

PLANS AND INSTRUCTIONS FOR:

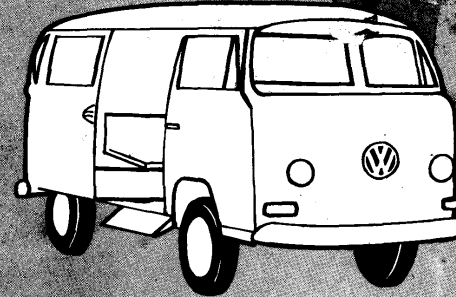
VOLKSWAGEN VAN CAMPER

PLANS FOR EASY TO MAKE QUICK-ON-OFF 'FURNITURE'
FOR INSIDE OR OUTDOOR CAMPING FUN.

INCLUDES MANY OPTIONS

BOOK NUMBER 75

\$3.95



PREPARED BY

CLINTON R. HULL

FOR AMATEUR AND PROFESSIONAL BUILDERS

INCLUDES:

DETAILED HOW-TO-BUILD-IT INSTRUCTIONS.
COMPLETE BLUEPRINT DRAWINGS.
BILL OF MATERIALS.
PRINTS AND INSTRUCTIONS FOR MAKING
ALTERATIONS TO SUIT YOUR NEEDS.

PLANS AND INSTRUCTIONS FOR:

**VOLKSWAGEN VAN
CAMPER**

PREPARED BY

CLINTON R. HULL

QUICK-CHANGE INDOOR-OUTDOOR VOLKS VAN CAMPER

Plans for easy to make quick-on-off 'furniture' for inside or outdoor camping fun.

If you've wished for some easily made, do-it-yourself, inexpensive quick in and out 'furniture' for your van so it will do double duty as a work or passenger vehicle on the job, or at home and as a 'camper' for week-end or vacation trips, these plans should fill the bill.

Designed for easy building with a minimum of tools, most of the units do double or triple duty, either inside, or outside the van and can be set in place or removed in 10 minutes. So-o- if you like to build things, have the average handyman's saw, plane, square, screwdrivers, hammer, pliers, hand drill or brace—or electric drill—hacksaw, files, sandpaper, etc. you're all set—and can save enough on one vacation to more than pay the cost of materials. You can make the units as plain or fancy as you wish and if you choose plywood with a fine grain on the good side, finishing them is a snap.

If yours is a family style vehicle with removable passenger seats you need only to replace the tie-down bolts with thumbscrews for fast removal or replacement. Just have the nuts on the through-floor bolts brazed to the underside of the floor and replace the bolts with thumbscrews inserted from above. You can also replace the screws at the top of the seat backs with $\frac{1}{4}$ " thumbscrews by threading one of the screw holes in the van's ribs (frames) at each bracket to take a $\frac{1}{4}$ " 20 thread thumbscrew bolt.

If the rig is a working van without windows there are special combination sliding window sets available at your trailer supply house, or one of the many camper equipment companies and either will doubtless make the necessary cuts in the side panels and do the installation. If the van is unlined the furniture will fit just as well. But if you wish you can line it inside with $\frac{1}{8}$ " pre-finished plywood and even insulate it with foamed plastic slabs, fiberglass, rockwool, or other such material.

Easiest way to do this job is to buy 10' lengths of the plywood and apply them lengthwise to the walls and roof. They bend more easily from side-to-side than endwise, require less cutting and fitting and have fewer problems of contacting the van's ribs. Any pieces left over can be used in making the cabinets or shelves.

To fasten the panels to the van's ribs use $\frac{3}{8}$ " #9 self-threading pan or flat-head metal screws through $\frac{3}{16}$ " clearance holes in the plywood into $\frac{1}{8}$ " pilot holes in the ribs. You can also tap the holes for #8 machine screws and use them instead.

Easiest way I've found to attach the plywood is to cut a panel to fit, then start at one edge and work across to the other, bending and fastening the panel as you go. The holes must also be drilled in the same way in order to get them to match. It's a rather slow process, but since only a few screws are needed except around the edges and only enough there to hold them in line, a few hours work will do the job.

Usually you will need someone to help hold a panel in place while you set enough screws to hold it. When the panels must be curved sharply, as at the turn of the roof, the ceiling panel should be centered, side-to-side and fastened down the center, end-to-end, then gradually drawn up to each rib as you work progressively toward the edges. An auto jack and piece of fairly wide lumber with a cloth on its upper end to prevent damage to the wood is a big help here and the screws should be placed about 8" apart along the ribs.

If the final curve above the windows is too much for the wood you can fasten the edges and let the panel span some of the curve. Some professionals also use some of the material to make 4" to 6" wide valances to hide the panel edges and the curtain rods above the windows. Small wood blocks are set between the window frames and the valances to space them over the rollers, or you can make metal supports from 6" to 8" pieces of $\frac{1}{8}$ " x $\frac{5}{8}$ " strap iron; the lengths depending upon the distance you want the valances from the wall. I personally prefer the strap iron. Narrow strips of plywood or cove molding can also be used to fill in any spaces left between the ceiling panel and those on the walls. The curtain rods should also be easily removable for a working van.

Wherever joints are made between panels be sure the edges are true. You can always get one straight edge from the outside or end of a plywood sheet. If there is a long span between ribs and fastenings it's best to insert a block of wood behind the joint and fasten the edges to it. Seams can also be covered with strips of the plywood or one of the several trim strips available at lumber yards and building supply houses, but if they will be used set the screws in the panels back from the edges an inch or so so the strips will fit between them.

Some working vans have only two large frames or ribs; one at each side of the door. On these vehicles the **easy** way is to

leave them unlined. But if you wish to line them an extra metal or wood frame must be installed at the rear and any blocks necessary to support a table bracket, seat support fasteners, etc. must be attached to the outer walls before doing the lining. One method is to drill clearance holes through the walls and attach the blocks with #10 or #12 pan-head, cadmium plated, self-threading metal screws into $\frac{1}{8}$ " pilot holes drilled into the wood. The blocks should be mounted in mastic to prevent entry of water and cadmium plated washers used under each screw head. Screw lengths depend upon the thickness of the blocks, but usually about $1\frac{1}{4}$ " is about right. It's also a good idea to lay out the sizes and positions of the 'furniture' so you will know where the blocks must come before you apply the plywood panels.

To fit the plywood around the wheelwells get a large piece of cardboard and cut out the approximate curve on it. Set it over the well, hold a pencil or piece of chalk so it contacts the cardboard and draws a line on it as you move the block around the well. With a sharp knife make a new cut along this line. Be sure it fits, then use it as a template to mark the curve on the plywood at the proper place so it will fit the well and the wall. Use a large scroll saw, sabersaw, small keyhole saw, or sharp knife to cut out the piece. Professionals often use a sharp linoleum knife.

Since the lining and furniture will be exposed to considerable moisture from cooking and outdoor conditions, all the plywood should be of exterior or marine grade. Also, for greater strength, **all** joints in the furniture should be made with water-proof glue and rust-proof screws or nails. All nails should be clinched for better holding if possible. Where there is any danger of splitting the wood all nails and screws should be set into pre-drilled pilot holes somewhat smaller than the nails or screws. A good—and unbreakable—drill for wood is the next size smaller nail with its head clipped off and its point sharpened spade shape. Nail 'drills' for pilot holes for screws should be approximately the size of the **solid** part of the threaded section, exclusive of the threads.

To drill clearance holes through any pieces to be attached to framing or to other pieces so they will pull tightly together, the drill should be the same size, or slightly larger than the threads and shank of the screw or machine screw so they will pass through the holes. If you use nails the dipped galvanized ones are rougher and hold better than the plated ones and a spiral grooved drive screw (actually a nail) will hold even better,

but are difficult to clinch and cost considerably more. But now for the building.

Because the engine cover of a Volkswagen takes up approximately 4' of the van's rear end area and cannot be moved, the 'furniture' must be made accordingly and the cover itself become part of the double bed, seat and daytime storage space. But because the cover slopes forward about 12" and the wheelwells about 16" they make using the cover as a seat rather uncomfortable. To overcome this problem—and gain a lot more storage area—you need only to join a piece of $\frac{3}{8}$ " plywood to the engine cover and flush with its surface so it extends past the front of the wheelwells (Figs. 1-3-3A).

On older model vans having 33" wide engine cover top surfaces (32" wide inside the closed rear door) make the seat panel 22" wide. On the later models having 36" (35") tops make it 18" wide. With either it should be about $\frac{3}{8}$ " shorter than the width of the van. Lay it good side up and measure 12" in from each end along the front edge. From these points draw lines 14" toward the rear edge. From the ends of these lines draw a third line parallel with the rear edge. Saw back to this line along both of the others. Bore a $\frac{1}{2}$ " hole at the end of one of them, insert a keyhole or sabersaw and cut out the section. This is the 'lid' to the under-seat storage compartment. Lay the piece aside for now.

Cut a 1" x 2" frame $3\frac{1}{4}$ " longer than the lid and attach it along the under-side of the opening at the rear so it overlaps it $\frac{3}{8}$ ". Cut two more frames $12\frac{5}{8}$ " long and attach them along the ends of the opening in the same way. They should come within an inch of the panel's front edge and are to help support the lid as a part of the seat.

Use six $1\frac{1}{4}$ " #10 flathead machine screws and nuts, or $1\frac{1}{4}$ " #10 pan-head self-threading metal screws, to attach a 1" x 2" frame to the front of the engine cover $\frac{5}{8}$ " below the level of its surface. If the machine screws are used drill clearance holes through both the frame and the cover. If metal screws are used drill clearance holes through the frame and $3/32$ " pilot holes into the cover. Easiest way with either is to bore the holes through the frame, then through the cover at each end of the frame, fasten it in place, then drill the other holes.

Set a $3/16$ " screw-eye into the frame 14" from each end and turn their eyes at a 45° angle. Set heavy gauge 3" door hooks on the under-side of the seat so they will engage the eyes. They are to hold the seat on the frame and should be a snug fit. The 45° angle prevents them from falling out. Block the seat panel

level while placing the hooks.

Cut a $1/4$ " x $18\frac{7}{8}$ " piece of plywood $3/8$ " to $5/8$ " shorter than the width of the van (Fig. 1). Attach 1" x 2" frames to it at the top and bottom of its rear (poor) side. Attach another 1" x 2" frame $5/8$ " down from the top of its front (good) side. This one will support the bed-wing (of which more later) and will hold it flush with the surface of the seat (Figs. 1-3-3A).

At the center of the panel length-wise, butt a 1" x 2" x 6" frame against the lower rear frame (Fig. 1) and attach it to the panel. Do the same at each end of the panel and attach a $3\frac{1}{4}$ " barrel type (round bolt) door-bolt to the **front** of the panel at each of the pieces so the lower ends are flush with the lower edge of the panel (Figs. 1-3A).

These bolts slip into holes drilled into the van's floor to hold the support panel in position. However, if you prefer wood blocks permanently attached to the floor to hold the panel against the front of the wheelwells—or between a pair of them—they too are shown in the drawings. Attach another door-bolt on each end of the 1" x 2" bed-wing support frame on the front of the panel. They engage holes in $1/4$ " x 3" plywood strips, or $1/8$ " strap iron strips which extend over and are attached to the nearest wall ribs on each side of the panel, or into 2" x 4" wood blocks attached to the outer walls—as previously explained—when there are no ribs (Fig. 3A).

