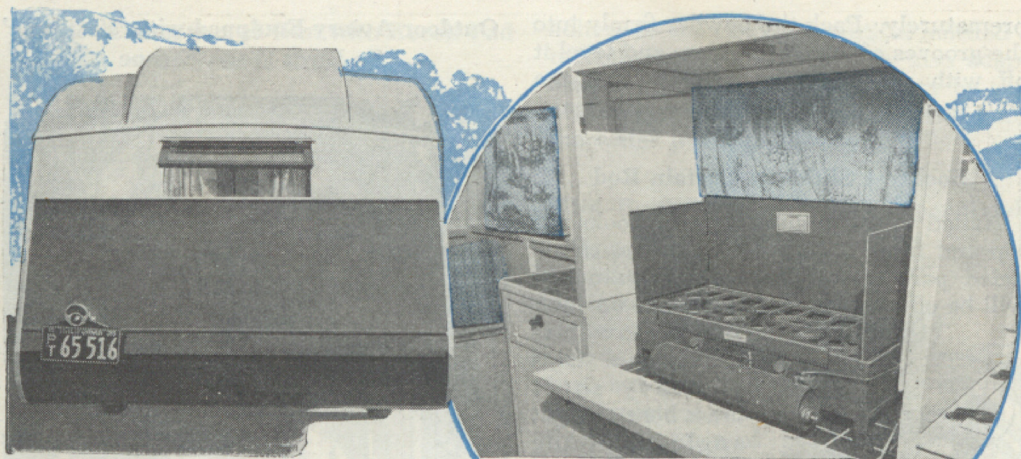




At Home in this



Every Need for Touring Is Met in This Trailer; Cook-stove, Sink, Icebox, Clothes Closet and Other Equipment Are Conveniently Arranged and Adequate Cross Ventilation Is Provided by Numerous Screened Windows

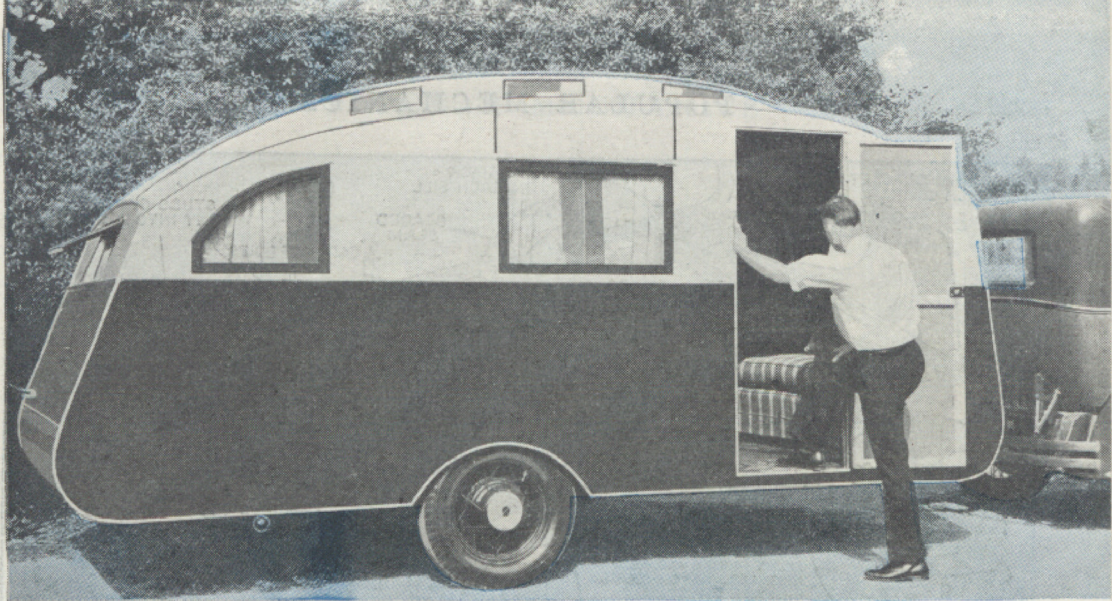
PART I—BUILDING THE CHASSIS

STYLED in the latest streamline, roomy, yet light and sturdy, this trailer affords you all the comforts of home. "Roadability" is assured by a clever arrangement of interior fittings to give an equal distribution of weight. An underslung axle of unique and original design maintains a low center of gravity and at the same time provides a spring seat as close to the wheel as possible. The tubular construction of the axle reduces the unsprung weight to the minimum.

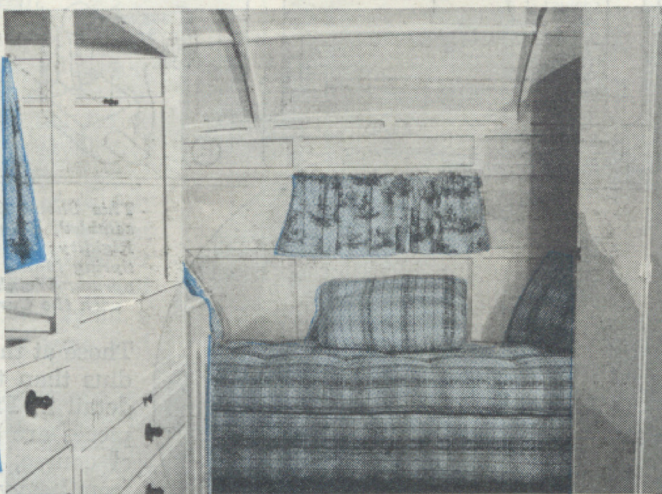
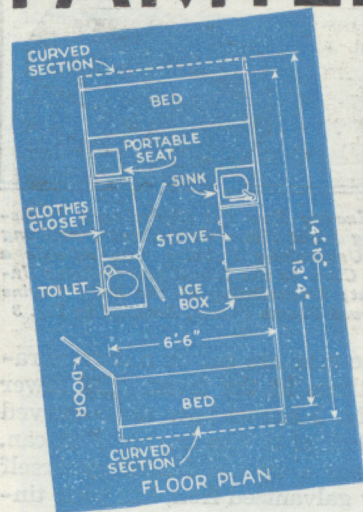
Construction begins with the sills. Fig. 1 gives you a perspective view of the under-frame assembled, and over in Figs. 4 and 5 you will find the essential dimensions.

The sills, A in Fig. 1, are of selected hard maple, $2\frac{1}{4}$ by 4 in. in cross section, and are joined by spruce cross members, B, $1\frac{1}{2}$ by $2\frac{1}{2}$ in. in section. All joints are mortised and secured with $\frac{5}{16}$ -in. carriage bolts. Before you begin work, notice from Fig. 4 that all the cross members, except the ends, are spaced on centers. A section of each sill between the third and fifth cross members is rabbeted to take the fender as shown in Fig. 1 and the detail at the left in Fig. 5. With this rabbet cut at the bench you can mortise the sills and cross members.

The care you use in mortising determines to a great extent the rigidity and



FAMILY TRAILER...

