comes dead air space and below it an additional reflective sheet and below it a fiber blanket.

A typical well insulated mobile home would have the following: *In the walls* a sheet of reflective paper installed between the inside wall and the mobile home studding, with the reflective side facing toward the interior; a vapor barrier just below the reflective sheet, consisting of asphalt impregnated paper (if the reflective sheet is an aluminum foil with paper backing, this constitutes a sufficient vapor barrier without the use of asphalt impregnated paper); between the studs will be placed a fibrous material; between the outer skin and the studs an additional sheet of reflective material will be used, with the reflective surface facing out. *In the floor* will be found fibrous materials in the dead air space, a vapor barrier on both sides of the studding, and a reflective surface facing up. *In the roof* there will be a porous material in the dead air space, a vapor barrier



Courtesy Silvercote Products, Inc.
Wall insulation shown here consists of fibrous blanket against inside wall, then a reflective sheet. Between outer wall of mobile home and reflective sheet is dead air space.



Courtesy Silvercote Products, Inc.
Floor construction shown here emphasizes protection against heat loss due to radiation. Two reflective sheets coated both sides are provided with dead air space between them.

on both sides of the studs and a reflective sheet just above the inside wall, with the reflective surface facing down, and a reflective surface just below the outside skin facing out. You will seldom find a mobile home that is insulated to this degree, but from the information given, you can determine for yourself exactly what insulation is in the mobile home you are planning to purchase.

We caution you again not to take a salesman's word on the question of insulation. You will find units with all degrees of insulation. We've seen factory jobs that were advertised as insulated when the only insulation consisted of a fibrous material between the inner and outer walls. Technically speaking, the mobile home was insulated. But, lack of a vapor barrier meant that in a matter of a few months the air cells in the fibrous material would be vapor laden and would no longer constitute a good insulator. What is more important is that most heat gains or losses come about through radiation, and if no reflective surfaces are provided, the insulation is not adequate.

Bear in mind that insulation is a practical matter. Cost and weight must be taken into consideration. Investigate before you invest, and make sure that a reasonable attempt has been made to provide protection against radiation and convection, and that a vapor barrier is present.

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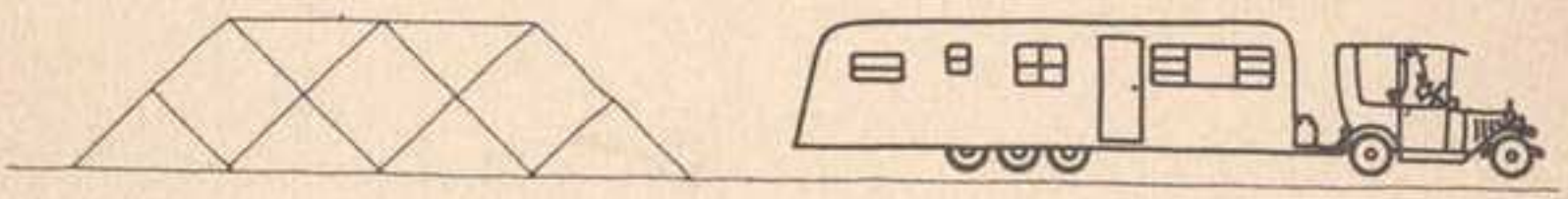
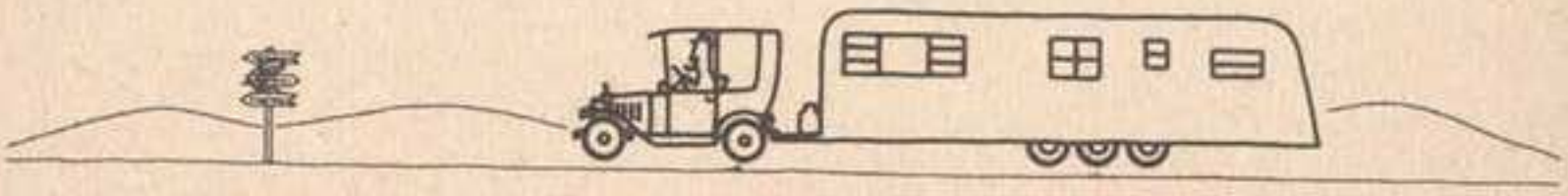
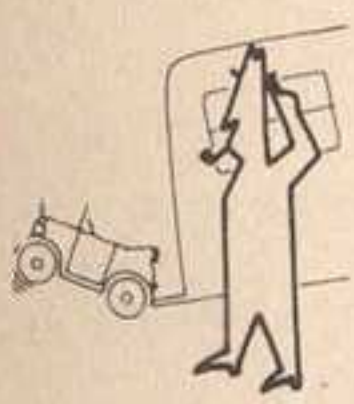




CHAPTER II

WHAT YOU NEED TO KNOW TO SAFELY AND ECONOMICALLY PULL A MOBILE HOME

What You Need To Know About Automobiles



WHAT CAR TO BUY – Automobiles are not engineered to pull a mobile home. However, most modern American cars are capable of pulling mobile homes up to 27 ft. long at reasonable speeds over our modern highways. To pull a unit of more than 27 ft., it is necessary to get a larger and more powerful car. The larger and more powerful the car, the better. Even though a particular car may be capable of pulling a particular mobile home, it must be borne in mind that to subject it to this task works an extreme hardship on the car. The car will wear out faster. The repair bills will be higher. Operation cost will increase. This is the reason many who own large mobile homes, and move them frequently, purchase a half ton or three quarter ton pickup truck instead of an automobile. This is also the reason some mobile home owners. especially those who do not move often, hire transport firms to move their mobile homes for them.

Here are things to bear in mind when purchasing an automobile for the purpose of pulling a large mobile home:

1. The bigger and more powerful the car, the better.

2. The car should not have a loose link front end or it is inclined to drift and wander on the highway. Power steering is desirable.

3. Rear axle gear ratio should be at least 4.8 to 1.

4. Automatic transmissions are debatable. The big advantage is it automatically shifts gears when they should be shifted. This makes driving easier and saves the car. The disadvantages are its initial cost, higher operating cost (you don't get as good mileage with an automatic transmission), grade climbing ability is normally not as good, and on especially steep hills the hand shift lever is superior to the automatic transmission in some cases.

DESIRABLE MODIFICATIONS – It is possible to do many things to modify a stock automobile to improve its ability to handle a mobile home. Here is a list of things for you to discuss with your automobile dealer to determine the desirable changes in the automobile.

1. Install a heavy-duty clutch.
2. Install a heavy-duty transmission.
3. Install a heavy-duty differential.
4. Install oversize radiator and larger fan blade.
5. Install a specialized hitch that moves the weight of the mobile home from the rear of the automobile to the center of the car's frame or to the rear axle of the car.
6. The horsepower of the car can be increased by (a) high compression heads, (b) dual carburetion, (c) dual manifolds.

The larger the mobile home the more desirable will be the modifications listed above. Careful consideration should be given to making any particular modification. Costs may be high, and the improvement that can be effected will depend upon the make and model car. For that reason, discuss all planned modifications with the automobile dealer handling your make car. He can help you weigh the benefits against the cost.

EFFECTS OF MOBILE HOME PULLING ON CAR – It is obvious that when you require your car to pull a heavy load, mileage, acceleration, top speed, and grade climbing ability are reduced. A general statement as to what will happen is not reliable. Accurate reporting of facts would require specific statements as to what happened to a particular car pulling a particular mobile home under particular conditions. Such tests have been made. The reporting of these facts in this publication would require too much space. The figures we now give can be criticized as being entirely too broad. But, we quote them for the specific purpose of giving you a general idea of what happens when a heavy mobile home is towed by an automobile. Here's what you can expect:

1. Mileage is reduced 40% to 50%.
2. A fast get-away uses approximately 35% more gasoline.
3. Grade climbing ability is reduced from 50% to 75%.
4. Top speed is reduced as much as 50%.
5. Acceleration time is doubled.

HOW TO MAINTAIN CAR AND IMPROVE ECONOMY – We have said that pulling a mobile home subjects a car to a task for which it was not engineered. For this reason, special attention must be given to

the car when it is used for this purpose. Normal maintenance procedures are not adequate. We have also emphasized increased operating cost. Careful attention to economy possibilities will therefore pay big dividends. Here is a check list to act as your guide in maintaining your car and improving economy:

1. Special attention must be given to the lubrication of your car. It needs it more often. Stay around and see that it's done right, too.

2. Give constant attention to rear axle and gear box lubrication. They need to be checked and serviced frequently and kept full at all times.

3. Change oil more often – oil filters, too.

4. Flush radiators thoroughly every 3000 miles. If the plug or tap at bottom of radiator is small, remove hose at bottom of radiator to make sure it is thoroughly flushed out.

5. Your battery gets much heavier use. Check it often and keep it full.

6. Don't waste gasoline by pumping accelerator when starting. If engine does not respond immediately, press accelerator clear to floor and then try to start.

7. Don't race your engine. It wastes valuable fuel.

8. To get the best mileage, travel between 25 and 35 miles per hour.

9. Avoid stops and starts by timing signals. When you do start start slowly. *Stepping on the gas* feeds an extra rich mixture into your engine. Avoid it.

10. Don't use cheap gas. The use of cheap gas requires the engine to be tuned down, hampering top performance.

11. Set distributor for the grade gasoline you use.

12. Do not fill gasoline tank to top. It is apt to splash out. Furthermore, in hot weather gasoline will expand and overflow. Don't drive with tank too empty. This permits excess vaporization of fuel and escape through the gasoline cap air vent.

13. Clean air filter every 1500 miles. A dirty air filter chokes the engine, reducing power and mileage.

14. Have carburetor cleaned regularly.

15. Prevent the formation of carbon in motor with resultant loss of power by regular *hot shot* treatments.

16. Keep battery fully charged. It is subjected to an extremely heavy load, and a hot ignition spark is necessary for full power realization.

17. Keep about ½" slack in fan belt. Don't let it get too tight and increase motor friction.

18. Check spark plugs every 2500 miles and regap.

19. To cut down engine friction use the lightest weight motor oil possible. If you are using too much oil, an overhaul is much cheaper than an increase in the weight of oil used.

20. When approaching grades, build up as much momentum as is possible.

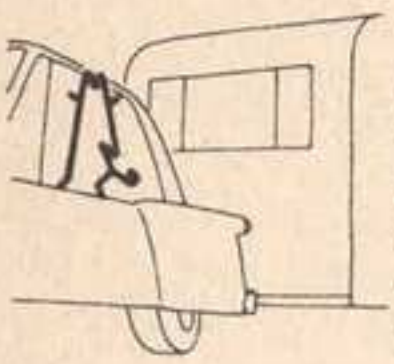
21. Keep carburetor needles in adjustment.

22. Use oils containing detergents.

23. You can reduce your gasoline cost as much as 5% by purchasing gas in the evening or early morning before it has had a chance to expand in station tanks.

24. Avoid heavy traffic.

How To Pull A Mobile Home



SHIFTING GEARS – Proper shifting will save your car. If you wait too long to shift gears, or shift roughly, it throws unusual stress on all mechanical parts of the car. Your clutch, transmission, differential, drive shaft, and tires are stressed far beyond what they were originally designed to bear. Don't rush shifting. It increases wear and could even cause a snapped axle.

Try to eliminate unnecessary stop and go signals. When approaching a signal, slow down, so that it will not be necessary to come to a full stop. Proper timing of signals will pay off many times over in longer life for your car. One of the biggest strains on the car is when you start from a dead stop. Avoid stops wherever possible. Try to keep at least 300 feet between you and the next car. This will enable you not only to avoid many unnecessary stops, but it's an added safety precaution too. You never know what the driver in front of you is going to decide to do.

You may be able to avoid shifting when going up a hill if you will speed up, traffic permitting, as you approach the hill.....the momentum may carry you over without shifting. When going down a mountain grade, always shift into second and if the grade is unusually steep, use low gear. This enables the car motor to assist the brakes of the car and coach. In climbing a grade, an easy way to judge when it's time to change gear is to depress the accelerator. If there is not an immediate response, it's time to get into a lower gear.

When starting, start slowly and steadily. The same applies to stopping. Both sudden stops and starts are hard on a car and coach. They can cause damage to the contents of the mobile home too. Remain in low gear until the equipment is rolling along nicely before shifting into second. Stay in second until a speed of about 30 is attained and then shift into high. When going up a grade, shift into second when you reach 25 miles per hour, and shift into first if you slow down to below 20 miles per hour.

Important Pulling Tips

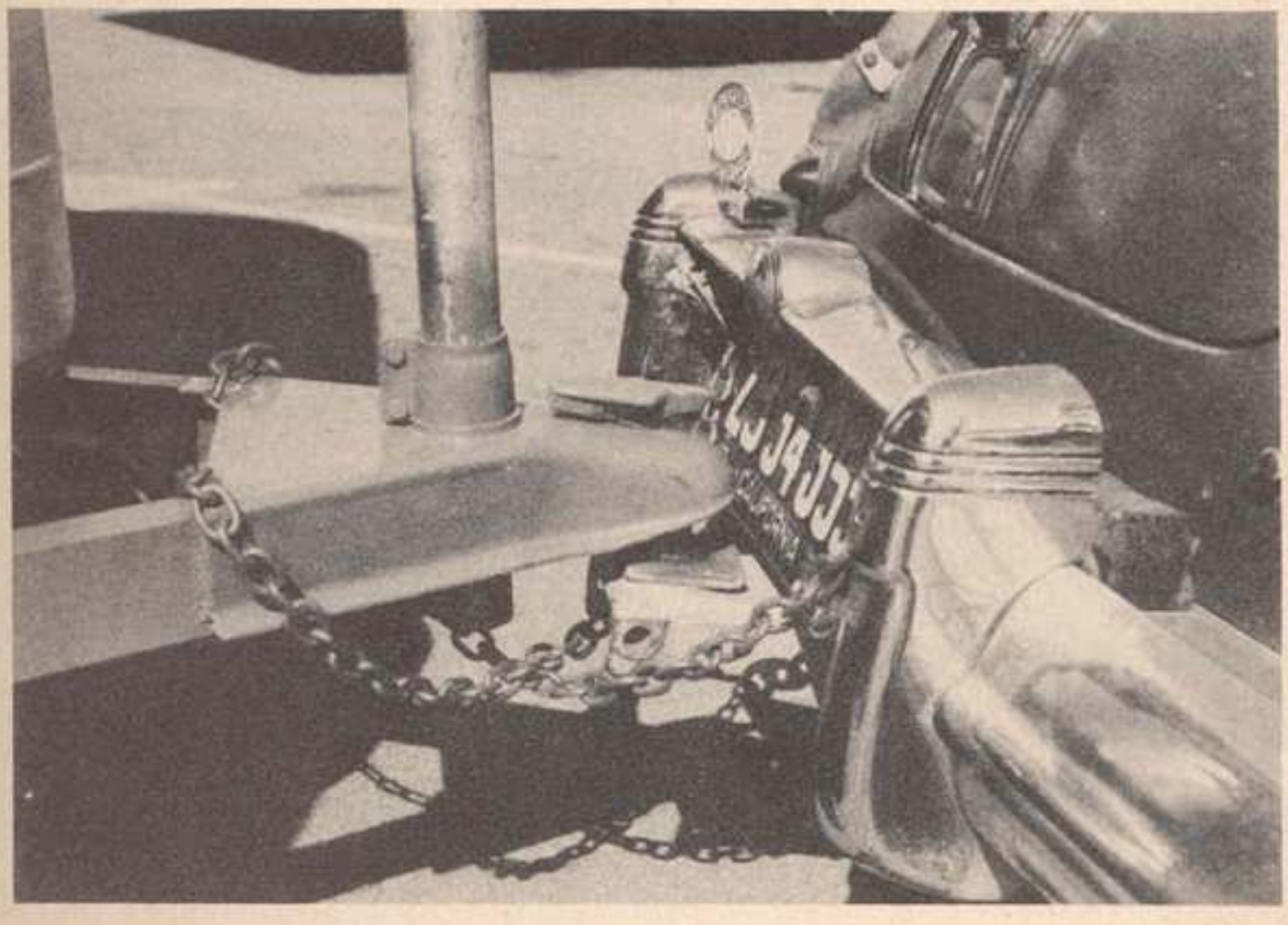
WHAT ROUTES TO TAKE – When pulling a heavy mobile home, stay on the main roads and try to avoid steep grades wherever possible. Light camping trailers can be pulled easily over most types of roads. Stick to the right hand side of the road and keep a careful lookout for route markers, for you won't want to back up to take another look.

WHAT SPEED IS SAFE – In many states cars pulling mobile homes are limited to a speed of 45 miles per hour. Speeds higher than this

are definitely unsafe and should be avoided at all times. Remember, you have a tremendous load behind you, and should your brakes fail to function, you'll be in serious trouble. Most serious accidents are due to excessive speed. In wet weather, you *must* cut your speed in half. In fact, it's better *never* to travel at all on wet or icy roads. Just as important as maximum speed is the speed during stops and starts. Always start *very* slowly, and stop in the same way. Remember, fast accelerations or decelerations will impose tremendous loads on the chassis, engine, and the body of the car. The same applies to turns. Never negotiate a turn rapidly. This is hard on the whole structure of the car.

Keep your distance in traffic so that you can maintain a steady rate of speed. Keeping your distance and keeping to the right side of the road permits faster traffic to pass safely and permits you to stop on time in an emergency.

SAFETY CHAINS – Most states have statutes requiring safety chains to be looped around the mobile home hitch and the car bumper. Unfortunately, the dimension of the chain is not usually specified. A safety chain can be very important in preventing a serious accident in case of hitch failures. The chain should be of sufficient strength to keep the front end of the towed vehicle from dragging on the pavement in case of hitch failure. For the same reason, the loop should be short. The chain furnished by the mobile home manufacturer or dealer may not be heavy enough. Get a good, strong one, and never fail to hook it up properly.



Hook up a safety chain so it will hold mobile home hitch off road in case of a breakaway. Be sure chain is strong enough to hold the load.

THE IMPORTANCE OF A REGULAR INSPECTION OF YOUR COMPLETE HOOKUP – We cannot over-emphasize the importance of regularly inspecting your car-mobile home hookup. The most important habit you can form is the habit of walking entirely around the car and coach at each stop, inspecting all tires, wheels, hitch, safety chain, and electrical connections. It takes but a few seconds. Any experienced mobile home owner will tell you of the many times he has found difficulties that would have resulted in serious accidents had not he made his regular inspection. As soon as it's dark at night, get out and inspect your running lights and stop and tail light to make sure they are operating. Check signal lights too. Then, they should all be re-examined at every stop you make. Check your tires and grab hold of all wheels and shake to determine whether or not any of the lug nuts are starting to loosen. Examine hitch to make sure it's still well connected to the car. Look at the weld points on your hitch. The application of your brakes has a thrust and twist effect on the car hitch which may cause cracks to appear. If any have appeared, make sure they are repaired immediately.

WHAT TO DO ABOUT SWAY – If you find that your equipment has a tendency to side-sway or wobble as it goes down the highway, the fault probably does not lie with the manufacturer. Manufacturers of mobile homes understand the engineering principles involved in engineering the mobile home so that this will not occur, provided it is properly pulled. We can't speak for the home-made type whose builder may not have been acquainted with correct engineering principles. If your mobile home sways, it's dangerous. It looks bad, too, wobbling down the highway. Sway must be eliminated at the earliest possible moment. Here's what you can do to correct it:

1. Sway is frequently caused by placing too much weight in the rear of the mobile home. Transfer weight to the front. You may even find it necessary to remove the mattress from the bed, and put it in the front.

2. Check tire pressure. The amount of air pressure should be equal on both sides of the mobile home. Unequal tire pressure is often a cause of swaying. What's more, air pressure in the tires on the rear of the car should also be equal. The same applies to dolly tires.

3. Sway is sometimes caused by a loose fitting hitch which permits the mobile home hitch to swivel easily on the car ball. Tighten the hitch socket as much as possible. You may also find you are using a ball that's too small for your hitch. Obtain a larger one that fits tightly.

4. Check the mobile home axle where the springs have been attached with U-bolts. Occasionally these U-bolts will work loose, allowing the springs to shift on the axle. It is easy to tell whether this has occured by noting the paint on the axle. If your springs have slipped, it will be seen easily. Move them back in place and retighten. *(Illustrated top of next page.)*

5. Perhaps you have too much weight on one side of the mobile home. This can be checked by using the public scales. If there

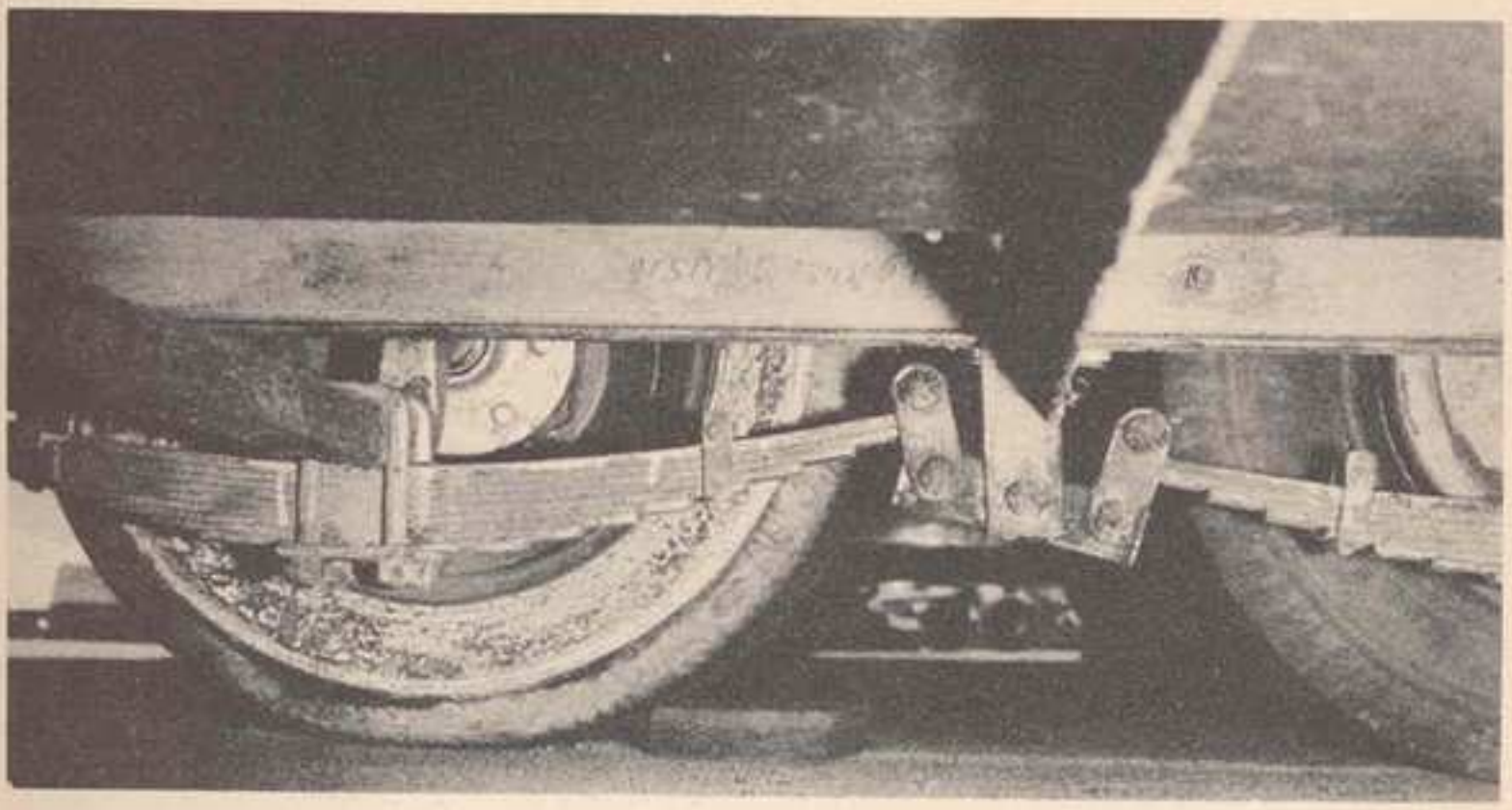


Photo shows U-bolts attaching springs to axle. Loose bolts can cause springs to shift on axle. Result is a swaying coach.

is too much differential, shift some of the weight to the unbalanced side. Furthermore, heavy articles should be packed near the floor – not in high cupboards.

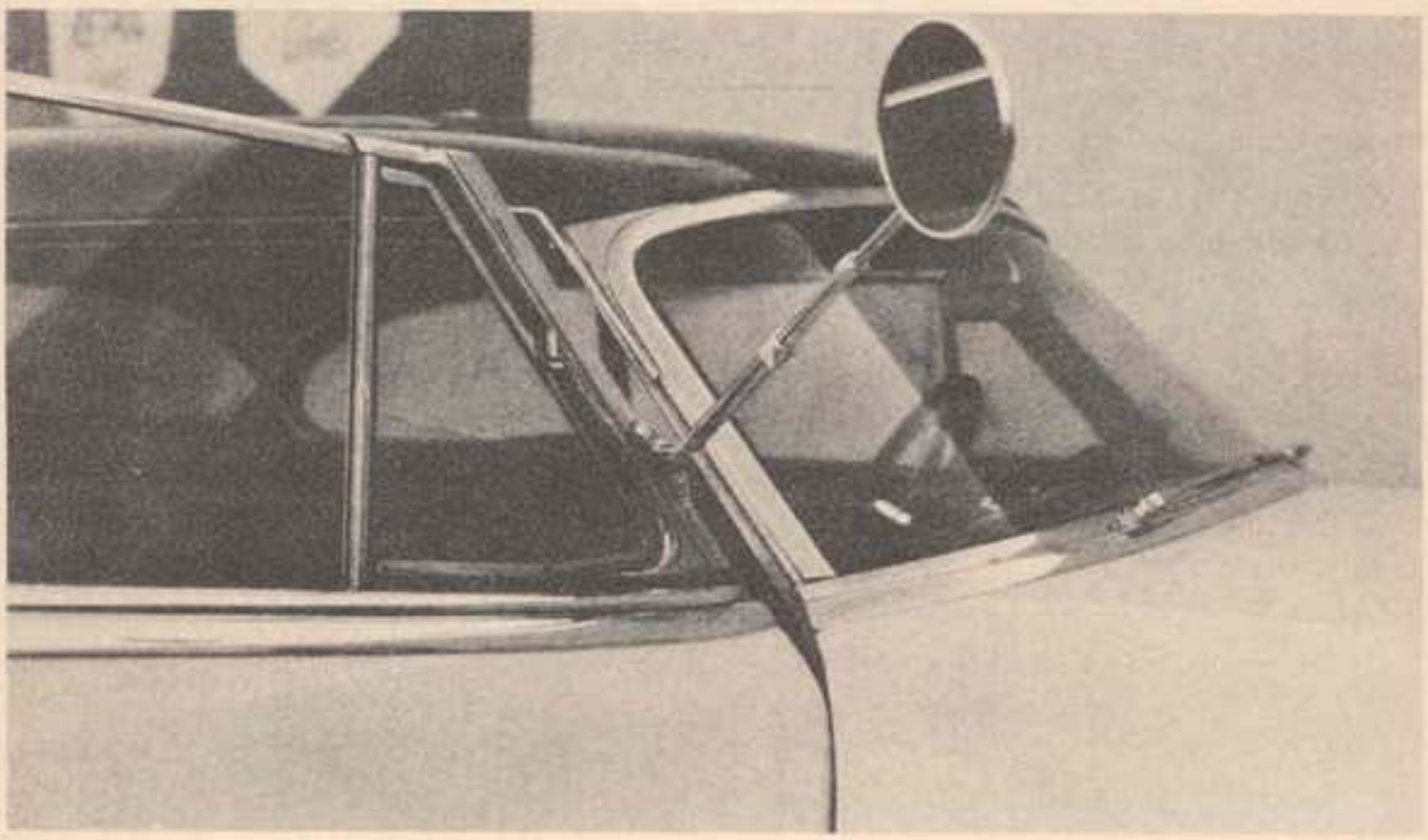
6. The modern car is built on highly flexible springs for the purpose of giving a light, airy ride. This is conducive to sway. If none of the above corrects your problem, you will probably find it necessary to use a dolly or a hitch that has been especially designed to move the weight of the mobile home from the rear bumper of the car to the rear axle, or, better yet, to the center of the car frame. Use of these specialized hitches will, without question, eliminate sway.

YOU MUST CONFORM TO STATE LAWS – The various states do not have uniform laws regulating mobile homes. Obtain a copy of the Official Trailer Park Guide published by the Trailer Coach Manufacturers' Association – price $1.00. *(See our chapter entitled "Publications")* It contains a summary of state laws. If your equipment exceeds the length limitations of any state through which you plan to travel, make sure you write ahead and obtain a permit. Be sure your mobile home is properly equipped to comply with the laws of the state in which it is licensed. If you are properly equipped in accordance with the laws of the state in which you are registered, other states usually will not bother you. They will not require you to re-equip to comply with their laws. Here is a list of *musts:*

1. You must have a stop and tail light.
2. Reflectors must be installed on the rear of the mobile home.
3. You must have clearance lights on each side.
4. Be sure you have an adequate safety chain.
5. The mobile home should be equipped with turn-signal devices on the rear. The car must have turn-signal lights on its front. In some states you can get by with an adequate arm signal. Special arm signals are made that attach to your automobile door. They are

pushed out manually for signaling purposes and can easily be removed from the car when not needed.

6. You must have a long extension mirror on the left side of the car, preferably one of the regular mobile home type that will extend to at least 19". This enables you to see clearly behind your mobile home. We further recommend attaching a similar mirror on the right hand side of the car. This will enable you to see when you have cleared vehicles you are passing. You will know when it is safe to turn into the right hand lane.



All mobile home supply stores carry this type special mirror. Mirror clamps to car door. No drilling is necessary. Mirror can be removed when desired, extends the full 19 inches required.

7. Be sure your mobile home is equipped with brakes.

8. Always carry two fire extinguishers – one in the car and one in the towed vehicle.

9. Carry some type of flare equipment, such as a red flasher light or regular flares that burn. Reflectors are acceptable too. This equipment is important because if you develop trouble and are forced to stop, you are responsible for any accidents that occur while you are parked on or by the highway.

It is also desirable that you know some of the standard signals used by truck drivers since they may be of value to you in understanding information the driver of a truck may be trying to give you. When an approaching truck turns his headlights on and off rapidly, he is trying to tell you that your headlights are on during the daytime. If an approaching truck driver extends his arm out and waves it vertically up and down, he is warning you of some sort of trouble ahead, necessitating extra precaution. If you find yourself pocketed behind a large truck, he will flash his trailer tail lights on and off if he sees an opportunity for you to pass.

WHAT ABOUT BACKING? – Is it hard to back? The answer is, yes, if you've never backed a mobile home before. The answer is, no, if you've had thirty minutes practice. We could write many pages of special instructions for you on this point, and when we got all through you probably wouldn't know much more than when we started. The essential things to know are really quite simple:

1. Try to move backwards toward some object that is nearly behind you.

2. Make your turns to the left so that you can see out the left side of your car.

Where possible, always make backing turns to left so you can watch rear of mobile home out of window at drivers' seat.

3. Concentrate your attention on the rear of the coach and don't get confused in which way to turn your wheel. If you keep watching the end of your coach, you will soon discover whether or not you are turning the correct way and will have a chance to correct it.

4. The big danger in backing is jack-knifing – that is, getting the angle between the car and the mobile home so pronounced that they touch each other. Leverage in this position is great and you can do serious damage to the car or coach. What's more, this can happen very fast, so back slowly.

5. Remember, there is usually a delayed action, when backing, between any movement you make with the car steering wheel and the resultant effect on the direction in which the coach rear will swing. The degree of delay varies with different hook-ups and must be taken into consideration.

6. There's only one way to learn to back, and that's to get out and try it. Find yourself a place in the wide open spaces and practice for thirty minutes or more. You'll soon find that there's really nothing to it. Remember, there's no substitute for experience. Practice! Practice! Practice!

A FEW WORDS OF CAUTION – Watch out for dips and depressions. Take them slowly. The rear end of your mobile home may drag bottom in some of these places, but you will avoid damage if you take it slowly.

Stay on the right side of the highway wherever possible. There is no necessity for running a risk of a head-on crash with on-coming traffic.

Go slowly on bumpy roads. There's danger of breaking car springs and axle.

Always drive with the idea of getting where you're going in one piece rather than at a given time. Accident engineers established long ago that so-called accidents are 99 times out of 100 a question of someone's negligence due to haste, absent mindedness, over-confidence, or physical condition. Drive carefully and make a periodic inspection of the equipment you are using, and observe the rules of the highway.

If you come to a dead end street and there's no room to back around, the solution to your problem is to unhook your car from the mobile home. Turn the car around and then try to turn the mobile home around by hand. If it's too large, hook a rope on the hitch ball of your car, and with the other end tied to the front end of the mobile home tongue, pull it around with the car. A word of warning. If you're on a hill be careful to block the wheels in such a way that it will not get away from you.

For safety's sake, always shift into second or first when going down a grade. It's an added precaution in case of brake failure.

In winter and wet weather driving be extra careful and avoid speed. This applies to cases where the road is just a little bit wet. A few minutes of rain is sufficient to warn you to double your precaution and cut your speed at least in half. Remember, you're pulling a load that is dangerous.

In wet weather always apply mobile home brakes ahead of the car's. In icy weather apply brakes lightly, and if you start to slide, release brake, straighten out and then make another application.

If you're stalled in sand or mud, couple car to mobile home at an angle so that you may swing the coach as you start. By so pivoting the coach, your car has a few feet of free movement before it takes on a full load. A similar procedure should be followed if you are stopped on a steep hill.

Don't take a chance and decide to go over an area where you suspicion the ground may be soft or sandy. Get out and walk over the area first, making a close inspection.

Make all turn signals well in advance to warn all traffic. Get into the correct traffic lane for the turn well in advance. Take turns with the widest possible sweeps.....you can't cut corners when

pulling a mobile home.

When passing a slow vehicle, make sure your whole hookup is in the clear before cutting back to the right hand lane of traffic.

What You Should Know About Overload Springs

Do I need overload springs? If so, why? What are they? Which kind shall I buy? These are questions that plague the inexperienced mobile home traveler. As he makes inquiries he gets conflicting answers and wonders what information is correct. This seemingly complex subject is really quite simple. Understand a few simple fundamentals and the overload spring mystery vanishes.

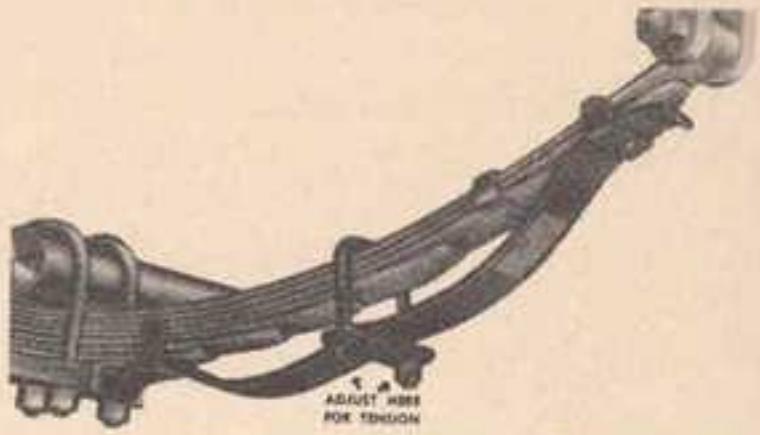
WHY YOU NEED OVERLOAD SPRINGS – The inexperienced mobile home traveler knows he can put two or three passengers in the back seat of his car, and that he can load baggage in the trunk. He knows all this load will not make him need overload springs. He can easily add up the weight figures and see that it's possible to put six to eight hundred lbs. in the rear of the car without overload springs being required. Therefore, when he purchases a mobile home with a tongue weight of three, four or five hundred lbs. and his dealer tells him he needs overloads, he is inclined to be skeptical. He does not stop to consider that the weight in the back seat or trunk is loaded directly over the axle and the springs where the manufacturer of the car figured the load would be carried. He does not consider that the weight of the mobile home will be placed on a bar *behind the bumper* of the car. Weight placed at this point has a tremendous leverage action. It's the old story of a man being able to lift the earth if he had a pole long enough and a fulcrum for the pole. To place a 300 lb. weight behind the bumper of the car is not at all the same as placing 300 lbs. in the rear seat or trunk of the car.

THE PURPOSE OF OVERLOAD SPRINGS – The modern automobile is built to give you a light, smooth, airy ride. When you place weight behind the bumper, leverage pushes the car's rear down and the front up. This throws the whole car out of equilibrium. The head lights shoot up, steering becomes difficult, and, in general, you get a bad ride. Installing overload springs raises the car's rear; lights shine down on the road; steering becomes easier; you get a good ride; the equilibrium of the car is re-established. Furthermore, failing to install overload springs when you should causes bad tire wear; you will actually look silly as you drive down the road; you run the risk of a broken axle caused by the frame of the car striking the axle when you go over a dip or a bump.

WHAT IS AN OVERLOAD SPRING? – An overload spring is an auxiliary spring attached to the axle or regular springs to help retard sagging of the car's frame toward the axle. There's nothing new about overload springs. They were in use long before anyone ever thought of mobile homes. They were used when the automobile owner found it necessary to put a big load into the car. They have been manufactured many, many years for truck equipment and are installed when a

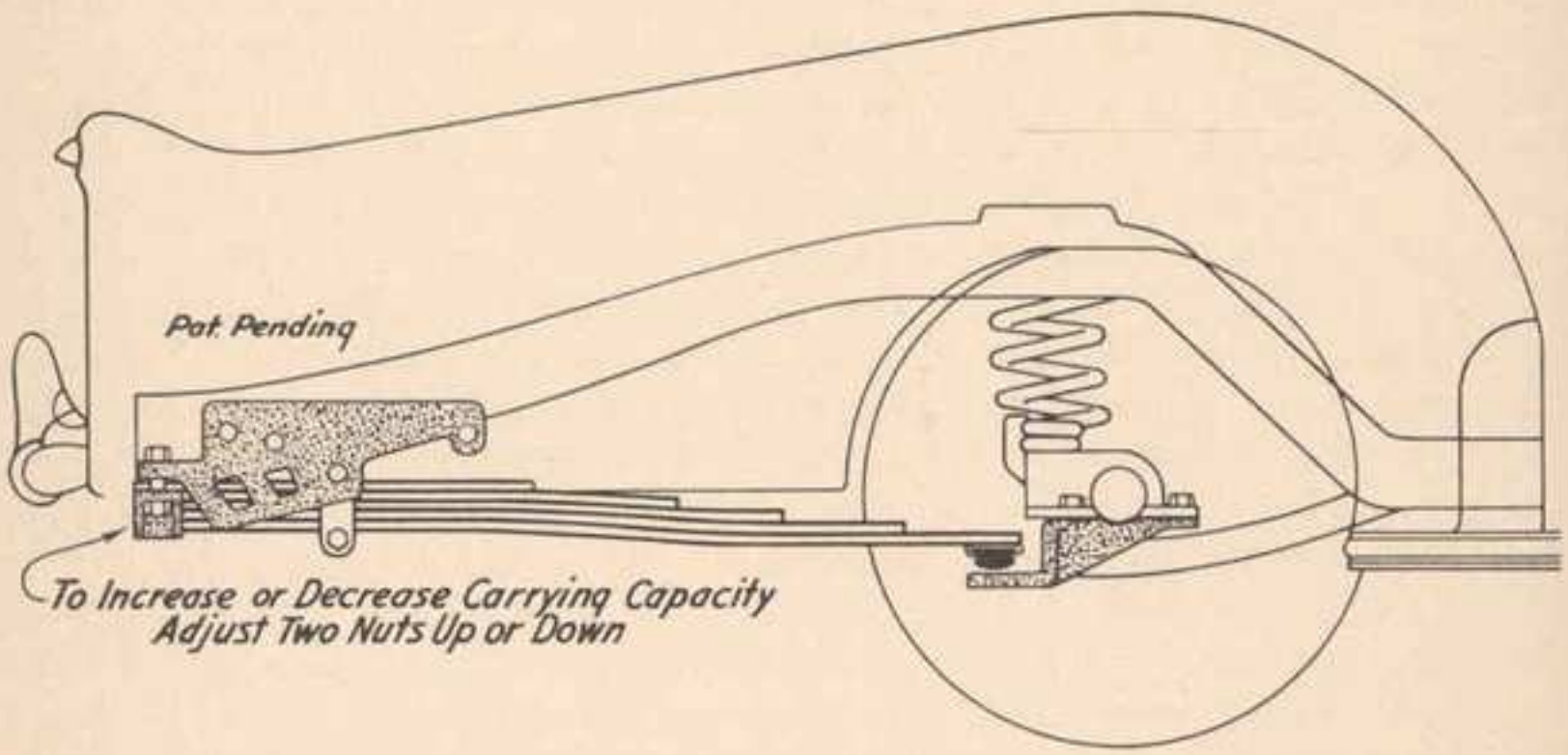
Courtesy Laher Spring & Tire Corp.

Laher Universal for cars and light trucks with under the axle rear leaf springs. Contacts main rear springs only when car is overloaded. They therefore do not detract from the riding ease of the car under normal load. Adjustable for loads up to 1500 lbs. You install by removing nuts and plates from car's spring U-bolts, setting the overload spring casting in place under U-bolts and replacing nuts. A medium priced overload.



Courtesy Laher Spring & Tire Corp.

Laher Spring Booster. Clamps with U-bolt to all cars with leaf springs (on front end or rear end of rear springs). Installation is simple. Increases carrying capacity of springs 400 to 600 lbs. For use with light mobile homes. Adjustable for load carrying capacity. Must be removed to restore normal car spring action. Cost is low.



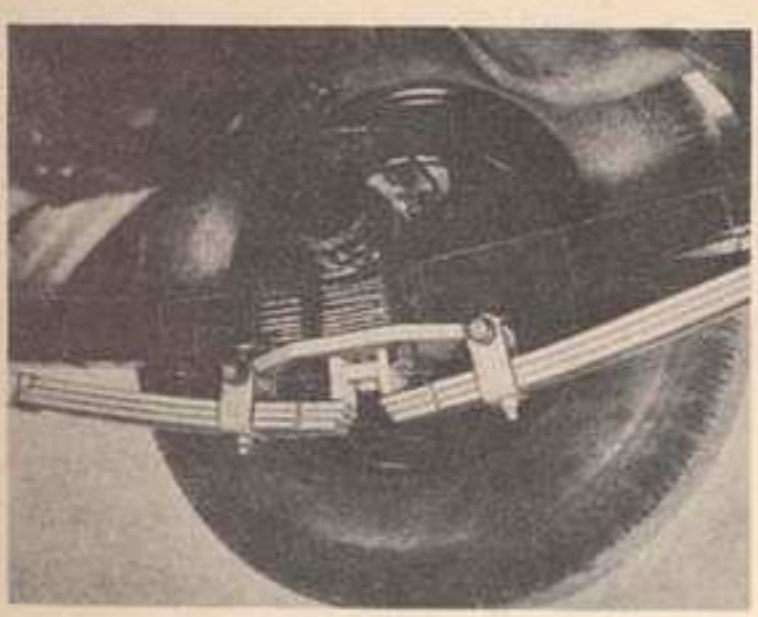
Courtesy Laher Spring & Tire Corp.

Functions same as Laher Universal. Designed to fit cars with coil rear springs.

constant overload situation is anticipated.

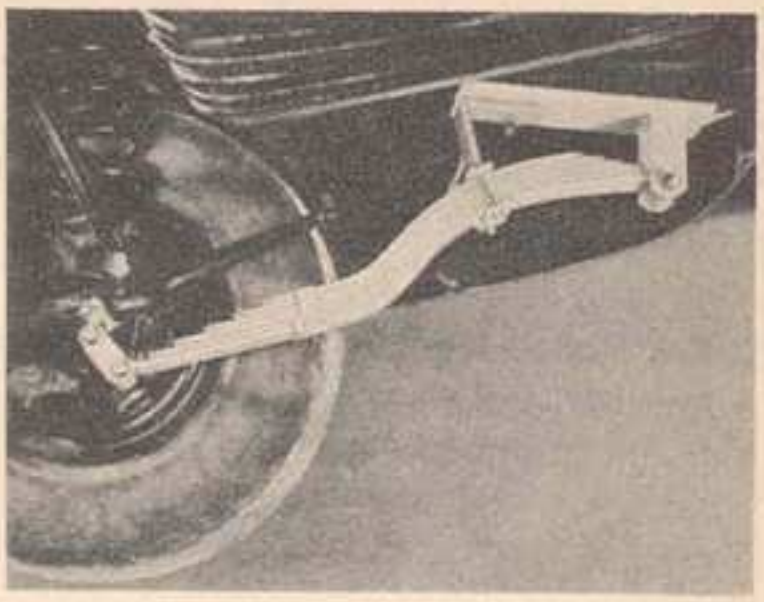
WHEN DO YOU NEED OVERLOAD SPRINGS? – This is an easy question to answer. You can answer it for yourself. Merely attach the mobile home to the car and then stand back. If the load tends to raise the front end of the car and lower the rear enough to cause a noticeable slant, you need overload springs. You do not need overload springs when you use a dolly. A dolly takes most of the weight off the car and sustains the weight on itself. The car's equilibrium is re-established and overload springs are not necessary.

If you use a hitch that transfers the mobile home's weight from the rear of the car directly to the car's rear axle, then there is no weight on the auto frame. Overload springs are unnecessary in this case. When you use a hitch that transfers weight from the car's rear to the center of the frame, the mobile home's weight is transferred



Courtesy Duo-Control Spring Co.

Duo-Control for Leaf Spring Cars



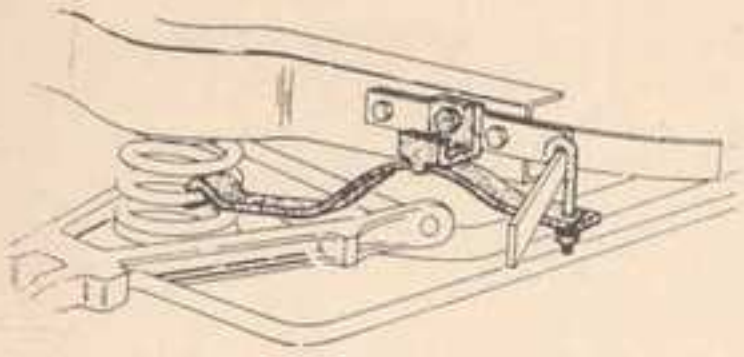
Courtesy Duo-Control Spring Co.

Duo-Control for Coil Spring Cars

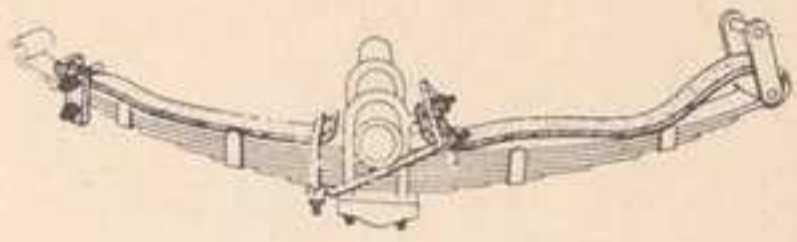
The two photos above illustrate Duo-Control releasing overload springs. Spring tension can be turned off or on. To turn off or on, car is jacked up and tension block mechanism is switched. You must purchase a model to fit your specific car. For leaf spring equipped cars it is built in two models.....for 500 to 600 pound hitch weight and for 600 to 800 pound hitch weight. For coil spring equipped cars made only for 500 to 600 pound hitch weights. Most mobile home owners consider these springs deluxe equipment. They are priced accordingly.

equally to all four wheels of the car. You may still need overload springs. This occurs when the mobile home is extremely heavy. A heavy weight placed in the center of the car's frame will depress the springs at all four wheels. Should this depression be sufficient to materially change the distance between the car frame and the axle, there is danger that the car's frame will hit the axle as you go over bumps or ditches. In this case, overload springs should be installed *on all four wheels.* You can determine whether overload springs should be installed by noting the distance between the frame and the axle before the mobile home is attached, and afterwards. If there is a material decrease in the distance, install overload springs. It is not possible to state a rule in terms of a specific number of lbs. of tongue weight for the mobile home. The type of car used and the nature of its spring action will be the determining factor. If your mobile home weighs over 800 lbs. and if you use a weight distributing hitch attaching to the center of the car's frame, give consideration to installing overload springs on all four wheels.

WHAT KIND OF OVERLOAD SPRINGS SHOULD YOU BUY – There are literally hundreds of different overload spring makes. This is an item almost every mobile home owner requires. The demand for them is great and competition is stiff among manufacturers. Each make has its advantages and disadvantages. It's impossible for us to discuss here all the various makes. When you get ready to buy, discuss the advantages and disadvantages of various makes with different dealers and supply stores. Don't buy the first set that's offered. Look around. You can pay prices from ten to seventy-five dollars. But, remember the primary function of the overload spring is to put addi-



Courtesy Hellwig Products Co., Inc.



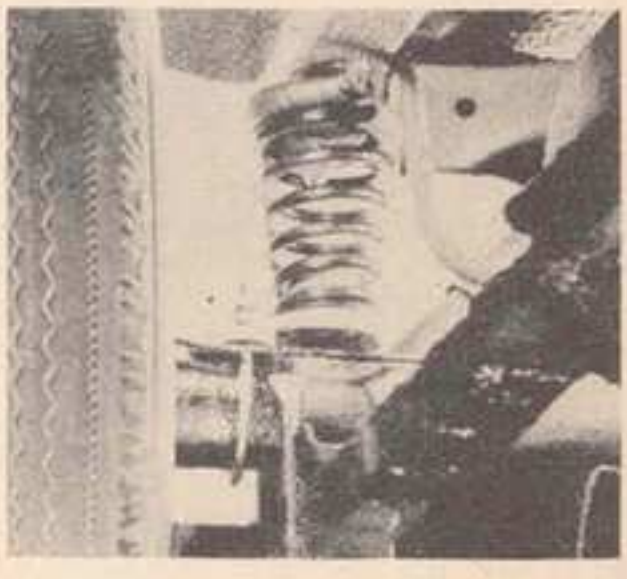
Courtesy Hellwig Products Co., Inc.

Picture on left is Hellwig front stabilizer for cars with knee action. Picture on right is Hellwig overload for cars with rear leaf springs. Made in two models. One for light loads (up to 500 lbs.), another for heavy loads. Hellwig also makes an overload for cars with rear coil springs. Helwig springs are adjustable for desired tension. A medium priced overload.

tional spring power between the axle and car's frame. Regardless of how fancy a spring may be, none of them can do more than this. True, expensive models have advantages over the less expensive. In discussing your spring purchase with dealers, here are considerations that you must bear in mind:

1. The price.

2. The cost of installing. Many types are so easy to install you can put them on yourself.



Courtesy Dunn Distributors

Ace overload spring is typical of many makes of coil type overloads. Installation is easy. Quickly bolts to axle with U-bolts. Rubber protected top fits rubber bumpers on car frame. To remove, jack up car with bumper jack & pull out springs. They slip off base that remains on car. A popular low priced overload. Made in two sizes: for weights under 1000 pounds and for weights under 1500 pounds. A low priced overload.

3. The load carrying capacity of the spring. All overload springs have a rated load carrying capacity. You must know the tongue weight of your mobile home so you can intelligently select a spring with a load carrying capacity sufficient for your mobile home.

4. You will want to remove overloads when you're not pulling a mobile home. The car will ride rough unless you do. So, consider the problem of removing the overloads. Some of the more expensive types have an off-and-on mechanism. All you do is throw a switch and the overload spring effect is removed. Other springs must be completely removed from the car.

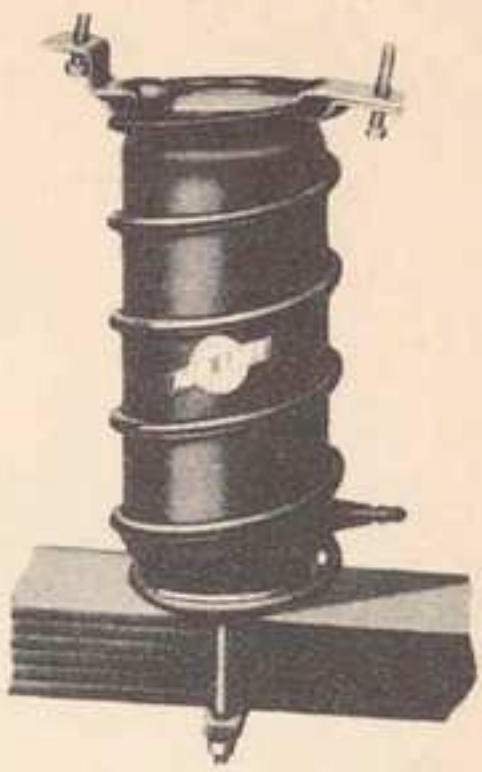
5. The durability of the springs you are purchasing is important. How long will they last? Will it be necessary to replace them every few years, or are you making a purchase that will last the lifetime of the car?

6. Can the spring be fitted to another car should you trade in your present automobile? Some makes will fit only a particular car. Others are semi-universal in that they fit almost any make of car.

Others that are made for a specific car can be fitted to other cars by merely purchasing a few additional brackets when you change cars.

7. Models that attach to axle and bump against car frame are justly criticized on the grounds that heavy loads could cause frame to bend or break. Overloads that reinforce present springs, thereby putting stress on spring shackles or overloads that do not localize point of stress on car frame, have an advantage.

SOME POPULAR MAKES – We have shown throughout this section pictures of various makes of overload springs, together with a few comments. The data and pictures printed will give you a background that will enable you to intelligently discuss your overload spring problem with your dealer.

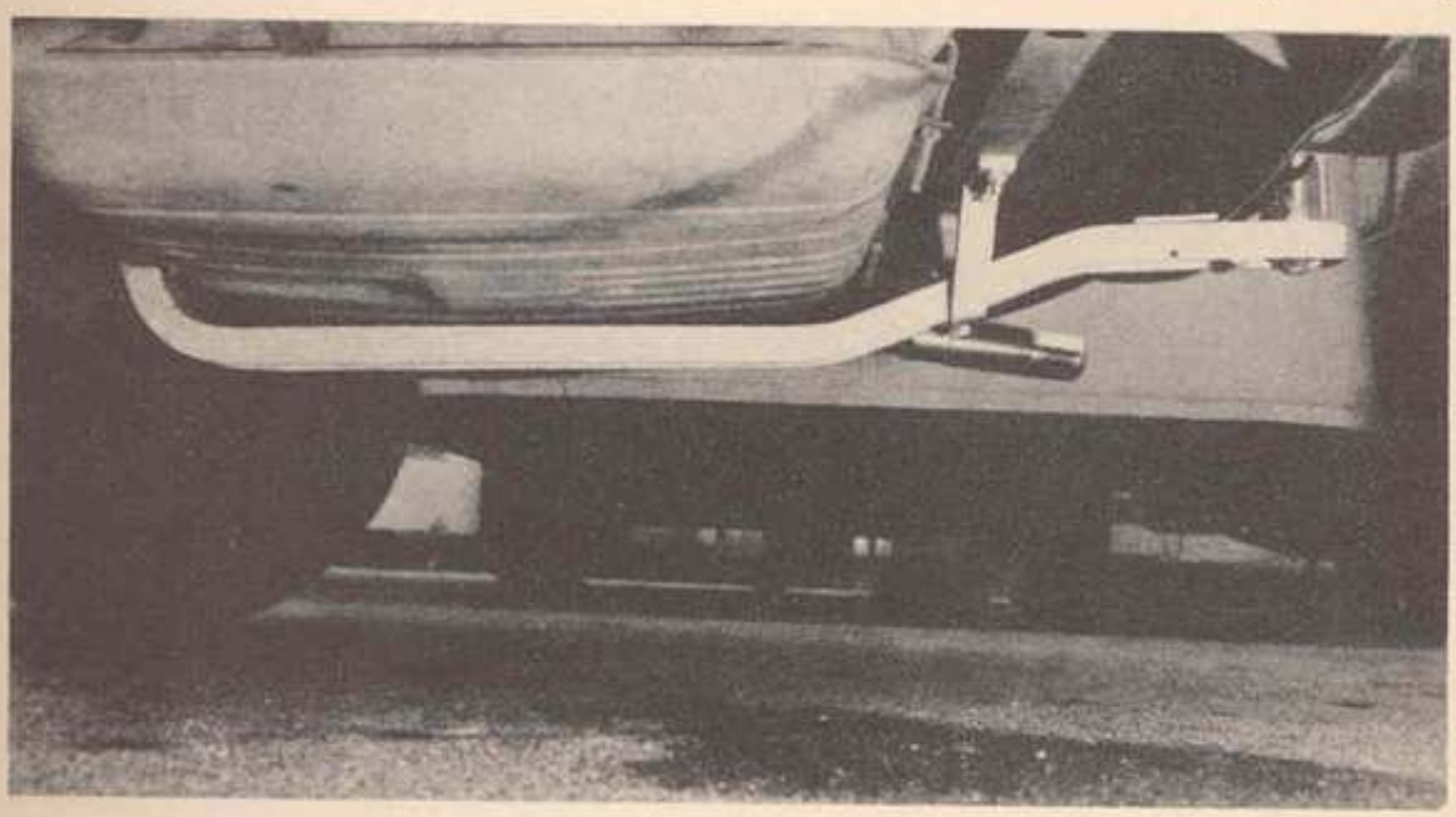


Courtesy Air-Lift Co.

A pneumatic spring booster that inflates with air the same as a tire. Handles overloads up to 250 pounds per wheel. Available for both front and rear car spring installations. You control its load carrying capacity by amount of air put in tube. To restore car springs to normal, just release air from tubes. Made in many models so all cars can be fitted. Cars with coil springs fitted just with tube that fits inside car coil springs. For other car's coil springs, installation brackets and tubes are supplied. A medium price overload.

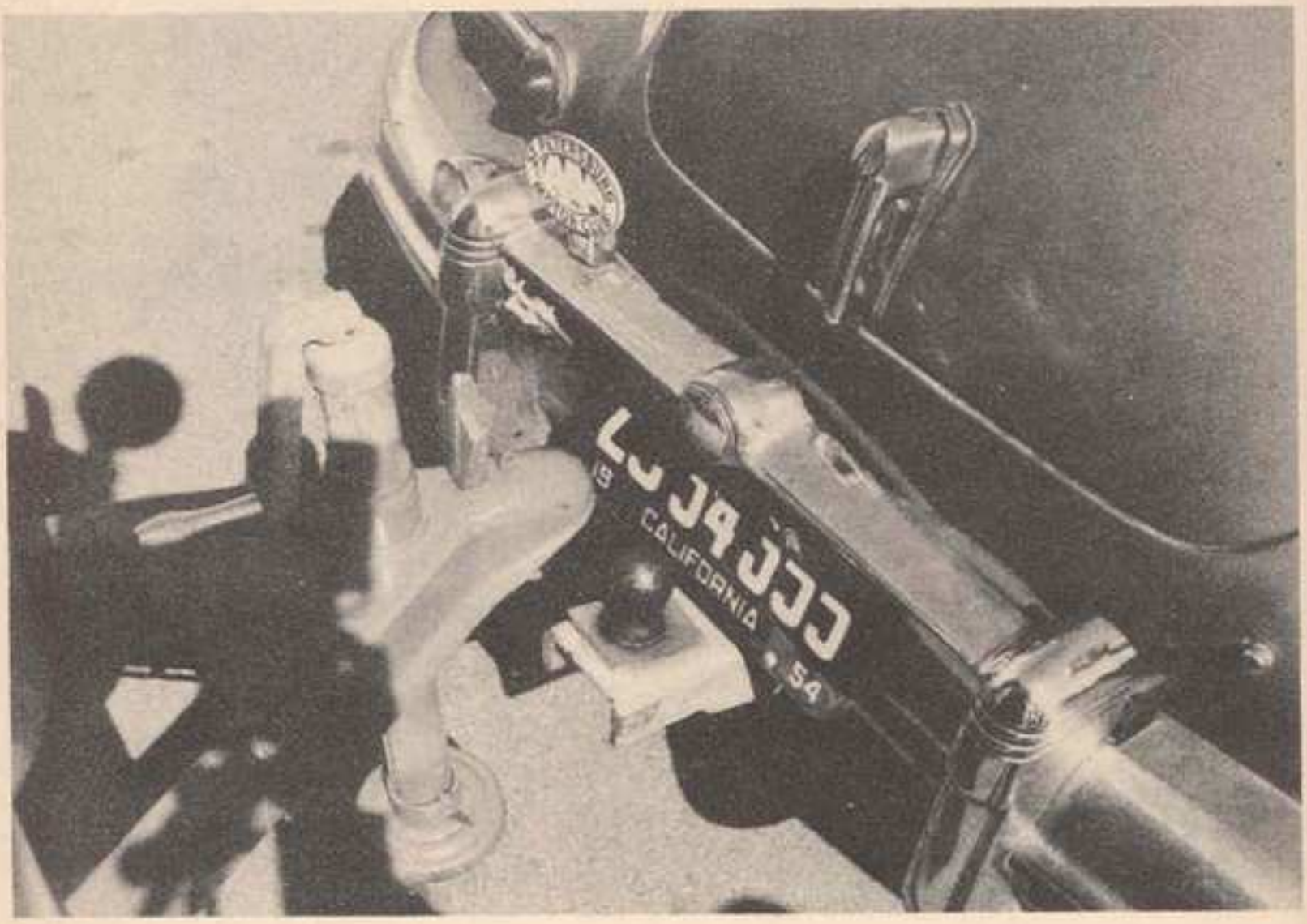
What You Should Know About Hitches And Dollies

HOW TO HITCH CAR AND MOBILE HOME – To hitch car to the mobile home, use the jack to hoist the socket of the hitch high enough so that the ball can be backed underneath the socket. Then, back the car to place the ball underneath the socket. You will find this almost impossible,



A good hitch will bolt to car in three places, the rear bumper and a rear and forward member of the car frame. Don't gamble on a questionable hitch.

so try to get the ball to one side or the other of the socket since it's easier to push the coach by hand from one side to the other than it is to move it forwards or backwards. When you have the ball exactly below the socket, screw hoist down, dropping the socket on to the ball.



Don't try to back car so ball is exactly below mobile home hitch socket. It's almost impossible to do so. Back car so ball is to right or left of hitch socket. It's usually easy to swing mobile home hitch sideways enough to complete hook-up.

Be sure the hitch latch is up when you lower the socket on the ball, and be sure you snap and lock the latch in place when the hitch has been lowered. After you think you have the hitch properly hooked up, it's a good idea to test the hitch to make sure it is correctly attached by lifting the mobile home up on the hoist. If you have not made the hookup properly, the coupler will come off the ball.

When you have properly hitched, remove the metal caster wheel from mobile home jack and raise jack shaft to prevent damage from road obstructions. After you've gone a few miles down the highway, stop. Go back and recheck your hitch to make sure that everything is in order. If your equipment has been in a collision, has jack-knifed, or been ditched, twisting or forcing the ball out of the socket, be careful to check the hitch thoroughly before recoupling and pulling. When in doubt, install a new hitch.

The selection of a good hitch for your car is extremely important. Make it a point to inquire around among mobile home owners in your own community to locate a reliable firm. The advice of dealers is sometimes not too reliable. Ready-made hitches are usually all right for pulling box trailers and light campers, but if you're pulling a

Test hook up of mobile home and car when you think they are tightly fastened by lifting mobile home up on hoist. If connection is bad, ball and socket will come apart.

heavy mobile home, the custom-made hitch is best.

When you've located what you believe to be a reliable firm, here's the way you can check whether they're doing a good job. It's better to bolt a hitch to a car than to weld it. Bolting it gives just as strong a hitch, and it may be removed easily for repairs or replacement. A good hitch should be made of three inch channel, reinforced with two inch channel welded inside, and the whole mechanism should be forged to the right shape to fit your car. It should be attached to the car in three places, the rear bumper and a rear and forward member of the car frame. Hitch ball must be mounted at car's dead center.

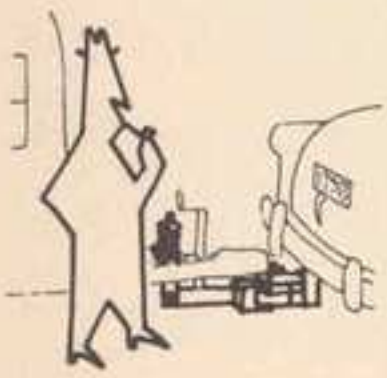
Those who don't move often may find it desirable to forget the hitch altogether. Hire a professional to do the towing.

Pulling *heavy* equipment with a conventional car? You will find it desirable to use a dolly or specialized hitch that transfers the weight of the mobile home from the rear of the car to the center of the car or to the car's rear axle.

HITCH FUNDAMENTALS – Those who engineer the modern automobile do not consider that it might be used to pull a mobile home. It is engineered to carry a normal number of passengers and a small amount of baggage. The springs have been engineered to give a light, smooth, airy ride. When you attach a mobile home to a modern vehicle, you are asking it to perform a function for which it was not engineered. The whole car undergoes a strain not contemplated by its manufacturer. The amount of damage done is dependent upon the amount of weight the mobile home throws upon the car.

There are several possible solutions to this problem. They

are: (1) Use a dolly to remove the weight from the car so the car functions only as a towing vehicle. (2) Use a truck. A truck is engineered to carry weight. This is the reason you see many mobile homes towed by pickup trucks. This solution is not too popular because most people just don't want to drive a truck. (3) Build the mobile home as a combination motor vehicle and mobile home. Again, this is not popular although there are some units of this type in use. Truck type construction is necessary and who wants to drive a truck? Cost too, is prohibitive. (4) Turn the mobile home into a four wheel vehicle with wheels at the front and back. This would force all the weight on the highway and permit the automobile to act only as a towing vehicle. This may be the best solution. There is experimental work being done on four wheel units, and we may find in future years that the four wheel mobile home will sweep the market. Such units, to be practical, must have an automatic steering mechanism on the front end to give it maneuverability equivalent to the two wheel mobile home. (5) Use a specialized hitch to make it easier for the car to carry the load. In this field we have the many weight distributing hitches that have become so popular in recent years.



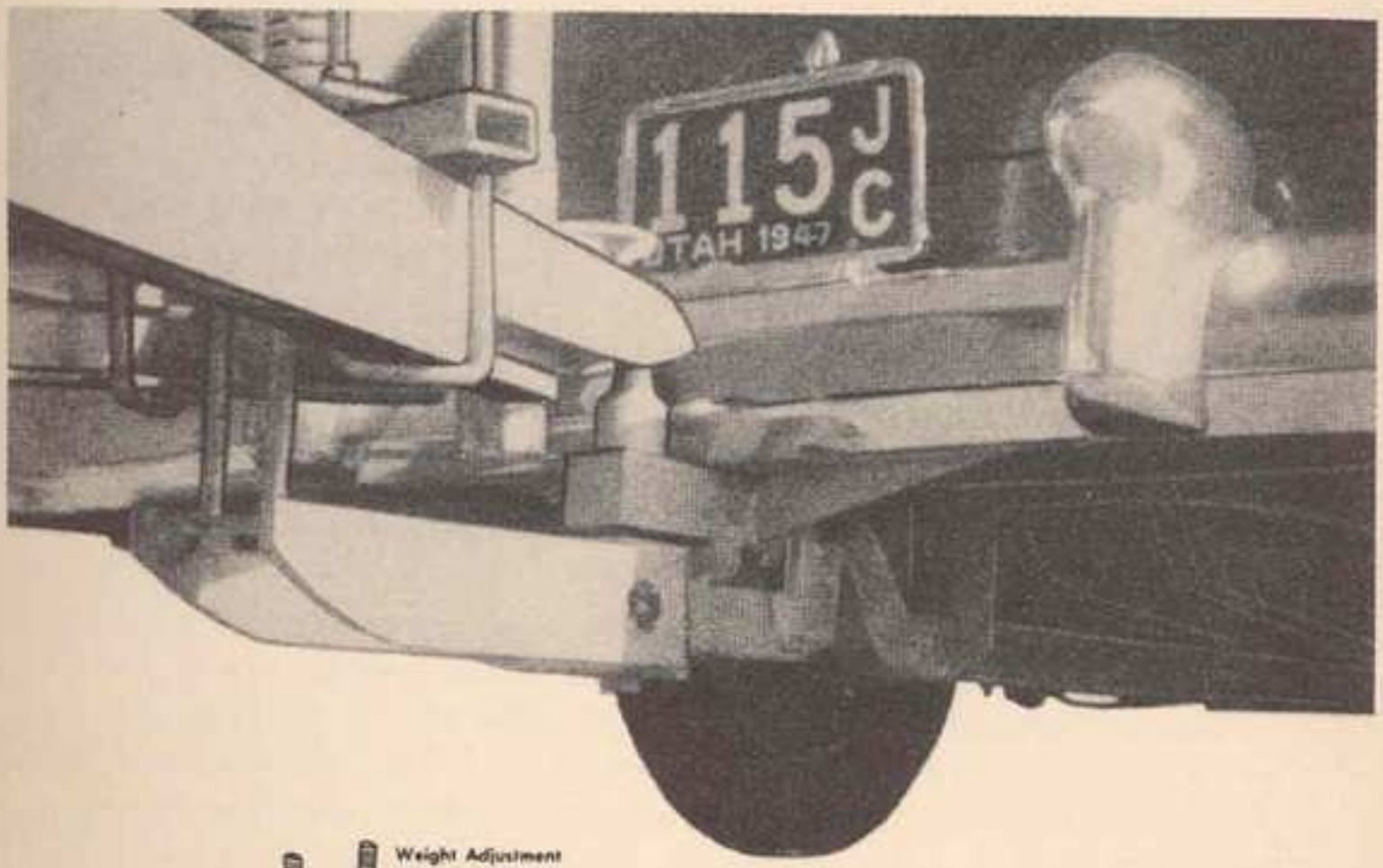
THE WEIGHT DISTRIBUTING HITCH – The conventional hitch places the weight of the mobile home behind the rear bumper of the car. This is the worst possible place for this weight. Weight placed here has a leverage action. It is much worse than two or three times the same amount of weight placed right over the axle of the car, or even inside the car. Weight placed here causes the rear end of the car to sag and the front end to go up. The traditional method of dealing with this problem has been to install overload springs. The effect of overload springs is to raise the rear end and lower the front. But, the use of overloads does not change the fact that the weight is still behind the bumper.

Weight distributing hitches seek to transfer weight from the rear of the car's bumper to a more advantageous point. There are many makes. They all have in common the aim of better distributing the mobile home's weight on the car. If you're pulling a heavy mobile home with a car and don't want to use a dolly, you *must* use a weight distributing hitch. Safety, consideration for the automobile, and driving pleasure leave you no alternative. Some mobile homes are so large that it's necessary to use weight equilizing hitches even when pulled with half or three quarter ton pickup trucks.

Our purpose here is to analyze weight distributing hitches in general. The facts we give will help you select the hitch you need. The purchase of a weight distributing hitch represents a sizeable investment. You'll understand the choices you have when you know the facts. At the end of this section you will find a list of the various makes, and the names and addresses of their manufacturers. Before you buy, send to each of these manufacturers for literature and information on their make. With the information given here you can analyze the literature and select the hitch that will best suit your purpose.

Weight distributing hitches can be classified into two basic groups. One group transfers the weight to the rear axle of the car. The other transfers the weight to a more desirable spot on the car's frame.

Frame Hitches – Most models transfer the weight from the rear of the car's bumper to the center of the car frame so weight is equally distributed over the car's four wheels. This is accomplished in most models by running a rigid bar from the car frame to the mobile home frame. Various kinds of spring action are used in connection with this rigid bar. These springs perform two functions. First, they can be adjusted to provide additional leverage on the bar to transfer weight as desired to the car. Secondly, the springs act to absorb some of the excess weight of the mobile home when there is a downward thrust on the front of the mobile home, such as is experienced when passing over bumps or dips. Other models rely less on the rigid bar and more on a heavy spring leverage set-up between the car and mobile home. This spring leverage throws the weight on the hitch ball partly back on the mobile home and partly toward the front wheels



Courtesy Mobile Equipment Co.

Equil-i-zer coupler is a popular low priced frame type distributing hitch.

of the car so as to distribute the weight over all four wheels. There is one model that requires special attention because its method is unique. This hitch attaches the mobile home to the car inside the trunk of the car. This transfers the weight of the mobile home to the frame of the car directly over the rear axle.

These hitches not only transfer the weight of the mobile home to a better place on the car, but they also perform additional functions. They tend to eliminate the usual sway and side suction experienced when passing buses and trucks on the highway. The rigid hookup between the mobile home frame and the car frame is responsible for this improvement. To understand exactly why this is so, push on the rear end of your car without your mobile home attached. Notice how the rear end floats easily from side to side. When the towed vehicle is attached to the car with just the ball and socket, this motion continues to be possible. As the rear of the car floats, the towed vehicle pivots on its wheels and snakes its way down the highway. When you use a weight distributing hitch this motion becomes impossible because the mobile home frame is rigidly connected to the car frame. Another important benefit of weight distributing hitches is their ability to transfer some of the weight that normally rests on the rear of the car back onto the mobile home wheels. Thus, they not only distribute the weight to be carried better, but they actually remove some of this weight and place it back on the mobile home undercarriage that is built to handle the load. The amount so transferred may be small, but any change in this direction is beneficial.

When you study literature put out by the manufacturers of the various models available, here are a few things that may not be entirely clear to you. You should bear them in mind.

1. Most of these hitches are expensive to install. A welding shop must do the work. Most hitches do not come with all parts necessary for attaching it to the car. These parts must be provided by the welding shop. If the hitch is to be removed when you purchase a new car you have double expense. You must first have the hitch cut from the old car and then have it welded to the new.

2. Sometimes the claim is erroneously made that these hitches make it unnecessary to use overload springs. This is not necessarily true. If the front end of the mobile home is extremely heavy, you will find that you have to use overload springs. These hitches put the weight on the frame of the car. The frame of the car, in turn, transfers its weight to the springs of the car. This weight may considerably depress the normal springs of the car. This makes overload springs on the front and rear a necessity. On very heavy mobile homes it is *always* necessary to use overload springs and this increases the cost of the installation.