Set the panel on edge at the front of the seat panel and let the seat down on it. It should butt against the ends of the frames of the lid opening and be flush with the seat's front edge. Be sure it's vertical, then tap the door-bolts at the bottom and wing support ends with a hammer to mark the points of contact—or use a pencil. Bore $5/16$ " holes at each spot to accept the bolts. They should hold the panel rigid and vertical. To prevent any water from entering the holes in the floor when traveling and the furniture is out of the van get some small rubber or plastic plugs. Auto parts stores have them. Or you can just drop some $5/16$ " round head machine screws into them.

To hold the top of the support panel at the center in place set another pair of screw-eyes into its rear top frame opposite the ends of the 1" x 2" frames at the ends of the lid. Set another 3" hook in each of these frames to match the eyes. Use 1" piano hinge to attach the lid to the seat panel and bore a 1" hole 2" from its front edge for easy lifting it (Fig. 1). Smooth the edges of the hole and all exposed edges with medium grade sandpaper. An easy way to do the panel edges is to wrap the sandpaper around a small wood block (block-sanding).

Unfortunately, the under-seat storage space is rather V shaped, but if you don't mind losing a little of it to gain a better contour you can hinge a piece of $\frac{1}{4}$ " plywood so it will fold **upward** when not in use and the support panel is removed. A strip of piano hinge makes a good hinge for it, but the bolts should be $\frac{1}{2}$ " #6 flathead machine screws put in from the front of the panel, and the heads pulled flush with the wood surface. To prevent damage to anything placed in the storage space use a small hammer to pean and smooth the screw ends. Attach the shelf in the same way to the other wing of the hinge, then set a 1" x 2" frame up against the hinge on the support panel to help support it. To support the free side of the shelf set another 1" x 2" frame at the correct position on the engine cover slope as you did for the seat.

The shelf may be set at any height you wish, but about 11" from the top is about right and lets the shelf swing up below the top frame for storing it when not in use. Fig. 3 gives the details and the space below the shelf is a good place for carrying seldom used tools, or other items.

From the remaining length-wise section of the $\frac{5}{8}$ " plywood cut the bed-wing (Fig. 1) 21" wide and 48" long, round its corners and block-sand its edges smooth. From the straight-grained 1" x 3" lumber cut two pieces $18\frac{7}{8}$ " long and plane them so one end is about 2" wide. These are the legs for the bedwing.

Attach the strap part of a 3" 'T' hinge to the wide end of each of the legs so their ends are flush with the 'T' part of the hinge when it is at a 90° angle. An easy way to check it is to place the 'T' part flat on the floor, set the leg against the hinge and raise the strap part against the leg. Mark the holes with a pencil, then drill $\frac{3}{32}$ " pilot holes and mount the straps on the legs with $\frac{5}{8}$ " #8 flathead wood screws.

Turn the bed-wing good side down and mount the 'T' ends of the hinges on it as shown in Figs. 1-4 so the legs come flush with the edge of the wing. Turn the wing about so the legs are at the front as the wing faces the front of the van. The leg which is spaced $13\frac{1}{2}$ " from the end should then be at the left side of the van as in Fig. 1. Since the hinge is set $13\frac{1}{2}$ " on center, its edge should be 12" from the wall of the van. The other leg should be 6" from the right end of the wing.

To hold the bed-wing in place for its job as a part of the **bed** use another pair of the 3" door hooks, but to be sure they don't pull out of the support frame with use, substitute a pair of $\frac{3}{16}$ " screw-eyes with 1" screws instead of those which come

with the hooks. Set one screw-eye into the 1" x 2" support frame about 6" from the left end and another about 16" from the right (wall) end so it is easy to reach when the kitchen cabinet is in place. Set the eyes about $\frac{3}{4}$ " from the frame's lower edge and parallel with it so the hooks drop into them from the top and will not fall out. Leave about $\frac{3}{16}$ " of the screw still exposed and be sure the frame is well fastened to the panel and inside frame at the points where you set the screw-eyes.

Put the rear edge of the bed-wing in place on the frame with its legs supporting its front edge. Have someone hold it firmly while you crawl under it and measure where the screw-eyes on the hooks are to be located to match those on the frame. An ice pick is a good screw starter if you want to set them in place while you're under the wing. Set these screws all the way in, but also turn them so the hooks will go into the screw-eyes point downward (Fig. 1).

If you get the hooks too close and they fit too loosely just set the screw-eyes in a bit farther so the hooks go into them snugly and hold the bed-wing tight against the seat panel. If they're a little too far away a tap or two with a hammer should bring them close enough. If not, better re-set them. To keep the hooks from hanging in the way when using the wing for other things set the screw-eyes which came with the hooks into the wing to engage and hold the hooks (Figs. 1-4).

On the rear side of the legs at the lower ends, mount door-bolts so their ends are flush with the ends of the legs. They are for plugging into holes drilled into the top of the engine cover or seat to hold the legs in place as props when the wing is reversed and set up in one of its jobs as a back-rest, both in camp and when traveling (Fig. 3A). To hold the back-rest in position at the bottom, attach a 3" door hook on the wing's under side at the center (Figs. 3A-4). The back-rest can also be used outdoors if you wish.

You can use the bed as is if you have sleeping bags and air mattresses. Just roll or fold the bags onto the engine cover when not in use. But for real comfort get a pad of 3" to 4" thick foamed plastic material as a mattress and cushion and 'upholstery' for the back-rest. Set the bed-wing in position as a back-rest with its folding legs supporting it. Shove the door-bolts on the legs and wing down until they contact the seat or engine cover. Mark the points of contact and bore $\frac{5}{16}$ " holes to accept the bolts. Slide the bolts into the holes, then mark the spot and set a small screw-eye into the seat to engage the 3" hook mentioned above. Engage the hook. It's to keep the bolts from climbing out of the holes.

There are a couple of ways of making the cushions. If you will keep each of them as a separate unit cut the seat cushion the width of the seat and the one for the back-rest 21". If it extends above the back-rest a bit it won't matter. This leaves a third section about 22" wide for use in making the bed. But since the pads may tend to move about, especially if you carry sheets and blankets and do a home type bed making job, I recommend joining the cushions at one edge so they will fold easily, but still hold together. But because the third piece would then become a problem when the others were used on the seat and would not be available for anything else, it's much better to have $\frac{3}{4}$ " flaps left at one edge of each pad and to set heavy snaps every 8" on those of the back-rest pad and corresponding buttons on the other two.

In this case, however, the seat and back-rest cushions should be cut 4" narrower for 4" material and 3" for 3" material. Reason is that they will stand apart their own thickness and leave a hollow corner as shown in Fig. 3A. The extra piece will then also be that much wider.

The cloth covers should, of course, be heavy and strong enough to stand camping use. If you're careful of them and use them only in the van they can be of upholstery type cloth which will lend color and warmth to your camper. But if you will use them outside they should be washable or vinyl type. Each cover should also have a zipper at one end so it can be removed when necessary. Any tent and awning or upholstery shop can make them for you if the boss-gal finds them too difficult. Since they're but 48" long they're easy to handle and make excellent nap or sun bathing pads—or an emergency life preserver.

If you have a small child another 24" wide by 45" long pad can be laid on the floor at the front of the bed-wing, or one end of it shoved **under** the wing between the cooler and kitchen cabinet. This last leaves more floor space open for moving about. For a second child you can also make a bed on the front seats. But since they are only about 17" wide and usually set well apart, another piece of plywood 24" wide is the easiest 'bed frame'. It can be of $\frac{1}{4}$ " material and have folding legs like the main bed-wing, but of 1" x 2" framing and with 3" strap hinges so they'll fold easily when not in use.

Another sleeping bag is also in order; either with an air mattress, or another pad of the foamed plastic. The bed will block the walk-through, but that isn't too important at night and the youngster **can** use it if necessary.

Incidentally, if a couple buys a double width sleeping bag,

or zippers two singles together to make a double they'll have a lot more comfort and making or storing the bed is a breeze. With removable sheets or washable blankets pinned inside the bags they can all be kept clean. The foamed pads can also be compressed into very small space and if rolled tightly inside the bags will require surprisingly little storage space. Pillows can be made of the foamed plastic, but should have soft, washable covers.

To make the bed-wing serve another purpose, mount $\frac{1}{2}$ " pipe flanges on its under-side about 10" from each end and 2" in from the side. Cut four pieces of $\frac{1}{2}$ " pipe 28 $\frac{1}{2}$ " long and thread one end of each to screw into the flanges. Cap the other ends with rubber crutch tips and you have a table, for either indoor or outdoor use.

To make it even better for inside use obtain an available demountable table bracket and mount one part of it on the left wall of the van between the kitchen cabinet and the seat and at the height to match the table. Since the brackets vary somewhat, an easy way to locate it is to put the table legs in place then mark the spot on the wall. You **can** put the bracket directly on the end of the table, but since the wing is 4' long, I prefer a 1" x 2" frame set on its under-side as shown in Fig. 4 and the bracket mounted on it. It not only gives greater strength, but may let the wall part of the bracket mount on the window frame. If there is neither window frame nor ribs a wood block is in order, as previously described or it can be glued to the plywood wall. And with the table bracket instead of the pipe legs at the wall end you can also install a fifth pipe flange (Fig. 4) and use only one pipe leg at the other end. It isn't quite as strong, but gives easier access to the seat behind the table.

Since the distance from the backs of the front seats to the rear door of older vans is about 104" and on the later ones about 110", the 74" total length of the bed should leave 30" on the older ones and 36" on the later models. But because the table should have a couple of inches for moving it and the counter of the kitchen cabinet should over-hang its open end $\frac{1}{2}$ ", the cabinet on the older vans should be about 27 $\frac{1}{2}$ " long and for the later ones about 33 $\frac{1}{2}$ ". Both should be about 30" high and 16" wide, plus $\frac{1}{2}$ " over-hang of the counter at the front.

To build the cabinet use 1" x 2" framing as shown in the drawings. Side, end, bottom, top and door panels are of $\frac{1}{4}$ " plywood and to prevent spillage from the sink and counter, bring the rear and right end panels 2" above the framing. Fig. 5 gives

the building detail and shows three full length and one half length shelf, but may be changed to suit your own ideas or needs. If you prefer to use a couple of plastic dishpans instead of a sink the half shelf can be made full length; but the sink is recommended for its greater convenience. Your trailer supply dealer has them.

If you prefer a drawer in place of the half shelf Fig. 6 gives the how-to. With either, an easy way to assemble the framing is to make the front and rear sections first, then add the end, top, bottom and any intermediate frames. Use zig-zag fasteners (Fig. 9), plywood joint patches (Fig. 10), corner braces (Fig. 11), or nails. Make all joints with water-proof glue and if nails are used set them into pre-drilled pilot holes if there is any danger of splitting the wood.

If your lumber yard carries Harboard, or one of the other plywoods having one surface of masonite, or other hard plastic, it's ideal for the counters of both the kitchen and cooler cabinets. And for its small extra cost its worth buying the full sheet if necessary. You can use the rest of it as shelves in the cabinets. It's water-proof, highly resistant to wear and needs only a thorough application of liquid wax, parafin oil, or liquid plastic and an occasional re-wax job to keep it in perfect condition. But don't use it without one of the finishes, or it will stain.