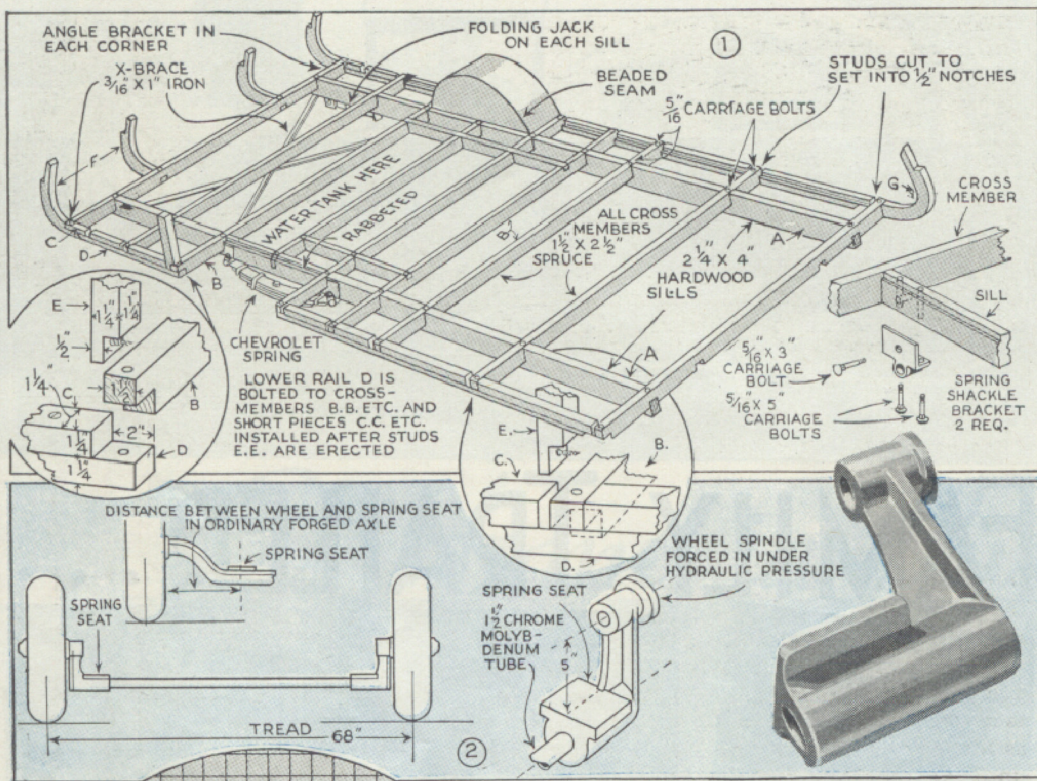


For Sleeping Quarters That Will Accommodate Four Persons, a Luxurious Studio Couch Is Placed at Each End; the Aluminum-Painted Top Reflects Heat, Keeping the Interior Cool; for Added Insulation, the Walls and Top May Be Made Double

strength of the frame. Accuracy in laying out the spacing and depth of the cuts and the use of a miter box in sawing down the shoulders of the mortises will assure a close fit. Scoring the depth of each mortise with a marking gauge will aid in chipping out the waste with a chisel, as the last few chips will break off at the scored line. Now you level two sawhorses on the floor and place the sills on these. Then with the cross members in place you can check the fit of all the joints and bore the $\frac{5}{16}$ -in. holes for the bolts. When you bore

these holes it will help to clamp the parts tightly together so that the bit goes through the two members as though they were one piece. Waterproof casein glue is used in all joints of the underframe. Now with this assembly set up and bolted together, be sure, before the glue sets, to check the frame at each corner with a square. If necessary, put clamps on the frame to hold it in the square position until the glue is dry.

Now you're ready for the lower rails, fenders, springs, and the curved end mem-

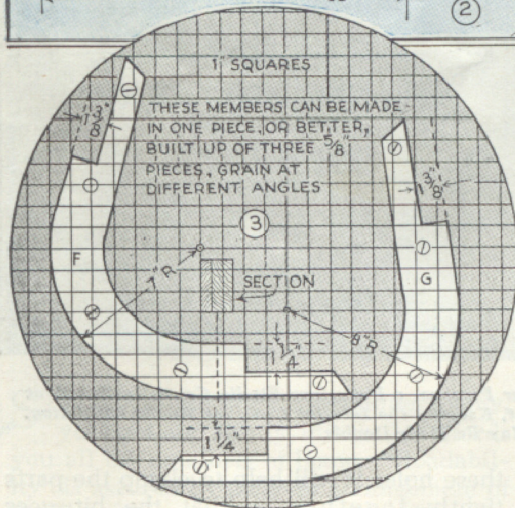


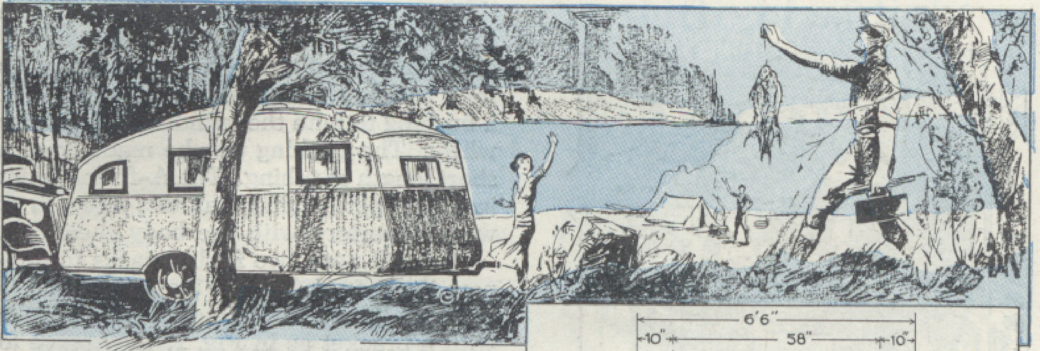
This Shows Exactly How the Underframe Is Assembled, Using Light Materials without Sacrificing Rigidity; an Underslung Tubular Axle Affords a Spring Mount Close to the Wheel and Reduces Unsprung Weight; Streamlining of the Body Begins with the Curved Frame Pieces, Detailed in Fig. 3

Those at the rear are cut on a shorter radius than those at the front. The lower detail in Fig. 5 shows how these curved pieces are bolted to the frame. You can, of course, make up the fenders yourself from heavy galvanized iron, but your tin-smith, with the equipment he will have at hand, can do a neater job in far less time and at a nominal cost. The fenders are cut on a 16-in. radius but not to a full semicircle, as they are only 14 in. deep and 10 in. wide. Chevrolet front springs are mounted on the sills as in Fig. 1, the shackle brackets being bolted to the sill as in the detail at the right. The bolts holding the shackle brackets should be a snug fit in the holes bored through the wood. It's a good idea to use lock washers on all bolts in the underframe.

Now that you've progressed to this stage you're ready to start with the axle. As shown in Fig. 2, this is a simple affair con-

bers. The cross members are halved at the ends to take the lower hardwood rails, which are $1\frac{1}{4}$ by $1\frac{1}{4}$ in. in section. These rails, part D in Fig. 1, are bolted to the cross members with $\frac{5}{16}$ -in. bolts. There are two longitudinal pieces halved into the cross members directly over the axle. These form an opening for the water tank. Fig. 3 shows what you will want to know about the curved end members, F and G.





sisting of two wheel-spindle brackets of electric steel joined with a chrome-molybdenum tube. You can buy the tube but it will probably be necessary to make the spindle brackets. The additional cost of this work will be money well spent, as this type of axle is so far superior to anything that can be improvised from standard auto parts. After you get your axle made up as suggested in Fig. 2, you make a trial fit on the springs, but do not attach the axle permanently to the frame as the latter must remain on the sawhorses until the upper structure is set up.

Two jobs remain to be done before you have the underframe complete. The first is making and installing the 14-gal. water tank, which is dimensioned in Fig. 6 and shown in position in Fig. 4. Once again, a tinsmith can save you a lot of time and

