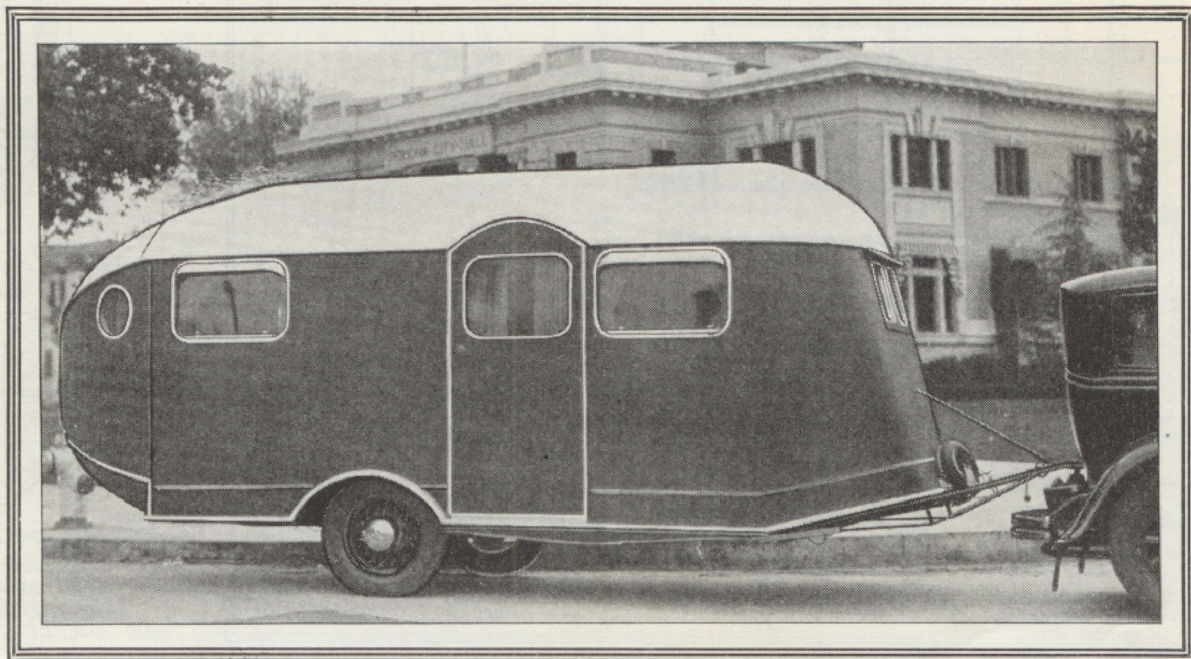


"The TRAVELER"



A Light, Utilitarian Trailer

GEORGE A. VON OFEN

ONE WHO TRAVELS the highways and byways cannot but be impressed by the fact that the trailer method of getting places and living is firmly established. As a result of our nomadic tendencies we have created trailers which are really inhabitable, easy in locomotion, comfortable for riding, rigidly constructed and well designed. Experimentation has removed many of the unwieldy and uncomfortable aspects of the old, swaying trailer. Today, in the main, they conform to all practical requirements, and designers are constantly attempting improvements in line effects, lightness and rigidity. And essentially paramount is the question of lightness. The reason is obvious.

Rigid in Construction

Strength, of course, cannot be sacrificed, but modern airplane construction gives an object lesson on building structures of great strength and rigidity and yet they are light

and portable. So the same principles are being applied to trailer construction.

Rather than construct a trailer of larger pieces of stock and nail assembly, one may use the lighter, strong woods, build strong joints and assemble parts with glue and screws. This trailer conforms to all good practices in construction; and the worker must exercise care in workmanship, for the structure is subject to much stress and strain. Build honestly and it will stand up well for years.

This trailer complete with built-in features, exclusive of couch, should not weigh over 1200 pounds. Considering its generous proportions, this weight is nominal. And its cost is also nominal. Materials should cost in the neighborhood of \$400.00. One, of course, may have the desire to utilize fine cabinet woods on the interior which will increase the cost. But, with excellent materials, the ultimate expenditure