You can also use a fine grained surfaced plywood such as birch or mahogany and finish it with one or two coats of the liquid plastics, such as Varathane. But don't apply the plastic until the counter is finished. These plastics are also excellent for finishing all the cabinets, bed-wings, etc.

Another good counter is made by cementing sheet formica to the plywood. It's available at builder's supply houses and some lumberyards. Just follow the directions on the cement can and you'll have no trouble. But do block-sand the exposed edges of any of the counters and be sure the counters butt tightly against the rear and right end panels and that the left end and front edges of the counters overhang the cabinets $\frac{1}{2}$ ". It's also easier to apply the formica before making the cut-out for the sink. And the cut-out should be made before attaching it to the cabinet.

To do this have the counter ready and fitted to the cabinet frame. Lay the sink on it up-side-down and $\frac{3}{4}$ " from what will be the right end and the rear. Trace around the flange with a pencil. Measure back from it $\frac{1}{16}$ " all around and draw another

line. This is the cutting line and allows some space for adjustment and fitting.

If the sink is round you need drill but one $\frac{1}{2}$ " hole to start a keyhole or sabersaw. If it is square, or oblong it requires holes at two opposite corners. But if using a keyhole saw you can change to a regular saw as soon as the cut is long enough. Since the sink is usually mounted with a metal frame over it, the saw cuts are covered and there's no problem. When the counter is ready attach it in place with glue and screws or nails and set the sink in mastic. Ask your Trailer supply house.

The compartment beneath the sink can be used for cooking utensils and a 4' length of good garden hose with a male hose connector on its free end can be brought out through the right end of the cabinet and down through a hole bored through the floor just back of the driver's seat. The balance of the 25' hose with the female connector on it should be carried for draining dishwater to a sewer inlet in trailer parks and campgrounds, or away from camp in primitive areas. To dispose of the water without making a mudhole in these latter places, dig a 12" deep by 24" wide hole, fill it with rocks, insert the hose end and cover the rocks with dirt. That way you'll leave a clean camp and no one will fall into the hole later.

If you want to be **really** outfitted you can also install a faucet with its own length of hose and a **female** hose connector. Have another female connector attached to the rest of the hose for connecting to hydrants when they're available. You can also install a hand pump and an available 5 to 10 gallon plastic tank made for the purpose. The tank can be placed beneath the left end of the bed-wing along the wall and a hose from the pump inserted into it. Otherwise better carry a five gallon plastic water bottle, or galvanized can with a spigot near the bottom. For cool drinking water with either set-up, a good two gallon water bag hung in the shade and breeze is hard to beat.

To cover the holes through the van's floor when not in use, cut a piece of 20 gauge sheet iron to fit over them. Drill a $\frac{1}{4}$ " clearance hole at one corner and a $\frac{3}{32}$ " pilot hole in the floor and set a $\frac{3}{8}$ " #9 pan-head metal screw into it as a hinge. But don't bore the holes or fit the cover until you finish the cabinet and know where they should be.

To give you more storage space in the under-sink compartment bring the hose—or hoses—through the end panel about 3" below the sink outlet. Adjust them to a rounded curve, then put several wraps of friction tape around them inside and outside of the cabinet so they will stay in that position. When

they're not in use coil and tie them on the cabinet end. For easy carrying of the cabinet either attach fold-down metal handles at one of the shelf frames, or bore two $\frac{3}{8}$ " holes in each frame about 5" apart, insert the ends of pieces of $\frac{5}{16}$ " sash cord and staple them to the frames, or tie knots in them so they won't pull out. To make the knots stay put pass the rope ends through the loops twice and pull them tight.

To keep grease and water out of the seams along the splash shields at the cabinet's rear and right end, mount $\frac{3}{4}$ " wood, plastic, or aluminum inside corner molding in mastic over them. And to prevent water from running off the front and left ends of the counter get a length of wood or plastic trim strip and cement it on top of the counter flush with the edges. Use one of the water-proof contact cements or fixture adhesives, such as Wilhold or Elmer's. Be sure to do this before applying the wax or plastic or it will not hold.

There are several ways to hold the cabinet in place while traveling, but one of the easiest is to set a couple of $\frac{1}{4}$ " 20 thread eyebolts with $\frac{1}{2}$ " to 1" bolts into the side ribs of the van. Locate them about 15" from the floor, drill $\frac{5}{32}$ " pilot holes and tap them to accept the bolts. Set the bolts tight and leave them permanently.

Tie one end of each of two lengths of sash cord into the eyes and seize the other ends of the cords with electrical plastic tape to prevent them from fraying. When traveling just tie them into the cabinet's handles. A fancier, but more costly way is to have small snaps put in one end of each of two web straps and a tension type buckle on the other end of one of them so you can set or release the straps as needed. They go completely around the cabinet. If there is no rib at the rear end of the cabinet an eye-bolt can be set into the floor close to the wall and a piece of the sash cord run from it to the cabinet handle, or one end of the strap can be attached to it. Small eye bolts set into the floor and door hooks on the cabinets also make good hold-downs, as do available trunk latches.

To save the cabinet's counter finish it's a good idea to carry a cutting board for cutting meat, bread, etc. They're available at hardware and variety stores, or you can make one by impregnating a 10" x 12" piece of plywood, or hardwood with paraffin oil. If you use formica on the counter the cut out section for the sink makes a good cutting board.

Figs. 12-13-14-15-16-17-18-19 show a couple of ways of making the cooler cabinet and stove counter, or you can change the design if you prefer. There are so many front seat widths

it's nearly impossible to design cabinets to fit all of them so you must be governed by those in your own vehicle. If you have a narrow driver's seat and a wide passenger seat, with a narrow walk-through, the cooler cabinet can be made much wider, as in Fig. 17. If the passenger's seat is narrow and the walk-through wide it can still be built and will leave about 6" or 7" for the walk-through, but the narrow cabinet, as in Fig. 12 is probably better. If the passenger seat joins the driver's seat to make a full width seat you can probably make both cabinets fit behind it and give more floor living room. However the cabinets shown will fit most of the plans and are shown for that reason.

The cooler cabinets are designed to fit the large size Coleman type horizontal and vertical coolers; though the horizontals must be pulled out to open, or drain off accumulated water. Twelve volt refrigerators, such as Mr. Chill are also available and draw current from the van's battery. They're okay if you're traveling enough to keep the battery charged, but if they open at the top they must also be pulled out of the cabinet to open them, or the counter must not cover them and the stove must be used on the kitchen cabinet or table. Since the cooler cabinet is easily reachable from the outside, it can be left in the van and the stove placed on one end of the table or kitchen cabinet for outdoor use.

Coleman type adjustable flameless heaters are worth considering to heat either the van or a tent. They are claimed to be safe against igniting even paper should it accidentally come in contact with them and to give off practically no carbon monoxide gas; though they do exhaust some oxygen and must have some ventilation. If you use a burner of the stove as a heat source be sure to open a couple of windows a few inches and **never** leave the flame going while you sleep. It's also a good idea to set a kettle of water on the stove to replace moisture used by the flame. And to prevent possible damage to the ceiling above the stove if the van is lined, better attach a 12" x 18" aluminum faced insulated hot pad to the ceiling directly above the stove and keep a kettle or pan on the burners. The pads are available at dime and hardware stores.

A Coleman type lantern is almost a must for outdoor living at night. But to keep insects away from camp, hang it 15' to 20' away. You'll still have ample light for cooking and dining. The lantern will also do a fair job of heating the van on cool evenings, but must also have ventilation. For warm nights an electric lantern or lamp, or a 12 volt fluorescent is fine inside

and a couple of flashlights should always be carried. To hold the cooler cabinet in place set an eye-bolt into the door frame, another in the seat back and sash cord around the cabinet when traveling, or use the eyebolts and door hook or trunk latches.

Since there is only about 36" of space between the roof and the top of the engine cover and that space drops about 7" in the 12" allowable along the right hand wall for a wardrobe, hanger space is very limited. Even the full 36" is scarcely enough for a man's jacket and not nearly enough for a woman's dress. But with the wonderful wash-n-wear fabrics today most shirts, dresses, pants and sweater type jackets can be carried folded and come out wrinkle free and okay for dining out or visiting friends along the way.

For this reason the easy in-out shelf cabinet (Fig. 20) is designed to give 12" wide shelves 32" long for stowing everything from socks and towels to Pop's straw hat. The lower section is left unusually deep for storing boxes of clothes and supplies, but may be changed to suit your own needs. Just be sure the front shelf frames are set **behind** the main members so the framed plywood doors (Fig. 7) will close over them, as with the kitchen cabinet. The cabinet can also be moved forward a foot or so and a 10" or 12" board set on blocks above the windows to span the van and give more storage space in the curve of the roof. To prevent things from falling off it attach 2½" wide strips of plywood to its edges.

The cabinet's end panels are cut to follow the curve of the roof as shown, but should just clear the ceiling if the van is lined to prevent damage to the lining. The top is left uncovered. To cut the curves make cardboard templates as previously described for fitting the plywood to the wheelwells. Make the doors to overlap the openings, as with the kitchen cabinet and hinge them with off-set hinges.

To protect the van's sides if they are finished attach a 1" x 2" frame across the back of the cabinet at the second shelf frame and pad it with a piece of old blanket, towel, or other soft cloth. If the van has several wall ribs make the piece long enough to span one on each side of the cabinet about an inch. Drill a ⅜" hole through the ends directly over the ribs. Drill 7/32" holes into the ribs and tap them for 5/16" 18 thread machine screws and use 1½" x 5/16" thumbscrews to hold the cabinet in place. To protect the van's finish use one of the glue-on fixture cements, such as Wilhold and attach a thin washer over each hole through the finish. They will also help in locating the holes.

If the ribs come close to the sides of the cabinet you can set 5/16" eyebolts into them and use long gate hooks, make hooks of ¼" welding rod, or set screw-eyes into the cabinet framing and use sash cord. The window framing can also be used for anchoring the eyebolts if necessary.

On vans having only two major ribs it may be necessary to attach a wood block on the wall and set a screw-eye into it. The rear door frame can be used to hold an eyebolt at the cabinet's rear side.

To carry a couple of jackets on hangers cover them with plastic bags to keep off dust and prevent wear on the cabinet doors. Shorten the hanger hooks and bend them to go over the top front frame, then notch the frame to keep them in place, or on unfinished, or plywood lined vans, set small eyebolts into the overhead ribs.

The 36" x 48" piece of ⅝" plywood left from the bed-wing and seat will make a fine hook-on table and stove rest for outdoor use, or a four legged table on its own, plus being a 'floor raiser' in front of the seat in the van.

Cut it lengthwise and 20" wide and use #8d nails to attach 1" x 3" straight grained framing on edge to its under-side and flush with its edges. Set two 1" x 2" frames on edge between them about 12" from each end. Since the piece will be used as a 'floor' in the van, the 1" x 2"s are to prevent the 1" x 3"s from bending over. Reason for the floor raiser is that in order to be level with the top of the engine cover the seat must be 19½" above the floor. With the 3" or 4" cushion it's a bit high for comfort.

If you wish to use the piece as a stand-alone table put another pipe flange at each corner and make four more legs to fit them. If you will use it only as a hook-on, mount only two flanges at the corners of one side and make two more legs.