3. Weight distributing hitches do not remove a significant amount of weight from the car. They *do* transfer a small amount from the car back to the mobile home. What they basically do is transfer the weight from the rear of the car to a more advantageous place on the car. This change is certainly beneficial. The weight of the mobile home, however, is still on the car. On large mobile homes this

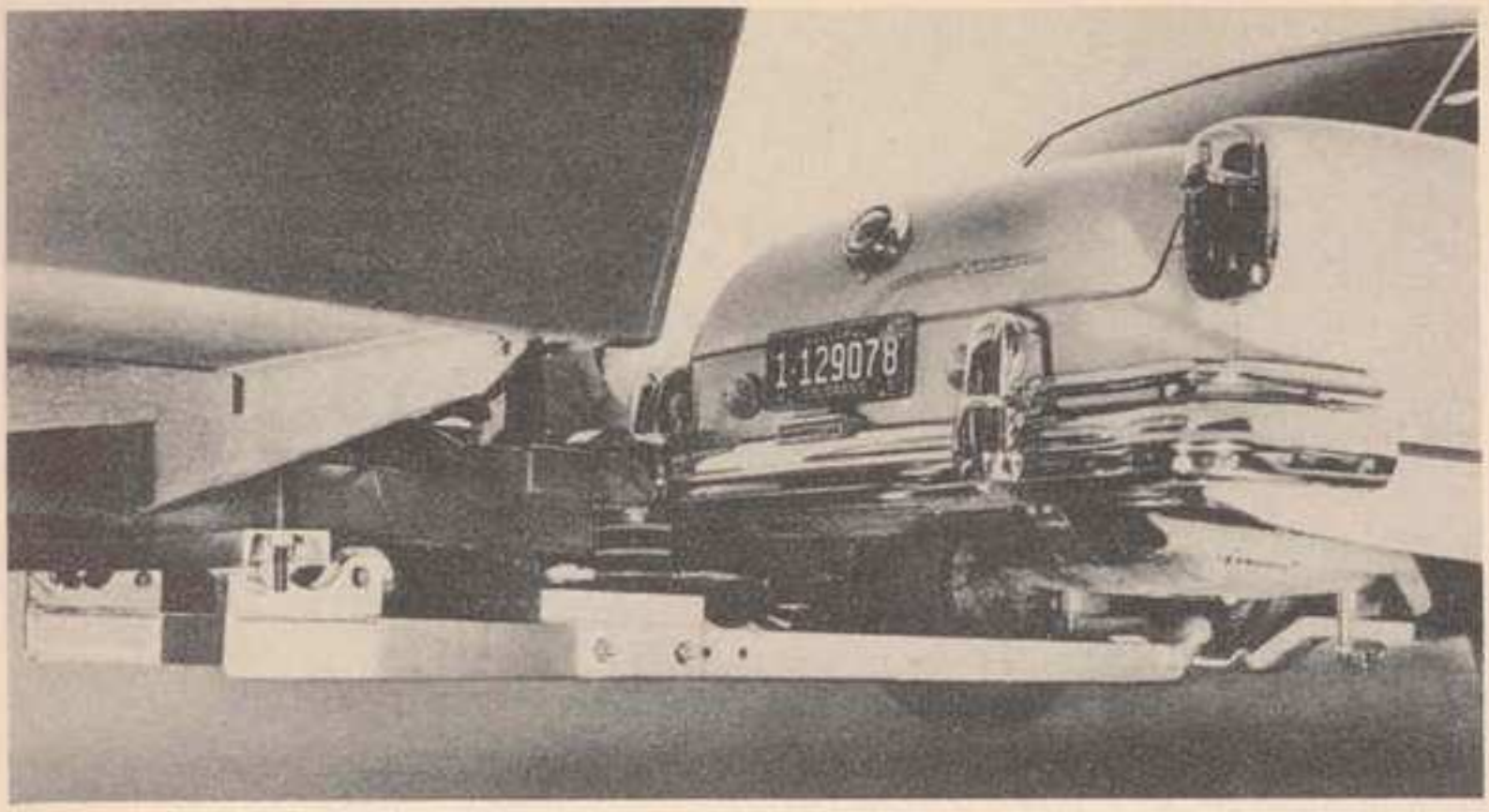
Courtesy Prestow Engineering Co.

The Pres-Tow Hitch transfers mobile home tongue weight to inside of auto trunk directly over car's rear axle.

weight may be in excess of 1,000 lbs. At times, when there is a downward surge on the front of the mobile home, this weight may be many times the actual weight when the mobile home is standing still. We emphasize again that the modern automobile is not engineered to handle this weight. It is possible for these hitches to cause car frames to bend or break. We've heard of cases where this occurred. We have no facts that would enable us to state how frequently this situation is likely to occur. We suspect that it would require an extremely heavy mobile home and a very rough road.

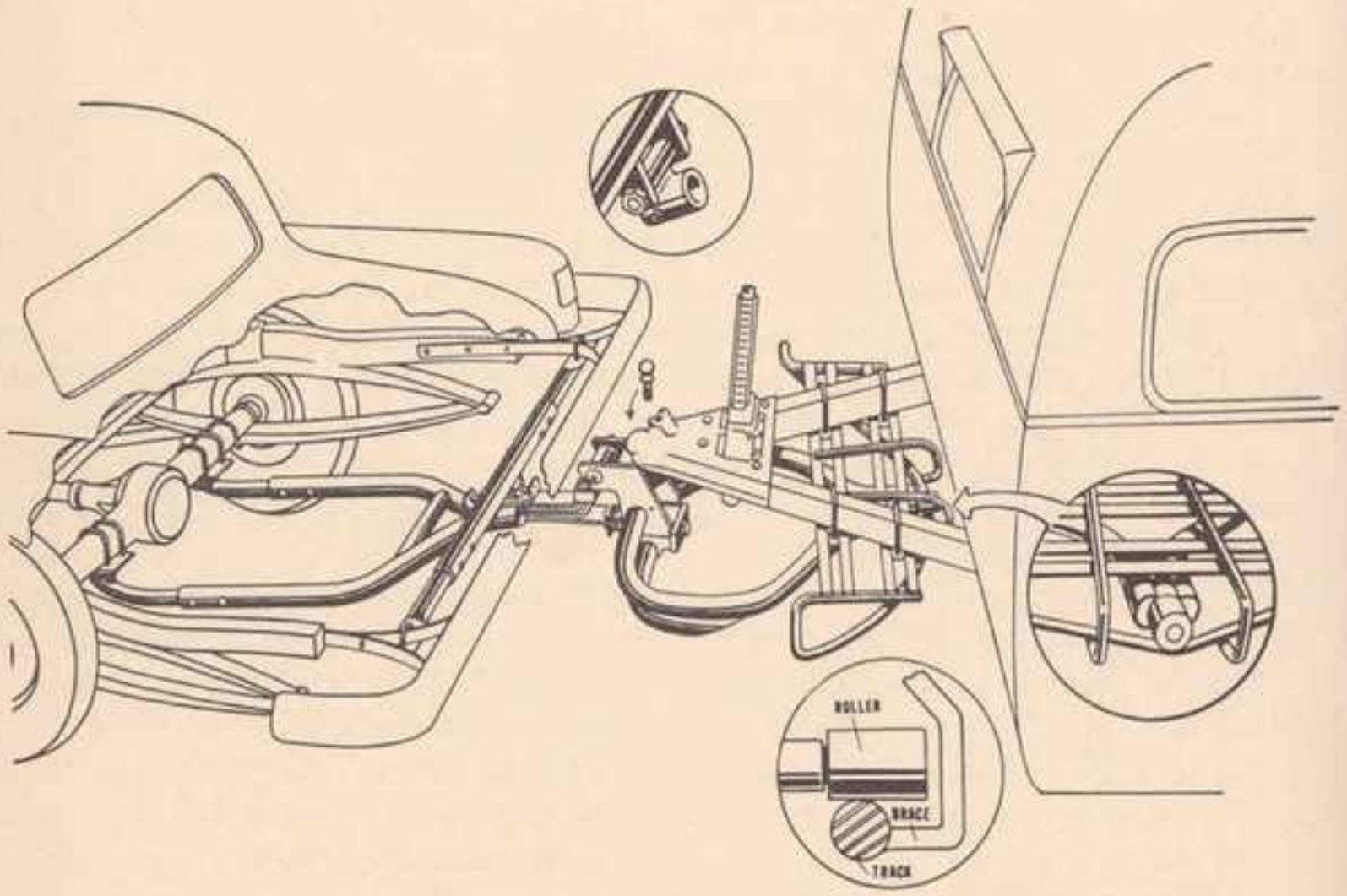
4. Some hitches use a heavy bar to connect the car and mobile home. In some cases they leave very little road clearance. This makes it difficult, if not impossible, to navigate rough roads, steep short driveways and similar road conditions. Under certain circumstances it is even possible for the rear wheels of the car to be lifted completely off the ground.

Rear Axle Hitches – This group of hitches transfers the mobile home tongue weight from the rear of the car to the rear axle of the car. A tow bar connects the mobile home to the car's rear axle. Spring action is provided to absorb some of the full force of the downward surge of the front end of the mobile home. These hitches, like the ones discussed in the previous section, transfer some of the mobile home tongue weight back onto the mobile home wheels. They also provide a rigid bar connection between the mobile home and car and thus eliminate sway. These hitches place no weight on the car frame, so you never require overload springs. One advantage of this group of hitches is that they are easy to install. They bolt easily to the car and the towed vehicle. You can do the job yourself so there is no installation cost. When you get a new car, it is easy to change over.



Courtesy PerfecTow Corp.

PerfectTow hitch is a rear axle type hitch. Note how it bolts to both car and mobile home.



Courtesy The Glide-A-Ride Mfg. Co.

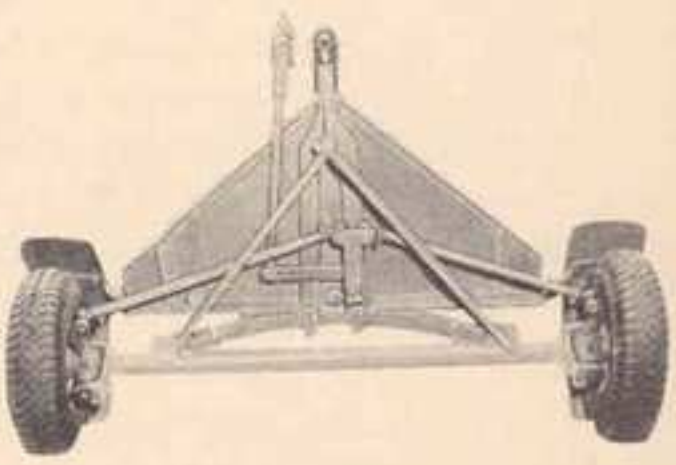
Glide-A-Ride hitch is a rear-axle type hitch. Requires no welding for installation and fits all cars and mobile homes. Easily transferred to another car.

Axle hitches are more expensive than the frame type. On some, road clearance is poor. The principal argument directed against this group of hitches is that they place all the weight on the rear axle. It is argued that this places a strain on the bearings and the rear axle assembly for which it was not designed. We have no engineering facts to prove or disprove this argument. We suspect that these hitches, when used with large mobile homes, may lead to rear wheel bearing difficulty. Remember, if your tongue weight is, say, 800 lbs., at moments of downsurge it is considerably more. The question is, can the wheel bearings take it?

What Hitch Should You Buy? – We can't answer this question for you. We can't recommend that you buy a weight distributing hitch. Before you buy, you should weigh the advantages and disadvantages of dollies as compared to the advantages and disadvantages of weight distributing hitches. However, we *can* tell you this. If you don't want to use a dolly, you are better off using a weight distributing hitch. In spite of any disadvantages these devices may have, their advantages far outweigh the disadvantages. But, before you buy, get information on all models available. Consider the good and bad features of each. Consider cost. Then buy the one you like best. To assist you in this project a partial list of makes and their manufacturers is given below.

Roll-o-Flex:	Roll-o-Flex Trailer Coupler, 3912 San Fernando Rd., Glendale, Calif.
Equal-i-zer:	Mobile Equipment & Mfg. Co., 1833 S. State St., Salt Lake City, Utah.
U-Neek:	Uneek Coupler Inc., 4424 San Fernando Rd., Glendale 4, California.
Eaz-Lift:	Eaz-Lift Spring Co., Box 207, Burbank, California.
PresTow Hitch:	PresTow Engineering Co., 1414 W. Huron St., Ann Arbor, Michigan.
Glide-A-Ride:	Glide-A-Ride Mfg. Co., 7th at College, Spencerville, Ohio.
PerfecTow:	The PerfecTow Corp., 3740 San Fernando Rd., Glendale 4, California.
Tour-Aid:	Martin Industries, Box 322, Jonesville, Michigan.
Gar-Bro:	Gar-Bro Products Co., 827 Royal Union Bldg., Des Moines 9, Iowa.

DOLLIES – The first efforts to solve the problem of weight on the rear of the car resulted in dollies. Through the years many models have come and gone. Lack of public acceptance has been the cause of the disappearance of most. There are some models that have been on the market for years and years, and they continue to sell because they are acceptable to the mobile home owner who finds that they do a satisfactory job. Don't rule out the possibility of a dolly just because you've heard they're no good. There have been far too many dollies marketed that were not engineeringly sound. Purchasers of these dollies found them unsatisfactory and then became disgusted with dollies in general. They are inclined to pass this unwarranted conclusion on to friends. This is regrettable. A dolly can do an excellent job of solving the

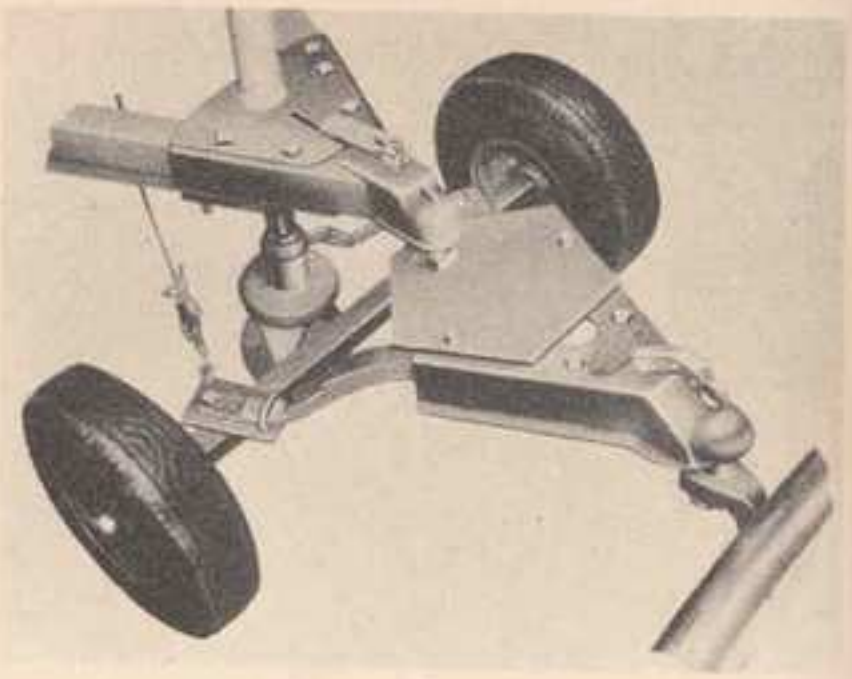


Courtesy Tru-Steer Mfg. Co.

Tru-Steer dolly has 60 inch tread width and a steering mechanism the same as that on an automobile.

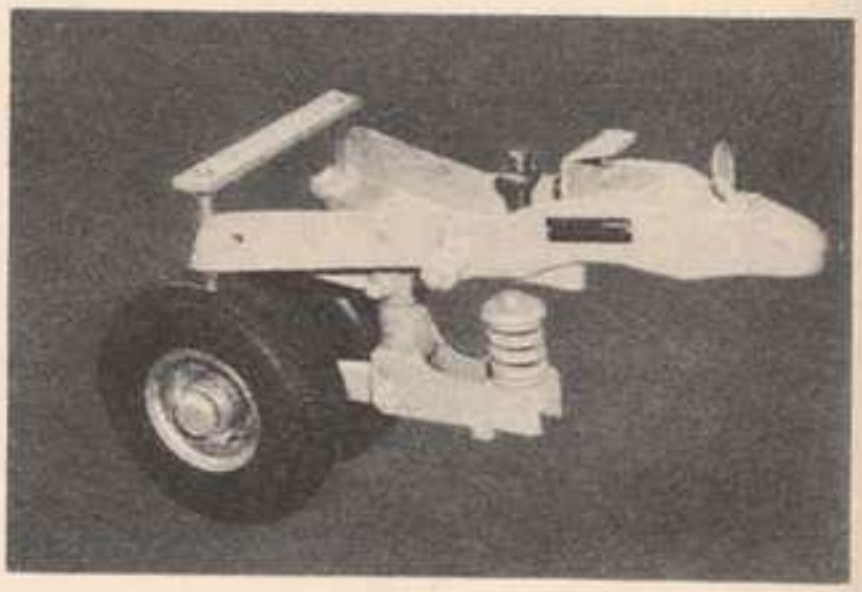
problem of towing a heavy weight mobile home.

The principal advantage of the dolly is that it removes the weight of the mobile home from the car. This is a big advantage and one to which you must give consideration when deciding between a weight distributing hitch and a dolly. Taking the mobile home weight off the car adds considerably to the life of the car.



Courtesy Nelson Manufacturing Co.

Manufacturer of Nelson Dolly claims to have 50,000 in use.



Courtesy Slimp Axle Products

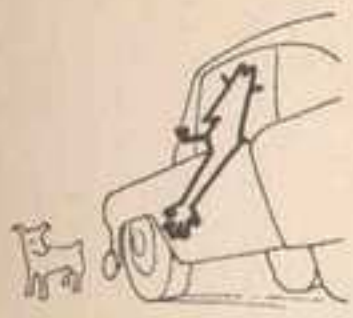
Slimp wheelcoupler is made in many models. Different models handle loads from 600 lbs. to 1500 lbs. Made with wheels on wide or narrow tread.

The best way to analyze the dolly market is to obtain the literature on the makes that are available. For that purpose we publish here a list of some popular makes, together with the names and addresses of their manufacturers. Obtain literature on all and carefully study it. To help you in this, some of the principal objections raised against dollies are as follows: (1) Some makes are difficult to maneuver when backing; (2) They increase the overall length of the car and the towed vehicle. In view of state laws on combination length of car and mobile home, this presents a problem in the case of large mobile homes; (3) Some result in considerable road splash on the front of the towed vehicle, defacing the otherwise attractive surface of the mobile home....fenders solve this problem; (4) Dollies with caster wheels do not sufficiently resist jack-knifing and have been known to contribute to accidents because of this difficulty....dollies with the center wheel have been criticized on the grounds that they do not track with the car, so high road centers and other impediments in the road present hazards.

DOLLY MANUFACTURERS

Trail-True: Trail-True Mfg. Co., 12401 Cloverdale Ave., Detroit 4, Michigan.
Nelson: Nelson Mfg. Co., Bay Cities, Michigan.
Tru-Steer: Tru-Steer Mfg. Co., 2435 Lakeshore Dr., Elsinore, California.
Slimp: Slimp Axle Products, Colton, California
Watson: Watson Automatic Machine Co., 303 Park Ave. West, Mansfield, Ohio.

What You Should Know About Brakes

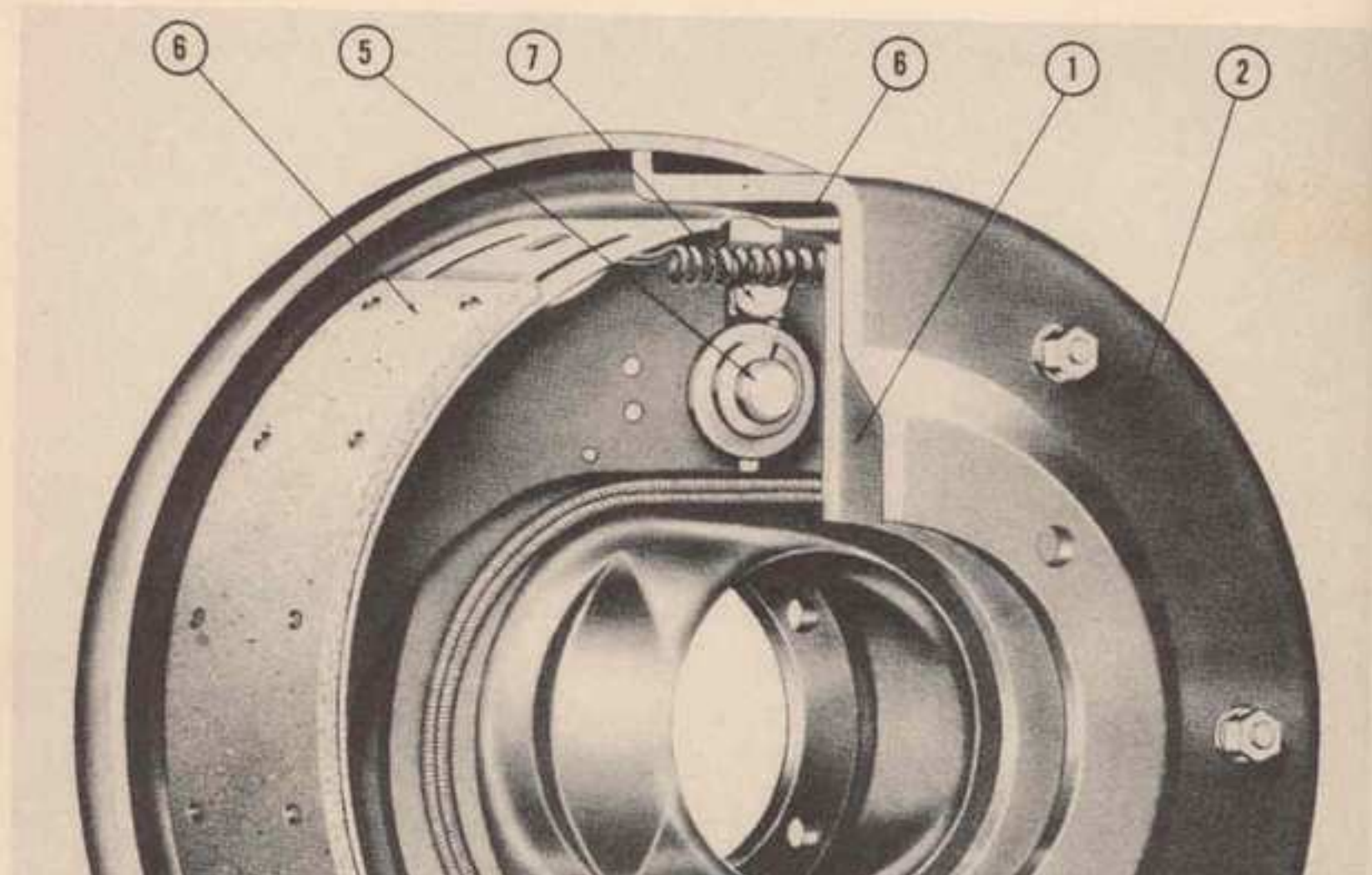


State laws require mobile homes weighing over 1500 pounds to be equipped with brakes. To safely pull a mobile home you need to know something about brakes. Mobile homes have either vacuum brakes, electric brakes, or hydraulic brakes. Vacuum brakes are unusual. The mobile home industry has favored the electric brake. The principal advantage of the vacuum brake is your ability to get it repaired in any garage. All mechanics understand this brake. This is not true of the electric brake.

A vacuum brake system is simply a mechanical brake system that is controlled by the vacuum from the intake manifold of the car. Boosters are installed on the mobile home to control the brake cables that cause the shoes to contact the brake drums. Air lines are run from the boosters on the mobile home to the front of the tongue. A control valve is mounted on the steering wheel of the car and air lines are run to the rear of the car. A connector joins the air lines of the mobile home and car. Opening the valve with the car motor running causes vacuum from the automobile intake manifold to operate the mobile home's boosters which in turn control the brakes. Control equipment for vacuum brakes is usually sold in two kits, one consisting of the parts for the car, and the other the parts for the mobile home. Vacuum brakes will not operate when the car engine is not running.

ELECTRIC BRAKES – Almost all mobile homes are equipped with electric brakes although in the last few years there has been a slight trend toward hydraulic brake equipment. There are two popular makes. One is the Warner, put out by the Warner Electric Brake and Clutch Company, Beloit, Wisconsin; the other is the Kelsey-Hayes, manufactured by the Kelsey-Hayes Wheel Company, 3600 Military Ave., Detroit 32, Michigan. Find out which you have and then write the manufacturer. Request a service manual and literature on the brake. Then keep this material with you at all times. Space does not permit us to tell you all you need to know about your electric brake system. Sending for this literature will give you the information needed. Most garages do not understand electric brakes. Keep your brake manuals with you. They'll help you stay out of trouble since you will be able to assist mechanics making emergency repairs because you have the necessary instructions with you. The Warner people even put out a directory of authorized service stations. When writing them, ask for this booklet.

The simplest possible statement of what an electric brake system does is this. The hydraulic system on your car has cylinders that force the brake bands against the drums. In an electric brake system, the bands still do the braking, but the armatures and electro-magnets in the electric brakes move these bands against the drums. The current to operate the electro-magnet comes from the car's six or twelve volt system.



1. Armature Disc 2. Brake Drum 3. Electro Magnet 4. Actuating Lever 5. Lever Pivot 6. Brake Band 7. Actuating Block

How the Kelsey-Hayes Electric Brake Operates

When the controller permits current to flow through the electro-magnet (3), the energized magnet is attracted to the armature disc (1), which is attached to and rotating with the brake drum (2). The frictional and magnetic force developed by the magnet against the armature disc draws the lever in the direction in which the brake drum is rotating. The movement of the lever (4) changes the position of the actuating block (7), spreading the brake band (6), so that it presses on the drum.

The multiplication of the magnet force by the lever develops the smooth, powerful action that is characteristic of the Kelsey-Hayes Electric Brake.

Courtesy Kelsey-Hayes Wheel Company

BRAKES

New brakes must be broken in. Here are Warner's recommendations for the breaking-in procedure. (1) Speed up to at least 30 miles per hour, apply the brakes only until speed is reduced to 15 miles per hour, then regain speed. Do not lock the wheels. (2) Drive for a half mile without using the brakes, and then repeat step (1). (3) Repeat steps (1) and (2) several times until you have traveled about six miles. (4) Let the brakes run free for about four miles. Then apply them again to check their efficiency. New brakes have a tendency to make a slight squealing noise. Do not be concerned. The noise will disappear when brakes have been broken in.

The best rule in applying brakes is to avoid sudden stops. The correct procedure is as follows: apply, release, apply, release, and then apply with a sort of off and on motion. On long down grades the braking should be divided equally between the car's foot brake and the coach's brakes so that neither becomes overheated.

Never start a trip without first testing your brakes. This applies to each day. On your first 100 yards of travel, thoroughly test brakes and make sure they are operating. If they fail to operate, get off the highway until they have been overhauled or repaired.

The electric brake control should be on the left hand side of the car steering column just below the wheel. Normally you should apply the brakes on the mobile home before applying the car brakes. This is important in emergency stops. Unless the mobile home brakes are applied first, there is serious danger of jack knifing due to the weight of the towed vehicle pushing the car sideways.

The biggest disadvantage of electric brakes is that they can't be applied when the car is disconnected from the mobile home. This can be overcome by installing a six volt dry cell battery in the coach and a break-a-way switch assembly on the front of the coach. This accessory is made by electric brake manufacturers and is available at parts stores. It's a switch you mount on the towed vehicle. A chain is supplied that attaches to the car. If the mobile home breaks loose from the car, the chain pulls the switch and sets the brakes. This accessory costs little compared to its potential value in preventing possible total loss of the mobile home. We strongly recommend you install it. Most people are not aware that this accessory can be purchased. That's why you don't often see them in use.

Do you need brakes on both axles if you have a tandem undercarriage? Yes. If your mobile home is large enough to require a tandem undercarriage, it's heavy enough to need brakes on both axles.

Here are a few important things you should know about electric brakes:

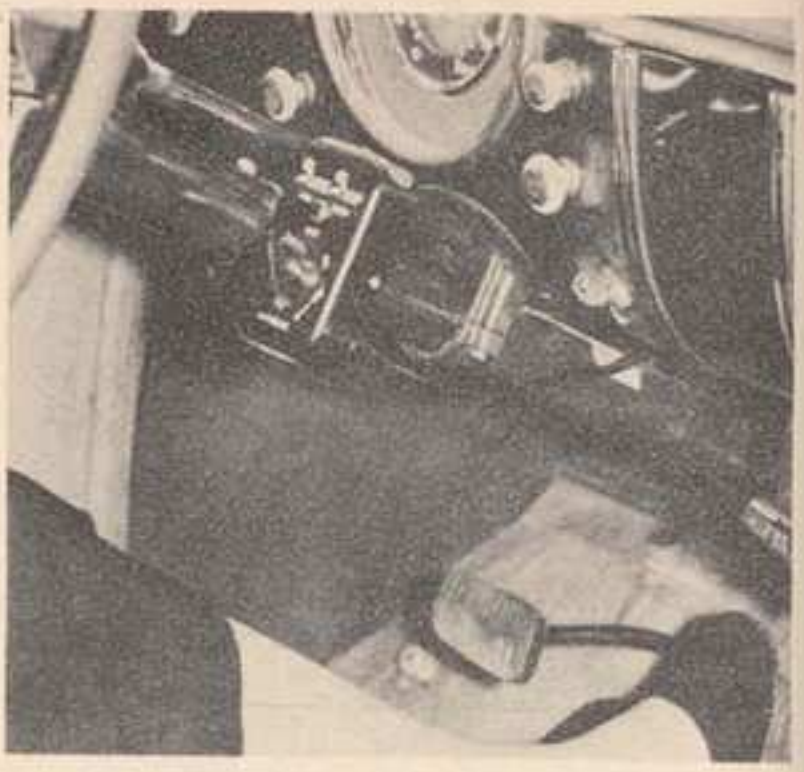
1. They never need adjustment. They adjust themselves automatically.

2. You never need worry about scoring your drums.

3. Most difficulties are electrical in nature, rather than mechanical. Careful checking of the wiring will ordinarily repair most defective electric brakes. Special attention must be given to the connector between the car and mobile home which should be one that can be firmly locked, and the points must be kept clean.

4. Prolonged use of brakes causes fading and overheating. Do not use them for long intervals.

There are devices on the market that may be installed on the car to operate the electric brakes off the car foot pedal. Do not install them unless they permit you to operate the brake systems of the car and mobile home independently. To install a device that makes it impossible for you to operate the two brake systems independently is courting disaster. For example, on icy or wet roads it is usually desirable to use only the mobile home brakes. The same situation might arise in case of a flat tire. If there is a blow out on the mobile home, there is a tendency for it to swing to one side. To apply the mobile home brakes may cause this tendency to become so strong that it causes a serious accident. The same applies to a lost wheel. In such circumstances, use only the car brakes. On the other hand, should there be a blow-out on the car, the car tends to skid sideways. Just remember not to apply the car brakes at all. Bring the equipment to a stop using only the mobile home brakes.

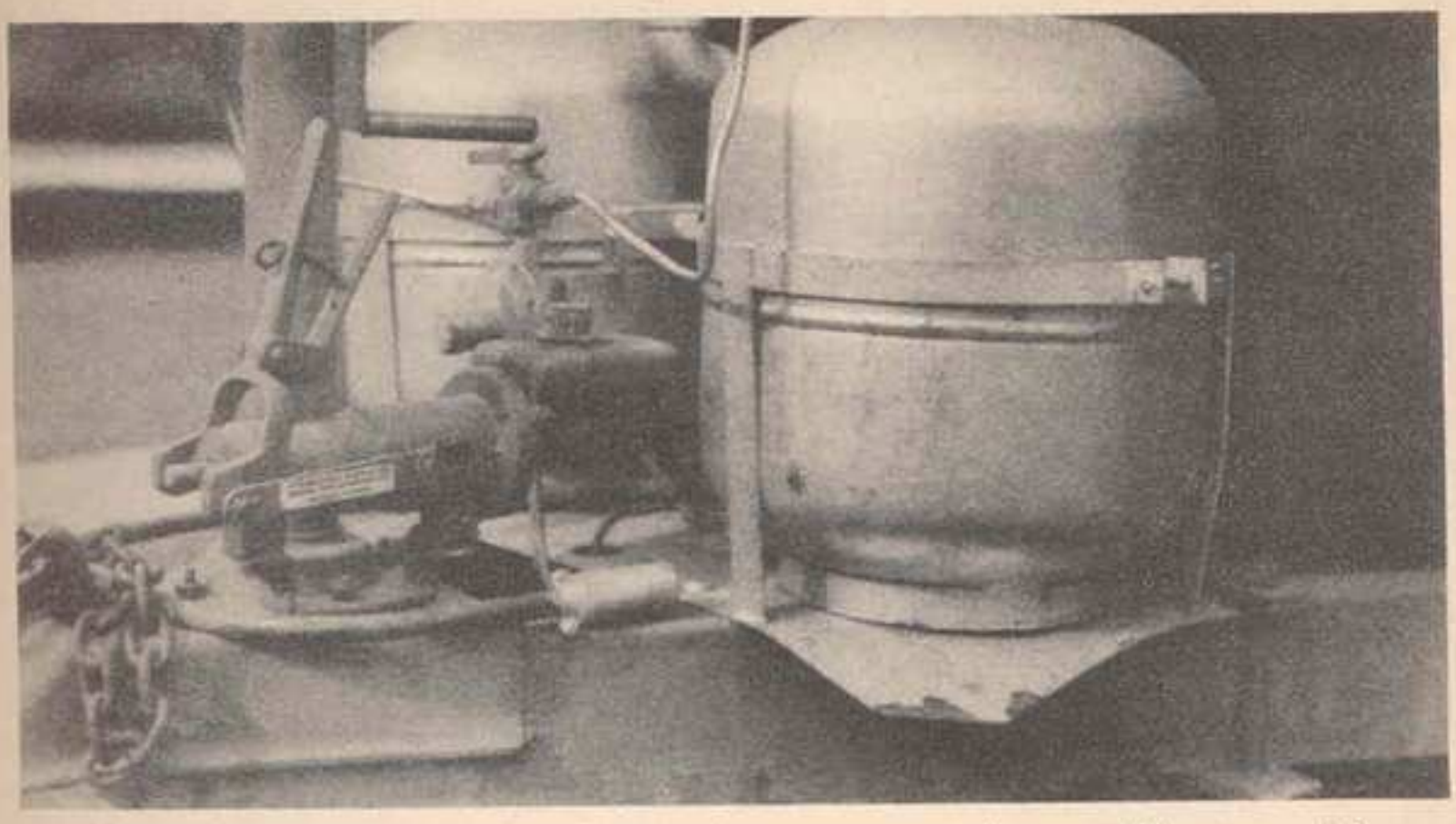


Courtesy Sure-Stop Brake Control, Inc.

The Dual Sure-Stop foot pedal brake control shown here permits operation of mobile home brakes off auto foot pedal yet allows hand control of mobile home brakes independent of car brakes when desired. Note hand controller mounted on steering wheel column.

HYDRAULIC BRAKES – Hydraulic brakes on mobile homes have been made possible by the invention of the Stromberg Hydraulic Brake Coupler. An hydraulic brake system is installed on the mobile home. The hydraulic system of the car and the mobile home are then connected by means of the Stromberg Coupler. This coupler is designed to eliminate any interchange of fluid between the car and mobile home brake systems. Fluid from the towing vehicle does not pass to the mobile home or vice versa. Therefore, there is at no time loss of fluid or admittance of air into either system. When uncoupled, they are two independent brake systems. When coupled, these two systems become synchronized. With the car and mobile home connected together you merely step on the brake pedal of the car and you have a complete braking system for both car and mobile home.

The best hydraulic installation involves the use of a hand control. It permits individual braking of the mobile home when desired. The hand valve operates in this way. Under ordinary stopping with the foot pedal the valve is held open, allowing pressure to build on both the towing vehicle and the mobile home. When the hand lever is pulled, the valves seat automatically, and pressure is only applied to the mobile home brakes. After you've applied the mobile home brakes you may still step on the foot brake to apply the car brakes. An important feature of this system is this. Should the driver apply



Stromberg Hydraulic Brake Coupler is shown mounted on mobile home A-frame. Hydraulic brakes are increasing in popularity.

the mobile home brakes with the hand control and then apply the brakes on the car with his foot brake, pressure will build up on the car brakes until they reach a pressure equal to that on the mobile home brakes. At this time the valve will unseat and the pressure will increase on both mobile home and car. This feature makes it impossible to apply more pressure to the car than to the mobile home.

New hydraulic systems need adjusting after the first 500 to 1,000 miles. Maintenance after that is the same as maintenance on any hydraulic brake system. Repairs are easy because any garage understands hydraulic brakes. One advantage of hydraulic brakes is that they can be set when the car is uncoupled from the mobile home. Another advantage is that if the car and mobile home break apart, the hydraulic brakes on the towed vehicle will automatically set. Another thing, hydraulic brakes are more likely to operate satisfactorily after long periods of idleness. One point of caution here is important. The coupler has a lever that must not be left in an unlatched position for an indefinite period of time. The manufacturer recommends not more than 48 hours as a safe period. At the end of this time the lever should be latched, relieving the pressure for a few moments, and then it may again be unlatched, reapplying the pressure. The purpose of releasing the pressure every now and then is to relieve the pressure on the cups in the cylinders so that they will not adhere to the cylinder walls and eventually start to leak. Leakage occurs only if constant pressure is left on for a long period of time.

What You Should Know About Tires

TIRES FOR YOUR CAR – Tire manufacturers build tires to a standard, based on the load the tire will carry. All tires have a maximum rated load capacity, and this is stated in a specific number of pounds.

TIRES

Automobile manufacturers, when equipping cars with tires, do not consider that the car may be used to pull a mobile home. For that reason, your car tires will be overloaded when your car pulls a mobile home. Subjecting a tire to overload causes excessive wear, tire damage, and increases the possibility of blow-outs and dangerous accidents. Therefore, it is customary to change tires when you pull a mobile home. There are too many factors to be considered in selecting the right tire for us to attempt to give you accurate information as to what tires you should use under all varying circumstances that may exist. But, here is what you should do to make sure your car has the proper tires:

1. Determine the tongue weight of your mobile home. If you do not know what that weight is, take it to a public scale where this can be determined. Be sure you load mobile home ready for travel before you weigh it. You should also ascertain the amount of extra weight you will carry in back of the car.

2. Determine what equipment will be used to tow the mobile home. Do you plan to use a dolly? If so, the data furnished by the dolly manufacturer will enable you to determine, once you know the tongue weight of the mobile home, the amount of weight that will be on the car. Are you going to use a conventional hitch in conjunction with overload springs or do you plan to use one of the specialized weight distributing hitches? If you plan to use a weight distributing hitch, are you going to use the type that distributes the weight equally over all four wheels of the car or are you going to use the type that puts all of the weight on the rear axle of the car?

3. When you have the facts regarding the first two points mentioned above, go to a large distributor of tires, not to a small service station or a small tire dealer. Present these facts to the distributor, and he will give you advice as to the size and type of tire you should put on your car as well as the correct amount of air pressure to use in those tires.

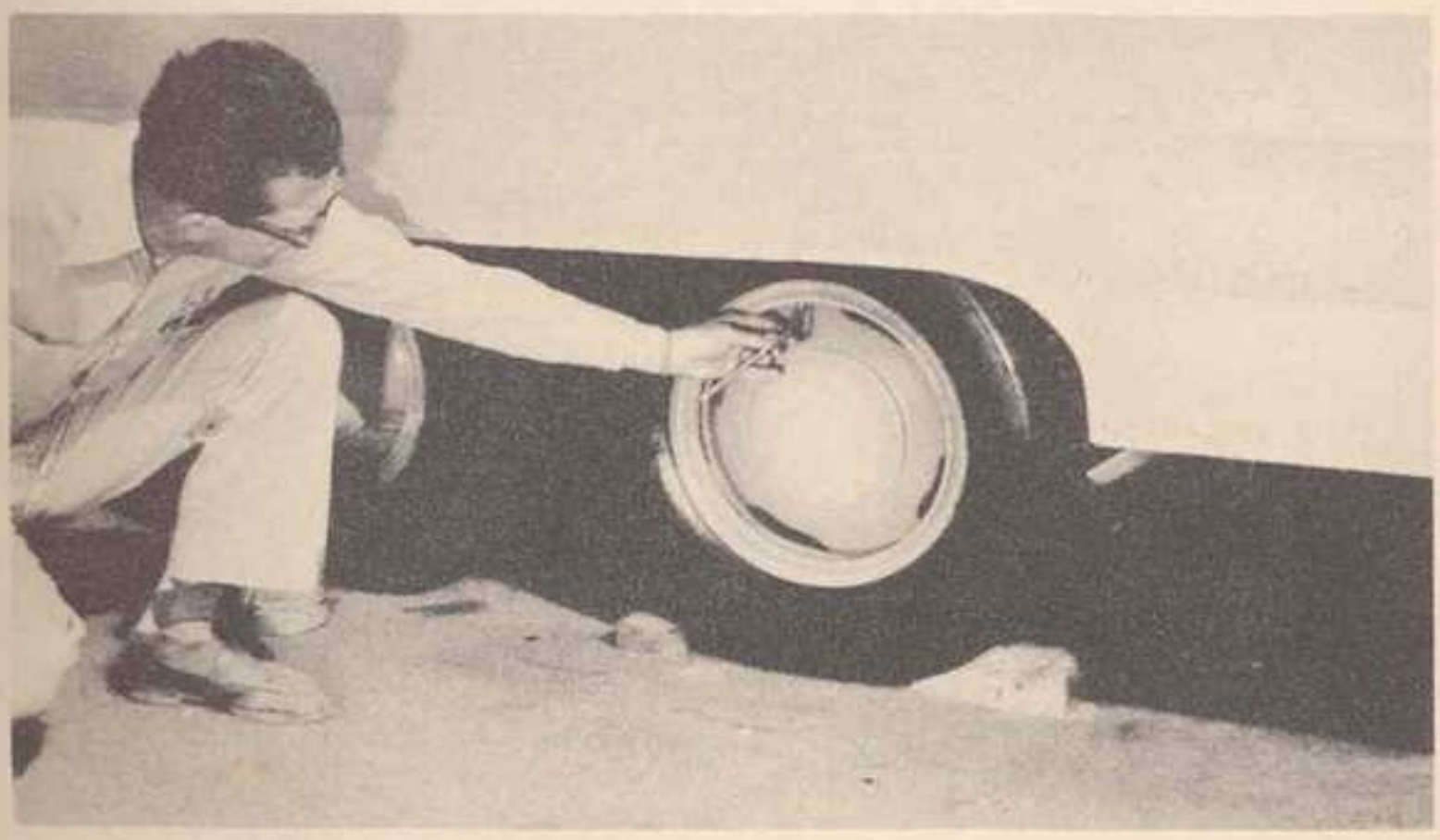
MOBILE HOME TIRES – The weight of your car is distributed over four wheels, whereas the weight of your mobile home is normally distributed only on two wheels (there is a small amount of the weight on the tongue). For this reason, mobile home tires must carry considerably more weight than ordinary automobile tires. This is why you see mobile homes equipped with larger tires, such as 750 x 16, either 6 or 8 ply, or even larger in many cases. When the weight of the mobile home, due to its size, becomes so great that it is not practical to place all of this load on two tires, the mobile home is equipped with a tandem undercarriage which permits this weight to be distributed over four tires.

WHAT WHEEL IS BEST? –Semi-drop or flat rim wheels are desirable on heavy mobile homes. The regular drop rim wheel used almost universally on automobiles is not practical. There are two reasons. First, a heavy load on a drop rim wheel may cause the tire to pinch the tube. Many a mobile home traveler has had the frustrating exper-

ience of frequent flats when his equipment was fitted with this type wheel. A flat on a large mobile home is no laughing matter. Tire changes are difficult to make. His experience is frustrating because he usually doesn't know why he is having so many flats. The second disadvantage of the drop rim type wheel is that when a flat occurs, this type of wheel is easily bent out of shape, necessitating replacement of the wheel. If you are having difficulty with frequent flats due to tire pinching, turn in your old wheels and get flat rim or semi-drop rims. This will solve this problem permanently. When you buy a coach, find out what kind of wheels it has and insist on having the correct type.

WHAT TIRE PRESSURE IS CORRECT – You can't be too careful about maintaining the correct tire pressure. Over-inflation subjects the tire to improper wear and makes it vulnerable to road damage. Under-inflation is even worse. Under-inflated tires may twist on the rims when brakes are applied, shearing off the valve. There is danger of cuts and other damage on pitted pavements or rough roads. The biggest enemy of tires is overheating. An under-inflated tire is likely to overheat.

There's no simple formula for the correct pressure for mobile home tires. The correct pressure will vary with your load and with the type of tires you have. The recommended procedure is for you to check with the nearest truck tire sales agency. They have charts for the various size mobile home tires that show the correct pressures for them. Find out the correct pressure for your tires and then see that it is maintained. Carry your own air pressure gauge to check tire pressures. Check at least twice daily when traveling. Service station gauges are usually not accurate. Test pressure when tires are cold. If you tend to be careless about tire pressures, over-inflate rather than under-inflate.



Carry your own tire gauge and check tires twice daily when traveling. Don't rely on service station gauges.

HINTS FOR INCREASED TIRE LIFE – Here's a list of do's and don't's to assist you in getting the maximum service from your mobile home tires:

1. For better tire mileage and smoother tread wear, rotate tires every three or four thousand miles.

2. Keep brakes in first class working condition so they do not drag. This will assure smooth stops and minimum tire wear.

3. Keep wheels balanced to reduce tire wear.

4. If you're lazy about checking your tires, and you certainly shouldn't be, then there is one gadget you should definitely install. This is known as a Save-A-Tire. It is a gadget that attaches to the axle of the mobile home and immediately notifies the driver when his tires are low by a light on the dashboard. This item is available at parts stores.

5. Check tires regularly and remove rocks, glass and other imbedded foreign materials.

6. Keep tires inflated to correct pressure. Over-inflation is better than under-inflation.

7. Use the right size tire for the load you are carrying.

CHANGING TIRES – Mobile homes are ordinarily not furnished with with spare wheels and tires. Flats are a rare occurrance. Space and weight consideration rule out the desirability of carrying spares. Should a flat occur, the wheel is merely pulled and taken to the nearest repair station in your automobile. On small campers it is often possible to make the car spare tire fit the trailer. For this reason, many camper owners or box trailer owners fit their trailer with the

Keep tires on parked mobile homes painted with synthetic rubber protective paint.

Wherever possible give tires on parked mobile homes canvas protection.

same style wheel as is used on their car.

On some mobile homes, removing a wheel to repair a tire is an extremely difficult operation. The wheels and tires are heavy and large. There is often insufficient space in the wheel housing between the outer wall and the chassis to remove the wheel easily. Under these circumstances, the proper procedure for removing the wheel and tire is to jack the axle well off the ground with a good hydraulic jack. Then, block up the axle; now, again using the hydraulic jack, jack up the side of the body so that the wheel can be removed easily. Remember too, it will be easier to get the tire off when it is flat than when it has been reinflated, so allow plenty of clearance when taking off the tire and wheel. Sometimes, on a dirt road, it may be easier to dig a hole in the ground to remove the wheel than it is to jack up the mobile home.

TIRE CARE WHEN MOBILE HOME IS PARKED – If the coach is to be left standing idle for long periods of time (six weeks or more), the axle should be blocked up so the weight does not rest on the tire. The air pressure in the tires should be reduced to a few pounds. If it is impossible to block up the coach, then the full air pressure must be maintained, and the equipment should be moved every week or two to place the load on a different portion of the tire. If the coach is out-of-doors, the tire should be painted regularly with a synthetic rubber protective paint and given canvas protection wherever possible. Especially protect tires from light, heat, oil, dust, and dirt.

What To Do About Overheated Engines

One of the big problems encountered when pulling heavy equipment is overheated auto engines. Your car's cooling system was not designed to handle the load to which it is subjected when the car tows a heavy load. Overheating is most frequently encountered when going across desert country, going up grades and in mountainous countries. Here is a list of the things you can do to correct this condition.

1. Put in an oversize fan with more blades.

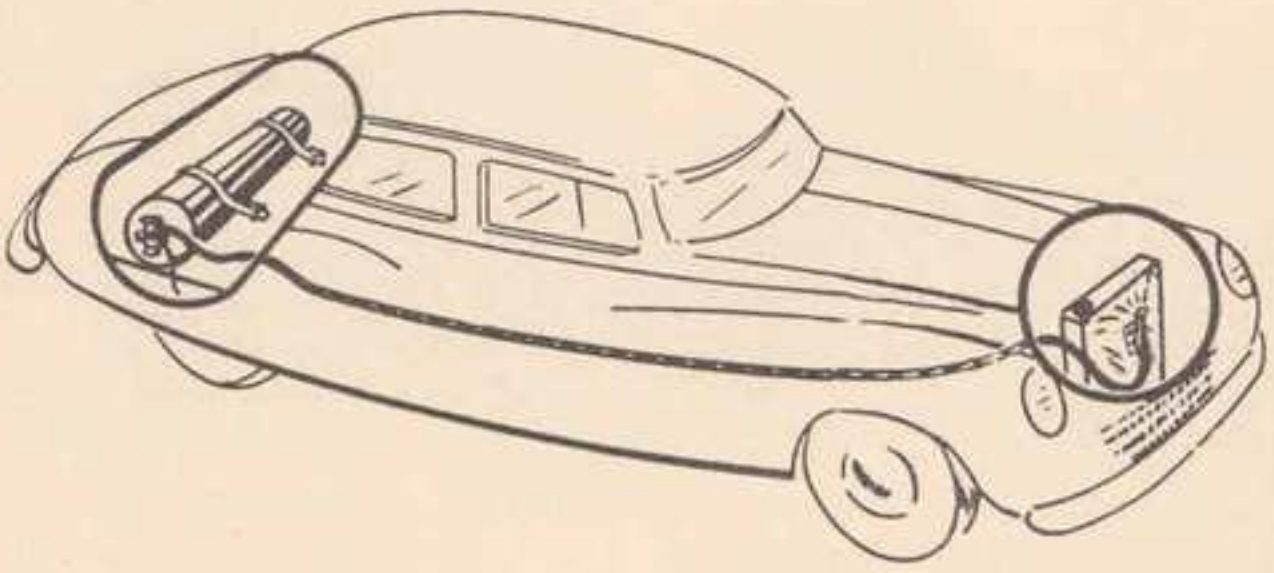
2. Check to see that your fan belt is tight and in good condition.

3. Use anti-freeze in your radiator water, using a proportion of about one half distilled water to one half anti-freeze. This will tend to cool the water faster.

4. Purchase and install an oversized radiator, or use a radiator cooler. Radiator coolers may be purchased from mobile home supply stores, or you can build one yourself. To build your own, install an auxiliary water tank in the rear of the car of approximately twenty gallon capacity. Buy an electric pump at any auto store and install it between the tank and the line you must run to the top of the car radiator. Attach the tubing along the top of the radiator and perforate it with small holes. Crimp the end of the tubing line closed. Then, when you turn on the pump, a spray of water will be thrown over the radiator. This wets the radiator and causes evaporation. This evaporation cools the water faster as it runs through the automobile radiator. This is one of the most effective methods of combating overheating problems.

5. Removing the thermostat from the water system of the car will, in some cases, reduce boiling.

6. Drive through the mountains and across deserts in the cool of the night.



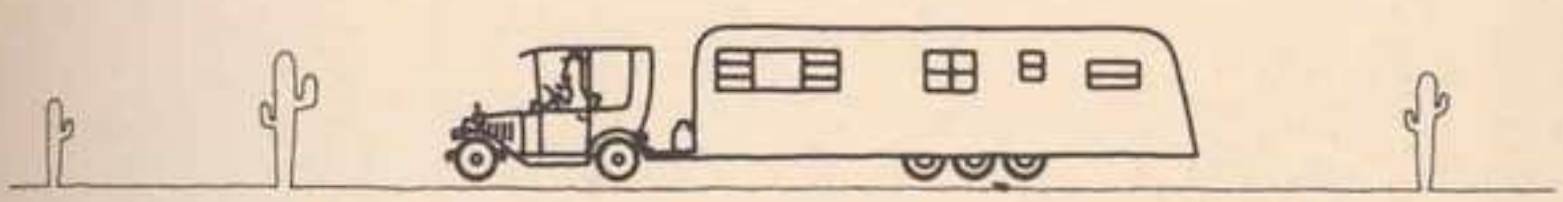
Courtesy Vapor-Kool Mfg. Co.

Engine coolers will help eliminate overheating troubles.

7. Keep your cooling system well flushed out to cut down friction in the system and assure maximum flow of water through the motor and radiator.

8. Have a mechanic check your spark. New car dealers frequently retard the spark on new cars to get rid of ping. Make sure that yours is properly set. A retarded spark means a hotter engine.

9. Use a water injector. These devices not only give you a cooler engine but increase the octane rating of the gasoline you use.



CHAPTER III

INFORMATION FOR MOBILE HOME TRAVELERS, VACATIONERS AND CAMPERS

First, let us emphasize what we have already pointed out in the section on purchasing a mobile home. Travelers must not purchase large mobile homes. Large, super-deluxe, heavy weight, modern mobile homes are designed primarily for living. Don't, for a minute, consider pulling one to travel about the country. Select the smallest possible unit consistent with the minimum number of conveniences you feel are necessary. You should be able to hold the overall length to 27 ft. or less.

All evidence is overwhelmingly in favor of the argument that you save money when you travel with a mobile home. Don't reduce this saving by trying to pull a large mobile home. Not only will you considerably reduce gasoline mileage, but you will increase automobile maintenance cost tremendously. What's more, you will encounter all types of travel inconveniences that may more than offset the savings of traveling with a mobile home.

Planning Your Trip

Whenever possible, plan details of your trip in advance. Give yourself plenty of time to map out your itinerary and collect as much data as possible. There are many ways to get the information you will need to plan your trip. Here are a few suggestions. (1) If you have a credit card with any oil company, they will be glad to assist you in planning your trip. Consult a local office of the oil company, and they will explain to you how to get the information you want. (2) If you are a member of any automobile club, they can supply you with information that will be of assistance. (3) Write to the State Chamber of Commerce and/or the Department of Motor Vehicles at the state Capitol of any state through which you plan to travel. Tell them that you plan to visit their state and want road maps and literature to give you information regarding points of interest in the state. A 2¢ postcard will bring a flood of valuable information. You can also obtain information by writing to the Chamber of Commerce of any city you plan to visit. Tell them of your planned visit and request information regarding routes and points of interest.

There are three books that are *musts* for those who plan to travel in a mobile home. They are: (1) *Woodall's Trailer Park Directory;* (2) the *Official Trailer Park Guide;* (3) *Camp Ground Guide.* You will find further particulars about these publications in the chapter, "Publications of Interest to Mobile Home Owners." We suggest that you have all three of these directories because the Camp Ground Guide gives information not contained in the other two directories. The other two directories differ in many cases in their ratings of parks. Therefore, it is desirable for you to check one directory against the other.

Consider weather conditions carefully when planning a trip. For instance, pulling a mobile home through the Rocky Mountains in the winter time presents innumerable difficulties. Other difficulties are encountered in trying to pull a mobile home across the desert in the heat of summer. (If you must, travel at night.)

Give careful consideration to your mail problem. Use General Delivery addresses and instruct that your mail be marked "hold till arrival". Never have mail forwarded to mobile home parks in advance of your arrival. Some parks are careless in handling mail and may send mail back in error. Use General Delivery. It's reliable.

Where possible, write ahead for reservations at the parks you plan to stop. Reservations are important in traveling through areas where parks are crowded. If you have no reservation, you will find it necessary to stop early in the afternoon to assure yourself of adequate parking facilities. Of course, when traveling in a mobile home, it is always possible to find somewhere to stop overnight. However, reservations should be made by those who prefer the choice facilities. A word of caution. Some mobile home parks, if you make definite reservations in advance, will charge you for the nights your reservation specifies even if you are late in arrival. This is fair since they are holding a space empty for you that they would have been able to rent if you had not put in your reservation. So be careful to make your reservations precise, and arrive on time.

In general, it is not too difficult to get your personal checks cashed by park operators, provided you have adequate identification with you. It is desirable to carry as little cash as possible. Where large amounts of cash must be carried, be sure to use Traveler's Checks. Oil company credit cards as well as other types of credit cards are extremely desirable.

If you are planning to leave the United States to visit Mexico or Canada, it is important that you have with you your birth certificate, your naturalization papers, or voting credentials. Those who plan to visit Canada should write the Canadian Government Travel Bureau at Ottawa to obtain the latest information on requirements for entering Canada. This Bureau will also send you information on the various attractions in Canada that will be of interest to you. If you plan to visit Mexico, you should write to the Mexican Consulate in the city nearest you. The Consulate can give you information regarding requirements for entry, as well as information on points of interest in Mexico.

Complying With State Laws

It's extremely important that you familiarize yourself with the State Laws relating to mobile homes. Of special importance is the size of the mobile home and it's length in combination with the car. Laws relating to the way in which your mobile home or car must be equipped are of equal importance. Almost all states have laws relating to the length of the mobile home and the combination length of the car and mobile home. If your equipment exceeds the limits set down by the law, it is necessary for you to obtain a permit before you at-

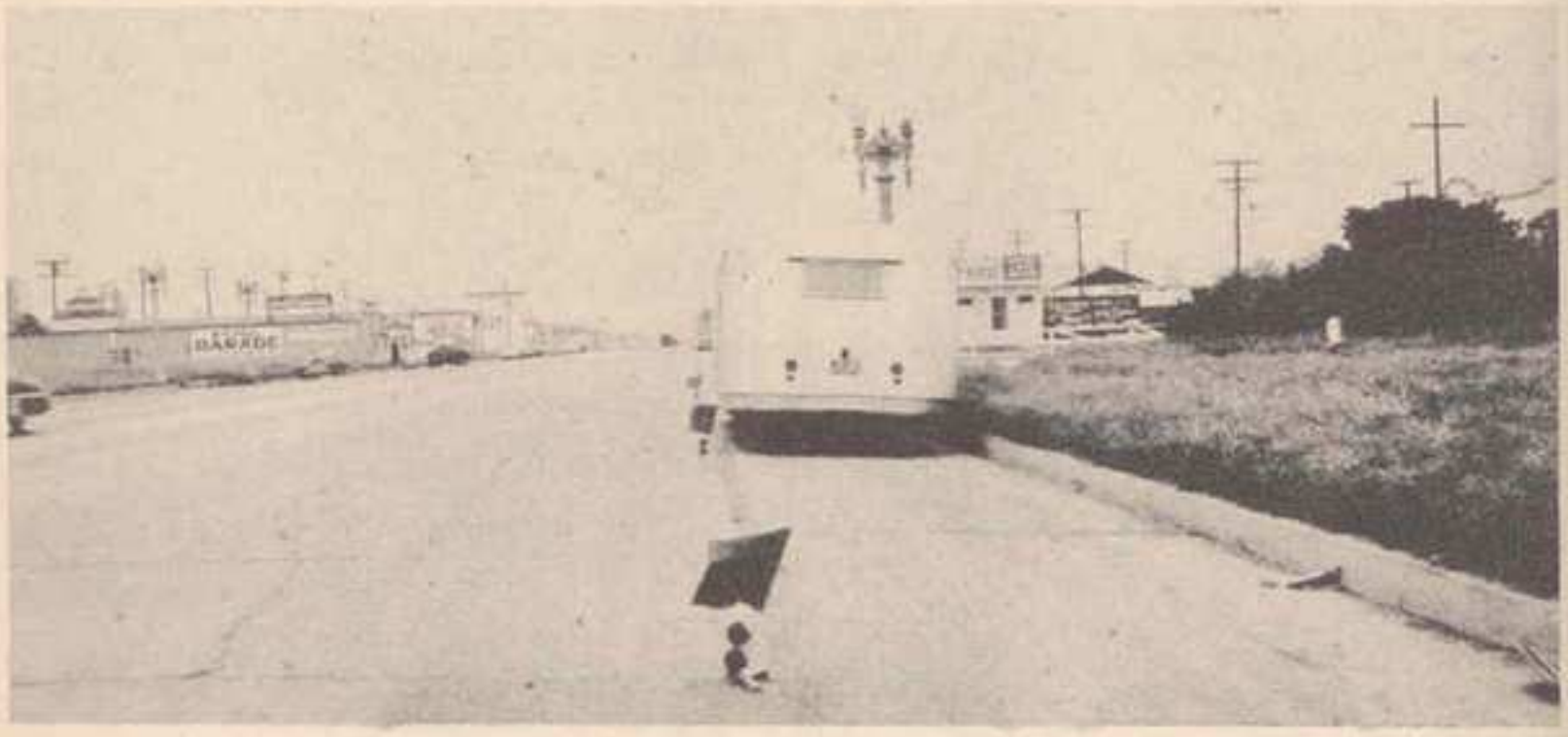
tempt to cross the state. Some states even refuse to permit overlength mobile homes at all, and you must plan accordingly.

Laws relating to mobile homes are too elaborate for us to recap. The necessary information, however, is available in the Official Trailer Park Guide and in Woodall's Trailer Park Directory. The Official Trailer Park Guide is especially helpful in giving you information as to where you should write in advance to obtain your permit, if one is necessary.

State laws on equipment are also quite elaborate. They cover such things as brakes, reflectors, clearance lights, signals, hitches, fire extinguishers, safety chains, etc. The specific regulations of each state regarding these matters are outlined in Woodall's Trailer Park Directory. In considering these laws it is important for you to bear in mind that many states do not differentiate between mobile homes and commercial trailers. They have only one set of laws to govern both types of vehicles. States that fall into this classification normally enforce the laws in detail only against commercial trailers.

When in doubt about state laws, bear in mind that state authorities hesitate to enforce specific requirements of their state against a mobile home passing through it *if the mobile home has been properly registered and equipped for its home state.* Don't fool yourself for a minute by thinking that officials of one state are not familiar with the laws of other states. They are. It is extremely important that you equip your mobile home for your own state and register it correctly in your own state. This non-enforcement policy *does not* apply to size laws.

Be sure to carry flares and other warning equipment for your use should it be necessary to stop your car and mobile home along the side of the road for repairs. The law puts the obligation on you to warn oncoming traffic of the hazard. Any accident that may result from your stopping along the highway is normally considered your fault unless you put out the proper warning devices.

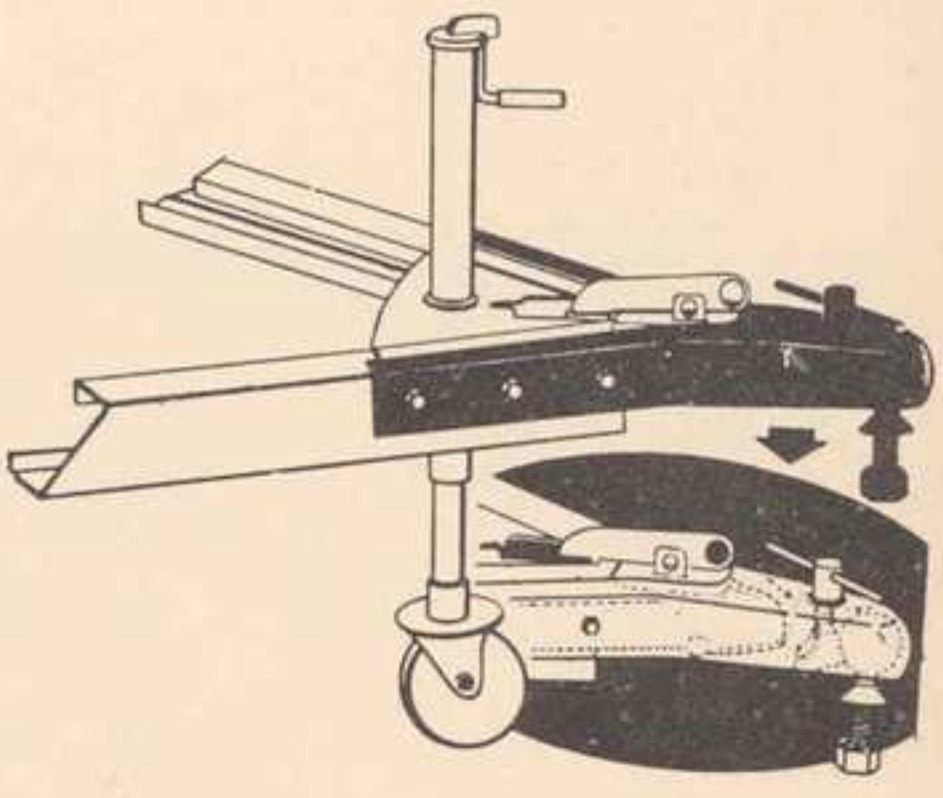


When you stop for repairs, the law makes it your obligation to warn oncoming traffic of the hazard. Use reflectors and red flags, or other warning devices.

Red flares or red flasher lights should be used at night. During the daytime red flags should be used. These devices must be placed on the highway in such a manner as to give plenty of warning to oncoming vehicles of what is ahead.

Be sure to have a good hitch. If you don't know where to get one, inquire of mobile home owners in your area. They usually know the right place to refer you. Don't try to save money on a hitch. The *best* is a MUST. Your life may depend on it; your investment in car and mobile home certainly does.

There is a law requiring mobile homes over 5,000 lbs. to have a 2-5/16" ball with a 1¼" shank. It does not apply to mobile homes built before July 1, 1953, but we certainly recommend that you have your mobile home changed to comply with this law even though it was built before this date. This regulation was not made without reason. Don't take unnecessary chances. The cost of a conversion hitch is small.



Courtesy Slimp Axle Products

Slimp conversion hitch can be used to convert 5000 pound mobile homes with 2 inch hitch ball to hitch with 1¼ inch shank so mobile home will meet I.C.C. requirements.

What To Take With You

The guiding principle in deciding what to take with you is that you must hold weight down to a minimum. You never know in advance exactly what you are going to want while you are on the road, but you certainly can't take everything. We cannot over-emphasize the importance of keeping weight down. Take only the barest of necessities.

Here's a partial list of things experienced mobile home travelers take with them:

1. Take two butane tanks on a fuel tank rack at the front of your mobile home. It's a problem to run out of gas in far away places.
2. Try to get a national list of dealers that handle your type of mobile home. This can frequently be done by writing to the mobile home manufacturer and will enable you to have repairs made by factory authorized dealers.
3. Be sure to have home state registration papers and license.
4. Hold the quantity of food you carry down to a minimum. There are plenty of places to shop as you go.
5. Carry a minimum of cooking equipment and make sure the pans you take are not too large to fit in your small oven.

6. You will probably plan to do some washing enroute. Therefore, take some sort of collapsible clothesline.

7. Some states require you to have a fire extinguisher in your mobile home. Take one along.

8. If you are particular about the care of your car, you might want to take along a tarp to cover it. A lightweight plastic cover is best.

9. Carry some type of insecticide.

10. If you are going to be away from civilization quite a while, where electric power is often not available, you will find a gasoline iron very satisfactory.

11. Include a first-aid kit.

12. Take along a tool kit that will include all of the tools experience has shown you will need. Some of these tools are as follows: Stillson wrench, saw, brace and bit, monkey wrench, tin snips, hammer, nails, screws, tacks, a cross-x type lug wrench, a small pick, some hay wire, and various lengths and sizes of insulated copper wire.

13. Take along a rope that is heavy enough to pull the mobile home. You may find yourself in places where it will be necessary to pull the mobile home before you can hook it up to the car.

14. A couple of lengths of 12 to 16-foot chain with hooks on both ends are desirable. In many cases, you will find that it is better for pulling your mobile home than a rope.

15. A small hydraulic jack is a *must* for jacking up the mobile home in case of wheel or tire repairs. Of course you'll want the standard bumper jack for your car.

16. Take a tire gauge that you can carry with you. Be sure it is a dependable one and use it often to check all tires.

17. Stabilizing jacks. Buy wheel chocks, or take along blocks of wood to act as wheel chocks. If you use blocks, you will need four. They should be placed on each side of the wheel and should be about six inches square and a foot long.

18. Of course you need a tire pump.

19. Carry at least one jeep can with 5 gallons of extra gasoline, and at least one jeep can filled with extra water. A few quarts of extra oil are also desirable.

20. A canvas water bag is always handy.

21. Don't forget a flashlight or some other type of electric battery lantern.

21. Be sure you are

Commercially made wheel chocks or blocks of wood to act as chocks are a necessary item for your "travel kit."

properly insured and have the address of the insurance company to notify in case of accident.

Preparing For Travel

Here are a few tips that will help you prepare your mobile home for travel:

In general, things will not shift around much inside your mobile home if you are traveling on regular roads.

Keep food in refrigerator in flat, broad base receptacles, preferably unbreakable polyethylene plastic containers. There is no need to pack the refrigerator solid to prevent things from shifting around if you use containers of this type. Just be sure, when you open the door after being on the road, to open it cautiously.

Combination ice and electric refrigerator shown here is ideal for mobile home traveler. Unbreakable polyethylene plastic food containers solve problem of breakage. Use this type container for staple storage, too.

Radios, lamps, and other large items can be screwed to tables.

If possible, take rear seat out of car and leave it at home. This area can then be used for storage space.

When packing, bear in mind that it is desirable to put the things you are going to want for short stops where they can be conveniently reached.

You can pack quite a bit in the sink well, using towels or wadded newspapers to prevent shifting.

Put non-skid underneath your rugs, and then you can set heavy articles on the rugs to prevent shifting.

It is desirable to carry all of the parts you need for hitching and unhitching in one box in the trunk of your car.

If you go over any bad bumps or exceptionally rough roads, it is a good idea to get out and check your mobile home at frequent intervals.

Pillows work well in cupboards to hold dishes, pots, and pans in place.

Use newspaper between dish stacks.

Use hooks for hanging your cups. The best is the snap type, and put them far enough apart so that they cannot swing and hit each other.

Some large items can be placed on your divan.

When loading, put the heavier things to the front and the lighter things to the rear.

Put all fragile articles toward the front of the mobile home since the front rides much more gently than the part back of the axle.

Keep the center of gravity low by putting the heavy things on, or near the floor. Put the lighter things in the higher cabinets and the heavier things in the low cabinets.

Aircraft shock cord is ideal for holding down loose items. Just locate hooks on the floor, in the closet, or in the drawers to assist you in using the cord to lash everything down.

The answer to the dish problem is plastic dishes.

Clothing in closets that is not packed firmly will wear at the shoulders due to the swinging back and forth. Therefore, pack clothing tight.

Remove loose parts of stove and store in oven.

If cupboard closets are likely to jolt open, use rubber bands or screen door hooks to fasten them securely.

Now here's a last minute list for you to check before you pull away:

1. Turn off cooking gas at tank.
2. Make sure hitch ball is securely locked to hitch.
3. Make sure heat stove is turned off.
4. Check metal folding steps to make sure they are securely under mobile home.
5. Make a last minute check of interior of mobile home to make sure all is packed and ready for the road.
6. Couple electric connector between car and mobile home.
7. Test clearance lights, stop light and tail light.
8. Secure safety chain.
9. Remove water connection and sewerage connection.
10. Close and lock all ventilators and windows.
11. Close and securely lock all outside doors.
12. Remove wheel blocks.

13. Move away from the parking space, stop, get out, go back to see whether you left anything and make sure hookup is satisfactory.

Parking

Here are a few tips that will come in handy when parking your mobile home:

1. If you are going to use mobile home parks for your parking facilities, try to make reservations in advance, especially at busy times of the season.

2. Camping out? Pick a parking site during the daytime.

3. When picking a spot in the open, the best ones are usually at the base of hills and wooded areas, or near creeks and rivers.

4. You will find it easy to make deals with farmers to park on their farmland. Just be nice about it, and you will usually find they are willing.

5. Never park your mobile home where a flash flood could endanger it. You can usually tell by inspecting the site whether or not it has ever been under water.

6. When you are parking under trees, be sure to select those that will not shed heavy limbs, or blow down easily. It is also desirable to select trees which normally do not shed leaves or other parts that might cause damage to the mobile home. It is unwise to park under a Eucalyptus or Cottonwood tree. What's more, make sure you are not under an isolated tree. It will be a definite risk in case of an electrical storm.

7. In many states you can stop in wide places beside the road for one night stops. Check with the state highway patrol to get any information on this point.

8. One of the easiest parking areas to find is an area just outside of the small towns or villages which is neither a farm area nor a village area.

9. If you are having difficulty parking, the police are glad to to give you information and are usually most cooperative.

10. You can almost always pull into a filling station and give the attendant a $1.00 bill for letting you stay there for the night. He will allow you to plug into the electric outlet, and you can normally use bathroom facilities of the station.

11. If you are parked in areas where there are a lot of insect pests, you will find it necessary to set your stabilizing jacks in pans of water. This will separate the mobile home from the ground, and insects normally do not climb tires.