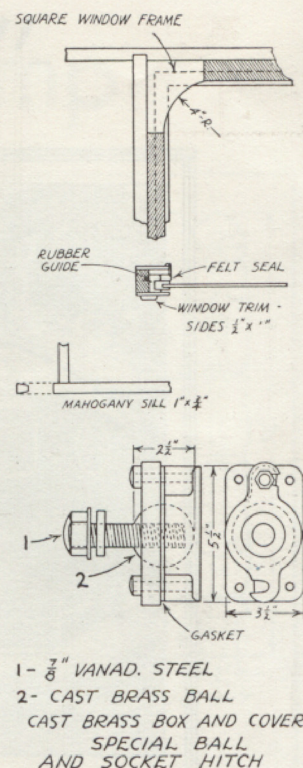
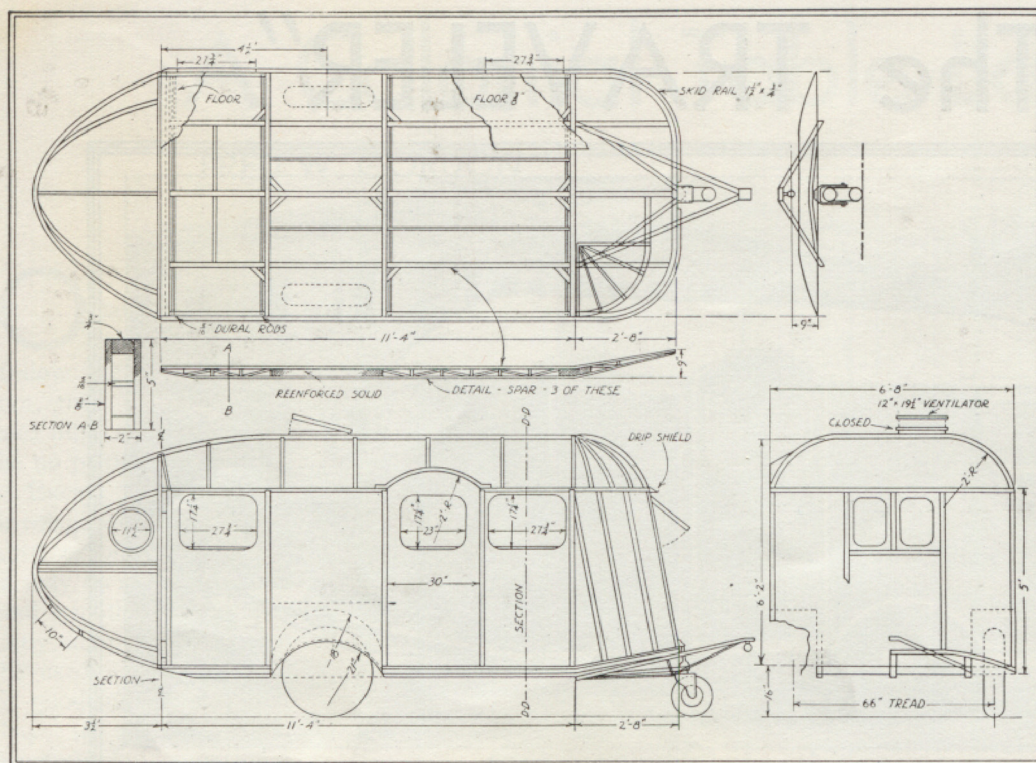
is nominal for so satisfactory a trailer, and one so generous in proportion.

Frame of Spruce

The frame of this light trailer is constructed entirely of spruce. This wood possesses considerable strength in proportion to its weight and is an ideal wood for this purpose. Duralumin has not been used because it is fairly prohibitive in cost, and considerable difficulty would be encountered in welding the pieces together. Tubing presents its own problems and is less satisfactory as to cost and time.

The drawings are essentially complete. There are interval dimensions which have not been recorded, because the workman proficient enough to construct a trailer, also wishes to follow his own ideas on modification in design. All necessary dimensions are given, and explanations are adequate. Information which may not appear in this article will appear in the next, and final, installment.

The first step in construction is laying out the frame. The outline is made from 1¼" x 2½" straight grained spruce, accurately machined.



Cut the pieces to measure as shown by the sketches. Make tongued joints wherever possible and reinforce them with glue and wood screws. A good grade of glue is necessary. In some instances, we will suggest water-proof glue.

After all pieces have been cut to size, they are set up on a level floor on which a chalk outline has been accurately laid out. This is the start of the frame, so the dimensions and outline must be double-checked. The finished job depends much upon accuracy here. Use knife lines in scoring for the joints. The front curved pieces are joined to the side as illustrated in the sketches. This is merely a reinforced butt joint cut at about 45 degree angle. The two members join at the point where the curve of the one member ends. These are securely held with glue, screws and block. The piece which is cut from the straight member is used as a filler, as indicated in a second sketch.