Put the legs in place and set a pair of 3/16" screw-eyes into the 1" x 3" frame of the other side about 1" below the plywood and spaced so they will contact the kitchen cabinet's vertical corner frames. Turn the eyes so they're parallel with the table edge. Set the cabinet and table on a level floor, butt the screw-eyes against the cabinet, be sure the table is level and mark the points of contact on the cabinet.

Use a chisel or screwdriver and open the eyes of two more screw-eyes ¼". Set them into pre-drilled holes in the cabinet ½" **above** the marks made by the table's screw-eyes and with the openings pointed **upward**. In use, the eyes on the table simply drop into and rest in those on the cabinet to give a steady work

table, stove rest and dining area if you wish. The bed-wing can also have screw-eyes set into its edge and be used in the same way if you prefer and don't need the floor raiser.

To put the raiser under the bed-wing-table in the van the easiest way is to use the table bracket and one table leg as previously explained, then cut a notch—or hole—in the raiser to allow the leg to reach the floor. To put the raiser in place or remove it just lift the table and slide it in or out. But so it slides more easily, round off the corners of its 1" x 3" 'runners'.

That about wraps it up, but here are a few kinks which may be of some help. To keep bare feet off the cold metal floor use a piece of old rug or one of the new synthetics such as Ozite, which wear well and clean easily; especially when mounted on a 'sub-floor' of 1/4" plywood. To protect the seats and walls from grease and water from the stove and sink when living inside the van carry some pieces of heavy sheet plastic and drape them where needed. And always use the metal wind shield of a camp stove. A folding stool for the cook is also handy to save too much stooping in the low van.

You can put a couple of towel racks on the end of the shelf cabinet and mount small holder shelves on the doors of the older vans whose doors open instead of slide. Also, a detachable, or folding shelf for a camp stove for indoor or outdoor cooking. And that piece of 8" wide 5/8" plywood cut from the hook-on table 'floor raiser' can be used for the shelves in the end of the cooler cabinet if you make it. Since the hook-on table will be used part time as a **floor**, it should have three coats of either the Varathane or porch and deck paint on its top surface. A plastic table cloth covers it when in use as a table.

For more comfort outdoors carry folding aluminum chairs or chaise chairs. The latter even make good beds if fitted with available foamed plastic pads and a hammock may be handy at some camp spots. For an unbreakable and easily moved mirror get a photographer's 12" x 18" chromed ferrotype tin, bore a small hole at one end and use a small finish nail as a hanger pin. And for real comfort ask your dealer about cutting out a section of the van's top and either replacing it with a higher one, or making it so it can be raised to give full headroom. That does it. Have fun.

. . . The end . . .

MATERIALS LIST

Since the 'furniture' can vary so widely and your ideas may differ from mine, it's pretty difficult to give exact figures in a materials list, but these will be close and you can delete any you will not need. Actually, you can study the drawings and figure the material needed for any changes you decide to make.

- 1—Sheet $\frac{5}{8}$ " x 4' x 8' exterior grade plywood good one side.
- 4—Sheets $\frac{1}{4}$ " x 4' x 8' exterior grade plywood good one side.
One of these may be the Harboard type if you wish.
- 1—1" x 3" x 14' straight grained lumber for wing legs and 'floor raiser' runners.
- 1—1" x 6" x 5' board for drawers if desired.
- 4—1" x 2" x 10' framing for seat assembly (Fig. 2).
- 6—1" x 2" x 12' framing for seat assembly for cabinets, doors, etc.
- 1—48" x 76" piece foamed plastic 3" or 4" thick, plus extra pieces for children's beds if needed.
- Cloth, vinyl, or leatherette for covering the foamed plastic—with zippers.
- 1—1" x 12" x 5' board for over-head shelf if desired.
- 2—Pieces formica with cement for cabinet tops if desired.
- 1—Lb. water-proof glue.
- 1—Tube fixture adhesive.
- 1—Folding step for van if needed.
- 1—Camp stove or hotplate.
- 1—Coleman type lantern.
- 1—12 volt fluorescent light if desired, or a battery type electric lamp. Don't forget flashlights.
- 7—3" heavy gauge door hooks and screw-eyes.
- 2—2" door hooks and eyes.
- 10— $\frac{3}{16}$ " screw-eyes.
- 2—Thumbscrews to replace seat hold-down bolts.
- 2— $\frac{1}{4}$ " x 2" 20 thread thumbscrews to replace screws in seat back brackets.
- 6— $\frac{5}{16}$ " x 1" 18 thread eyebolts.
- 8' length 1" piano hinge.
- 2—3" 'T' hinges for bed-wing legs.
- 2—3" strap hinges for child's bed on front seats if needed.
- 10—Cabinet door hinges with $\frac{1}{4}$ " off-set. Your choice of several available.
- 36" to 48"— $\frac{1}{8}$ " x 1" strap iron for supporting ends of seat support panel if used.
- 5—Door catches. Several types available.
- 24— $1\frac{1}{4}$ " #10 or #12 self threading cadmium plated pan-head metal screws.

- 1—Box $\frac{3}{8}$ " #9 self threading cadmium plated pan-head metal screws.
- 1—Box 1" #8 or #9 flathead woodscrews.
- 36— $\frac{1}{2}$ " #6 round head machine screws and nuts for the under-seat shelf hinge.
- 12— $1\frac{1}{2}$ " #9 flathead wood screws for wing support frame.
- 9— $\frac{3}{4}$ " barrel type door-bolts.
- $\frac{1}{2}$ " pipe flanges. Number desired. See text.
- 1—Wall mounting table bracket.
- Necessary lengths of $\frac{1}{2}$ " pipe and crutch tips for each leg.
- 1—13" x 13" sink.
- 1—Standard sink faucet if desired.
- 1—25' length good grade $\frac{5}{8}$ " or $\frac{3}{4}$ " garden hose for sink drain line.
- 1—25' length special hose for water supply. Ask your dealer. Garden hose tastes bad.
- 1—Hand pump and hose if desired. Ask your dealer.
- 1—Five or 10 gal. plastic water can if hand pump is used.
- 1—Two gallon water bag.
- 1—Five gallon galvanized or enameled can with spigot near the bottom for water if desired.
- 15'—Cotton sash cord.
- $\frac{3}{4}$ Lb. zig-zag fasteners. $1\frac{1}{4}$ " size.
- $\frac{1}{2}$ Lb. #6d galvanized nails.
- $\frac{1}{2}$ lb. #4d galvanized nails.
- $\frac{1}{4}$ Lb. #8d galvanized nails.
- Drawer handles if needed.
- Bullet catches if needed.
- 4—Small screw-eyes and chain for drop-door if it is used.

If you will line the van.

- 3— $\frac{1}{8}$ " x 4' x 10' sheets pre-finished plywood.
- 1—box $\frac{3}{8}$ " #8 pan or flathead self-threading metal screws.
- 20'—cove molding for ceiling-to-side joints if used.
- 48"— $\frac{1}{8}$ " x $\frac{1}{2}$ " strap iron for curtain valances.

FIG 1—VOLKS VAN.

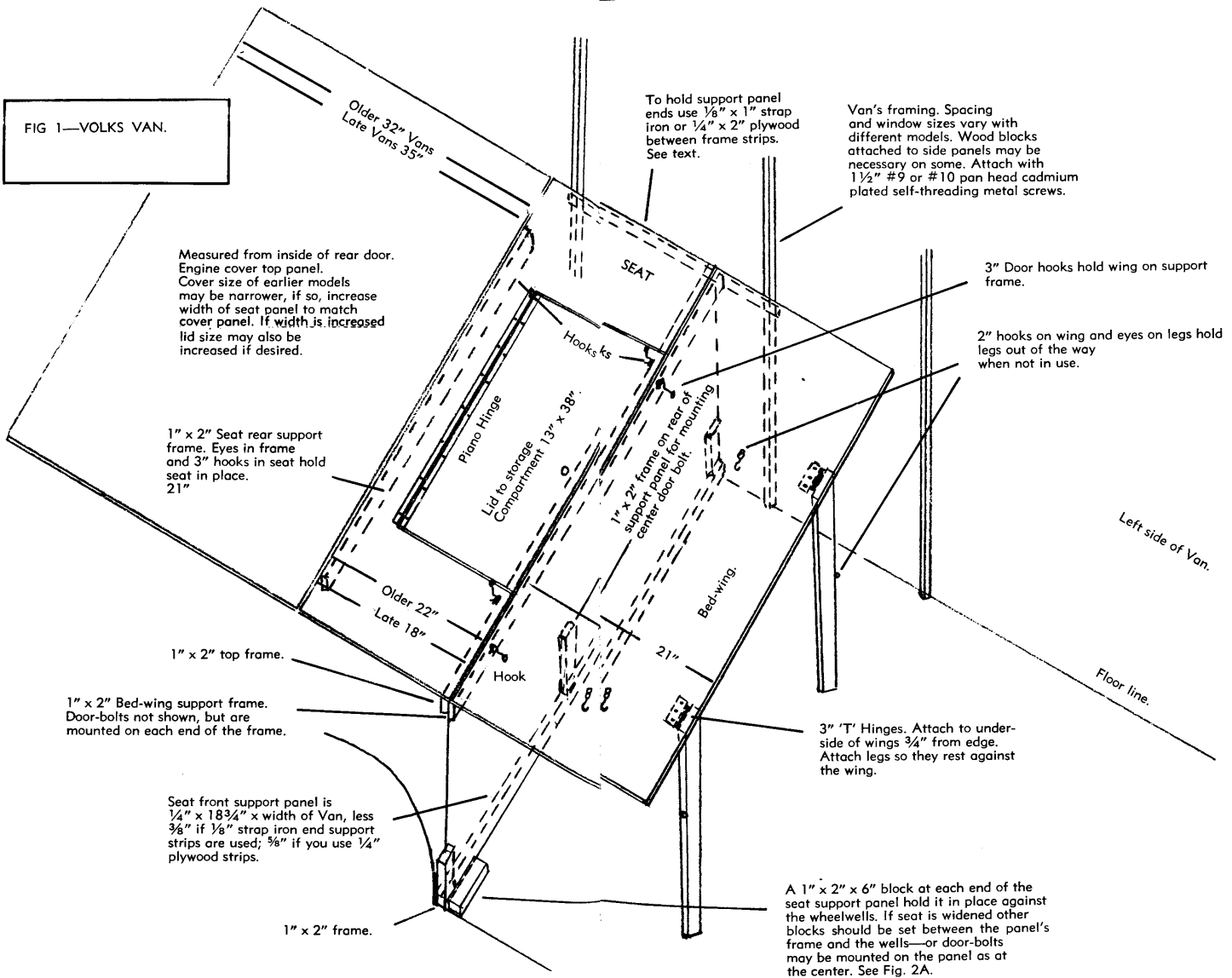


FIG. 2. NOT TO SCALE. VOLKS VAN.
Door Bolt. May be mounted to
give long or short bolt.

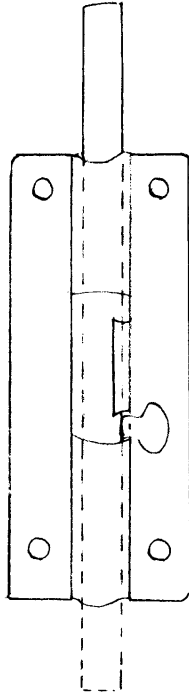


Fig. 2A. Not to scale. Vans.