12. Try not to park near main highways. The noise will disturb your sleep.

Water And Sanitation

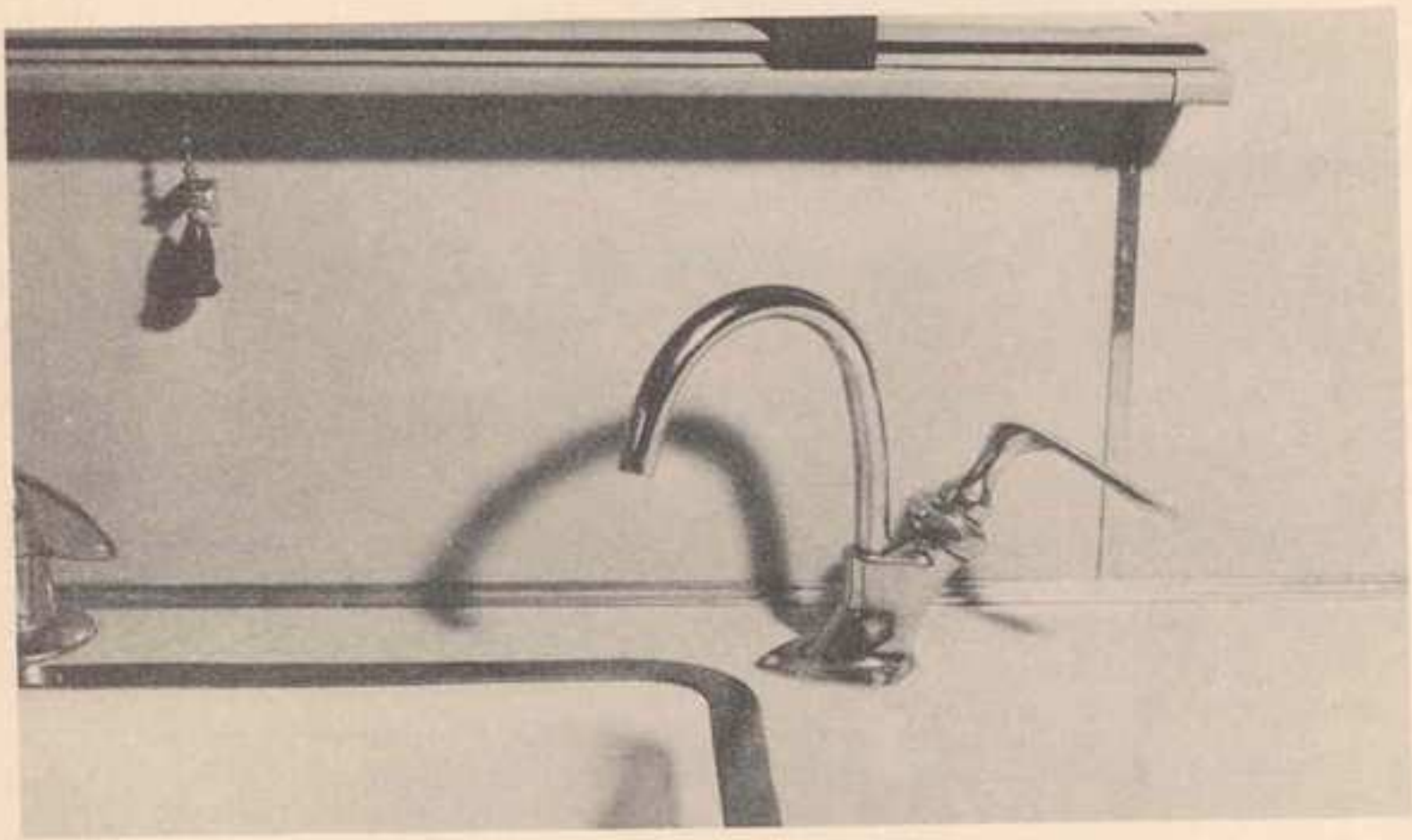
For those who are doing their traveling in out of the way places, or who are camping out in the wilderness, a few words on the subject of water supply are important. Here are a few tips for you:

1. If you are going to be parked where there is no available electricity, you will find an electric power plant desirable.

2. You will find that the standard electrical toilets or even regular house type toilets are of little value in out of the way places unless you have an electric power unit and plenty of water.

3. The mobile home traveler will usually find the regular chemical toilet his best solution to the sanitation problem. Such toilets should be emptied daily even though chemical deodorants are used.

4. Trailers for camping purposes should be equipped with a pump and a large capacity water tank. At least 12 gallons is a minimum, and a larger size is desirable.



Camping trailers should be equipped with water pump.

5. Be careful of the water you drink. Questionable water can normally be made drinkable by doping it up with chlorinated tablets. To be on the safe side, boil your water for five minutes when there is any question. You can always use the local water for purposes of bathing and washing. You can carry with you an adequate supply of what you know to be safe water for drinking, using five gallon jeep cans, bottled water, or large polyethylene bottles.

6. Water tanks carried in a camp trailer should be placed under the seat toward the front of the trailer; never behind the axle. The best water tanks are stainless steel, but they are expensive. Galvanized iron can be used to save money. Be sure to clean your tank occasionally, using a strong solution of baking soda.

7. The average couple will use from 5 to 10 gallons of water a day.

8. Bathtubs present a problem when traveling. In the first place, they are difficult to fill due to the quantity of water they hold, and secondly, it is difficult to drain them due to the large amount of water. A shower is more desirable for traveling.

9. Take clothes that do not need to be ironed when washed.

10. You can build your own shower by using a large 5 gallon

paint can with holes punched in the bottom. If your mobile home already has a stall shower in it, you will find that it is easy to take a sponge bath in the shower stall.

11. If you move often, or are away from civilization, you will find it impossible to get cleaning and laundering done. Therefore, plan what you take with you on this basis and supply yourself with cleaning solvent.

12. Want hot water? Then install a bottle gas water heater.

Lights

And now a few words on the subject of lights for those who are parking and traveling away from civilized routes.

Kerosene lamps are excellent. They operate without pressure, are noiseless, and cooler than gasoline lanterns. They are also safer and require practically no maintenance.

It is undesirable to use storage battery lights. The batteries weigh too much. Also, try not to use lighting that works off of your car battery. It's too easy to find yourself in a position where your car won't start because the lights have pulled too much juice. If you insist on using the car battery for lights, use fluorescent lights. They require less juice.

We recommend the use of power units if you can stand the expense and carry the extra weight. Both Kohler and Ohan make units that are adaptable for mobile home installations. These two manufacturers have nationwide dealer organizations equipped to service power plants. It's important not to buy an off-brand. Power plants frequently require servicing and you should have models that can be serviced by a nationwide dealer organization. If you're interested in this type of equipment, write to D. W. Onan & Sons, Inc., Minneapolis 14, Minnesota and Kohler Co., Kohler, Wisconsin. Ask for literature and the name of their closest dealer. The right electric power unit is a highly technical matter and the dealer can discuss this with you. We have one word of caution about power units. You won't be able to use them in mobile home parks. They make too much noise. Of course, you don't need them there. Electric power is available. They are prohibited in most State and National Parks, too. The main word of caution is this. Don't attach them permanently to the mobile home. When parked away from civilization, you will get better results from the power unit by placing it 20 or 30 yards away from the mobile home. This will prevent noise and vibration from keeping you awake at night.

One of the best solutions to the lighting problem when you are away from civilized areas is the use of a butane light.

Refrigeration Tips For The Traveler

The best refrigeration for those who travel is butane or propane. But, don't expect it to work while you're traveling on the road. Such refrigeration, to function properly, requires the mobile home to be level. While traveling, this is impossible. It will be necessary for you to turn the gas off while you're on the road. But, liquified petro-

Refreezants solve problem of keeping refrigerator cold while on the road. Electricity in park allows you to freeze them at night while you are parked. During travel day they provide "ice" without water run off problem.

leum gas refrigeration is perfect when you're parked. It gives you refrigeration without the necessity of electricity.

Several manufacturers of mobile home electric refrigerators make a special unit for traveling. These units can be used as a refrigerator when power is available, but they also provide a space for ice when power is not available. You can convert regular refrigerators to ice boxes by merely placing a large pan in the refrigerator with an adequate supply of ice. Just make sure you provide facilities for the water run off and keep it emptied so that it does not overflow and damage food in the refrigerator. The plastic industry has provided a wonderful new product that helps solve the ice problem. These are plastic containers in which a jelly-like substance is packaged. This jelly-like substance can be frozen in a regular refrigerator and then used to keep the refrigerator cold while you travel. They're handy because there's no water runoff problem requiring attention as they thaw. Furthermore, they are more efficient than regular ice because one pound is equivalent to 3 lbs. of ice. A supply of these enables you to keep the refrigerator cold during the day as you travel, and you can then refreeze them at night when you're parked.

If you're using an ice box, keep the door closed as much as possible. The conventional mobile home type of ice box will keep a

50 lb. cake of ice for approximately 3 days. Ice is available almost everywhere, and you should not have difficulty replenishing the box.

Should your trip take you so far away from civilization that you do not have ice, there are many things you can do. First of all, try to use foods that do not require refrigeration. Use canned or dehydrated foods. Fresh vegetables, should you be able to obtain them in an area where ice is not available, can be kept cool by wrapping them in wetted cloths and placing them where air circulation is good. The same applies to butter or milk.

Here's a special word of caution to those with electric refrigerators. Before you set out on your trip, find out whether your refrigerator requires AC or DC current, and then make sure that you find out what type of current is provided where you stop. Don't plug into the wrong type of current. You'll ruin the motor.

How To Properly Park And Stabilize A Mobile Home

The importance of properly stabilizing a parked mobile home increases with the size of the mobile home. The only purpose of stabilizing a small camp trailer is to keep it from bouncing around on its springs as you move around inside. The method you use is not of much importance since it is not probable that much damage could be done by the use of poor stabilizing methods.

On the other hand, you can find yourself facing a several hundred dollar repair bill should you stabilize a large mobile home improperly. What's more, unless the coach is properly stabilized, your plumbing and refrigerator may not work right.

Correct stabilization accomplishes three important functions:

1. It puts the mobile home on a rigid foundation.

2. It levels the floor so that the plumbing and refrigeration will function properly.

3. It prevents sag in the structure of the mobile home which ultimately results in expensive repair bills.

HERE'S WHAT YOU NEED TO DO THE JOB RIGHT: –

1. A carpenter's level. Place it on the floor of the mobile home so you'll know when it's level.

2. The right number of stabilizing jacks. The number required will depend upon the size of the mobile home. They should be equipped with a screw mechanism so that they can be adjusted to the exact height required. The use of concrete blocks or wood blocks is not recommended. They cannot be adjusted to the fraction of an inch that proper stabilizing requires.

Just about any of the standard stabilizing jacks on the market may be used. This is a volume item for most mobile home supply firms and they usually have a large variety. Actually, one type is probably just as good as another. They should be reasonably sturdy and have a good solid base. Some makes attach permanently to the mobile home chassis so that when you move, it is not necessary to remove them and place them inside the mobile home. They are equipped with fastening devices which permit them to be folded and fastened underneath the chassis.

Don't be too concerned about the actual load capacity of the jack. The primary function of a stabilizing jack is not to hold *all* the weight of the mobile home. The mobile home should never be jacked completely off of the ground with all of the weight being on the stabilizing jacks. A lot of weight remains on the wheels and on the front jack.

3. If you're stabilizing a large mobile home, it is desirable to have the help of another person. They can remain inside and give you instructions by watching the carpenter's level on the floor.

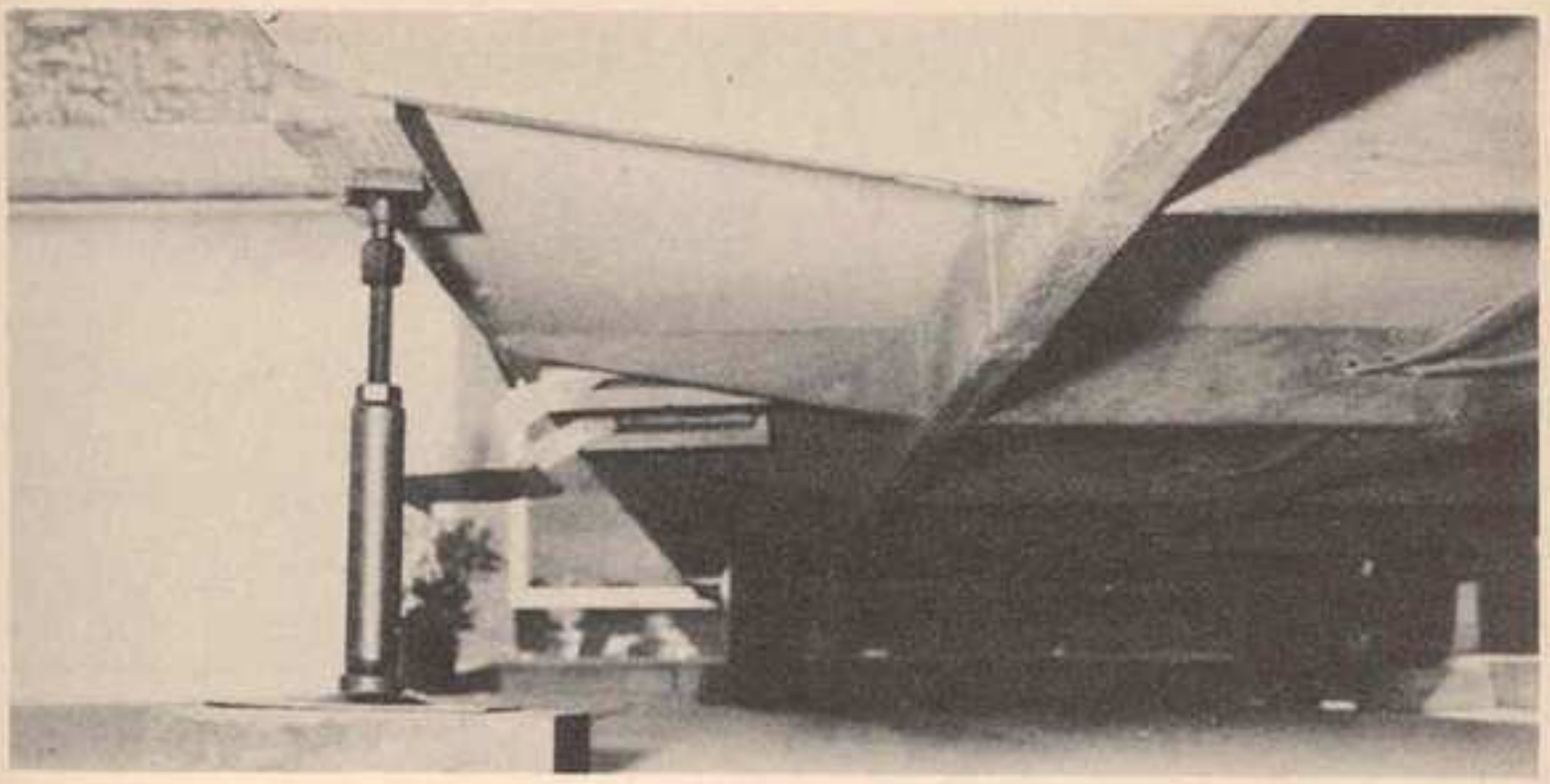
HERE'S HOW TO PROCEED: —The most important principle is, *never* place the stabilizing jacks under any part of the mobile home except the two main beams of the chassis. You're in for serious trouble if you attempt to place stabilizing jacks under the floor boards, under the sides, or under the narrow cross members of the chassis. Be sure to use the two main steel frame members running from the front to the rear of the chassis.

Start with your mobile home as level as possible. To adjust, use the jack on the front of the mobile home. Place the carpenter's level on the floor of the mobile home, running parallel with the side walls. The front end is either lowered or raised to level the mobile home. When this has been accomplished, use the jack to lower the front end about three inches. This will automatically raise the rear end of the coach. Now place two of your stabilizing jacks (one on each side) underneath the two main channels of your chassis, approximately 12 inches behind the rear spring hangers. Screw the adjustment on the jacks so that they are tight against the chassis members.

Next, using the jack on the front, raise the front of the mobile home slightly above level. Now place two of the stabilizing jacks under the front part of the chassis (one on each side). Again, be sure to place them approximately at that point where the two main chassis members are bent to form the front "A" frame. Adjust the jacks to approximately the same height as those which you placed at the rear and lower the chassis on to the jacks by letting the front end jack down. Do not lower the screw jack on the front of the mobile home all of the way. It is still to support its share of the weight.

Additional jacks should now be placed under the two main channels of the chassis. They should be placed at approximately five to seven foot intervals. When you place a jack under one side of the chassis, a similar jack should be placed on the other side of the chassis. One pair of jacks should be placed close to the rear end of the chassis. Another set should be placed approximately ten inches ahead of the front spring hangers. A jack should be placed under the center of each doorway. Again, remember to place it under the main chassis member (not immediately under the doorway), and of course a corresponding jack should be placed on the other side of the chassis.

After all of the necessary jacks have been placed, they may be adjusted upward or downward slightly to level the mobile home, as indicated by the level placed on the floor at advantageous points to determine whether or not the coach is level. When the job is properly done, the tires should still be touching the ground, and should bear



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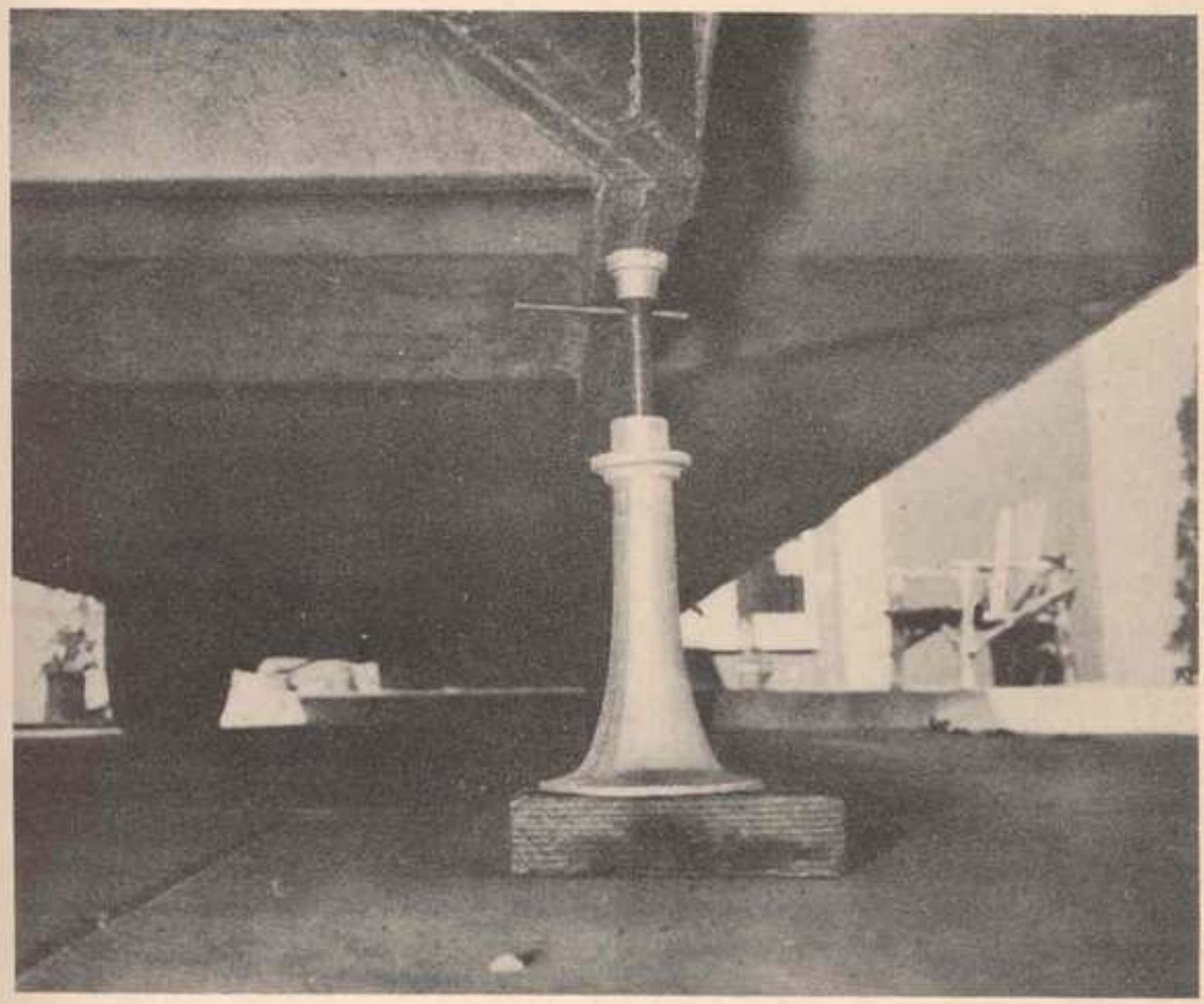


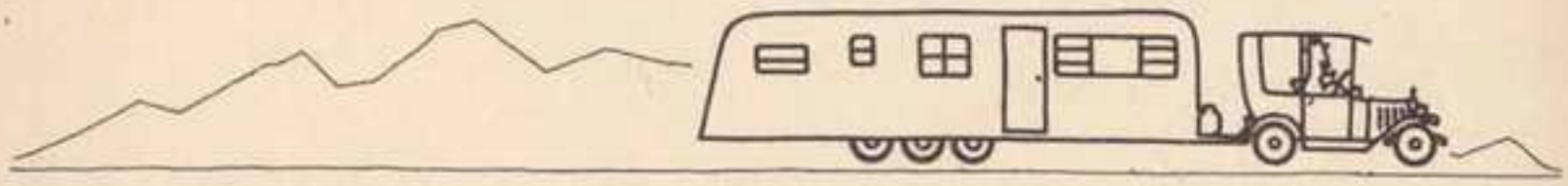
THIS IS RIGHT

NEVER place stabilizing jacks under any part of the mobile home except the two main beams of the chassis.

part of the weight.

Remember, it is still necessary for you to recheck the levelness of your mobile home frequently, using your carpenter's level. This is necessary because ground will tend to settle and raise, especially as there are rapid and severe temperature changes.

When you buy a new mobile home, ask the dealer whether there are any special leveling instructions that apply to the make you are purchasing. Care must be taken not to distort the body of the mobile home by the use of stabilizing jacks. The jacks should be used merely to lift the complete chassis slightly so that it continues to set in exactly the same way it would set if there were no jacks installed. The jacks merely raise the setting level slightly for the purpose of giving a rigid foundation and to remove *some* of the weight from the undercarriage.



CHAPTER IV

HINTS FOR LIVING IN A MOBILE HOME

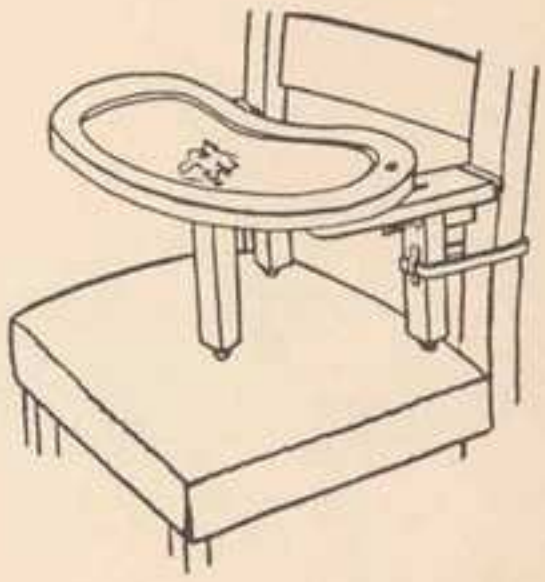
Mobile home living is a specialized way of life. Knowledge of the tricks of the trade will add to its pleasure. Our purpose in this section is to tell you where you can obtain additional information on this subject and to give you a few helpful hints.

All mobile home consumer magazines carry articles on how to live in a mobile home. You will find the names and addresses of these magazines in the section entitled "Publications of Interest to Mobile Home Owners". Subscribe to these magazines. You will learn many new facts about mobile home living.

In another section of this Manual (see chapter entitled "How to Repair and Maintain a Mobile Home") the names and addresses of firms that issue mail order catalogs of interest to mobile home owners are listed. Some of these firms give special attention to gadgets for mobile homes. Write for these catalogs. Browsing through them will acquaint you with products that mobile home owners need.

Keep several fire extinguishers on hand. The carbon tetrachloride type is best and can be purchased with brackets which go on the wall. Put them inside closets and keep them away from oil heaters and stoves. Many serious fires have been avoided by having fire extinguishers ready.

Find out about storm windows. They reduce heat loss in cold regions and will in time pay for themselves by reducing fuel bills. In warm climates they will assist in making air conditioners more effective. You will find information about them in the chapter, "How to Repair and Maintain a Mobile Home", under the "Window" heading.

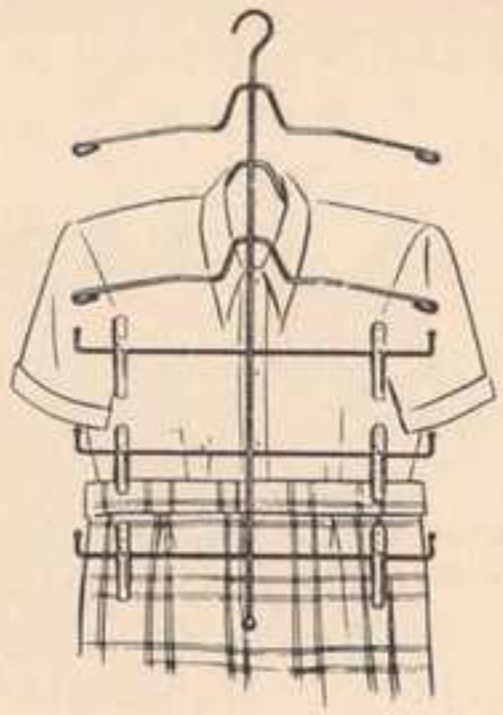


This gadget converts almost any chair into a hi-chair for baby, yet folds away compactly for storage. Available at children's stores.

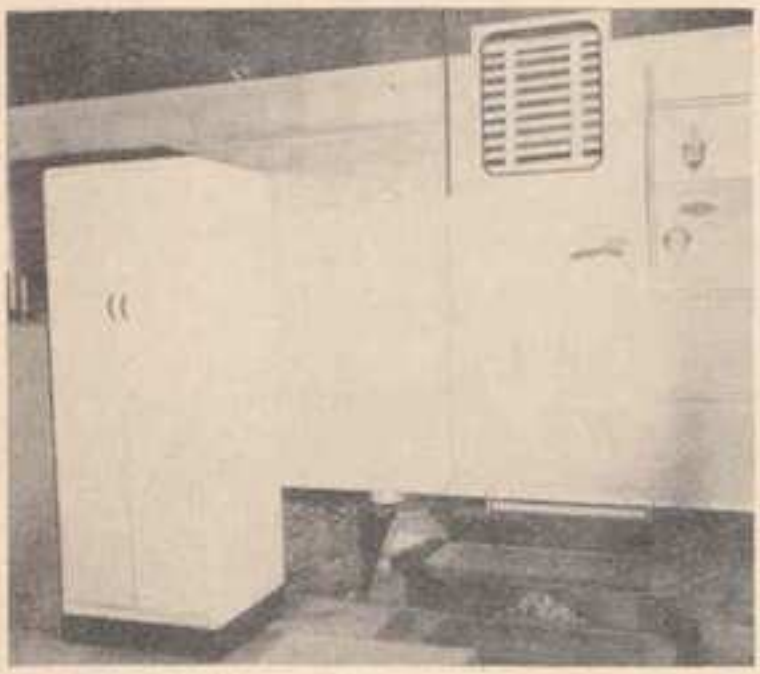
If you have children, here are a few tips. Chair beds are often used by families with children. They provide adequate furniture during the day and excellent sleeping facilities for children at night. If there is a baby in the family, buy a crib that converts into a play pen. This way one piece of furniture does two jobs. There's lots of space under cribs. Make a little storage locker underneath the crib to hold toys. You can usually make extra storage space for clothes in children's closets by having two rungs for clothes hangers, one high and one low. Children's clothes are small and can be hung on double tiers in this way. There is no need to take up space with a high chair. Most stores carrying children's furniture have a special device for converting a conventional chair into a high chair. You can quickly convert the chair back into a

regular chair too when the baby is through with it.

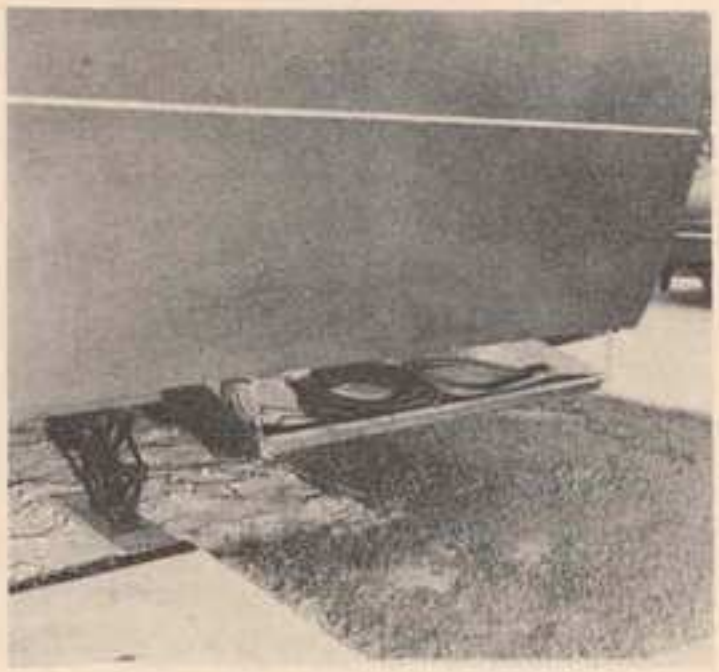
Raise all beds as high as possible. This provides lots of wonderful storage space underneath. It even makes the beds look better. Make additional space by adding more shelves to closets. Mobile home manufacturers place shelves far apart. You can get more on shelves if they're closer together. Install shelves under sinks. Get a small clothes hamper for storing dirty clothes. Visit your local department store or mobile home accessory store and look over their supply of closet accessories. Hat racks, belt racks, tie racks, and shoe racks all make space go further. You can get hangers for skirts, blouses, pants and other clothing to make more space. Partition off drawers. Make your own dividers or buy dividers from hardware stores, department stores, or mobile home supply stores. You will find that partitioned drawers hold more.



This hanger holds 3 skirts and 3 blouses in space usually required to hang just one. Your local department store will have a whole collection of space saving hangers and closet accessories.



Steel storage cabinets under awning outside mobile home provide lots of extra storage space.

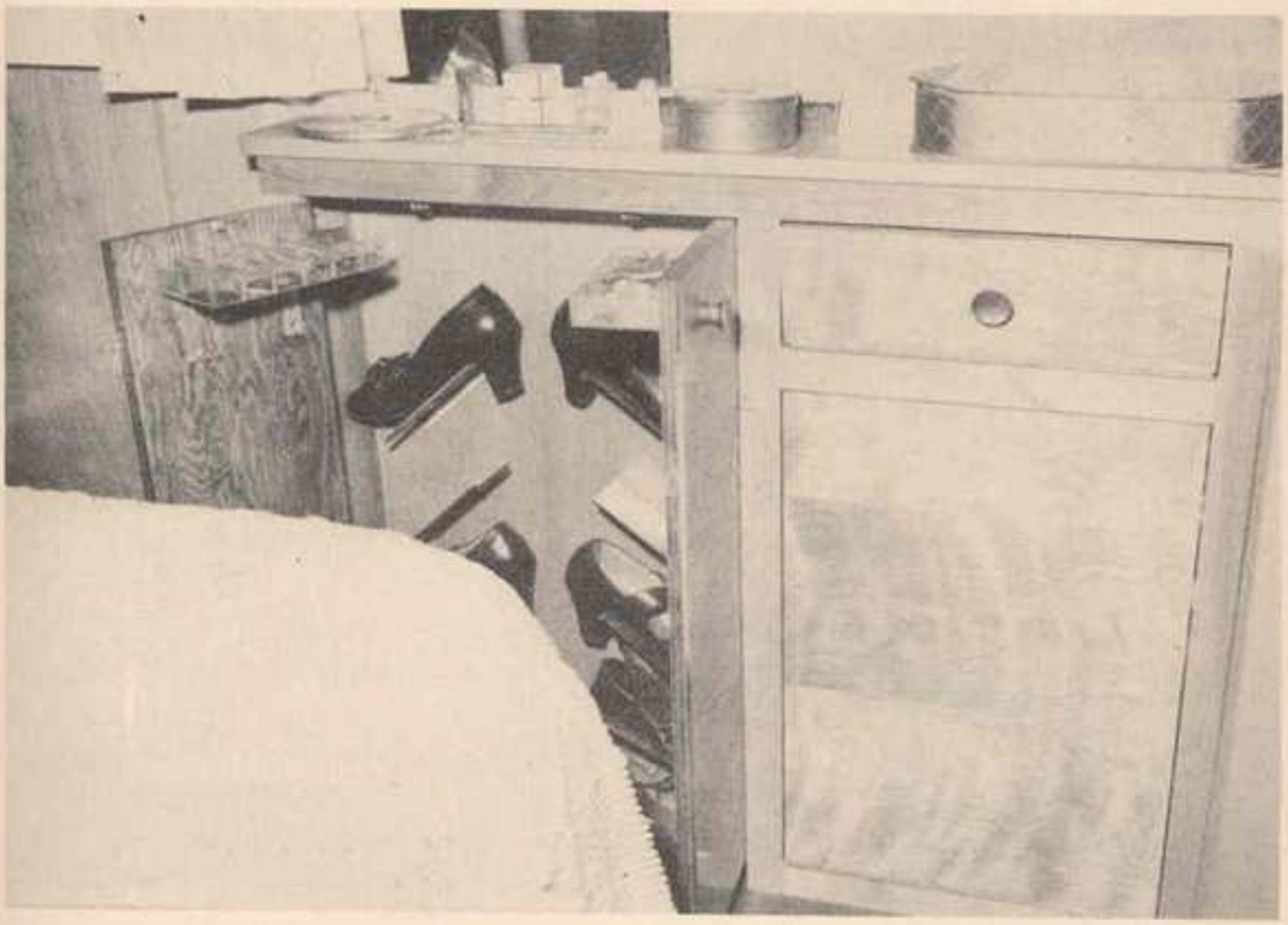


This mobile home owner built special storage cabinet under mobile home frame that can be latched closed when traveling. Hose, light cord, and other necessities can be stored.

There's not much point in our telling you to discipline yourself about throwing away useless junk. You will find it absolutely necessary. You have no choice. But go through closets regularly to rearrange them and dispose of un-needed items. Don't save old magazines or newspapers. Clip and file the articles you want to save.

Doors themselves are wonderful for providing additional space. Install pegboards, hangers, cabinets, or even additional shelves on them. Use magnetic hangers on insides of doors, or on kitchen walls to make space go further. Intelligent use of wall space will really stretch the interior of your mobile home. Use wall spice racks in

kitchen. Use pot holders that hang on the wall. Magazine racks can be placed on the wall. Nicknack shelves can serve both utility and decorative purposes. Wall towel holders keep drawers free for other use.



Here's a clever vanity arrangement. Note small plastic boxes attached to inside of doors to hold the "Missus' Collection".

One of the best places to find useful gadgets for your mobile home is in the catalogs of mail order firms specializing in gadget merchandise. Here are the names and addresses of some firms that specialize in gadget merchandise.

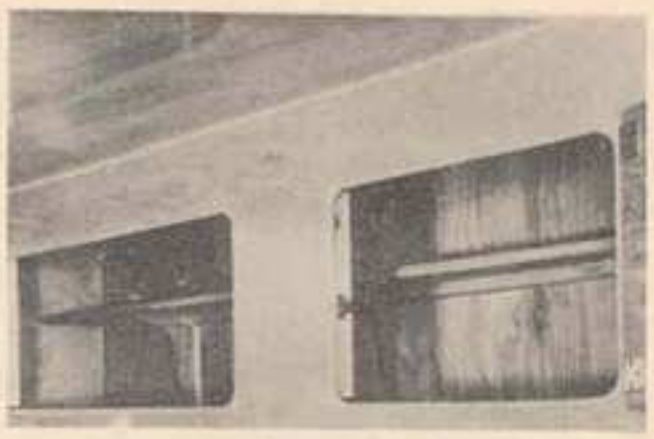
Breck's of Boston – 100 Breck Bldg., Boston 10, Massachusetts
Mrs. Dorothy Damar – 250 Damar Bldg. Newark 5, New Jersey
Black & Co., Inc. – 125 Merrick Road, Rockville Centre, New York
Bancrofts – 1112 S. Wabash Ave., Chicago 5, Illinois
The Burgess House – 426 S. Sixth St., Minneapolis 15, Minnesota
Miles Kimball Co. – Kimball Bldg., Oshkosh, Wisconsin
Meredith's – 504 Main St., Evanston, Ill.

Write for their catalogs. Go thru them for ideas. Kitchen gadgets are especially helpful. You will

Courtesy Schult Corp.

One way to utilize door space is with shoe racks.

find racks that attach to the underside of shelves. They help make space go a lot further. There are racks to hold cups, pots and pans, and even glasses. You'll find small folding ironing boards that may be stored in a small space as well as small brooms and mops. Tiny vacuum cleaners are wonderful in mobile homes. They can be used for cleaning curtains and furniture, as well as rugs. Regina makes one called The Electric Broom. It requires only a small amount of storage space and it's very light, yet at the same time has as much suction power as a standard size vacuum. It's perfect for use in mobile homes.



Courtesy Schult Corp.

Shelves in cupboards make space go further.

The plastic industry is providing products that are helpful to the mobile home housekeeper. Small plastic waste baskets eliminate the problem of rust rings left on the floor by metal baskets. Plastic dishes eliminate dish breakage when traveling. Square, plastic food containers help stretch refrigerator space, and eliminate any possibility of breakage. If you do much traveling, we recommend that you use as many plastic items in your kitchen as possible. Polyethylene plastic is best. This plastic is flexible, easy to keep clean and seems to last indefinitely. You can buy polyethylene containers in many sizes and shapes. Use in refrigerator and for storing staples in cupboards, too.

Courtesy Schult Corp.

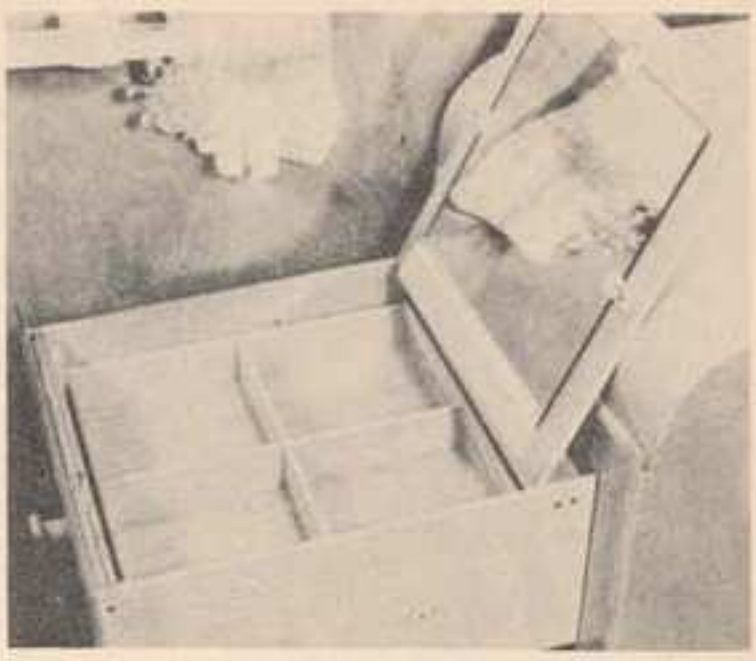
Divided drawers help stretch drawer space.

For emergency clothes drying you need a collapsible clothes dryer. They store in a small space and can be unfolded to hold a lot of clothes.

Make sure all tables and chairs fold. You can then expand seating and table facility as required. The little folding snack tables available everywhere are wonderful for mobile home living. There is one item called a Stak-O-Seat that's a dandy. This is a hassock made in three sections. Each of the three sections can be converted into a table or chair as desired, yet when set up as a hassock it takes very little space. Don't overlook the possibility of installing large mirrors on the walls at various advantageous points. They not only improve the interior looks but add the illusion of larger space. Be sure to use non-skid under small throw rugs.

Extra storage space can be provided by using a front door step containing a storage compartment. Such steps have a lid underneath which is a large storage area. Be sure to use a door mat on your step to keep dirt out of the mobile home. If you're in an area where cabanas are permitted, the installation will provide additional space.

Many mobile home owners keep freezers under awning just outside entrance door.



Courtesy Schult Corp.

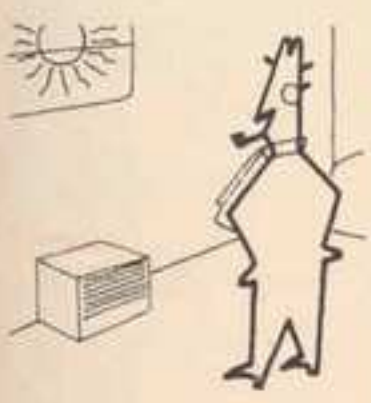
Vanity tray and mirror built into bedroom chest drawer.

They provide an additional room almost as big as the mobile home itself. Be sure to install an awning. Even if you can't enclose the awning, it will give you extra space. Many mobile home owners install lockers and cabinets underneath awnings. You'll even find freezers and extra refrigerators placed under awnings and, of course, don't overlook the desirability of folding porch furniture under your awning.

Turn to chapter "How to Remodel and Modernize a Mobile Home." You'll find many pictures that will give you ideas about handling space problems in your mobile home.

Two things of special importance to those who live in mobile homes are awnings and air conditioners. Here are some facts about these two important subjects.

Facts About Mobile Home Air Conditioning



Mobile home air conditioning is more important than air conditioning in a home. The living area is small. The walls protecting you from outside heat are thinner. Your mobile home has no second story, no attic, no roof with a large dead air space. You do have the advantage that the area to be cooled is small, making the cost of air conditioning much less than it would be in a house. Unfortunately, most coolers are purchased without first finding out the facts. Lack of information often results in inadequate equipment which gives unsatisfactory cooling. As a result, air conditioning as a whole, is condemned, which it shouldn't be. When you buy air conditioning equipment, you need the facts. Here they are:

AIR CONDITIONING AND INSULATION – Unless you have a *well* insulated mobile home, you have a tough problem. We emphasize the word "well" because there is all the difference in the world between insulations. Most mobile homes sold today are advertised as being insulated. Unless you have a *well* insulated mobile home, air conditioning is difficult, if not impossible. We have discussed elsewhere

in this manual the difference between insulations. In discussing air conditioning, insulation is important for this reason. In well insulated mobile homes the cool air provided by air conditioning is not rapidly dissipated through the walls. It is easier and considerably less expensive to keep the temperature down inside relative to outside temperatures.

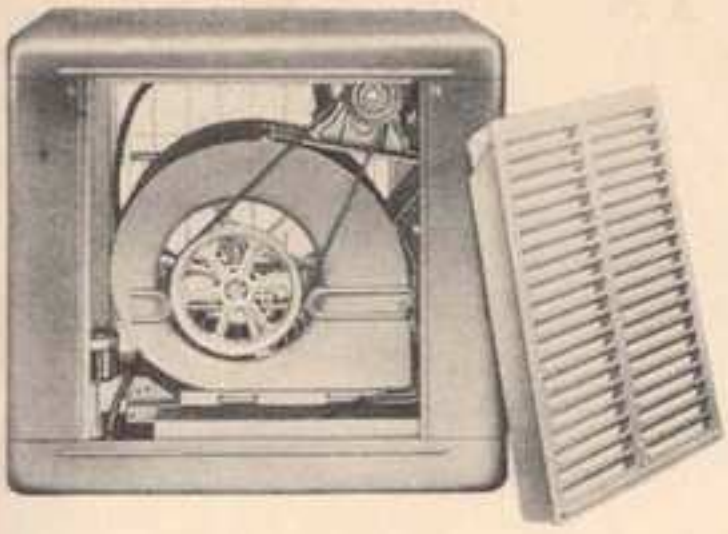
TYPES OF AIR CONDITIONING – You can be cooler inside your mobile home by: (1) insulating it if it is not already adequately insulated; (2) taking a shower; (3) turning on an electric fan that will lower the effective body temperature as much as 5°; (4) installing adequate air conditioning equipment. The last method mentioned gives the only real and permanent temperature drop. There are two types of air conditioners. One is the familiar evaporative air cooler; the other is the refrigerator type air cooler.

Evaporative Coolers – Evaporative coolers draw air from outside the mobile home through pads that have been saturated with water and throw the air inside the mobile home. As the air passes thru the damp pads the water evaporates. Changing liquid, such as water, into a vapor requires energy. The energy in this case is the heat in the air. Therefore, the vaporization of the water in the pads draws the heat out of the air so the air thrown into your mobile home is cooler. Also, the water itself is usually cooler than the air, and the air loses some of its heat to the water. Evaporative coolers can give you an effective bodily temperature drop of 15°. That's enough to be really worth while on a hot day. About 5° of this drop comes because the blower fan in the cooler keeps the air circulating in the mobile home, and the other 10° comes from the evaporation process. The evaporative cooler has two advantages over the refrigerator type cooler. First, its cost is considerably less; second, the electric power available in any mobile home park is sufficient to operate an evaporative cooler with enough capacity to cool a large mobile home.

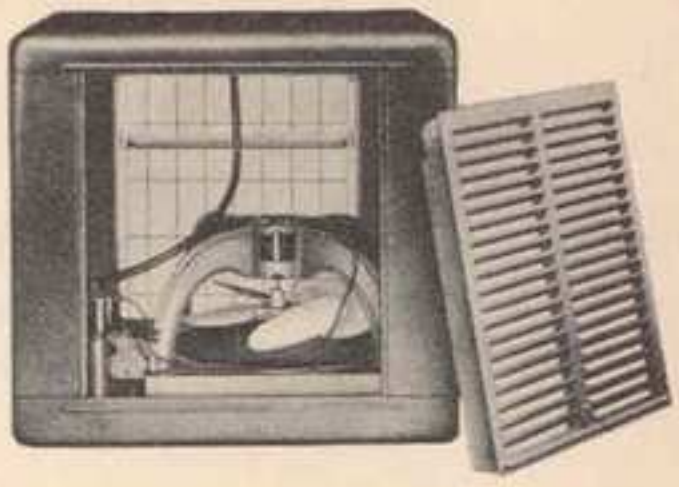
Courtesy International Metal Products Co.

Evaporative coolers are frequently installed on roof over a ventilator opening from which vent top has been removed.

The evaporative cooler has disadvantages which are as follows: (1) They work on the principle of evaporation, and if the mobile home is parked in a humid climate, the outside air may already be so full of moisture that additional evaporation is impossible. There is a limit to the amount of moisture that air will hold. Pulling hot, moist air through an evaporative cooler may result in no evapora-



Courtesy International Metal Products Co.
Picture illustrates typical 110 volt evaporative air cooler – blower type.



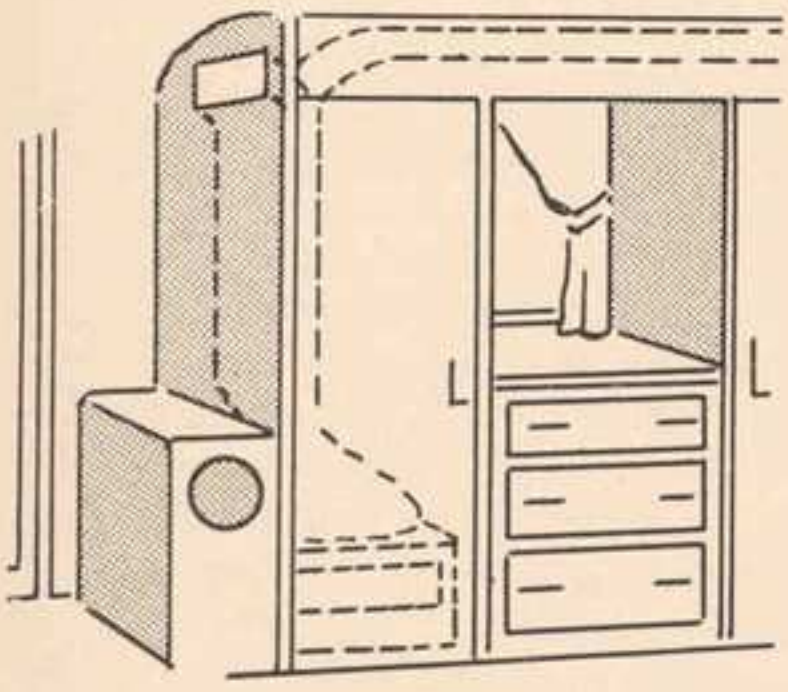
Courtesy International Metal Products Co.
Picture illustrates typical 110 volt evaporative air cooler – fan type.

tion at all, or such a small amount that there is little cooling effect. Evaporative coolers work best in hot, dry climates: (2) They increase considerably the amount of moisture in the air in the interior of the mobile home. This can result in warped plywood. You may have difficulty with mildew. It is also argued that a moist climate is bad for the human body, particularly for older people. We're not qualified to make a statement on this point but have heard it argued that such a climate is particularly bad for arthritis and heart conditions. It is also said that it is a shock to the system to step from hot, dry climate outside into a cool, damp climate inside the mobile home, or vice versa.

Refrigerator Type Coolers – Refrigerator type air conditioners take the air that is inside the mobile home, remove the heat from that air, then put the air back into the mobile home. It throws the heat that was in the air outside. In other words, it drops the temperature of the air that is inside the mobile home. It cleans, filters, and cools this air. It does not throw moisture into the atmosphere. It actually extracts some of the moisture. These coolers are much more expensive than the evaporative. There are many makes on the market made to act as room air conditioners for homes. They can be used in mobile homes. The only one we know of that is specifically engineered for mobile home installations is the one put out by Marvel Industries.

Refrigerator type air conditioners have a serious limitation for mobile home installations. Here's why. It takes energy to remove heat from air. Since you cannot get more work out of a machine than its equivalent of energy input, any refrigerator type air conditioner has its limitations. Because mobile home parks furnish only 110 volt current, the size of the refrigerator air conditioner is limited by the inability to get additional current. Refrigerator air conditioners with sufficient capacity to cool large mobile homes require 220 volt current. The absence of sufficient power rules out the possibility of installing 220 volt room air conditioners that are sufficient in capacity to do a good job in large mobile homes. In building an air conditioner for mobile homes, the Marvel people were limited because

they had to build an 110 volt unit. In most areas of the United States, a 110 volt capacity refrigerator air conditioner will give an adequate 15° drop in temperature inside the mobile home. But, the largest mobile homes parked in areas where it is extremely hot will not be air conditioned adequately by a cooler operating from 110 volt current. Under these circumstances the cooler can be used to air condition part of the mobile home very well. This is accomplished by shutting part of the mobile home off from the other. Until such time as 220 volt power is available in parks, it will be impossible to air condition *all* of a large mobile home located in a hot area by the use of refrigerator air conditioners.



Courtesy Marvel Industries

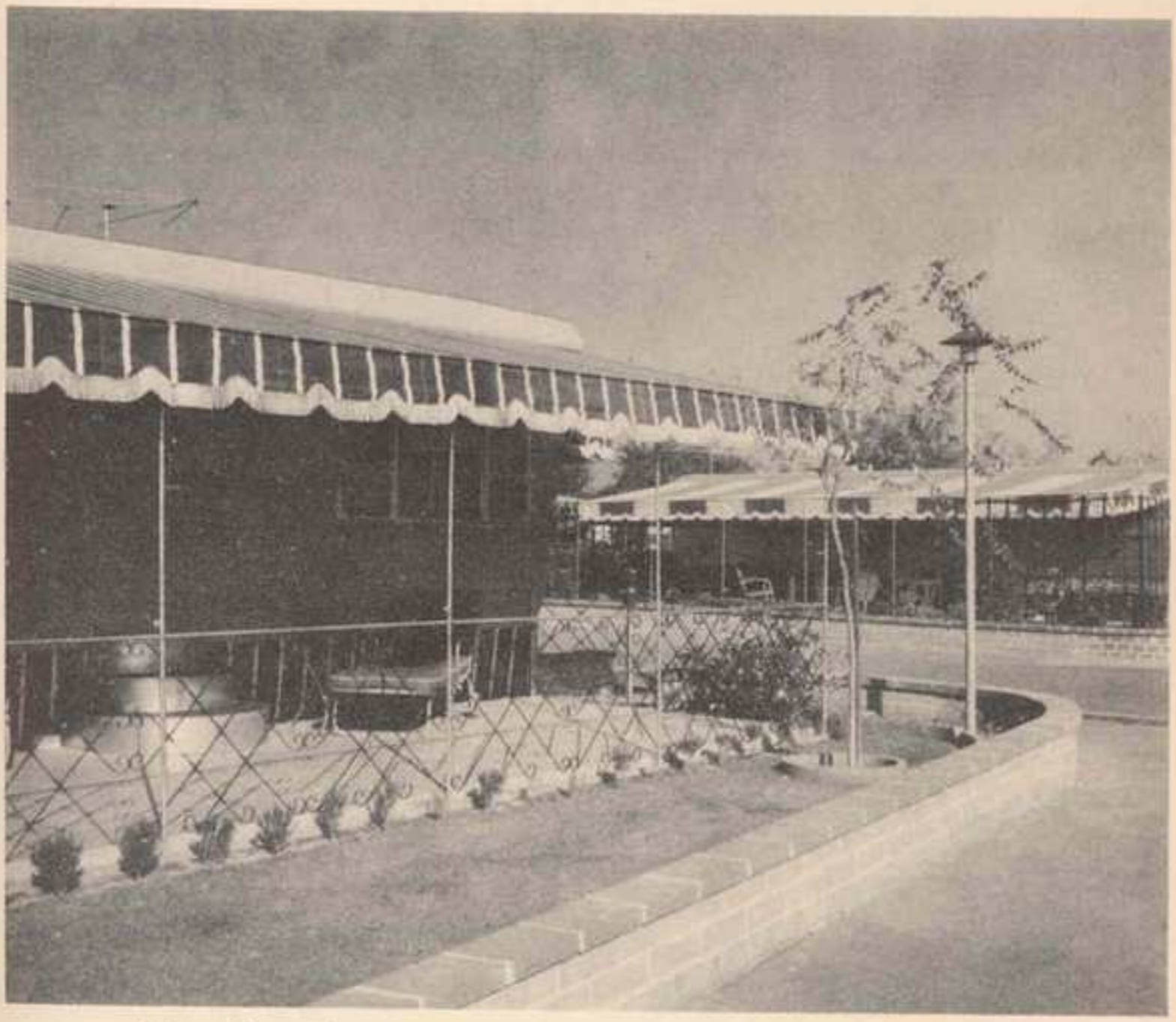
Diagram shows Marvel refrigerator type air conditioner installed in hall closet. Note suggested ducting system with conditioned air directed to living room and to back bedroom.

Courtesy Marvel Industries

Air conditioner built by Marvel industries is a refrigerator type air conditioner designed especially for mobile home installations.

WHAT TO BUY – If you have a large mobile home and are satisfied with cooling only part of it, or if you have a medium size mobile home and can stand the expense, the refrigerator type air conditioner is the better solution to the air conditioning problem. But, if your finances are limited or if you desire to cool the whole mobile home, the evaporative cooler is your only alternative. But, don't just buy *any* evaporative cooler. Find out what capacity cooler you should purchase or you are going to be dissatisfied with the air conditioning job the cooler does. Manufacturers put out data relating to the proper size for the amount of cubic area inside your mobile home and your geographical location. Don't just buy a cooler because it's advertised as a mobile home cooler. Look into the engineering facts and determine what size cooler you require. Your dealer should be able to give you the necessary literature, or you can always obtain it by writing to the manufacturer of the cooler you plan to buy. Far too many mobile home owners buy evaporative coolers because they think they can afford the price quoted, only to find that they have purchased a cooler that is altogether inadequate for the amount of cubic area inside the

mobile home. Don't waste money. Be sure you get the authoritative facts before you buy. Listen attentively to what the salesman says. Then request that he give you factory literature containing information that will enable you to compute the cooler capacity you require.



What You Should Know About Mobile Home Awnings

Almost every mobile home owner purchases an awning. It's a sizeable investment. Here are some facts you should know before you buy. First, we will discuss canvas awnings. When you buy an an awning, you are usually given a choice between three grades of material. There is one exception. We shall mention it later. The lowest price material is a high count, close woven, 10 ounce, vat dyed material. The second grade material is the same except it has been painted to give the awning a more attractive appearance. Painting also helps preserve the canvas. The best grade offered is a 12 ounce, extra heavy woven, striped or plain material. This canvas, when striped, has a pattern woven into it with various colored threads. Any of these three materials are waterproof and are usually treated to resist mildew.

In dry climates, the 12 ounce material is by far the best looking and will give the longest wear. However, this material should not be used in damp climates because it is more subject to mildew. Painted materials should be preferred in damp areas.

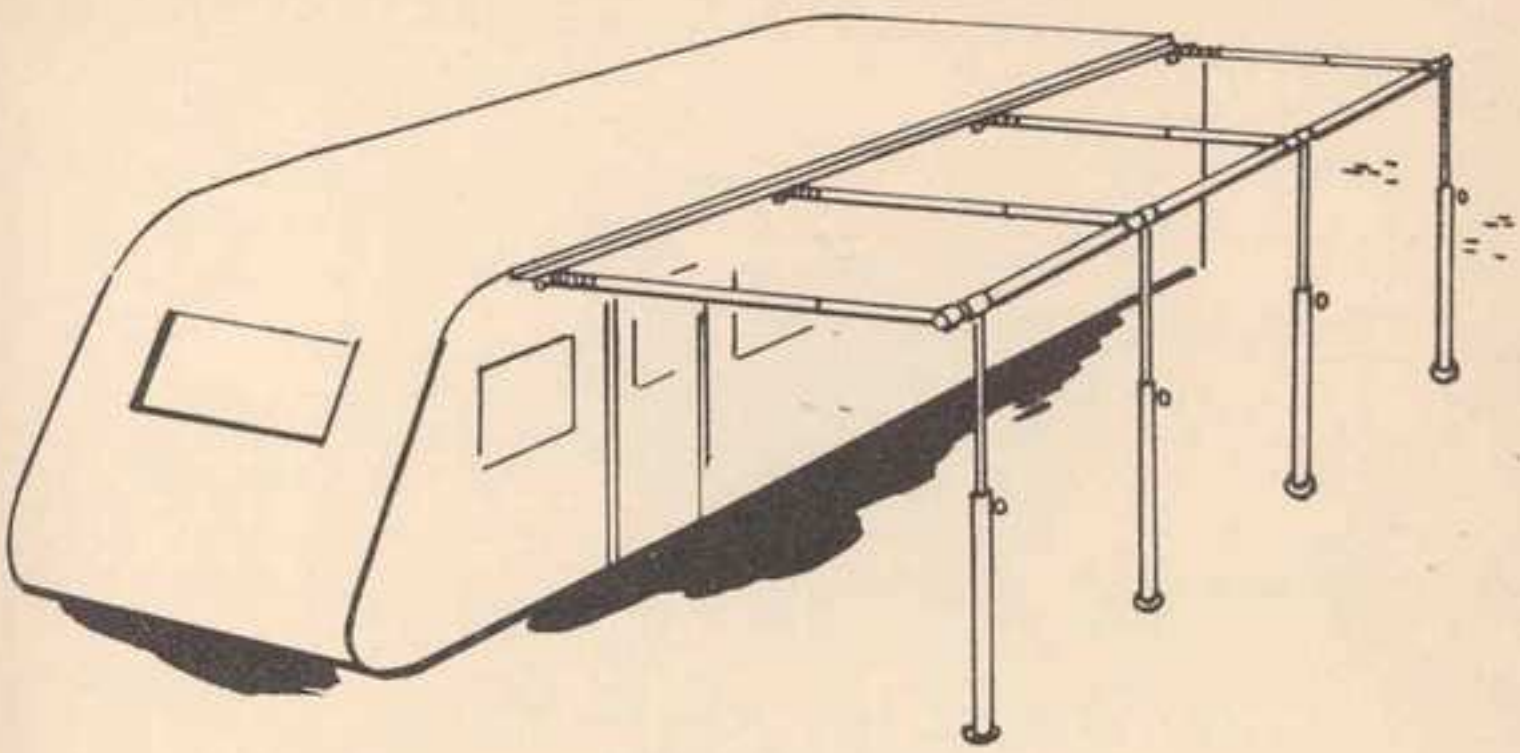
FACTS ABOUT AWNINGS

Awning prices vary according to the grade material, the unpainted being the cheapest, and the 12 ounce, woven material being the most expensive. The exception to these three grades of material is what is commonly known as a shade awning. These awnings are made of less than 10 ounce material and are not water resistant. Their cost is low. They should be bought only for campers or for shade alone. A good awning should be double or triple sewn with rot proof thread. Awnings normally have scalloped and tape bound valances with the addition of white or colored fringe.

There are two basic types of awnings. They are the pole and frame awning. The pole awning is used on the vacation mobile home or camp trailer. It is used because it is easier to put up and take down. The pole awning is kept up by poles placed on the outer edge of the awning. The poles, in turn, are kept up, and the awning is kept tight by the use of ropes and stakes. The ropes are equipped with adjustable springs to assist in keeping the awning tight. Pole awnings cost less than frame awnings. Poles should be telescoping to permit you to give the right pitch to the awning top so it will shed water. Pole awnings, like frame awnings, are attached to the mobile home side with awning rail. Quarter inch rope is sewn in the awning at the edge where it attaches to the mobile home, and this rope is threaded through the rail.

POLE TYPE AWNING

Frame awnings are almost always used when the mobile home is stationary in one location for a long period of time. The frame comes in sections permitting the awning to be taken down and stored in a small space. The frame is made of steel or aluminum tubing. Poles are telescoping to permit adjustment of roof pitch. The advantage of the frame awning is that it holds the awning rigid at all times. In most cases, it prevents the awning from being ripped by strong winds. It eliminates the undesirable rope and stake hazard. The awning is attached to the framework by pockets sewn into the awning through which the various rafters are threaded.

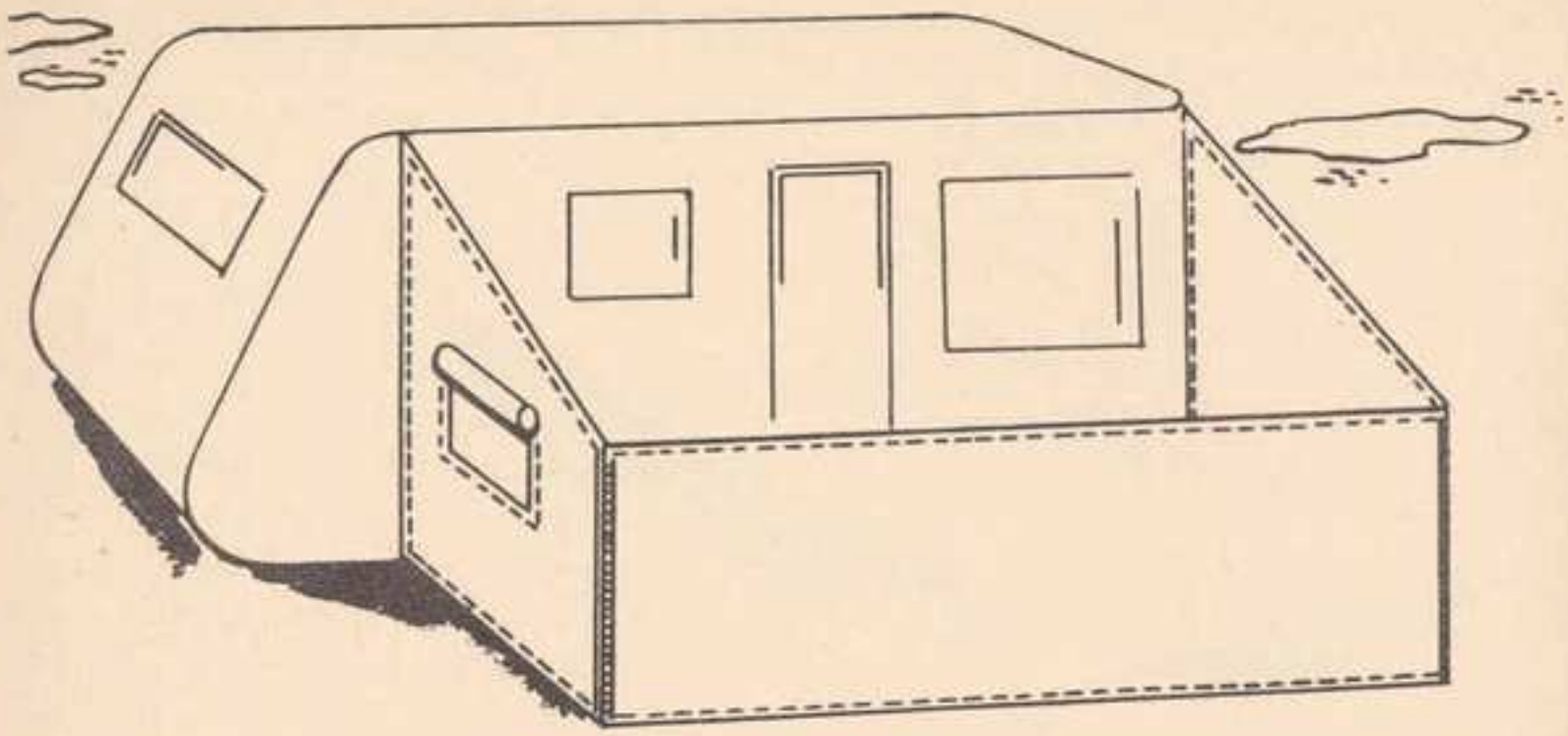


AWNING FRAME

AWNING INSTALLED ON FRAME

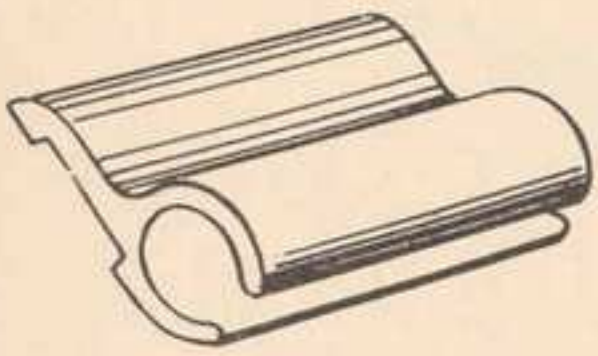
Enclosures are often used in connection with mobile home awnings. An enclosure may be partial or complete. It is a series of drop curtains that attach to the outer edge of the awning and go to the ground. Before you buy an enclosure or a partial enclosure, check with your park manager *and* city officials. In many communities, they are illegal. Enclosures may be used on either pole or frame awnings. They are more satisfactory when used on a frame awning since there is a more rigid structure to hold the drop curtains. Enclosure curtains are joined at corners by heavy zippers. Screened windows are frequently installed in enclosure curtains.

The installation of an awning or enclosure is usually very simple. Most mobile homes come from the factory equipped with the necessary awning rail. If it is not so equipped, you must purchase a rail and install it yourself, or have it installed. Completing the rest of the installation operation is simple but even so, most manufactur-

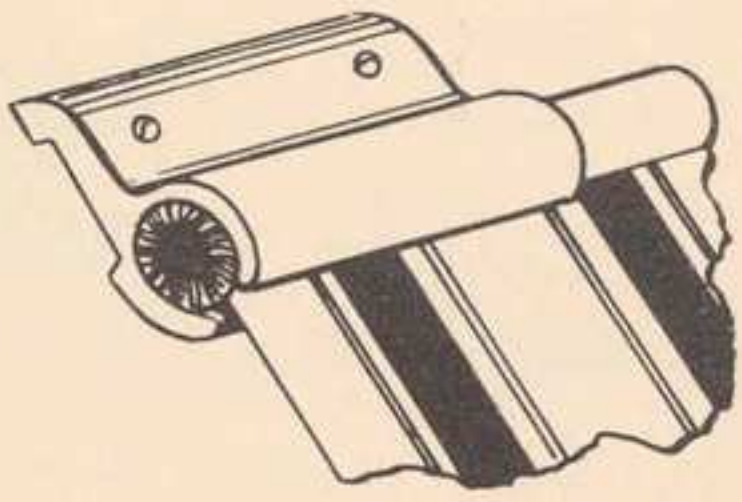


AWNING ENCLOSURE

ers furnish full instructions with their product. Where installations are semi-permanent, poles are usually nailed to a wood platform or screwed with appropriate devices to concrete slabs. Drop curtains, if used, are held secure to the ground with stakes or by heavy pipe threaded through a pocket sewn in at the bottom.



AWNING MOLDING



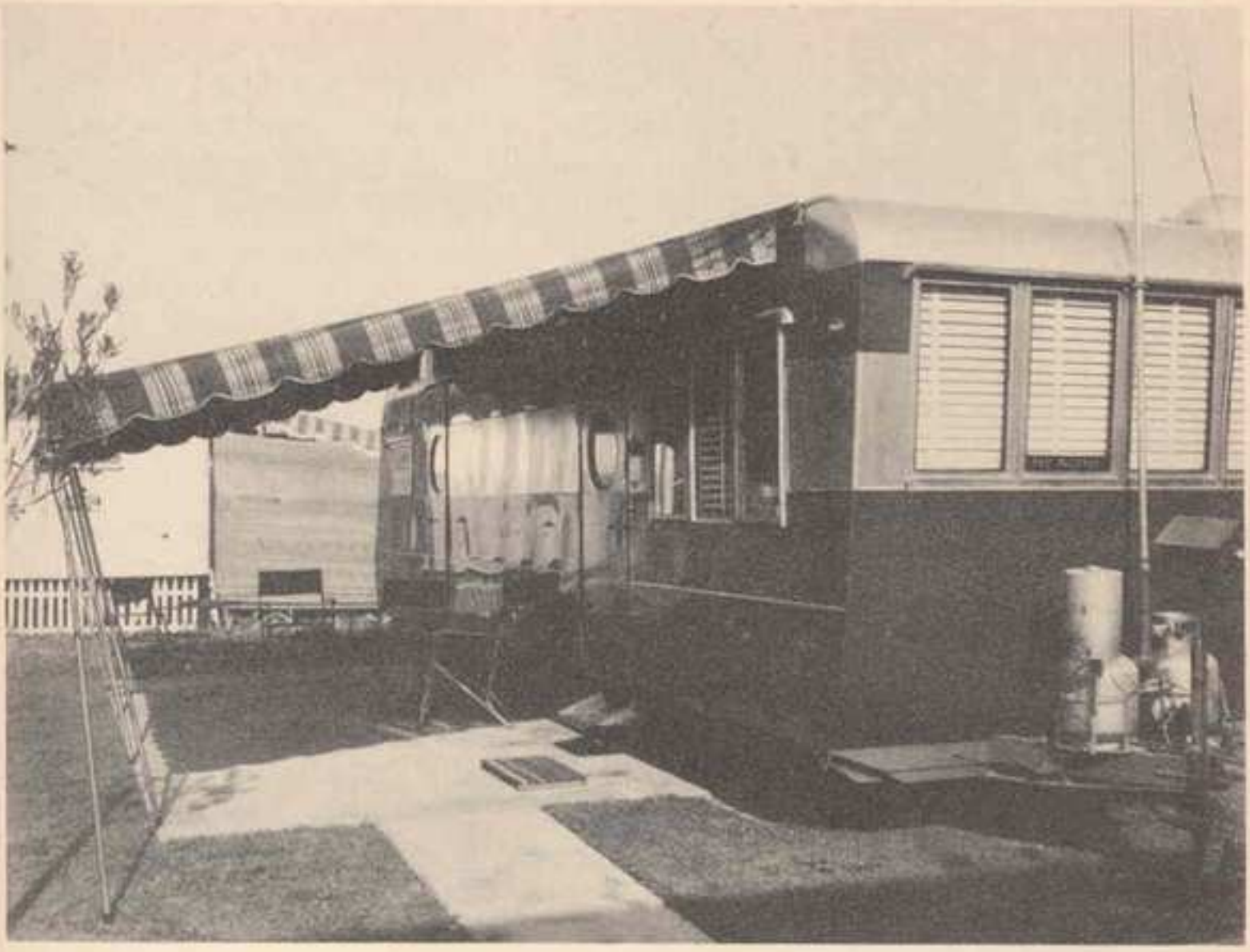
AWNING INSTALLED IN AWNING RAIL

CARE OF AWNINGS – A neglected awning can be ruined in a few months. Your big investment in an awning warrants careful attention. Here is a check list of instructions for you:

1. Keep awning tight and at a good pitch. This will make it impossible for water or dirt to settle on top of awning at low points. Tight awnings will not stretch due to the settling of water, and are less likely to be ripped by high winds.

2. Treat regularly with awning waterproofer or preservatives. Treat at least once a year. Twice a year is not too often.

3. Keep awning clean. The biggest enemy of an awning is mildew. Even though awning materials are treated to resist mildew, it is possible for them to suffer severe mildew damage. Dirt and



Keep awnings tight and with a good pitch. Water and dirt will settle in pockets of sagging awnings. Result may be severe damage. Awning in top picture is tight. Note slight incorrect sag in awning in bottom picture.

debris are not mildew proof. If permitted to settle on top of awning, the debris may mildew, and the presence of this on top of the awning will cause the awning itself to mildew. Therefore, brush and wash top of awning regularly. Never use soap when washing awnings.

