

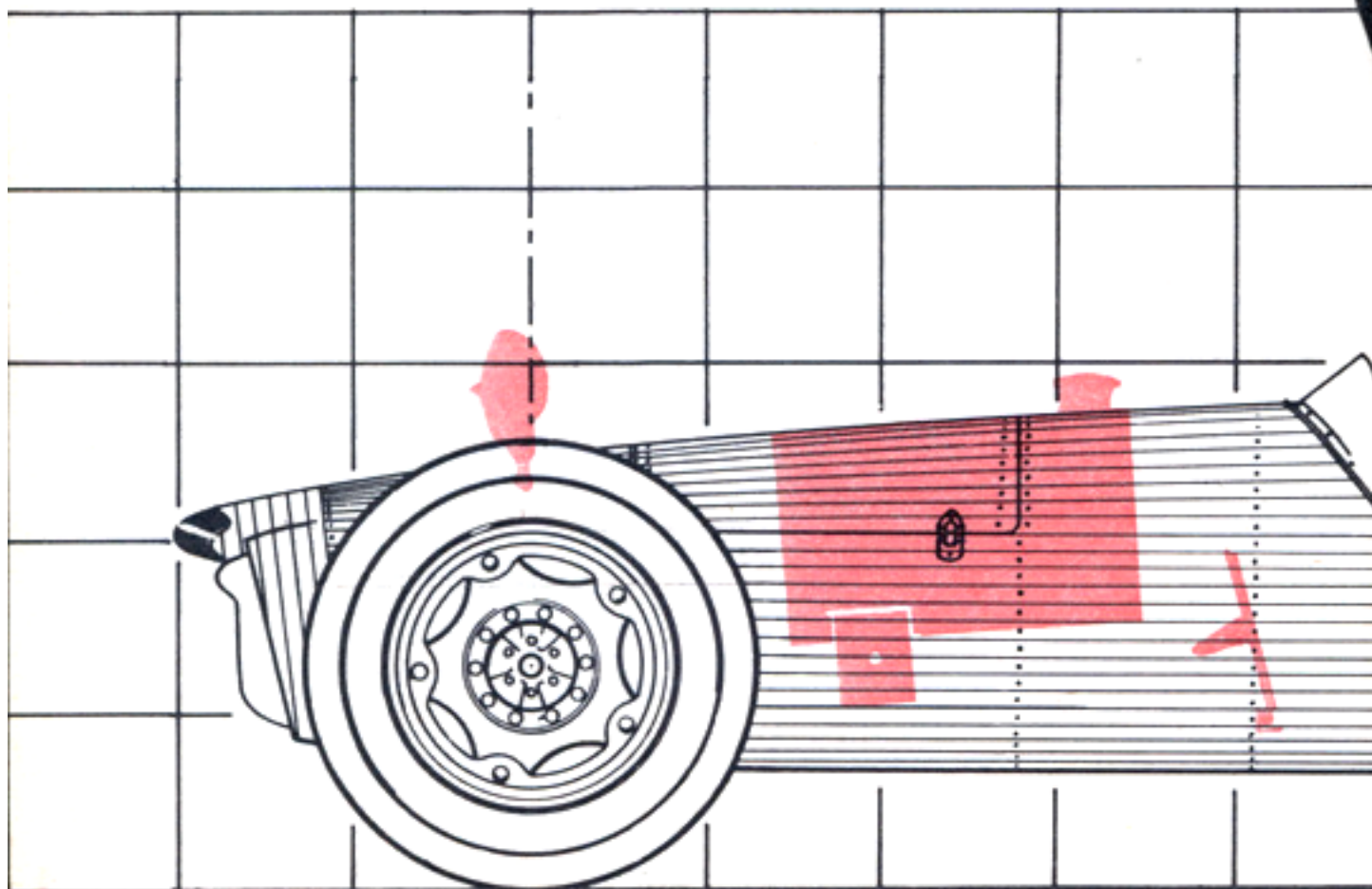
MI's SPEEDBALL

You can build this beautiful sports car for less than \$500 with ordinary tools.