The pieces for the wheel housing

run clear across the frame. They are half checked over the spars, and all but 1/2" of stock is cut away. The back cross piece is not put on until the floor is laid. It is then placed over the floor across the back and held with 5/16" bolts through to the spars.

Before assembling the framework, the spars and channels may be made. The spars are three pieces made as shown. One side is left off until reinforcing and trussing is put in. The center spar needs no reinforcement, for the springs are attached to the outside spars only.

Laying Out the Spars

The three spars are laid out on the chalked floor line. The outside pieces are then assembled and blocked to line up with the spars. Square up all pieces and then assemble them. First, however, prepare the front cross pieces where the angle starts upward. This piece is made in an identical manner to those at the wheel housing.

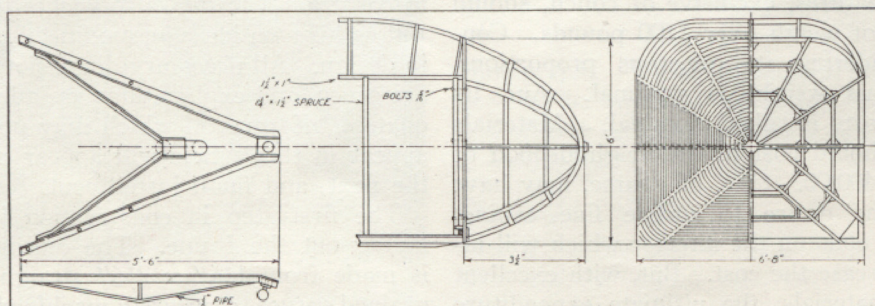
Holes may now be bored for the 5/16" dural rods. The rods are threaded at each end and are placed close to the cross pieces at the bottom. The front cross pieces, connecting the two curved pieces, may now be joined in a bevel joint to the curved pieces.

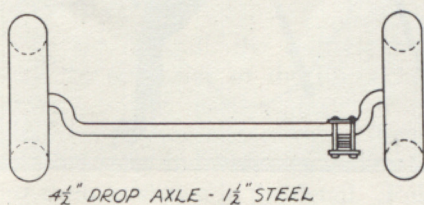
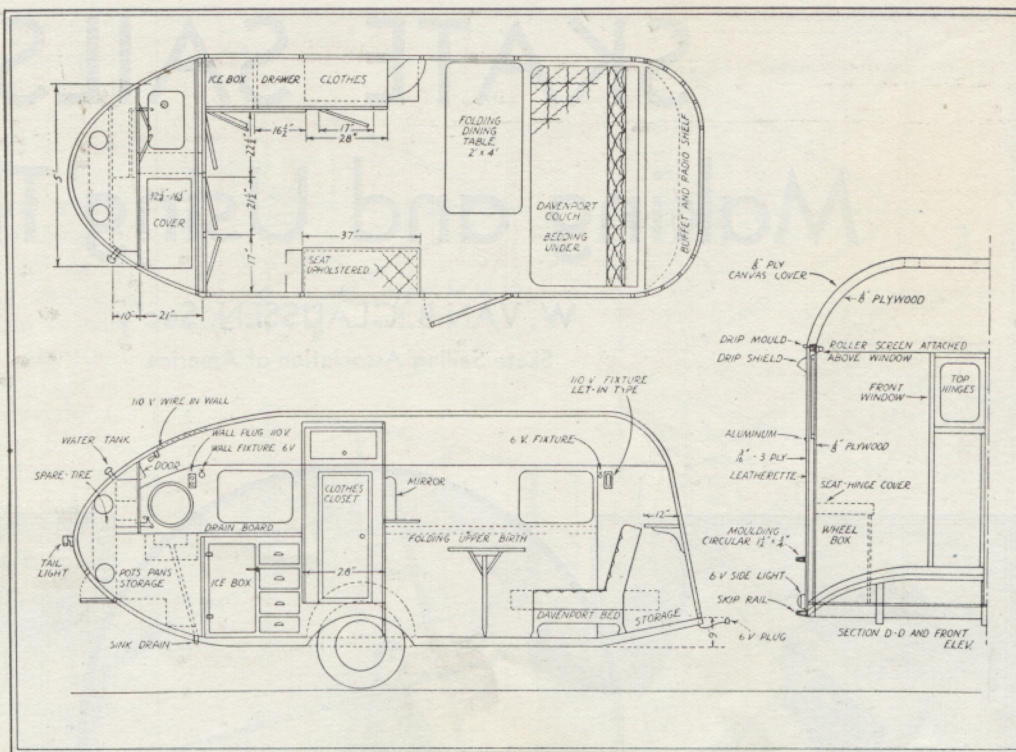
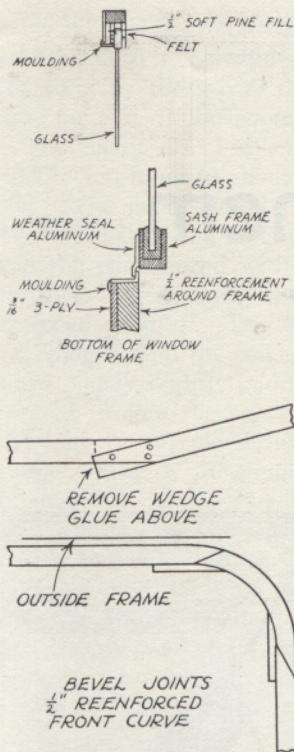
The spars may be cut off to suit the curve at the sides. The curved side pieces at the front may either be sawed out of a segment of two thicknesses of 1 1/4" stock glued and nailed together. Or it may be made of thin laminations glued in a form to the proper curve. The worker may choose either plan.