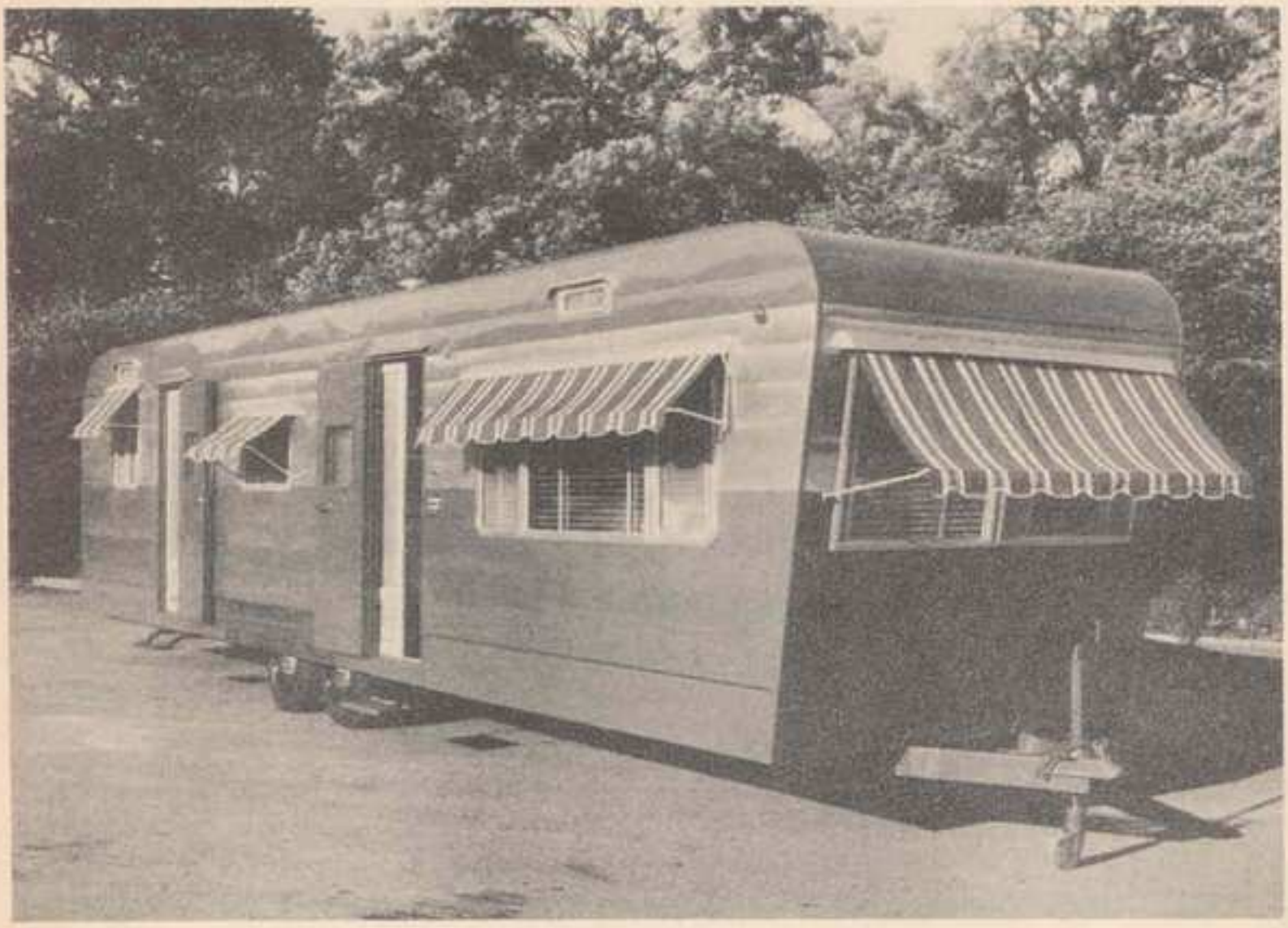
4. Awnings can be painted to brighten them up and help preserve canvas. Use special canvas paints available from paint stores.

5. Rips, tears, or holes can usually be repaired by using canvas cement and small pieces of canvas. Badly torn sections can usually be replaced by any awning company.

6. If threads rot out, it does not mean that awning has completely deteriorated. It is often possible to resew an awning and get many additional years of service.

7. If you find it necessary to store awning, be sure it is thoroughly clean and dry before rolling up for storage. Keep in a dry place.

8. Keep frame rafters and poles painted and waxed. Rusty frames will speed deterioration of awning.



Courtesy Supreme Trailer Sales Corp.

Window awnings offer the same benefits to the mobile home owner as they do to the house owner. Awnings on this mobile home roll up like windowshade in drip cap over window.

ALUMINUM AWNINGS – Awnings made of aluminum have become increasingly popular. They cost from 50% to 75% more than a comparable canvas awning. But, even though original investment may be larger, year to year awning cost is considerably less. This is because the aluminum awning does not wear out as rapidly as a canvas awning. The valid advantages claimed for aluminum awnings are as

follow:

1. They require less upkeep.
2. They are not as susceptible to wind damage because they cannot be ripped by high winds.
3. In the long run they cost considerably less than canvas awnings because they do not have to be replaced every few years.
4. They will not stretch and sag.
5. They are fireproof, mold proof and vermin proof.
6. They do not make noise by flapping in the wind.
7. They provide a stronger structure and are therefore more waterproof.

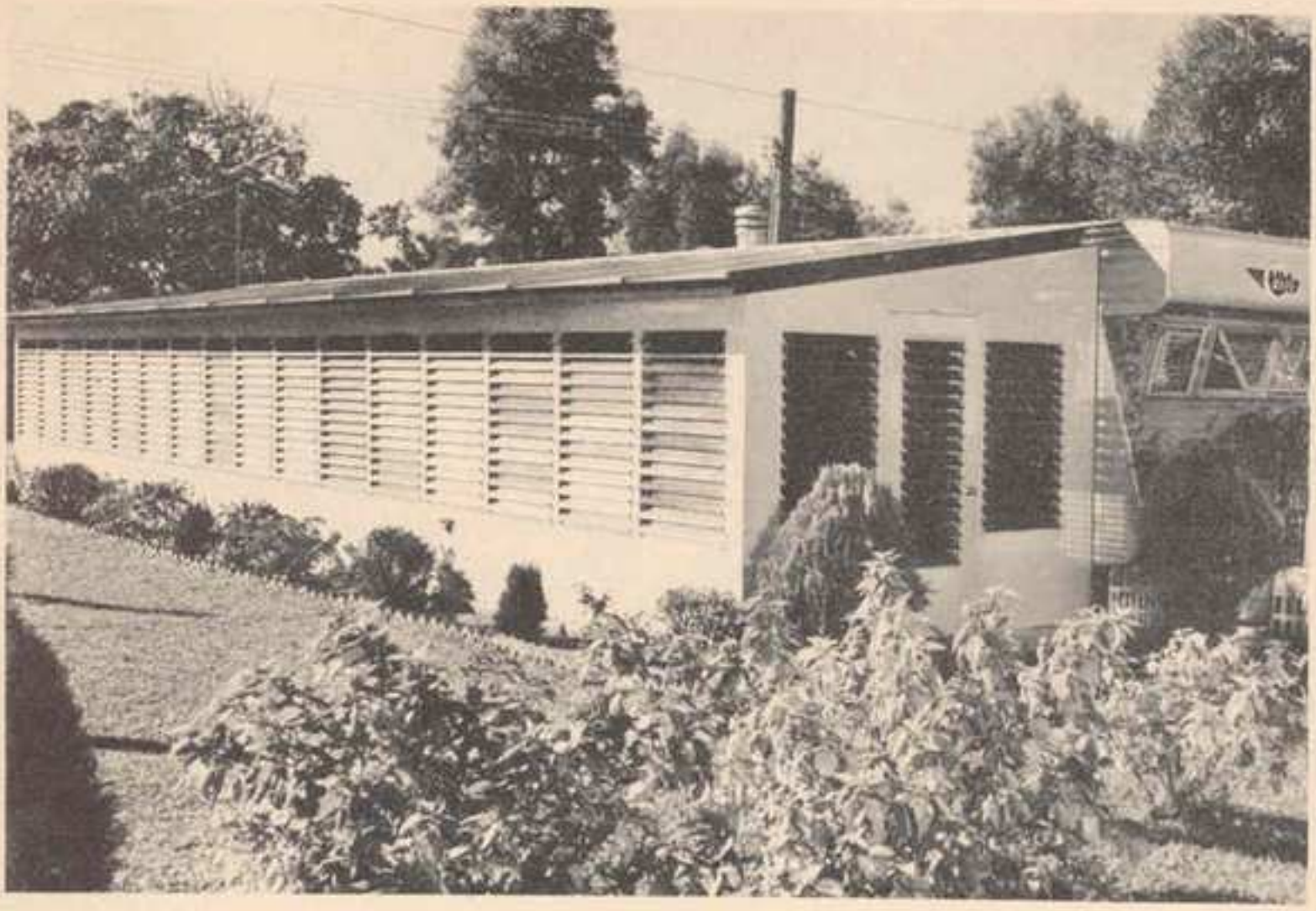
The valid arguments *against* aluminum awnings are as follow:

1. The initial investment is larger.
2. Some communities prohibit rigid structures of this type being attached to the mobile home.
3. They are more difficult to put up or take down.
4. They cannot be rolled up into a compact package for traveling.

If you are permanently located, *if* you can stand the larger investment, and *if* local laws do not prohibit aluminum awnings, they may be your best buy from a long run viewpoint. But, before you buy, make sure there are no local ordinances against this type structure. Just because other mobile home owners have them is no reason to assume they are legal. An ordinance may exist that is not being enforced at the moment. The investment is large . . . . so before you invest, investigate. The local police department, fire department, and housing officials should *all* be consulted. Keep this in mind, too: should you move to a new community you may find this kind of structure illegal in the new area.

Aluminum awnings *do* require care. They require the same care as the exterior of an aluminum mobile home. See section on exterior painting and exterior care, Chapter VII, in this Manual.

CABANAS – Cabanas, whether they be made of canvas, aluminum or other materials, offer the mobile home owner a source of additional space. Cabanas can, in fact, supply even more space than the interior of the mobile home itself. Structures of this type are usually strictly regulated by local ordinances. What we have said previously about aluminum awnings and local laws applies equally to cabanas. In fact, more so, because there are many cases where aluminum awnings may be permitted by local laws but cabanas are outlawed in the same community. A cabana for the mobile home is *the* answer to the space problem. It is regrettable that more communities do not allow them. It is to be hoped this situation will change.



Photos courtesy Modern Metal Craftsmen Inc.

Above pictures show interior and exterior views of all-aluminum Cabana sold under trade name — Alum-O-Room.

CHAPTER V

HOW TO REMODEL A MOBILE HOME

Construction Features Of Mobile Homes

To repair, maintain, or remodel a mobile home you need knowledge of a few fundamental principals of mobile home construction. It has been said that one picture is worth 10,000 words. For this reason the following pages are devoted to numerous pictures showing construction features of mobile homes. Basically a mobile home is: (1) a chassis with an undercarriage to which a floor is attached; (2) walls consisting of studding and an inner and outer skin bolted to the floor; (3) a roof consisting of an inner and outer skin bolted or nailed to the side walls; (4) interior cabinet work. Openings are left in walls for doors and windows. Openings are left in the roof for vents and stacks. Some manufacturers do the interior cabinet work before walls and roof are put on mobile home. Others do the interior cabinet work after the complete mobile home shell has been constructed.

When considering the advisability of undertaking major repairs or extensive remodeling, keep these facts in mind:

1. It is difficult to change floor construction. The whole mobile home is built on the floor foundation. It is usually impractical to undertake major floor reconstruction.

2. It is not difficult to remove the external skin of the mobile home. This makes it practical for you to insulate, revise wiring and plumbing, install large modern picture windows, or recover mobile home with a new and more modern outer skin.

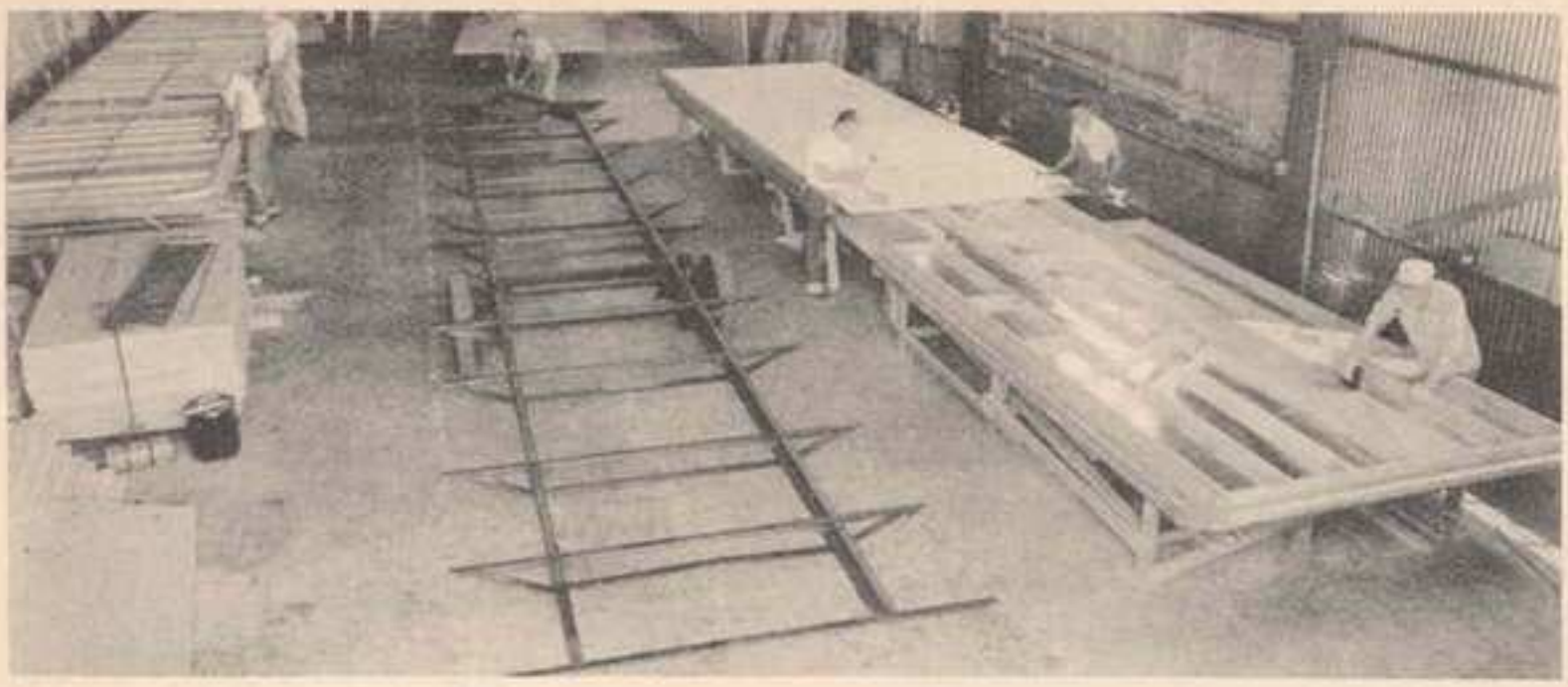
3. Roof reconstruction is the easiest major repair or remodeling operation.

4. It is practical to remove all or part of interior cabinet work for the purpose of changing your floor plan, adding bathrooms or modernizing mobile home interior.

5. Interior wall skin is easily removed. This is especially true if cabinet work has been taken out. This makes it practical to remove and replace damaged interior wall panels, or you can give the interior a "new-look" by replacing outdated woods with modern design paneling.

6. Increasing the openings in roofs for larger vents or cutting new holes for additional vents is not difficult. The same applies to side wall openings for windows. Old studding can be removed and new installed to give the desired opening size.

The above facts are given as general rules. As with all generalizations, there are exceptions.

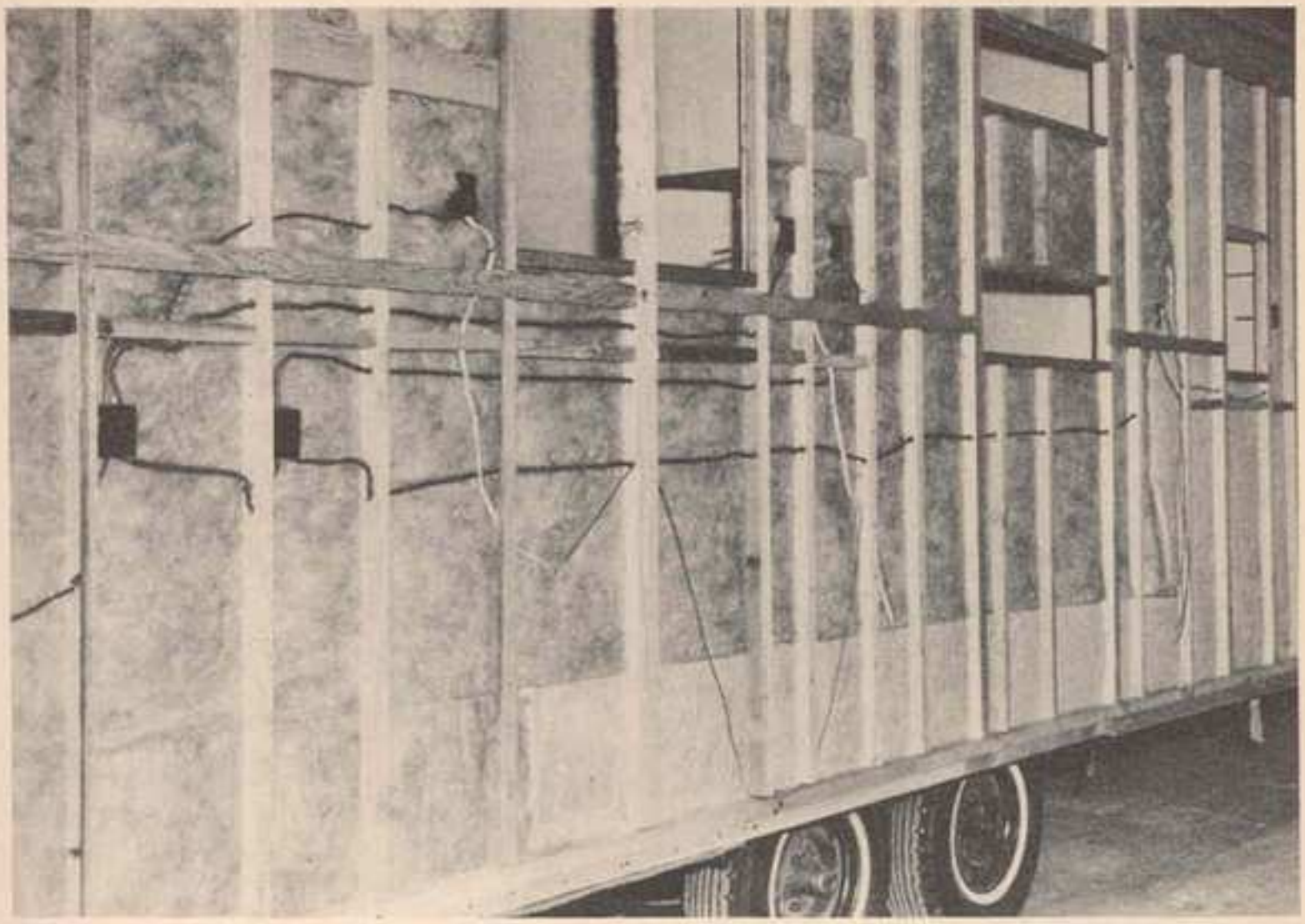


Photos courtesy Terry Coach Industries, Inc.

Top photo shows chassis ready for floor, made with 2x3 floor stringers on 13" centers, ½" asphalt fiberboard with ½" fiberglass and foil paper insulation. Floor is five ply Douglas fir.

Middle photo shows plumbing (All is over floor except the 3" outlet. Plumbing cannot freeze when outside temperature is low), wiring, and cabinets installed before walls are lifted.

Bottom photo illustrates roof having 2"x4" risers and a tapered 2" pitch. Picture posed to show reflective vapor barrier, 1" fiberglass insulation and one piece aluminum sheet. Note 1¼" x .031 anchor strapping around sides of mobile home.



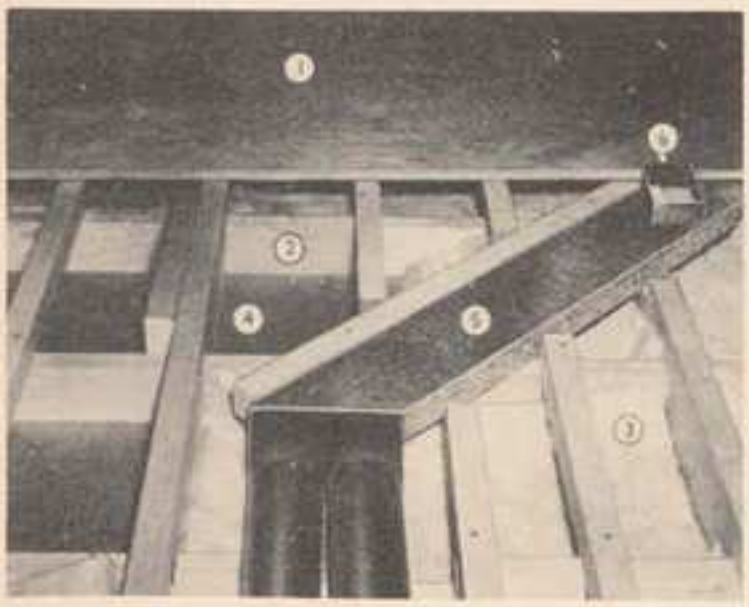
Photos courtesy Terry Coach Industries, Inc.

Top photo illustrates side wall construction. Studding is 1¼" x 2", 2" x 2" and 2" x 3". Insulation is same as shown in roof picture on previous page. Note openings for windows. No 8 wiring runs through holes in studding.

Bottom picture shows mobile home skinned and ready for window installation. Windows are caulked to waterproof. French windows are put in with 1¼" No. 7 sheet metal screws, stationary windows, with 1" sheet metal screws.

Courtesy Liberty Coach Co.

Plumbing in Liberty coach is of heavy duty house-type construction and is located above floor to protect against freezing. Workman installs sweat fitting.



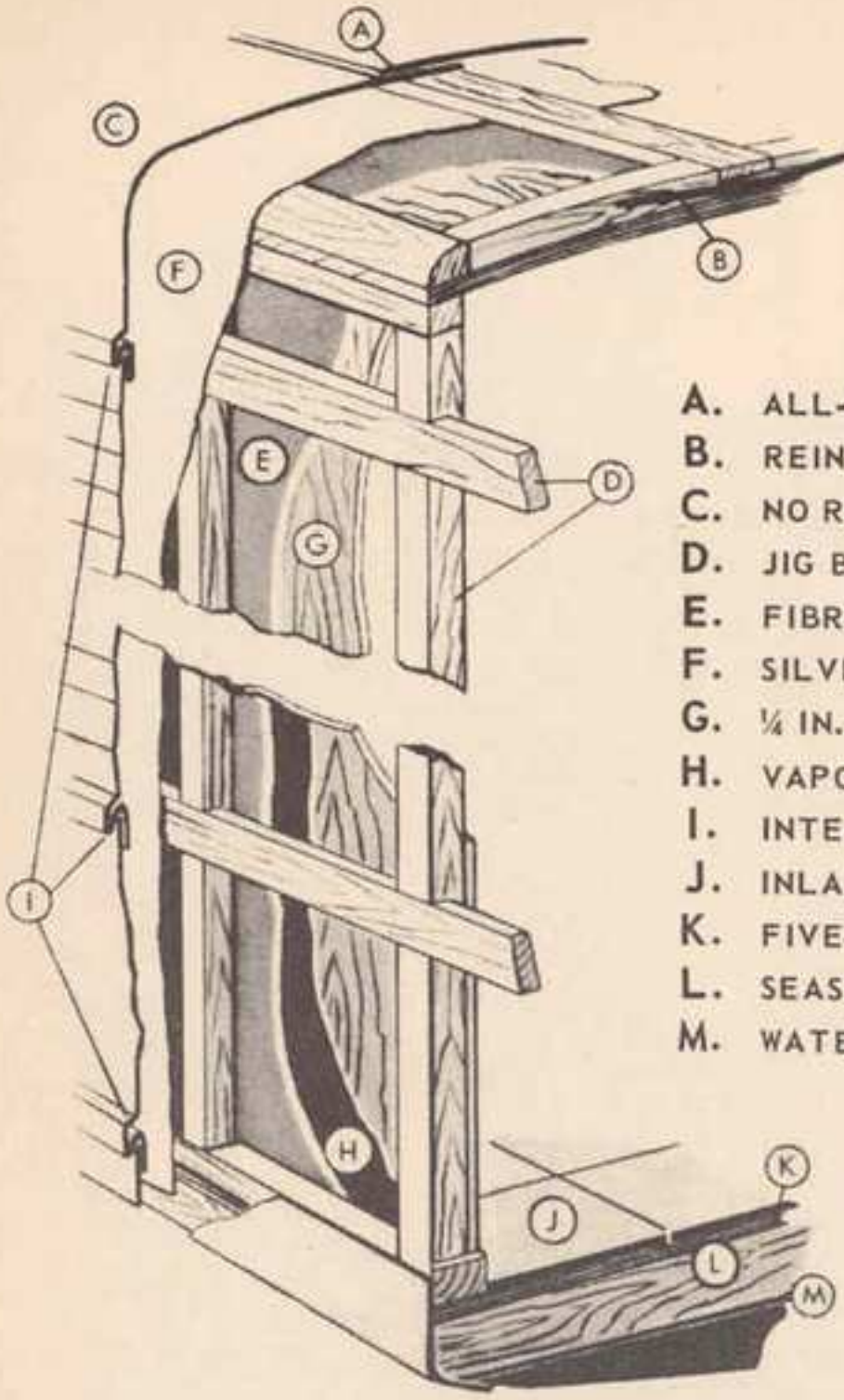
Courtesy Liberty Coach Co.

Cross section of a Liberty forced air heating system shows: (1) plywood inner floor (2) 6 inch studding for heating system and insulation (3) underfloor steel sheathed and undercoated (4) portion of forced air heating system with cold air return (5) fiberglass mats (6) oil heater location.

Courtesy Mid-States Corp.

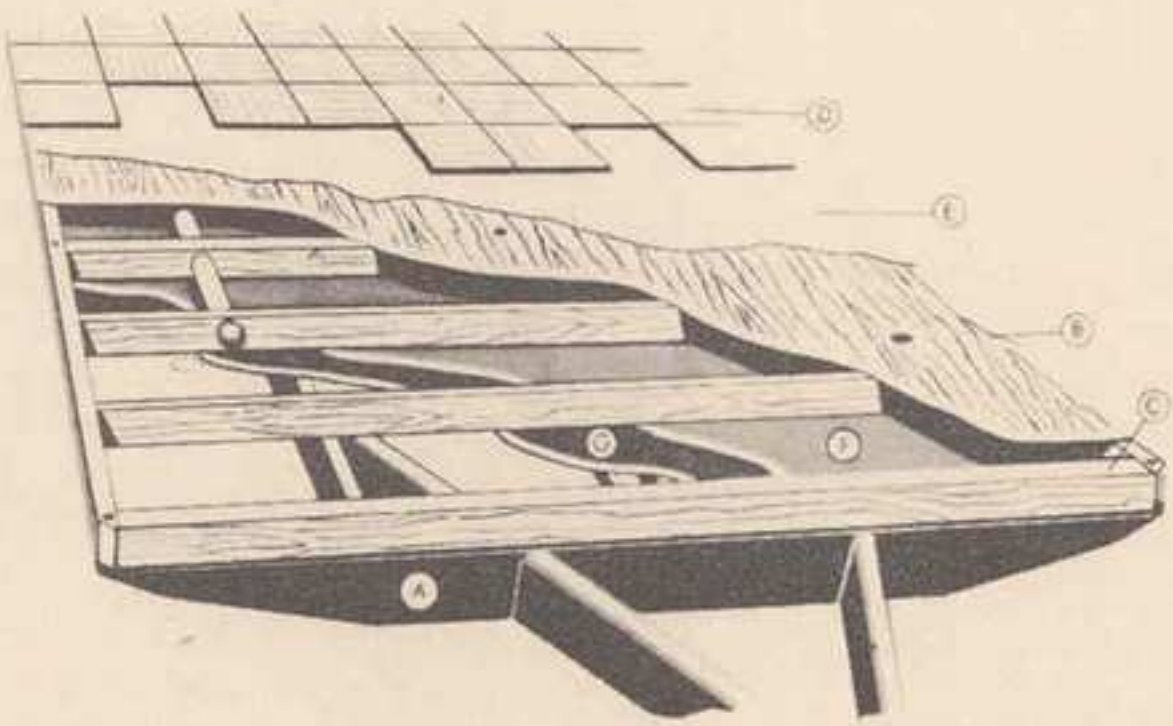
Workman installs metal exterior skin. Sheets are overlapped to waterproof.

CONSTRUCTION FEATURES



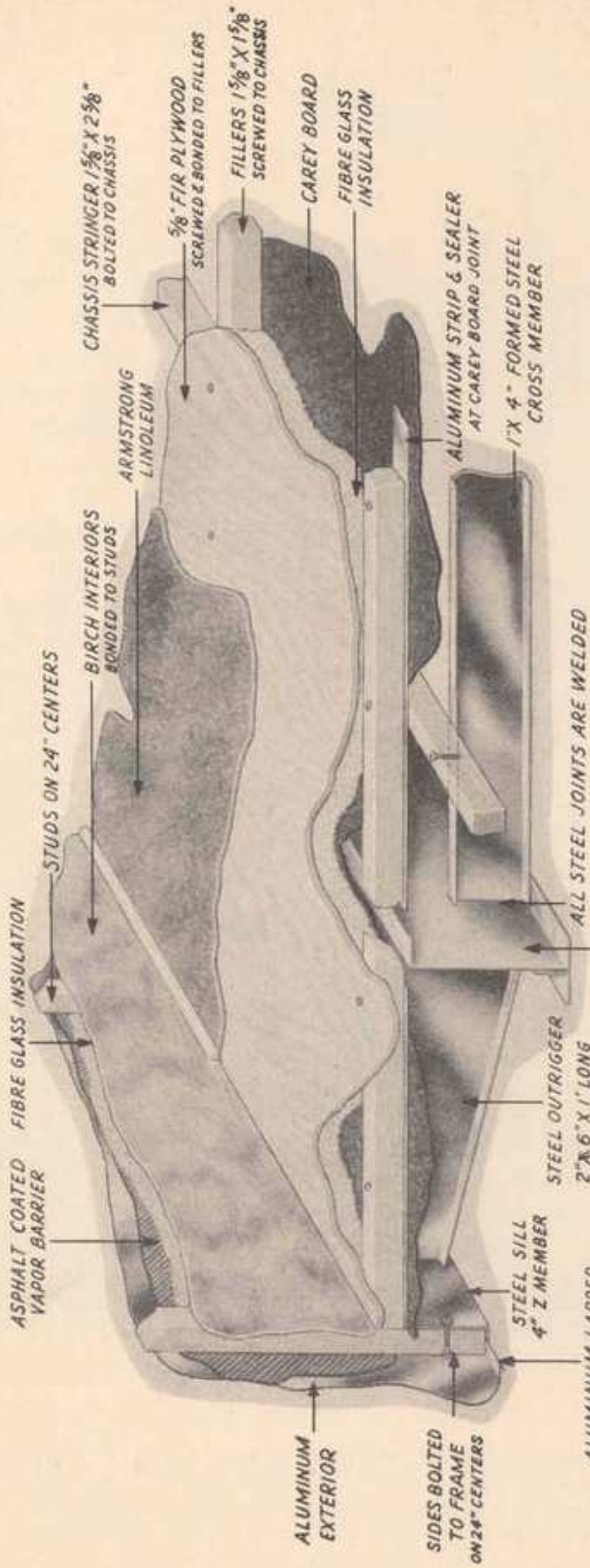
A. ALL-METAL ROOF PANELS OVERLAP SIDES
B. REINFORCING ANGLE IRON
C. NO ROOF EDGE SEAMS
D. JIG BUILT WALL FRAMES
E. FIBRE GLASS INSULATION
F. SILVERCOTE INSULATION
G. ¼ IN. PLYWOOD INTERIORS
H. VAPOR BARRIER
I. INTERLOCKING PITTSBURGH JOINTS
J. INLAID LINOLEUM TILE
K. FIVE-PLY 5/8 IN. FLOORING
L. SEASONED WOOD FLOOR JOISTS
M. WATERPROOF FIBRE SHEETING

Courtesy Prairie Schooner, Inc.



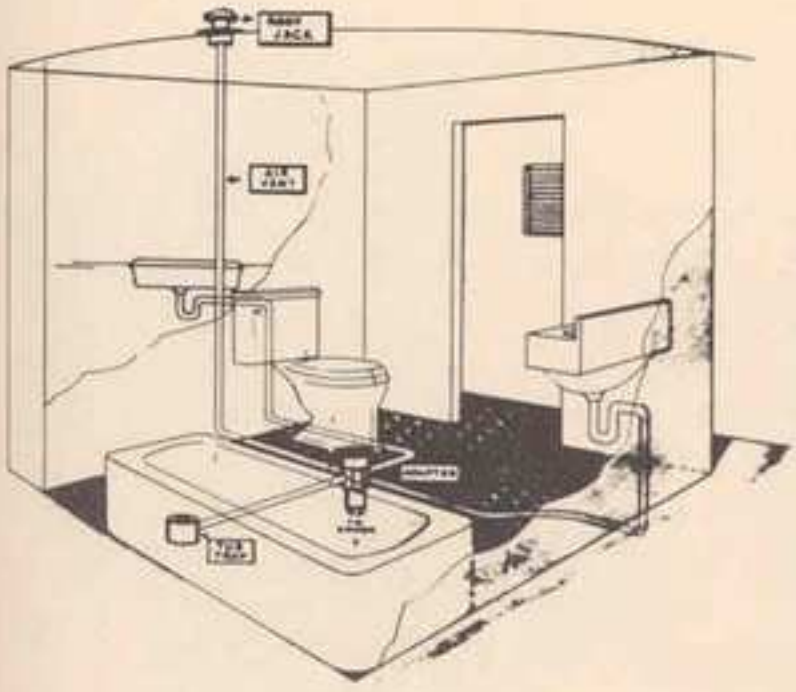
Courtesy Prairie Schooner, Inc.

JOIST FLOOR CONSTRUCTION ON HEAVY STEEL FRAME – All frame members (A) are heavy "C" channel steel . . . welded together. Flooring (B) of 5/8-inch plywood is laid over 2"x4", and 1"x4" wood frame and joists (C). Floor covered with heavy inlaid linoleum tile (D) over heavy felt (E). Under floor joists is a fibre glass blanket of insulation (F), covered with durable fibre sheeting (G). In addition the dead-air space between the joists also acts as an effective barrier to cold and heat.



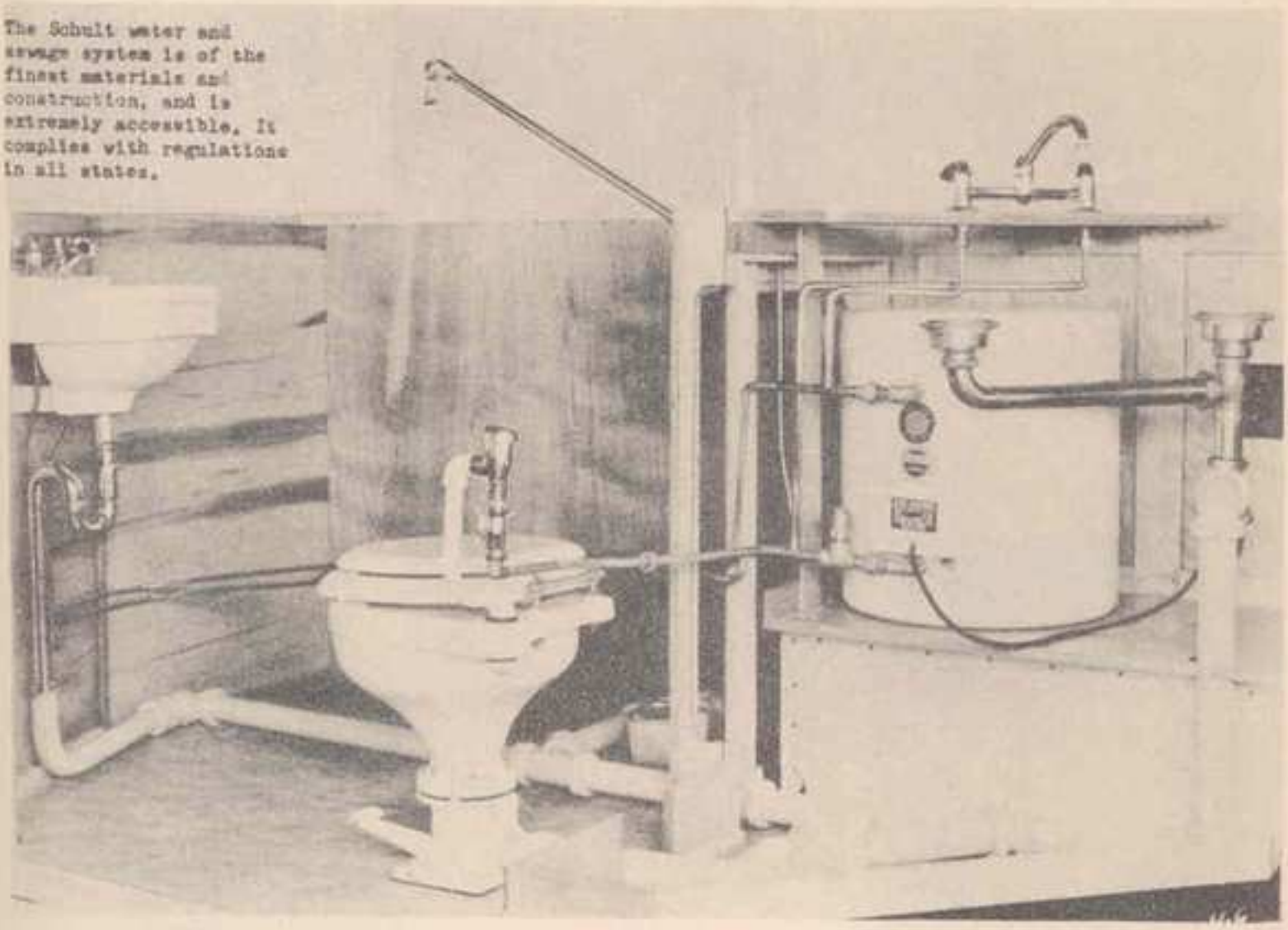
Courtesy Alma Trailer Company

This picture showing construction features of an Alma Trailer gives excellent view showing construction of floor and walls and how they are joined.



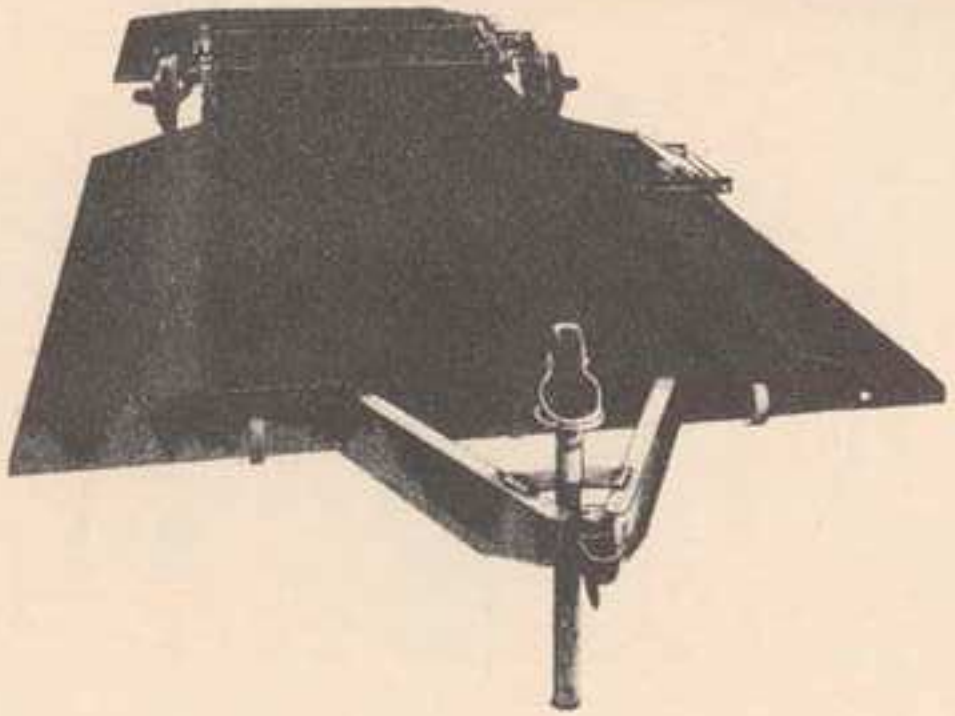
Drawing at left shows typical sewage line plumbing for a mobile home. Each plumbing fixture is trapped, and drains through common outlet at base of toilet. Toilet is regular house type with self-contained trap. Sewage system to conform to codes must be vented through roof.

Courtesy Mobile Supply, Inc.

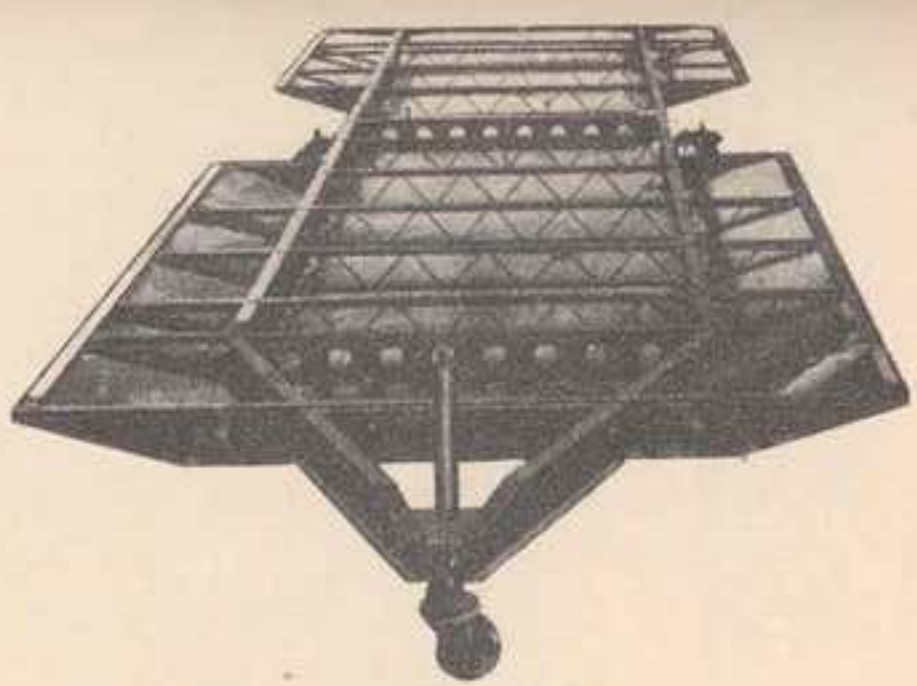


Courtesy Schult Corporation

Picture shows water and sewage system of a Schult mobile home in detail. Plumbing for double kitchen sink is at right. Kitchen sink, wash basin and bathtub are individually trapped and drain into base of stool. Note sweat joints on incoming water system. Water heater has temperature and pressure relief valve.



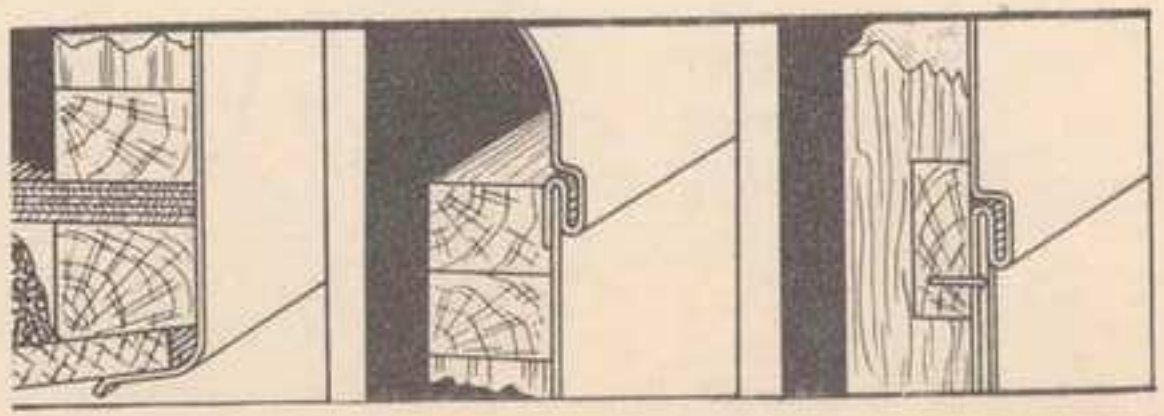
Courtesy American Coach Co.



Courtesy American Coach Co.

Pictures above show design of frame used by American Coach Co. Deep main I-beams interlock with close-spaced truss-type cross members. Under frame is completely enclosed and then undercoated to protect and weather-seal it.

Some manufacturers use special seams for exterior skin of mobile home. Purpose is neater appearance . . . . to end leak problems. Pictures at left show seams used by American Coach Co. Lockform Seams are rolled right into metal. Far left is lower side wall; center is top side wall.



Courtesy American Coach Co.

Why Not Remodel?

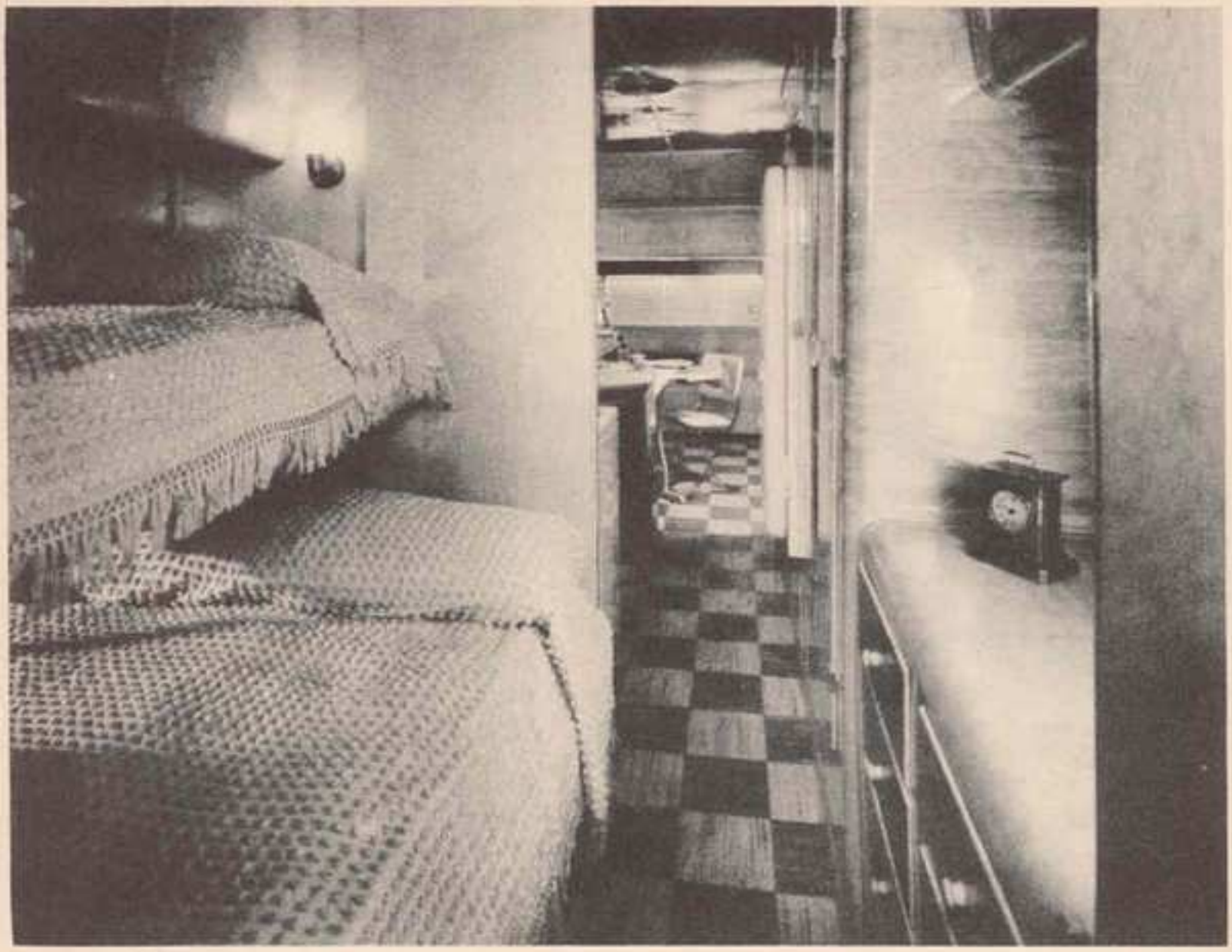
American home owners, as a group, spend tremendous amounts each year remodeling their homes. They learned long ago that it was much less expensive to remodel and bring their home up to date than it was to buy a new home. The fact that it's cheaper to remodel than buy new applies to mobile homes, too. What's more, money spent on remodeling is wisely spent, for it increases resale value. But, buying practices in the mobile home industry do not indicate that the average mobile home owner is aware of these facts.

When you trade your old mobile home in on a new one because you want more space or less space, it makes sense. It also makes sense when you have so much money that it doesn't make much difference to you how you spend it. Then, too, perhaps you wouldn't for a minute consider the inconvenience of remodeling. But, when you trade in the old model because it doesn't have some of the modern conveniences, or because it looks dull and drab, or because it's "too badly" run down, then you're overlooking the possibility of considerable savings by remodeling.

Long ago, smart dealers recognized the profit possibilities in remodeling. They've picked up old models for a song, remodeled them and made much more profit on that type of transaction than they could make by selling the largest new modern mobile home. There's no reason why you shouldn't pocket this profit yourself. When you have the space you need, give consideration to remodeling. You will probably find it unwise to trade the old model in on a new one.

HOW TO REMODEL . . . . AND SAVE – To save the most, do the remodeling work yourself. It's actually fun if you're the least bit handy with tools. You don't need to know a lot about it. Much of the important information you need is contained in the various sections of this Manual. Feel unable to tackle the job alone? Well, then find an independent repair man in your community. Most dealers have service men that do remodeling work. Most of these fellows would like to make a few bucks on the side. Offer them a proposition. You will find they will work during their free hours at a reasonable labor rate. You can work with them and effect real savings.

Before you remodel, carefully decide exactly what you're going to do, and determine the cost in advance. Get as many bids on the work as possible and decide exactly what work *you* can do. Then compare the cost of the remodeling with the cost of buying a new mobile home containing the features you desire. Of course, it's foolish to tackle a remodeling job unless the savings are going to be worth the effort. So, carefully analyze your motives for remodeling. You may discover that what you really want is more eye appeal. Eye appeal can be accomplished at very little cost. Many a dealer takes in a mobile home that's just been neglected. He does very little to it except put elbow-grease into cleaning up the interior and the exterior and adds a few nick-nacks to dress it up. A dab of paint here and there, a little polish on the outside, a little cleaner on the interior walls, thorough scouring of stove and ice box, thorough scrubbing of the floor, a few new lamp shades or curtains, and an old, depressed looking mobile home becomes a Cinderella. So, decide ex-



Courtesy Indian Trailer Corp.

When you remodel don't overlook the possibility of bunk beds. The interesting arrangement used in 1953 – 36 foot Indian mobile home shown above provides sleeping quarters for three persons. Picture at left shows a more conventional bunk bed arrangement.

Courtesy Mid-States Corp.

actly what you want. You probably don't really want everything you see in a new mobile home – at least not when you consider the cost.

REMODELING HINTS – Here's a list of suggestions for those who are considering remodeling. The cost of some of the suggestions is high. In other cases the cost is negligible, yet they make a big difference. No effort is made to tell you exactly how to do the work itself. Careful study of the construction section of this Manual, as well as the repair and maintenance section, will give you most of the information you require.

1. Picture windows are one of the most distinctive features of the modern mobile home. You can easily take out old windows and install large, modern picture windows. These modern style windows

Courtesy Alma Trailer Company

The two pictures above show excellent in-a-wall bed arrangement used in this Alma mobile home. Permits more flexibility in living room decoration, yet provides excellent sleeping facilities.

are available at parts stores, and it's easy to cut a larger hole in the side of your mobile home to accomodate the larger window.

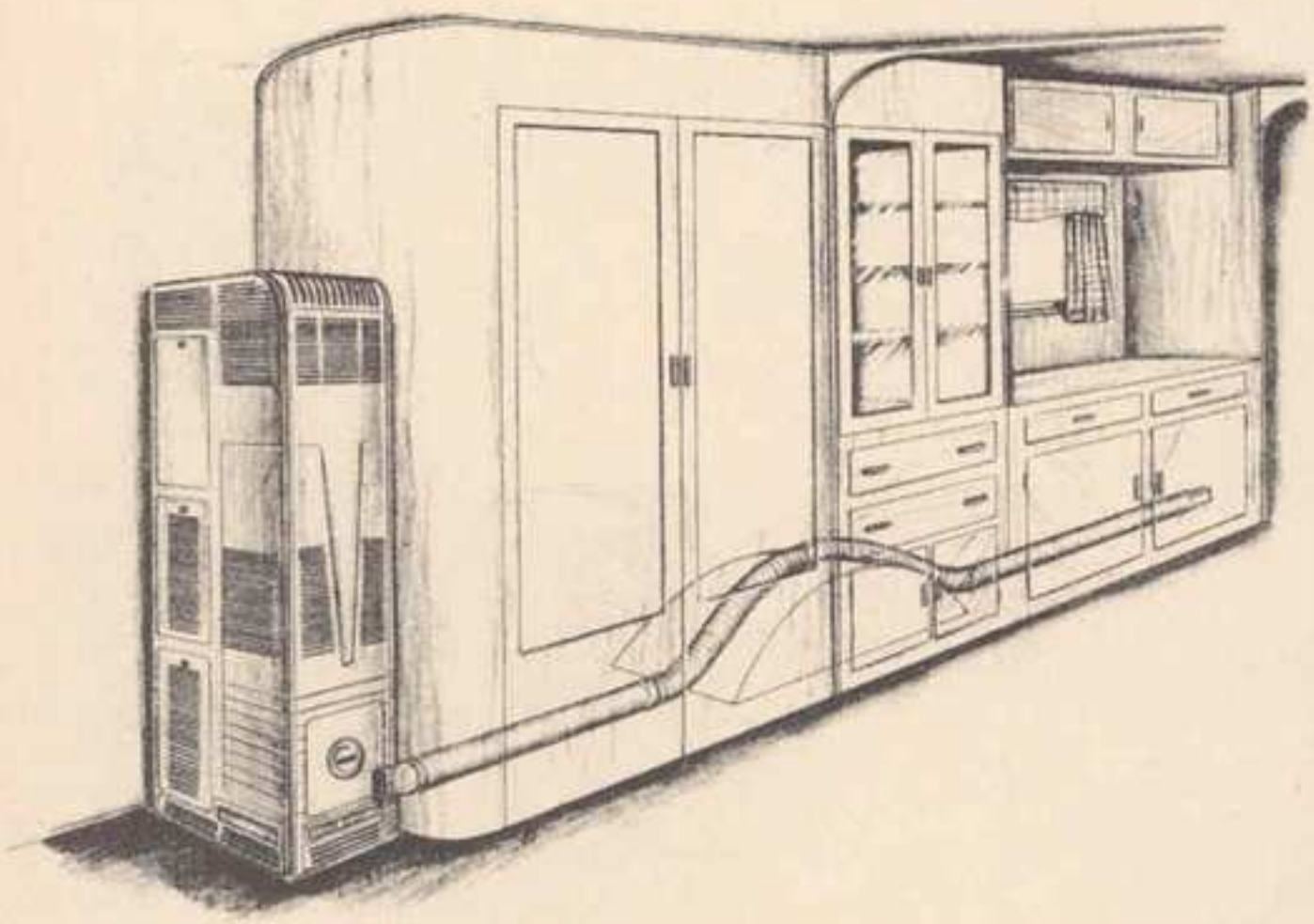
2. Interior or exterior repainting make a world of difference. Most modern mobile homes have metal exteriors. Old models with masonite or canvas exteriors can be reskinned, using sheet aluminum or galvanized sheet metal. All you need is a pair or tin snips, a screw driver, some sheet metal screws, appropriate moldings, a drill and somebody to assist you. Just screw the new skin to the old surface, trying to find studding wherever possible. Seal all seams, apply molding, and paint.

Courtesy Supreme-Victor Mobile Homes, Inc.

Effectiveness of large picture windows is illustrated in this attractive interior of a Supreme-Victor Mobile Home.

3. Look at modern style heaters and consider replacing the old model. Install a thermostat. (See data on this point under heater section in Chapter VII).

4. Replace old ventilators with modern design vents.



Courtesy Coleman Lamp and Stove Co.

Oil heaters can be replaced with up-to-date models. If the new heater is equipped with a blower, it is not difficult to install a ducting system for better heat distribution.

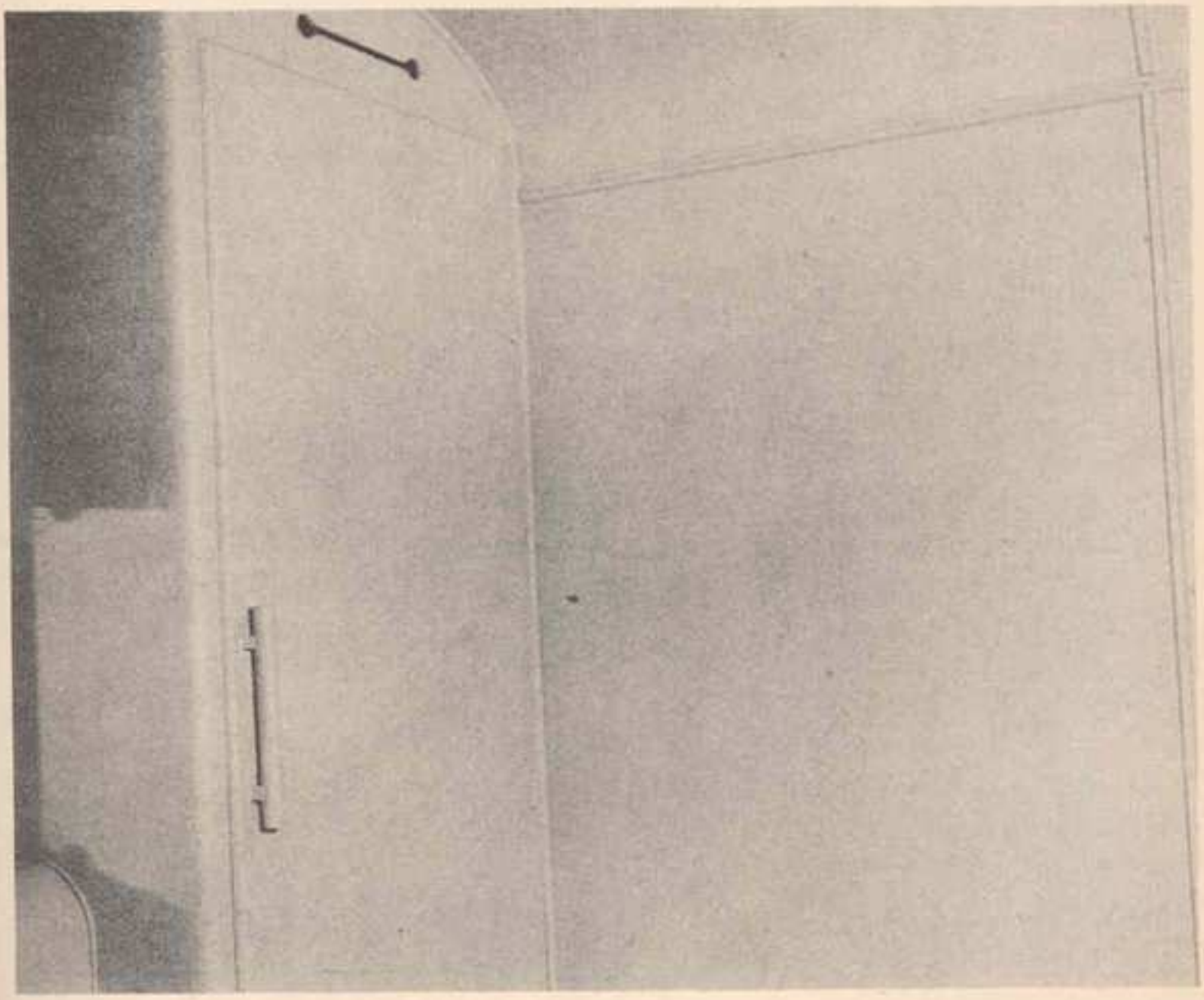
5. Drab old floors can be made to look like new by wall to wall carpeting, or an even brighter and gayer approach is the installation of asphalt blocks. They're easy to lay, and there are many bright color combinations. The local dealer selling this type of merchandise will be glad to help you in explaining exactly how to do the work yourself. It's simple.

Courtesy Supreme Trailer Sales Corporation

Old drab floors become bright and gay with easy-to-lay asphalt tile. This kind of flooring is often used in new mobile homes. See how attractive it looks on the living room floor of this Supreme mobile home.

6. Replace old interior furniture with new furniture.

7. There's one paint process that's a wonderful help in remodeling. The process is known as Zolatone. Find a local dealer for Zolatone and arrange to have him repaint the interior of your mobile home. This paint comes in beautiful speckled colors.



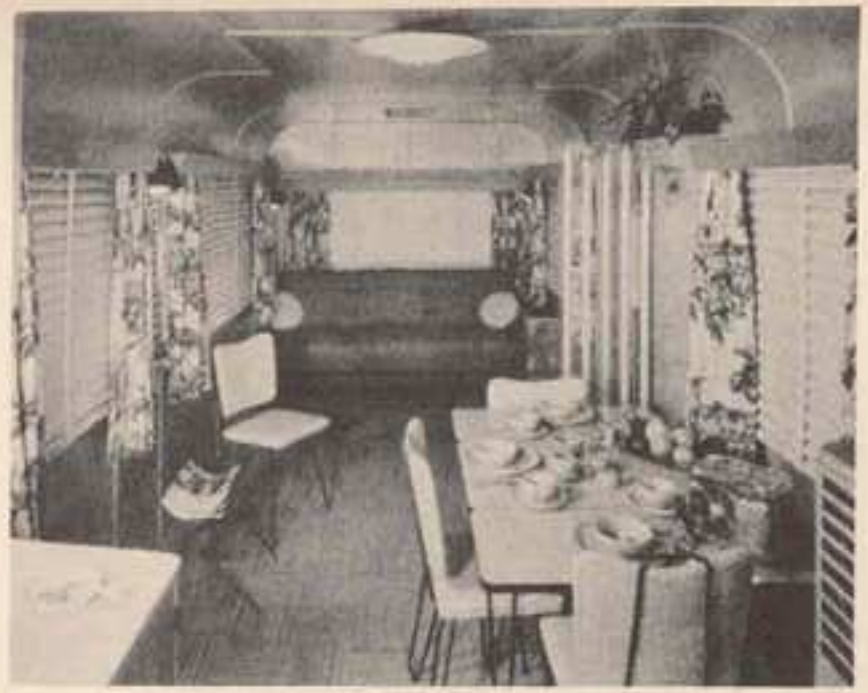
Zolatone paint process makes interior refinishing easy. It's thickness covers all scratches and imperfections . . . . makes interior of mobile home look brand new.

It is sprayed on thick. This enables it to cover all old scratches and imperfections. The cost of this type of painting is low. What's more, this process is being used extensively in new mobile homes. You can't beat this combination of low cost, ability to cover a multitude of imperfections, and that modern look.

8. Cabinet work is easily changed and remodeled. Remember, your mobile home is basically a shell. The cabinet work is placed inside the shell. It's not too difficult to tear out all of the cabinet work inside your mobile home and start from scratch in rebuilding it with

Courtesy American Coach Co.

If you have the space, a complete bathroom is not difficult to install. Raised floor permits below-bathroom-floor plumbing; yet plumbing is weatherproof because it is above main flooring.



All pictures Courtesy American Coach Co.

These beautiful interiors of modern American Coaches emphasize the affect of up to date (1) light fixtures, (2) furniture, (3) appliances, (4) heating, (5) flooring, (6) windows.

whatever new floor plan may suit you best.

9. The modern mobile home is equipped with showers and toilets. Larger models even have bath tubs. Unless you have an exceptionally small floor area, it's not too difficult to find a place to put a shower. Ready-made showers can be purchased, and a little cabinet work will enclose them. The same applies to toilet installations. Any mobile home repair man can bring the plumbing on your mobile home up to date at nominal cost.

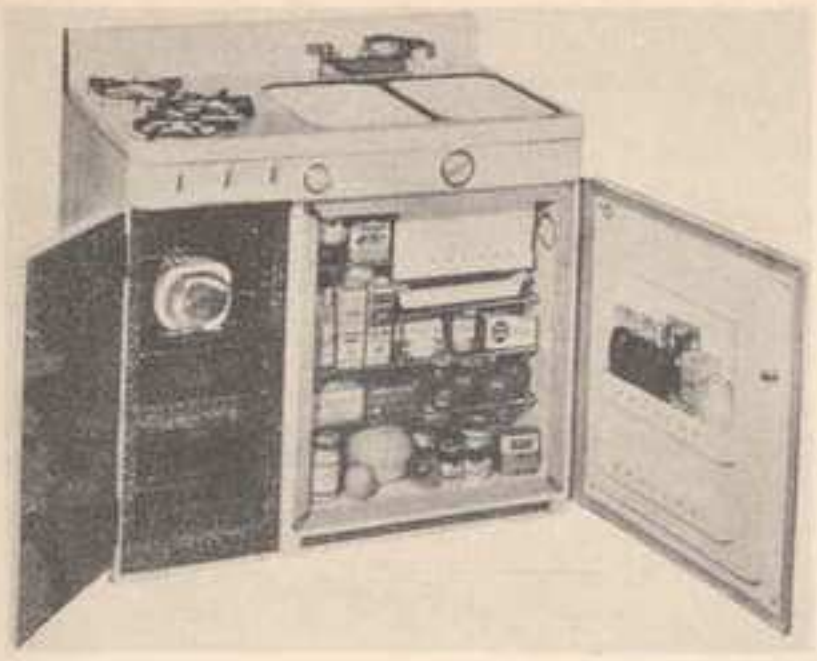
10. Don't overlook the importance of the "little things" in remodeling. New curtains, mirrors, lamp shades, nick-nack shelves and wall brackets, and light fixtures make a world of difference in the appearance of your mobile home.

Courtesy Mid-States Corp.

It's a cinch to remodel kitchens when you take out all old cabinet work and one piece sink assemblies. It's easy to buy ready-made kitchen equipment.

Courtesy Indian Trailer Corp.

Use of large wall mirror in this 40 foot 1953 Indian mobile home illustrates how mirrors can be used to give illusion of larger area.



Courtesy General Air Conditioning Corp.

A big space saver is this General Chef, consisting of stove, complete with oven and broiler, six cubic foot refrigerator, and twin sink. Requires space 40-3/16" high x 45-1/4" wide x 29-9/16" deep.

Courtesy Indian Trailer Corp.

Tips for remodeling can be found in this picture of center bedroom of an Indian Chieftain mobile home. Note 6 large drawers in wardrobe, 2 large drawers below wardrobe, sliding wardrobe door and accordion type door to bedroom.

Courtesy Liberty Coach Co.

It's not difficult to replace small, out-dated sinks and faucets. This double sink arrangement in a "step-saver kitchen" of a Liberty Mobile Home shows desirability of a modern sink arrangement. Note mirror on back wall that gives illusion of extra space.

Courtesy Anderson Coach Co.

Revolving Lazy Susan Storage shelves with capacity of 80 cans of food right at your fingertips is an outstanding feature in this Anderson Coach. When remodeling, use revolving shelves to give you the use of otherwise inaccessible space.

11. No hot water? The installation of hot water heaters is extremely simple. See your local supply store. They'll be glad to explain how to install one.

12. A new refrigerator or a new stove helps a lot. This is one of the most frequent changes made by dealers who strive to dress up old models for resale purposes.

13. Install venetian blinds if they weren't installed before, or

clean up and repair the old ones. The best bet is to install the latest in modern venetian blinds. Their cost is low.

14. Modernize kitchens by installing modern sinks and modern sink plumbing. Use Formica and new moldings to recover sink drain boards.

15. Sliding doors are popular in modern mobile homes. Any hardware store carries the necessary hardware to enable you to convert your doors to sliding doors.

16. Vinylized wall fabrics may be used in lieu of repainting to modernize interiors. Such materials transform interiors into a warm, inviting, modern home. Vinylized wall fabrics defy scuffs and scratches, need no waxing, are easy to clean, and are reasonable in cost.

17. Kitchen remodeling is made easy by the many kinds of steel cabinets and steel sink assemblies that can be bought, ready to install.

Courtesy Supreme Trailer Sales Corp.

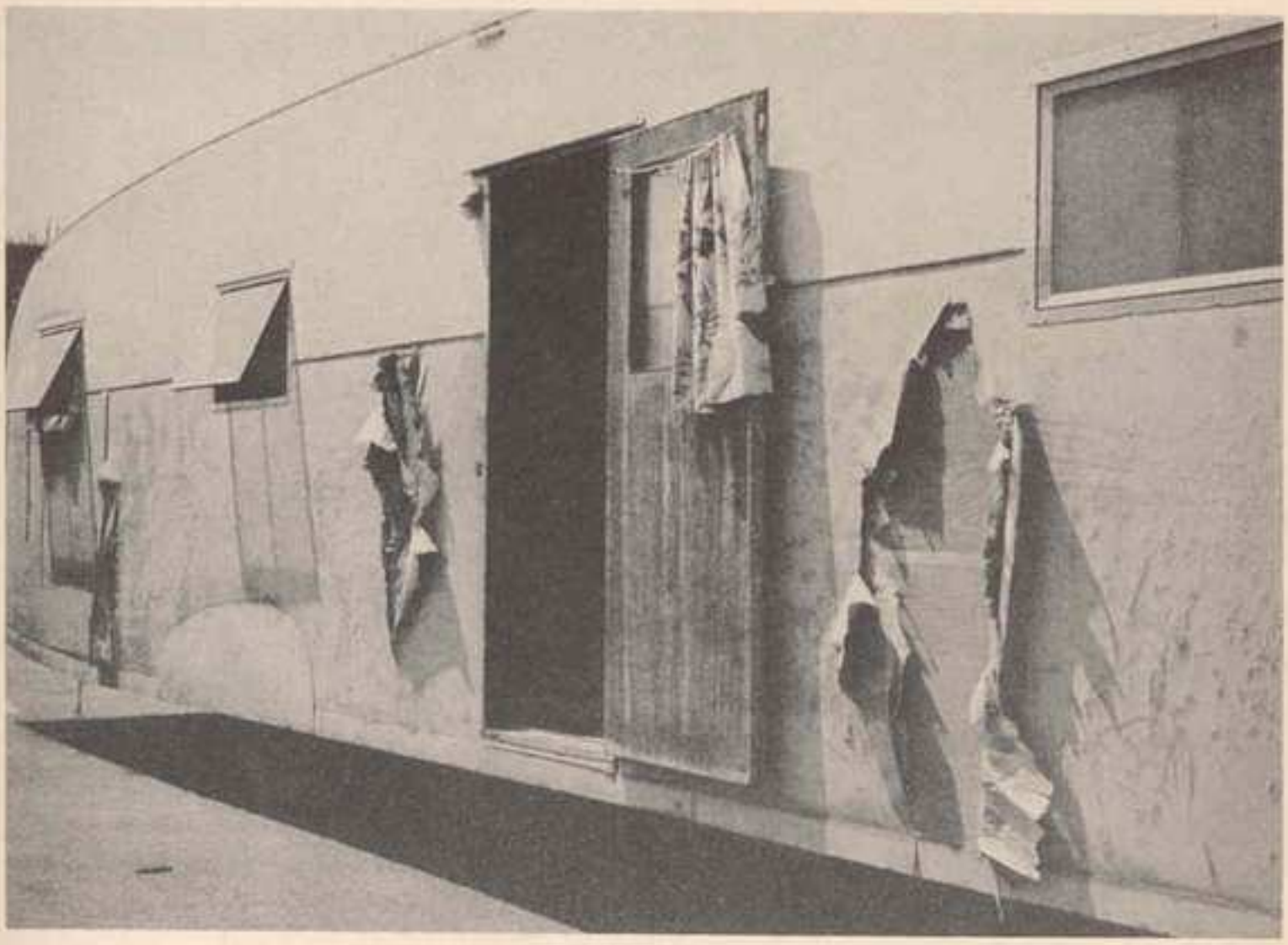
A dinette arrangement like this is typical of many a modern mobile home. If you're remodeling, you'll find you can buy a seat ready to install as well as a Duncan Phyfe table.

Courtesy Avco Mfg. Co.

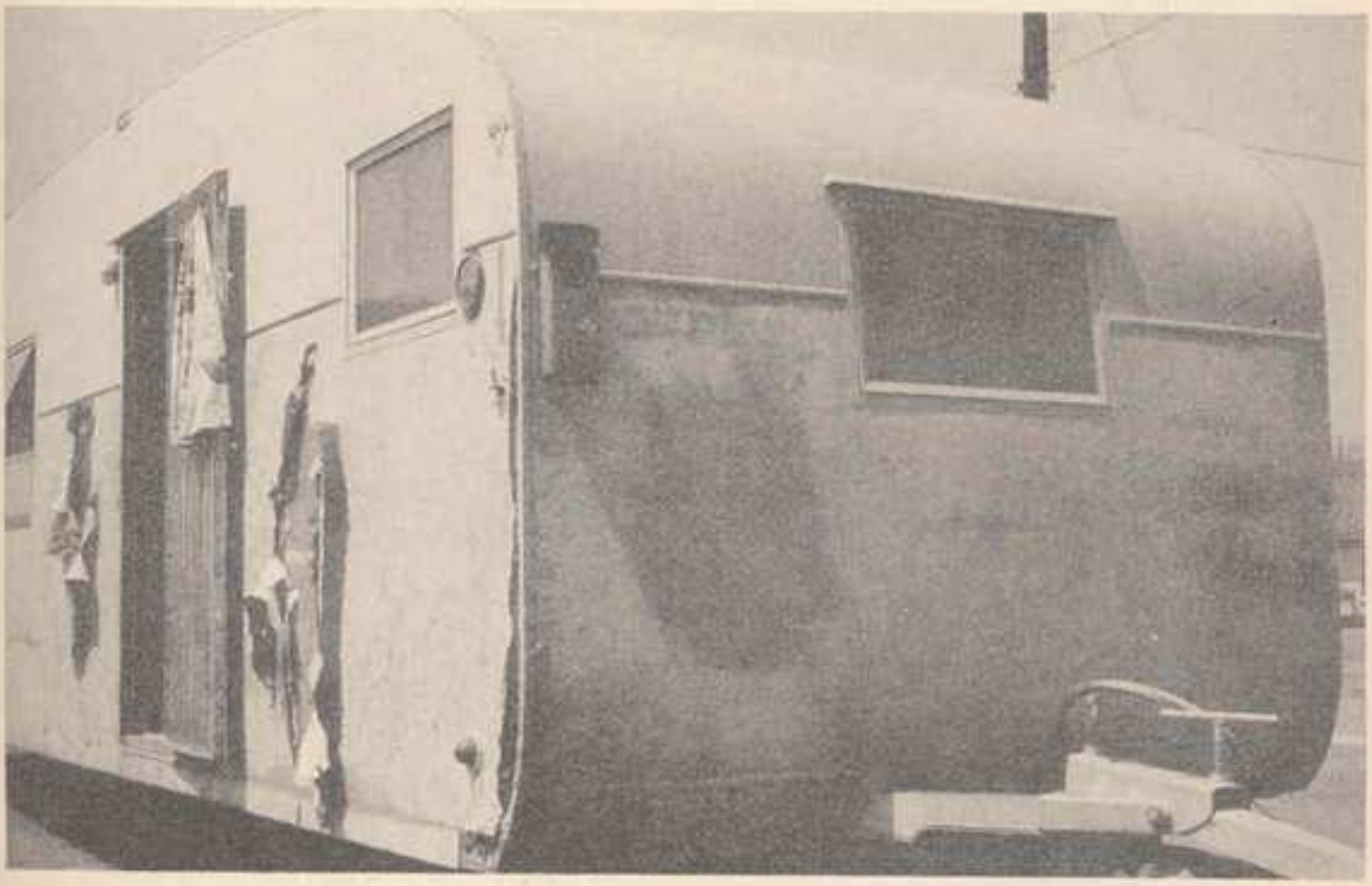
1953 ABC Mobile Home shown here is equipped with Crosley and Bendix appliances. Note Bendix Economat washer, Crosley refrigerator, Crosley all metal steel cabinets and sink assembly.