By Don Bruce

HOW would you like to own this snazzy-looking mahogany-paneled sports car? You can—and for less than \$500 if you are the least bit handy with ordinary tools and not afraid to get your hands dirty. The entire chassis and body are made of wood. The power plant can consist of any 2- to 4-cylinder motorcycle engine. Because of its high power to weight ratio, about 12.3 to 1, you will be able to do close to 90 mph. The finished car will weigh in the neighborhood of 750 pounds.

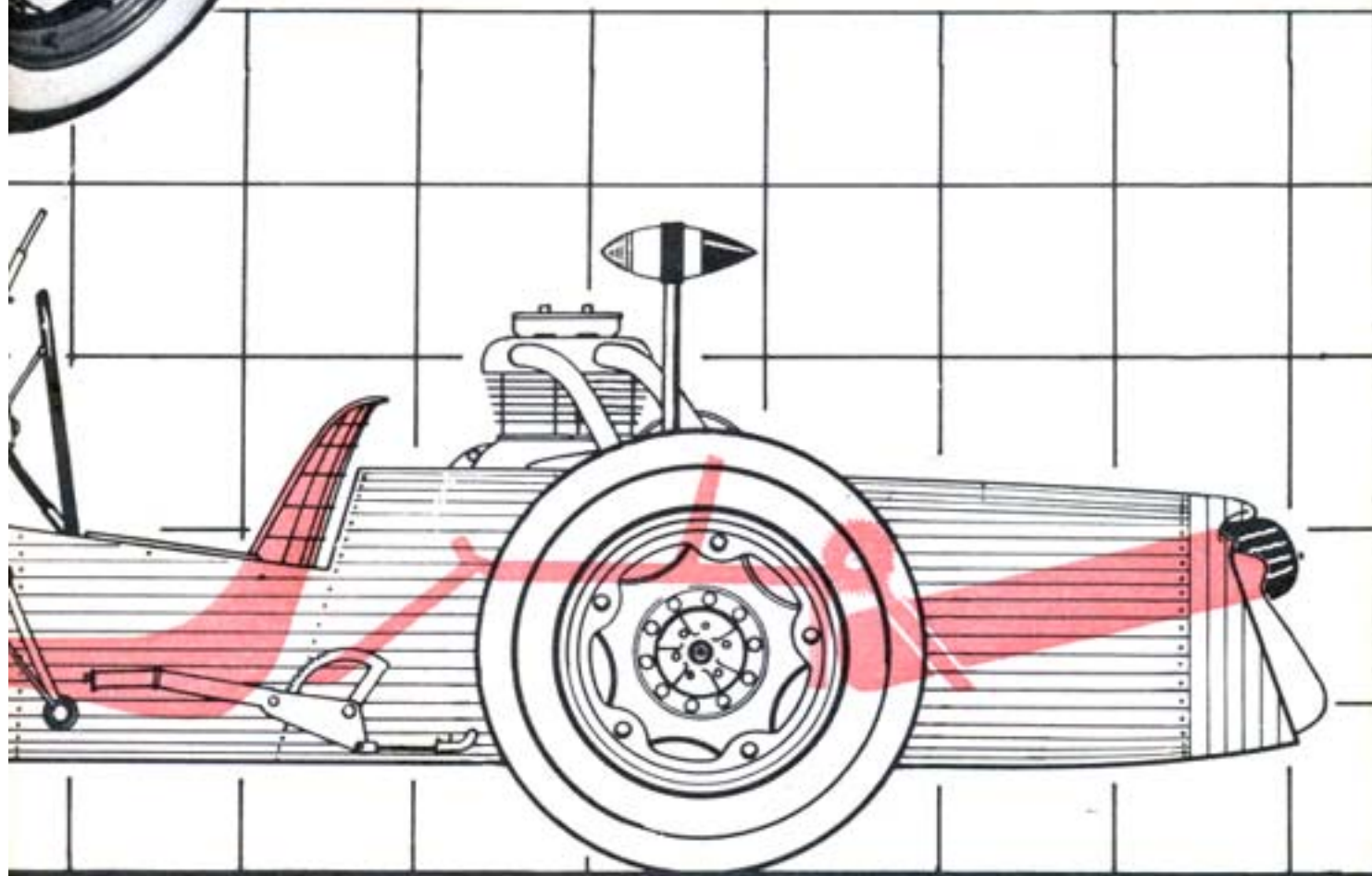
The car has a wheel base of 94 in.