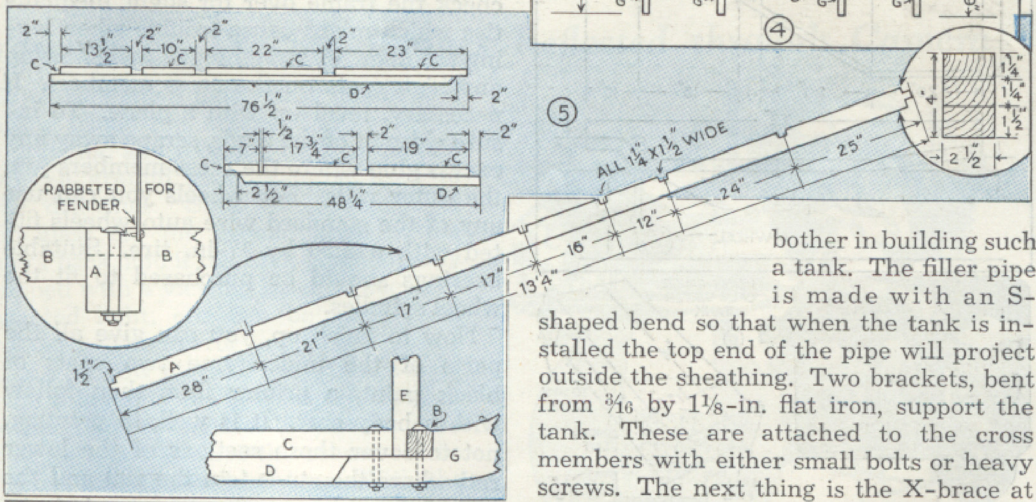
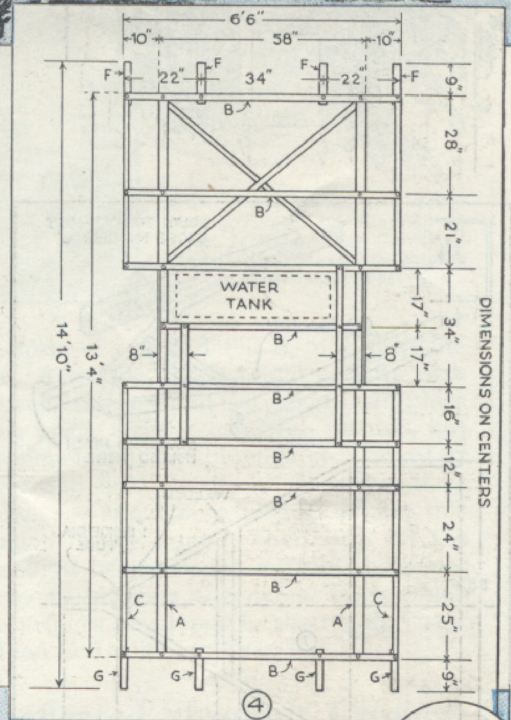
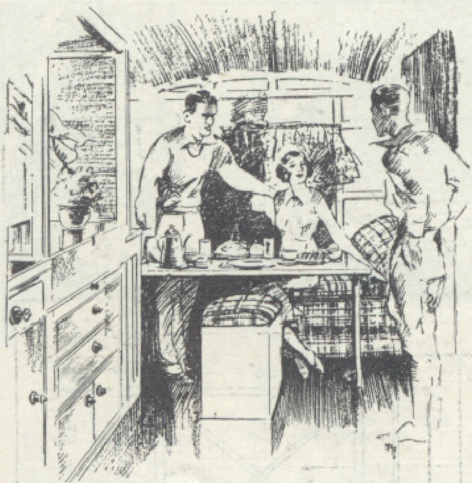


Fig. 4 Gives You a Dimensioned Plan of the Underframe Shown Assembled in Fig. 1, While Fig. 5 Details the Sills and Lower Rails

bother in building such a tank. The filler pipe is made with an S-shaped bend so that when the tank is installed the top end of the pipe will project outside the sheathing. Two brackets, bent from $\frac{3}{16}$ by $1\frac{1}{8}$ -in. flat iron, support the tank. These are attached to the cross members with either small bolts or heavy screws. The next thing is the X-brace at the rear, and the 1 by $2\frac{1}{4}$ -in. channel-iron A-frame, which carries the coupler and the caster wheel at the front. Details on

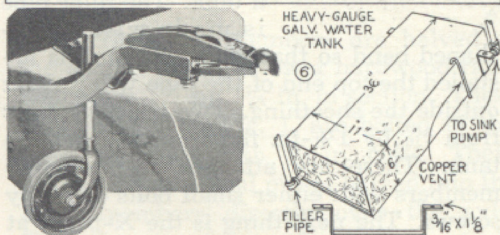
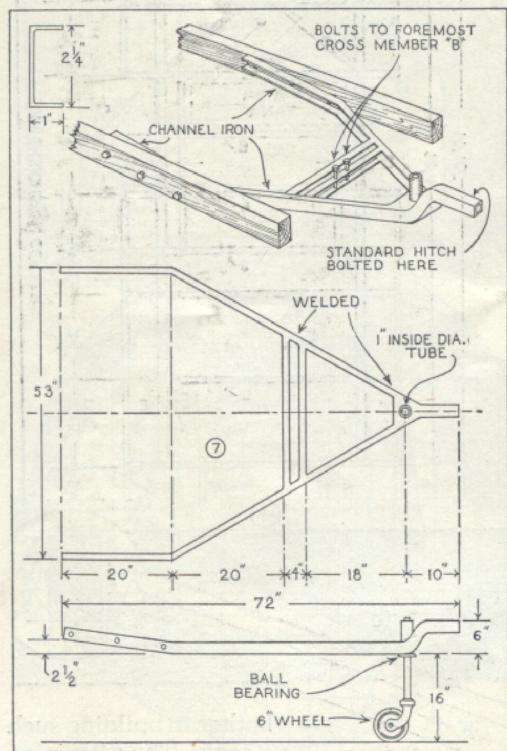


the construction of the A-frame are given in Fig. 7, and the X-brace is shown installed in Figs. 1 and 4. The A-frame calls for a simple welding job and the fitting of a bushing to take the spindle of the caster wheel. The bushing can be made from a short length of tubing. The A-frame is not installed permanently at this time as it would interfere with the body sheathing.

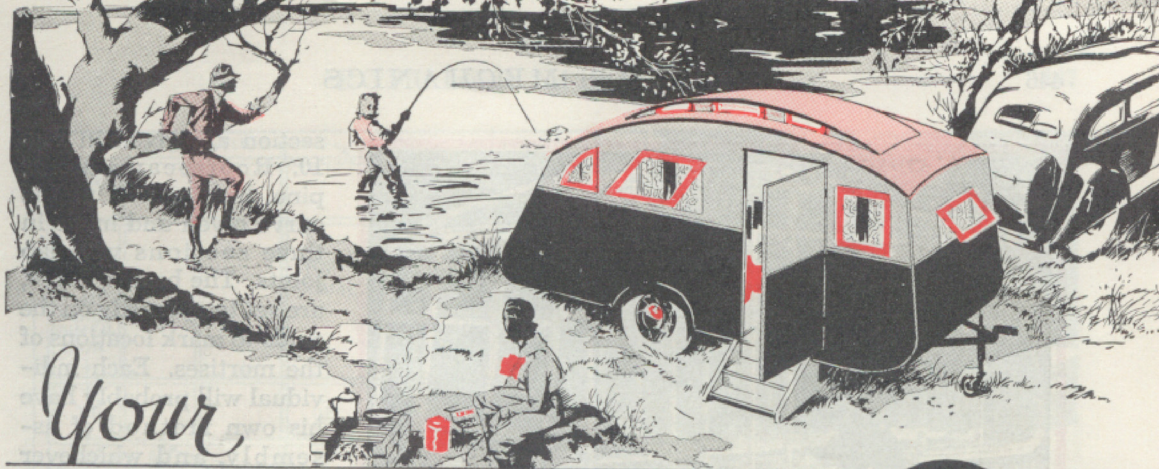
You will need two folding jacks to support the rear end of the trailer when it is parked. These are attached to the sills with a bracket as in Fig. 1; they serve to prevent tipping and ease the weight resting on the tires. Provide a reliable catch or hook so that the jacks will not drop down when you're on the road. You can also get out the filler pieces, C in Fig. 1. The position of these is shown in the enlarged detail at the left. These pieces are cut to fit but are not installed permanently until the studs, E, are erected. In connection with the fitting of these pieces, see the lower detail in Fig. 5, which shows the curved end member, G, bolted both to the cross member and the filler piece, C. This assembly is not completed until the studs are set up at the four corners, as the studs are glued and screwed to the cross members before the filler piece is put in place. When you cut these filler pieces be sure of the length. Properly cut and fitted, with the studs in place, they contribute greatly to the strength and rigidity of the whole structure. Just now is also a good time to check the frame over for slight inequalities which might cause trouble when laying the floor. A straightedge will show up any high spots on the cross members. If necessary, level up with a plane. To insure close fit of the studs, scrape away any excess glue where the cross members join the outer rails. For wheels you can use any of the standard wire auto wheels fitted with a 5:50 by 17-in. tire. Suitable bearings should be purchased to fit the wheel spindles.