When you decide to modernize and remodel, go at it in a business-like way. The first procedure is to get all the ideas you can. Go to all the dealers' lots in your area. Look at the mobile homes on their lots, especially the used ones. See what they've done to modernize them. Go over the new mobile homes carefully to see what features you'd like to reproduce. Read the chapter in this Manual entitled "Publications of Interest to Mobile Home Owners". Obtain those publications that will assist you in getting ideas as to what you want. Read the chapter in this Manual on how to buy a mobile home, following the instructions for obtaining all possible information about mobile homes. Furthermore, you'll get information on the construction features of mobile homes that will enable you to go about the remodeling procedure more intelligently.

On the following five pages, pictures show what one dealer did to remodel a mobile home for resale purposes.

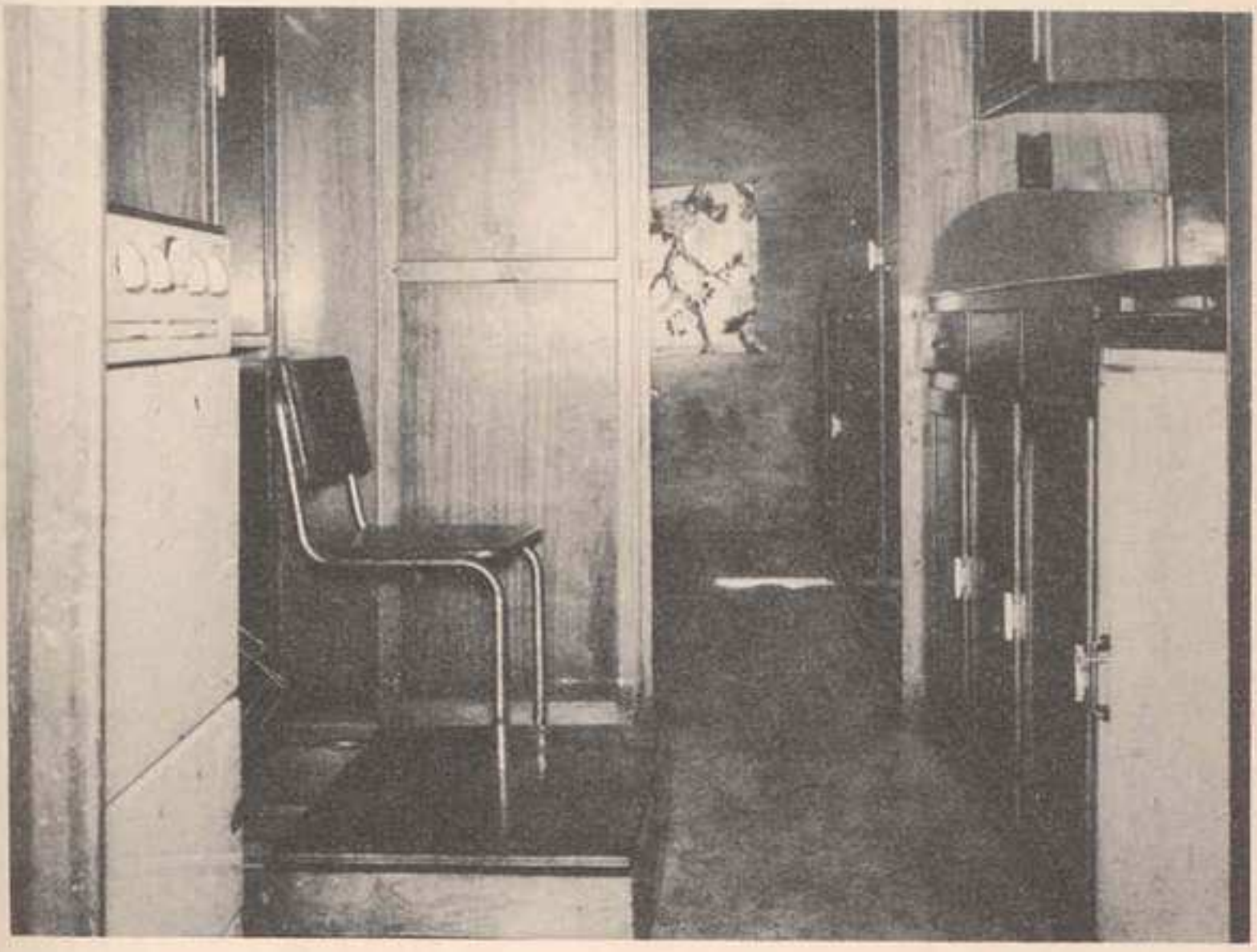


Picture 1. Dealer buys old mobile home. Sides are muslin and cotton wadding over plywood. It looks like a real junker. As it stands, it is.



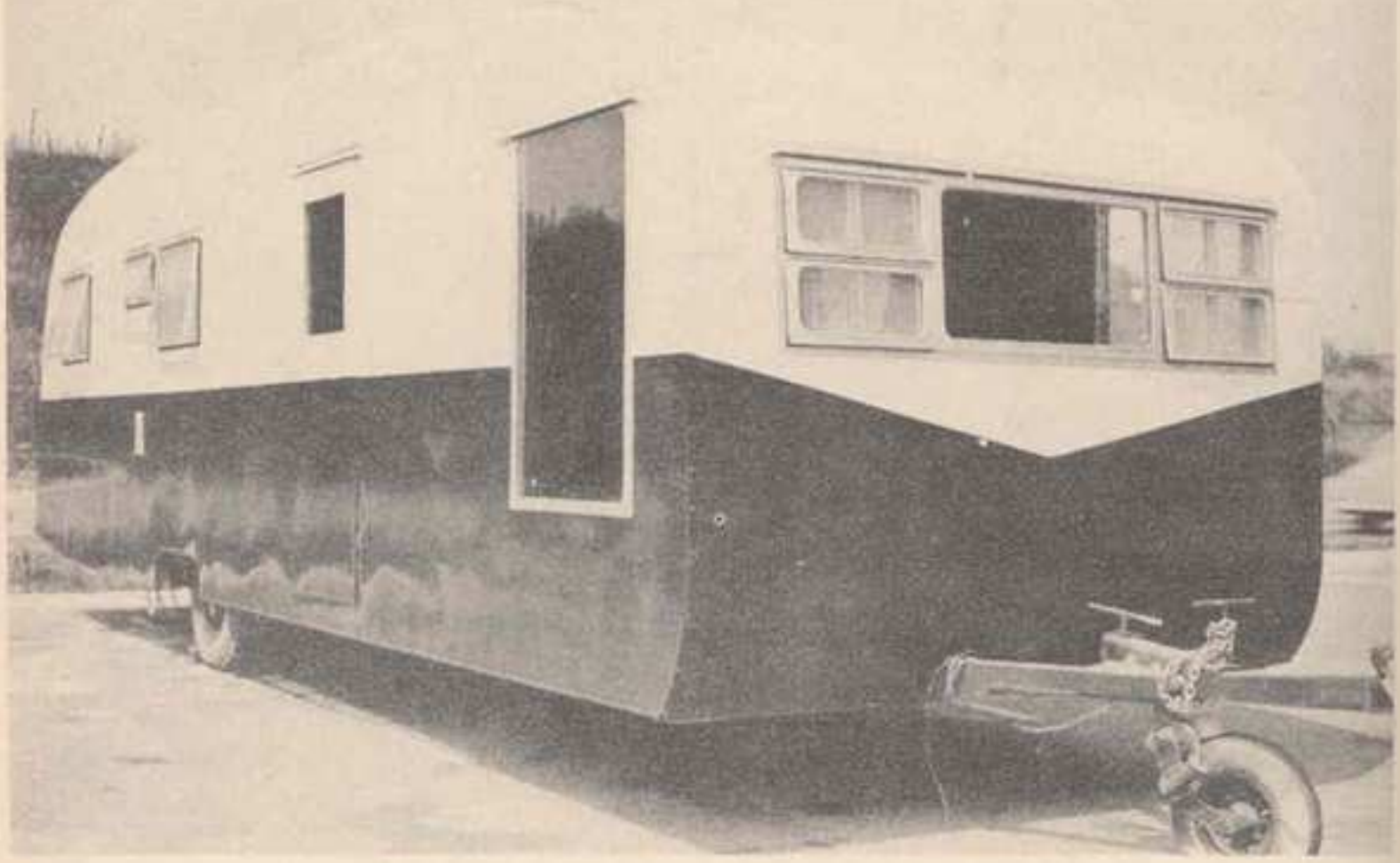
Picture 2. Coach is many, many years old. Note old fashioned windows. This mobile home has been badly neglected but basic structure is still solid.

Picture 5. Note arrangement of kitchen before remodeling starts.

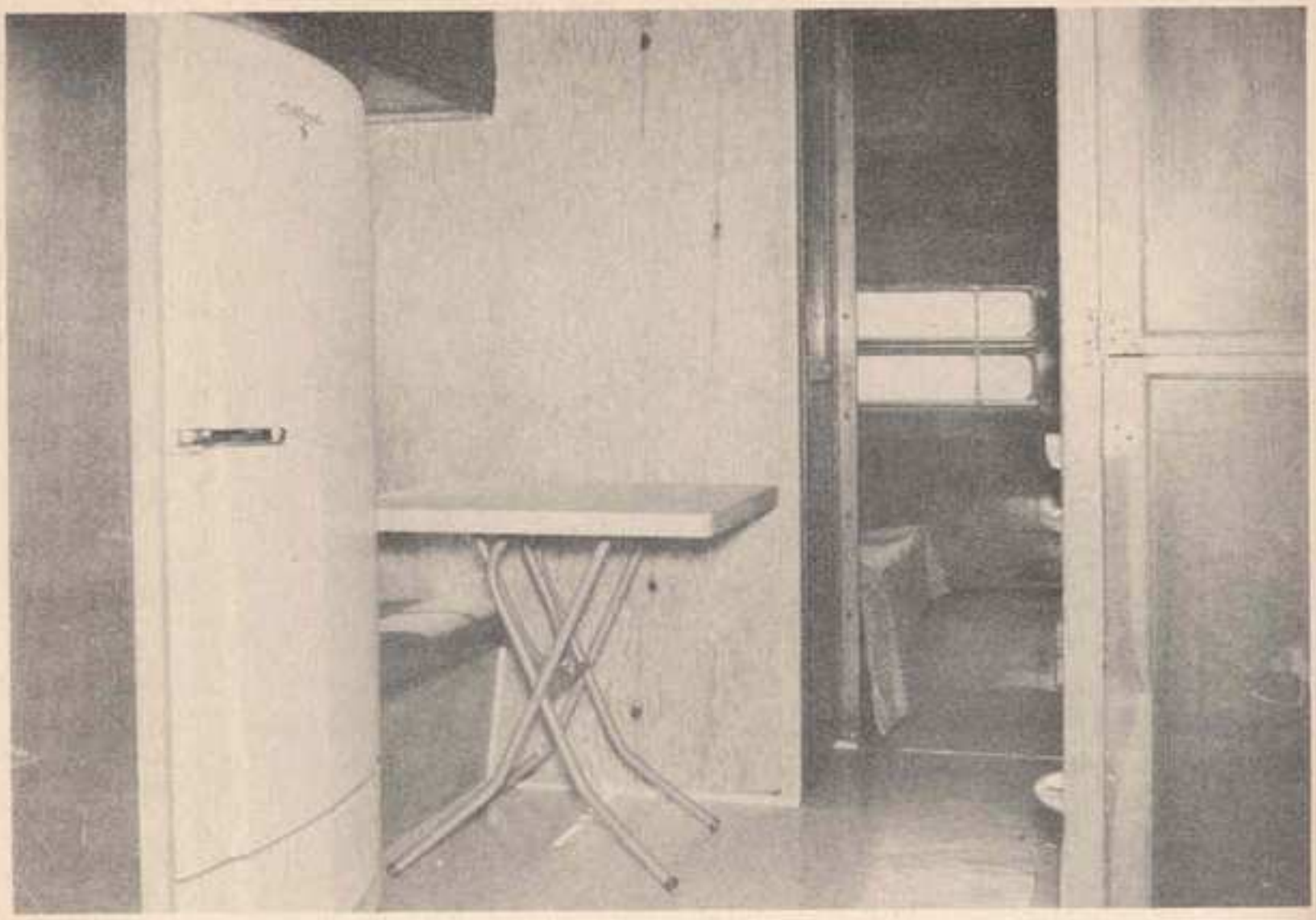


Picture 6. . . . and here's another picture of kitchen before remodeling starts.

Picture 3. Interior is dull and drab. Furniture is "shot"..... and what light fixtures!!

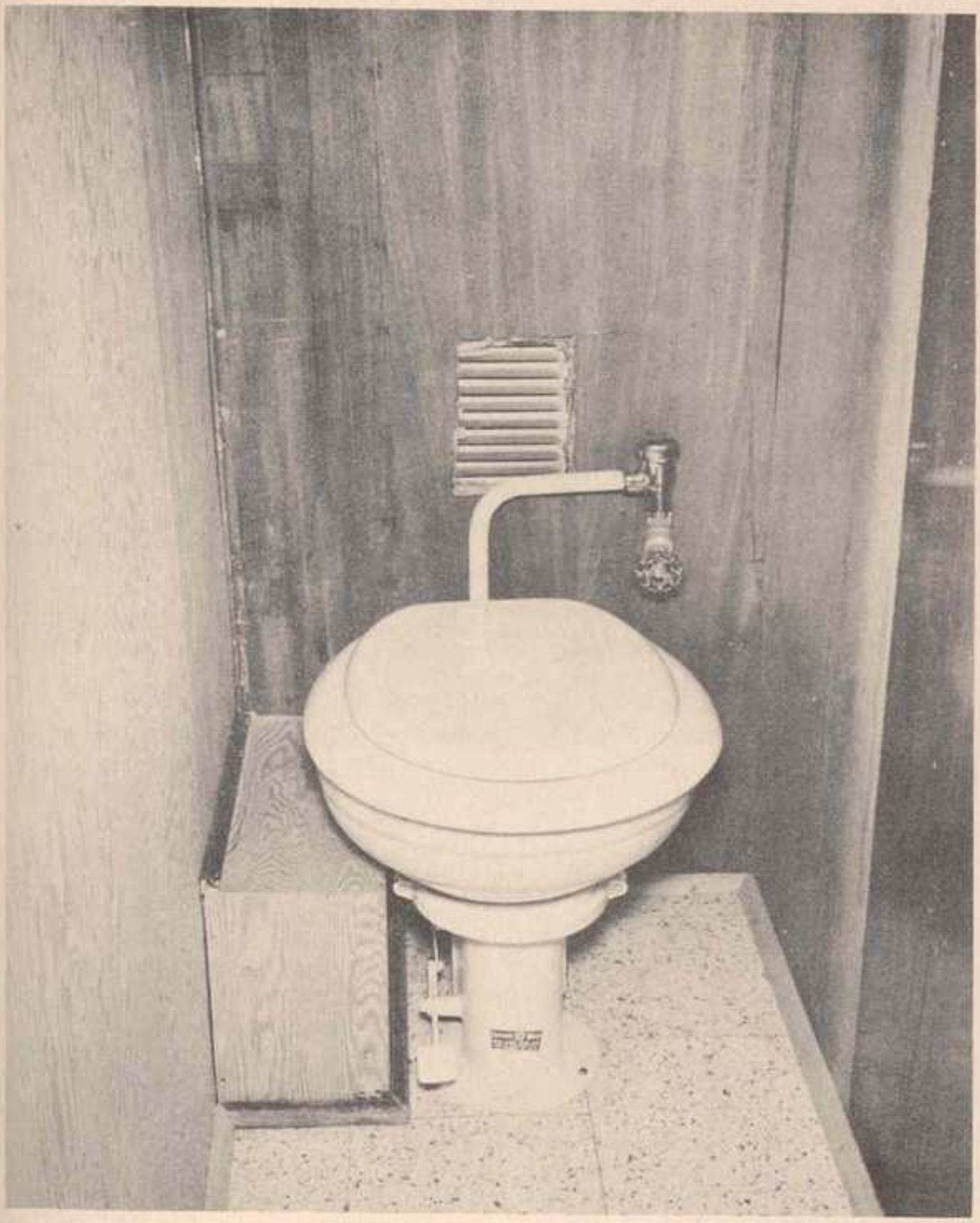


Picture 4. *Look what's happened!* Exterior has been reskinned with galvanized sheet metal, new windows have been installed and a bright new paint job applied. Note new small window near rear. Compare this picture with picture Number 1. New window is for small bathroom that's been added to floor plan.



Picture 7. Remodeling is under way. Old cabinets are removed. Part of kitchen is blocked off to form a small bathroom. Old stove is replaced by new refrigerator. A dinette is built in and floor is recovered with asphalt tile.

Picture 8. Old ice box is replaced by new stove. Old sink is replaced with new double sink and swing faucet. Sink drainboard is recovered with Formica.



Picture 9. Building in bathroom is under way. Floor plan did not allow for tub or shower. Toilet is in. Wash basin is to be installed.

...and here our story ends. A customer delighted with the remodeling program purchased the mobile home, unfinished, and left town with it to finish remodeling to suit his own taste. Still to be completed: repainting of interior, new furniture, new and modern light fixtures, new curtains, mirrors, etc.

CHAPTER VI

WHAT YOU SHOULD KNOW ABOUT MOBILE HOME INSURANCE

The three most important parties involved in the usual insurance transaction are the insuring company, the agent, and the client. The insuring company accepts the premium with the understanding that if a loss occurs, it will, in accordance with the contract drawn between the company and the client, reimburse the client for the loss.

The agent is the representative of the insurance company. He contacts the client for the purpose of selling the client insurance written by the insuring company. He is a salesman for the company, usually a commission salesman. He is also usually an independent businessman operating his own insurance selling business. The client in seeking insurance deals through the agent as an intermediary. There are two types of agents. One sells insurance for a specific company or of a specific type, such as life insurance. He cannot sell insurance for other companies or other types. The other type of agent is called a broker. He contacts the client, determines the client's requirements, and then finds an insurance company to write the insurance his client needs.

The client, in the case of mobile home insurance, is you, the mobile home owner.

It is possible to grade insurance companies as excellent, good, fair, etc. It is likewise possible to grade agents or brokers in a like manner. Insurance companies measure clients as either excellent, good, fair, or bad risks. The usual basis for measuring insurance companies is: the length of time in business; the financial stability of the company; the type of policy it writes; its reputation in living up not only to the letter but the spirit of its contracts; its promptness in paying claims. The usual basis for grading an agent or broker is: experience; knowledge of the insurance market; ability to intelligently advise clients; willingness to stand by verbal contracts; ability to get a fair settlement for clients in questionable cases. The usual basis for grading a client is his conduct and its relation to the probability of being involved in a claim.

An insurance agent must be licensed to do business. To get his license he must usually pass an examination. This examination tests his knowledge of the type insurance he seeks a license to sell. An insurance broker is also licensed and must pass a much more difficult examination since he is licensed to buy and sell *all* kinds of insurance.

Insurance Practices in the Mobile Home Field

In the past, most mobile home insurance has been written by insurance companies which have the mobile home dealer act as their

agent. When you bought a mobile home you were informed that certain types of insurance were required and that other types were desirable. The dealer explained the insurance to you and made it part of your sales contract. In a few instances, the mobile home owner has bought insurance through regular insurance agents or brokers rather than through the dealer. The trade practice in the industry has been for the dealer to *insist* that the insurance be written through him when the mobile home was purchased because it meant additional profit to him on the transaction due to his commission as an agent for the insurance company. This is similar to the same type of *insistence* in the automobile business when the dealer *insisted* that the buyer purchase insurance through him at the time the automobile was purchased. But dealers in the automobile business no longer write the majority of insurance on automobiles.

A similar transition is now taking place in the mobile home insurance field. Due to the increase in the number of mobile homes, insurance for them has become big business. More and more insurance companies have taken an interest in it. In the past it was frequently difficult to find an insurance company that would write mobile home insurance. Many mobile home owners have experienced difficulty in trying to buy insurance for their mobile home. Their auto insurance agent usually gave them a blank look when asked about mobile home insurance. Therefore, they went to a mobile home dealer for advice and usually paid a premium they felt was high. This situation no longer exists. If you want insurance today, your regular insurance broker can easily find a company that will write it.

In recent years firms have been organized to write mobile home insurance direct with the mobile home owner. These firms sell by mail and employ no agents. They are aggressively soliciting business. All this means that there is more competition today in the mobile home insurance market. This competition has meant better policies and rates for the mobile home insurance buyer.

Types of Mobile Home Insurance

Fire and Theft. – This covers the mobile home in case of fire, or in case it is stolen. If your mobile home is not paid for in full, finance companies insist that you carry this type of insurance. For your own protection, if your mobile home is not financed, you should carry it.

Combined additional coverage. – This insurance is frequently referred to as CAC. It is usually written in connection with fire and theft insurance. It protects you from any losses resulting from such things as lightning, trains, windstorm, earthquake, explosion, hail, external discharge or leakage of water, flood or rising waters, riot or civil

commotion, forced landing or falling of any aircraft, or its parts or equipment, and malicious mischief and vandalism. If your mobile home is financed, you will usually be required to carry this type of insurance. If it is not financed, you should still carry it.

Collision. – This reimburses you for any loss suffered to your mobile home as the result of a collision. It makes no difference who is at fault. You are reimbursed for the loss regardless of who may have been responsible for the collision. This type of insurance is required by the finance company when your mobile home is financed. It is difficult to say whether one should or should not carry this type of insurance. It is usually quite expensive. If you do not travel, it is certainly an undesirable form of insurance. If you travel extensively, there are pros and cons as to whether it is desirable or undesirable. This insurance is frequently written on what is known as a deductible basis. The most frequent form is $50 or $100 deductible. This deductible clause in the policy means that the amount stated as deductible is paid by you in case of an accident, and the balance by the insurance company. Thus, if you have $50 deductible collision insurance and are involved in an accident causing damage to the extent of $500, you must pay $50 and the insurance company pays $450. If the damage is $50 or less, you pay it all. The big advantage of the deductible type of policy is that the rate is considerably lower. The real purpose of insurance is to protect you against a loss you cannot afford. For that reason the deductible type of policy is recommended should you elect to carry collision insurance. And the larger the deductible amount, the better, since the premium goes down. Of course, that which determines the amount of deductible that you want will be your ability to absorb part of the loss.

Liability and Property Damage. – This type of insurance protects you against loss because of property damage your mobile home might cause while it is on the road. It also protects you from loss due to your liability for personal injury to another party. Insurance companies ordinarily will not write this type of insurance just on your mobile home. The company that carries your liability and property damage insurance on your car will add a rider to your automobile policy covering the mobile home as well as the car. The premium for adding this rider is usually small. There is a good reason for the same insurance company wanting to carry the policy for liability and property damage on both the car and the mobile home. If one insurance company covered the car and another the mobile home, it is conceivable that you could be involved in an accident wherein there would be a dispute as to whether the loss was caused by the mobile home or the car. Insurance companies do not like to get involved in arguments among themselves as to which should pay a claim. It is

better for you and for the insurance company not to be involved in such disputes. It is also better for you to know exactly who is going to pay the claim and not be shoved around between two insurance companies. Therefore, if you are having this type of policy written on your mobile home, have the company that carries your present automobile policy add a rider to the policy. In a few cases insurance company contracts already provide this coverage without the addition of a rider. You should, however, consult with your insurance agent to determine whether or not you are so covered and if not, have the necessary rider added. If you want to carry this type of insurance on your mobile home (you should carry it, unless your mobile home is parked at all times because the cost is low compared to the possible loss you might suffer), then it is probably desirable to have the agent who is writing the rest of your mobile home insurance also write your car insurance. This recommendation is made on the assumption that you prefer, for the sake of simplicity, to have all your insurance written by one agent.

Personal Effects. – This insurance protects your personal property in your mobile home from fire. The rate is low, and the amount you carry is determined by the amount of personal property you have in your mobile home. This type of insurance is also frequently written in combination with combined additional coverage on personal effects. The CAC on personal effects is usually written only when you also write fire on personal effects, and it covers your personal property within your mobile home from the types of damage described above in our paragraph discussing CAC coverage for the mobile home itself. This type of insurance is not essential but is carried by people who feel that they could not stand the loss of their personal effects. If you are so financially situated that the loss would not hurt you, this type of insurance is certainly not a necessity.

Trip Insurance. – This insurance is written for those who do not carry collision insurance because their mobile home is normally parked. When it becomes necessary to move, or if you desire to take a trip, then trip insurance is purchased to cover any collision that may occur during the trip. This type of insurance is usually written on the basis of a specific number of days. In other words, you purchase 30, 60 or 90 day trip insurance to cover you during the period you plan to be traveling. It costs less than regular collision insurance written on a yearly basis because it covers you for only a small part of a year. It, too, is normally written on a deductible basis because it is much cheaper when written in this form. This type of insurance is normally a good buy. If you are not used to pulling your mobile home, the probability of your having an accident is greater and though rates seem high, the probability of loss is even higher.

Vendors Single Interest and Dual Interest. – Vendors single interest insurance is more frequently known as VSI insurance. If you finance your mobile home, you will be required to buy VSI insurance. This insures the finance company's interest in the mobile home against fire, theft, collision and CAC. It is usually written in combination with embezzlement and conversion insurance, which protects the finance company from loss due to illegal resale of the mobile home, or due to "skips". VSI protects only the finance company and the protection is only up to the amount of the finance company's interest in the mobile home. As you pay off your mortgage, the insurance company's risk decreases. This same type of insurance is called Dual Interest insurance when the mortgage holder *and* the mobile home owner are *both* insured for their equities in the mobile home. Dual Interest insurance is more expensive since the full value of the mobile home is covered at all times. If a loss occurs, the finance company is paid the amount still due on the mortgage and the owner is paid the balance. When VSI or dual interest insurance is purchased, separate fire and theft, CAC and collision coverage is not required. The VSI or dual interest policy accomplishes the same protection in one policy.

Window Glass Damage. – This insurance reimburses you for loss due to window glass breakage in your mobile home. The cost of this insurance is low.

Comprehensive Personal Liability. – This insurance reimburses you for any loss you sustain as a result of a suit against you because of your personal liability for any accident that may occur in or around your mobile home. This is a highly desirable type of policy and the cost is usually very low.

Mortgage Insurance. – This insures you against inability to pay off the mortgage on your trailer due to sickness or death. The policy simply provides that in case of the death of the breadwinner of the family, the insurance company will pay off the mortgage in full, or in case of sickness, the insurance company will keep up the payments until such time as the breadwinner is able to get back on the job. This type of insurance is desirable in cases where death or sickness would work a severe hardship on the family. It is protection against loss of the mobile home by repossession due to inability to make payments in case of death or illness.

Rates and Cost

It is impossible to give insurance rates in a publication such as this. Rates vary from state to state and from community to community. they are based upon circumstances existing in various areas through-

out the United States. In some cases, rates are fixed by State Insurance Commissions. In other cases, rates are determined by competition.

The cost of your insurance program is determined by the rates prevailing in your community and the amount of insurance it is necessary for you to carry. Insurance rates are usually expressed in terms of so much money per hundred dollar's worth of insurance. To determine your cost for any particular type of insurance, it is usually necessary to determine the rate and then multiply it by the amount of insurance you require, in units of one hundred dollars. Thus, if you own a mobile home worth $3,000 and wish to insure it against fire, and the rate on fire insurance in $1.25 per $100, your cost for fire insurance on the $3,000 mobile home would be 30 times $1.25, or $37.50. The computation of insurance costs and the determination of rates is complicated. When you buy insurance, your agent will be able to give you the necessary forms and information relating to this point. These forms are usually so prepared that even those who are not familiar with insurance costs and rates are able to understand how to arrive at the cost of insurance they wish to purchase.

What Insurance Should You Buy

In the copy that has preceded we have made a few recommendations regarding particular types of policies. It is difficult to make any broad statements regarding what insurance any particular family should buy. There are just too many individual factors that must be considered. The general principal upon which you should proceed is this. Protect yourself against losses you cannot afford to take within the limits of your income. It is foolish to insure against risks you can afford to take. In considering the amount of liability and property damage insurance you should carry you must give careful consideration to your vulnerability. If you are financially situated so that you have a lot to protect, it is highly desirable to increase the amount of insurance you carry to give full protection. The additional cost of writing larger policies is usually quite small.

How to Buy Insurance

The ordinary buyers of insurance are not acquainted with the highly technical aspects of the insurance market. They do not know the difference between a good and a poor company. They do not know the difference between a high and a low price, nor the advantages of purchasing at a high or a low price. They do not know how the contracts should be written. They do not know in detail what they can, or should expect from their insurance company. Nor do they know what they should expect of their agent. Insurance buyers normally know

only that insurance is a good idea, and that they should have it.

The insurance business, being a highly technical and specialized business, will best be approached by the average insurance buyer through the facilities of an expert. When you have a legal problem, you see a lawyer. When you have a medical problem, you see a doctor. When you have an insurance problem, see an insurance broker, and the more qualified the individual with whom you deal, the better off you are. That, of course, is the rub. The problem is to determine who is well qualified.

Here is what a good insurance broker will do for you. He will go over your insurance problems with you and make recommendations as to *what* and *how much* insurance you should carry. He will do this on an impartial basis, with no consideration for the amount of commission he is going to make. He will put himself in your position and recommend that you buy only the same insurance he would buy if he were you, knowing what he knows. He will find the best possible companies to write your insurance, and he will place it at the most favorable rate. Should you ever have any claims, he will go all out for you to see that you get a good, fair, and prompt settlement in accordance not only with the insurance contract, but in accordance with the spirit in which that contract is written. A good insurance broker normally writes a large volume of insurance contracts. The companies for which he writes insurance want him to continue to give his business to them. Therefore, he has power that you, as an individual, can never have in dealing with an insurance company. He can always tell any company that he believes, or feels, that they are pursuing the wrong policy, and that he will place his business elsewhere if they do not change their methods. This gives him a powerful weapon in going all out for you to seek a fair and reasonable settlement in case of disputes between his client and the insurance company. The insurance company will listen to the agents who place a great deal of business with them, whereas they will not listen in many cases to the requests of an individual purchaser of insurance. For this reason, always buy your insurance through a broker who has a substantial volume of business, a good reputation in the community, and a good background of experience. He is your best protection against buying insurance at the wrong rates from the wrong company. He considers it his obligation to protect you in return for the commissions he makes from the insurance you purchase through him.

In general, it is better not to purchase insurance through dealers, or through companies that deal direct with the client. There are many fine dealers who operate strictly on the principle that they will be in business for the next 50 years and that a satisfied customer is their best advertisement. They will write insurance for you on the basis of

what you legitimately need and require, rather than on the basis of the amount of commission they are to make. The principal drawback, however, in dealing with a dealer is that he usually is not an insurance specialist. Even though he may be working in your interest, he may not have the necessary knowledge to permit him to make wise decisions.

Insurance companies that write insurance direct with the client through employees of their own, acting as the agent, frequently claim that their insurance is cheaper because they do not have the cost of paying commissions to an agent. To some extent, this may be true. On the other hand, they do have costs that insurance companies not writing direct do not have. They do have the cost of operating the selling part of the insurance business. This involves not only the employment of selling personnel, but the employment of personnel to do all the work that an insurance agency conducts. Their selling costs may be lower than they would be if they sold through independent selling brokers or agents. The savings, however, would be small. The direct selling insurance company usually advertises that they pass these savings on to the insurance buyer, and they hold out the "plum" of lower rates.

This brings us to the final subject: what is the proper rate? How should you obtain the proper rate? In the insurance business it is generally considered that those companies which sell at low rates must, of necessity, be more strict in their settlement of claims. They are taking in less money for the same type of insurance. They must correspondingly pay out less in order to have a profit. It's a matter of simple mathematics. Although it may not be true in all cases, you may find yourself in this position. Suppose you buy insurance at low rates. The savings are real if you do not have a claim. Should you have a claim, you may find that your s a v i n g s were not what you thought them to be. After all, the real purpose of insurance is protection. If your protection is inadequate you are not really saving money. The fact is, you are not buying what you think you should have. It's the old story of a bargain. As a general rule, we get what we pay for. When you deal through a reputable, well established broker who writes a volume insurance business, you may pay more than you would if you deal with cut-rate i n s u r a n c e companies. The advantages are as follows: you will probably get the type of insurance you think you are buying; you will receive the advice you should have; when you have claims, they will be settled fairly and promptly without the necessity of resorting to the courts. A good insurance broker will place your business with firms not necessarily offering the l o w e s t rate, but which offer a rate consistent with fair settlement of claims. He knows that he cannot force a company to pay out claims in excess of their

income less expenses. He knows that he may jeopardize his client's position and his own, for future business, by dealing with firms which do not charge rates that will permit settlement of claims in the way he knows claims should be settled.

When you seek mobile home insurance, or any other type of insurance, seek the advice of an established, reputable broker doing a volume business. This is the only real protection you have.

Before You Buy . . . . Use This Check List

Prefer to buy insurance through an agent? The following things should be considered in selecting the policy best for you. If you are buying your insurance through a broker, he will be advised on all of these points and will do the best he can for you, based on what is available to him in the insurance market. But, when you deal with agents for specific firms, it is desirable for you to have information which will enable you to evaluate the policies offered you. The agent probably represents *one* company. He is interested in selling you a specific policy. He is a salesman. Evaluate what he says in this light. Here are things you must bear in mind.

1. Don't over buy or under buy insurance. The amount of money you pay for insurance is determined in part by the value of your mobile home. *You* may value it highly, but should a loss occur, the insurance company will pay only its current market value. For example, if you buy a $3,000 fire policy on a mobile home worth only two thousand dollars in the current market, you will pay an unnecessary premium on an extra $1,000. In case of total loss the insurance company will pay you only the actual value of your mobile home, regardless of the amount of premium you may have paid, and regardless of the value you may personally set on it. Most insurance companies try to check valuation when they write the policy. They don't want you to over insure. But, it is always possible for their clerical help to make errors on this point. To be safe, shop to determine for yourself what it would cost to replace your mobile home. On the other hand, it is equally wise not to under-insure. If you buy a $1,000 policy on a $2,000 mobile home and suffer a complete loss, you will be paid only the amount of the policy.

2. The insurance company policy in making settlement on claims is important to you. Investigate the insurance company's reputation. Ask the agent for a list of policy holders who have had claims. Ask them how they were treated. Claims should be handled promptly and fairly. When repairs have to be made by the insurance company, it is important that they use legitimate repair companies that do reliable work. If you travel, be sure to do business with a firm that has nation-

wide claim services.

3. Never buy insurance for a period of more than 1 year. If you buy more than a 1 year policy, you may pay too much. Here's why. In case of total loss, the insurance company will pay only the current market value of the mobile home. Each year its value decreases. Therefore, each year the size policy you purchase should be less. For example, suppose you buy a mobile home for $3,000 on January 1st, 1954. Suppose you take out a three year policy for $3,000. In 1955 and 1956 your mobile home is worth less than $3,000, and yet you are paying for a $3,000 policy. Should the mobile home be destroyed, the insurance company will pay you only its current market value. There is one type of insurance that is legitimately sold on more than a 1 year basis. This is Vendor's Single Interest insurance that the dealer may sell you at the time you purchase a mobile home on a deferred payment plan. If you write a three year contract with the dealer, he will require you to take Vendor's Single Interest insurance for a three year period. The premiums are based on the decreasing amount due the finance company. But, remember, Vendor's Single Interest insurance protects only the dealer or the finance company. It does not protect any equity you may have in the mobile home.

4. When you buy insurance, pay cash in full at the time of purchase, if possible. Premiums are slightly higher when you pay on a deferred payment basis.

5. Make sure any policy you purchase covers the dealer *and you.* If you're buying a mobile home through a dealer, he is required by the finance company to sell you Vendor's Single Interest insurance. This protects the finance company for its equity in the mobile home. The policy does not protect *your* equity in the mobile home. If you wish to protect your interest, make sure that the policy you purchase is one that *does* protect you. Buy a dual interest policy.

6. Before you use your automobile to pull a mobile home, check your automobile insurance policy. Many auto insurance policies are voided if the car is used for the purpose of pulling a mobile home. Different insurance companies have different policies on this point. It is necessary that you read your policy to determine exactly how you stand. If you are not covered, contact the insurance company that has your present automobile policy, or cancel your present auto policy and write a new one with the firm carrying your mobile home insurance. As explained previously in this section on insurance, it is not desirable to have a liability and property damage policy on the auto carried by one insurance company and a policy on the mobile home carried by another. There's too much possibility of argument between the insurance companies as to whether the mobile home or the car is

responsible for a specific accident. As a matter of fact, most insurance companies will not write such insurance on a mobile home unless they also have the policy on the car. If your automobile policy is void when you pull a mobile home, then the proper procedure is to have them attach a rider to your policy, voiding this part of the contract and giving you the coverage you require. Such riders can usually be obtained for a small additional premium, or in some cases, no additional premium is necessary.

7. Most insurance buyers check rates before they buy. Of course, this is a wise procedure. But don't just compare one rate with another without analyzing what you are getting for your money in each case. You're likely to find that one rate which appears to be quite low may, in fact, be high. Fair evaluation of rates requires technical information, but here are a few points to help you compare rates:

a. Make sure that you are comparing rates of companies with basically equal reputations in settling claims.
b. Make sure the rates are quoted on the same payment basis. Compare cash rates with cash rates, and time payment rates with time payment rates.
c. Make sure both policies cover *your* interest as well as the finance company's interest.
d. When you compare rates for fire insurance, find out exactly what type of protection you have. Some policies referred to as fire policies cover fire only. Other policies are actually all-risk policies. You are protected for *any* loss, including fire. This is especially true of policies on personal belongings in your mobile home. An all-risk policy covers you for the loss of any of these belongings regardless of the source of the loss, whereas a fire policy will cover you only in case the loss is due to fire. Again, don't compare the fire rate of one company with the fire *and* C.A.C. rate of another. In one case you are covered only for fire; in the other you are covered for fire and other losses. Even C.A.C. coverage must be carefully evaluated. There are many types of C.A.C. policies written. Find out whether the policy includes losses from windstorm, vandalism, malicious mischief, lightning, earthquake, explosion, hail, external discharge or leakage of water, flood or rising waters, riot or civil commotion, forced landing or falling of any aircraft (including any of its parts or equipment). Various types of policies may cover *only part of these risks.* Therefore, when comparing rates where C.A.C. policies are involved, *make sure you understand exactly what the C.A.C. policy covers.*

CHAPTER VII

HOW TO REPAIR AND MAINTAIN A MOBILE HOME

How To Buy Parts

Mobile home repair and maintenance often requires knowledge of mobile home construction features. In the chapter "How to Remodel and Modernize A Mobile Home", you will find important pictures and information about the mobile home structure. This information, combined with the detailed instructions and additional pictures in this chapter, will assist you to an inexpensive "do-it-yourself" solution to most maintenance and repair problems.

Repair and maintenance requires replacement parts and maintenance supplies. Mobile home owners, living where there is not a sufficient number of mobile homes to support a supply store, will find it necessary to buy supplies through mail order firms. In many cases mail order buying is advantageous even though there is a local supply store. If you have a choice between local or mail order buying and plan substantial purchases, don't buy until you've weighed the advantages of local and mail order purchasing.

The arguments in favor of mail order buying are as follows: (1) Many mail order firms offer price advantages. They do a large volume and can afford to sell at lower prices. Price differences between local supply firms and mail order firms tend to be greatest when there is only one local supply firm enjoying a semi-monopoly. (2) Mail order firms have more complete stocks. You can usually get exactly what you want. You have a larger selection from which to choose. (3) Mail order firms operate under postal laws that give the customer wonderful protection. Returns are easy to make and information in catalogs can be relied on. (4) It's fun and interesting to read catalogs. They are a source of much information.

Here are the arguments against mail order buying. (1) It involves too much delay. When you buy locally you can get what you need immediately. (2) Price savings may be more imaginary than real because of postage or freight costs. (3) When you buy from a local store you can see the merchandise before you buy.

Here is a list of firms selling mobile home parts by mail. All these firms issue a catalog for which you may send.

American Trailer Co., Inc. – 4030 Wisconsin Ave, N.W., Washington 16, D.C.
Theodore Bargman – 16425 Hamilton Ave., Detroit 3, Michigan.
Hanna Trailer Supply Co.,– 615 W. Layton Avenue, Milwaukee 15, Wisconsin.
Leslie's Trailer Parts and Accessories – 1920 Stewart Ave., S.W. Atlanta, Georgia.
Marvel Industries, Inc. – Sturgis, Michigan
National Trailer Equipment Co. – 431 W. Mitchell St., Milwaukee 4, Wisconsin.
National Trailer Stores, Inc. – 12145 National Blvd., Los Angeles 64, California.
225 W. 34th St., New York 1, N.Y.
30 Washington St., Chicago 2, Illinois.
Pierce Trailer Sales – 221 1st Ave. So., Moorhead, Minn.
Trailer Parts Supply – 1001-07 East Central, Wichita 7, Kansas
Wood Brothers Co. – 1150 W. Washington Blvd., Los Angeles 15, California.

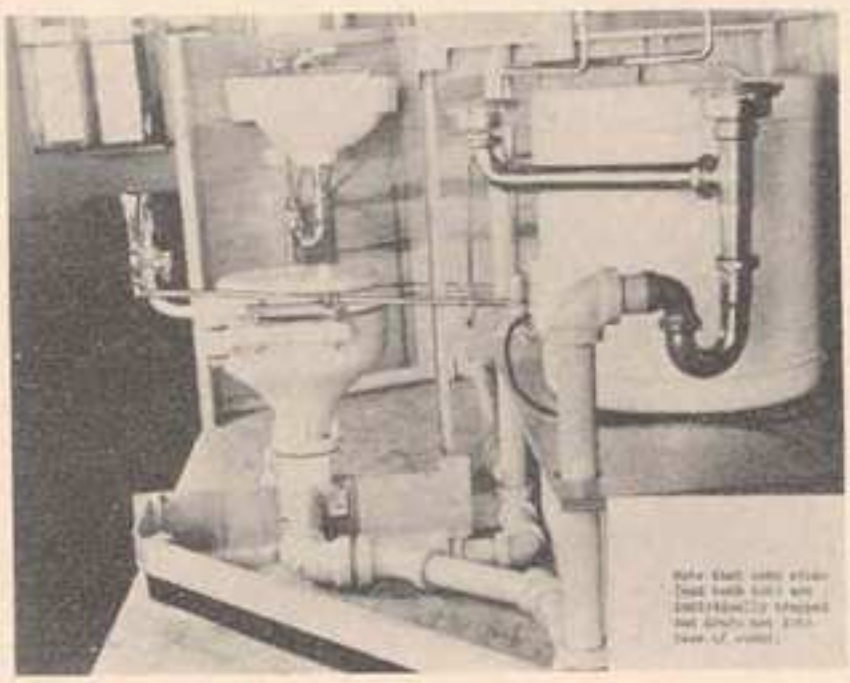
The firms listed above carry fairly complete lines. There are

many firms with whom you can deal by mail that handle one or more of the items required for repair or maintenance. We have mentioned some of these firms and their addresses elsewhere in this manual. When you have a supply problem because you find it difficult to locate a specific part, here's what to do. Write the mail order firms listed above, explaining your problem or, write the manufacturer of the mobile home you own. Either the manufacturer or some mail order house will be able to tell you where to go or write to get the parts you need.

The Mobile Home Plumbing System

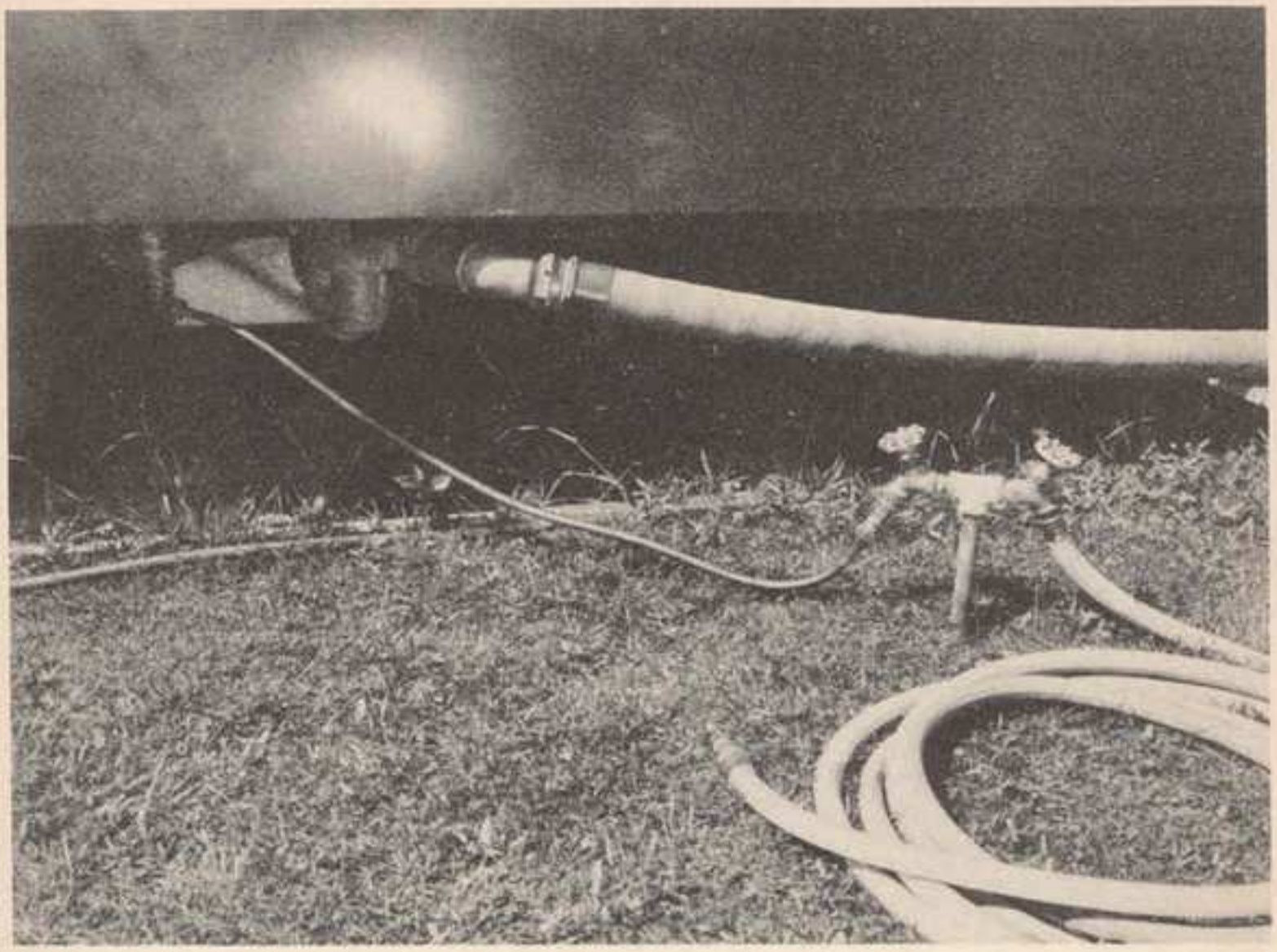
The modern mobile home has house type plumbing. Most state, county, and local housing officials now require mobile home plumbing installations to conform to state, county and local housing laws. This applies not only to the mobile home, but to park installations as well. Sewerage systems in modern mobile homes include house type toilets with a three inch sewer outlet. Sink, wash bowl, toilet, and shower are fitted with traps. The plumbing system is vented to the roof. The sewerage system is connected to the sewerage system in the park by means of a flexible hose. In many communities this hose must be 3" in diameter. In other communities, 2" hose is permissible although the trend is toward 3". The flexible nature of the connection between the mobile home sewerage system and the park sewerage system is usually a requirement of fire ordinances. The purpose is to permit the fire department to sever the connection with an ax should it be necessary to move the mobile home in an emergency.

The mobile home's water system is ordinarily half inch copper tubing. A ¾" female hose thread connection is provided so the mobile home can be connected to the park water system by means of a garden hose. Since garden hose gives an unpleasant taste to water, the mobile home owner uses copper tubing, special non-tasting hose, or specially designed plastic tubing to make the connection between the mobile home and the park water supply. In years past the most



Courtesy Schult Corporation

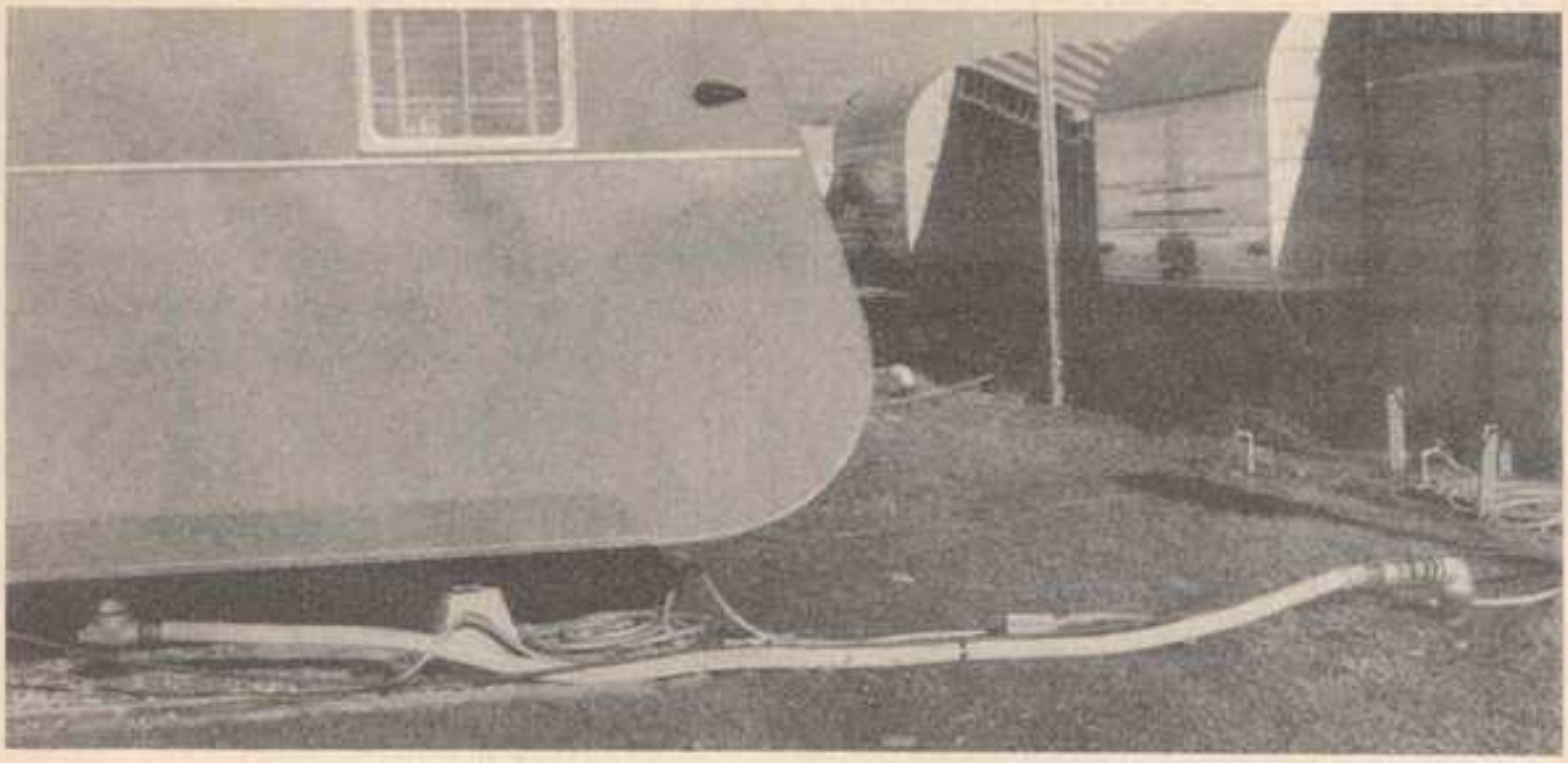
The modern mobile home has house type plumbing. Picture shows details of plumbing system used in a Schult mobile home.

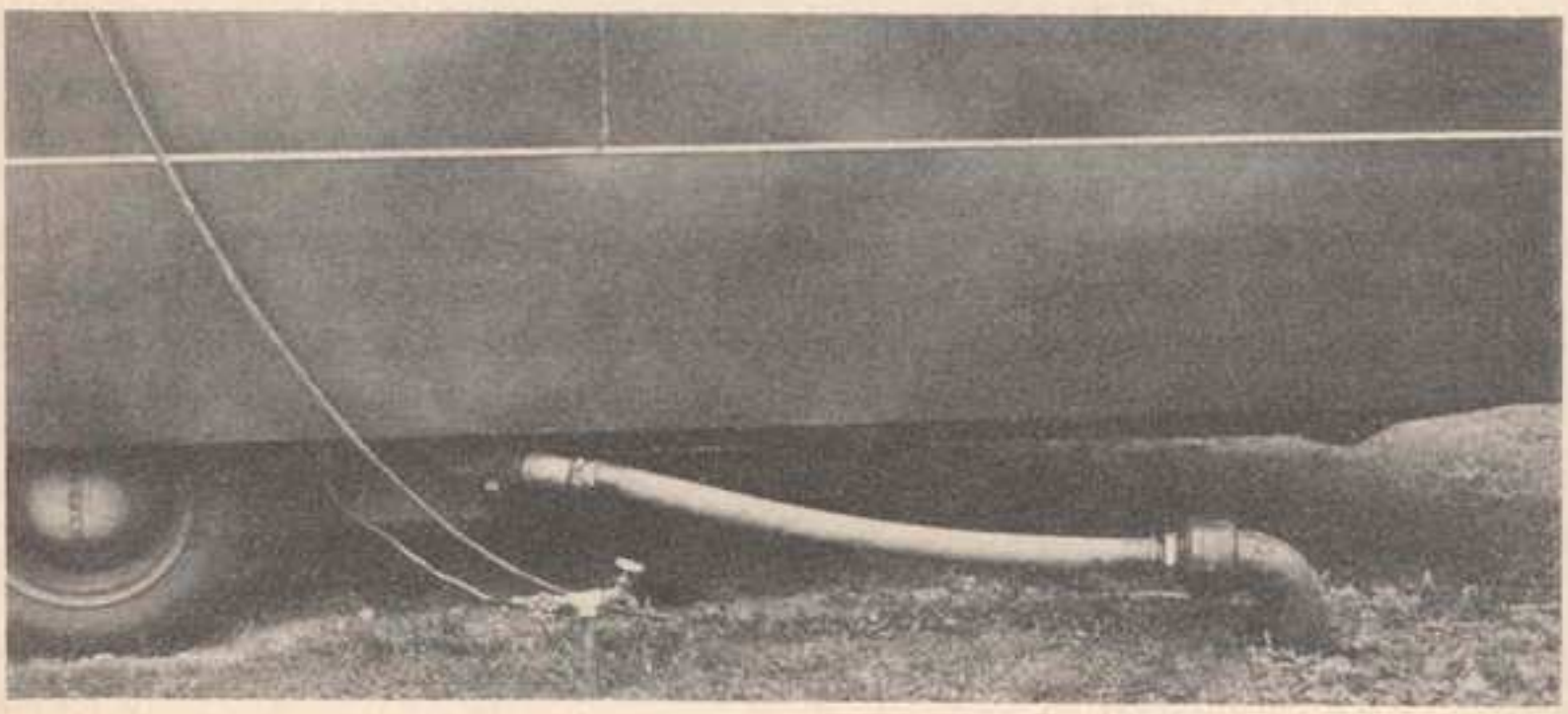


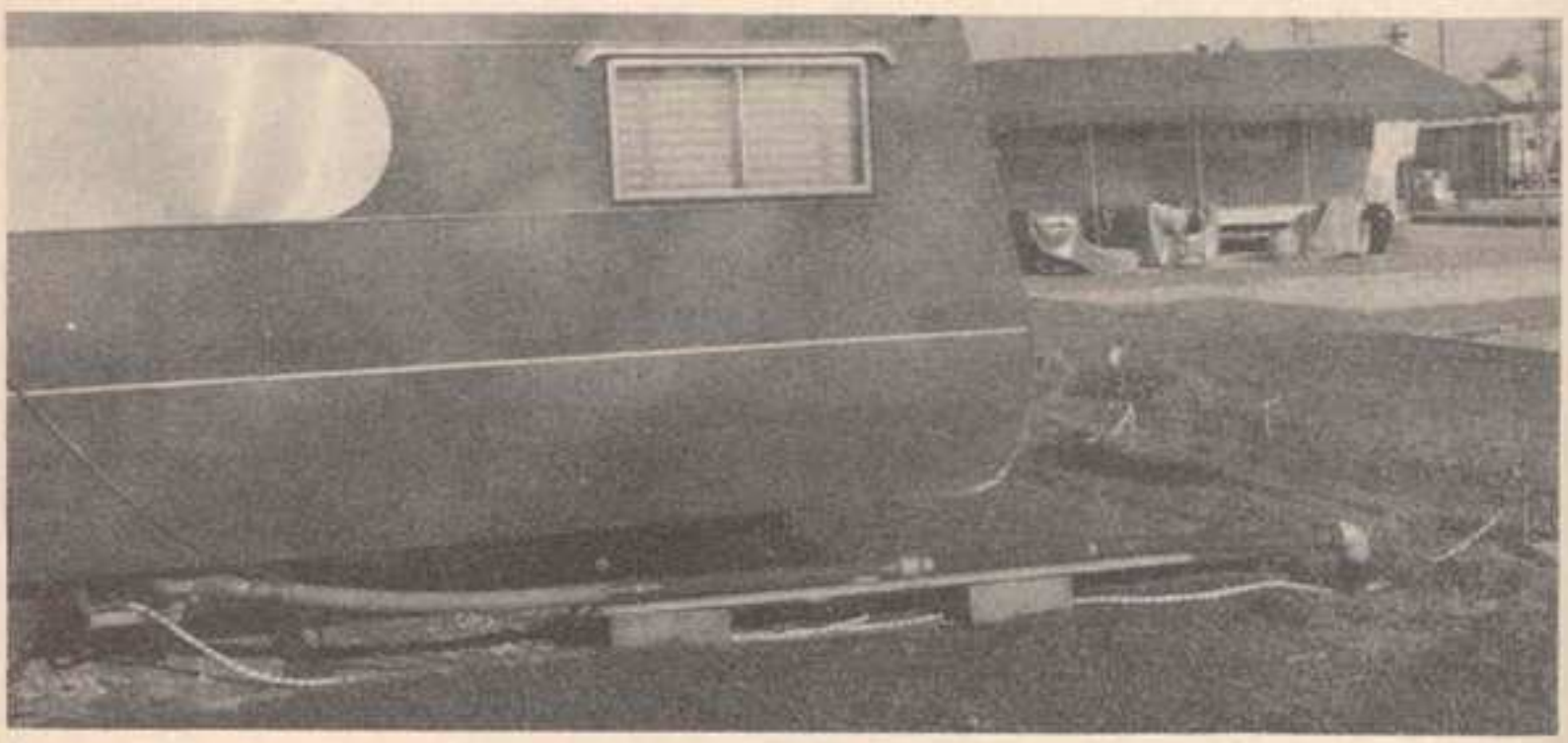
Picture illustrates a typical water hookup. Copper line runs from park faucet to connection under mobile home. Extra faucet provides connection for hose used to wash mobile home or water shrubbery. Large hose is sewage line.

popular connection has been copper tubing, fitted at each end with regular garden hose connections. A copper line has two disadvantages. One is the possibility of tubing damage due to freezing. The other is constant coiling and uncoiling of copper tubing tends to kink and harden it. The tubing must be replaced whenever this occurs. In recent years the plastic industry has developed special plastic tubing that can withstand the high pressures of city water systems even when the tubing is subjected to the hot rays of the daily sun. This tubing is inexpensive and is not damaged by coiling and uncoiling. Most mobile home owners now equip themselves with this style water line.

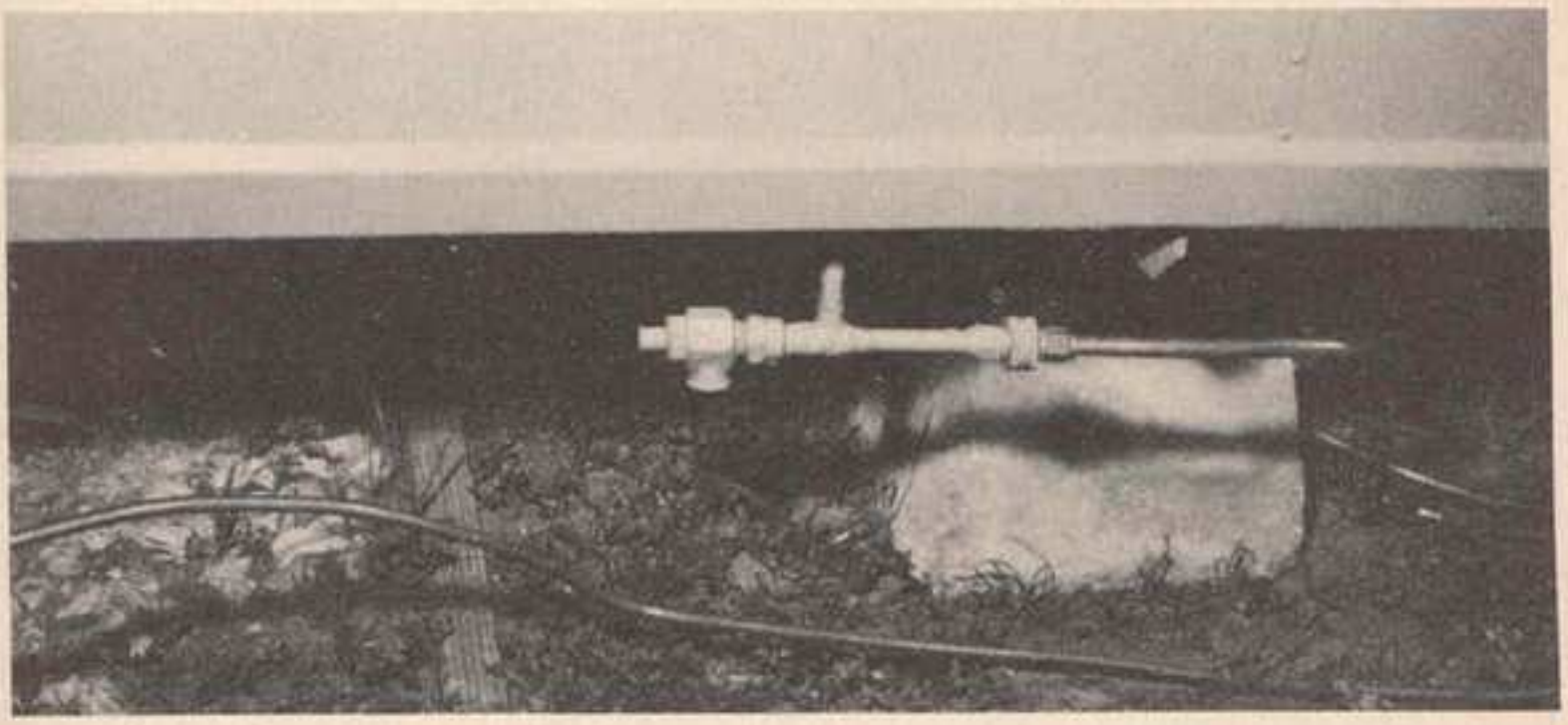
The mobile home owner is expected to furnish his own water line and the sewage hose used to connect his sewerage system to the park sewerage outlet. Little difficulty is experienced in making a water connection. All parks standardize with a ¾" male garden hose thread at the park faucet. All manufacturers standardize with a ¾" female garden hose fitting at the point where the water is let into the mobile home. However, mobile home owners experience considerable difficulty making sewerage hookups. There is no standardization in this department. Parks do not provide the necessary fittings to make the sewerage connection and the mobile home owner is required, if he moves frequently, to carry a fantastic collection of plumbing fittings to make sure he can hook up wherever he goes. There is a trend toward standardization with 3" plumbing in the parks and on mobile homes.





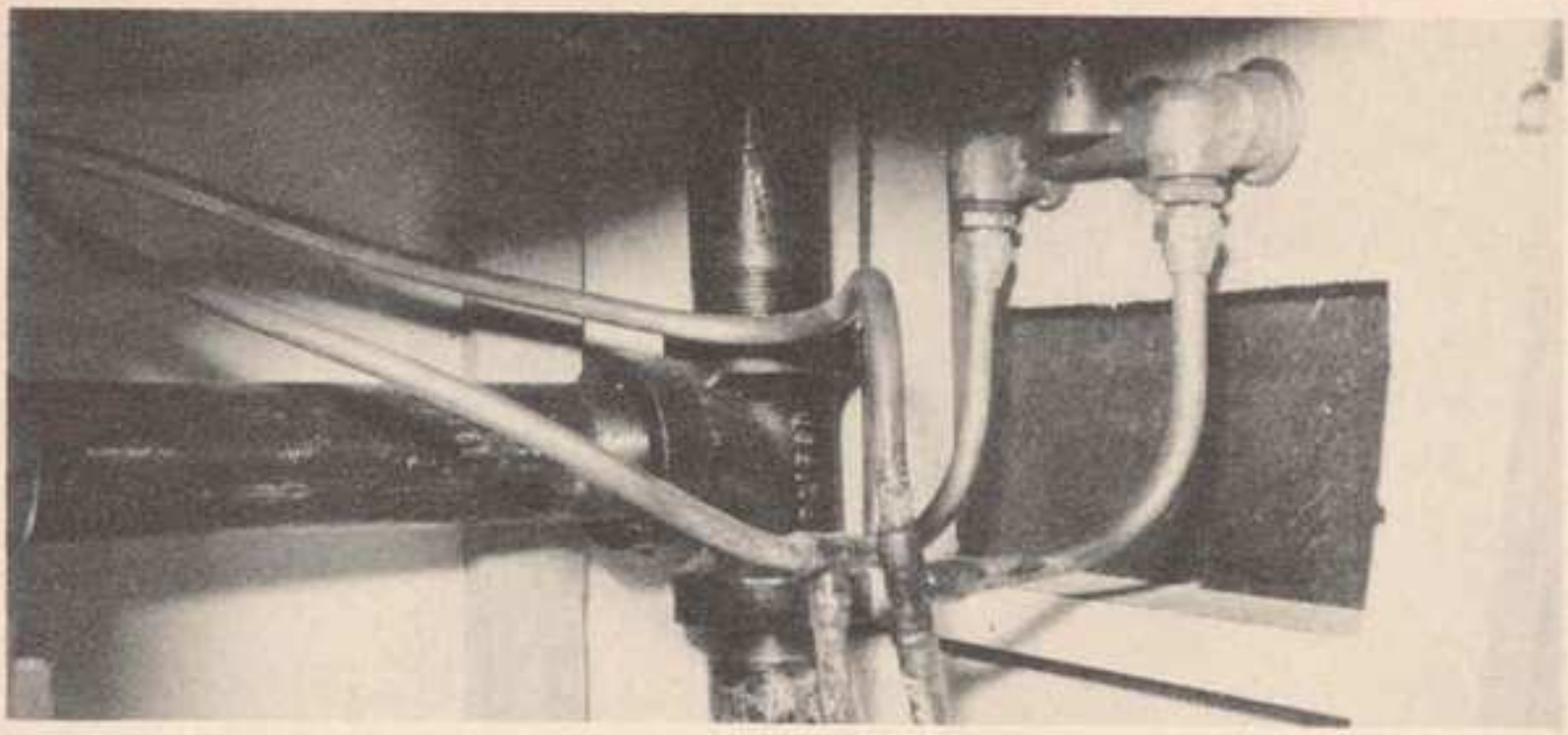


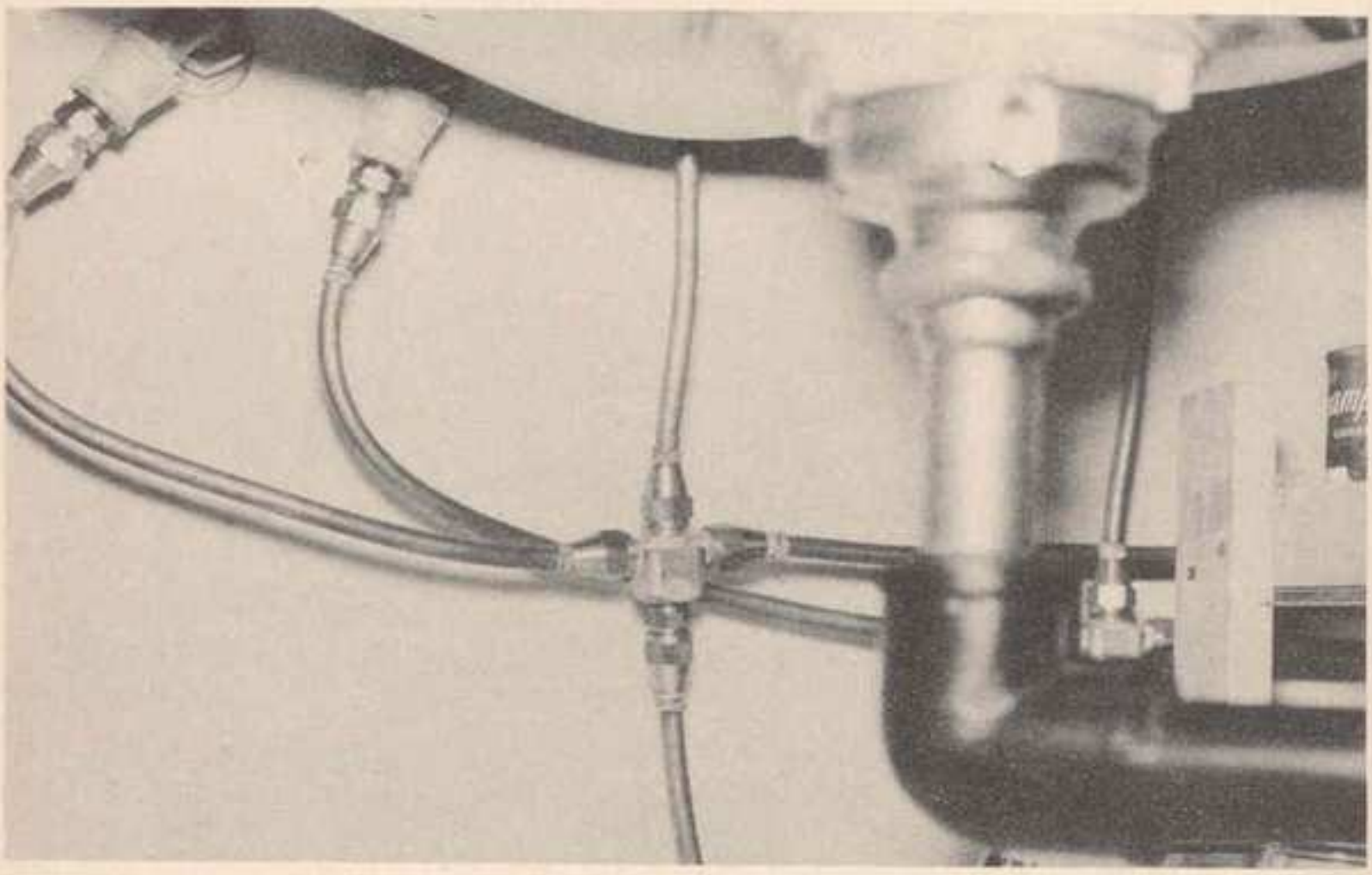
Sewage connection in top picture is bad. Connection should be short, where possible, as shown in middle picture. When a short connection cannot be made, support sewage line to give it a downward slope between mobile home and park outlet.