SPECIAL



Below: Headlamps, gas tank, footboards, seat, motor supports and spare tire are shaded red.

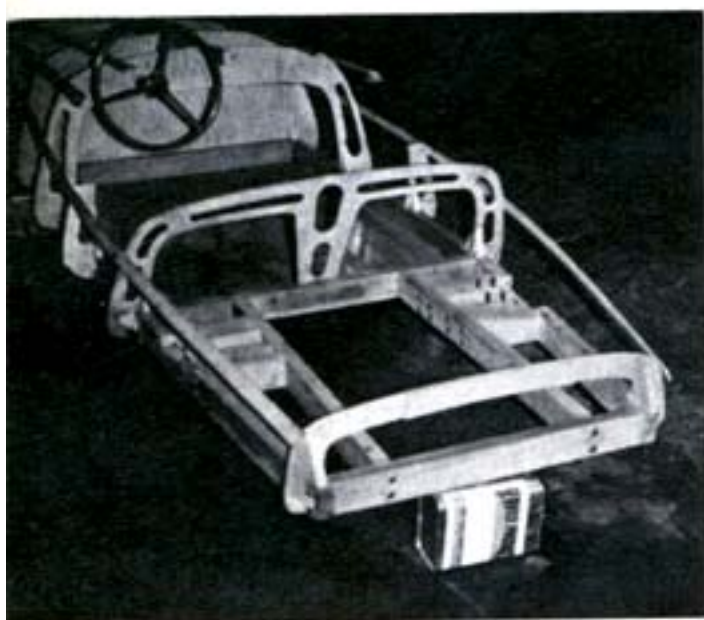




Four forward speeds are engaged by lever at side of car. Short lever is for reverse.



A front end view of the finished car. Note the use of the 1952 Ford bumper guards.



First model built had low bulkhead in rear which was later raised for spare tire.

The gas tank is located at the right side of car to balance the weight of the driver.



and is 143 in. long with suspension independent on all wheels. It uses a Renault rack and pinion steering gear. The frame of the car is made of 2x4-in. oak. All the body bulkheads are $\frac{3}{8}$ -in. marine plywood.

From the first sketch of the Speedball Special, duplication by the home builder was the primary concern. Six cars were built before this one was actually finished. Many parts were tried and discarded. This is the first car in many years to feature wood as its basic material. Wood, of course, was the only material used when cars were first built. Antique cars were thus studied for ideas. Styling features from the antiques were also incorporated such as the outside gear shift levers, emergency brake handle and small suspended windshields. This old-new construction gives wonderful flexibility to the individual builder, plus the advantage of a familiar material.

This car uses mahogany for the body skin, but here again the builder has his own choice. If you don't care to get so involved in building the complete car, the body can be built on a stock or modified chassis. The basic shape can apply to a front or rear engine chassis and can be lengthened or shortened.

All of the car's components are simple, engineered to give no running or service problems. The oak frame, plywood bulkheads and mahogany strips are ordinary boat-building operations. A motorcycle engine is used



Instruments are from a used motorcycle except tachometer. No red ammeter lamp.

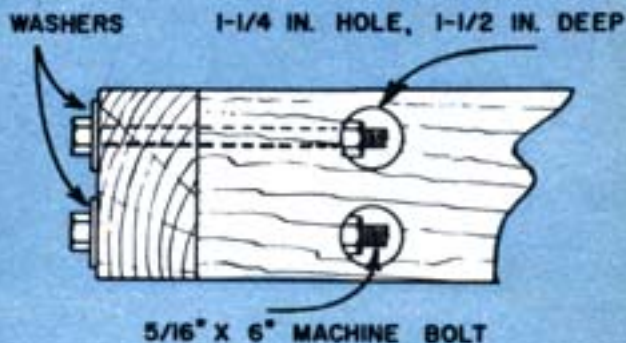
for power. An ad in the local paper will help you locate a used one. It will supply almost all the power train items operation will need. Since no differential is used, the drive is transferred to the left rear wheel only. But don't buy a one-lunger. Get one with at least 40 hp.