Now to finish up, you can give all the parts of the underframe two coats of black paint, a primer first, then follow with a body coat. It is well, in painting, not to cover those sections of the lower rail where the studs join the rail and the end of the cross member, as glue is to be used in these joints.

(To be continued)



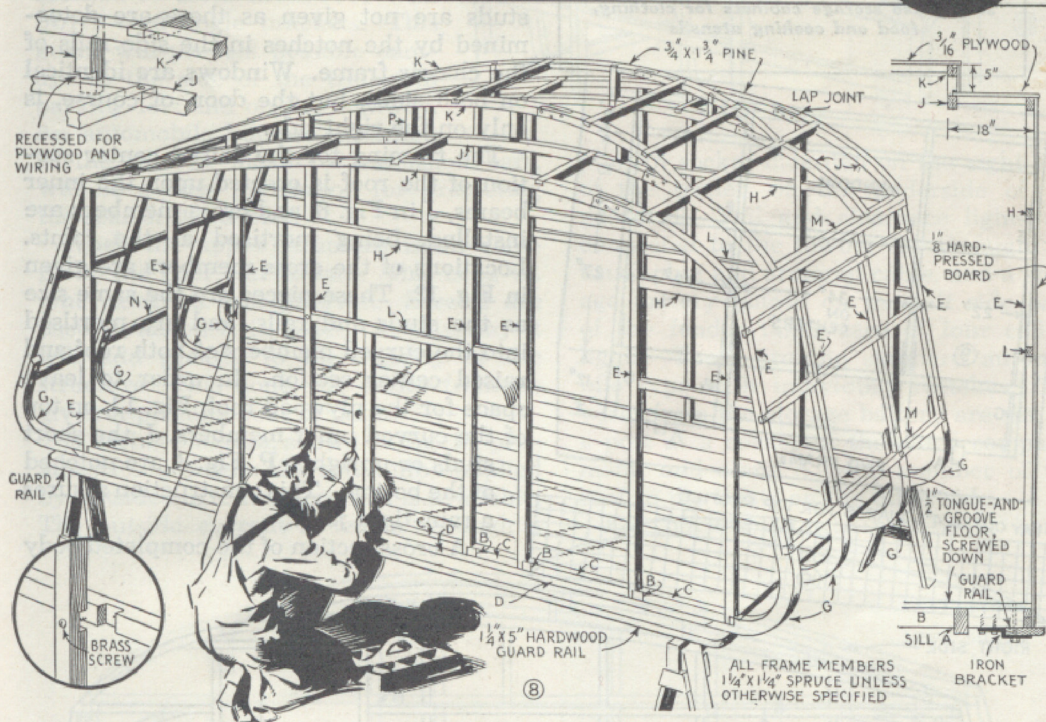
An A-Shaped Frame of Channel Iron Carries the Trailer Hitch and Caster Wheel; the Galvanized Tank Supplies Water to a Marine-Type Pump



Your

FAMILY TRAILER

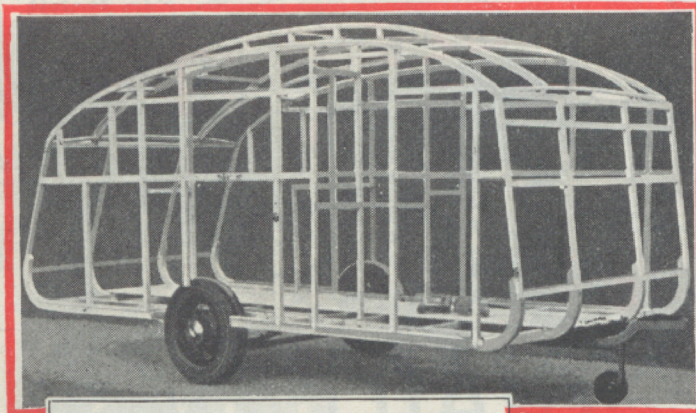
Part 2



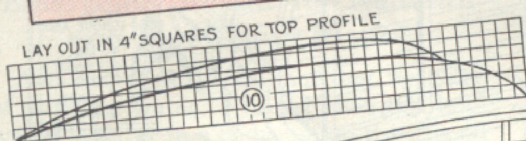
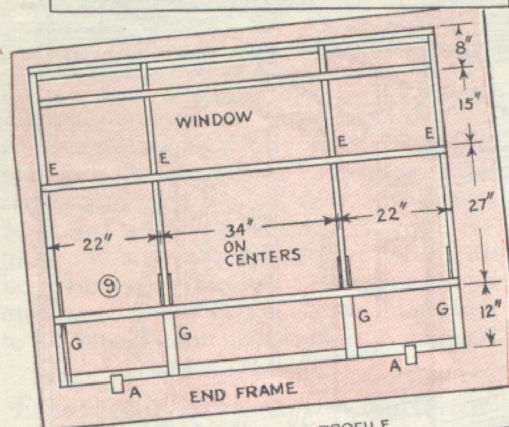
NOW that you have completed the trailer chassis, Fig. 8 shows what's next. Notice first, from Figs. 11 and 14, that the position of the vertical and horizontal members differs on the two sides of the frame. The end frames, Fig. 9, are identical with exception of the top cross member, which is 1 in. lower on the rear frame. To start the framing, set up the corner studs, E in Fig. 8, then follow with the top rails, H, and those across the ends, M, which are double. At the lower ends

the studs are halved and screwed to the cross members, B. Then the filler blocks, C in Fig. 8, are screwed to the lower rail, D, to complete the joint. All joints in the entire frame are set in waterproof casein glue and wherever vertical and horizontal members join, the two parts are halved to make a flush joint which is held with a 1-in. screw. Some care is necessary in mortising, as a tight joint adds greatly to the strength of the structure.

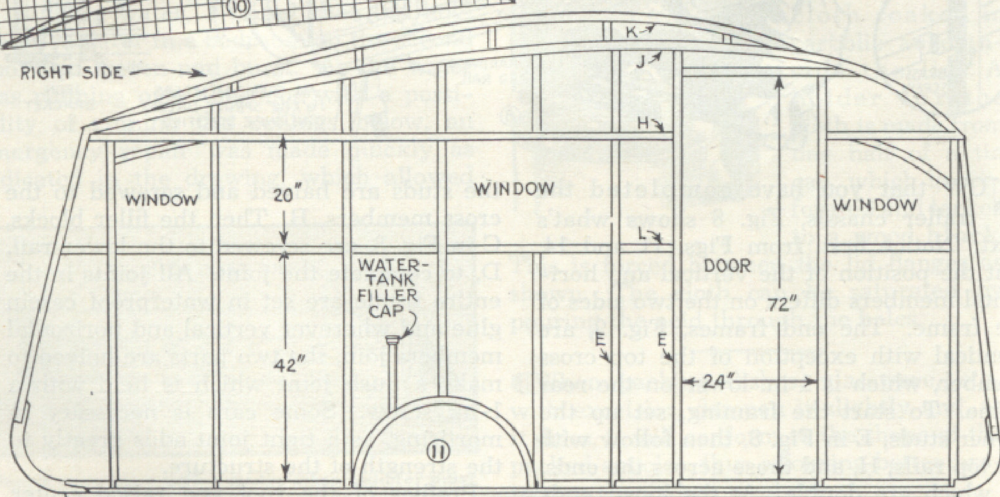
Profiles of the roof and raised center



Provision is made in the framing for building in a sink and a compartment for a gas stove, also storage cabinets for clothing, food and cooking utensils