Detail of cut-out for lid of seat-storage compartment. Lid removed to show 1" x 2" framing and hooks to frame on the seat support panel.

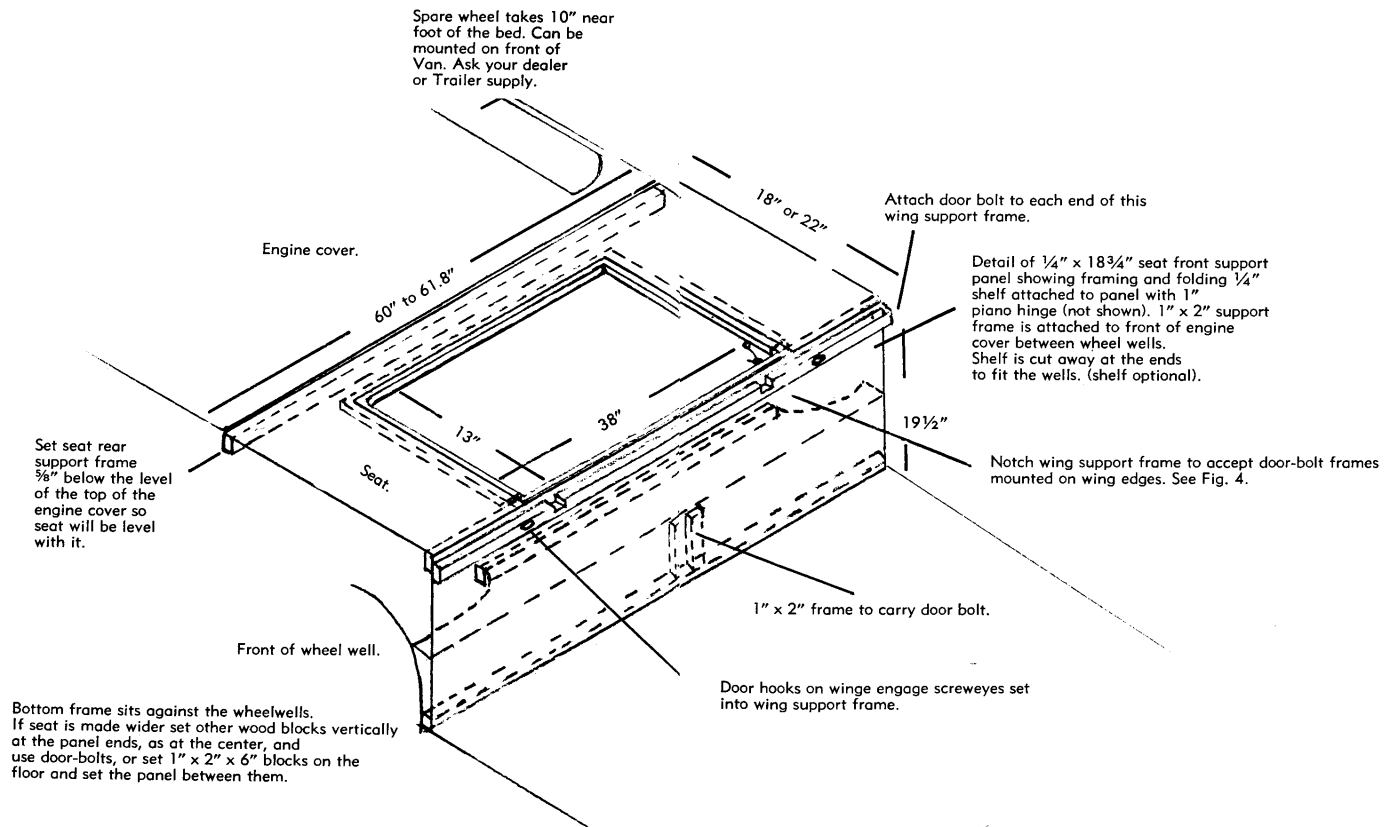


Fig. 3 Not to scale. Vans.
Detail of bed-wing used as back-rest

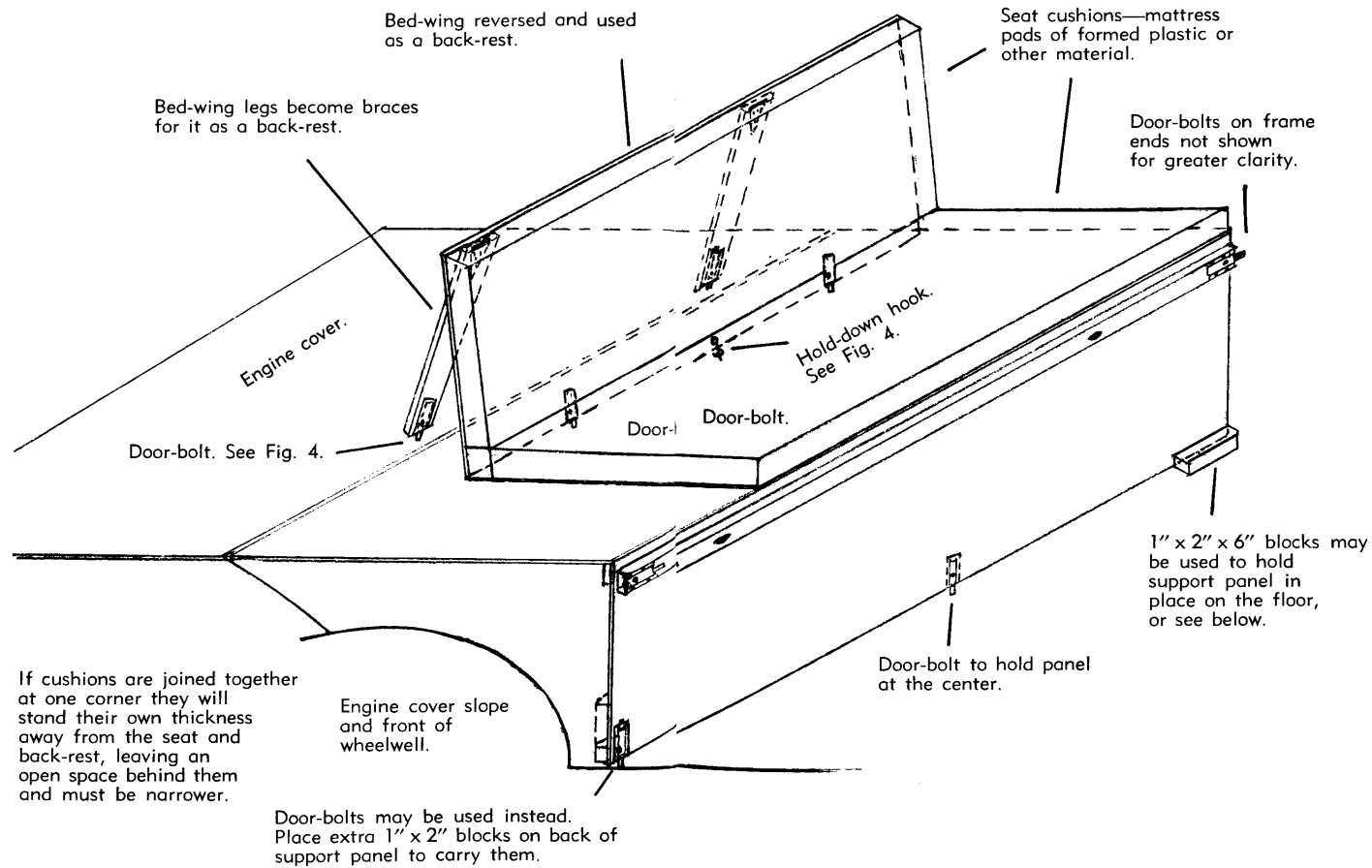
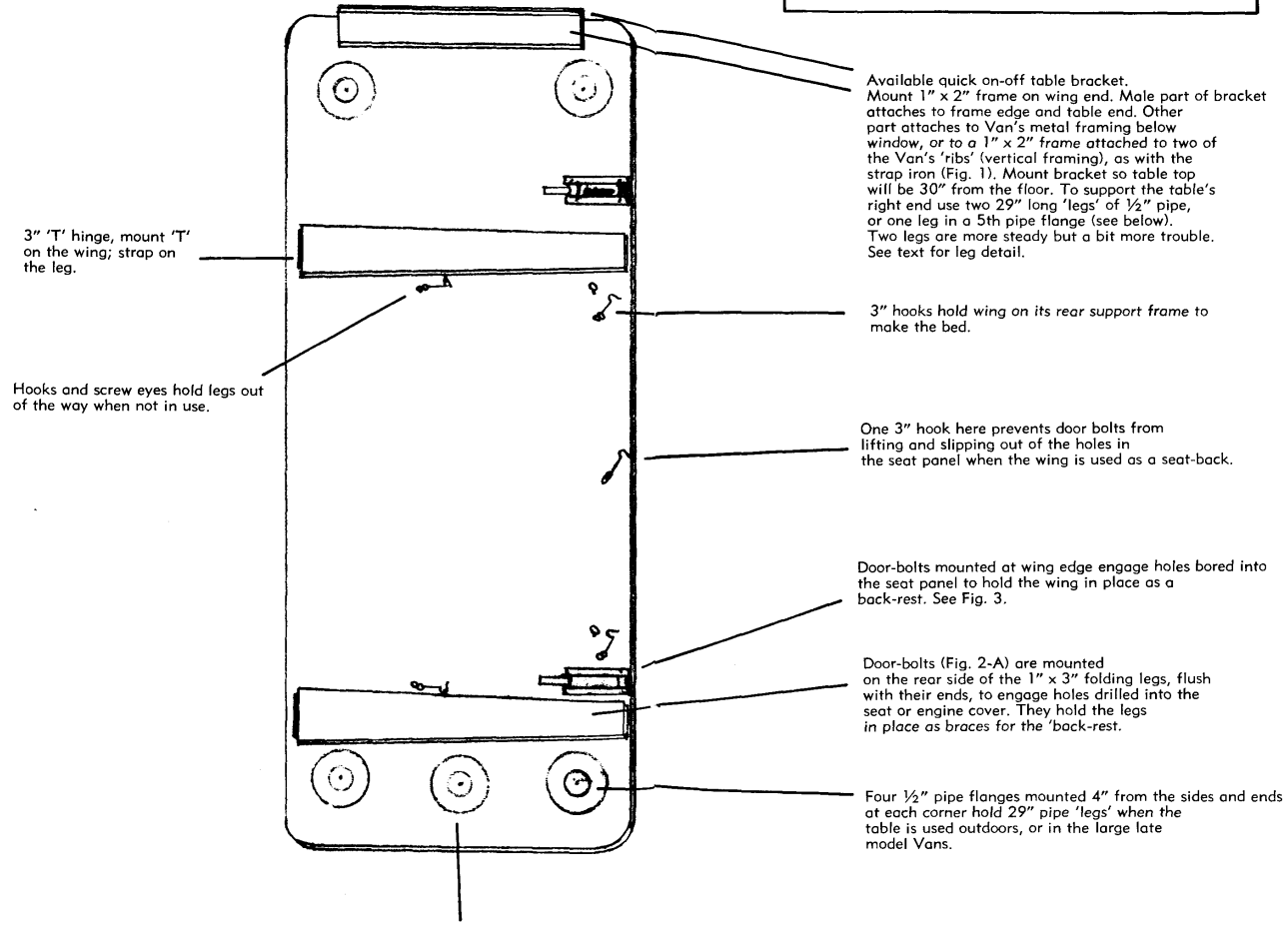


FIG. 4. SCALE 1½" TO 1". VOLKS VAN.
View of under-side of bed-wing — table — back-rest.