The parts of the bike used are: engine, clutch, transmission rear hub, brake and sprocket, oil tank and gas tank plus all instruments, cable guides and switches. If you buy a foreign bike, you'll get a four-speed gearbox but no reverse gear. With American jobs, you can get a four-speed, or a three-speed-reverse box. If the four-speed is desired, a starter motor can be hooked up for an electric reverse. Don't worry about its power, it'll pull you at about 15 mph if you want it to.

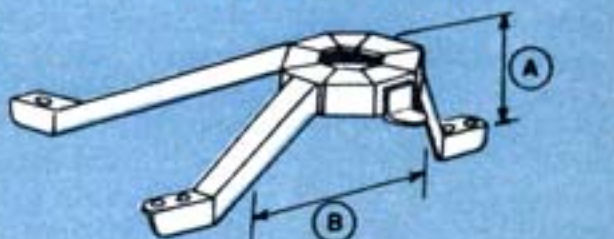
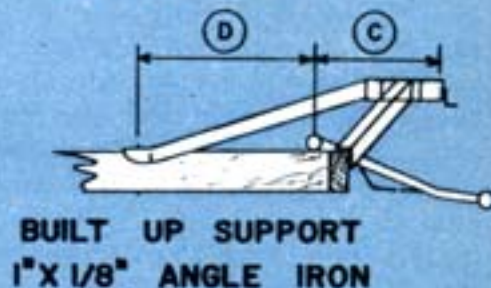
Frame Construction

The first step is to cut both side members to the correct length and curve up the bottoms of the front frame horns as shown in the frame layout drawings. Then mark and drill the bolt holes for No. 1 and No. 2 cross members. Cut and drill these cross members to receive the attaching bolts as shown in detail drawing No. 1. Now raise the frame on a couple of wooden horses. Install cross members 1 and 2, but do not bolt up tight. Leave some slack in the bolts to allow the frame to flex. Get a stout rope and use a bumper jack to pull together the two side members until they

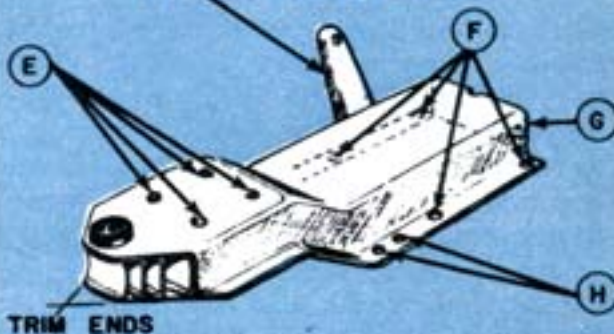
DETAIL NO. 1



DETAIL NO. 2



CROSSMEMBER METHOD STEERING GEAR SUPPORT



- (A) DISTANCE BETWEEN LOWER & UPPER "A" FRAME MOUNTS.
- (B) ALLOW FOR LOWER "A" FRAME CLEARANCE
- (C) DISTANCE FROM LOWER "A" FRAME TO COIL.
- (D) AT LEAST 10 INCHES
- (E) UPPER "A" FRAME MOUNT HOLES.
- (F) DRILL FOR MOUNTING TO FRAME.
- (G) CUT IN HALF.
- (H) LOWER "A" FRAME MOUNT HOLES.



The right headlight turns with the wheels while the left one remains stationary.



The two headlamps can be raised or lowered flush into hood from driver's seat.

are the correct distance apart for inserting the No. 3 cross member. Mark the angle at each end and cut. Then glue in position with a good waterproof glue. Hold in place with finishing nails. Now drill for the bolts. This is repeated for all remaining cross members except No. 6. This one is installed without glue, then removed. Nos. 1 and 2 are loosened, glue inserted, then No. 6 is glued and inserted. Lastly, Nos. 1 and 2 are tightened. The bumper jack is also used to pull in the rear half of the side-rails. The engine support rails and gussets for beefing up the rear suspension points are installed last.