Careful joint making is essential in constructing the frame. It must be straight except for a crown of about 1/4" across the floor and lengthwise, a 1/4" convex. The width crown may be taken care of by the rods; the length by blocking. This may now be done by raising the frame to a convenient height, and accurately leveling it in preparation for laying the floor.

Laying the Floor

Plywood, 3/8" thick, of Oregon Pine, makes an excellent floor. The laminations, of course, should have been put together with waterproof glue. Fitting the panels crosswise will be found to be the most convenient. Glue and screw a batten at the joints, but better still, allow the joints to hit on a cross piece.





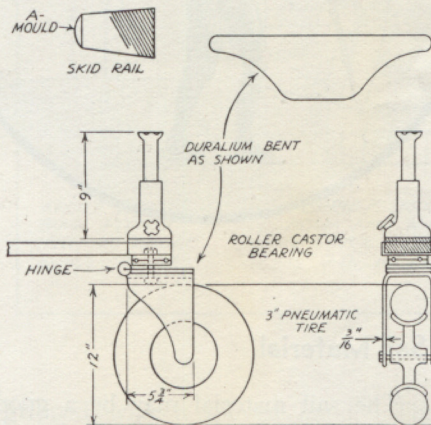
The panels are glued with a waterproof glue and nailed with cement coated nails, and held with screws placed about 8" apart.

The underside of the floor must be water-proofed. But first set in the corner braces with glue and screws. Turn the frame on edge and apply a coat of asphalt paint.

The springs might be secured at this point in construction, also a short length of 2" angle Duralium about 5' long to take the spring shackles. This may be bolted onto the reinforced spar. The drop axle of chrome vanadium steel may now be set up, and if the right tread is used the wheel clearance will be found to be correct.

The spring and axle assembly may be set on now if desired. The spring must be of proper curve to allow about 6" of axle play. A 2" spring about 40" long is about right. Springs which are longer may cause side sway. Install rubber bumpers. Use tires 6:00 or larger.

Location of each upright may now be found from the drawings. These must be accurately marked. Each upright should be cut as shown to extend in about $\frac{3}{8}$ " into the header.



The uprights are screwed to the floor with a brace cut from $1\frac{1}{4}$ " x $1\frac{1}{4}$ " angle dural about $\frac{1}{8}$ " thick. The upper piece of frame, 1 " x $1\frac{1}{2}$ ", is now marked and cut to receive the uprights, then coated with glue and screwed from the top downward. The framework is now complete except for the front and rear.