RIGHT SIDE

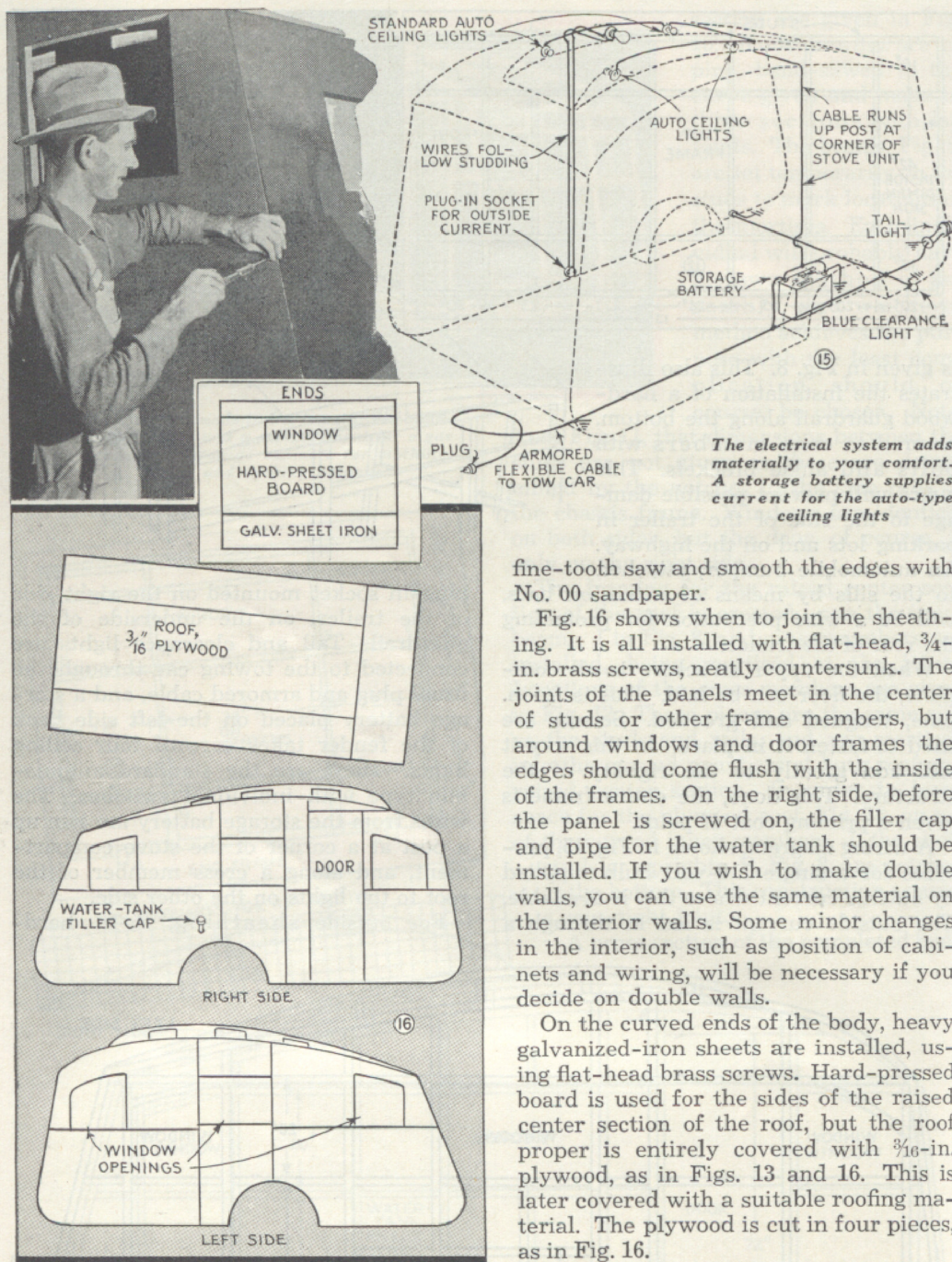


section are given in Fig. 10. Roof beams are of pine, band-sawed to the curve given and made in three sections with lap joints. The beams, Fig. 8, are set temporarily on the studs to mark locations of the mortises. Each individual will probably have his own method of assembly, and whichever method achieves the purpose with the least complication, should, of course, be chosen. Note,

from Fig. 11, that dimensions between the studs are not given as these are determined by the notches in the side rails of the chassis frame. Windows are identical on both sides, but the door, of course, is only on the right side.

The framing for the raised center section of the roof is erected upon the inner beams, J in Fig. 8, and cross members are installed, being mortised at the joints. Locations of the cross members are given in Fig. 12. These pieces are the same size as the studs and rails, and are mortised into the curved members of both roof and raised center section. In order to leave space for the plywood roof, Fig. 13, on top of the curved inner members, J, the short studs or uprights, P, Fig. 8, are notched at the bottom. This construction assures a rain-tight joint.

A cross section of the completed body



fine-tooth saw and smooth the edges with No. 00 sandpaper.

Fig. 16 shows when to join the sheathing. It is all installed with flat-head, $\frac{3}{4}$ -in. brass screws, neatly countersunk. The joints of the panels meet in the center of studs or other frame members, but around windows and door frames the edges should come flush with the inside of the frames. On the right side, before the panel is screwed on, the filler cap and pipe for the water tank should be installed. If you wish to make double walls, you can use the same material on the interior walls. Some minor changes in the interior, such as position of cabinets and wiring, will be necessary if you decide on double walls.

On the curved ends of the body, heavy galvanized-iron sheets are installed, using flat-head brass screws. Hard-pressed board is used for the sides of the raised center section of the roof, but the roof proper is entirely covered with $\frac{3}{16}$ -in. plywood, as in Figs. 13 and 16. This is later covered with a suitable roofing material. The plywood is cut in four pieces, as in Fig. 16.

There are two ways of finishing the exterior. One is to cover with Fabrikoid and the other to fill seams with plastic wood to make an invisible joint, and spray the body with automobile lacquer or enamel. Both finishes are very effective, especially when the lower half is in a dark color to

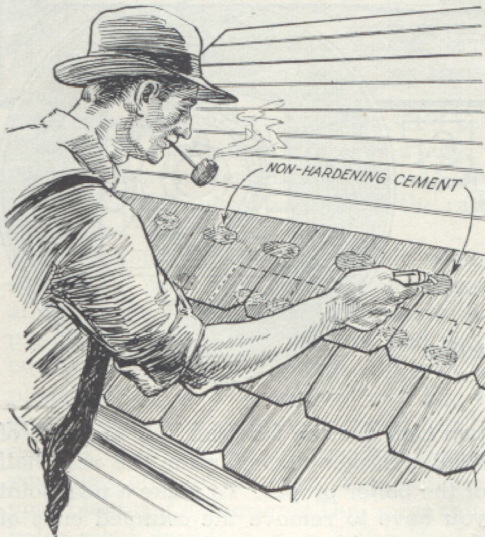
pressed board is excellent material, having a very smooth finish and rigid structure. It is obtainable in 4-ft. widths, and should be accurately marked by tacking to the frame temporarily and outlining with a sharp pencil. Cut with a sharp,

match the car and the upper portion, above the window sills, in aluminum, with window sash to match the lower part of the body. For that matter, any color that matches your car will give a pleasing contrast with the aluminum-painted top.

Before the sheathing is put on, it is well to decide on the interior finish. If you prefer all one tone, the painting can be done anytime, on the interior. If, however, you like a light framing contrasted with dark panels, paint the wood before the sheathing is set on.