3" 'T' hinge, mount 'T' on the wing; strap on the leg.

Hooks and screw eyes hold legs out of the way when not in use.

Available quick on-off table bracket. Mount 1" x 2" frame on wing end. Male part of bracket attaches to frame edge and table end. Other part attaches to Van's metal framing below window, or to a 1" x 2" frame attached to two of the Van's 'ribs' (vertical framing), as with the strap iron (Fig. 1). Mount bracket so table top will be 30" from the floor. To support the table's right end use two 29" long 'legs' of ½" pipe, or one leg in a 5th pipe flange (see below). Two legs are more steady but a bit more trouble. See text for leg detail.

3" hooks hold wing on its rear support frame to make the bed.

One 3" hook here prevents door bolts from lifting and slipping out of the holes in the seat panel when the wing is used as a seat-back.

Door-bolts mounted at wing edge engage holes bored into the seat panel to hold the wing in place as a back-rest. See Fig. 3.

Door-bolts (Fig. 2-A) are mounted on the rear side of the 1" x 3" folding legs, flush with their ends, to engage holes drilled into the seat or engine cover. They hold the legs in place as braces for the 'back-rest.

Four ½" pipe flanges mounted 4" from the sides and ends at each corner hold 29" pipe 'legs' when the table is used outdoors, or in the large late model Vans.

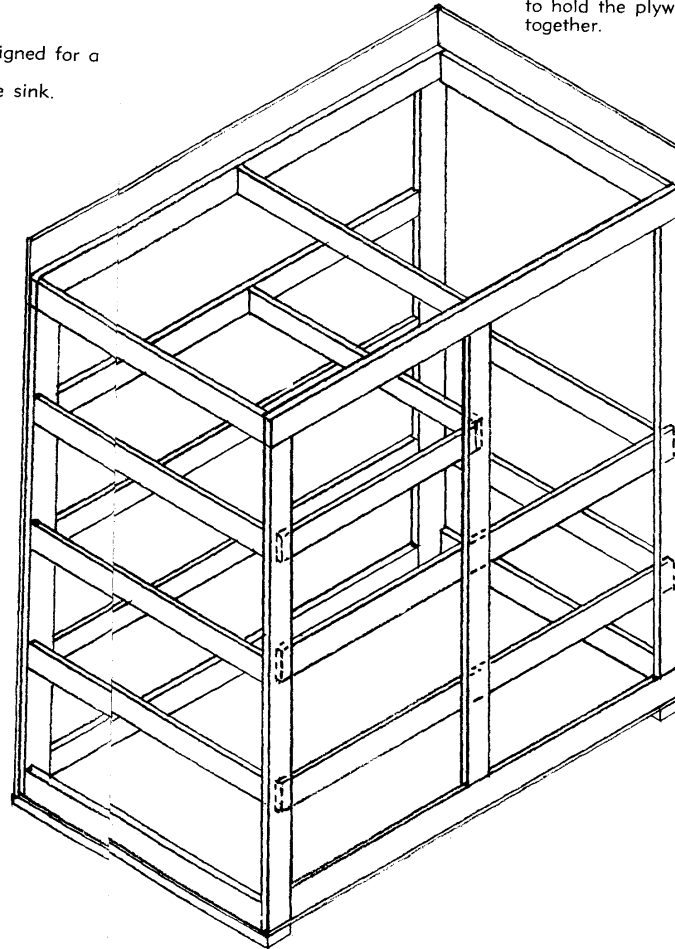
If you prefer a single leg with the table bracket mount a 5th pipe flange here. The single leg gives easier access to the seat.

Fig. 5 Scale $1\frac{1}{2}''$ to 1'. Kitchen Cabinet. Vans.

This cabinet is 28" long, 16" wide and 30" high. Designed for a sink at right end. The half shelf leaves space for the sink, hose—or hoses—and pots and pans beneath the sink. Plywood bottom, rear and right end panels are in place, but the top, front, left end and shelf panels are left off for clarity. Framing is 1" x 2" and the three intermediate front cross-frames are set inside the others to allow doors to close. See Fig. 7 for door detail. If cabinet will be used cross-wise behind either front seat hinge the doors to the left and right corner frames. If it will be used between the driver's seat and the bed-wing, hinge both doors at the right. Sink may also be changed to left end and the half-shelf to the right. Put plywood at end of half-shelf to keep articles in place.

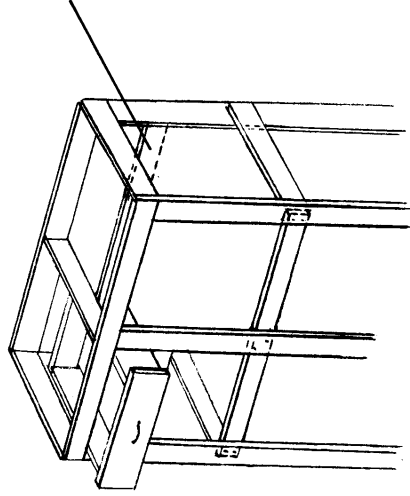
The rear and the end panel next to the sink extend 2" above the framing to prevent water from flooding over. The counter is fitted against them and made to over-hang the front and open end $\frac{1}{2}''$. See text for counter details. Cabinet may be made any desired length and where space permits 30" or more is suggested.

To give more storage space the bottom panel is attached to the bottom of the cabinet frame. To keep the plywood off the ground and floor, attach 1" x 2" frames as shown as 'feet'. Over all height of cabinet is then $32\frac{3}{4}''$.



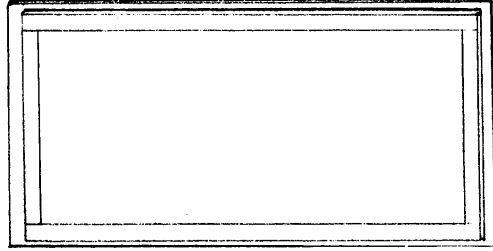
When counter and the cove corner molding are installed glue a piece of the molding in the corner to hold the plywood together.

Fig. 6 Not to scale. Kitchen cabinet. Vans.
Detail of installing drawer in kitchen or
ice box cabinet.



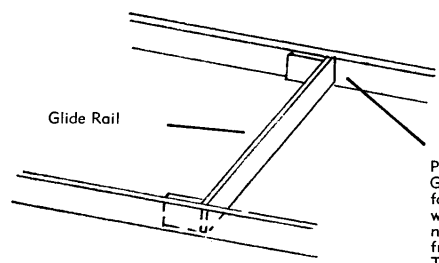
Put extra frame at rear to support the drawer
glide bar. See Figs. 8 - 8A - 8B for drawer detail.
Rear frame here can be attached to rear panel
and need be only 6" long; not full length as shown.
door must also be shortened to fit under drawer.

Fig. 7 Not to scale.
Door Detail.
Door panel should be 1" longer
and 1" wider than door opening
so it over-laps it.



Attach framing to plywood
door panel $\frac{3}{4}$ " from the top
and bottom edges and from
the opening side. Put it $\frac{1}{4}$ "
from the hinge side so
the off-set hinges can
operate properly.

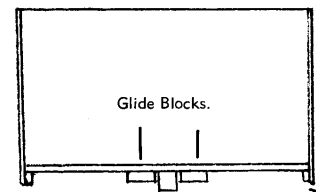
FIG. 8 NOT TO SCALE. DRAWER DETAIL. VANS



Glide Rail

Preferred method.
Glide rail is glue and nail fastened to 1" x 2" blocks which are glue and short nail or screw fastened to front and rear frames. The drawer rides on this rail.

Fig. 8B. Not to Scale.



Glide Blocks.

1/2" strips support sides of drawer bottom.

Rear view of a drawer end.
Both front and rear end panels are of 1" (3/4") stock. Sides and bottom are of scrap 1/4" plywood. Side panels are cut 3/4" less than the opening in the cabinet. Sides extend below the bottom 1/2" and wood strips are glue and screw fastened to them. Guide blocks on rear end panel keep drawer on the glide.
Plywood drawer bottom is fastened to underside of end panels and rests on the 1/2" strips.

Fig. 8A Not to Scale.

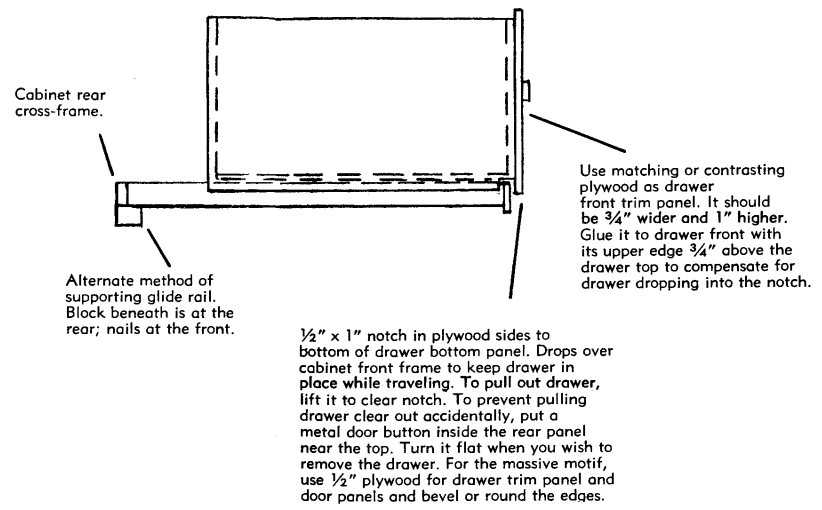
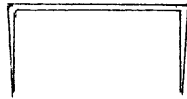
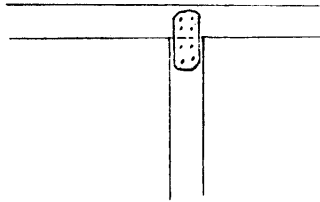


Fig. 9. Not to scale. Vans.



Zig-zag fastener.
Use to tie joints together.
See Fig. 11.

Fig. 10. Not to scale.



Scrap plywood joint
patch. Use glue and screws
or nails.

Fig. 11.
Corner brace. Mount with screws.