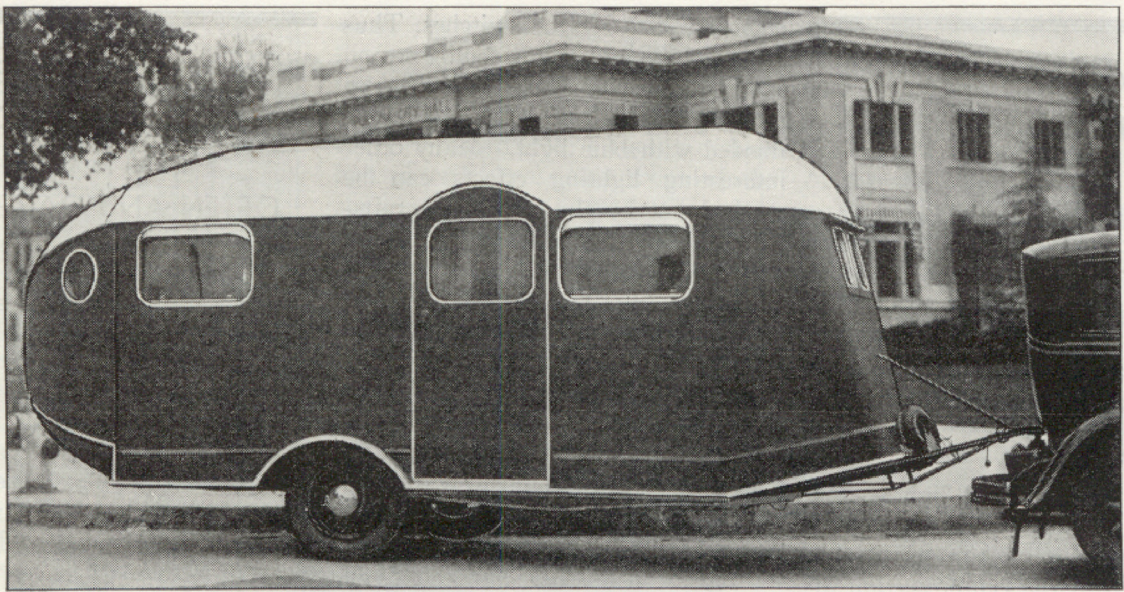
Now cut the front curve from two segments of $\frac{3}{4}$ " stock. Being thicker than the sill, allow the excess to extend below. Fit the front cross piece as shown in the sketches, allowing this curve to match the lower one. Set up this front part for testing before final assembly. If everything checks, finally assemble with glue and screws. Use no nails. Pilot holes for the screws may be advisable, as spruce splits rather easily. Screws about No. 6 or No. 7 are satisfactory for the floor; on other places about No. 10 and long enough

to hold well.

The framework is now complete except for the top bows. It must be braced well. The bows are sawed from five-ply stock, $\frac{3}{4}$ " thick. First make a templet to insure accuracy. The bows are $1\frac{1}{2}$ " wide on the circle and joined to cross pieces at the top. The cross piece should be about $1\frac{3}{4}$ " wide and the same thickness as the bows. Thus $\frac{1}{4}$ " will need to be planed off from the center to match the bows making a slight crown to the roof. One complete bow for the top should be made; others are made to match this to assure uniformity. The top braces are set lengthwise, one in the center and one on either side.

Longitudinal braces are of $\frac{3}{4}$ " x $1\frac{1}{2}$ " spruce. The last two bows are made shorter, as the drawing shows, and the longitudinal ones dipped down to suit. After the bows are set to the located points, they are secured with dural braces, as for the uprights. The front corner bows may be set, glued and screwed at top and braced below. This completes the main framework except for the curved piece for the door. For this, glue up tapered pieces and plane them to the correct curve. Then saw to shape and set firmly in place.

The next installment is the final one. In this we will explain how to cut and fit the streamline end piece, how to cover the framework, and discuss the interior cabinet work. Actual photographs of the interior will show how convenient and compact a trailer may be made.



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GEORGE A. VON OFEN

IN the last issue we carried the workman thru to the completion of the framework of the *Traveler*, except for the construction of the streamline end piece. This piece, which measures $3\frac{1}{2}$ "", is made separately on the floor, with the flat side down. It may be finished independently except for those points where it fits onto the trailer proper.

The main frame, matching the end of the trailer, is laid out and half checked together and assembled with glue and screws. From this are set the curved bows, which are best determined in curve by using spruce strips soaked in water and fastened at each end to a flat strip to hold the curve. The curve is marked with a pencil onto $\frac{3}{4}$ " spruce, making the two side ribs and the top and bottom ribs. These may be sawed out. The center piece, or top of the streamline end will need to be made separately. It is about 14" long, sawed to the right curve, and $1\frac{1}{2}$ " wide, half checked together like a cross. These are half-lapped to the long ribs, the ribs fastened with braces to the flat floor frame. This is the skeleton, with four

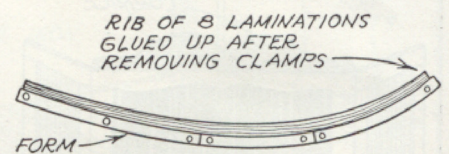
side ribs, on which to complete the end. Eight additional ribs are cut from laminated stock. The curves of these may closely approximate those shown on the plans (previous article) for the eight corner pieces, two each for the bottom corners, and two each for the top corners. These must be worked out with a piece of wet spruce, as mentioned before, laying it on the corner and lining across with a straight edge. Brace the curved strip securely.