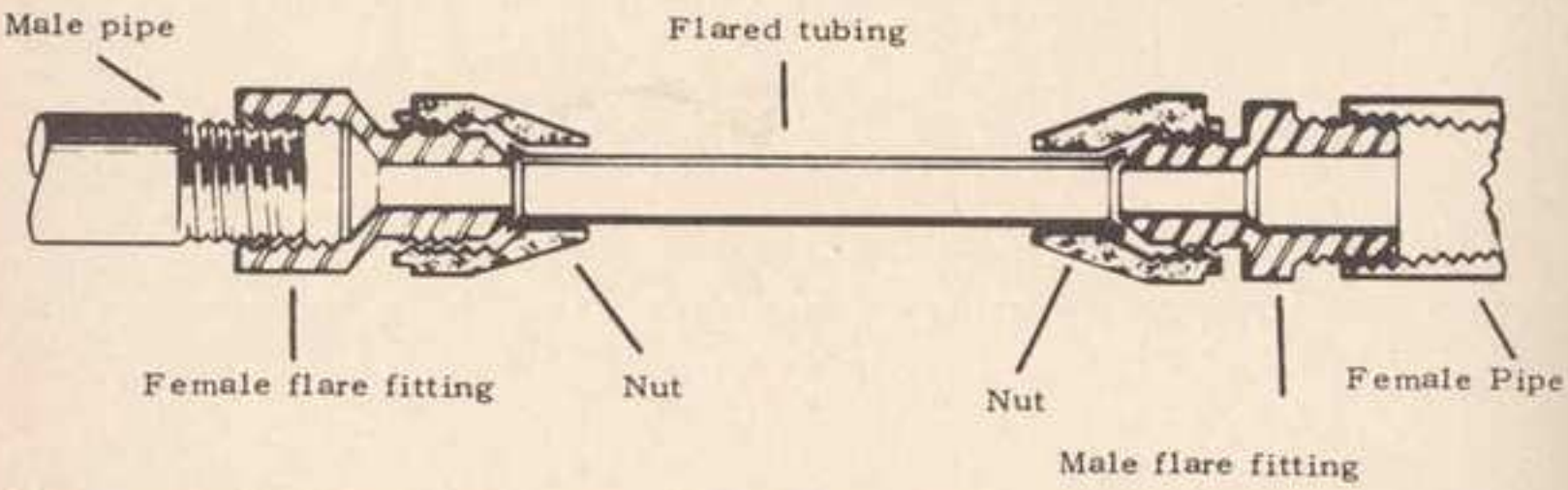


Top picture shows severe damage to a mobile home caused by hot water heater explosion. Note remains of heater over right hand wheel. Modern construction standards specify a pressure relief valve in all mobile home water systems to prevent such catastrophies.

Bottom picture shows a typical pressure relief valve installation. If water heater causes excessive pressure in water system, valve opens and excess water drains to ground. Be sure your water system has this necessary safety protection.





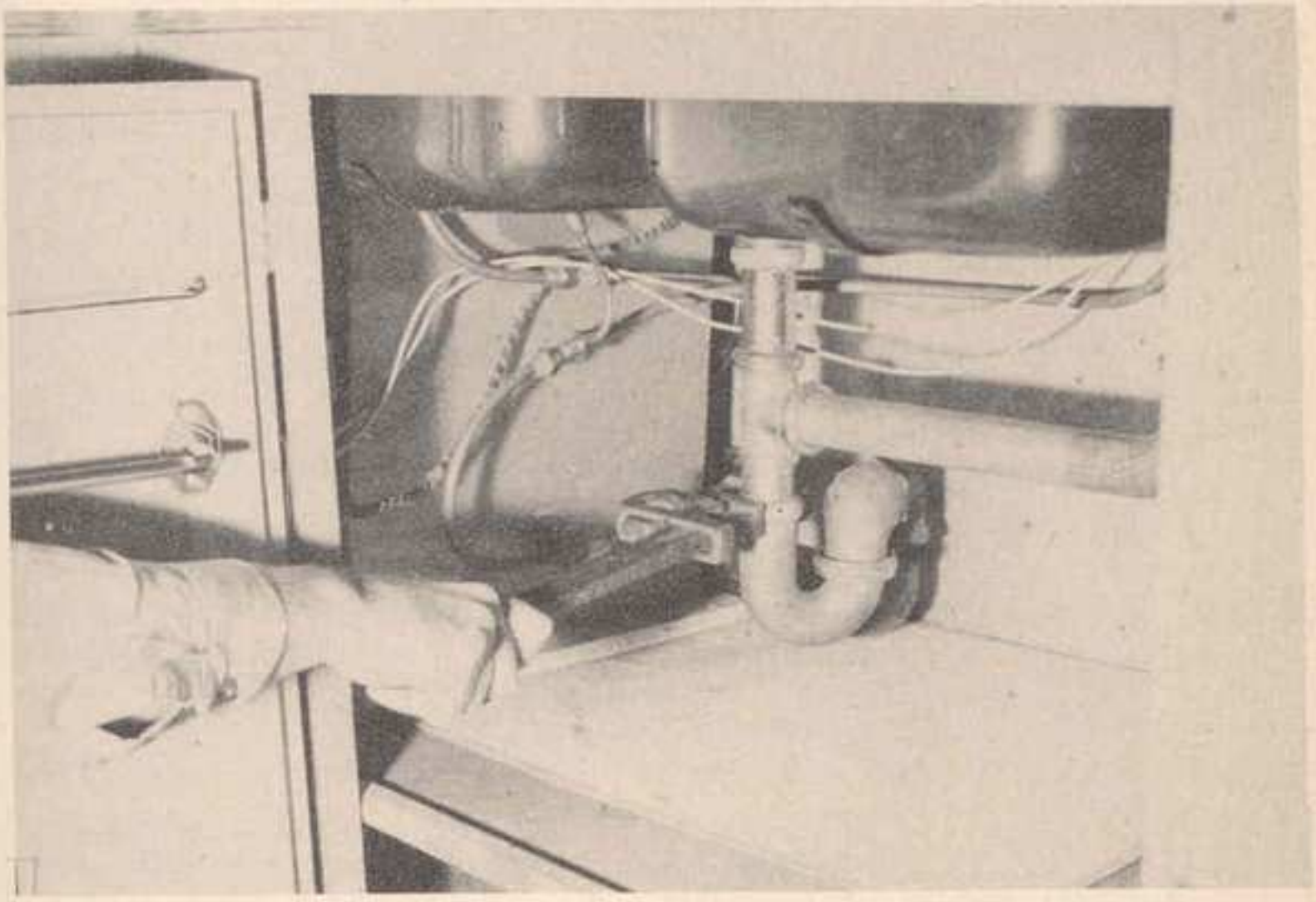


Some manufacturers use sweat fittings in water tubing system (top photo). Should leaks develop you can correct them by substituting flare fittings after cutting out old sweat fittings. (Center picture shows typical flare fitting hookup.) Mobile home supply stores, auto stores, hardwares, or plumbing supply firms carry flare fittings. Flare fitting hookups are easy to make. Borrow a tubing cutter and flaring tool from park manager or supply store and make hook-up as shown in bottom picture.

Should this trend continue, the irksome plumbing hookup problem will vanish.

The park water faucet to which the mobile home owner connects is equipped today with a back-flow preventer. This makes it necessary to equip mobile homes with a pressure relief valve when there is a hot water system installed. Heating water causes it to expand. In the days before back-flow preventers were installed at the park faucet, water could back up into the park line. The installation of back-flow preventers eliminated this outlet for excess pressure. Unless a pressure relief valve is installed in the water line, water pressure will build up in the water system and a leak will develop. An explosion is not impossible. A leak can cause severe water damage to the mobile home. Pressure relief valves must be installed. Then, when pressure becomes excessive, a small amount of water is released through this valve onto the ground under the mobile home.

COMMON PLUMBING DIFFICULTIES AND WHAT TO DO ABOUT THEM – All sewage systems work on the principal of gravity. Unless your mobile home is level you will experience difficulties. As soon as you make connection with the park sewage outlet, seal all traps by running water through the drains. This will seal off the possibility of sewer gas entering the mobile home. Trap connections are made with a slip type rubber connection. These connections absorb shock between the rigid piping and the fixture while in transit. As soon as you park, check all traps and their connections for leakage. Tighten nuts where leakage is in evidence.



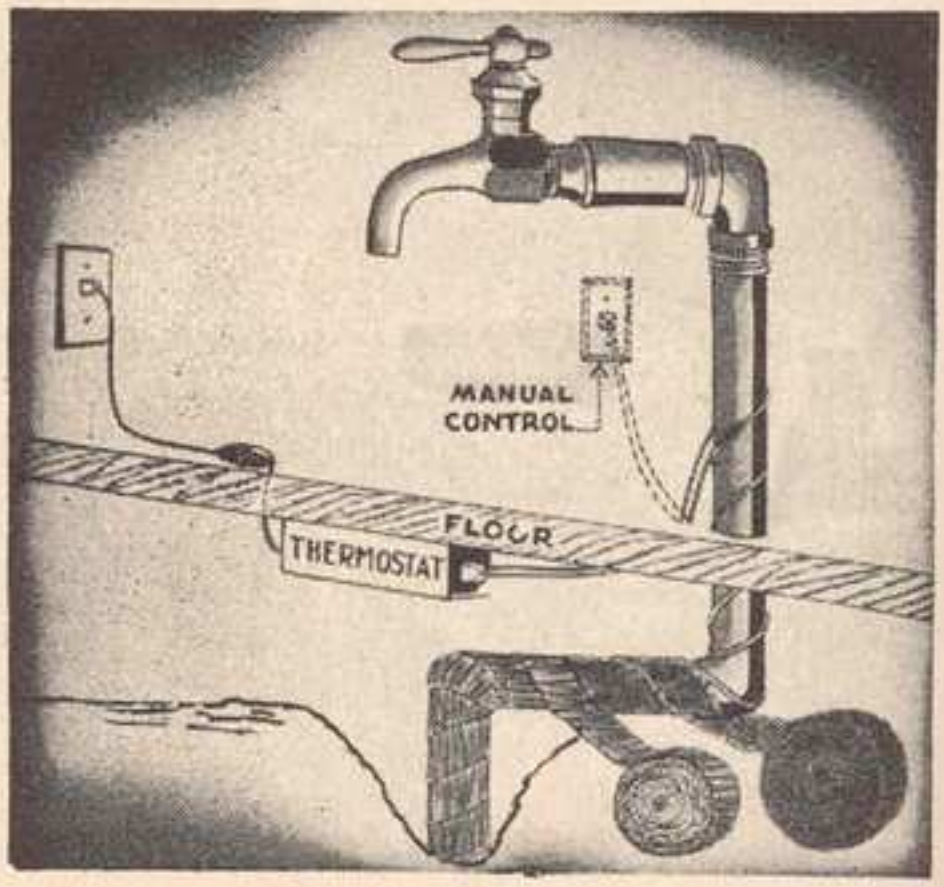
Road shock may loosen trap connections in sewage system. At the end of a trip check all traps for leakage and tighten where required.

Make sure that sewerage drain hose running from mobile home to park outlet is running down hill *at all points.* Any failure to maintain a gravity flow in the sewage system can result in sewage backing up into bath tubs and showers.

It is not recommended that you try to alter the plumbing system in your mobile home unless you know exactly what you are doing. The use of the proper fittings is important and there is always danger of a cross connection between the water and the sewer system.

Pipe sizes used in mobile homes are usually smaller than those installed in a home. This causes water to move through the tubing in the mobile home at a high velocity. This may cause noise in the water system which can be eliminated by installing a pressure reducing valve on the incoming water supply of the mobile home.

Many manufacturers use sweat fittings to connect the mobile home water tubing system. Sweat fitting connections require the use of a blow torch, thus making repairs difficult for the mobile home owner himself. This difficulty may be circumvented by cutting off the old sweat fittings where leaks occur and remaking the connections with ordinary flare type fittings.



Courtesy Associated Specialties Co., Inc.

Incoming water pipes exposed to freezing must be protected. You can obtain kits of equipment sold for this purpose.

Sewer lines are equipped with traps designed to retain enough water to form a seal and prevent gas and bad odors from entering the mobile home through the drain. In general, they cause little trouble, but they may become clogged occasionally with accumulations of hardened grease and dirt. Such trap stoppages may be removed by means of (1) a force cup or plumber's friend, (2) chemical drain pipe cleaners, (3) removing the trap and cleaning it out, (4) using a flexible coil spring agar.

Although you cannot be expected to perform all of the functions of an experienced plumber, it is possible for you to make small repairs in a plumbing system. Trouble and unnecessary expense will be avoided by repairing leaking faucets promptly, or by cleaning out drains at the first sign of clogging.

Incoming water pipes exposed to freezing temperatures must be protected. You can obtain kits designed for this purpose. These kits contain wires that wrap around the pipes, and insulation that wraps around the pipes and wire. Many of these kits also contain thermostats which insure the proper temperature to prevent freezing. These

kits are inexpensive. All parts of the mobile home water system exposed to freezing temperatures should be protected by these devices. Should pipes become frozen, they must be thawed out promptly to prevent bursting. In copper pipe a bulge in the pipe will disclose the location of the frozen area. Any heat applied to this area will usually solve the problem. Open a faucet so you will know when flow starts and then apply heat, working toward the supply end. Sewerage systems are not likely to freeze. The pipes are larger and they usually carry warmed water. The water quickly flows off, leaving the pipe empty.

Toilets placed in mobile homes may be classified into six groups: house type; electric grinder type with water seal in bowl; electric grinder type with no water seal; grinder type that is water powered; flapper type; and marine type.

House Type Toilets – These are similar to the tank toilets installed in houses. Special mobile home models are manufactured. The water tank is smaller, the space required for installation is smaller, and special gaskets are provided to give a flexible mounting to the floor. Flexible mounting is required to prevent the bowl from cracking because of road vibration. These tank toilets are advantageous because of their low cost and because they require very little service. If the tank fills up to the point where the water flows down the overflow tube inside the tank, it usually means the washer in the valve needs replacing. If the water runs in the bowl after tank has refilled but does not flow from the overflow tube, it usually means that the flushing ball is not seating and should be replaced. The trend in the mobile home industry is toward the installation of this kind of toilet. When these toilets are used, 3" sewerage plumbing is required. If you try to get by with less, sewerage will back up in showers, sinks or tubs. There are many manufacturers of this type toilet. If you find it difficult to get replacement parts at local hardware stores or mobile home supply stores, write the manufacturer of your mobile home to obtain the name and address of the toilet manufacturer so you can write to obtain replacement parts.

Courtesy
James Cunningham, Sons & Co., Inc.

Cunningham Jet toilet exemplifies tank type toilets that are slightly smaller than those used in house installations. These toilets, manufactured specifically for the mobile home industry, incorporate special features required for mobile home installations.

Grinder Type Mobile Home Toilets – The grinder type mobile home

toilet with water seal in the bowl is exemplified by the Pat Toilet. This toilet has a constant water level in the bowl and its own built in trap. It is equipped with a grinding mechanism that pulverizes waste materials. The electric powered grinder with no water seal is exemplified by the McPherson electric power driven grinder toilet or the Wellens Pulverator. These toilets have no trap and do not maintain a constant water level in the bowl. A trap must be installed below the toilet. These toilets are equipped with electric grinders to pulverize all waste material. The water powered grinder type toilet with no water seal is exemplified by the water power driven McPherson Toilet. This toilet will not function in the absence of adequate water pressure. No electric power is required for its operation. It pulverizes waste materials and is not equipped with a trap.

Courtesy Bonner Engineering Co.

Pat toilet has built in water trap, constant water level in bowl and built in grinder.

The principal disadvantage of grinder type toilets is their high cost. They usually sell for $135.00 and up. They have two principal advantages. One, they may be used for the disposal of all types of waste material; they operate like the familiar sink garbage disposal unit. Two, they do not require a large 3" sewerage system. However, since housing authorities tend to enforce 3" sewage plumbing code restrictions on mobile homes, regardless of the type of toilet installed, this advantage is of little or no importance. The grinder toilet is flushed by turning on the water. The toilet automatically does the rest. The water, however, must be turned off when the flushing operation is to terminate.

Flapper Type Mobile Home Toilets – These toilets have a flapper valve in the bowl bottom that is manually operated. A constant water level is maintained in the bowl. To flush, the water is turned on and the manual flapper valve is pushed down. The three most popular makes are the Cunningham, the Swirl-O-Way and the Wilcox Crittendon. There is very little required in the way of maintenance. The manually controlled flapper valve occasionally requires repair. If all of the water drains from the toilet, even though the flapper valve is not pushed down, it indicates that the water seal is defective. To repair, replace the rubber gasket, or the spring, which may not be providing enough tension. In many mobile homes these toilets are installed without a trap. Should the water seal be broken it is important that it be repaired immediately since a defect in the water seal will

permit sewer gas to enter the home.

REPAIR AND MAINTENANCE OF MOBILE HOME TOILETS – We have mentioned above that one of the big advantages of the house type mobile home toilet is the ease with which it can be repaired and its tendency not to get out of order. The other toilets mentioned above are more elaborate in design. Some operate with an electric motor. The possibility of their getting out of order is greater and due to the intricate design of the mechanism, repairs are more difficult. The repair problem is increased by the difficulty experienced in obtaining parts which are not always stocked by mobile home supply houses or plumbers. For the convenience of mobile home owners who have toilets of the above mentioned makes, we publish here the name and address of the manufacturers. Should you own any of these toilets and have difficulties with it, drop a letter to the manufacturer requesting a parts list and maintenance literature. Determine the manufacturer of any toilet by carefully searching the toilet for a trade name or a name plate. To assist you in obtaining parts for popular toilet makes, here is a list of addresses and manufacturers:

Courtesy
James Cunningham, Sons & Co., Inc.
Cunningham trailer type unit is typical of flapper type mobile home toilet.

Cunningham – James Cunningham, Sons & Co., Inc., Rochester 8, New York
Wilcox-Crittendon – Wilcox-Crittendon, 43 S. Main Street, Middletown, Connecticut.
Pat – The Bonner Engineering Company, 2149 E. 27th St., Los Angeles 11, Calif.
McPherson – McPherson, Inc., 4603 W. Osborne Ave. (Drew Park), Tampa 3, Florida.
Swirl-O-Way and **Wellens Trailerator** – Wellens Manufacturing Company, 3921 W. Jefferson Blvd., Los Angeles 16, Cal.

Marine toilets are rarely used in mobile homes. Replacement parts for them can often be obtained from firms carrying marine supplies.

Hot Water Heaters

Because of space problems, hot water heaters for mobile homes are not as large as those installed in houses. The normal mobile home hot water heater has a capacity of 4 to 12 gallons. The exception is the super deluxe mobile home in which you might find a 20 gallon hot water heater. Because the capacity of the hot water heater is small, hot water should be used conservatively. Mobile homes with showers require at least a 6 gallon heater. Mobile homes with a bath tub require a 10 to 12 gallon capacity water heater. Even with this

capacity, don't expect that you can do the dishes and have the family take baths immediately afterwards. The re-heating of a 10 to 12 gallon hot water heater isn't that fast.

Mobile homes, until recently, have always been provided with electric hot water heaters. Small butane or propane hot water heaters were not manufactured. This situation has changed recently. Manufacturers of gas hot water heaters for houses have taken an interest in the mobile home market and are now manufacturing for mobile homes. At the present time, however, most mobile homes are still equipped with electric hot water heaters. Our discussion, therefore, is limited to electric hot water heaters.

The cost of operating electric hot water heaters depends upon the power rate in the area in which you are located. However, a general rule is that the cost is approximately 1¢ per gallon.

Here's a list of remedies for common difficulties encountered by electric water heater owners:

1. Your water tank consists of an inner water tank covered by insulation and an outer jacket. The purpose of the outer jacket is to hold the insulation around the inner tank. The inner tank can develop leaks. All water heater manufacturers provide replacement tanks should your inner tank leak; note the name and address of the manufacturer from the name plate on the heater and order a new tank.

2. Water tanks can be damaged severely by freezing. If you're traveling in cold climates, make sure that water tank is drained before disconnecting current. To drain tank merely remove water connection to mobile home and open hot water faucet. A syphoning action takes place which removes all, or at least enough of the water to eliminate the possibility of freezing damage.

3. A possible trouble point is a loose wire or bad connections at thermostat. On old model water heaters you must remove the jacket to get at the thermostat. On newer models you will find an access door that can be removed to get to thermostat.

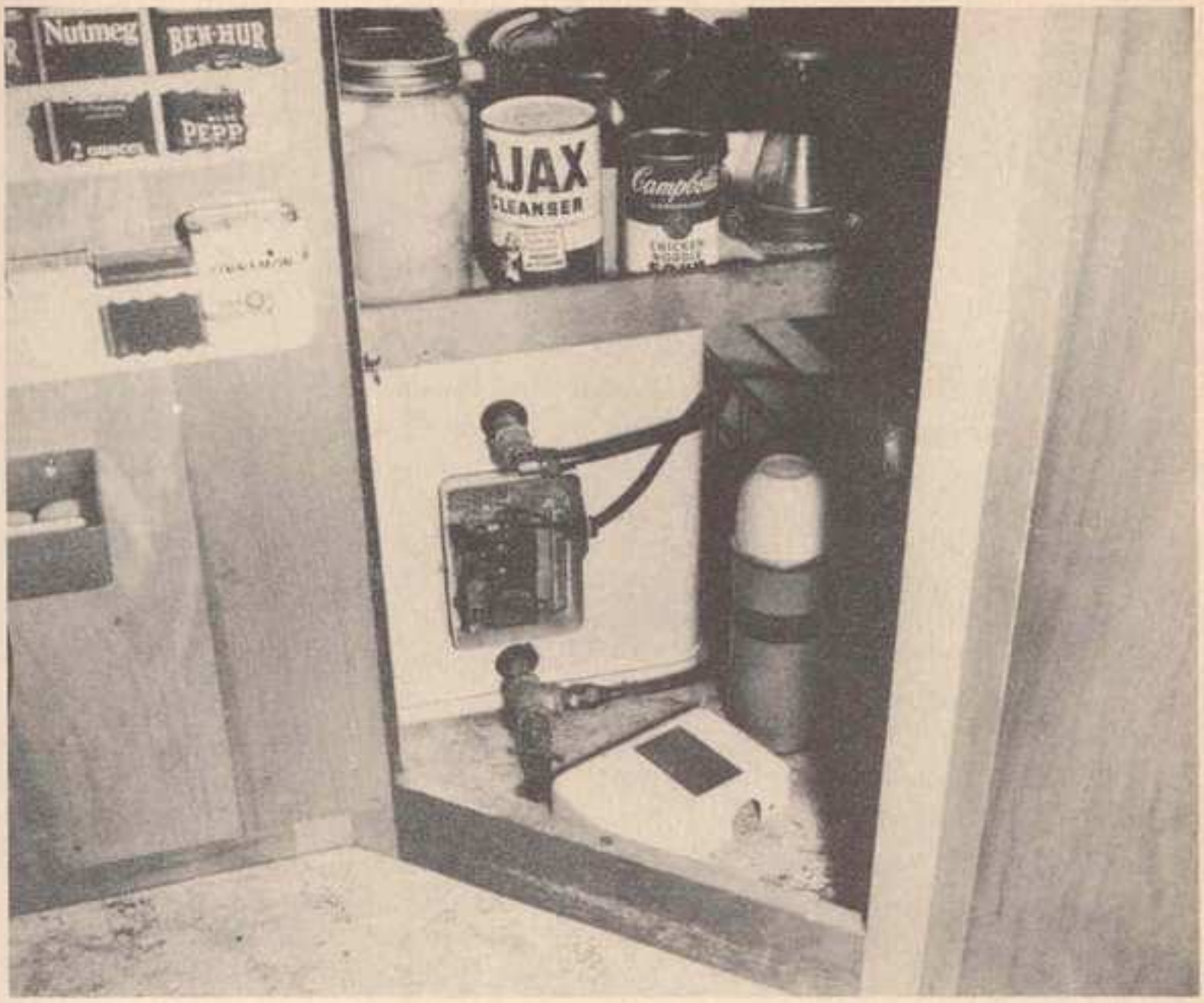
4. All hot water heaters are provided with a heating element. Should heating element fail, a new heating element must be purchased. Cost is small. Special attention should be given to immersion type heating elements. They should be taken out periodically so lime deposits can be scraped off.

5. A water heater switch is mandatory. There's no need to leave the hot water heater on when you do not anticipate the need of hot water. Most mobile homes are provided with water heater switches with a pilot light that indicates when the heater is turned on. Should you have a hot water heater with no switch, you should install one.

6. Should heater fail to work, the cause may be broken wires in cord or a defective thermostat. Broken wires are easily repaired. New thermostats can be installed.

7. When water is either too hot or cold, thermostat should be reset. Most thermostats on hot water heaters can be regulated. Pointer is moved to left to reduce heat, and to right to increase heat. Pointer should be moved but a fraction, and should be moved slowly.

8. Should unit heat slowly, check the trailer park load. You



Water heater is usually installed in cabinet beneath sink. Most models have an access door that can be removed to get to thermostat which may be set for desired temperature. Access door on this heater protrudes from side of heater. (See door lying on floor.) On many heaters, access door is a small plate, flush with side of heater, that may be opened by removing two screws.

need a full 110 to 120 volts to insure proper operation.

9. Most leaks are due to faulty pipe connections that are easily overcome by tightening all joints.

10. No hot water heater should ever be installed without a pressure relief valve. The importance of a pressure relief valve has been emphasized in the section on plumbing and should be re-read. The only exception to this rule is a water heater that is equipped with a positive electric safety switch that cuts off electric current to the heating element before the water temperature becomes too high.

Courtesy Liberty Coach Co.

A water heater switch is mandatory. Light serves as a constant reminder that heater is in operation.

Chassis Care

One of the big advantages of mobile home ownership is that there is not a great deal of responsibility connected with it. Lubrication of the chassis is extremely simple. Oil the spring shackles and brake connections about once a month with penetrating oil. If spring shackles are fitted with grease nipples, grease with a grease gun about once every 1,000 miles or so. Wheel bearings and hubs should be repacked every 5,000 to 10,000 miles with standard medium grade fiber wheel bearing grease. You can do this job yourself by dismantling the hub, noting carefully the order in which the parts come off so that the hub may be easily reassembled. Remove all the old grease from the axle and bearings inside the hub, washing all parts clean with gasoline. Make sure that the felt or other grease containing devices are in good order. Before reassembling, thoroughly smear bearings with the grease recommended above.

Keep ball and hitch socket well greased. The jacking mechanism should also be greased regularly. The ball on the back of the car hitch should be kept covered when not in use. Use an old tennis ball from which a slice has been removed or a small can if you do not have a standard ball cover. Standard ball covers are available at most supply stores.

Wheel bearing trouble may develop in cases where the equipment sits idle for a long period of time. The trouble is caused by rust, due to moisture condensation inside the bearings. Therefore, if the coach is to be left standing idle for long periods, pack bearings solid. Then it will be impossible for moisture to condense inside the bearing and cause rusting. When the coach is to be taken on the highway again, some of the grease should be removed, leaving the hub only about two-thirds full. This will prevent grease leakage through the seals onto the brakes.

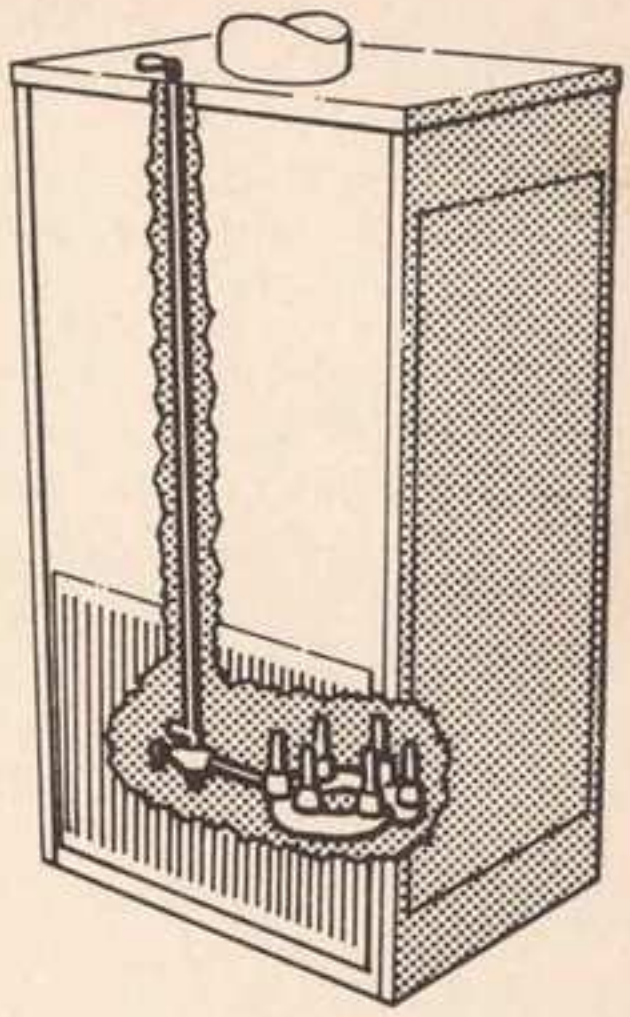
Mobile Home Heaters

Heat for mobile homes is usually provided by either oil heaters or gas heaters. Oil heat has the advantage of being less expensive. It has another advantage. The conventional oil furnace is designed so that it will not add to the condensation problem inside the mobile home. The disadvantage of oil heat lies in the maintenance problems, the inconvenience of handling the fuel, and the soot problem that accompanies oil heat. The principal advantage of gas heat is its convenience. The disadvantages of gas heat are: (1) its higher cost compared to oil; (2) most gas heaters increase condensation problems within the mobile home; and (3) in the past, no one manufactured a gas heater specifically designed to heat a mobile home properly.

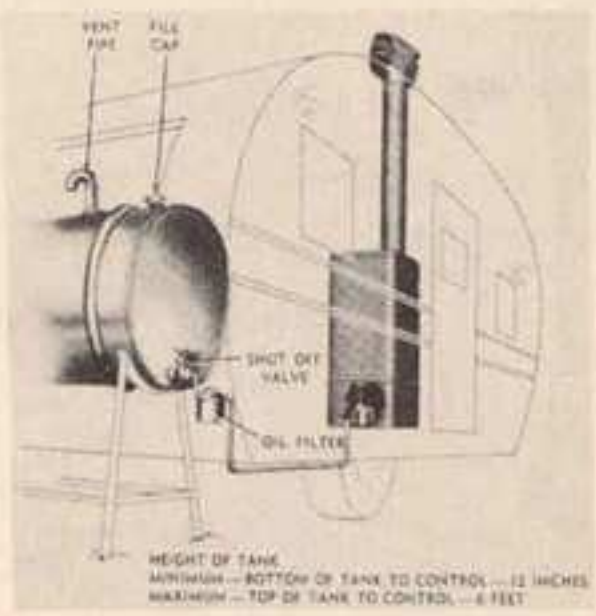
The modern trend is toward gas heaters. The most popular oil heaters have been those made by the International Oil Burner Co., the

Duo-Therm Division of Motor Wheel, and the Coleman Lamp and Stove Company. Early in 1954 both International and Duo-Therm started selling gas heaters that are properly engineered for mobile homes. These heaters do not increase condensation problems. Before these new heaters were developed, mobile home owners desiring gas heat found a solution to the problem of the non-existence of adequate gas heaters by converting oil heaters to gas. This conversion can be made at a cost of from $20 to $40. These conversions are satisfactory provided the B.T.U. rating of the conversion burner is sufficient.

Oil heaters are made in various sizes to provide the necessary heat capacity required for the small or large mobile home. The largest models adequately heat the largest size mobile home. Mobile home gas heaters used in the past had B.T.U. ratings somewhere between ten and twenty thousand. This is insufficient heat for large models, so when large mobile homes were heated by gas, two heaters were installed. All oil heaters are vented. Gas heaters should also be vented. Non-vented gas heaters should never be used. A desirable type of gas heater is the vented floor furnace. These furnaces draw air from outside the mobile home and discharge all fumes outside.



Oil heaters can be converted to gas heaters by using conversion burners. Burner is installed in fire pot and connected to gas line. These burners available at parts stores, can be bought with 100% shut-off safety control and pilot light. Be sure the one you buy is so equipped. .... it's safer and this type can be thermostatically controlled, too.



Courtesy Duo-Therm Division of Motor Wheel Corp.

Auxiliary fuel tank for oil heaters assures adequate fuel supply; eliminates bothersome task of constantly refilling small heater fuel tank. Picture shows proper installation method.

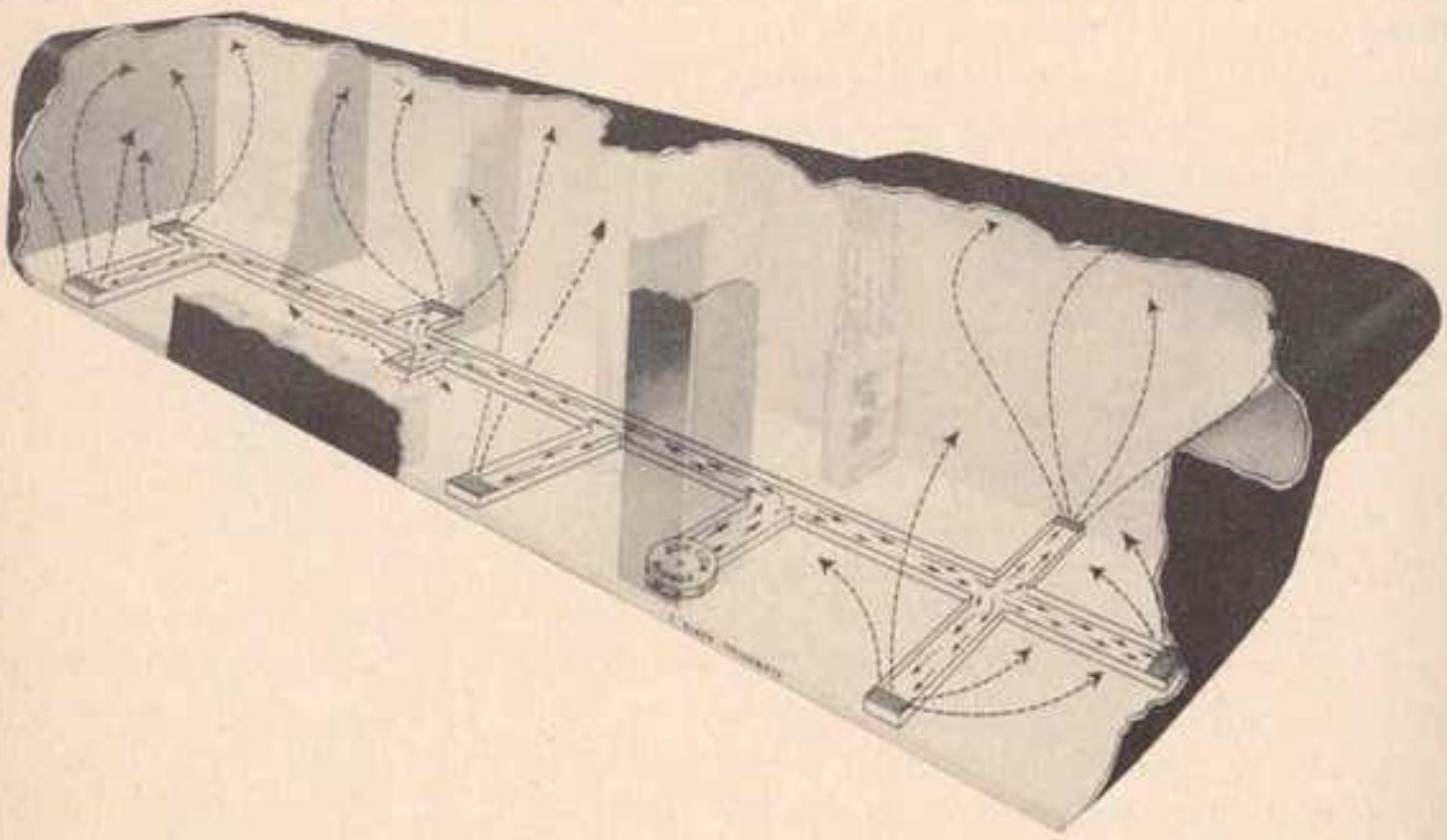
The best oil heater installation requires an auxiliary fuel tank outside the mobile home. A fifty-five gallon oil drum is placed outside and hooked up to feed oil to the burner. This makes it unnecessary to fill the oil heater fuel tank. The use of an auxiliary tank assures an adequate supply of oil. It eliminates the bothersome task of constantly refilling the small heater tank. The use of a single furnace in large mobile homes re-

quires a system of ducts and blowers to move the heat from the heater to the parts of the mobile home that require heating. The modern trend in mobile home construction is an elaborate system of ducts to insure proper heating of all parts of the mobile home. Oil heat in the modern mobile home is normally thermostatically controlled. The newest gas heaters can also be thermostatically controlled.

To heat mobile homes adequately, heaters must have sufficient B.T.U. rating. It's not possible to state a reliable rule for you to follow in determining the correct B.T.U. rating a heater should have for a specified size mobile home. To determine the B.T.U. rating required, a heat engineer would consider such things as climate, size of mobile home, nature of insulation, number of windows, interior arrangement of mobile home, blower capacity and its relation to heat distribution, etc. If all you want is a rule of thumb, here it is:

Size Mobile Home	Required B.T.U. Rating for Heater
25 ft.	20,000
30 ft.	25,000
35 ft.	30,000
40 ft.	35,000
45 ft.	40,000

Want reliable and accurate figures? See a heat engineer, or write heater manufacturers for their advice. Does your heater supply insufficient heat? Perhaps the mobile home manufacturer didn't anticipate your move to a really cold climate. Your heater may not be large enough.



Courtesy Supreme-Victor Mobile Homes, Inc.

Modern trend in mobile home construction is exemplified by picture showing excellent system of ducts in a Supreme-Victor mobile home that insure proper heating of all parts of the mobile home.

THE CONDENSATION PROBLEM AND WHAT TO DO ABOUT IT – Condensation is a serious matter. It results in mildewing of clothes and water damage to the mobile home structure itself. It must be avoided.

Condensation occurs because warm air holds more moisture than cold air. When warm, moisture laden air contacts a cold surface, the water in the air condenses and a water deposit is left on the cold surface. The biggest contributors to moisture in the warm air inside a mobile home are (1) hot water, (2) showers, (3) cooking, and (4) the use of liquified petroleum gas in appliances (one gallon of liquified petroleum fuel, when burned, adds approximately one gallon of moisture to the air inside the mobile home).

Here's a list of things you can do to help solve the condensation problem.

1. Use a modern design heater. The properly designed mobile home heater brings the outside cold air with low moisture content into the mobile home, and expels, through the flu of the heater, the inside air that is high in humidity.

2. A vented canopy must be placed over the cook stove. It should be equipped with a small exhaust fan. This fan should be turned on and the vent kept open during all cooking operations.

3. When using hot water, mix it immediately with cold water to the desired temperature so there will be no unnecessary steam.

4. When taking a shower, keep door to the shower room closed and the shower room vent open. Equip shower vents with an exhaust fan and turn the fan on while showering. Keep the shower compartment closed for at least an hour after showering and leave the fan running during that period of time.

5. Do not undertake laundering operations inside the mobile home. Use the park facilities for this purpose.

6. Keep one roof ventilator partially open at all times.

7. When heat is on, keep the blower in the furnace operating. The result is good heat circulation. Cold spots under and behind beds, in wardrobes and closets will be eliminated.

8. Use storm windows to prevent condensation of moisture on windows.

9. If you find cold spots in your mobile home, not adequately serviced by the blower system, install a small auxiliary blower fan to give better circulation.

10. If possible, pull bed slightly away from wall to allow circulation between bed clothes and wall. The same applies to clothes in closets.

11. There are several products on the market that absorb moisture from air. Use them at advantageous points to help reduce the condensation problem.

CARE AND MAINTENANCE OF YOUR HEATING SYSTEM – Since gas heaters require little or no maintenance, most of what we say here applies specifically to oil heaters. A heating system must be maintained in good condition if it is to provide operating economy and long service.

The furnace interior should be inspected at regular intervals and cleaned if enough soot and dust have accumulated to materially lower efficiency. Excessive formation of soot indicates defective heater operation. Correct such defects by using information given below, and remove excessive soot. Soot can be removed with soot removers available at hardware stores. Just put soot remover in the burner pot and burn.

At least once a year heater should be thoroughly cleaned of soot, ash, and other residue. This includes carbon formations. The stack should also be removed, cleaned and repainted. If it is not properly cared for, you will have to replace it every two or three years.

Sooty fire boxes cause oil heater to operate inefficiently. At least once a year, clean out soot, ash, carbon and other residue.

Inside of furnace can be cleaned with a wire brush and scraper. After cleaning, give the metal parts inside the furnace a light coating of lubricating oil to prevent rust during the summer months.

Electric motors used for blowers should be inspected and oiled at least once each heating season. If a single phase motor is used, it may be necessary to replace brushes every two or three years. If motor is not totally enclosed, excessive accumulation of dust inside the casing may, in time, interfere with the operating of the starting mechanism. Clean by forcing a jet of air through the casing. It may be necessary to disassemble and wash motor with solvents.

Use an automatic draft regulator between the burner and the chimney to maintain a steady and proper draft.

Do not expect commercial soot removers to remove hard carbon. Carbon must be wire brushed or scraped off. When burning soot remover to remove soot from the heater or chimney, the roof of the

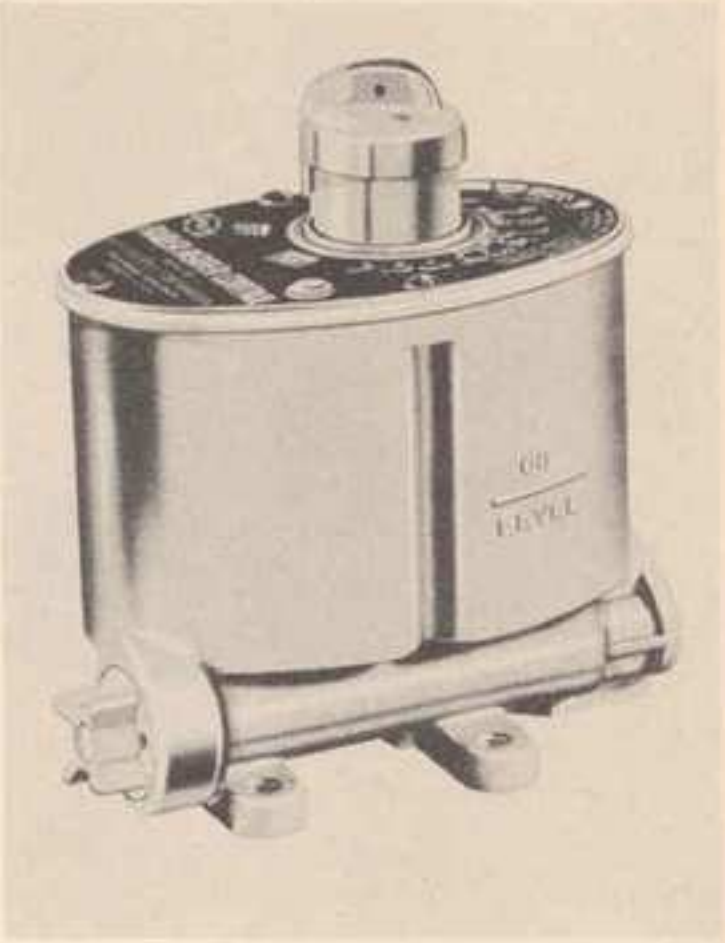
mobile home should be watched carefully. There is always danger that a soot fire may develop in the chimney which might ignite combustible material near the chimney.

When cleaning stove, protect the floor with newspapers. Pipes and removable parts should be taken outdoors and away from the mobile home before cleaning. When handling pipe, take care not to pound or bend the ends. Reassembled pipe *must* fit tight or heater will not burn properly.

Don't keep heater turned down over too long a period. It will lead to an accumulation of soot. Don't turn heater all the way up when you go to bed or leave the mobile home, and a good fire extinguisher is indispensable. Keep one on hand.

RECOMMENDED SOLUTIONS TO COMMON OIL HEATER PROBLEMS – Certain oil heater repairs may be made easily, avoiding the expense of calling a repair man. If your heater fails to function properly, try any of the suggestions given below, and then, if it continues to function improperly, call in a qualified service man. Mobile home owners frequently find it difficult to get service on oil heaters because they believe a mobile home repair specialist is required. This is not the case. Any firm qualified to repair oil heaters can repair a mobile home oil heater. Just use the yellow section of your phone book and look under the heading, "Furnaces". Here is a list of things you can do to restore a defective oil burner to good operating condition:

1. If oil fails to flow to the burner pot, oil lines may be clogged. This may also be caused by an accumulation of water in the oil control valve. Another possible cause is the oil control meter stem slot may be partially clogged. To correct clogged oil lines, disconnect lines and blow them out, or clean them with a rod. The line from the carburetor to the burner pot is most likely to be the clogged one. This is a short line and can be cleaned easily with a rod or screw driver. If you suspect that the oil control metering stem slot has become clogged, rotate knob rapidly a few times to clear the clogging. If you suspect that water has accumulated in the carburetor, call a repair man. The carburetor on your oil heater is a delicate mechanism. It is better not to fool with it. There is one exception. The strainer in the oil valve may be clogged. This is easily removed and cleaned. Don't forget to check to make



Courtesy A-P Controls Corp.

A frequent cause of oil heater difficulty is a defective oil control. Most supply stores carry replacements. When you replace a control, make sure it's the same model as the one removed.

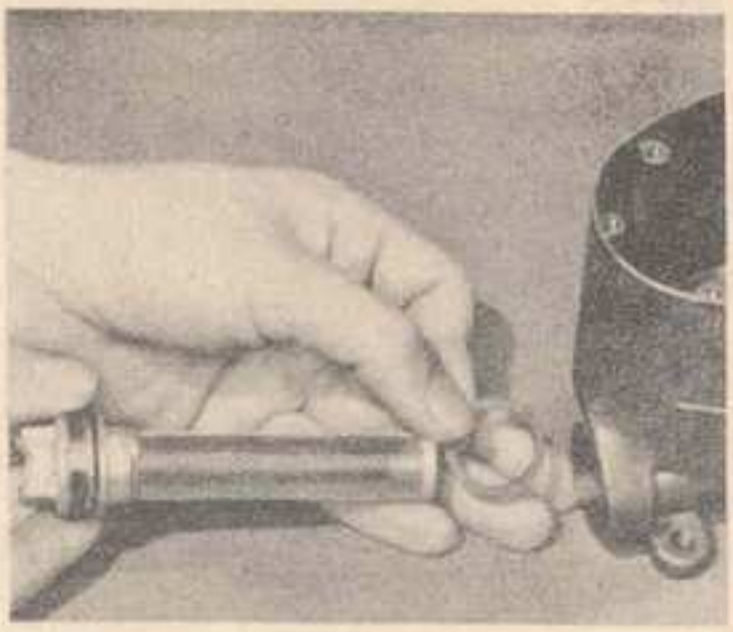
sure you're not out of oil.

2. If heater smokes or soots and fails to burn with a clean flame, it indicates incomplete oil combustion. Complete combustion of oil requires a good draft. Here's what you can do to correct incomplete combustion.

(a) Go to roof and check the rain cap on top of the heater pipe. The bottom of the cap should be ¼" higher than the top of the chimney. If the cap is lower than this, it is choking off the draft. It can be easily raised by removing the cap and bending up the brackets supporting the cap.

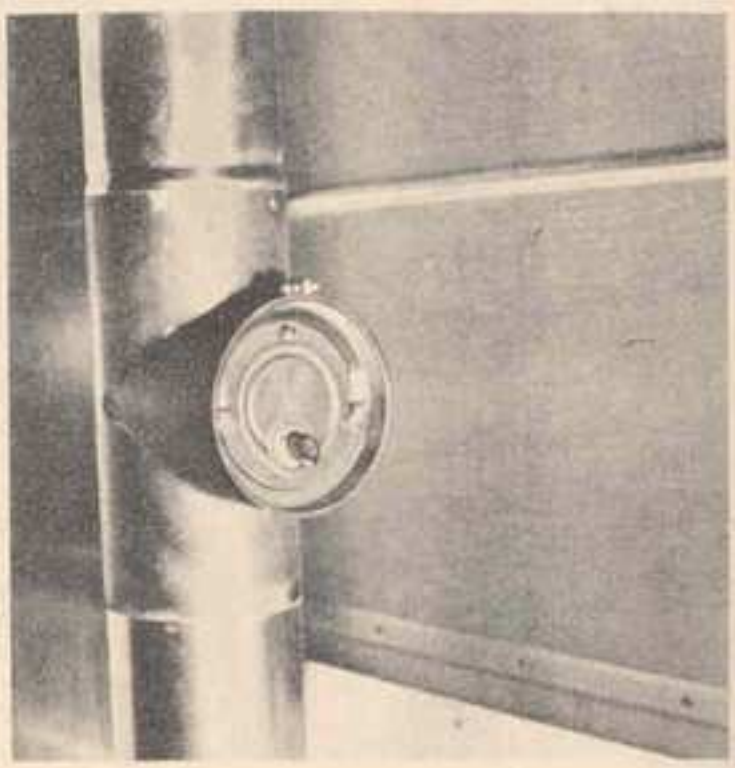
(b) If you are parked near a building, under a tree, or in a low pressure area, the wind may be going down on your flu stack, causing a back draft. The solution is to add a piece of pipe to raise your stack higher than any surrounding obstacle. Be sure to replace the cap after raising the stack height.

(c) Improper functioning of automatic draft regulator is frequently a cause of difficulty. The flapper in the draft regulator must remain closed all the time. If you find it open, screw the weight all the way up to the end of the bolt and leave it there. The purpose of the draft regulator is to relieve excessive pressure on strong down drafts. The flapper is supposed to open only when there is a lot of wind going across the mobile home.



Courtesy A-P Controls Corp.

Oil control strainer assembly should be removed and cleaned occasionally. A clogged strainer screen prevents adequate oil flow.



Flapper on automatic draft regulator must remain closed.

(d) Check the pipe leading from the stove to the roof. Check where it fastens to the stove, at all joints and also where the pipe enters the roof jack. Be sure that all seams are tight. Any leak will cause bad draft.

(e) A smoky flame may be caused by the valve setting being too high. Oils in different localities vary and in high altitudes may flow thru the valve too fast, flooding the burner pot. If the heater smokes when turned on full, turn down the high fire adjusting screw on top of the valve just enough to stop smoke coming out of the chimney.

(f) Smoke is sometimes caused by the use of an exhaust fan in the mobile home while the heater is burning, and the mobile home is sealed off from outside air. If you must use an exhaust fan while furnace

Courtesy A-P Controls Corp.

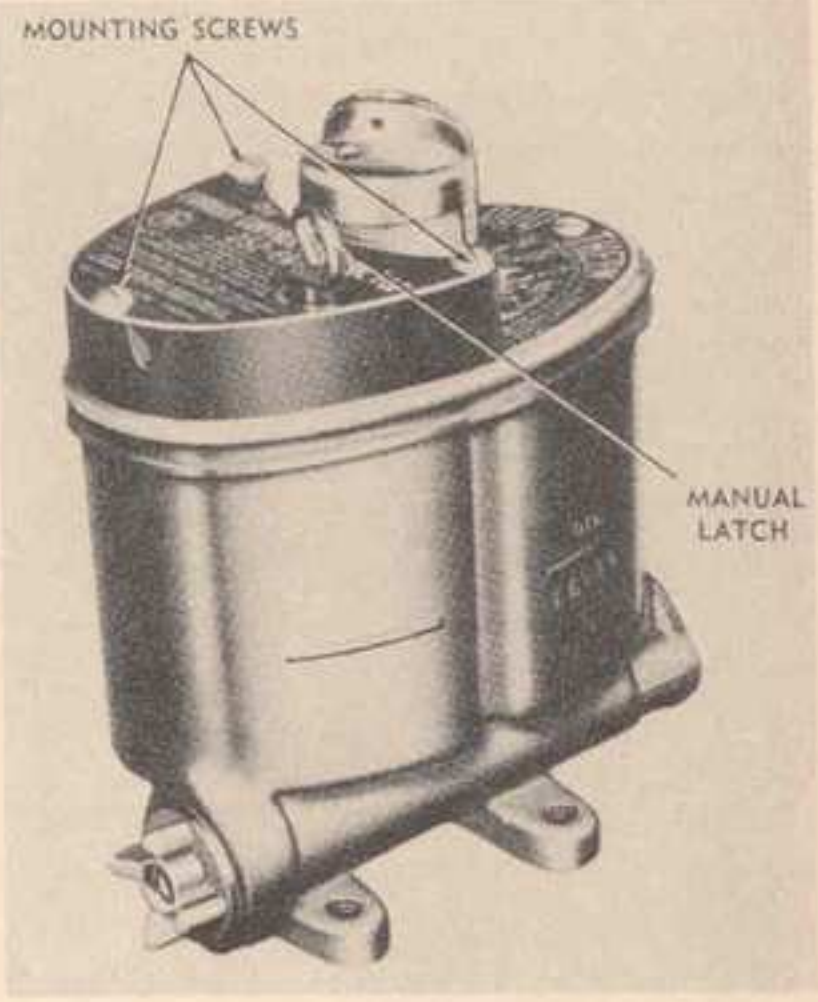
A thermostat assures maximum efficiency from an oil heater. Parts to thermostatically control modern oil heaters can be obtained from supply stores. You can install the thermostat yourself.

is burning, open a vent or window so as to relieve suction on the heater.

(g) Sometimes, thermostatically controlled heaters that do not smoke on high fire will smoke on low fire. This is caused by too low a pilot flame. This is corrected by increasing pilot oil flow by turning low fire screw on top of oil control, clockwise. Set low flame to burn steadily and have it burn through the low fire ring.

If your heater has smoked for any period of time and you have located the difficulty and corrected it, then make sure to clean soot and carbon out of the flu and stove thoroughly so as to restore efficiency.

3. If blower fails to work, check fuses, switches, and wires. Check motor shaft to see that it turns freely. If shaft is gummed tight, oil bearings with kerosene or number one fuel



Courtesy Duo-Therm Division
of Motor Wheel Corp.

Picture shows part of thermostat system installed on top of oil control valve. Manual latch permits operation of heater in case electrical difficulties cause thermostat to fail.

oil, and operate about a half hour. Then re-oil with number twenty motor oil. If blower makes noise, check to make sure blower wheel is not loose on motor shaft. Remove any foreign matter in motor housing and make sure that loose metal is not contacting motor or blower.

4. If thermostat fails to operate, clean contacts to make sure they are free of dust and dirt. Check fuses, plugs, wiring and switches. In emergencies, heater can be made to operate manually by lifting, and manually turning control knob on electric top mounted on oil control.

Care And Maintenance Of Mobile Home Windows

WHERE TO GET REPLACEMENT PARTS – Probably the three best known makes of mobile home windows are the Marvel, Woodlin, and Hehr. Some mobile home manufacturers build their own windows. Window repairs are simplified when you know where to get replacement parts. Supply stores, and even mail order firms, do not stock many window replacement parts. They must be obtained from the window manufacturer. Get parts for Marvel windows from Marvel Industries, Inc., Sturgis, Michigan; for Woodlin windows from Woodlin Metal Products Co., Marshall, Michigan; for Hehr windows from Hehr Mfg. Co., 3353 Casitas Ave., Los Angeles 39, Calif. If your mobile home has other make windows, or if you don't know the make of the windows, write the mobile home manufacturer, giving mobile home year, model and serial number. Ask the manufacturer where you should obtain replacement parts. When you write window manufacturers for parts, it is best to send the old part. You'll get the exact part you n e e d; you'll avoid unnecessary correspondence.

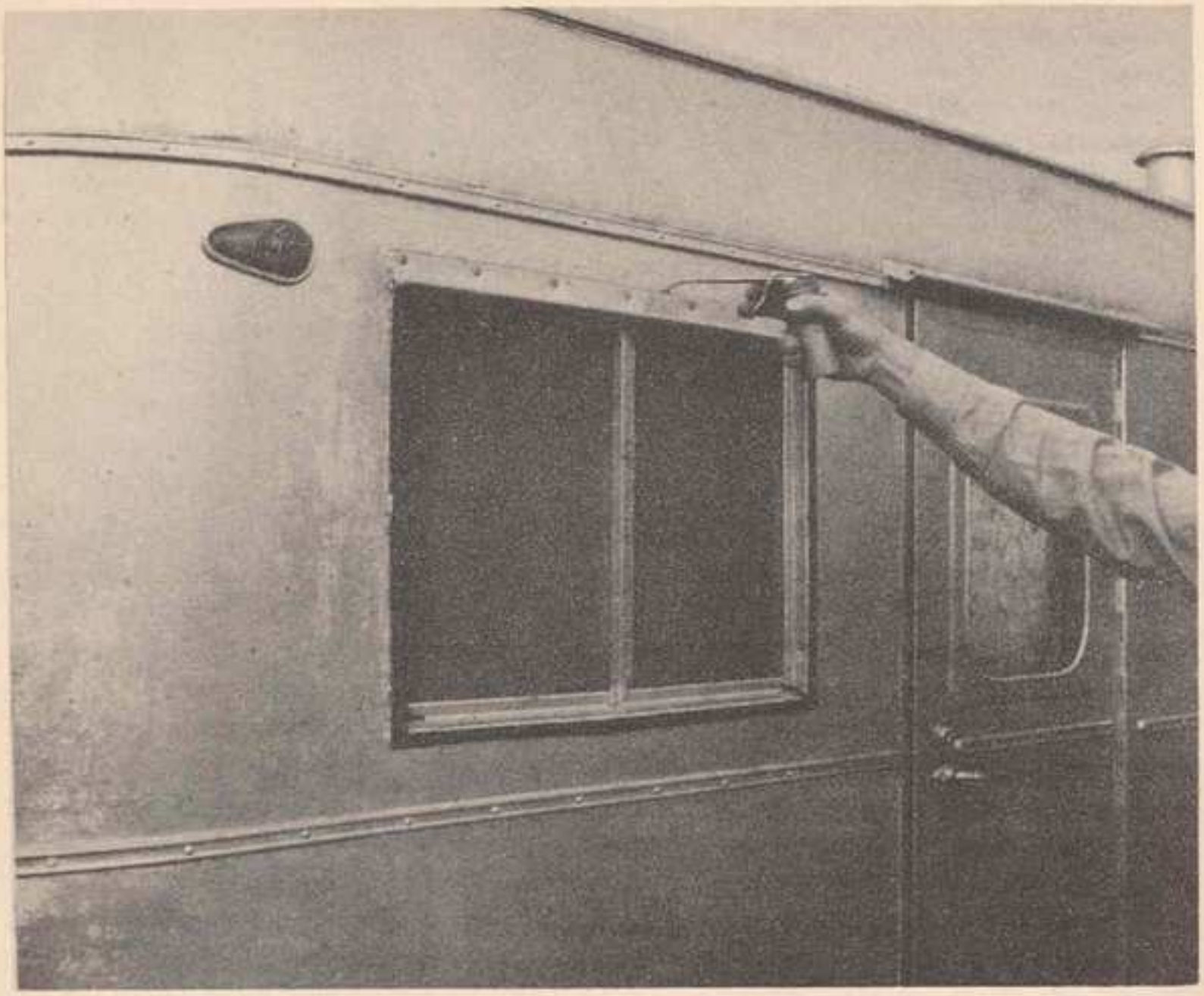
CARE OF SCREENS – Most window screens are either aluminum or copper. Some windows have plastic screens. The use of these materials for screens does not mean they do not require maintenance. Brush screens regularly to prevent them from becoming clogged with dirt and grease. Washing screens with paint thinner will cut grease deposits from them. Ventilator screens should be given the same treatment as window screens. Should screens show signs of deterioration, it's time to paint them. Not only do they look better, but they'll last longer. Have your local paint dealer recommend the proper treatment for the screen material you have. Whether you can replace damaged or completely deteriorated screens will depend on the type of window you have. In most cases specialized tools are required, and we do not recommend that the novice undertake this operation. Local sheet metal shops can usually replace them at a reasonable cost, or in the case of some window makes, new screens can be obtained from the manufacturer and easily installed.

WINDOW MAINTENANCE – Window troubles are usually leaks, broken window panes, or broken operating mechanisms. Here are the rules for good window maintenance:

1. Windows should be checked several times a year for the purpose of stopping leaks before they start. A window leak can cause serious and expensive damage. Careful window maintenance will avoid this catastrophe.

2. Windows should be kept painted. Should you prefer not to paint aluminum windows, at least give them a regular coating of an aluminum preservative.

3. When rubber gasket shows signs of serious deterioration, obtain new gasket from the window manufacturer and replace it. Should gasket pull out of line, replace, and seal with rubber cement. You may find it necessary to loosen mounting screws to restore rubber to



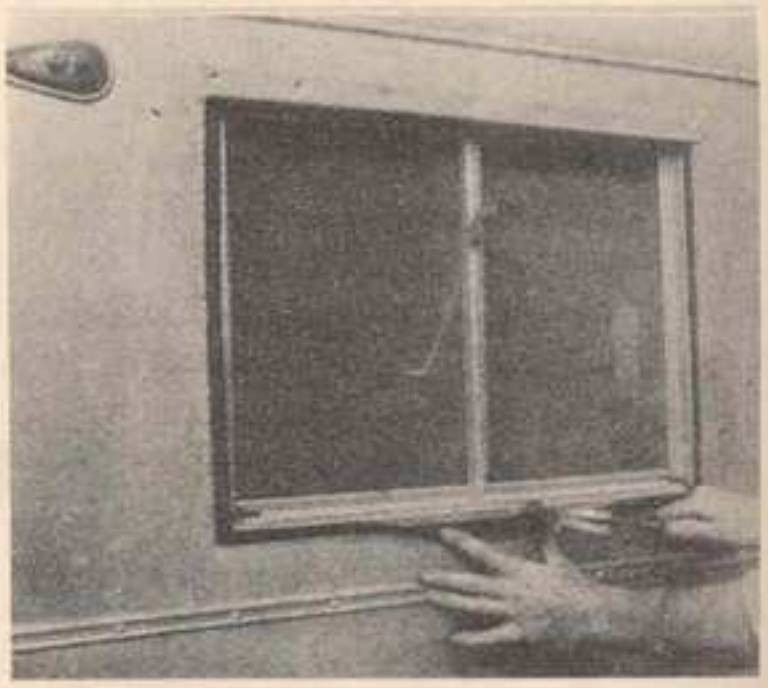
Stop leaks before they cause serious damage by resealing window frames once a year with a liquid sealing compound.

proper position.

4. Screws that mount window frame to mobile home should be tightened regularly.

5. Reseal edge every year, where window frame and mobile home exterior side wall come together. Use a liquid caulking compound, such as Ten-x.

6. Panes of windows improperly installed may not seat correctly. This can be remedied only by removing the window and reinstalling it correctly.



When rubber window gasket shows signs of deterioration, obtain new gasket and replace it.

7. Water around the inside frame of windows may not be caused by leaks. The real problem may be condensation. Check what we've said elsewhere in this manual about condensation before you presume windows are faulty.

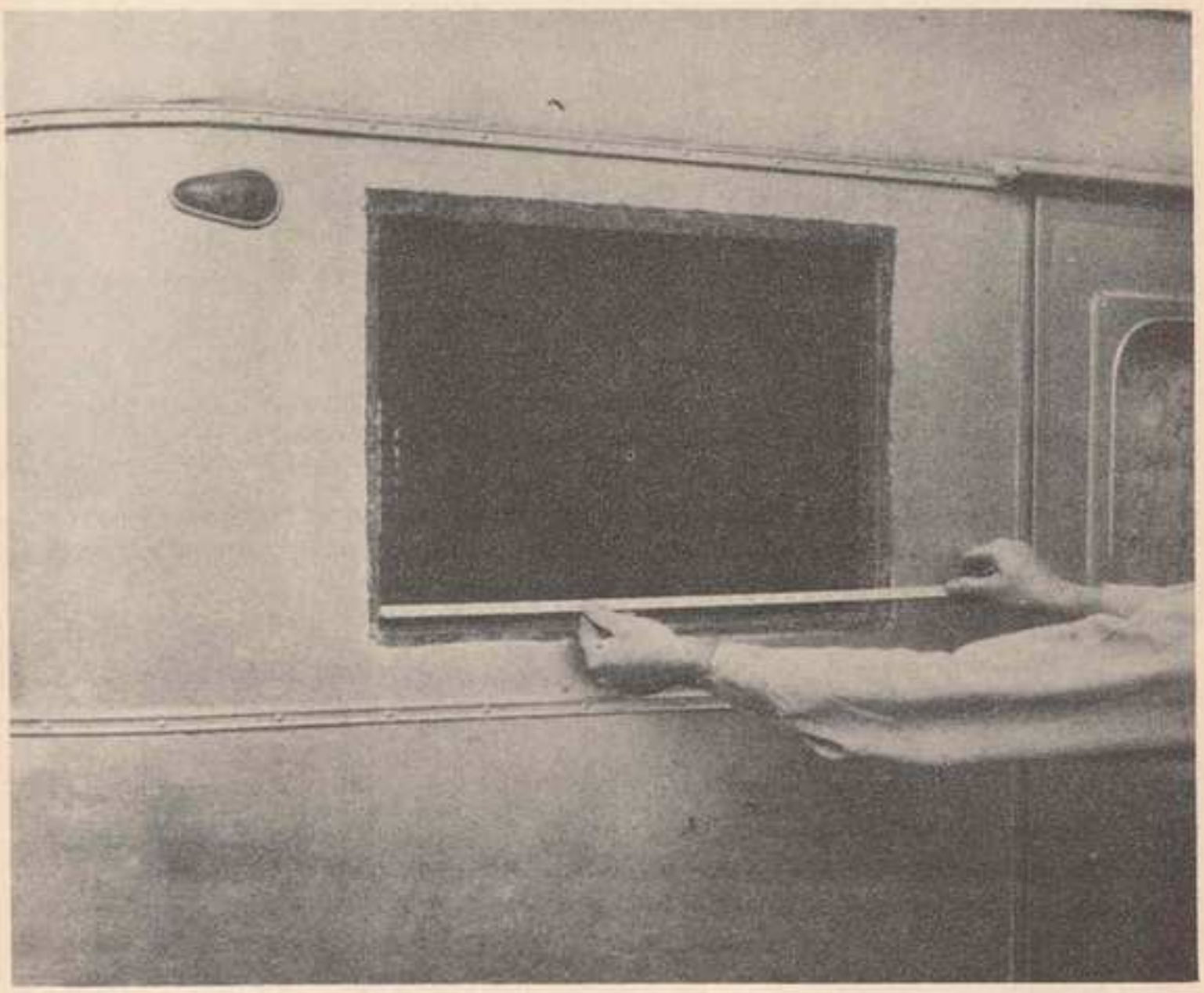
8. Be careful when opening a window that has been closed for some time. The outside rubber seal may have adhered to the metal. Unless you proceed with caution you may break the glass or the

operating mechanism. The correct procedure is to release the operator; then go outside to loosen the pane with a putty knife or similar instrument.

9. Should you find it impossible to replace broken window parts even though you follow instructions given regarding this above, you may find it possible to have parts made by a local sheet metal shop at a reasonable cost.

HOW TO REPLACE BROKEN WINDOW PANES – A broken window pane can be replaced ordinarily without too much difficulty. There are many types of metal sash, and the procedure for replacing glass varies. Careful examination of the window construction will usually reveal quickly the proper procedure for replacing glass. You will need a screw driver, a pair of pliers, and a waterproof sealing compound, such as Ten-x. If you're in a community where they have never heard of Ten-x, go to any automotive store and request a good brand of windshield sealer. In most cases the old rubber moldings can be used in conjunction with the sealing compound. When old rubber gaskets are too badly deteriorated, you must replace them.

The first step is to remove the broken glass and scrape the sash clean. Then measure sash so you can obtain from your local hardware or paint dealer the correct size piece of double strength glass. Give the dealer the measurement for all four sides because

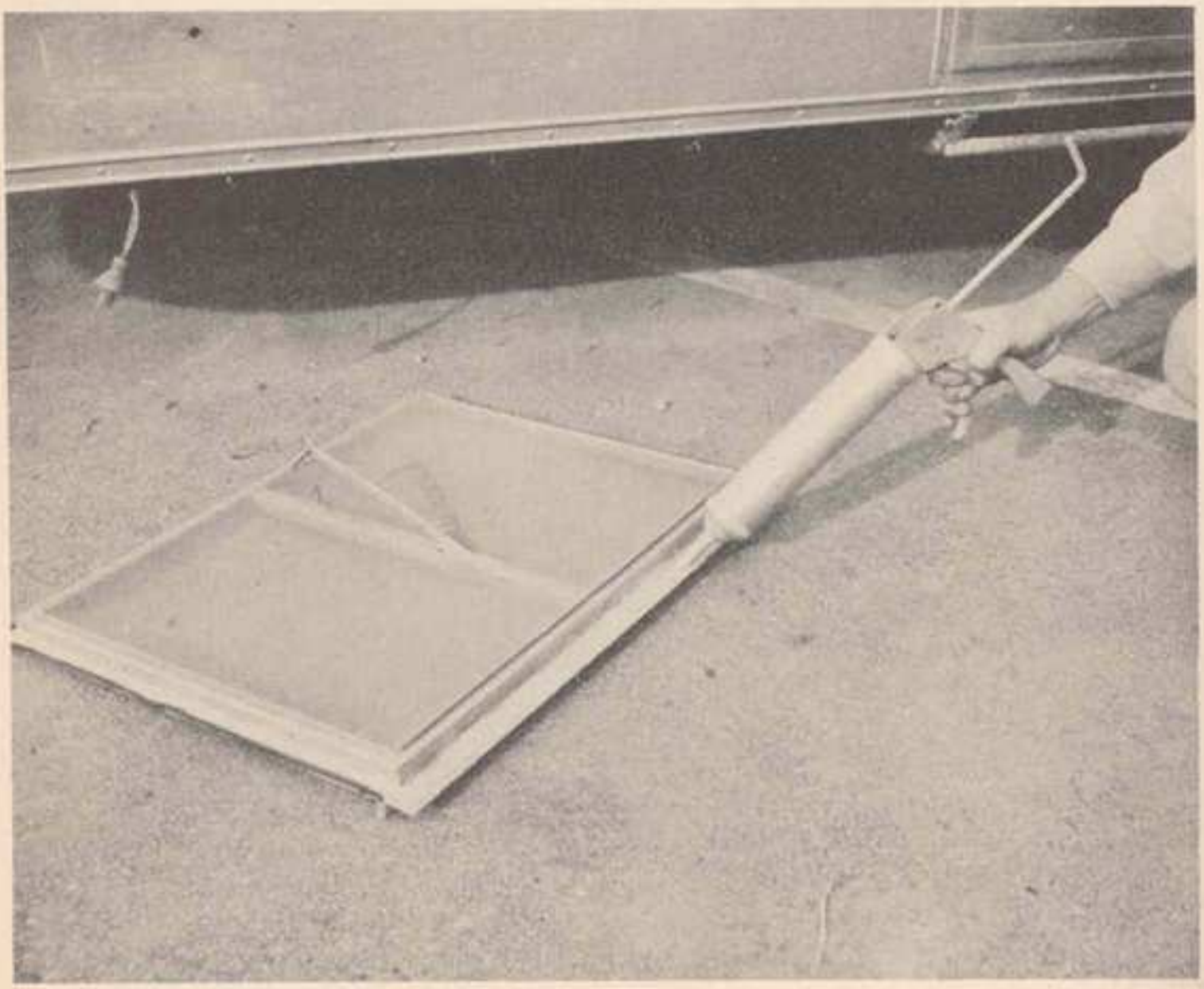


When you buy new windows, you must know the size of the opening in mobile home side wall into which window fits. Window supplier must know height & width of opening.

some sashes are not true; they do not form a perfect rectangle. Allow 1/16" on all sides for expansion and irregularities. Place the new glass in position, seal all crevices firmly with sealing compound and reassemble the sash.

HOW TO REPLACE OLD WINDOWS – When windows show signs of deterioration, it's time to replace them. Your local mobile home supply store may carry windows, or you may find it desirable to order from mail order houses. Mail order houses carry a much larger assortment of sizes. In replacing a complete window the first problem you will encounter is what size you require. All mobile home window sizes are based on the size hole that must be cut in the side of the mobile home to install the window. Therefore, to determine the size window you require, it is necessary for you to remove the old window. This is no problem. Look the window over carefully and you'll soon discover that taking out a few screws, bolts or rivets will enable it to be removed. Now, measure the size of the opening. This is the size window you require. You may find it possible to buy a window just this size. Look at your local parts houses and inquire of mail order firms. But in spite of careful shopping you may be unable to locate the exact size you require.

You are now faced with the alternative of buying a special



Old windows in good condition can be removed and recaulked to assure a waterproof installation. New windows must be caulked. Caulk liberally; then scrape off excess caulking after window is installed.

size window made to order, or changing the size of the opening. You can get a special size window built for you. But, since special size windows are hand-made, you're going to get a shock when you hear the price. If you're all thumbs when it comes to handling tools, you are better off paying the price and ordering the exact size window you need. If you can saw a toothpick in half and pound a tack in straight, you will find it much cheaper to find a standard window fairly close in size to your opening, and then change the size opening to fit the window. Since the overall dimensions of windows exceed the dimension of the hole which must be cut in the side of the mobile home to install, the window sizes do not have to be too exact. Furthermore, it's not too difficult to increase or decrease the size of the opening by a few inches. So, save yourself money! When you can't find the exact size you require, buy the next closest thing to it and make the minor alterations required.