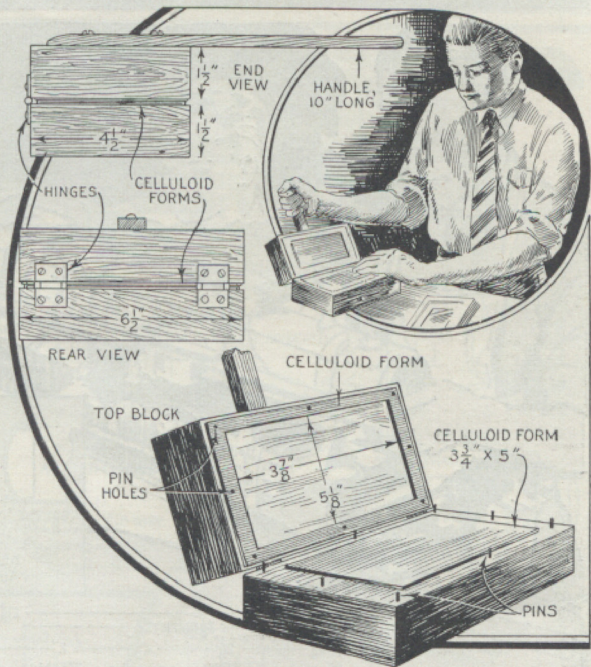
Cementing Nails in Roof Prevents Corrosion

When the home owner goes to the expense of installing a slate roof, it is certainly worth while to put in a little extra work in taking precautions against leaks by sealing over the nail heads. Even when the best quality of copper or coated nails are used, moisture often causes them to corrode and allow the shingles to loosen. A good precaution against such trouble is to coat each nail head with a little non-hardening roofing cement after it is driven.



Cement protects nail heads in slate roof against corrosion which allows wind to loosen shingles

Plate-Sinking Photos and Cards on Small Hand Press

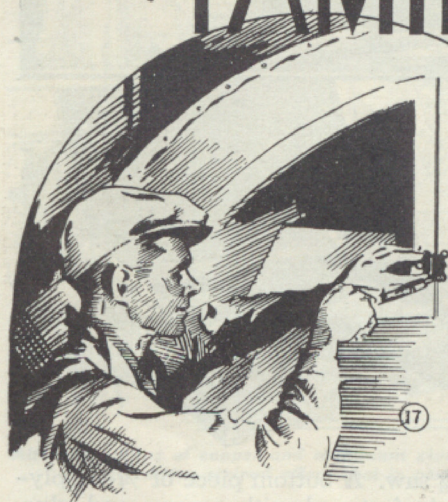


Pieces of celluloid cemented to inner surfaces of two hinged blocks plate-sink edges of photos and greeting cards

Handling two to three hundred photos or greeting cards an hour, this plate-sinking tool can be made by anyone at a cost of less than a dollar. It consists of two hard-maple blocks, one being faced with a rectangular piece of $\frac{1}{32}$ -in. celluloid and the other with a rim of the same material to fit over the rectangular piece with a $\frac{1}{8}$ -in. clearance all around. Guide pins in the lower block aid in centering the cards and in keeping the two pieces of celluloid in register when the blocks are pressed together. In squaring the blocks, be sure that the surfaces carrying the celluloid make good contact. Photo greeting cards will dry flat and have just enough flexibility to plate-sink easily if the final washing is done in a solution containing glycerin, 1 oz., for each 12 oz. of water used. Slightly dampening the backs of cards and photos already printed will help.

When a glue job must be invisible and non-staining, use a package of plain cooking gelatin dissolved in a little hot water.

Home Comforts *in this* FAMILY TRAILER



Part 3

Interior Furnishings and Painting

ONE glance at the cutaway view above and you have the whole story of the interior furnishings. There's your kitchen, dining and living room, and two bedrooms with clothes-closet space. When you stop along the road for the night, there's nothing to unpack, no ropes or awnings to bother with. Simply uncouple the trailer from the car and park it in any convenient place. One person handles it easily, even when fully loaded.

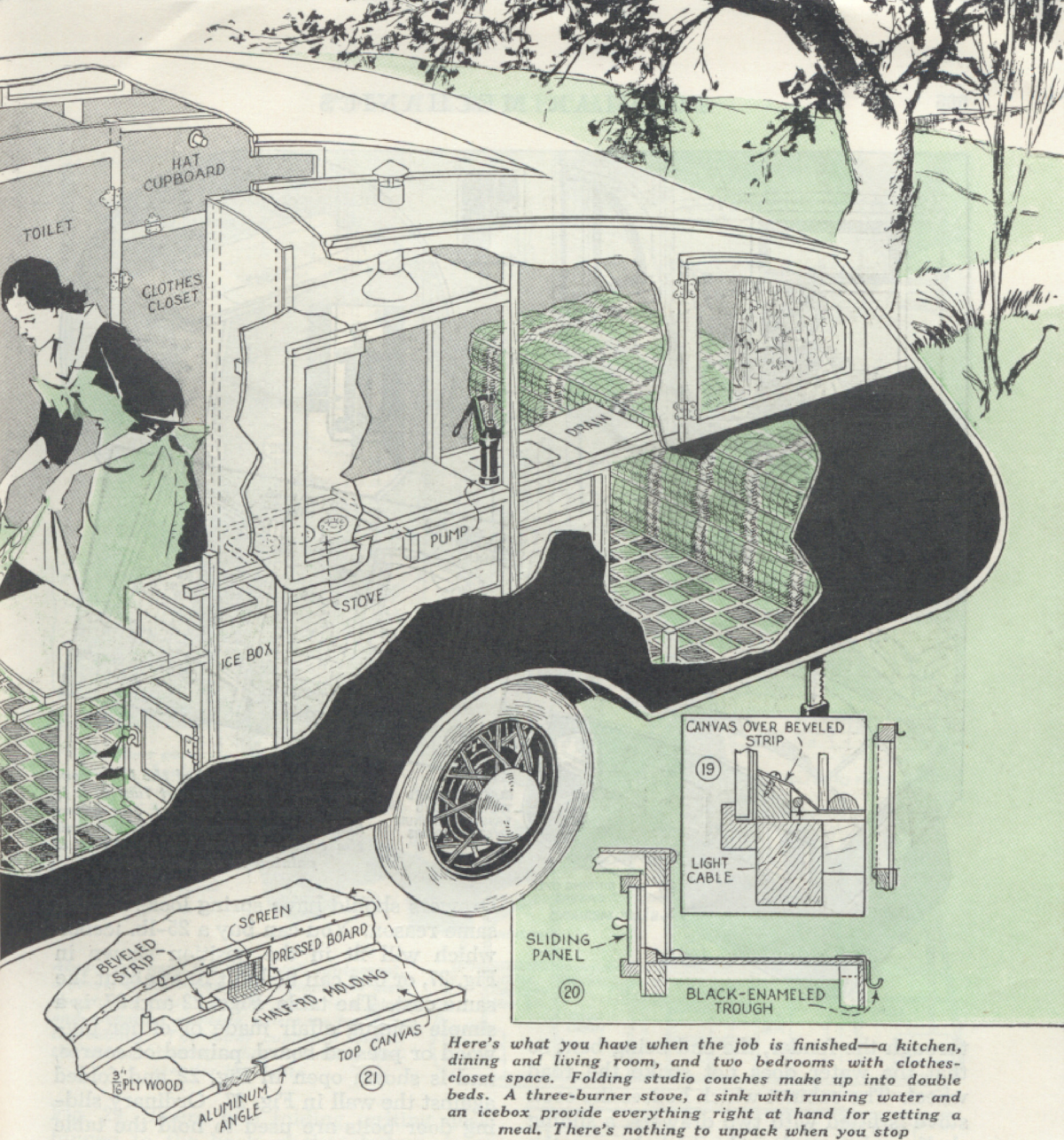
Now to finish the job. Remaining exterior details are application of the roof of auto-top canvas and, if you have so decided, a fabric covering of the body. In putting on the latter, you apply the lower half of the wall covering first, then lap the upper half over it, using copper tacks. A strip of auto-fabric binding is tacked over the seam. Fig. 24 gives you the distribution of the material, and the sectional views, Figs. 19 and 20, and the detail in Fig. 21 show what to do when finishing up



Selected as being representative of the type trailer many of our readers have desired to see published in Popular Mechanics, this trailer, of which this article is the third and last installment, was designed and built by Mr. C. Hart Collins. We are indebted to him for his kind cooperation in going through the entire construction in detail so that complete information, based on the actual work, could be supplied to our readers

the top at the outer edge and around the ventilator openings in the sides of the raised center section. Bindings of light aluminum angle are used to finish all corners of the body as in Fig. 18. Where the top canvas overlaps the sides it's a good idea to apply a light coating of marine glue under the seam. Aluminum gutters around the edges of the top finish this part of the job.