Suspension and Steering

To install these parts, care must be taken to duplicate the geometry of the car from which the components were taken. The best, and simplest way is to cut them out with a welding torch and position and bolt them to the frame. Track measurements if retained, would guarantee that the front-end camber and caster are correct. The front suspension for the rear wheels is twisted to allow the axle shaft to pass within an inch of the coil spring and still allow the bearing saddle support arm to be as short as possible. Frame notches are not shown since the suspension used governs their shape. At least $3\frac{1}{2}$ in. of wheel drop must be allowed for, $3\frac{1}{2}$ in. from the normal loaded position.

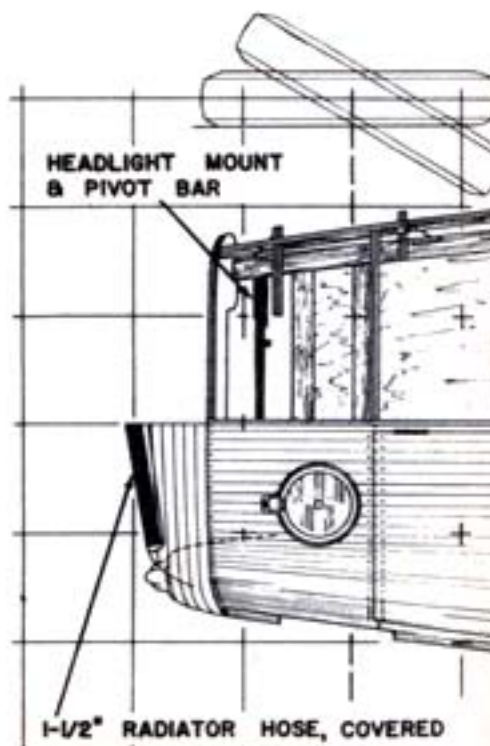
Chrome Parts

Bumper guards are from a 1952 Ford. The front guards were shortened $1\frac{1}{4}$ in. The rear guards are stock. Cover plates can be cut from aluminum or steel and

chromed. Polished copper or brass would go extremely well. When making patterns for these cut-outs, use a stiff paper and fit only a few inches at a time, taping your pieces together as you go along. This way a very close fit along even very irregular places can be had.

Engine Mount

This is built up from $\frac{1}{8}$ x1-in. angle iron. Its final shape is governed by the engine used, since all bike frames vary. Two things must be kept in mind however. It must be high enough to allow room for the axle below it and for good weight distribution the engine should be ahead of the axle. Secondly, the bike frame, with the extension for the transfer shaft, must also be high enough for the spare tire to nestle below it. It is important that the two chains, one from





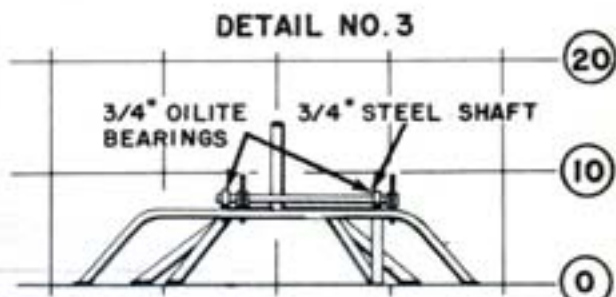
Temporary pine slats are laid over the bulkheads to check for the over-all contours.

the transmission to the shaft and the other from shaft to rear wheel sprocket, be kept as short as possible. This will insure a minimum of chain noise and long chain life. See detail drawing No. 3 for engine mount layout.

Left Rear Brake and Axle Construction

The reason for the alteration to the rear brake and sprocket drive is that the axle is stationary and the bearing hub rotates. This must be changed so that the axle rotates and the hub is stationary. Detail drawing No. 4 shows these changes and its mounting to the frame.