After the curve has been determined, a form made from $1\frac{1}{2}$ " stock is sawed out of the outside curve, then sawed out about 3" from the line. This form may be fastened to any heavy stock. Pieces of spruce $\frac{3}{16}$ " thick and $\frac{3}{4}$ " wide are then ripped to a length a little longer than required. Eight of these are bent dry. Lay all pieces together and bend in the form, holding them in place with clamps. A block of the reverse curve of the form will insure better gluing. Eight bows are made in this manner.

Covering with Plywood

When the bows have been complet-

ed and set in place, the corner braces may be set. The door frames for the spare tire may be set in and reinforced. The end then may be covered with $\frac{1}{8}$ " plywood, except where it may interfere with assembly. Now the framework of the structure may be covered with $\frac{3}{16}$ " plywood. Do not cover the window openings. This will utilize 4' x 6' plywood running lengthwise and with battens glued and screwed inside over the joint.



Lower the trailer bed before starting work and see that the frame is square and true. After the side covering is put on the streamline end, it may be set on and battened. If all measurements have been accurately made, this will fit perfectly, and when battened to the main frame it becomes an integral part of the trailer.

After the panels have been set on the sides, the top may then be covered to the side line with $\frac{1}{8}$ " plywood, down over the back, and extend over the joint where the end is fastened to the top bow. It is glued and nailed

to the curve of the end piece, as well as to the last bow. While plywood has been mentioned for covering the framework, there are also fine composition materials on the market which are not expensive, are durable, light and serviceable. The worker may select his own medium.

The window openings are reinforced, as shown in the drawings of the previous article. The leatherette covering may be applied with shellac, after priming the surface first with rather heavy shellac.

Covering the Top

Canvas is used to cover the top. The panels are first padded evenly, and special attention paid to the low places at the front curves. The canvas is then stretched carefully. Avoid all wrinkles and gatherings. Follow with a priming coat of white lead and oil. Finish with a coat of aluminum paint.

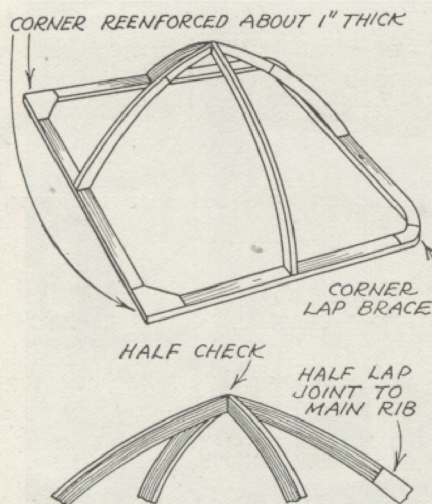
Now screw the drip mould in place. The skid rail is beveled and fastened at the place designated below the plywood and directly onto the $1\frac{1}{4}$ " x $2\frac{1}{2}$ " frame. Counter bore the rail at reasonable distances apart to take the head of the screw. A No. 12 screw of adequate length is sufficiently large.

The portion of the skid rail which is curved is sawed and fitted, as shown on the plans. These curves may be readily cut with a band saw, but careful work must be done if the fitting is to be accurate. This applies with considerable force to the top bows.

Window guides and corners may be finished next. If the lower corners were left square, much extra labor may be eliminated, but, of course, whether square or curved, may be left an optional matter. An aluminum strip, as shown on the sketches, prevents water seepage.

The sash has standard aluminum channel mitered corners, with an angle brace screwed on at the corners. These braces just fit inside, leaving the outside smooth. The machine screws are 6-32, and the holes to receive them may be easily hand tapped.

The front windows hinge from above and swing out. The moulding acts as a weather lip and is painted to match the body. Use double strength glass in the sash. Seal it



with putty and wood strip against the pane. The curved windows do not open; they are sealed. After the aluminum moulding and drip shield are installed around the windows, the structural part is completed.

While it has been suggested that the canvas be finished with aluminum paint, there is no particular finality to the idea. The worker may work out any color combination he wishes. He must, however, use high-grade materials, for a trailer is out in all kinds of weather and it requires a mighty

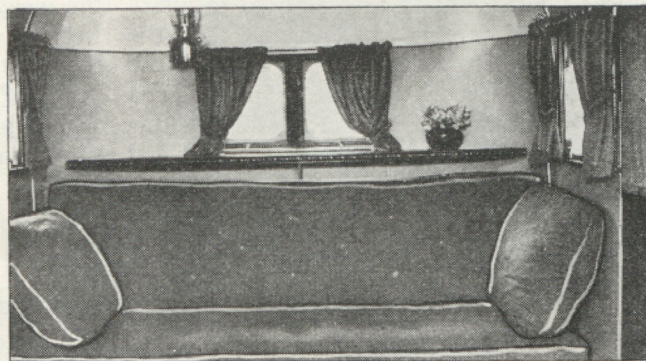
good finish to withstand seasonal changes.