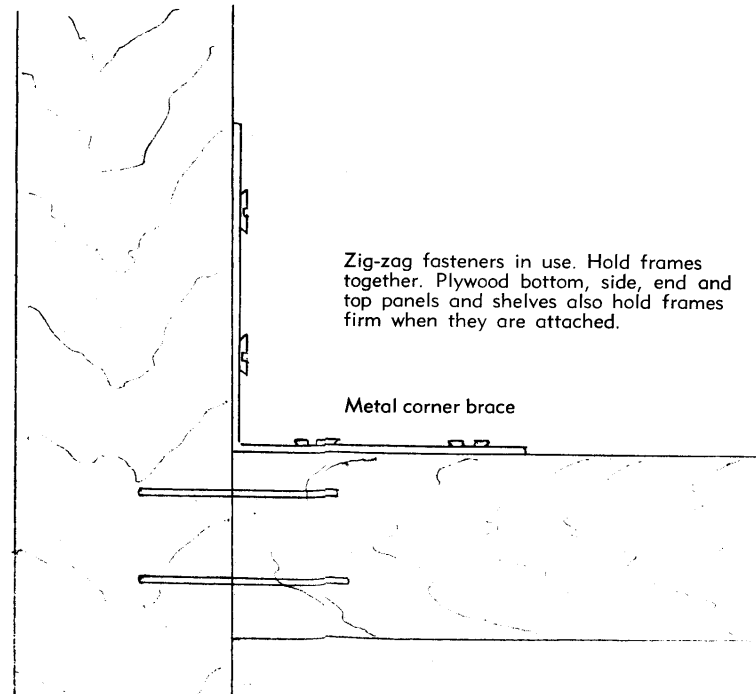
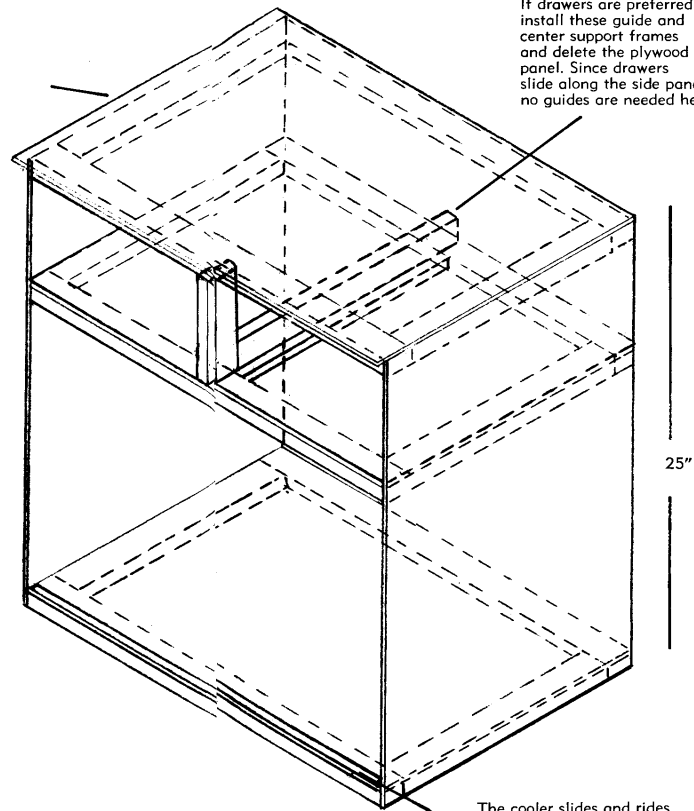


FIG. 12—SALE 1½" TO 1' VANS,
DETAIL OF ICEBOX CABINET.

If the space above the cooler will be used as a shelf attach a ¼" plywood panel to the top of the middle frame and delete the drawer guide frames. Make one long door whose ends come flush with the sides of the cabinet. (See Fig. 14). Several types of catches are available for all the cabinet doors. If the passenger seat of your Van is X-wide you can add shelves as with Fig. 17.

Attach a ¼" x 23" x 24¾" plywood panel at the rear and ¼" x 24¾" panels at the sides. Leave front open. The side panels over-lap the rear panel. The cover panel (counter) is ¼" x 23¾" x 15¾" and over-laps the front and left end ½". Block-sand all exposed plywood edges rounded and smooth and round the corners of the counter. Middle frame should be 16½" above the bottom shelf if a 15¾" high cooler is used. This cabinet was designed for a large cooler (See Fig. 13) for other sizes make the compartment about ¾" larger than the cooler all around.

Counter

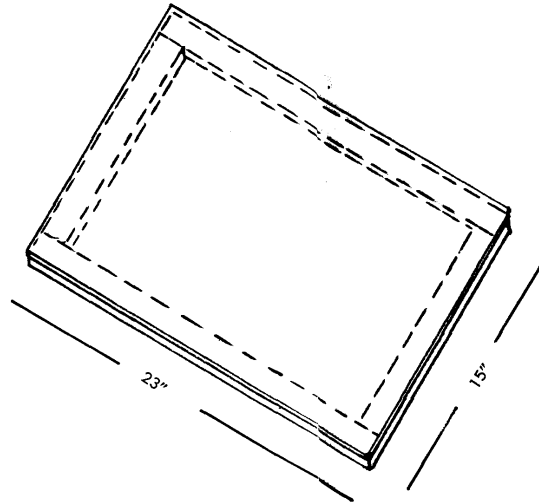


If drawers are preferred install these guide and center support frames and delete the plywood panel. Since drawers slide along the side panels, no guides are needed here.

25"

The cooler slides and rides on the ¼" plywood panel of the bottom frame, or shelf. To prevent cooler from sliding out when traveling attach a ¼" x ¾" half-oval strip along the front of the shelf.

Fig. 13. Scale $1\frac{1}{2}''$ to $1'$.



Make 3 of these frames $15'' \times 23''$
(for $13\frac{1}{2}''$ wide $\times 22\frac{1}{2}''$ long cooler)
of $1'' \times 2''$ stock, fasten corners
with zig-zag fasteners on
the under-side, then attach $\frac{1}{4}''$
plywood cover panels to the tops of
the top and bottom frames. Also, to the
middle frame if the space above the cooler
will be used as a shelf. If not, see Fig. 12 for drawer
guide frames. Drawers afford easier access but less space.

Fig. 14. Not to scale. Van.
Drop-door for ice box cabinet.

Door may either drop vertically,
or have small chains and
screw-eyes—or hooks—to hold
it horizontal when desired.

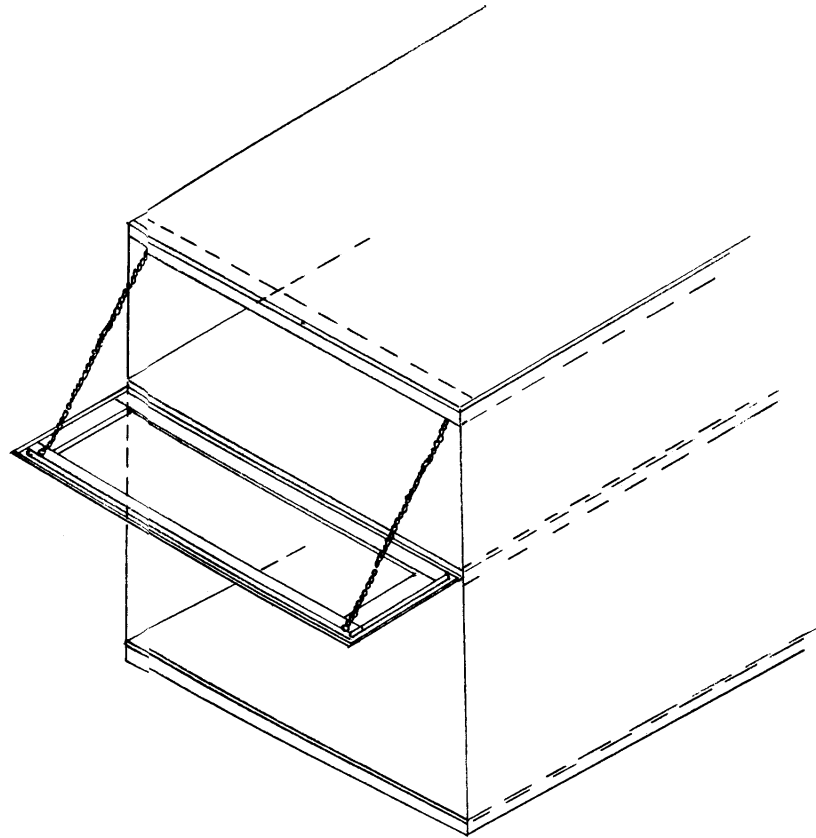
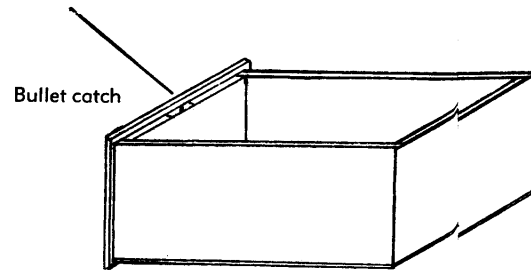


Fig. 15. Not to scale. Vans.
Drawer for ice box cabinet.

As a trim for the drawer front use either $\frac{1}{4}$ " or thicker plywood $\frac{1}{2}$ " larger all around. Attach with glue and screws and block-sand the edges.



Make drawers of 1" x 6" stock and attach $\frac{1}{4}$ " plywood bottom panel to the bottom of the drawer with glue and #5 or #6d nails. Before cutting the lumber measure the height of the openings and plane the material enough so it, plus the plywood, is $\frac{1}{8}$ " lower than that height. Also allow about $\frac{1}{8}$ " side-to-side. To make drawers slide more easily apply parafin oil or wax.

Since these drawers slide on the flat frames no glide rail is used and no notch is cut in them as in Figs. 8 - 8A - 8B. See Fig. 16.

Fig. 16.

To hold drawers in place when traveling install spring operated bullet catches on the drawers and receptacle plates on the cabinet frames above them.

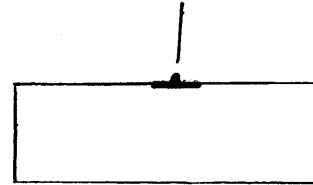


FIG. 17 SCALE 1½" TO 1'. VANS.
DETAILS OF ICEBOX (COOLER) CABINET.

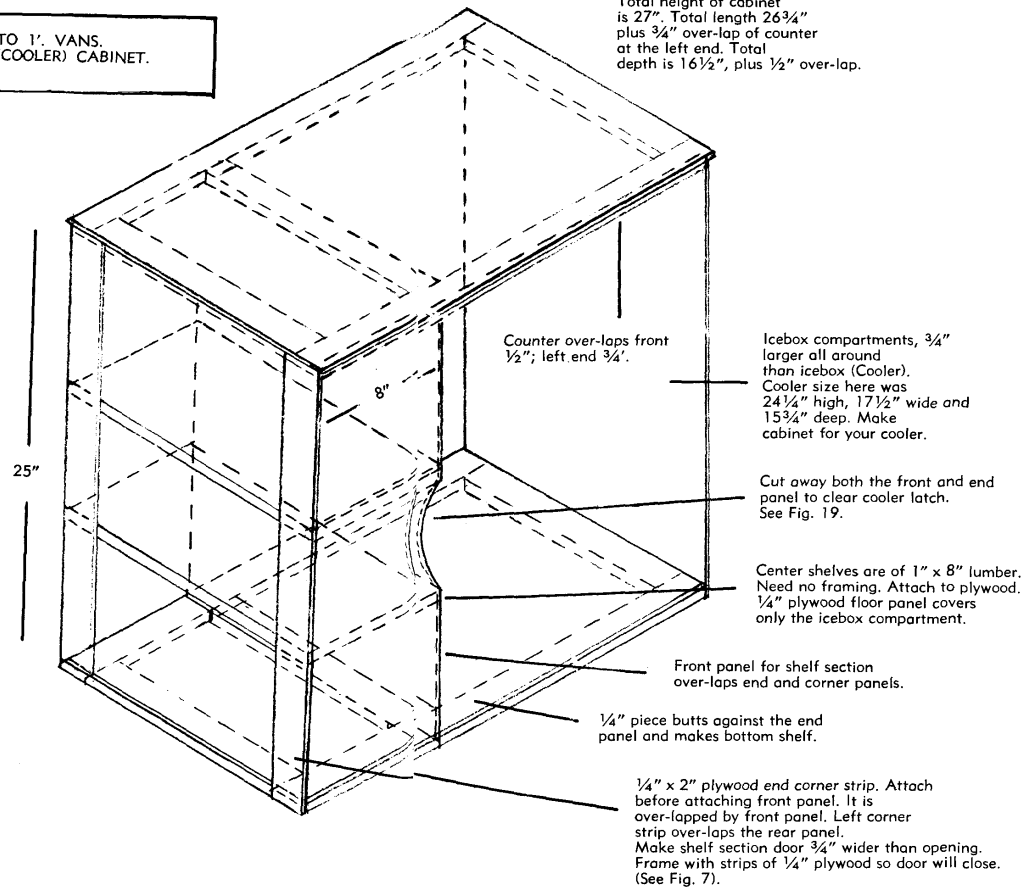


Fig. 18
Scale 1½" to 1".