Facts About Mobile Home Refrigerators

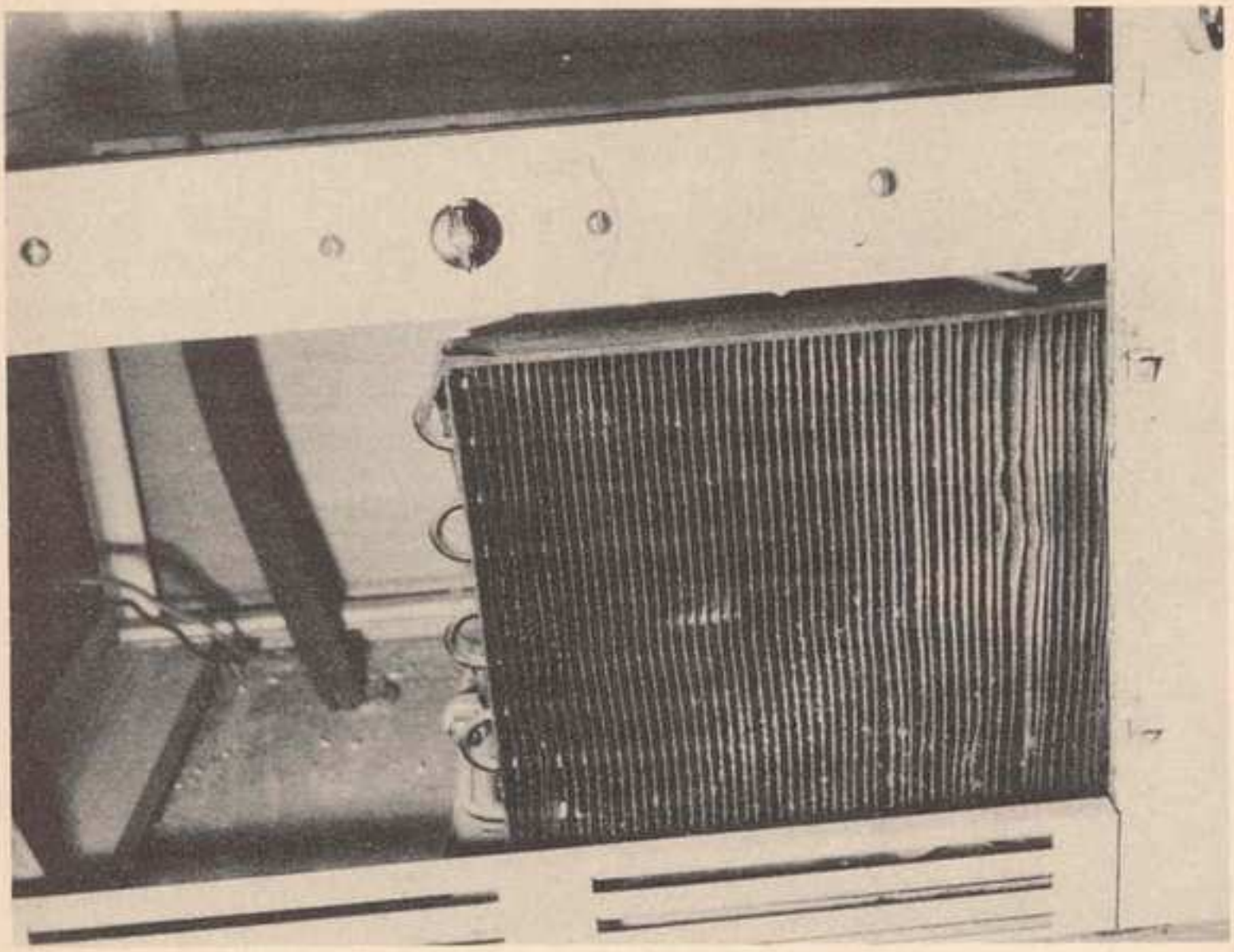
Unless your electric refrigerator is of a special design, it operates on 110 volt alternating current. Make sure your mobile home is connected to this type current or motor will burn out. If a refrigerator has been idle and unused and the weather is freezing, warm the mobile home interior thoroughly for at least two hours before attempting to start refrigerator.

Mobile home manufacturers do not always install refrigerators that are designed especially for mobile home installations. But, mobile homes that are used for extensive traveling should be equipped with mobile home type refrigerators. There's a good reason for this requirement. Mobile home refrigerators are designed to: (1) withstand road shock; (2) operate in extremely cold or extremely hot climates; (3) operate when connected to mobile home park wiring where low voltage conditions exist. Mobile home refrigerators are especially engineered to meet these requirements.

Should you be unfamiliar with the operation of mobile home type refrigerators you will immediately notice one important way in which their operation differs from a conventional refrigerator. They run at more frequent intervals. Don't be alarmed. They're supposed to. This does not mean they use more current. The actual running time in any one 24 hour period would be the same as for an equal size conventional refrigerator. The mobile home refrigerator merely runs more frequently for shorter intervals.

Refrigerators require only one maintenance operation. The condenser must be kept clean. The condenser is the part in the main operating mechanism near the fan that looks like a car radiator. Just brush it off every few months. This maintenance is important. Don't overlook it.

Never try to repair a refrigerator yourself. Should the refrigerator fail to operate properly even though you know current is flowing to the receptacle into which the refrigerator is plugged, you need a service man. Before you call a service man, read your guarantee. It may be necessary that you contact the manufacturer, or his represent-



The only maintenance an electric refrigerator requires is a bi-monthly cleaning of the condenser. Clean by whisk-brooming away all dirt and dust in the many crevices of the condenser, which looks like a radiator.

ative,for service. You should therefore file and keep your refrigerator guarantee for ready reference, and when you have difficulty, read it carefully before you act. Most guarantees are voided if you have unauthorized service performed. Should you be unable to immediately locate an authorized service man, you may face considerable inconvenience while you write the factory. Rather than void your guarantee by hasty action, use ice in the refrigerator to keep it cold while you negotiate for authorized service. You can get along this way, and you may save yourself a big repair bill.

You will find a discussion of mobile home bottle gas refrigerators in this same chapter in the section entitled "Facts About, And Safety Rules For Butane And Propane Systems".

Application And Care Of Mobile Home Exterior Paints

Hiring someone to repaint your mobile home is costly. You can reduce this cost considerably by doing the work yourself. It's really not difficult when you know how. Once you've repainted, you can avoid the necessity of reinvesting in a paint job every few years if you will take care of the surface. This section tells you how to paint your mobile home exterior, how to take care of the re-painted exterior, and how to take care of an exterior that does not require painting.

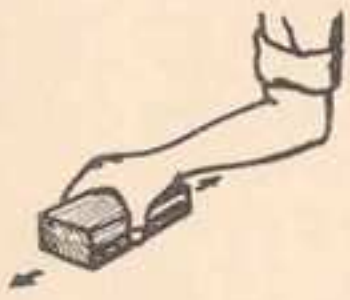
WHAT MATERIALS TO USE – Purchase the materials you require from your local mobile home dealer if he carries a line of parts, or

from a local parts house. If you do not find a local concern carrying the materials you need, you can obtain them from mail order mobile home supply houses. These firms carry paints that have been especially prepared for mobile home application. Their personnel is experienced in this line, and they are able to give you experienced advice.

The cost of the materials involved is small compared to the overall cost of the job. It is important that you get the best, and the right materials. The difference between the cost of mediocre and the best materials represents only a few dollars. It's a shame to waste your labor by putting on inferior or incorrect paints.

GENERAL INSTRUCTIONS – Before discussing the exact procedure to follow for the various types of surfaces to be repainted, here are a few general instructions:

Sanding and using steel wool. Preparation of the surface is the most important part of any paint job. It determines the smoothness of the job and the ability of the paint to adhere to the surface. Unless you have had experience in operating mechanical sanding machines, do not try to use them. Use a sanding block and a straight back and forth motion. Be careful to keep sandpaper clean. Permitting the sandpaper to clog will cause an abrasive action, often resulting in deep scratches. Therefore, use a stiff brush to brush out the sandpaper frequently. Wet sanding, which means that water is used in conjunction with the sandpaper, (you also need a special wet type sandpaper) is preferred on metal surfaces since it lessens the degree of scratching. It is not recommended for wood surfaces.



When sanding, use a sanding block and use a straight, back and forth motion.

There are various grades of sandpaper. Here are the correct ones to use. To sand bare wood, use 60, 80, 100, 150 or 220 grit or 1/0, 2/0, 4/0, or 6/0. To dry-sand metal, use 40, 60, or 80 grit. Steel wool may also be used for preparing surfaces. Medium grades are best for metals, and fine grades should be used on masonite or fabric materials. In selecting the grade of steel wool, use your judgment, based on how thick the substance to be rubbed away is and how delicate the surface beneath it. Steel wool is desirable on metal finishes since it slightly etches the surface and makes it easier for the paint to adhere.

How Much Paint To Use. The covering capacity of paint is difficult to determine. There are many factors to consider. An expert painter can cover 25% more surface with a quart of paint than can an apprentice. Light colored paints, spread over a dark surface, must be spread thicker than over a light surface. More surface can be covered by dark colors than by light. Porous materials absorb more paint. The paint, the painter, and the surface to be covered present an infinite number of possibilities. If you're looking for a rule of thumb, rely on coverage to the extent of 100 square feet per quart, but bear in mind that this may vary as much as 50%

How Long Does it Take Paint to Dry. First of all, be sure never to

paint over a wet surface. This is especially true of wood surfaces. The surface may be dry to the touch, but this does not necessarily mean that the wood is thoroughly dry. For that reason, do not paint wood surfaces until you have had a week or so of good dry weather to thoroughly dry out the wood. If you paint over a damp but seemingly dry surface, interior moisture will press through and, there being no air to dry it on the exterior, the wood will swell, blister, crack, and completely ruin an otherwise excellent paint job. Each coat of paint must be thoroughly dry before the next one is applied. In determining the correct drying time, never take the marking on the labels too literally. You must consider the humidity of the climate when you are painting and the material you are covering. If you are painting over porous materials, be sure to allow considerable additional time to dry.

How to Color Paint. It is not difficult to mix your own paint colors if you do not find the color you desire in a ready-mixed can. Most hardware and paint stores carry color in tubes for the specific purpose of adding colors to a can of paint. They also have a paint spectrum showing how to blend colors for the desired effect. The only important thing to remember on this point is not to squeeze the tube of color into the paint can. You must first thin the color in the tube with a little of the paint and stir it thoroughly. Be sure that it is mixed thoroughly before you add this to the paint can. Remember too, when you add the color mixture, to strain it with a piece of cheese cloth. It's also easy to tone down a specific color by adding it to a can of white paint. Be sure not to mix the white paint into the color. Do just the reverse. Add the color to the white paint, a little at a time, until the desired tone is obtained. When mixing colors, always mix outside. Light has a great deal to do with color, and light bulbs often result in deceiving color appearance.

Never add white paint to colored paint. Always pour colored paint SPARINGLY into white until desired tone is attained.

When to Paint. The weather has a lot to do with the ultimate success of your paint job. Here are the important "don'ts" for painting. Don't paint when there has been a sharp drop in temperature. Don't paint soon after a rain or when it looks like it will rain. The best seasons to paint are late summer and early fall when temperatures are most constant and the surfaces have had a good chance to dry.

Preparing the Paint. Paint comes in cans that are full to the rim. Therefore, it is usually necessary to have a can larger than the paint container when you first open the paint. Pour a little of the top oil (just enough to permit you to stir without splashing over the sides) into the larger container. Then, with a paint paddle, thoroughly stir the pigment in the can until the paint begins to look smooth. Then pour the oil back into the can, stirring carefully. When all of the oil has been returned and thoroughly mixed, pour the paint into the larger container and stir vigorously for a long period of time. You should then pour the paint back and forth between the two cans to make sure

that all of the pigment in the original can has been thoroughly mixed. If the paint appears to be too thick, thin slightly with thinner. Be sure to use the correct type of thinner for the type of paint you are applying. If the paint job you are going to do will require more than one quart of paint, be sure to mix all the paint required into one large container. Color may vary slightly from two cans that are marked as being the same color, and the intermixing of the two cans will assure a uniform color. You will find yourself in a mess if you do not thoroughly mix your paint. As you use the paint further and further down into the can, the color will be darker due to the existence of more pigment in the bottom of the can. Always mix your paint thoroughly. This point cannot be over-emphasized.

Pour paint into a larger container than the can in which it came and stir thoroughly.

To assure uniform color for whole paint job, mix all paint in one large container.

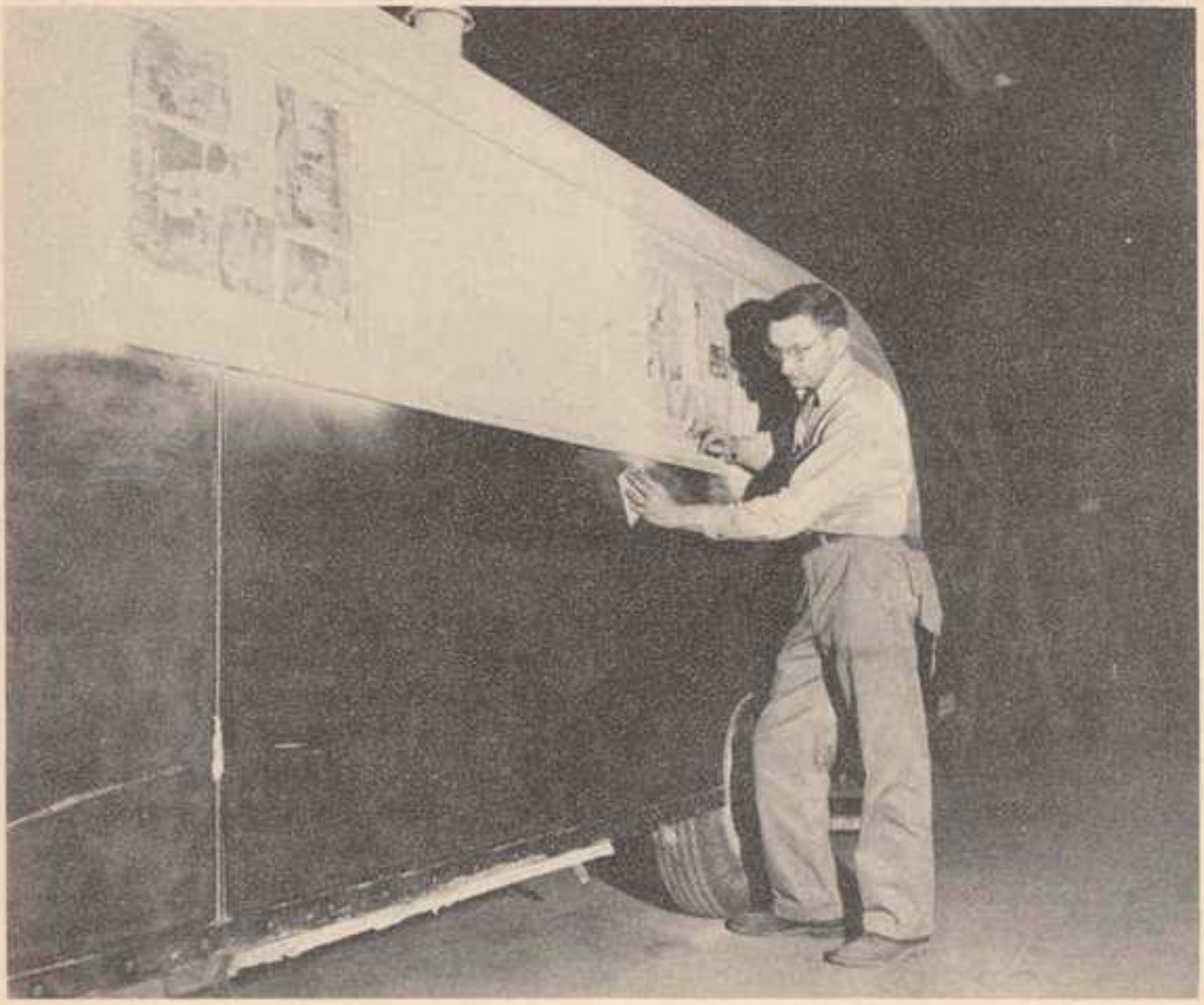
How to Brush Paint. The brush is of fundamental importance to a good paint job. Don't buy a cheap brush. Normally, a three inch brush is a desirable size for the mobile home painter. Use a two inch brush for sash trim. Before dipping brush into paint, fan it a number of times to remove all loose bristles and dirt. Nearly everyone can apply paint, but here are a few tips. Hold your paint brush as you would a fountain pen. Dip the brush about a third to a half into the can of paint and then tap the excess paint off the brush. Don't get rid of it by wiping the brush on the sides of the can. When you first apply the paint, bear heavily on the brush, using the heel. First, cover a fair amount of surface, say two square feet, and then go over the covered surfaces with finishing strokes, using long, even strokes that go in one direction only, preferably up and down.

Picture shows the correct way to hold brush.

Always clean your brush as soon as you are through with it. Never allow it to stand overnight in solvent. Clean brush thoroughly, using your fingers to see that the solvent has worked into the bristles close to the heel. Repeat this operation two or three times, and you will find your brush will last for years. And here's a tip on how to save some of your cleaning solvent. After you've cleaned your brush, let the solvent sit overnight. The paint will settle to the bottom; you can pour off the top and have clear solvent for reuse.

Clean brush thoroughly by using fingers to get cleaning solvent into bristles.

How to Use a Spray Gun. We don't recommend that a novice use a spray gun but if you want to try it, here are the fundamental principles. First of all, never use a spray gun in a mobile home court or near another coach or building. Some of the spray will land on articles that you do not desire to paint. It is ordinarily almost impossible to get a



Preparation of surface to be painted is the most important part of any paint job.

good spray job outside because of the wind. Even the slightest breeze will cause an uneven coating. If you must spray outdoors, move your mobile home where it is surrounded as much as possible and hang canvas blankets or whatever else you have to enclose it. You can usually rent a spray gun from a hardware store.

When you spray paint, thin it out to the consistency of coffee cream. Make sure that the air cap and fluid tip are absolutely clean. Otherwise, your paint will streak and sag. Fill the gun in accordance with the instructions for that type gun. Then, hold the gun six to eight inches away from the surface to be sprayed, pointing the gun at right angle to the surface. Pull the trigger and release it at the end of the stroke. The outside edges of the spray are always thinner than center section, so lap the spray one third to one half. Keep the same distance away from the surface at all times and keep the gun aimed straight at the surface. Needless to say, anything you do not want to paint must be covered by the use of newspapers and masking tape. Never leave paint in the spray gun overnight. Clean thoroughly with thinner just as soon as you have finished your spraying. Special attention must be given to the air cap and fluid tip.

How to Remove Old Paint. Paint removers are usually highly inflammable and should be used with the greatest of caution. Protect yourself when using removers. Wear rubber gloves and goggles where

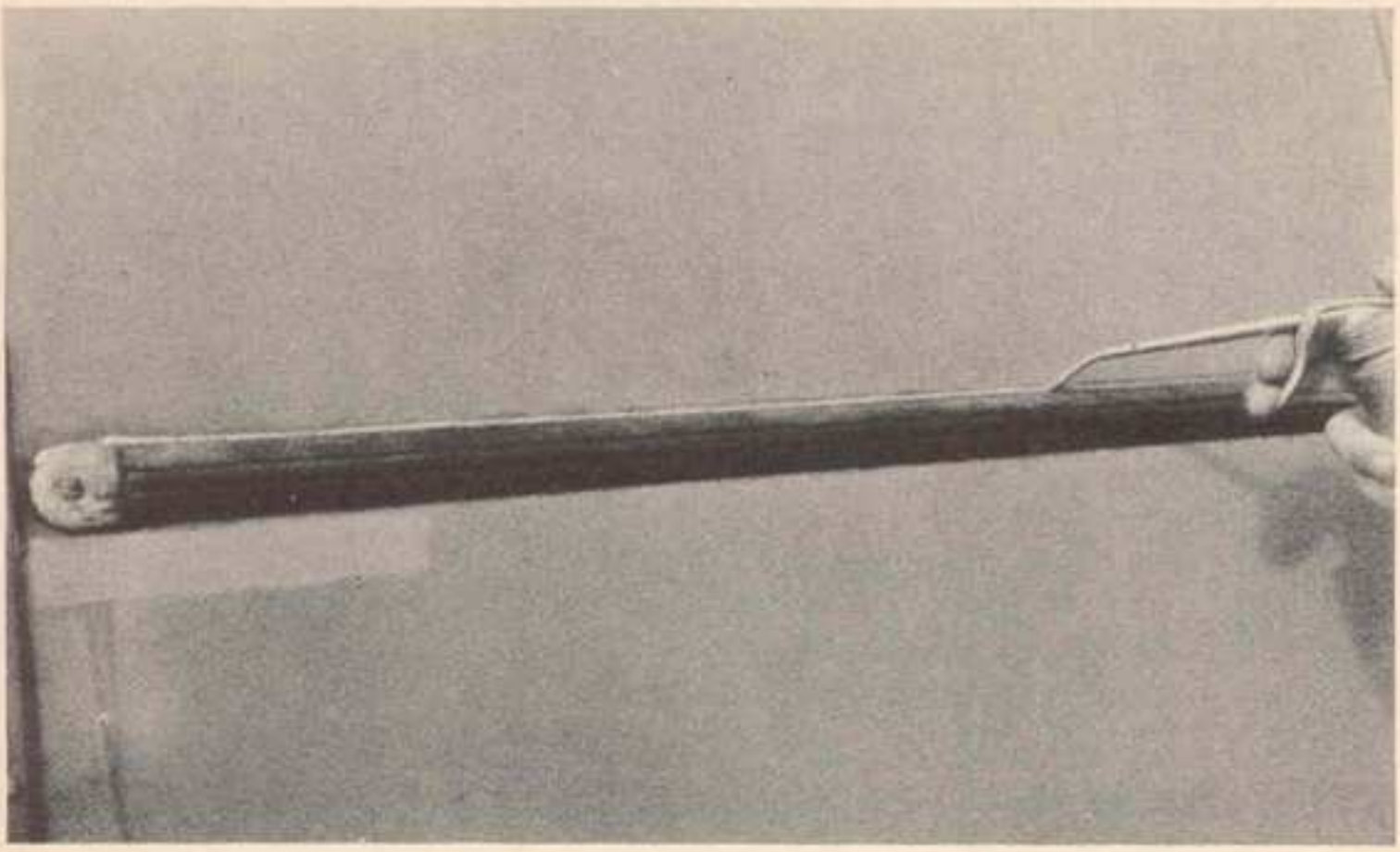
possible. Before applying remover, be sure you have an ample supply of neutralizer handy. The directions on the container will tell you the type of neutralizer to use for the remover you are applying. Usually water will suffice, so have plenty available and a large assortment of rags handy. In applying remover, do only a small amount of surface at a time. Apply liberally with a brush. A wax film soon forms after it has been applied. Do not break this film because this is what causes the paint to soften by holding the chemical reaction properties against it. Let the remover stay on as long as the directions specify. This is usually ten to twenty minutes. You will know when the remover has taken affect, for the paint begins to wrinkle or blister. After the finish has wrinkled or blistered sufficiently, take a putty knife or paint scraper and remove the old paint. If any of the old coating remains, apply another coat of remover and rub with coarse steel wool.

You may think you look silly wearing goggles and rubber gloves, but this is the safest way for an amateur painter to use paint removers.

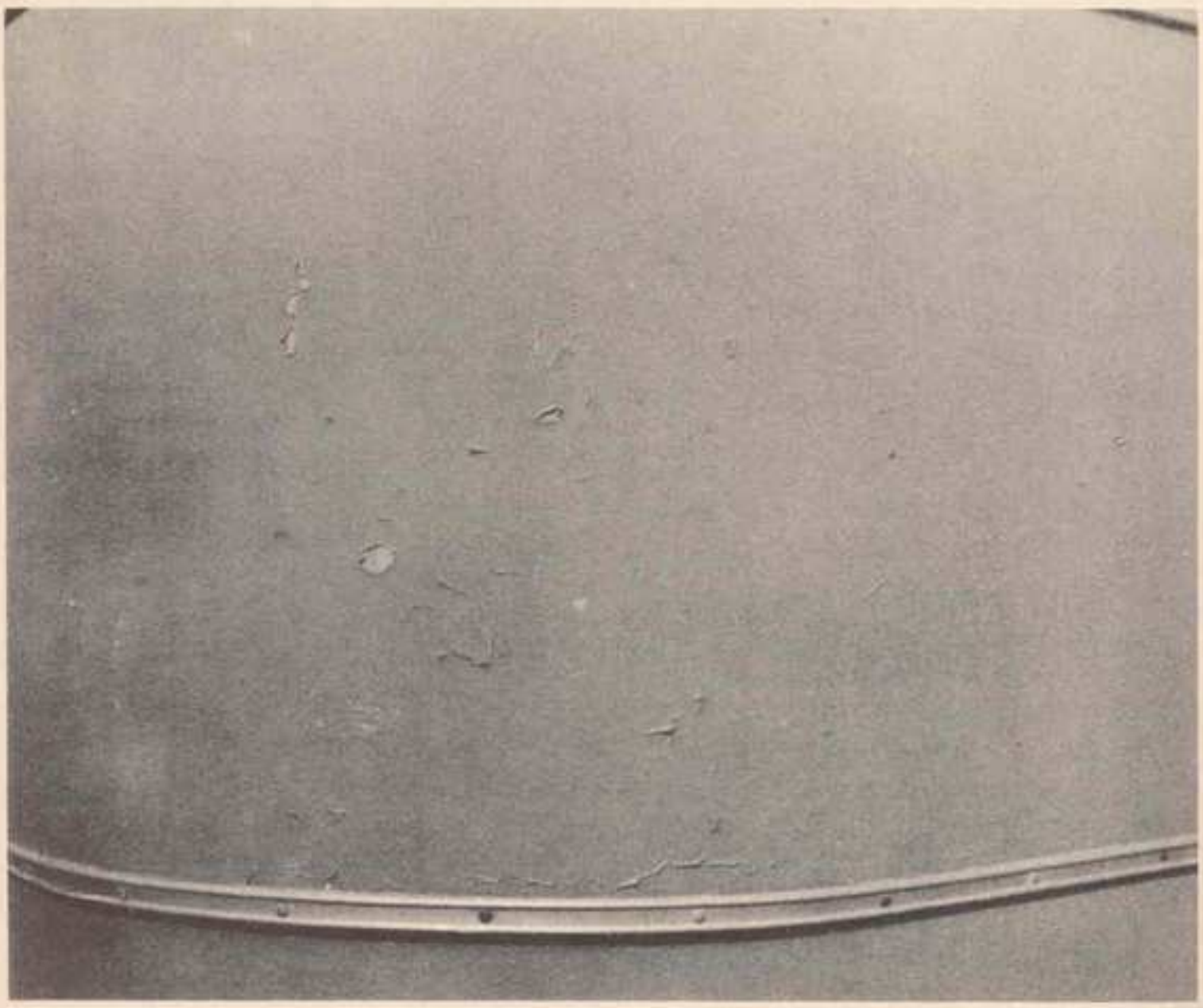
After the old coating is gone, wash the surface well with the neutralizer. If a neutralizer other than water is required, wash with water after the neutralizer has been applied. Wash at least two or three times until you are sure all of the remover and neutralizer are gone. If any is left, it will react on your new paint job exactly as it did the old one. When you have cleaned the surface thoroughly, wash it down with a weak solution of baking soda dissolved in water—about one level teaspoon to a quart of water. Then, remember to wait until the surface is absolutely dry before you paint.

How to Caulk. A good paint job requires proper caulking. Do not use regular painter's caulking compounds on your mobile home. Use the ones sold by mobile home supply houses which have been compounded to fill cracks between metal and wood or metal and metal. For the best possible job, remove old window frames, moldings, ventilators, and roof stacks. Remove old caulking with a putty knife and clean surface with a solvent. After main surface is refinished, put a good bead of caulking compound between the part to be mounted and the mounting surface; then replace. If you do not want to go to this trouble, adequate sealing can be accomplished, in most cases, by the use of Ten-X sealing compounds available from your local mobile home supply house. This material comes in a tube which is squeezed out to form a ribbon of sealer at the point where the part requiring sealing meets the surface of the mobile home.

HOW TO PAINT ALUMINUM SURFACES – If the aluminum surface has never been painted before, first clean surface with a solvent. Paint thinner is satisfactory for this purpose. When all traces of dirt and grease are gone, rub the entire surface with a medium grade of steel wool until it is covered with fine scratches. Then wash the mobile home down with pure vinegar. This will etch the surface so that primer will adhere better to the metal. Rinse well with water and wash down again with solvent. The surface is now ready for painting.



Liquid sealers are applied in a ribbon at all seams on surface.



Priming is important. Unless you prime surface, paint will soon peel.

If you are preparing a previously painted aluminum surface, proceed as follows. If the old paint is peeling, chalking, or considerably cracked, it is necessary to remove the old paint in accordance with the instructions given above for the use of paint removers. If the old paint is adhering well to the surface of the metal and is merely worn or faded, just sand rough edges to a feather edge. Wash surface with a good solvent until absolutely clean. Wherever there is bare surface exposed, it must be scratched with a medium grade of steel wool, washed with table vinegar, and rinsed well.

After your surface has been prepared in accordance with the above instructions, you are ready to prime it. Priming is extremely important in the case of aluminum surfaces. Unless the surface is properly primed, the finish coat will not adhere. Within a few weeks the paint job will start peeling. The recommended primer for aluminum surface is a zinc chromate primer. At least two coats of primer should be put on bare surfaces, and one coat of primer will suffice when you are painting over old paint that adheres already to the aluminum surface. Allow plenty of time between each prime coat for thorough drying. When the final coat of primer is thoroughly dried, use a good grade of mobile home exterior enamel.

PAINTING SHEET METAL SURFACES – The procedure for painting sheet metal surfaces is the same as for painting aluminum, described above.

PAINTING HOMOSOTE SURFACES – This material was used during the war due to the unavailability of better materials. It's a porous, cardboard-like material and is difficult to refinish. Never use paint or varnish remover. If old paint must be removed, scrape only the loose, peeling paint, and be careful not to flake off the outer surface of the homosote while you work. In sanding, use only the finest grades of sandpaper and apply lightly so that you do not fuzz the surface. After the surface has been smoothed as much as possible, clean thoroughly with a solvent and then apply a good coat of zinc chromate primer. After this has dried at least twenty-four hours, fill in all holes, cracks, and damaged areas with pure linseed oil putty. When putty has dried, sand until smooth and then apply a second coat of zinc chromate primer. Then apply one or two coats of good mobile home enamel paint.

PAINTING LEATHERETTE SURFACES – Inspect the surface carefully and locate all spots that are beginning to crack and peel. Sand these spots lightly and carefully with a light grade of sandpaper, working the hand toward the bad spot. Do not sand at the peeling or it will peel in larger hunks. Clean the surface with a good solvent and apply a good grade of mobile home enamel. Several coats will usually be required since leatherette will absorb a large amount of the paint. For best results prime surface first with zinc chromate primer.

PAINTING NON-TEMPERED MASONITE SURFACES – This material was used also during the war when it was impossible to obtain tempered masonite. It is delicate and must be handled in the same manner as homosote, described above.

It is important that homosote and non-tempered masonite surfaces be repainted just as soon as the paint begins to show signs of wear.

PAINTING TEMPERED MASONITE SURFACES – If the old surface is in fair condition, merely scrape off loose paint with a putty knife, being careful not to damage the surface of the masonite. Then, feather edge with a fine grade of sandpaper those portions which continue to adhere to the surface. Be sure, when you sand, to work on the paint, avoiding the bare surface. Sand down only to the masonite surface. If the old paint is quite thick or in quite bad condition, it may be necessary to remove it, using a paint remover. Use remover carefully on masonite surfaces. Follow instructions given above for the use of paint removers but do not leave remover on long enough for it to actually blister the paint. Leave it on just long enough to soften the paint. Take extra care to keep remover off the bare masonite surfaces. When you use your neutralizer on the remover, be careful that it does not run on to bare masonite surfaces. After surface has been prepared, apply two coats of zinc chromate primer and then one to two coats of a good mobile home enamel.

PAINTING CANVAS SURFACES – Remove old, peeling paint with a stiff brush or putty knife. Use sandpaper or steel wool to smooth the rough edges. Then, thoroughly wash surface with a good solvent. Damaged areas can be repaired, using strips of light weight canvas or pinked tape. These patches should be cemented on with a waterproof cement. Before painting surface, apply two coats of airplane dope or canvas waterproofer. First coat should be thinned approximately 50% with a thinner, and final coat must be applied straight. In applying dope or waterproofer, have plenty of liquid on your brush as you work and do not go back over covered areas. Surface may then be painted with any good mobile home enamel or aluminum paint.

CARE OF TRIM – This refers to the window frames, ventilators, roof stacks, chassis, butane tank, etc. All exterior metal parts of the coach should be painted either with a good aluminum paint or a good metal parts enamel. These paints are available from your local mobile home parts supply house. Prepare the surface for painting by scraping off old loose paint and use sandpaper to feather edge areas where paint sticks to the surface. Wash surface to be painted with a good solvent and then apply a coat of zinc chromate primer. Lastly, apply one to two coats of enamel or aluminum paint as desired. Screens should be reconditioned by cleaning thoroughly with a solvent. Then use black enamel, thinned about 30%, and apply two coats with a brush. Use paint sparingly and allow ample drying time between each coat.

Paint exterior trim with aluminum paint or a metal parts enamel.

CARE OF PAINTED AND UNPAINTED EXTERIORS – There is no secret to the proper care of exterior mobile home surfaces that have been painted. The care should be exactly that which is given to automobile paint. The surface of new coaches or surfaces which are

already in good condition can be kept in first-class shape by periodic waxings; every three to four months is recommended. The surface should also be kept washed down. If the surface has deteriorated, use any of the automobile paint cleaners before applying wax. There are hundreds of products on the market for this purpose, and any of them may be used on mobile home finishes. Surfaces that have been painted aluminum, such as the roof, the butane tank, or chassis, should be repainted at least once a year. When painted this often, very little preparation is necessary for repainting the surface. Just wash down with a good solvent to remove any wax that may have been deposited on the aluminum and give it a new coat.

A major problem is the care of unpainted aluminum surfaces. Unpainted aluminum surfaces oxidize rapidly, especially in areas close to salt water. There are many products offered that are supposed to work like magic. These products will clean the aluminum surface, but they require a great amount of effort. If you have an unpainted aluminum exterior and want to clean it, you have a big job. Buy any aluminum cleaner available at parts stores and go to work, bearing in mind that you have a lot of work ahead of you. Once you get it cleaned, don't let it oxidize again. To protect the aluminum surface from oxidixation, buy any of the many clear liquids meant to be applied on aluminum to seal the surface from oxidization. These materials should be applied at least once every six months to a year. Their application is simple. Once the surface has been cleaned of all oxidization, all you need do is wash the surface down thoroughly with a good solvent. After it has dried, brush on the clear preservative liquid. Unpainted aluminum exteriors look good, but it's a lot of work keeping them up. Where aluminum surfaces have deteriorated, we would recommend painting as the best solution. It's a more permanent solution to the problem and takes much less labor.

There are products on the market that easily clean oxidization off aluminum surfaces. They're dangerous to handle and are not offered to the public. Others, not dangerous, are difficult to apply to get good results, and require experienced applicators. Until someone develops an easy-to-apply and non-injurious aluminum cleaner, keep your surface covered with a clear sealer, applied about once every six months, or paint your aluminum and get rid of the worry.

COMMON COMPLAINTS ABOUT PAINT JOBS AND THEIR CAUSES

Paint streaks. Cause: Paint not thoroughly mixed before application.

Paint peeling off. Cause: Paint applied to insufficiently dried surfaces or to surfaces that have not been adequately primed. Surface not properly cleaned. All old loose paint may not have been removed, or wax may have been on surface, preventing paint from adhering to surface.

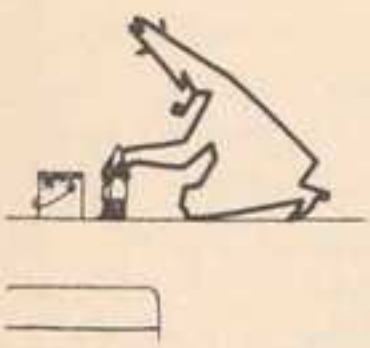
Paint chalks off. Cause: Surface improperly primed, the result being that the oils in the paint are soaked up in the surface, leaving the pigment to chalk off.

Color of paint not uniform. Cause: Paint not thoroughly mixed and all quarts used not mixed in one batch.

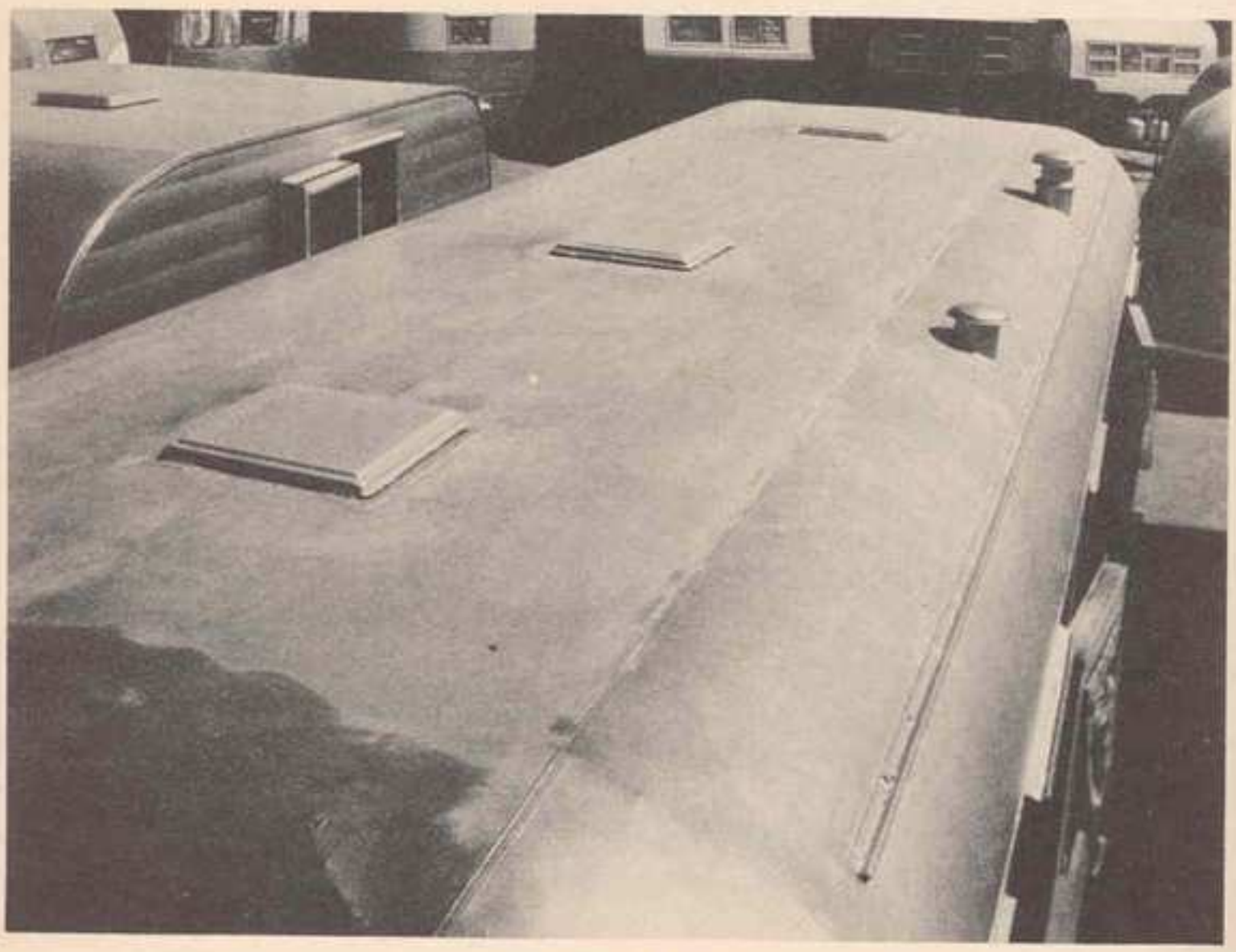
Finish coat is glossy in some spots and dull in others. Cause: Inade-

quate priming, permitting oils in finish coat to soak into surface at points where gloss disappears.

Care, Maintenance And Repair Of Mobile Home Roofs



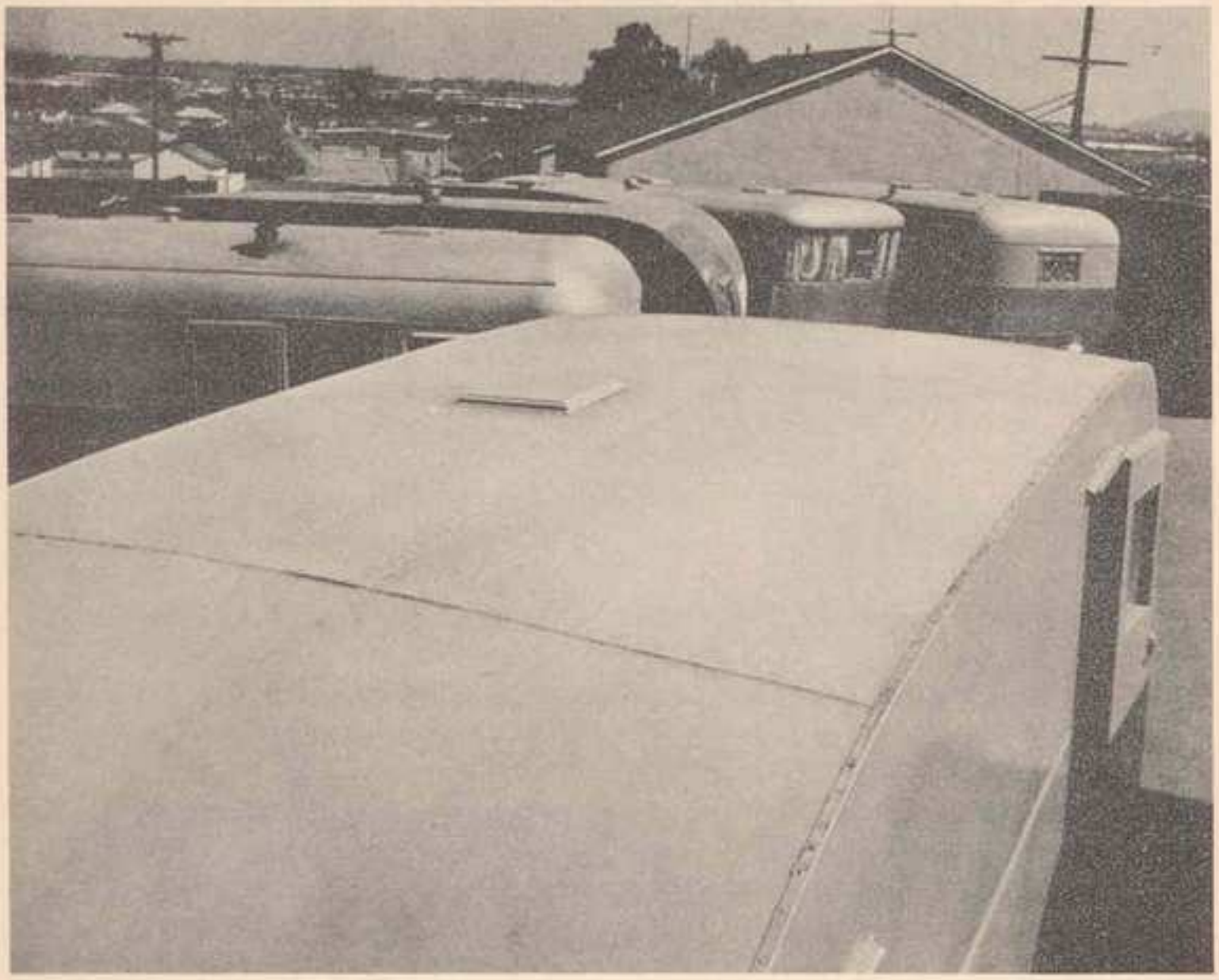
Mobile home roofs are usually sheet metal, sheet aluminum, canvas, or masonite. Occasionally you will find mobile homes, built during wartime, with roofs covered by paper roofing materials. Paper roofing materials are not desirable for mobile homes. Most manufacturers coat aluminum, steel, canvas or masonite roofs with heavy mastic roof coating. This kind of roof coating is sold under many different trade names. It is a thick, mastic, aluminum colored material. A coat, approximately the thickness of a penny, is spread over the roof – the thicker, the better. It is applied with a brush, trowel, or even a piece of wood. Mastic roof coatings are preferable to regular painting of the roof because they waterproof better, last longer and also insulate. When roofs are not coated with a heavy mastic coating, the manufacturer carefully seals all seams with a waterproofing compound and then paints it with a color to harmonize with the rest of the coach.



CANVAS ROOF

When roof is canvas, a thin layer of cotton is placed over a plywood base, and then sheeting is stretched over the cotton. The sheeting is thoroughly water-proofed and usually finished with aluminum paint or mastic roof coating.

Pictures above show easiest method for applying roof mastics.



METAL ROOF

CARE AND MAINTENANCE OF ROOFS – Roof maintenance is of critical importance. The smallest leak can cause hundreds, or even thousands of dollars' damage to the mobile home. Roof leaks can cause warped and water stained walls or cabinets and severe damp rot damage to the super structure of the mobile home itself. The best roof maintenance procedure is to use the heavy mastic materials mentioned above. A good thick application of this material provides a roof that will last from two to five years. Yearly painting of the mastic with aluminum paint will lengthen the life of this type of roof considerably. Heavy mastic roof coatings are available at parts stores everywhere. Small roofs require one to two gallons. Larger roofs require from two to five gallons due to the necessity of having a thick coat. The mastic should be spread over the roof and over ventilators and stacks so as to waterproof all points at which water seepage might occur. Mastics may be applied to metal, canvas or masonite roofs.

If you prefer not to use mastic roof coatings, your roof must be repainted at least once a year. Aluminum paints are usually used due to their reflective quality which causes them to act somewhat as an insulator. The same rules for repainting the exterior of a mobile home given elsewhere in this book apply to repainting mobile home roofs. Special attention, however, should be given to caulking roof stacks, roof ventilators, and roof moldings to assure a waterproof

seal. The best procedure is to remove stacks, vents, and molding, scrape off old caulking, and apply new. If you do not want to remove these, the next best procedure is to use a product such as Ten-X to seal all points where the roof comes in contact with the molding, roof stack, or ventilator.

REPAIRING MINOR LEAKS – Minor leaks are usually the result of inadequate sealing of roof seams, roof moldings, roof vents or roof stacks. The application of Ten-X type sealing compound to suspected areas will correct this difficulty, but if roof has not had good care, other leaks are likely to appear. It's time to apply a mastic coating or repaint the roof. Do it immediately.

REPLACING ROOFS – Because the mastic roof coating described above is available, it is normally not necessary to replace a mobile home roof completely. As long as there is a reasonable base to which this mastic can be applied, its application is the easiest, and by far the cheapest solution to any roof problem. Where metal roofs have received such poor care that they have been permitted to completely corrode, or where canvas or masonite roofs have rotted and ripped with resultant damage to the plywood subsurface, a new roof is required. Unless you are handy at repair work you better not tackle this job yourself. A mobile home repair station is your best bet. But, if you are handy with tools, the job is not difficult.

To replace metal roofs, remove roof stacks, roof vents, and roof moldings. Take out screws holding on old metal roof and remove metal sheets. If there is a plywood subsurface that has rotted out, it must be replaced, as well as defective insulation in mobile home roof framework that shows signs of deterioration. Obtain sheet aluminum or galvanized sheet metal from a metal house, cut to size and re-screw to roof, using large sheet metal screws. Overlap seams. Caulk moldings, roof stacks, ventilators, and replace. Seal all metal seams with a Ten-X type sealer. Roof is now ready for painting or application of a mastic roof coating.

To replace canvas roofs, remove roof moldings, ventilators and roof stacks. Remove all tacks holding down old canvas, remove canvas and cotton wadding under canvas. Replace any plywood and roof structure members that show signs of deterioration. Obtain new cotton wadding and new canvas. It is not necessary to buy expensive canvas. The material most widely used is an unbleached muslin sheeting. The only purpose of the sheeting is to hold the waterproofing compound. Sheeting is just as good for this purpose as canvas and is considerably less expensive. Tack new cotton wadding and canvas to roof in the same way old materials were tacked. *Caution*-- do not pull canvas tight as you tack it; leave it loose. Canvas is now tightened and waterproofed by the application of airplane dope. Airplane dope may be obtained from parts stores which sell it under various trade names. First coat should be thinned 50% with thinner. This permits it to soak down well into the canvas. Then, at least two additional coats should be applied straight. You will find that the airplane dope dries rapidly, and by the time you have gone from one end of the roof to the other, the first end will be dry enough to start

again. Now, liberally caulk moldings, roof vents, roof stacks, and replace. Roof is now ready for painting or application of mastic roof coating.

Application And Care Of Interior Mobile Home Paints

GENERAL INFORMATION – Refer to the section of this chapter entitled "Application and Care of Mobile Home Exterior Paints" and under the heading "General Information". Some information given there is important to the application of interior paints. What has already been said there will not be repeated. Here is additional general information of importance to the application of interior paint.

Before you select any color to use inside the mobile home, be sure you have seen the color inside the mobile home. The light outside or the light in the paint store is deceiving. Incandescent light over-emphasizes the reds, and produces a warm yellow glow. Fluorescent light produces a variety of color, generally with emphasis on blue and green. The amount of light also has an important bearing on color selection.

Here's how to brush varnish. Varnish must go on an absolutely clean, dry surface and one that has been made as smooth as possible. Walls must be completely free of grease. The slightest bit of dirt or grease causes varnish to blister or peal. Most varnishes will not stand up under wear and heat inside a mobile home. Therefore, use only a varnish that has been especially developed for mobile home application. Varnish should be brushed over a small area at a time. It should be spread quickly and evenly, brushing first across the grain and then with the grain. Get as much varnish on the brush as possible without dripping. Brush with even strokes and strive to achieve uniform thickness.

Here's how to apply wood fillers. Most mobile home walls are made of soft wood, and for this reason a filler must be used to obtain a natural blond or stained finish. Fillers are used to fill open grains in wood before it is painted or varnished. Fillers are usually brushed on like paint and wiped off before they are dry. Some dry faster than others so be sure to consult the label for the correct drying time. Brush fillers across the grain and wipe them across the grain with a clean, dry cloth. The object of a filler is to fill uneven surface caused by the wood grain. Therefore, wipe across the grain so the filler remains in the little grooves caused by the graining. Wipe firmly but gently. Don't press so hard your cloth permeates the little grooves and removes the filler. When filler has dried, dust the walls with a brush. A whisk broom or hair brush will do for this purpose. If the interior wood of your mobile home comes under the classification of hardwood, such as mahogany, white shellac may be used in place of a filler. Never varnish over bare wood surface.

Wipe fillers across grain.

Here are a few important safety tips you must bear in mind when painting inside a mobile home. Paints, thinners, turpentine,

It's best to remove hardware before painting.

solvents and removers are all highly inflammable. Don't smoke cigarettes around painting material, or when your hands are covered with them. Don't light a heater or stove when you are painting the interior or washing the walls with solvent. Turn off all pilot lights when painting inside the mobile home. Keep interior well ventilated while painting or using solvents. This gives heavy paint fumes a chance to get outside. Step outside yourself now and then to get some fresh air.

Before you start any type of interior painting, remove all hardware. Don't try to paint around hardware. You'll save time by removing it. Take out drawers and treat them separately.

BLEACHING WALLS, WOODWORK, OR CABINETS – Before wood can be bleached, old varnish or paint must be removed. Wood is bleached before it is filled because any substance other than wood itself bleaches a different color. Ask your dealer to recommend a bleach. Many are injurious to skin, so hands should be protected by gloves and eyes with goggles. Be sure to follow instructions on the label carefully. Cover furniture and floor with newspapers before you begin application. Liquid bleach is applied to the surface of the wood and allowed to soak until the desired color is obtained. This usually requires about 20 minutes. Then use water or a neutralizer to wash off the bleach. Follow instructions on the can and use repeated washings. Do not apply filler over bleach until you are certain wood is dry. This will take at least 48 hours and probably more. Be sure to obtain a filler that is the same color as your bleached wood. You may find it necessary to tint the filler. Your dealer can make recommendations for this purpose. After filler has been successfully applied, you are ready to varnish.

BLOND FINISHES –There are many types of blond finishes on the market. Some are made with a hard drying, wear resistant material that seals the surface and fills the wood at the same time. However, for mobile home use, a coat of special mobile home varnish should be used over this surfacing. Before applying blond finish, old varnish or paint must be removed and the surface thoroughly cleaned. If you find that wood has discolored in some places, it is best to bleach these spots. Apply bleach to the spots needing treatment and leave it on until it has reacted enough to make a spot just a little darker than the rest of the wood; then neutralize it at once. After wall is completely dry, apply a blond finish that fills and surfaces in one operation. Then, when this is hard, apply a coat of a good grade mobile home varnish.

PAINTING OVER PAINTED WOOD – Normally, it is not necessary to remove old paint from wood prior to refinishing. However, if old paint is improperly based and is chipping and peeling badly, remove it. Under normal conditions, just remove loose, scaly, cracked, or otherwise defective portions with a scraper and sand down to a feather edge. Wash surface thoroughly with thinner, fill and putty all

holes and cracks. Then sand filled areas until smooth. Shellac filled areas with clear shellac. If any bare areas of wood are showing, these must be painted with primer, or new paint will chip at these points. You are now ready to apply whatever number of coats of enamel or wall paint you desire.

PAINTING OVER VARNISHED WOOD – Paint will not adhere to varnish. Therefore, you must first remove all varnish. Then apply a prime coat, such as a zinc chromate primer. When first coat of primer has dried, fill all holes and cracks with wood fillers or caulkings. When fillers have dried, sand the filled areas and then apply another coat of primer. You are now ready for your final painting. Apply one to two coats as required.

STAINING WALLS AND CABINETS – Different types of wood require different types of stain. Therefore, consult with your dealer before purchasing the required stain for your type of wood. Stain should be thinned to the desired color. Before applying stains, make sure wood is absolutely clean, that there are no filled holes or cracks, and that all fine scratches have been removed with sandpaper. Stains bring out all flaws. New wood absorbs stains easily, but old wood tends to make it run. Use a short bristle brush with straight, up and down motions. Then brush the stain smooth, following the grain of the wood. Use a clean cloth to wipe off excess stain at once. After stain dries, fill all holes, cracks, etc. with putty that has been colored with the stain. If you cannot obtain a wood filler that exactly matches your stain, use shellac as a filler. After filler has dried, apply two coats of varnish.

CARE OF INTERIOR SURFACES –

Care of walls and cabinets – Regular cleaning of interior surfaces that have been enameled or varnished (provided you use cleansers that are not too harsh) will result in their lasting longer. Due to the small area inside a mobile home, a film deposit soon appears. This film should be removed every two or three months. Most patented wood cleaners are satisfactory for this purpose. An inexpensive cleaning solution is a good detergent soap dissolved in a small amount of water. The wall surface inside a mobile home is small compared to a house, and the task of washing walls is not too time consuming. It will also pay big dividends to wax surfaces once they have been cleaned. In some mobile homes, woodwork does not have a varnished or enameled finish. Natural dull finish interiors should be cleaned with warm water, allowed to dry, and then treated with a 50-50 solution of olive oil and linseed oil. This will preserve the finish and prevent it from drying out. After treatment has set a few minutes, surplus oil should be wiped off and the surface rubbed down with dry cloths.

Care of Floors – Mobile home floors are customarily covered either with linoleum, asphalt tile or carpeting. Carpeting must be kept free of dirt with a small vacuum cleaner. Don't allow dirt to accumulate in rugs as it results in excessive wear.

Here are the simple rules for care of linoleum floors.

1. Dust daily

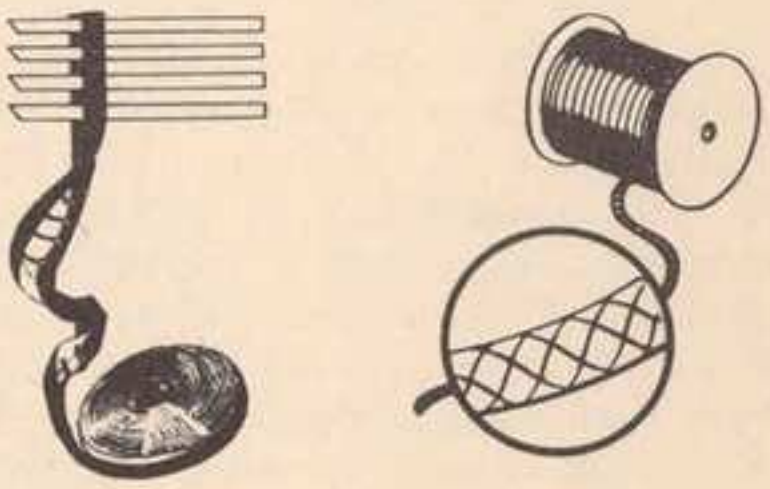
2. Use water sparingly
3. Clean with mild soap suds.
4. Apply a thin coat of wax film every two weeks.
5. Never use harsh abrasives to take off stubborn spots. Use fine steel wool. Either paste or liquid wax is suitable. Floor oils and sweeping compounds containing oils should not be used on linoleum because these materials leave a film of oil on the surface that collects dust and dirt.

Floors get heavy use in mobile homes. Wax every two weeks.

Asphalt tile floors are used frequently in mobile homes due to their water resistance. It is important that cleaners and polishes containing abrasive oils or organic solvents, such as gasoline, turpentine or carbon tetrachloride not be used to clean asphalt base floor coverings. Use products that are specifically recommended by the manufacturer for asphalt tile floors only. When in doubt, you can test any preparation by moistening a white cloth with the preparation and rubbing a small area. If the color of the tile shows on the cloth, the preparation has acted as a solvent and should not be used. Wash asphalt tile floors with soap and water. Water cannot harm this type of floor unless it is permitted to stand and seep under the edges. Asphalt tile floors should be waxed, but be sure to get the proper type of paste or liquid wax. Dealers carry waxes that are especially marked to indicate their suitability for asphalt tile floors.

Linoleum floors may be varnished with special linoleum varnishes. It is important that the varnish be applied to a clean surface. Therefore, wash floor first with mild soap and water, rinse well, and then wash floor with solvent to remove any grease or wax that may remain after the water washing. Do not attempt to remove old varnish. Two to three coats are recommended. If linoleum is not inlaid, pattern may be worn off. It is possible to repaint the linoleum under these circumstances, but never paint linoleum that has been varnished. Also, never use varnish or paint removers on linoleum. When linoleum is painted, use at least three coats.

CARE OF VENETIAN BLINDS – In most instances it is advisable to replace venetian blinds if slats have deteriorated. If deterioration is limited to tape and cord, this can be replaced easily. Mail order parts houses carry replacement tape and cord. Replacement is simple. Note how the blind is constructed as you take off the old tape and cord. If tape is just dirty but not worn, you may dye it with special venetian blind dyes. These dyes are applied to tape without the necessity of disassembling the blind.



It's easy to replace cord and tape on venetian blinds.

REPAIR OF PORCELAIN FINISHES – Chips in porcelain finishes of stoves and sinks can be repaired by porcelain repair kits, readily available at hardware stores or mail order firms. Be sure to make repairs before rust deteriorates metal at the chipped point.

REFINISHING BAKED ENAMEL SURFACES – Ice boxes, heaters, sink drain boards, etc. frequently have a baked enamel finish applied to them at the factory. There is no perfect method for refinishing baked enamel. Baking enamel requires extensive equipment. However, mobile home parts houses carry tough heat resistant paint that gives a high gloss resembling baked enamel. These finishes will make the surface almost like new and are recommended as the only practical solution to this difficult problem. Be sure to follow the instructions on the can carefully. Once applied, you can obtain a semi-baked finish on heaters or stoves, provided the heat from the appliance permeates to the outer surface. To bake finish, turn stove on at low temperature for an hour. Be careful not to allow surface to get too hot until surface has thoroughly baked.

Paint iceboxes, refrigerators, stoves with special enamels made for this purpose.

CARE AND REFINISHING OF METAL FIXTURES – Light fixtures and metal hardware should be refinished only if painted originally and the old paint is wearing off. Fixtures should be removed from wall or cabinet and the surface carefully prepared for refinishing in accordance with instructions given above for preparing surfaces for repainting. If old surface is removed down to bare metal, a coat of zinc chromate primer must be used first. Gold paints may then be used for brass or gold effects. Bronze liquids and powders are excellent for antique affects. Aluminum paint is recommended for silver finishes. Do not try to have fixtures replated. It is usually less costly to buy new ones. Brass, aluminum or plated fixtures may frequently be restored by the use of correct metal polishing formulas obtainable at hardware stores.

Brass, aluminum, or plated fixtures can usually be restored to original lustre by using appropriate metal polishes.

Facts About And Safety Rules For Butane And Propane Systems

Cook stoves in modern mobile homes, almost without exception, use butane or propane gas. These gases are often referred to as bottled gas, or, in more technical language as liquified petroleum gas, abbreviated L.P.G. The name, bottled gas, derives from the fact that they are stored and transported in steel, bottle-like cylinders. The name, liquified petroleum gas, derives from the fact that they are a by-product of the production of gasoline and when stored in steel bottles under pressure are in a liquid state. It is more expensive than natural gas. For this reason, many large, modern mobile home parks run natural gas lines to their spaces. Permanent tenants can easily convert bottle gas appliances over to natural gas and considerably reduce the cost of operating appliances. However, bottle

gas continues to be a necessity for the traveler and the vacationer who cannot depend upon the availability of natural gas. It also continues to be a necessity for most mobile home owners because natural gas is not piped into most parks. Many mobile homes are equipped with gas heating, especially in the milder climates. Mobile homes used for vacationing, traveling, or camping are often equipped with gas lighting and gas refrigeration.

PROPERTIES OF L.P.G. GASES – Liquified petroleum gases produce a good, hot, clean flame. Under pressure they are easily reduced to liquids, permitting storage in a minimum of space. The valve in the storage tank is always placed on top since the liquid remains in the bottom portion of the tank, and gas remains in the upper part. If you open the valve on top of the storage tank, gas will escape. If you turn the tank upside down and open the valve, liquid will come out. The use of the gas in the top portion of the bottle reduces pressure and permits the vaporization of the liquid in the bottom portion of the bottle. As appliances are used, this process continues until all of the liquid has vaporized and all gas has been drawn out of the tank.

There are more B.T.U.'s per gallon of fuel in butane than propane. The disadvantage of butane is that it freezes at about the same temperature as water. The freezing point of propane is much lower and for this reason it is almost universally used in cold climates. If your appliances fail to operate and you suspect freezing, pour hot water over the regulator and the tank. But first, to prevent any possibility of water damage to regulator, wrap it with a heavy cloth. Propane in its liquid state is lighter than butane. Propane weighs approximately 4.25 lbs. per liquid gallon, and butane weighs approximately 4.85 lbs. per liquid gallon. Since all L.P.G. gases are a by-product of the production of gasoline, their cost increases the further you get away from refineries. The cost of filling the conventional 5 gallon tank varies from 75¢ to $2.50, depending upon the area in which you are located.

Liquified pertoleum gases are heavier than air. Leaks in appliances or gas lines will cause the gas to collect near the floor and in corners. Leaks can be detected by a bad odor. If you suspect a leak due to the presence of a bad odor, the mobile home should be thoroughly aired out. Opening windows and vents is not enough. Circulation must be created at the floor level. The more violent the circulation, the better. Sweeping and fanning suspected areas is a necessity. L.P.G. gases, however, are no more dangerous than natural gas.

Although you may hear of an occasional explosion in a mobile home, remember, too, you hear of them in homes. Most explosions are due to downright negligence on the part of the appliance operator or to an improperly installed gas system. Gas lines *can* develop leaks due to road vibration. However, this is improbable. To be sure, check all gas lines from time to time. *Don't check them with a match.* Use a solution of soap and water and watch for bubbles which will indicate leaks. Apply to all joints or suspected areas with a small paint brush. Leaks found can usually be corrected by retightening loose

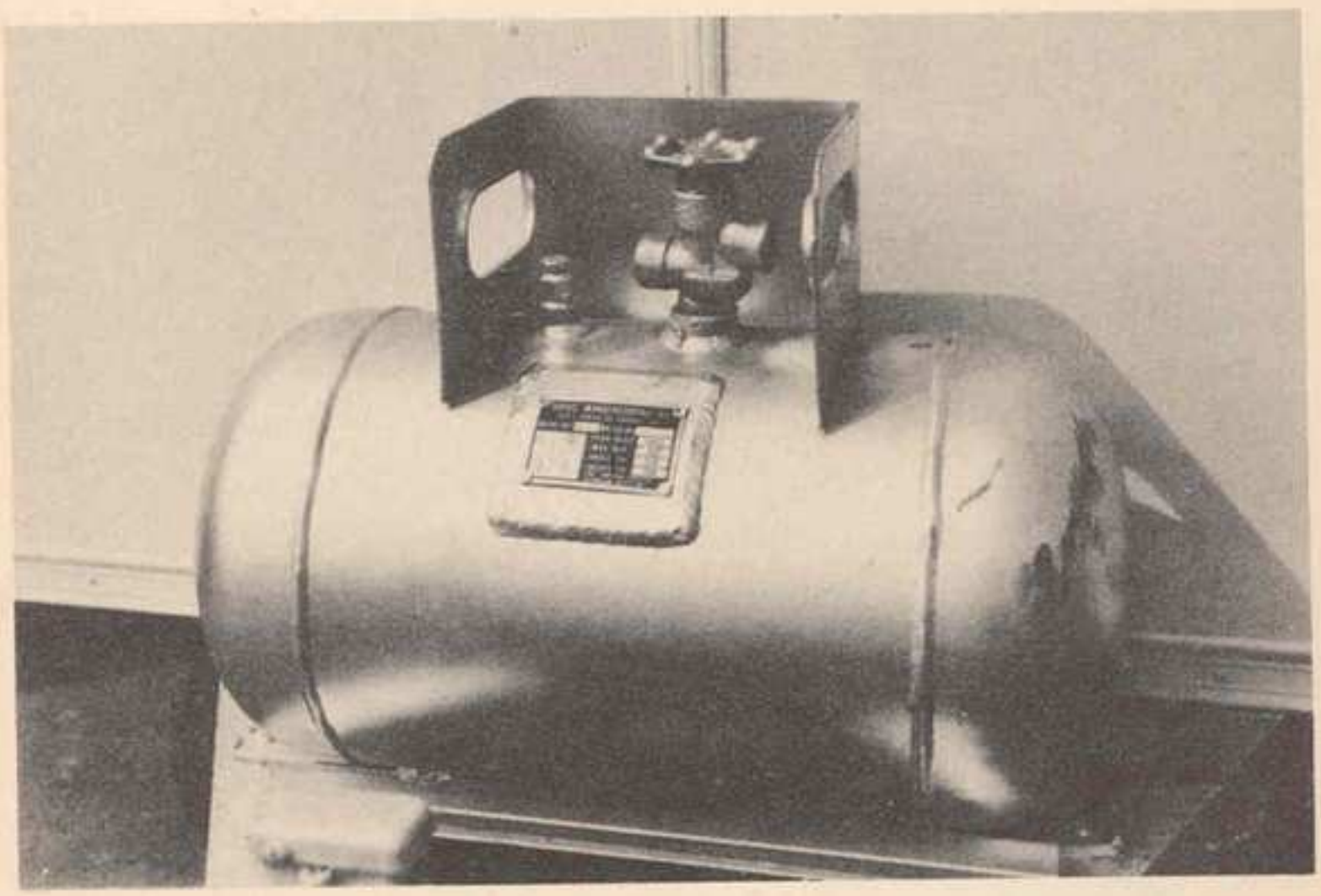
connections or with the application of plumber's dope. If you're the cautious type and want to be especially careful, you can turn the gas off at the tank when not using appliances. Of course, you can't turn off the gas if you have a bottle gas refrigerator which requires the gas to be turned on at all times. Manufacturers normally check and double check the gas system carefully before delivering the mobile home to the dealer. The dealer then rechecks it. If A.G.A. approved appliances are used in the mobile home, if you understand the principles of safe use of L.P.G. gasses and if your gas system has been properly installed, there is little need for concern. Be careful in handling non A.G.A. approved appliances. Be careful not to turn burners on without lighting, and if you detect a bad odor, thoroughly investigate before lighting a match. But, most of all, study our check list for the safe use of L.P.G. gases at the end of this chapter.

It's easy to determine for yourself how long a tank of gas will last. Every burner has a B.T.U. rating. Your dealer or manufacturer can tell you the B.T.U. rating of the burners in all appliances in your mobile home, or you can write to the manufacturer of the appliance and get it. The B.T.U. rating of any burner is the amount of B.T.U. it puts out, burning at high fire for a period of one hour. Propane gas produces 91,500 B.T.U. per gallon. Butane produces 102,600 B.T.U. per gallon. Here's an example computation for you. Suppose you are using butane and have a gas heater with a 20,000 B.T.U. rating. This means the heater at high fire will produce 20,000 B.T.U. per hour. Since a gallon of butane will provide slightly more than 100,000 B.T.U., the burner will consume at high fire one gallon in 5 hours. At half fire it would consume just half that amount.

THE L.P.G. SYSTEM – The L.P.G. system consists of the storage tank, the tank valve, the regulator, the piping, running from the regulator to the appliance, and the appliance.

Tanks are of two types, I.C.C. tanks and A.S.M.E.-A.P.I. tanks. An I.C.C. tank is a tank built to the specifications of the Inter-state Commerce Commission and may be used for transporting liquified petroleum gases in Inter-State Commerce. You can get them filled any place in the United States. The A.S.M.E.-A.P.I. tanks are built to the specifications of the American Society of Mechanical Engineers and the American Petroleum Institute. They may be filled in most states but are illegal in a few.

All I.C.C. and A.S.M.E.-A.P.I. tanks are completely safe. They are built to tremendous safety specifications and are equipped with safety valves to prevent explosion. Don't use tanks not clearly marked as either I.C.C. or A.S.M.E.-A.P.I. To fail to heed this warning may cost you your mobile home – even your life. All have a shut-off valve to control the passage of gas and all are equipped with 10% valves. A 10% valve is used when the tank is filled. It is merely a little valve with a stem going down inside the tank. It goes about 20% of the way down. This valve is open when the tank is filled. When the liquid in the tank rises to the point where it reaches this valve dip tube, liquid comes out of the valve and you know the tank is filled. The regulator is attached to the shut-off valve, and its pur-

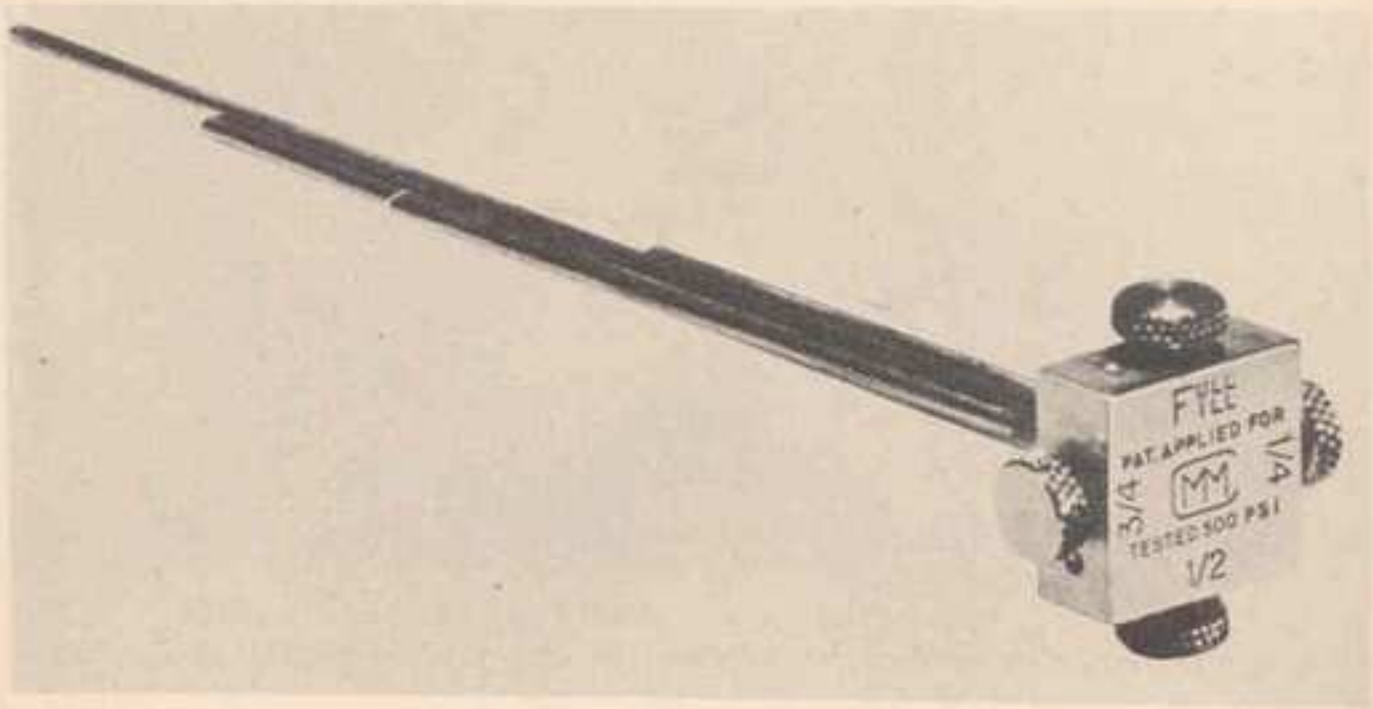


Picture at top shows how tank is marked to identify it as I.C.C. tank. Tank in bottom picture is A.S.M.E.-A.P.I. tank. Note marking at lower left of name plate. Large valve on top of tank is called P.O.L. valve. Regulator is connected to P.O.L. valve with P.O.L. spud and nut at opening on right of valve. Knob on left side of P.O.L. valve is pressure relief valve. Small valve on top of tank is 10% valve.

pose is to reduce the high pressure within the tank to the correct amount. When the gas leaves the regulator and flows into the gas system of the mobile home, the pressure is very low for safety reasons, yet sufficient to operate all appliances. Seamless copper tubing is connected to the regulator by means of brass fittings. The tubing is run to the appliance where it is again connected by brass fittings. If more than one appliance is used, tee fittings are used for gas lines. Lines of sufficient diameter to provide an adequate volume of gas are used (usually ½"). Some manufacturers use sweat fittings for lines rather than brass fittings. Should leaks develop in lines with sweat fittings, a plumber is required, or you may cut out the sweat fittings and replace them with brass flare fittings.

Your gas system requires practically no maintenance. Tanks and regulators should be kept painted, and connections should be tested after mobile home has been on the road. Should a full tank fail to deliver gas, the difficulty is probably in the regulator, and it should be replaced. Care should be taken to vent all appliances. Liquified petroleum gases produce a tremendous amount of water when burning. A gallon of liquified petroleum gas produces almost a gallon of water as it burns. To avoid condensation problems inside the mobile home, venting is important.