Interior Cabinet Work

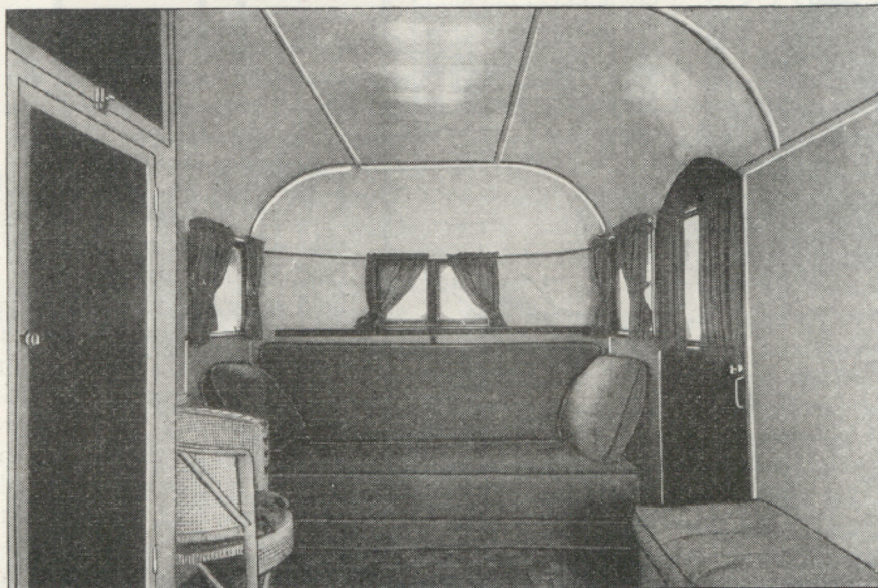
The photographs of the interior will perhaps give a better idea of arrangement than can possibly be given thru a written description. However, there are a few essential things to be done before built-in structures are made. First, full consideration must be given to lighting. The plan shows certain details and indicate space arrangement, but every craftsman has his own ideas of conveniences, and will wish to plan his own layout, to a fair degree at least. So be sure all outlets are placed properly, then proceed to covering the ceiling and walls. Templets may be made for the corner gores which run from rib to rib.

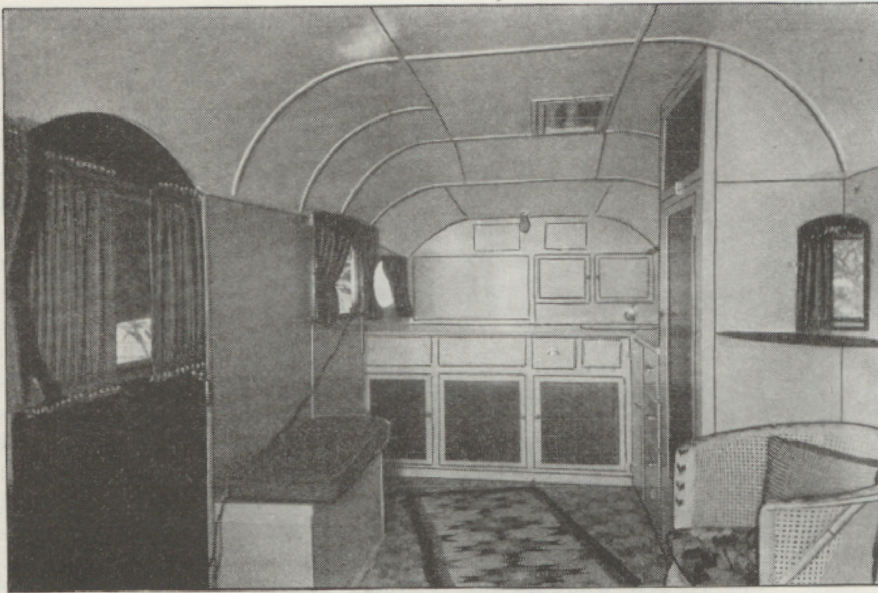
Light panel stock may be bent fairly well, but such material as Presdwood will probably conform much better. It is light, permanent and acts as an excellent insulator. The joints may be covered with strips or battens of the same material. Or spruce may be used if the covering is of paneling.