Window sash are made of white pine, rabbeted as illustrated in Fig. 23, the cor-



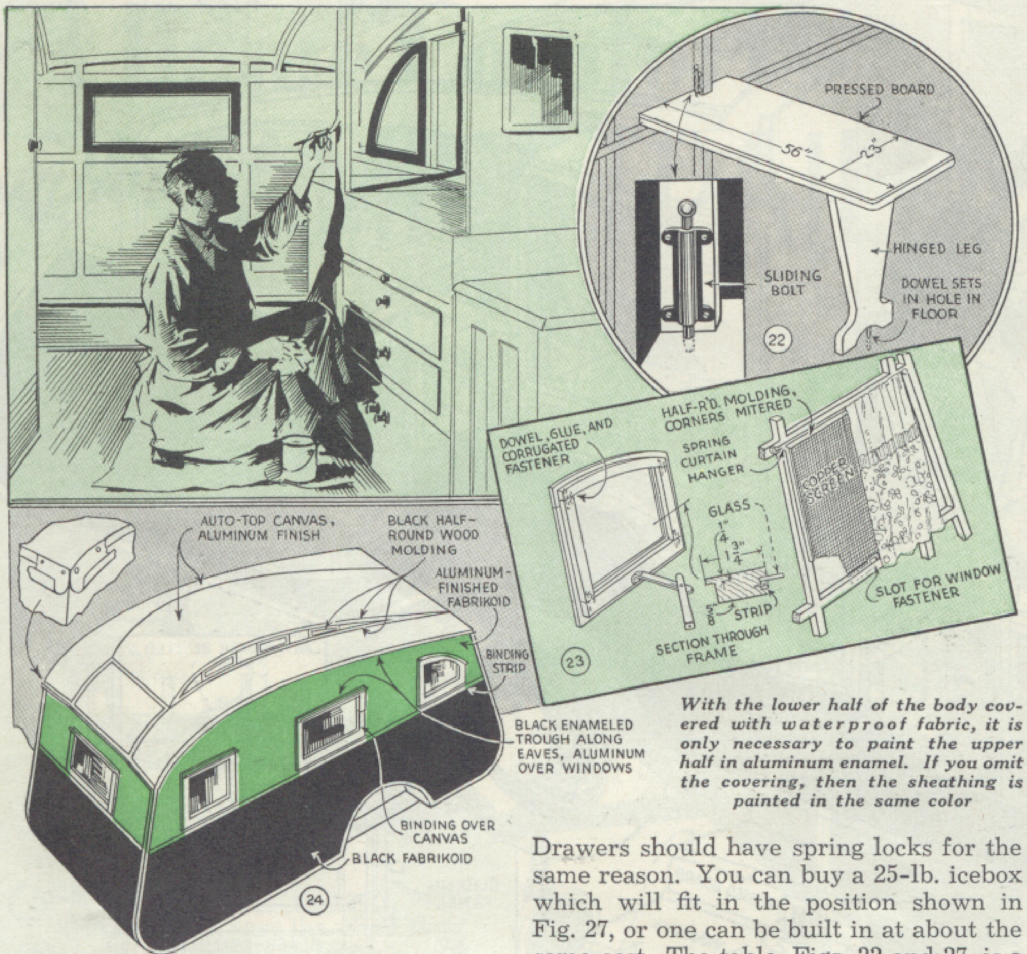
Here's what you have when the job is finished—a kitchen, dining and living room, and two bedrooms with clothes-closet space. Folding studio couches make up into double beds. A three-burner stove, a sink with running water and an icebox provide everything right at hand for getting a meal. There's nothing to unpack when you stop

ners joined with casein glue, dowels and corrugated fasteners. The same figure shows how the copper screen is tacked to the inside of the window frame. All windows swing outward on offset hinges as in Figs. 17 and 18. Jointed brackets hold the windows in any position. After you finish the exterior of the body you can permanently install the A-frame and coupling and also the tail and clearance lights.

When you go inside, the first job is painting. An undercoater and two applications of eggshell enamel in ivory or cream should take care of this. Remember that you can easily make a double-walled

job by sheathing the interior walls and ceiling with pressed board or plywood. Now's the time to do this if you desire. The interior walls and ceiling painted, the next job is the floor. A linoleum covering, cemented down, adds to the attractiveness of the interior and is easier to clean.

Now over to Figs. 25, 27 and 28 for the views and plan of the stove, cupboard and sink. Fig. 25 shows a space-saving arrangement of the drainboard. The latter slides down over the sink when not in use, and the swinging arm which supports it when open folds back against the cabinet. The drain pipe from the sink is led down

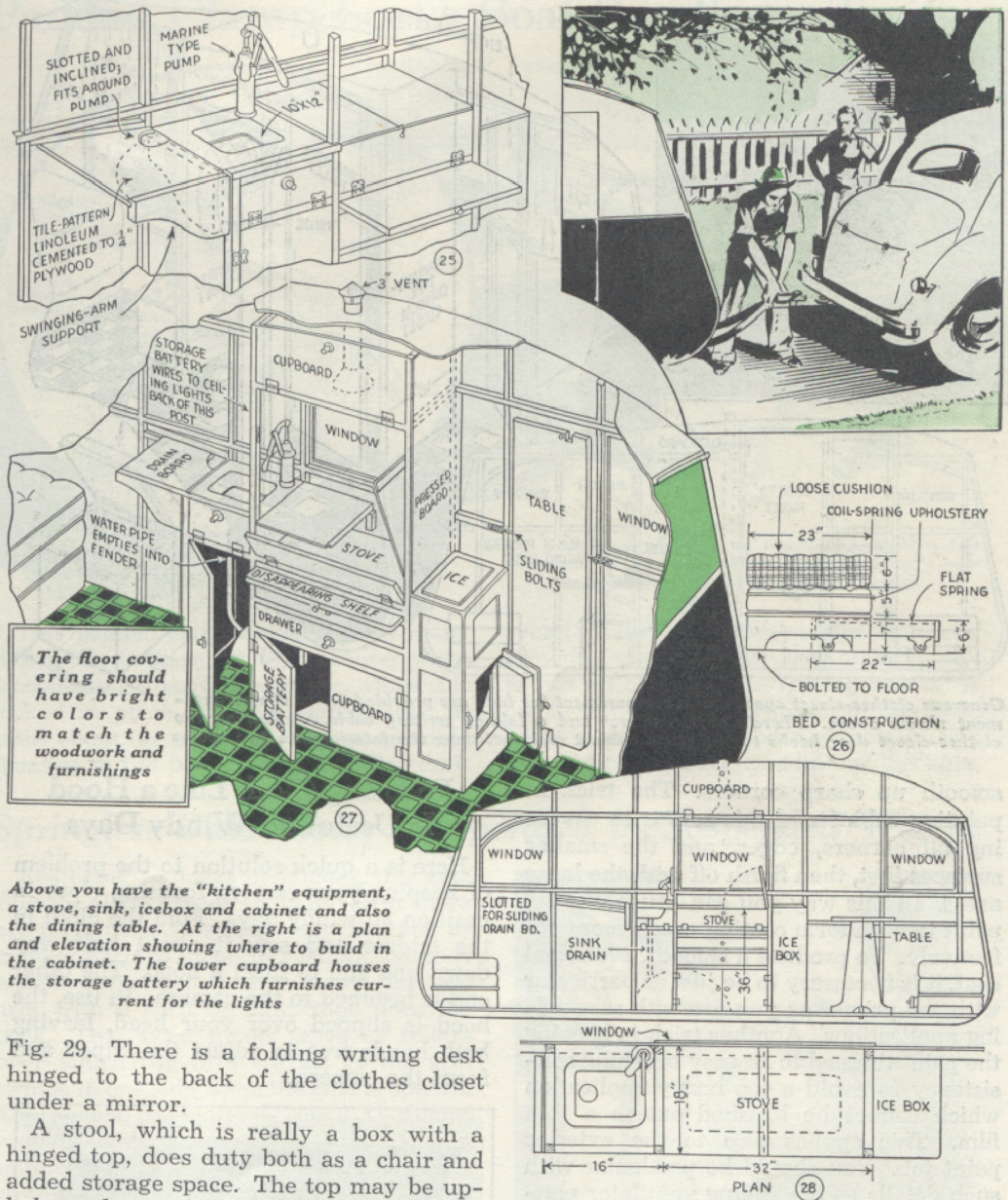


With the lower half of the body covered with waterproof fabric, it is only necessary to paint the upper half in aluminum enamel. If you omit the covering, then the sheathing is painted in the same color