The biggest problem of a gas system is the maintenance of an adequate gas supply. Tanks are not usually equipped with gauges that indicate the amount of fuel in the tank. Liquid level gauges are expensive. That's the reason you don't see them installed on mobile home tanks. A float gauge costs two or three times as much as the tank itself. There is one practical gauge on the market. This gauge is a series of dip tubes that replace the conventional 10% valve on the tank. A series of valves are provided, each one of which can be opened in succession to determine the liquid level in the tank. Because the gas supply is a problem, most mobile homes are supplied

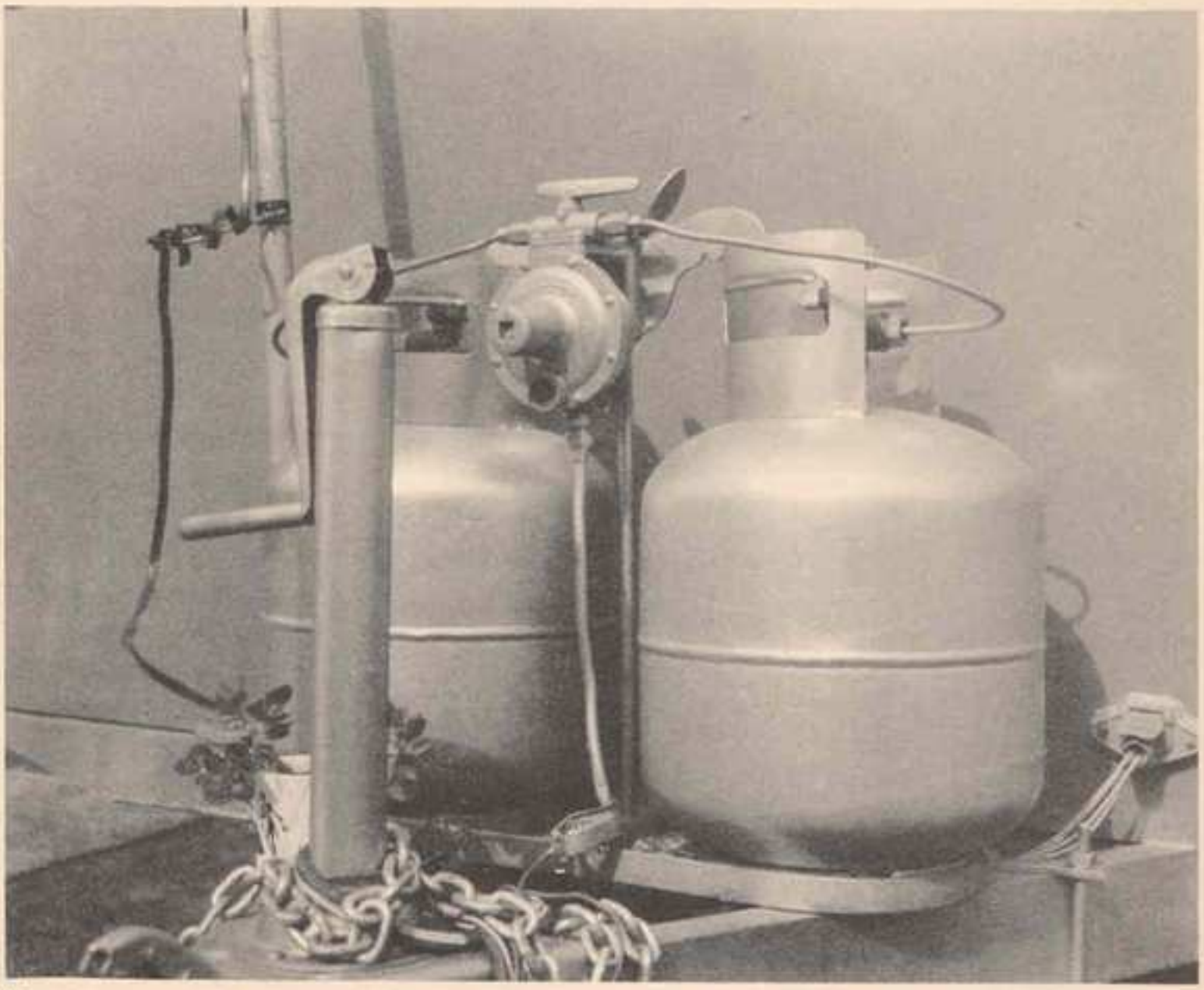


Courtesy Marsh Manufacturing Co.

This gauge replaces conventional 10% valve and determines level of liquid in tank by a series of dip tubes.

with two tanks. The extra tank actually costs nothing. The reason is this. Most gas companies have a flat price for filling a tank, regardless of the amount of gas it takes. If you have only one tank, you are forced to fill it before it is completely empty. You pay a premium for your gas. When you have an empty tank filled, you get the most for your money. A two tank system permits you to buy a *full* tank. Here's another economy tip. If permanently parked, rent a large 25 gallon tank. Gas is usually cheaper when bought in this quantity.

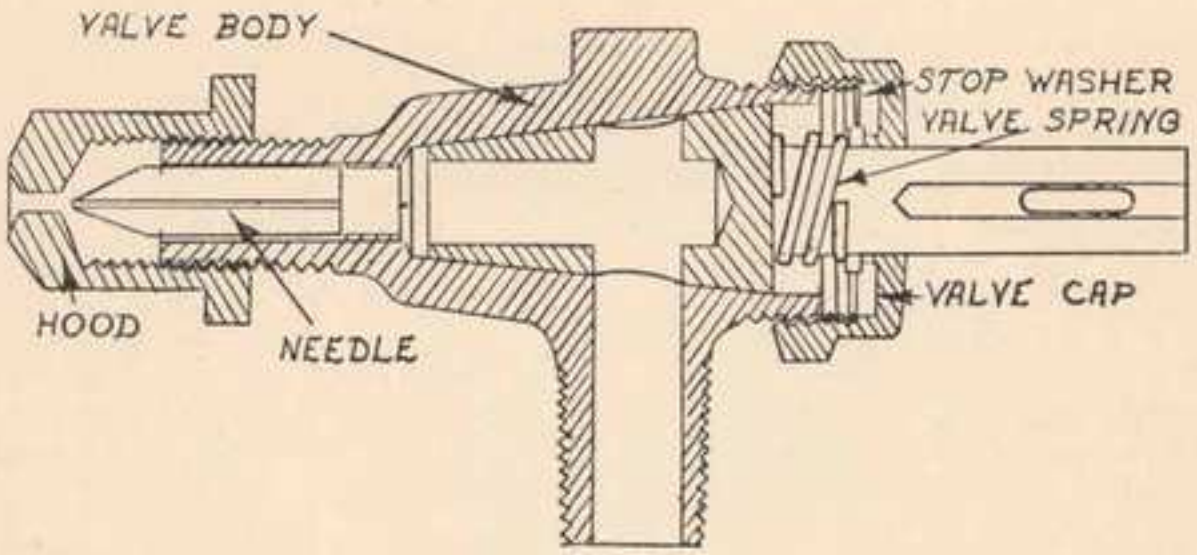
Many states require that the tank be placed outside the mobile home. For this reason tanks are conventionally mounted on the tongue of the mobile home. When two tanks are used, a rack is placed on the tongue, and the two tanks are mounted side by side on this rack. Various devices are used to connect the two tanks and pipe the gas through the regulator to the gas system. The simplest devices require you to turn one tank on and the other off. When you see that you're running out of gas, you turn on the other tank. At this time you know that the first tank needs refilling. More elaborate devices have a switch that you throw when one tank is out of gas. The most elaborate ones automatically shut one tank off and turn the other on when the first tank has been emptied. The automatic type is the



Here is a typical two tank installation. Tanks are held on "A" frame by a rack. Rack also supports regulator. Note how handle on regulator points to tank supplying gas to fuel line. When one tank is exhausted, this handle must be *manually* turned to other tank. For maximum safety, regulator should be one that *automatically* turns on second cylinder when other is empty.

safest and should be preferred. The important thing is to use a device that will let you know when one tank is empty and the other starts being used so that you can immediately refill the empty tank.

LIQUIFIED PETROLEUM GAS APPLIANCES – For safety's sake all gas appliances should be A.G.A. approved. Appliances that have been engineered and manufactured with the specific intent of their being installed in mobile homes should be preferred. All gas appliances that burn natural gas can be converted to burn liquified petroleum gases, or vice versa. All that is required is that the orifice fitting be replaced or adjusted. The orifice fitting is a small brass piece that will be found at the point where the burner contacts the valve. To find the orifice fitting it is usually necessary to just lift out the burner. It is the little hole in the end of this orifice fitting that determines whether or not the appliance burns natural gas or liquified petroleum gas. The hole must be larger to burn natural gas. On many appliances this hole can be adjusted by merely screwing the orifice fitting in or out slightly. In other cases, the old orifice fitting must be removed and a new one purchased with the proper size hole. Mobile home supply houses usually carry these.

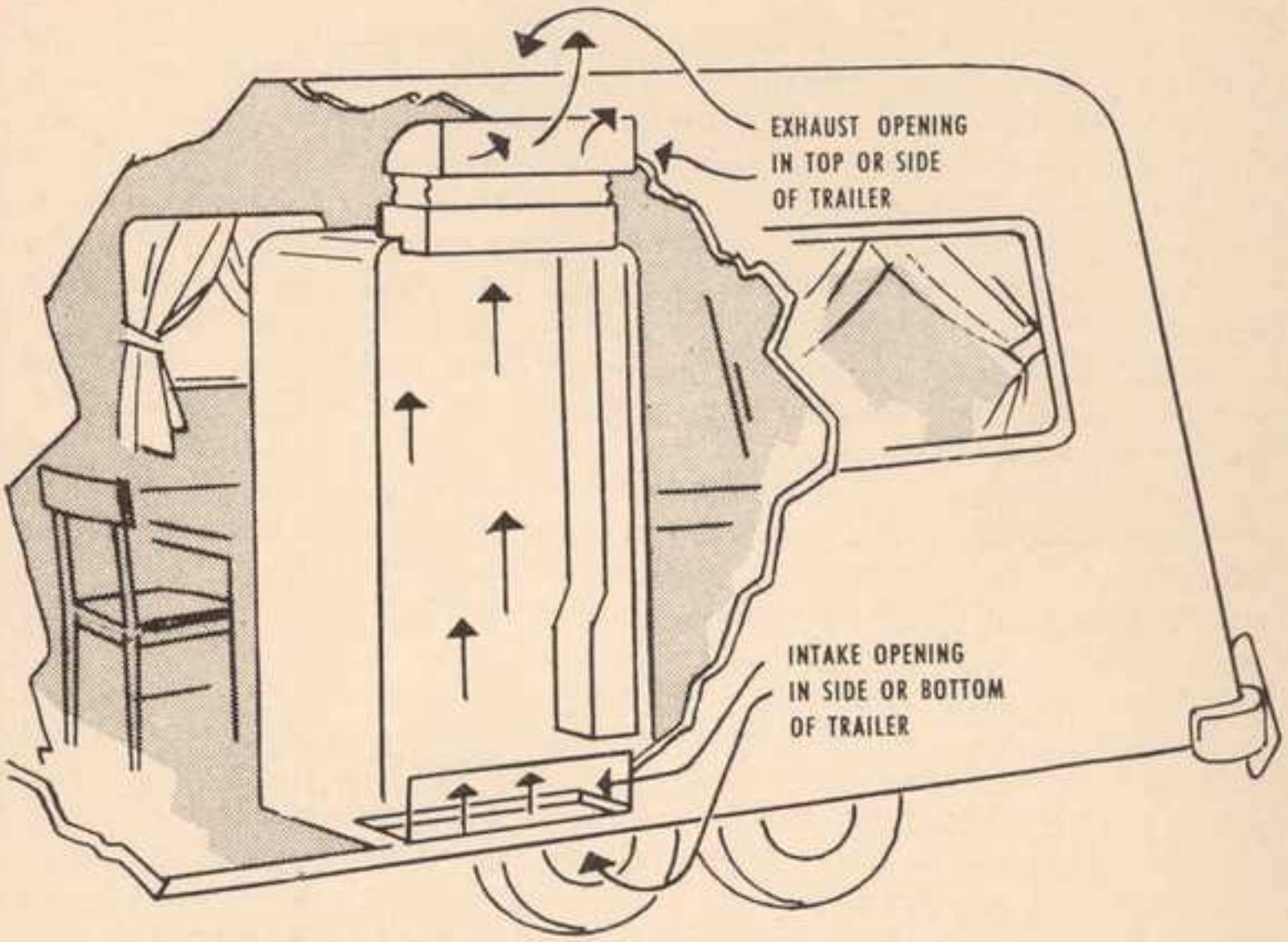


Courtesy Preway Inc.

It's easy to convert appliances equipped with valves like this from natural gas to Butane or Propane or vice versa. To change from natural gas, screw orifice fitting (hood) in to decrease opening thru which gas can pass. To change from L.P.G., screw orifice fitting (hood) out to increase opening.

Gas refrigerators are excellent for mobile home use. They make no noise. You are not confronted with the problem of an overheated motor in extremely hot climates. Servel makes a gas refrigerator for mobile homes, but it is so large that it can be used only in the largest ones. There is a very, very small liquified petroleum gas refrigerator made by Astral. At the present time there is no medium size gas refrigerator. This is unfortunate, but time will probably correct the situation. Gas refrigerators will not operate satisfactorily unless the mobile home is level. This is because gas refrigeration works on a gravity principal. The refrigeration fluid will not flow down through the tubes in the refrigerator unless the mobile home is level. It is important that gas refrigerators be properly vented. An air intake from outside the mobile home must be provided at the base of

the refrigerator to supply oxygen for the burner. The heated air must be permitted to rise and go out through a vent above the refrigerator.



Drawing shows how Servel L.P.G. mobile home refrigerator is installed with a sealed-duct system that takes air for flame from outside and exhausts it through top. Gas refrigerators MUST be vented.

Gas lights are excellent for travel, vacation, or camp units. They supply a good light and make you independent of electricity. They throw a tremendous amount of heat and must not be installed near ceilings. The usual problem with a gas light is that the mantles frequently break. Mantles supplied by light manufacturers are expensive. No. 20 Coleman gasoline mantles may be used instead. They don't break as easily, but they do not supply as good a light. Gas lights, of course, are not vented and do add to the condensation problem.

Gas heaters are used in some mobile homes. Non-vented types, however, should never be installed. Never use gas heaters that are not equipped with 100% safety shut-offs that turn off the gas if the flame goes out. Gas heaters equipped with 100% shut-offs and pilot lights can be used in conjunction with thermostatic control units. Gas heaters are not practical in cold climates where it is necessary to have heat on a 24 hour basis. The cost of L.P.G. is too high. If gas heat is used in mobile homes in mild climates and the mobile home is large, several heaters are normally used. Gas heat furnished by floor furnaces, wall furnaces, or space heaters usually

requires the installation of a heater in the front *and* back part of the large mobile home. An exception to this rule is a large gas furnace with an air ducting system to transfer the heat to the desired parts of the mobile home.

Oil heaters can be converted to gas heaters. A conversion burner is placed in the oil heater fire pot. The important consideration is to make sure you get a burner with a sufficient B.T.U. rating to heat the mobile home adequately. The burner should also be equipped with an automatic shut-off valve and a pilot light. Such burners can be operated from a thermostat. Conversions of this type, when fuel cost is an important consideration, are made only for milder climates. If a conversion is made and you move to a cold climate, it is possible to burn oil in the oil burner even though the conversion has been made. See section in Chapter VII on heaters for more information on conversions.

Gas hot water heaters for mobile homes are a development of very recent date. There are many good models on the market. Make sure that you purchase an A.G.A. approved heater and that the installation is vented. Make sure, too, that you buy a heater with adequate capacity for your hot water needs.

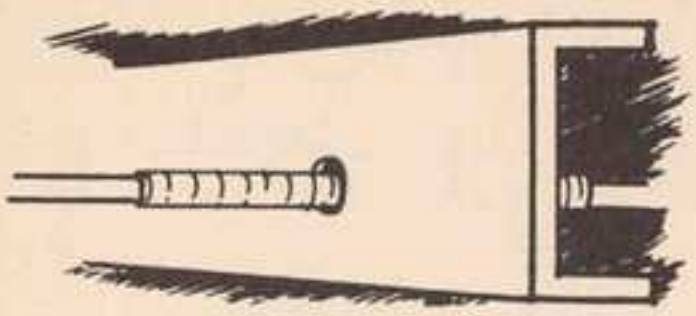
RULES FOR THE SAFE USE OF L.P.G. – Unfortunately, not all manufacturers of mobile homes are thoroughly familiar with proper procedure for installing an L.P.G. system. The rules that follow are given to help you check the L.P.G. system in the mobile home you buy, and to help you operate it safely once you have determined that it is correctly installed.

1. Fuel lines must be supported and protected to prevent possible leaks due to vibration or road damage. Lines must be fastened securely under mobile home floor every 2 or 3 feet. Fuel lines that pass thru holes in frame cross members should be shielded in electrician's loom, taped to the tube. Lines should be protected with a rubber grommet where they pass through walls or floors. Lines should be kept out of the way of flying stones and moving parts. They should be kept *inside* "A" frame of mobile home chassis. Lines should be below floor . . . . outside of, and below insulation or false bottom.

2. Only approved tanks should be used. This means tanks clearly marked I.C.C. or A.S.M.E.-A.P.I. Tanks must be equipped with 10% valves and P.O.L. valve equipped with pressure relief valve.

3. Tanks must be mounted outside mobile home and with pressure relief valve pointing *away* from mobile home. Exterior installation is important in preventing a possible explosion due to mobile home being filled with gas caused by a leaking tank or the release of gas from an overfilled tank through its pressure relief valve. Pointing pressure relief valve away from mobile home prevents tank from acting as a torch in case of fire. When fire occurs, pressure in tank causes gas to escape through pressure relief valve. Escaping gas burns, and it will add to fire problem if it is pointed toward mobile home.

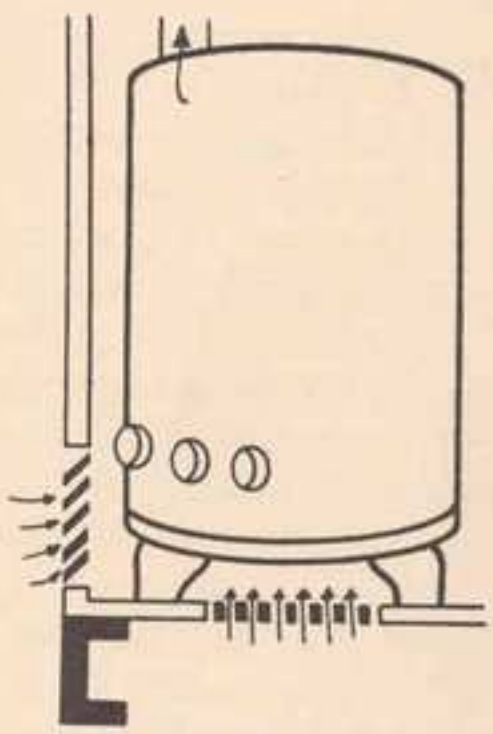
4. Appliances should be A.G.A. approved . . . . should be equipped with 100% shut-off and pilot light.



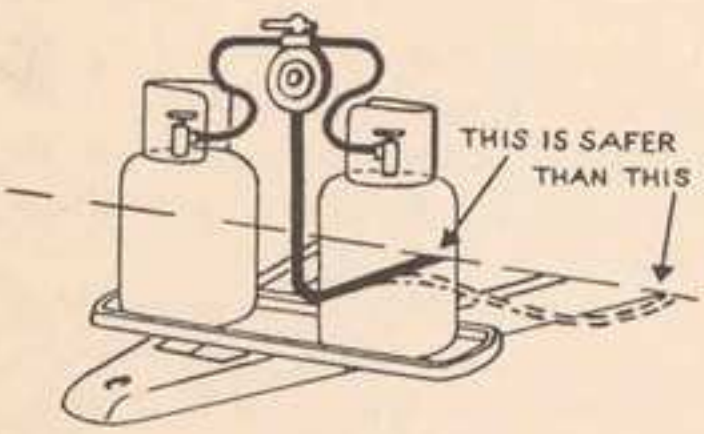
Fuel lines passed thru holes in cross members should be shielded in electrician's loom, taped to the tube.

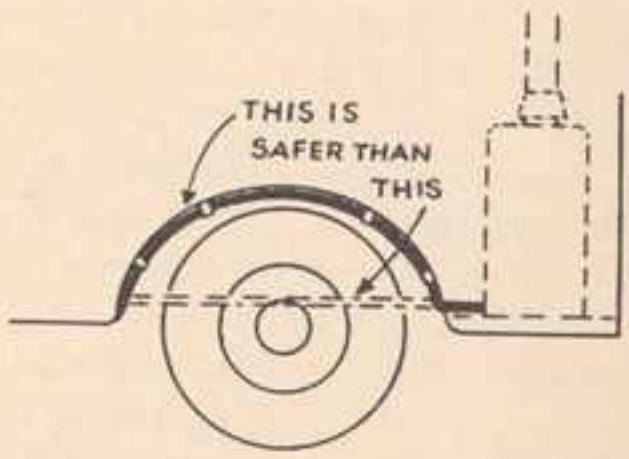
Fuel lines should be fastened securely under floor every 2 to 3 feet.

Fuel lines must be protected by rubber grommets where they pass thru the floor.



Combustion air for water heaters and comfort heaters should come from outside (thru wall or floor), and these appliances should be vented.

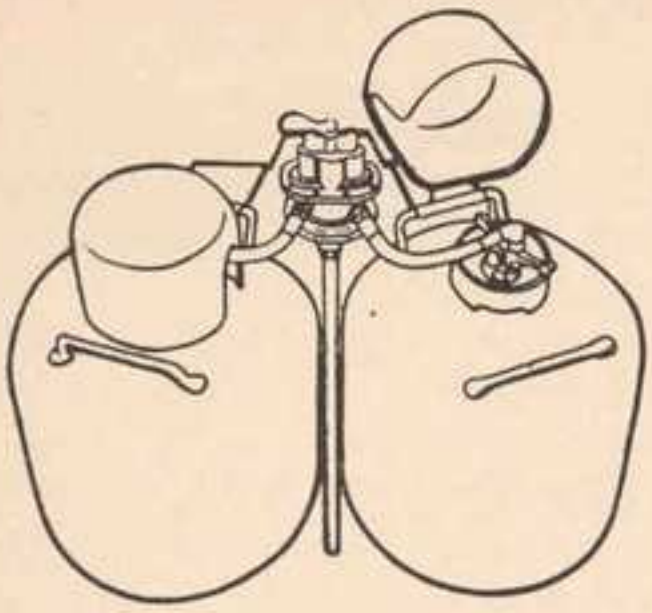


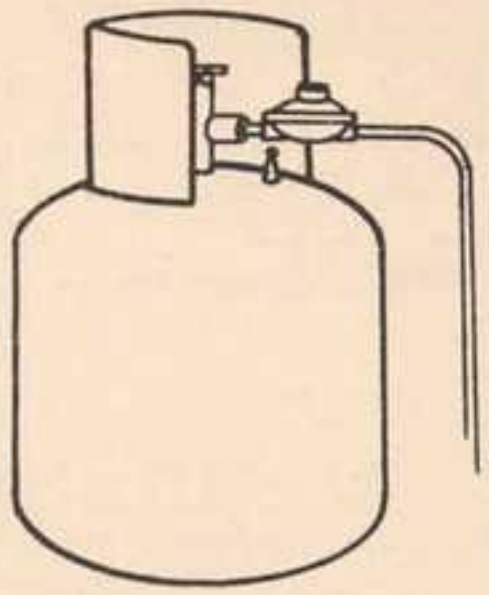


Fuel line must be kept out of the way of flying stones and moving parts. It must be inside "A" frame, supported, not suspended, if it passes over the axle. Unsupported fuel lines present a serious hazard.

Pictures courtesy Butane-Propane News

Watch these details to prevent mobile home accidents . . . . . .

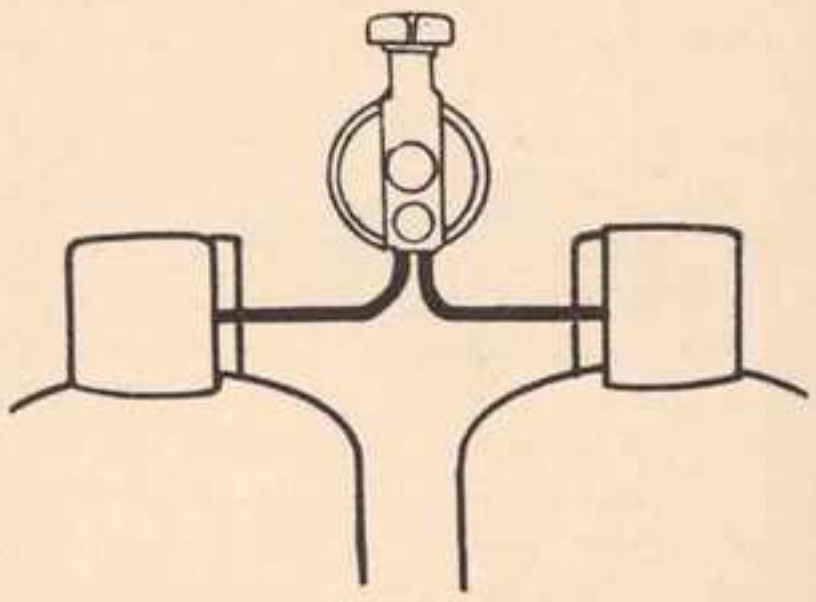




Courtesy Butane-Propane News

Use double cylinder installation instead of a single cylinder. It's safer and you'll enjoy better service.

5. All appliances, especially heaters, water heaters, and gas refrigerators, should be vented so as to exhaust fumes to outside of mobile home. Heaters (water and heating) and gas refrigerators must draw air used for combustion from outside mobile home.

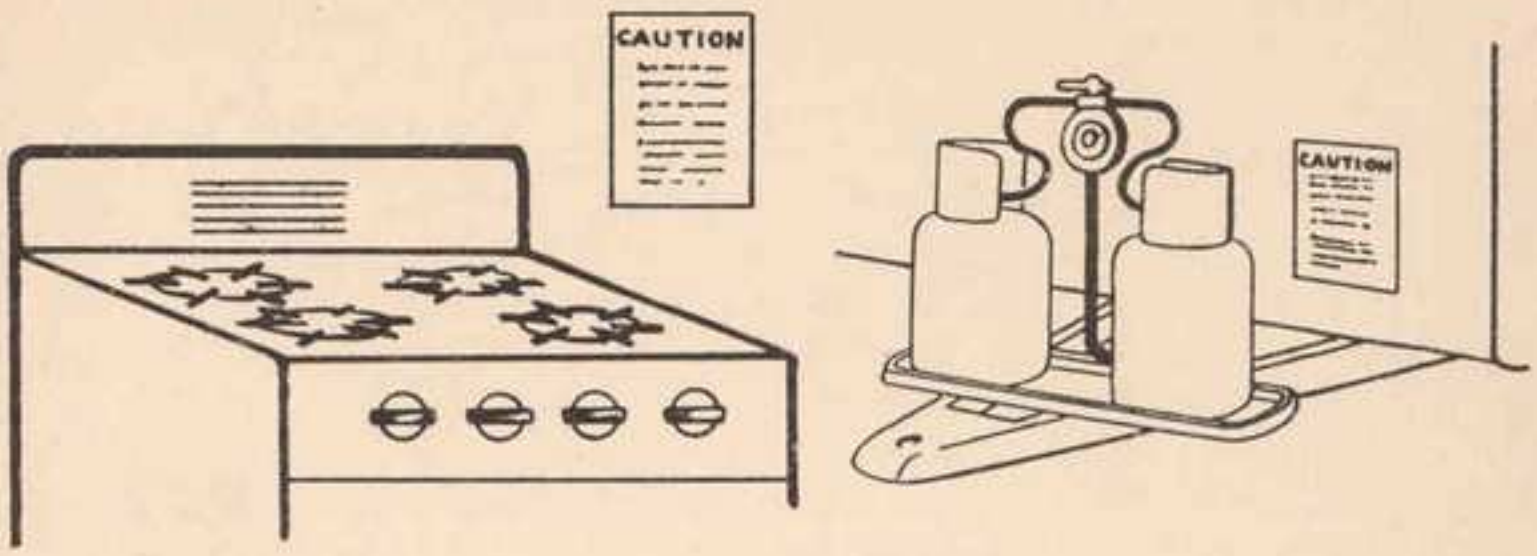


Courtesy Butane-Propane News

Appliances with continuous burning pilots should only be used with dual cylinders and automatic changeover regulators.

6. A common cause of fires is this. Appliance is burning, and suddenly tank becomes empty. Mobile home owner, noting flame going out, arranges to have tank refilled ....or goes outside and turns a manual switch to obtain supply from a second tank. But he forgets to turn off appliance burners before he permits the new supply of gas to enter the L.P.G. system. Result, by the time he returns to appliance to relight it, gas has accumulated and an explosion results. To prevent such catastrophes, follow this simple safety rule. *Turn off all appliances before opening tank valve to allow gas to enter L.P.G. system.* As an added safety precaution, use a two tank system with an automatic throw-over regulator and be sure to refill exhausted tank before other tank is emptied.

7. Do not allow gas company to over-fill tank. Tank is supposed to be filled only 80%. That's why tank is equipped with a 10% valve. If tank is over-filled, there is no room in tank to allow for expansion of its contents due to a rise in temperature. Should temperature rise, excess gas will escape through pressure relief valve, causing a dangerous accumulation of gas outside tank. If you're home when pressure relief valve pops, you'll know it has popped. It makes



Courtesy Butane-Propane News

People forget to be safe. Post a sign at tank rack and beside appliances to remind you to turn off appliance valves before opening a refilled cylinder valve.

a loud noise. The safest way to fill a tank is by weight, for this eliminates any possibility of over-filling. Far too many gas service companies fill the tank on the mobile home "A" frame, making no effort to weigh contents. Some firms do not even bother to open 10% valve. Tanks are filled to capacity, leaving no room for expansion. *Insist that your tank be filled by weight, even if it costs you more money.*

8. When tank is empty, keep valve closed. An open valve on an empty tank will permit moisture laden air to enter tank. Moisture may condense within tank. When tank is refilled, moisture will remain. When moisture reaches regulator, it will freeze in regulator nozzle if climate is below freezing. A frozen regulator nozzle will block passage of gas to appliances. For similar reasons, P.O.L. fitting used to connect regulator to tank should be capped to prevent dirt or moisture from entering the regulator when tank and regulator are not connected. Foreign matter in a regulator can prevent its functioning.

9. Don't tinker with any part of your L.P.G. system. When you have trouble or suspect trouble, call in an expert.

10. When you move mobile home, always turn gas off at tank valve.

The Mobile Home Electrical System

A few months ago you may have noticed a two-page ad in all of the mobile home industry publications depicting in pictorial form the history of mobile home development from the earliest 8-to-10 foot overnight sleeper for hunters and fishermen to the ultra-modern 45-to-50 foot mobile mansions that are now common in our modern courts all over the country. This development from the handmade "jerry-built" backyard model to the beautiful production line version took place in the short space of 20 years. In short, the mobile home industry did, in approximately 20 years, essentially the same thing that it took the stationary housing industry 150 years to accomplish. You are now able to live in your mobile home with the same conveniences and the same comfort that you would enjoy in the most modern stay-

put type of housing. Add to these the advantages of mobility and compactness, with the attendant lessening of housekeeping chores, and you have living at its simplest, most economical best.

In all of this evolution and development, one of the last phases of mobile home construction has been the modernizing of the 115 volt electrical wiring system. Within the past two years, however, there have been great strides in this particular field, and a large percentage of the new mobile homes now on the American market have an electrical system which is as modern, as adequate, and as safe as the wiring in the average 4 or 5 room house.

To this end, a committee was selected by the National Fire Protection Association (this is the association responsible for the compilation of practically all our safety regulations, including the National Electrical Code), which consisted of representatives of the mobile home industry and some of the most prominent men in the field of electricity and practical application of wiring methods. This committee presented to the association in 1952, a set of regulations governing mobile home and mobile home court construction, and these suggestions were accepted by the National Association and are being used by local authorities in setting up ordinances governing mobile homes and their use. These standards are known as N.F.P.A. Bulletin No. 501 and are titled "Standards for Fire Prevention and and Fire Protection in Trailer Coaches and Trailer Courts" and are published by the National Fire Protection Association International, with offices at 60 Batterymarch Street, Boston 10, Massachusetts.

Because of the importance of the wiring system in your coach, it would be well for you to know what to look for when purchasing a coach or buying a replacement for the one in which you now live. For the purposes of this discussion, then, we will divide this section into three parts headed, "Your Service Entrance Equipment", "Your Interior Wiring" and "Maintenance Tips."

YOUR SERVICE ENTRANCE EQUIPMENT – The service entrance equipment is the cord with it's connectors on each end, used to connect the mobile home to the electricity furnished by the mobile home park. Any old cord *won't* do. Here's why.

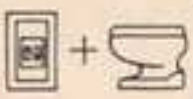
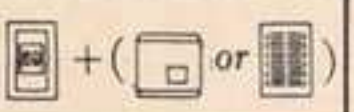
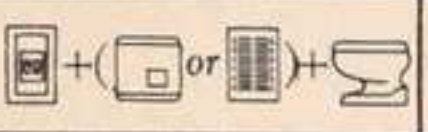
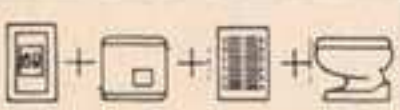
First, let's learn something about the electrical load that your coach will draw from the park wiring system with normal everyday usage. A formula for this is contained in Section 2203 of your National Electrical Code, but rather than bother you with formulas, you will find below a table which will help you determine your total connected load. The number you arrive at by using this chart is the connected load of your mobile home in amperes. *(See next page.)*

The standards provide that your coach should be furnished with a suitable service entrance cable by the manufacturer, and one which is adequate to carry the connected load of your coach.

You are, no doubt, aware of the fact that if you try to push too much electrical current through a wire, it will generate heat within itself which, in turn, builds up the resistance of that wire to the passage of current, thereby causing a loss of voltage or wasted electricity. This results in inefficient operation of your equipment or failure

MOBILE HOME ELECTRICAL SYSTEM

To determine your total connected load, select the line that describes all the permanent equipment in your mobile home. Follow this line across to the column listing your mobile home length. That square indicates the amperage required for use of all your electrical equipment at one time.

permanent equipment in use	*length of trailer in feet* 19	21	23	25	27	29	31	33	35	37	39	41	43
	18	18	19	19	20	20	20	21	21	22	22	23	23
	21	21	21	22	22	23	23	24	24	24	25	25	26
	27	27	28	28	29	29	29	30	30	31	31	32	32
	30	30	30	31	31	32	32	33	33	34	34	34	35
	36	36	37	37	38	38	39	39	39	40	40	41	41
	39	39	40	40	41	41	42	42	43	43	43	43	44

key:

 standard circuits

 1000-watt water heater

 300-watt electric toilet

 1000-watt radiant heater

Courtesy Hub Industries

of this equipment to operate at all and, very often, is the prime cause of extremely high electric bills.

Underwriters' Laboratories has, by a complicated testing system, arrived at the current-carrying capacity of conductors of various sizes. For your information, we list here the more commonly used conductor sizes and their current-carrying capacity.

Conductor Size	Amperes
#14	15 Amperes
#12	20 "
#10	25 "
# 8	35 "
# 6	50 "

Now, by referring to the chart above, let us take a representative coach, 35 feet in length and having installed your standard electrical circuits, a 1000 watt water heater and a 300 watt electric

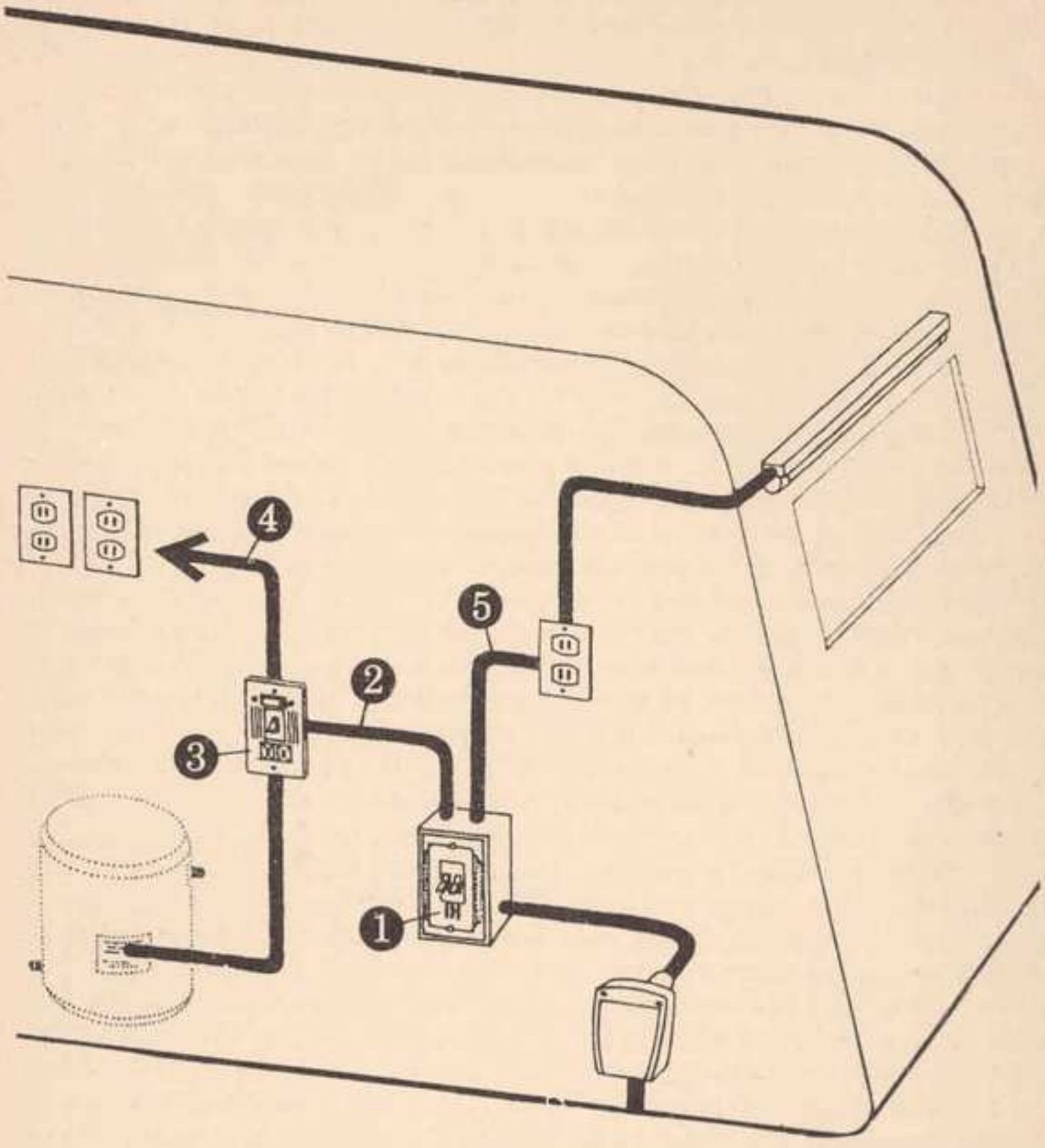
toilet, you find this category listed in the fourth horizontal line down from the top. By following that along to the right under the column headed "35", you will see that this coach has a connected load of 33 amperes. You can see, also, that it would be very impractical to attempt to carry this load on a #14 or a #12 conductor. A #10, also, would probably set up enough resistance to cause you considerable voltage drop. A #8 conductor is required to feed this coach adequately in order that you may obtain the maximum usage of your electrical equipment.

The coach further requires that all connectors used for this purpose shall be Underwriters' Laboratories approved, shall have a suitable rating and shall be weatherproof. This is why so many of the coach manufacturers now are building into their coaches at the time of manufacture, a heavy-duty cable with molded-on rubber connectors. Furthermore, this service cable should contain a grounding conductor which is usually a third wire built into the cable, and may be either bare or insulated. This wire would terminate in a third prong of the connector at the end of the cable and provides a path to ground for all stray currents, giving you full protection from shorts which may occur in your coach. This cable will enter the side or rear of your coach through a cable hatch or other suitable device and will terminate in the service entrance switch which may be located under the sink or in a wardrobe closet. Let us follow the cable into your coach, then, and see what we should look for in the Interior Wiring.

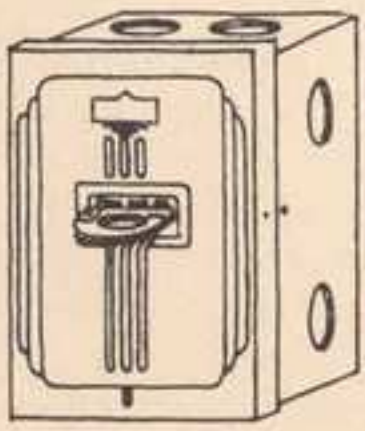
But first let us emphasize the importance of grounding your mobile home. Your very life may be at stake. Should a short develop that charges the mobile home body with stray current, you can get a real jolt. It's not hard to imagine the seriousness of arriving home some wet, rainy night and reaching for the door handle of a mobile home charged with electricity. *You become the wire to the ground.* A serious accident can result. But when a coach is properly grounded, this kind of accident cannot occur. If your mobile home has been built in the last few years, a grounding system has probably been built into the entrance cable. It's easy to check your cord. Make sure it has *three wires. Make sure the third wire is connected to the ground at the park outlet.*

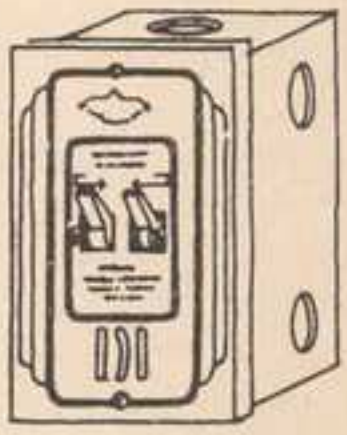
There are many mobile homes still in use that were built before modern wiring methods were adopted by most mobile home manufacturers. There are also many small units still being turned out for for travelers and vacationers that do not have a grounding system built into them. If you own one of these units, don't overlook the importance of grounding it whenever you hook up to 110 volt current. Here's how to ground it. (1) Use 14 gauge copper wire, or larger, and connect the mobile home chassis to an underground water piping system, or (2) connect chassis to a 3/4" diameter metal rod (preferably copper coated) driven 8 feet into ground, and be sure to make connection between rod and coach by using the same size wire specified above.

YOUR INTERIOR WIRING – There follows a diagram and explanation of a typical mobile home wiring system:



Courtesy Hub Industries

A 

B 

(1) This is your main switch. If it looks like drawing A, it has at least two fuses in it. One is a 20-ampere fuse and controls the "appliance" circuit. The other fuses are usually 15 amperes, and control lights and general purpose outlets. If it looks like drawing B, it has no fuses but makes use of "circuit breakers". These are automatic switches that open whenever a short circuit, a ground, or an overload endangers your wiring or equipment.

(2) This is the "appliance circuit" lead. It usually goes directly to the water heater switch and then to the water heater and other receptacles.

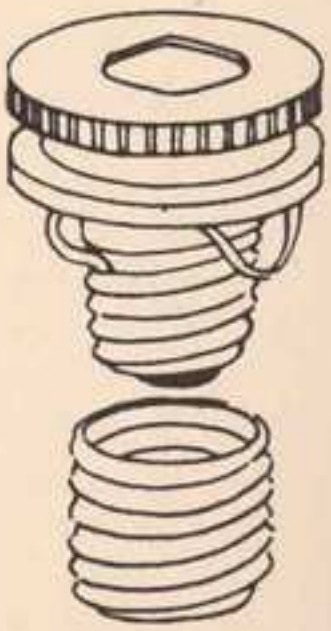
(3) This is your water heater switch. You can shut your water heater off when you leave your home; it usually has a soft white glow light that lets you know whether your switch is on or off (the pilot light on this switch does not indicate the operation of your water heater thermostat but glows continuously as long as the switch is in the on position). Also, this device usually has a receptacle for your toaster, iron, or waffle iron. It is engineered and built especially for you.

(4) This is your appliance circuit extension. In addition to your water heater, your mobile home manufacturer sometimes has some other outlets on your appliance circuit. They will be fed thru this extension line from your 20 ampere fuse and will usually comprise the receptacles in your cooking and dining area.

(5) This circuit and all others like it are known as "general purpose circuits". Your lights, receptacles in the living and sleeping areas, refrigerator, heater blowers, etc. are on these circuits. A bathroom heater .... and even an electric toilet ....are sometimes built into the very deluxe mobile homes. This equipment would very likely be fed thru another "general purpose circuit". There may be as many as three of these 15-ampere circuits in addition to your 20-ampere appliance circuit.

Now we have given you some general information about the service entrance equipment you should have in your modern coach and some information about your interior wiring, so now we will try to give you some Maintenance Tips.

MAINTENANCE TIPS – "When a fuse blows" in your electrical circuit, it has not "failed" (which is the common expression), but has been *successful* in doing the job it was designed to do. Whenever a fuse blows in one of your electrical circuits, it means that there is trouble somewhere on the circuit. It may be one of three things: a *ground*, a *short-circuit*, or an *overload.* Fuses or circuit breakers are designed to disconnect the circuit under any of these conditions. These are the safety valves that protect your home, its equipment, and even the lives of your loved ones.



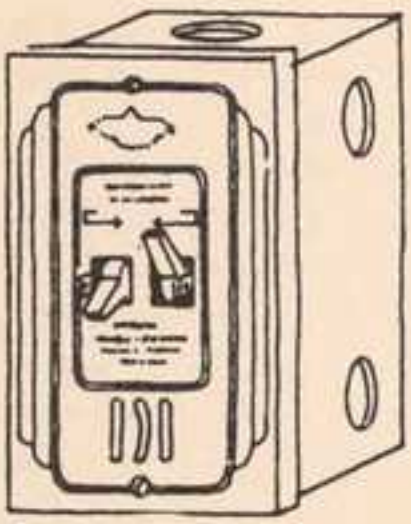
Following are the three types of circuit opening devices. Your mobile home may be equipped with any one of the three.

Fustat and Fustat Adapter (sometimes called the type "S" fuse). This is known as a tamper-resistant fuse. It is so-called because when properly used with its accompanying adapter, it is not interchangeable with one of a larger capacity. It is also impossible to put a coin or slug behind it to

short-circuit its effectiveness. (A large percentage of electrical fires are caused by someone foolishly short-circuiting the fusing device. When this is done, all protection has been removed from your wiring and your electrical equipment.)

The fustat adapter has a built-in device that makes it impossible to remove it from its socket without completely destroying it. Never try to remove a fustat adapter from your entrance switch. If it does not operate properly, call an electrician.

Edison base fuse – This is the standard Edison base fuse with which you are well acquainted, and no explanation of it should be necessary, except, that you should be warned *never* to substitute a larger size fuse than a 20-ampere in your appliance circuit and a 15-ampere in your other circuits. Over-fusing a circuit is a very dangerous practice and sometimes results in serious fires with attendant loss of life and property.



Circuit Breaker Switch – This is the front of your service entrance switch if you are using circuit breakers. We have shown the left-hand circuit breaker in the "tripped" position which indicates that circuit has been subjected to either a ground, a short circuit, or an overload. To restore this circuit to service (there are no fuses to replace) just flip the toggle handle as far down as you can and then back up into the *on* position.

Circuit breakers have the advantage of being equipped with a time delay device which permits them to carry a reasonable overload for a short period of time. This prevents them from tripping out continuously when your refrigerator motor comes on, or some other device that draws a heavy starting load is applied to the circuit. This time delay gives these devices a chance to get up a little momentum after which their current drain will settle down to a normal level.

Special Circuit Testing Device – Pictured here is a very simple device for trouble-shooting in simple electrical circuits. It will help you determine which fuse is blown, and also assist you in isolating any electrical trouble you may have in your mobile home.

The best type of a socket to use for this device is an ordinary weather-proof type socket that can be purchased at most of the chain stores or any electrical shop. You may want to lengthen the leads (which are long enough for most uses) on the socket a little, but most of them have leads 4 to 6 inches long. A 60-watt bulb is best for most of the trouble-shooting. Now here are some of the things you can determine with this very simple testing device:

1) If none of the electrical equipment in your mobile home will operate.
2) If part of your equipment goes out, and you wish to determine whether or not a fuse is blown — and if so, which one.
3) Checking for ground.
4) Determining whether or not your mobile home park receptacle is grounded, and finding a point to which to connect the ground wire.
5) Determining whether or not some of the equipment in your mobile home is grounded, and how to clear it up.
6) Testing the electrical continuity through your electric water heater.

GENERAL INFORMATION – Here is some general information which may serve to answer some of your questions.

Possibly, you have often wondered to yourself, "What is a watt?" A watt is, simply, the off-spring of a marriage between the voltage (power or pressure) and the amperage (rate of flow, comparable to gallons per minute in hydraulics) and is the unit measurement for power. It inherits all the productive abilities of both voltage and amperage, and expresses the direct application of these devices toward a job to be done. Essentially, it is the same thing as applying steam to the wheels of a locomotive or gasoline vapor to the cylinders of your car and producing horsepower. In electricity, it is watts.

"What do I pay for when I pay my electric bill?" You pay for the number of watts you consume over a given period of time, but because a watt is so small a unit of measure, and because we use so much electricity in our everyday living, our power company meters and bills us on the basis of kilowatts, which is, simply, 1000 watts. In addition to this, the meter contains another element which measures time. So, we are, consequently, paying for the use of a certain number of kilowatts of power for a measured length of time, or, "Kilowatt Hour." This abbreviated as KWH on your bill. One Kilowatt Hour is the use of 1000 watts for 1 hour, and is expressed by your electrician by the following formula:

W (Watts) × 1000 (Kilo) × 1 hr. = KWH (Kilowatt-Hour)

Your meter is so designed that it automatically applies this formula through electrical and mechanical means, and gives you a direct-reading result.

"Would it be a good thing for me to know how to read my meter?" Yes, there may be some occasions when it would be well for you to know how to read your meter. You might possibly want to check your consumption over a period of time in order to determine whether or not you are using an excessive amount of current, and there may be other reasons why you would like to be able to read your meter. It is a very simple process. To read your meter, you simply read the dials from right to left and write them down in the same manner, from right to left. After you have them all written down, then you read them from left to right, just as you read any normal material. The hands should always be read as indicating the figure which they have last passed, and not the one to which they are nearest. Thus, if a hand is very close to a figure, whether it has passed this figure or not

must be determined from the next lower dial; that is, the next dial to the left. The hand will not completely pass a figure until the dial next to it on the left has completed a revolution. If this hand has not completed a revolution, the one to the right has not passed the figure it is closest to; therefore, read it as the figure just lower. If there is a constant printed on the bottom of the dial plate, this must be used in determining your Kilowatt Hour consumption. If you read your meter at the beginning of a month, then you may read it again at the end of the month and subtract the first figure (the first-of-the-month reading) from the last reading you took, and this is your Kilowatt Hour consumption. If there is a constant printed on the dial plate, multiply this difference by the constant to obtain your Kilowatt consumption. This, then, multiplied by the rate at which you pay for your electric current will give you your bill for that period of time.

Below is a set of formulas which come under the classification of General Information that may help you in understanding something about your electric circuit.

Formulas

I = Amperes (Rate of flow or current "Gals. per minute").
E = Voltage (Pressure, corresponding to pounds per inch, psi).
R = Resistance (Opposition to flow of current – determined by size of wire and material).
W = Watts (Power – comparable to horsepower).

$$E \text{ (Volts)} = I \text{ (Amps.)} \times R \text{ (Ohms)}$$

$$I = \frac{E}{R} \; (E \div R) \qquad\qquad R = \frac{E}{I} \; (E \div I)$$

$$\text{Watts} = E \times I \qquad\qquad \text{KW (Kilowatts)} = W \times 1000$$

$$\text{KWH} = W \times 1000 \times T \text{ (Time elapsed in hours)}$$

$$1 \text{ Hp (Horsepower)} = 746 \text{ W}$$

Therefore:

$$Hp = W \times 746$$

$$W = \frac{Hp}{746} \; (Hp \div 746)$$

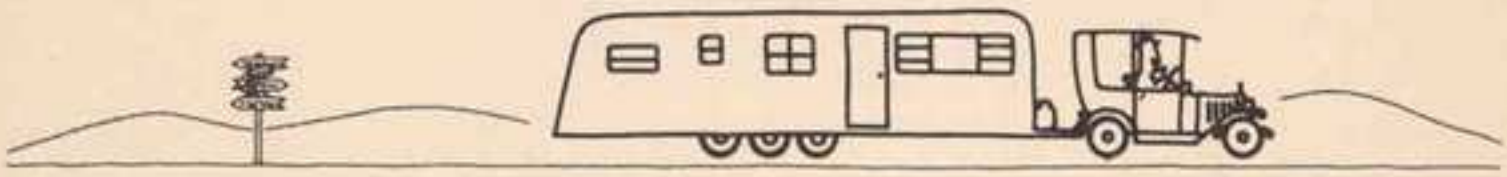
CONCLUSION – The most important things to watch out for, then, in choosing a mobile home either for the first time or as a replacement are:

1. Proper Service Entrance Equipment. Equipment which is adequate and which is safe; this is of vital importance.

2. A coach which is properly wired in its interior walls. It is an extremely difficult thing to do anything about the interior wiring in a coach after it has been built. We, therefore, can not put too much emphasis on the fact that the coach must be wired properly during manufacture. This should include, of course, boxes enclosing every splice or terminal, approved cable wiring with a grounding conductor, and all fixtures, plumbing and any other metal parts of your coach should be connected to this grounding conductor.

3. Respect the electrical system in your coach, for it can do

wonderful things for you, or fearful things to you. Never attempt to repair or dismantle any electrical wiring on your coach without first disconnecting it from the park receptacle. Never over-fuse, and unless you are well versed in electrical circuits, call an electrician for any repairs or trouble-shooting beyond those we have described in this section of your manual.



CHAPTER VIII

PUBLICATIONS OF INTEREST TO MOBILE HOME OWNERS

Publications for mobile home owners may be classified into the following groups: newspapers, magazines, books and booklets, and directories. For each publication, we list general information as to the nature of the publication, its cost, and its source of supply.

Magazines

There are four consumer magazines and three trade magazines in the mobile home field. The consumer magazines carry articles of interest to mobile home owners. Articles about travel, mobile home living, and interesting technical articles are found in all of these magazines. They also carry a considerable amount of advertising relating to new mobile homes and mobile home replacement parts and accessories. The four consumer magazines are as follows:

TRAILER LIFE – Published monthly by the Trailer Coach Association, 607 S. Hobart Blvd., Los Angeles 5, California.

TRAILER TOPICS – A monthly magazine published by Trailer Topics Publishing Company, 28 E. Jackson Blvd., Chicago 4, Illinois. In March of each year, Trailer Topics publishes a special issue containing photos and specifications of most mobile homes manufactured in the United States. If you plan to buy a mobile home, be sure to obtain a copy of this issue.

TRAIL-R-NEWS – A monthly magazine published by Trail-R-News, 534 W. Colorado Blvd., Glendale 4, California.

TRAILER TRAVEL – A monthly magazine published by the Woodall Publishing Company, 35 E. Wacker Drive, Chicago 1, Illinois.

If you are considering subscribing to any of these magazines and are not familiar with them, the publishers will usually send a sample copy upon receipt of your request for it.

The three trade magazines listed below are generally of little interest to mobile home owners. They are published for dealers, supply firms, manufacturers, and park operators. If you are considering engaging in any activity in the mobile home industry, you should definitely get copies. All are usually sent on a free basis to firms engaged in the mobile home industry. Just write a letter stating the nature of your activities and request that you be placed on the mail-

ing list. The first two magazines listed are of interest to dealers, manufacturers and suppliers. The last magazine is of interest to park operators.

MOBILE HOME TRAILER DEALER – Published monthly by Trailer Dealer, 4006 Milwaukee Ave., Chicago 41, Ill.

MOBILE HOMES – Published monthly by Mobile Homes, 624 South Michigan Ave., Chicago 5, Ill.

TRAILER PARK MANAGEMENT – Published monthly by Trailer Park Management, 4006 Milwaukee Ave., Chicago 41, Ill.

Directories

CAMP GROUND GUIDE – Gives the location of over 2,000 camp grounds, most of which are free in the United States and Canada. Shows camp capacities and recreation facilities for many. Contains a wealth of information not shown in conventional park guides. Also contains an article about a trip up the Alaska Highway. Published by Camp Grounds Unlimited, Blue Rapids, Kansas.

CALIFORNIA TRAILER PARKS – A publication of the California Trailer Park Association, Ltd., 4459 Avocado St., Los Angeles 27, California. It is a directory of California mobile home parks.

ARIZONA TRAILER GUIDE – Packed with interesting information about Arizona, emphasizing points of interest to the traveler. Contains information relating to mobile home and automobile regulations in the State of Arizona as well as route information. Lists Arizona mobile home parks. Published by Arizona Trailer Publication, P.O. Box 7296, Phoenix, Arizona.

FLORIDA TRAILERITE HANDBOOK – Presents a brief but complete picture of mobile home travel and mobile home life in the sunshine state of Florida. Contains data on Florida's 1100 mobile home parks and other vital information on how to enjoy your stay.

Florida Trailer News Publishing Company, P.O. Box 1168, Coral Gables 34, Florida.

FLORIDA TRAILER PARKS – Published by the Florida State Advertising Commission. Lists mobile home parks in Florida and contains

information as to rates and facilities. Florida State Advertising Commission, Tallahassee, Florida.

WOODALL'S TRAILER PARK DIRECTORY – The most complete Trailer Park Directory published; combines a very complete park list with a complete section on trailer laws of the 48 states. Lists parks in the United States, Canada, and Mexico. Has a wealth of information regarding facilities, rates, locations and advantages of various parks. Has information about points of interest for you. Published by Trailer Travel Magazine, 35 E. Wacker Drive, Chicago 1, Ill.,

OFFICIAL TRAILER PARK GUIDE – Published by the Mobile Home Manufacturers' Association as a service to mobile home owners. Has maps of 48 states and suggested routes. Has information on vacation spots and interesting articles on mobile home traveling. Contains a summary of state regulations relating to mobile homes. Lists only parks which have been inspected and approved by the Mobile Home Manufacturers Association. Mobile Home Manufacturers Association, 20 North Wacker Drive, Chicago 6, Ill.

WESTERN TRAVEL GUIDE – Covers 25,000 miles of principally traveled highways in the western half of the United States. Contains lists of first class hotels, motels, mobile home parks, etc. Published by Best Western Motel Association, 4217 E. Ocean Ave., Long Beach 3, California.

Newspapers

PACIFIC TRAILER NEWS – A weekly newspaper published on the Pacific Coast. Contains information relating to mobile home life on the Pacific Coast. Has articles of interest to mobile home owners. Published by Pacific Trailer Publications, Inc. 2109 E. Broadway, Long Beach 3, California.

TRAILER NEWS – Published weekly, October to May. Contains information of interest to mobile home owners in the state of Florida. Has interesting articles on mobile home life and important news of interest to mobile home owners. Published by Trailer News, P.O. Box 1168, Coral Gables, Florida.

MOBILE HOME NEWS – Published on the 1st and 15th of each month. Contains articles of interest to mobile home owners in the state of Florida. Has interesting articles on mobile home life and news of importance to mobile home owners. Published by Mobile Home News, 4012 San Luis Street, Tampa 9, Florida.

TRAIL-R-CLUB OF AMERICA CLUB MEMBER NEWS – A newspaper sent to members of the Trail-R-Club of America. Has factual information of tremendous value to mobile home owners. Keeps each member informed about club activities. This publication accepts no paid advertising. It has no advertisers to influence editorial policy. It's articles are therefore to the point from the mobile home owners viewpoint.

Books and Pamphlets

STATE MOTOR VEHICLE LAWS AFFECTING TRAILER COACHES – This book is an effort by the National Highway Users' Conference to publish a complete, up-to-date digest of the state motor vehicle laws affecting mobile homes. Contains information relating to registration, non-resident privileges, equipment provisions, size restrictions, speed limits, operator's licenses. It is valuable for those who travel in a mobile home. Published by the National Highway Users' Conference, 952 National Press Bldg., Washington 4, D.C.

WARNER ELECTRIC BRAKES SERVICE MANUAL – Contains just about everything you need to know about Warner Electric Brakes. Explains how they work, how they should be serviced, and is a handy thing to have with you when you're on the road. Many brake service stations do not understand electric brakes. Should you be in difficulty and have to go to a garage that does not understand electric brakes, this is a desirable publication to have with you. Published by the Warner Electric Brake and Clutch Company, Beloit, Wisconsin.

HOW TO BUILD CARAVANS – This is a book published by John D. Porter. It is published in Australia. To our knowledge, it is not available in the United States. It has a great deal of technical information for those who are interested in building mobile homes.

National Press Pty Ltd., 34 Lawnsdale Street, Melbourne C-1, Australia.

OFFICIAL MOBILE HOMES YEARBOOK – A yearly publication that contains the latest specifications and information concerning Mobile Home Manufacturers Association approved mobile homes. Published by the Mobile Home Manufacturers Association, 20 North Wacker Drive, Chicago 6, Illinois.

HOW TO HAVE MORE FUN ON EVERY OUTING – A book that tells you how to have a better time on your vacation. If you have a small vacation trailer, you will find lots of interesting information in this book. Published by the Coleman Lamp and Stove Company, Wichita, Kansas.

ANSWERS TO THE MOST ASKED QUESTIONS ABOUT MODERN LIVING IN A MOBILE HOME – Interesting advertising pamphlet put out by the Liberty Coach Company. Although it is designed specifically to sell Liberty Coaches, it contains a wealth of information about mobile homes and mobile home living. Published by Liberty Coach, Inc., Breman, Ind.

THE LONG, LONG TRAILER – This is a true and very funny story of a pair of neophyte trailerists. It's delectably humorous and sparklingly witty. A delightful book. Guaranteed to tickle your funny bone. It's the basis for a movie made by M-G-M studios. Written by Clinton Twiss and published by Thomas Y. Crowell Company, N.Y.

TRAILERING AT 65 – This is a story of a 65 year old retired woman who set out to travel alone in a mobile home. All she learned about traveling in a mobile home, she has put into this book. It's packed with valuable information, simply written. Written by Mary H. Dole, Published by Exposition Press, New York.

TRAILER COACHES – This is the only book, as far as we know, that goes into technical engineering facts about mobile homes. It's a valuable store of engineering data. It's not a recent publication but since a great deal of the information is engineering, it is of value to those who plan to construct a mobile home. Has chapters on towing, engineering balance, chassis, brakes, dollies, overload springs, jacks, hitches, floor plans, interior arrangements. Written by Ray F. Kuns, published by Ray F. Kuns, Madisonville, Cincinnati, Ohio.

TRAILER COACH CARE AND UPKEEP – A small booklet published by the Mobile Home Manufacturers' Association to act as a guide to the wise maintenance of your mobile home. Contains a lot of data in short, concise form. Deals with towing, stabilizing, hitches, dollies, etc. Published by the Mobile Home Manufacturers Association, 20 N. Wacker, Drive, Chicago 6, Illinois,

TRAILER COACH HOMES – Contains complete descriptions and photos of 40 makes of mobile homes. Has sections on parks, buying used mobile homes, how to pull a mobile home, and mobile home care. Has valuable information for those who are interested in buying a new mobile home. Published in 1952 and therefore contains information relating only to 1952 homes. Published by Fawcett Publications, Greenwich, Conn.

FIFTH AVENUE ON WHEELS – This is an authoritative book on mobile home traveling. Contains a wealth of information on buying mobile homes, pulling them, what to take with you, hitches, parking equipment and many other topics of interest. Has many fascinating chapters on traveling in foreign countries with a mobile home. Writ- by Wally Byam, published by the Cambridge Press, Los Angeles, California

FINLEY TRAILER PRIMER – This is a short booklet, published by Evelyn and Howard Finley, in which they set forth what they have learned about traveling in a mobile home and mobile home living as a result of many, many years of experience in this way of life. Contains information every mobile home owner should have.

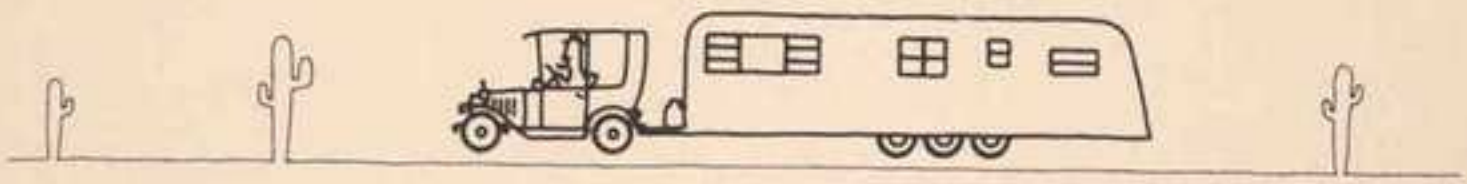
THE FUN OF TRAILERING – Another booklet by Evelyn and Howard Finley. Written by the Finleys to set down their experiences in traveling in a mobile home. Written in an interesting style and contains valuable material for those who travel extensively in a mobile home.

TRAILER COACH PARKS AND HOW TO BUILD THEM – A technical publication of interest to those who anticipate the construction of mobile home parks. Written by Boyd A. Wilson, a trailer coach park consultant, formerly a field representative for the Mobile Home Manufacturers Association.

TRAILER COACH SANITATION – This is a booklet prepared by the Federal Security Agency, Public Health Service, and is of great interest to those who are planning on modernizing a mobile home park, or who are planning to construct one. Copies may be obtained by writing to the Mobile Home Manufacturers' Association, 20 North Wacker Drive, Chicago 6, Illinois. This Association is interested in helping prospective mobile home park builders, and if you will indicate your interest in this subject to them, they will send you additional literature on the subject.

STANDARDS FOR FIRE PREVENTION AND FIRE PROTECTION IN TRAILER COACHES AND TRAILER COURTS – An excellent publication for the buyer of mobile homes. Armed with the information in this booklet you are better able to evaluate the quality of any mobile home you might purchase. Published by National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. You may obtain other important information on mobile home standards by writing to: Mobile Home Manufacturers' Association, 20 N. Wacker Drive, Chicago 6, Ill. or Trailer Coach Association, 607 S. Hobart Blvd, Los Angeles 5, Calif. Just ask for a copy of the association's standards for mobile homes.

PUBLICATIONS



PARTIAL LIST OF MOBILE HOME MANUFACTURERS

A B C Coach Company – Pinconning, Michigan
Airfloat Coach Mfg. Co. – 1600 E. 7th St., Los Angeles 21, Calif.
Airstream Trailers Inc – 1755 N. Main Street, Los Angeles 31, California
All States Trailer Company – 5951 S. State St., Chicago 21, Illinois
Alma Trailer Company – Alma, Michigan
American Coach Company – Cassopolis, Michigan
Anderson Coach Company – East Tawas, Michigan
Angelus Trailer Company – 1120 N. Tyler Avenue, El Monte, California
Best Industries – 508 San Bernardino Road, El Monte, California
Boles Mfg. Co. – 2929 N. San Fernando Road, Burbank, California
Breman Coach and Cabinet Co. – Breman, Indiana
Brentwood Trailers Inc. – 7920 S. Greenwood, Chicago 19, Illinois
Buckeye Coach & Mfg. Co. – Beaverdam, Ohio
Buddy Coach Company – 1601 W. Bristol Street, Elkhart, Indiana
Budger Manufacturing Company – 7601 Arvilla Avenue, Burbank, California
Cherny & Watson Lumber Co. – North Bend, Nebraska
Colonial Trailer Sales Corp. – 2750 Sheffield Ave., Hammond, Indiana
Columbia Trailer Co. – Glendale, California
Consolidated Trailer Corp. – 2310 Chico Street, El Monte, California
Continental Trailer Company – 4822 S. Cottage Grove Avenue, Chicago, Illinois
Cozy Cruiser Trailer Company – 1767 Blake Avenue, Los Angeles, California
Curtis Wright Ind. Inc. – 740 Valley Blvd., Puente, California
Delta Trailer Company – 742 Todd Avenue, Azusa, California
Detroiter Coach Company – National Bank Building, Detroit 26, Michigan
Drexler Coach Inc. – 2046 S. Main St., Elkhart, Indiana
Duo Coach Corp. – 831 S. Wabash Ave., Chicago 5, Illinois
Elcar Mobile Homes – 831 S. Wabash Avenue, Chicago 5, Illinois
Fleetwood Trailer Company – 15230 S. Lakewood Blvd., Paramount, California
Franklin Coach Company – Nappanee, Indiana
General Coach Works, Incorporated – Marlette, Michigan
Glider Trailer Company – 1824 W. Kinzie Street, Chicago 22, Illinois
Happy Home Trailer Company – 12339 E. Valley Blvd., El Monte, California
Holan Engineering Co., Inc. – Elwood, Indiana
Howard Industries Incorporated – Saginaw, Michigan
Ideal Industries Incorporated – 2328 N. Chico, El Monte, California
Indian Trailer Corporation – 122 E. 63rd Street, Chicago 37, Illinois
Ironwood Trailers,– Ironwood, Michigan
Keweenaw Industries Inc. – Ashland, Wisconsin
Kenskill Manufacturing Co. – 11321 Goss Street, Sun Valley, California
Kings Trailer Company – 437 E. Carson Street, Torrance, California
Kit Manufacturing Company, Inc. – 1401 W. Seventeenth St., Long Beach 13, Calif.
Kozy Mobile Homes – 831 S. Wabash Avenue, Chicago 5, Illinois
Kropf Manufacturing Company – Goshen, Indiana
Landola Traile. Mfg. Co. – Swayzee, Indiana
La Salle Coach Co. – Elkhart, Indiana
Liberty Coach Company – Bremen, Indiana
Lighthouse Trailer Company – 5761 W. Touhy Avenue, Chicago 31, Illinois
Lintzcraft Trailer Mfg. Co. – Grand Ledge, Michigan
Lutes Trailer Company – Goshen, Indiana
Luxor-Leffingwell Coach Co. – Brookville, Indiana
"M" System Incorporated – U.S. Highway 61N, Vicksburg, Mississippi
Marville Dwyer, Inc. – 3969 Medford St., Los Angeles 33, California
Masterbilt – 4420 San Fernando Road, Glendale 4, California
Mercury Coach Corp. – 2306 University Avenue, Des Moines, Iowa
Michigan Central Airlines Inc. – 1401 S. Dort Highway, Flint, Michigan
Mid States Corporation – 831 S. Wabash Avenue, Chicago 5, Illinois
Mobile Trailer Company – Marysville, Michigan
Modernistic Indistries – 1661 W. 135th Street, Gardena, California
Nashua Manufacturing Co. – P.O. Box 98, Linden, Missouri
National Mobile Homes – 831 S. Wabash Ave., Chicago 5, Illinois
Overland Coach Co., Inc. – 12140 S. Peoria Street, Chicago 43, Illinois
Owosso Coach Company – 619 S. Washington St., Owosso, Michigan

MOBILE HOME MANUFACTURERS

Pacemaker Trailer Company – Elkhart, Indiana
Palace Corporation – 3321 S. Dort Highway, Flint, Michigan
Pan American Trailer Coach Co. – 1501 S. Shamrock Ave., Monrovia, Calif.
Peerless Mfg. Corporation – Ft. Wayne, Indiana
Platt Trailer Co., Inc.– Elkhart, Indiana
Pontiac Coach Company – 4615 Dixie Highway, Drayton Plains, Michigan
Prairie Schooner, Inc. – Elkhart, Indiana
R. S. Engineering & Mfg. Co. Inc. – 2935 S. Fairfax, Los Angeles, Calif.
Raymond Products Co., Inc. – Saginaw, Michigan
Redman Trailer Company – Alma, Michigan
Richardson Trailer Mfg. Co., Inc. – Elkhart, Indiana
Roadmaster Company – 2112 N. Chico Ave., El Monte, California
Roll-a-Long Trailers – 300 E. Central, LaHabra, California
Rollohome Trailer Coach Co. – Marshfield, Wisconsin
Royal Coach Co., Inc. – Hastings, Michigan
Roycraft Coach Company – Chesaning, Michigan
Schult Corporation – 1800–30 S. Main Street, Elkhart, Indiana
Silver Dome Company – Berrien Springs, Michigan
Spartan Aircraft Corporation – 1917 N. Sheridan Road, Tulsa, Oklahoma
Star Mobile Homes – 831 S. Wabash Avenue, Chicago 5, Illinois
Starfleet Trailer Mfg. Co. – 1400 W. 260th Street, Harbor City, California
Stewart Coach Industries Inc. – Bristol, Indiana
Streamlite Trailer Company – 5538 Lake Street, Chicago 37, Illinois
Supreme-Victor Mobile Homes – 2337 S. Michigan, Chicago 16, Illinois
Terra Cruiser Co. – 831 S. Wabash Ave., Chicago, Illinois
Terry Coach Industries Inc. – 10801 Sessler Street, South Gate, California
Traveleer Trailer Co. Inc. – 4823 Rosecrans Ave., Hawthorne, California
Traveleze Trailer Company – 11473 Penrose Street, Sun Valley, California
Travelhome Co. of America – 9317 Cottage Grove Ave., Chicago 19, Illinois
Travelite Trailer Co. of Texas – 2730 Bryan Street, Ft. Worth, Texas
Travelmaster Coach Corp. – Elkhart, Indiana
Trotwood Trailers Inc. – Trotwood, Ohio
Universal Trailer & Mfg. Corp. – 707-15 Independence Ave., Kansas City, Mo.
Vagabond Coach Mfg. Company – New Hudson, Michigan
Victor Coach Industries Inc. – Bristol, Indiana
Viking Mfg. Co., Inc. – 12257 E. Ball Road, Anaheim California
Vindale Coach Company – Brookville, Ohio
Walco Trailers Incorporated – Nappanee, Indiana
Yellowstone Coach Co., Inc. – Wakarusa, Indiana
Zimmer Industries Inc. – Elwood, Indiana

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