The color scheme of the interior is optional. However, it is common

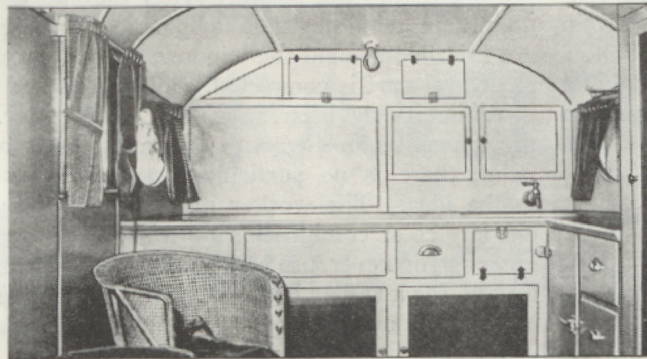


At the left is shown a close-up of the comfortable, convertible bed. Below is shown a larger view of the interior with couch showing at the right.





Above—a view of the interior looking forward. Note the compact arrangement of the "commissary." Right—A close-up view of the convenient kitchen.



sense to select colors which produce the greatest amount of light. This trailer was finished in ivory enamel for the ceiling and light tan on the walls.

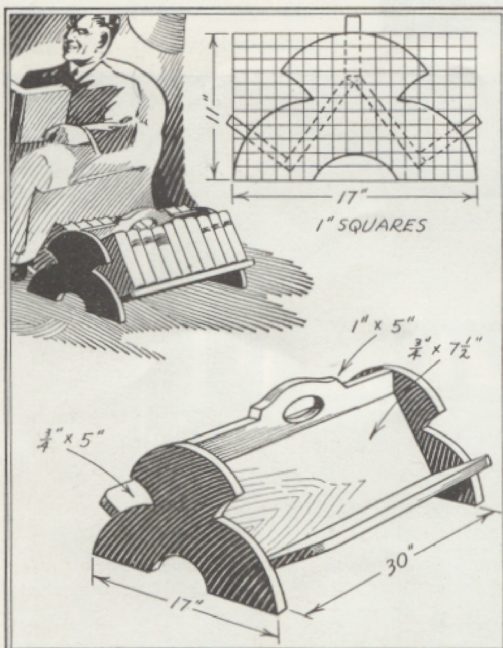
All built-in structures should be made of light stock, or composition panels may be utilized. The latter

will take paint as readily as ordinary stock, or it may be left natural, as the worker prefers. Refinements in the cabinet work may be as pronounced as desired. It is not possible in this space to go into such constructional details. We can no more than suggest a comfortable, convenient layout.

The Tow Brace

The tow brace is cut from angle iron and welded together, as shown in the details. The angle of the hitch is determined by the location of the hitch on the car. This must be a solid cross member on the back of the car. The small wheel is held up by a clip while the trailer is towed and the jack removed. This wheel is standard with a 3" pneumatic single tube. It is set in a fork made of 3/16" dural, cut according to pattern, as shown and bent cold with a sheet metal brake.

The caster bearings are any large thrust ball bearing, and a large strong hinge to which extension wings have been welded. This wheel permits the trailer to be moved about with facility by one person on any smooth roadway. It is held by a clamp when not in use. This trailer is so constructed that it will be found to tow very easily without side sway. The end is readily lifted from the car, as the weight on the small wheel is about 140 pounds only, exclusive of the weight of the couch. If careful work has been done, when completed the craftsman may reasonably expect years of dependability and certainly will enjoy many delightful days on the open road and in wayside camp sites. It is a traveling home in every respect, restful and comfortable.



Handy Book Rack

G. EVERETT VAN HORN

HERE is an intimate book rack that you can keep beside your chair or within easy reach, and is just the thing to hold some of those books that you want to read during the evening. Use 1/2" or 3/4" gumwood in constructing the rack, altho a slightly thicker board can be used for the handle panel at the top. Saw out the ends as shown. Each rack consists of a board 5" wide for the base and another 7 1/2" wide for the

back. These are fastened together with screws, and then attached at an angle between the end boards. The handle board is cut out as shown, with a handle cut out at the middle so that you can carry the loaded rack easily. The side racks can be increased in width at the back, to accommodate larger books, and the angle dropped. A length of 2 1/2 feet for the racks is a convenient one. Sand and stain the finished rack, and finish with a coat of clear lacquer or shellac.