through the fender, the end being bent so that the water does not strike the road wheel. The cabinet which houses the cook stove is fitted with two drawers, a sliding shelf, and a cupboard which houses the storage battery with additional room for large utensils. There is more cupboard space above the stove. A 3-in. vent, made as in Fig. 27, passes through this cupboard and the roof to carry off cooking fumes. In the main the framing for this cabinet can be the same material as the body frame, $1\frac{1}{4}$ by $1\frac{1}{4}$ -in. spruce. For panels you can use pressed board or plywood. Doors, drawer fronts, and the sliding shelf are best cut from $\frac{3}{4}$ -in. fir plywood. Fig. 28, with a plan and elevation, shows you where to place the cabinet on the wall. Doors should have positive catches so that they do not swing open on the road.

Drawers should have spring locks for the same reason. You can buy a 25-lb. icebox which will fit in the position shown in Fig. 27, or one can be built in at about the same cost. The table, Figs. 22 and 27, is a simple folding affair made of either plywood or pressed board, painted of course, and is shown open in Fig. 22 and folded against the wall in Fig. 27. Ordinary sliding door bolts are used to hold the table in either position.

Installation of the clothes closet and the chemical toilet as in Figs. 29 and 30 just about completes the job. The elevation, Fig. 29, will give you the size and position of these closets. For material you can use either plywood or pressed board. It will save time to cut the doors from $\frac{3}{4}$ -in. fir plywood for then there is no frame to make. Notice that there is a flap hinged to the clothes-closet door. This flap hooks to the corner of the stove cabinet, the arrangement forming a partition. All doors should have spring catches to hold them closed. The chemical toilet is vented to the roof through the clothes closet as in

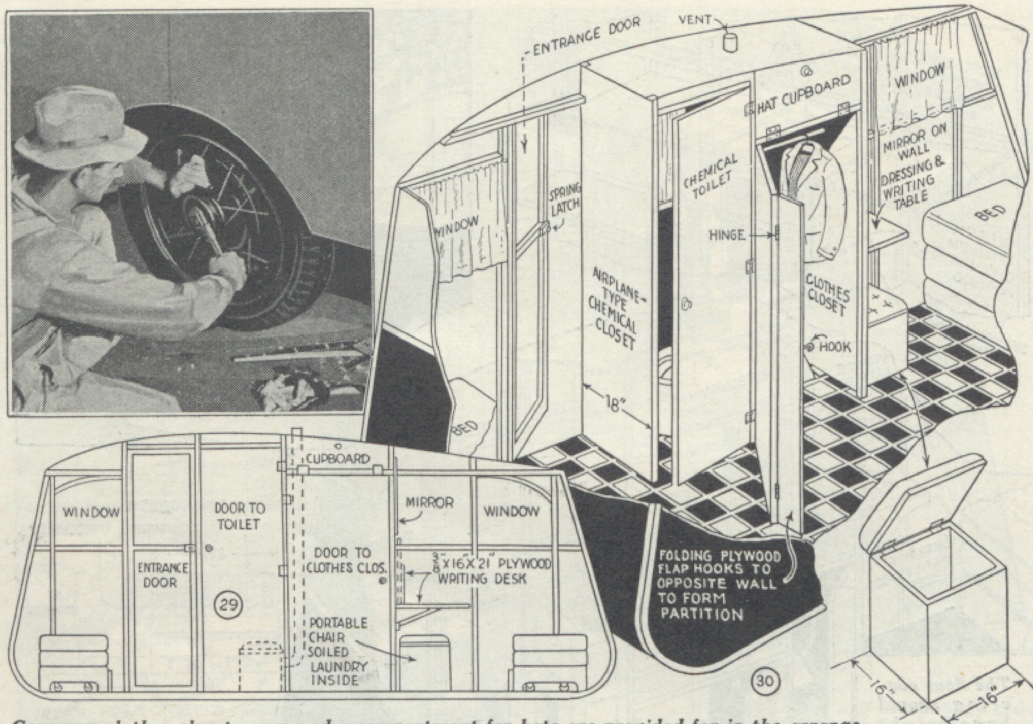


Above you have the "kitchen" equipment, a stove, sink, icebox and cabinet and also the dining table. At the right is a plan and elevation showing where to build in the cabinet. The lower cupboard houses the storage battery which furnishes current for the lights

Fig. 29. There is a folding writing desk hinged to the back of the clothes closet under a mirror.

A stool, which is really a box with a hinged top, does duty both as a chair and added storage space. The top may be upholstered as indicated. The beds are two studio couches, the end dimensions being approximately those shown in Fig. 26. Both can be made up into double beds. When folded there is space in a lower compartment for the bedding. You will save time by buying these ready made, as they are inexpensive. Fasten each to the floor with bolts or screws. Now you come to painting the cabinets, and, if you want a first-class job, give the walls one more

coat. If the doors have been cut from $\frac{3}{4}$ -in. plywood, as is recommended, it will be necessary to fill the edges of the plywood. A paste wood filler worked into the end grain on all the exposed parts will build up a smooth surface for the paint. Work it into the open grain with a cloth or your fingers, rub off the excess and allow the filler to dry. Then sand the edges lightly with fine sandpaper to level the filler and

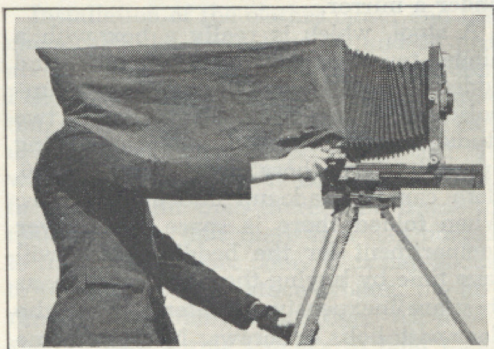


Generous clothes-closet space and a compartment for hats are provided for in the arrangement shown above. There's also a mirror and a folding writing table. A flap on the clothes-closet door hooks to the stove cabinet and partitions the interior into two rooms

smooth up sharp corners. The trick in painting cabinets of this sort is in covering all corners, edges, and the smaller surfaces first, then finish off with the large areas. In this way you can brush out the paint to a uniform coating much more effectively. To produce a smooth, even final coat, it is necessary to be just as particular with the primer as you are with succeeding applications. Another trick is keeping the paint thinned to an easy brushing consistency to avoid a too heavy application which cannot be brushed out to a thin film. This applies also to the exterior paint job. You should be particular with such details as the sliding ventilator panels and the windows. The panels, Figs. 20 and 21, are best removed while you are painting the slides, and the sash should be left open until the paint is thoroughly dry. In this way you will avoid sticking and possible breakage. The same thing is true of the closet and cupboard doors and also the drawers. Now with the painting done, all that remains is to fit and hinge the entrance door and provide a spring lock, and there you are.

Focusing Cloth Like a Hood Is Useful on Windy Days

Here is a quick solution to the problem of keeping your camera focusing cloth in position on windy days. Fold the cloth in the middle and sew it about half way down one end to form a hood. The other end is fastened to the camera. In use, the hood is slipped over your head, leaving both hands free to adjust the tripod and focus the camera.



Camera focusing cloth with one end sewed to form a hood is easy to keep in place