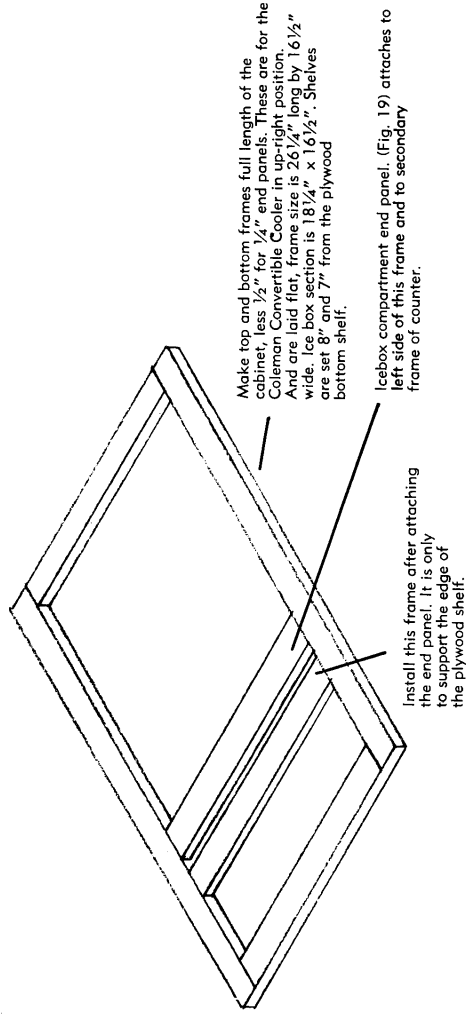
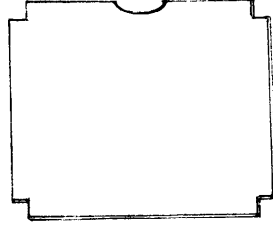


Fig. 19
Not to Scale.
Notch corners of the end panel to fit secondary frames at the top and bottom.



Over-engine wall cabinet is $12\frac{1}{2}$ " wide O.A., $32\frac{1}{2}$ " long and 36" high at the front, but may be made any desired size. End shelves may also be added as in Fig. 17 if needed. Cabinet may also be made to reach only to the roof curve and the top shelf made the cover. A 1" x 2" set on edge at the front and ends let it be used as a shelf. A 1" x 12" board 'shelf' can also be set cross-wise the van above the windows if you wish. To make it, mount small frames or brackets on the window framing and tack $\frac{1}{4}$ " x 3" plywood strips to its edges to keep articles in place.

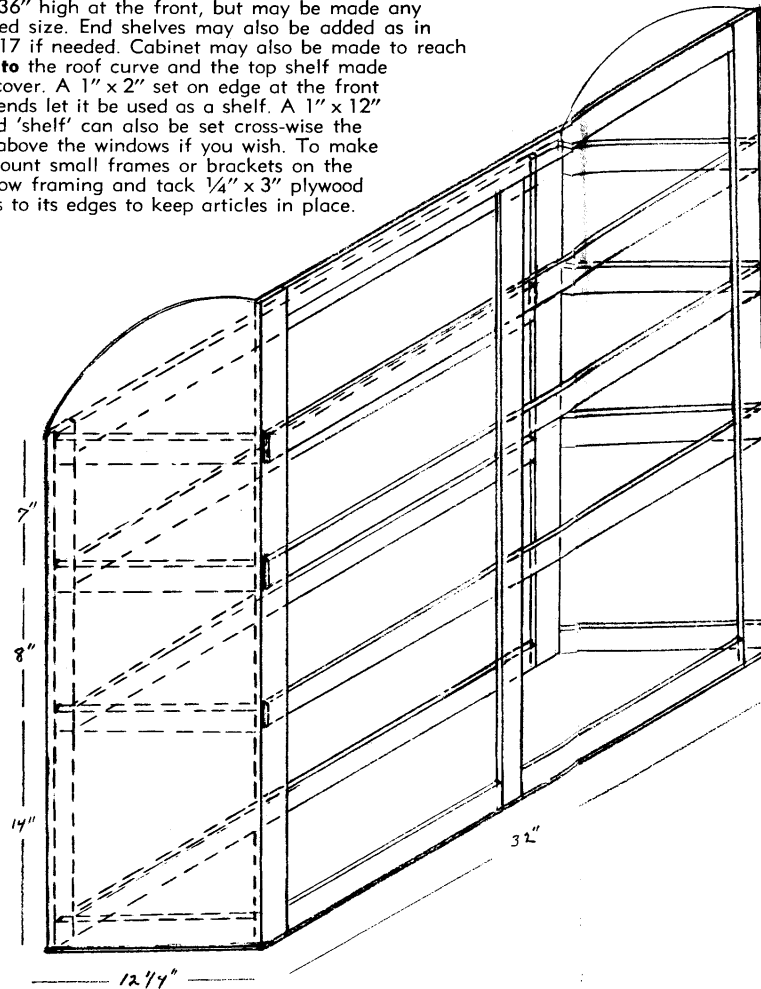
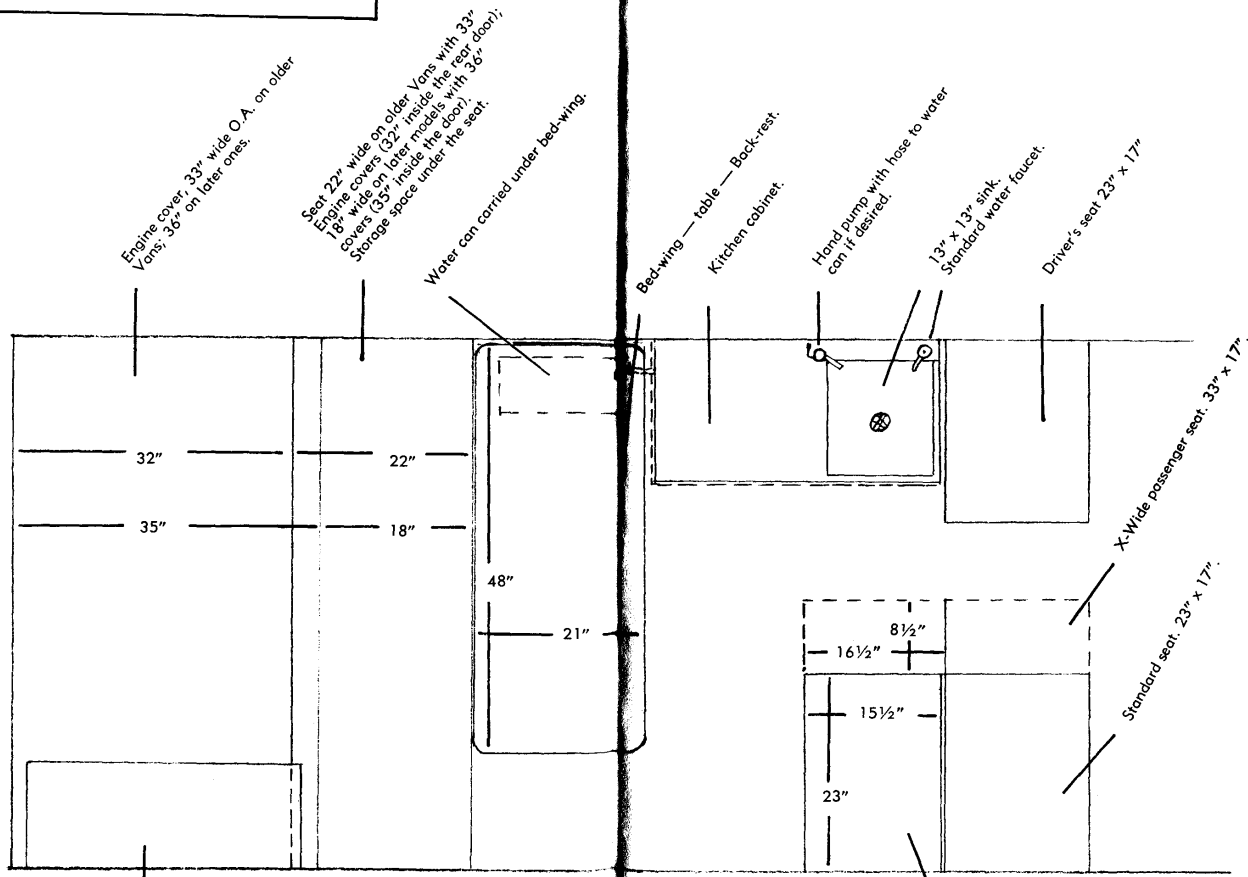


Fig. 20. Scale $1\frac{1}{2}$ " to 1'. Volks Van.

Cut the plywood end panels to the curve of the roof. Make templates of cardboard as described for the wheel-wells (see text). Framing is 1" x 2" and the 3 shelf support frames go inside the vertical front corner and center frames so doors will close. Shelves are $\frac{1}{4}$ " plywood. Notch to fit the framing. Top shelf is not covered. End and rear panels are shown in place. There is no front panel except the doors. Make them to over-lap the frames. Frame with 1" x 2" material (see Fig. 7) and hinge them to open from their left sides. Shelf spacing may be changed if you wish. See text for more details.

FIG. 21—SCALE ¾" TO 1" SUGGESTED

FLOOR PLAN FOR VOLKS VANS



Engine cover 33" wide O.A. on older Vans, 36" on later ones.

Seat 22" wide on older Vans with 33" engine covers (22" inside the rear door); 18" wide on later models with 36" covers (33" inside the door). Storage space under the seat.

Water can carried under bed-wing.

Bed-wing — table — Back-rest.
Kitchen cabinet.

Hand pump with hose to water can if desired.

13" x 13" sink.
Standard water faucet.

Driver's seat 23" x 17"

X-Wide passenger seat. 33" x 17"

Standard seat. 23" x 17"

Shelf Cabinet 12" width for folded dresses, etc.
For coats put hooks on window top frames or hang the hangers over the front top frame of the cabinet.

Ice box (cooler) cabinet. Dotted lines show shelf section if added.
Cabinet is 1" deeper if the vertical cooler is used.