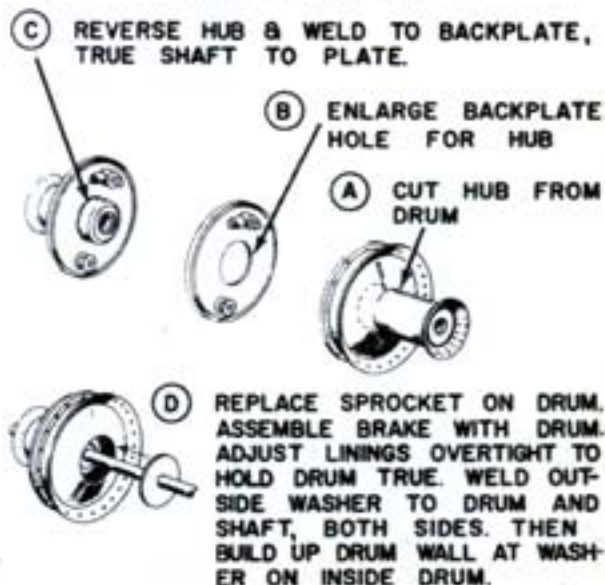
The axle used is built up from a Renault rear axle and $\frac{3}{4}$ -in. steel rod. See detail drawings Nos. 5, 6, and 7. The outer end of the axle is supported by the modified spindle from a front sus-



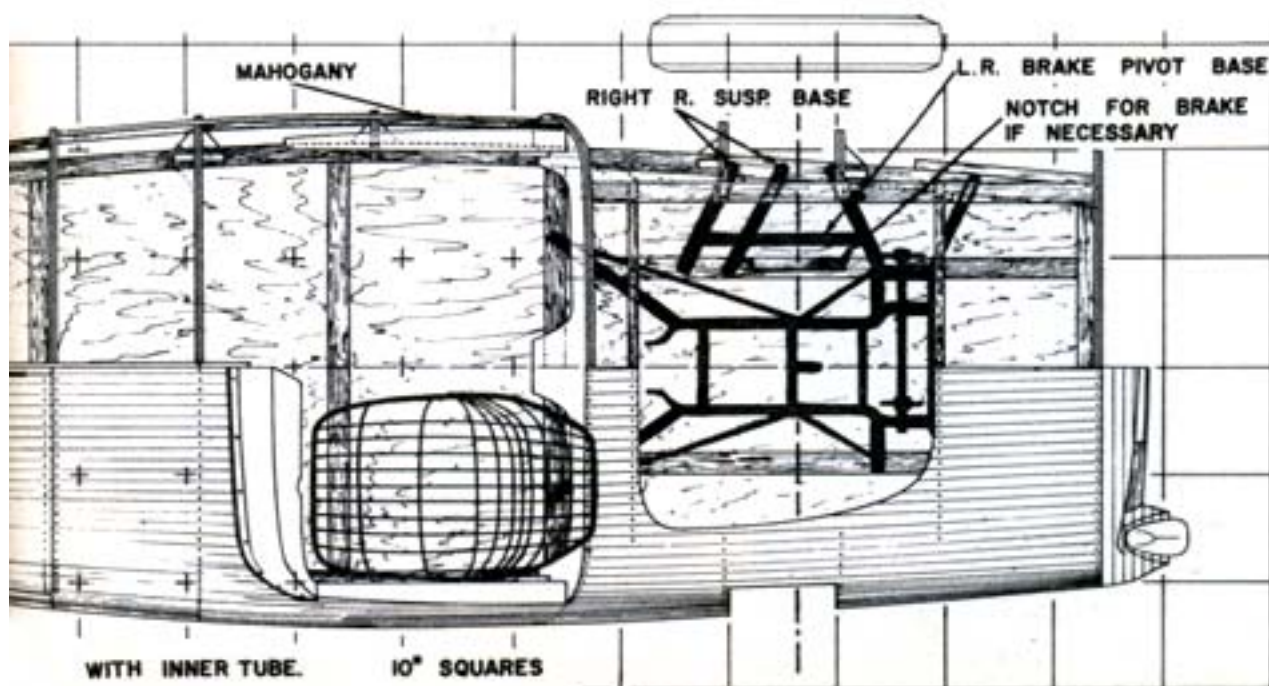
ENGINE MOUNT

B TRANSFER SHAFT-REAR VIEW

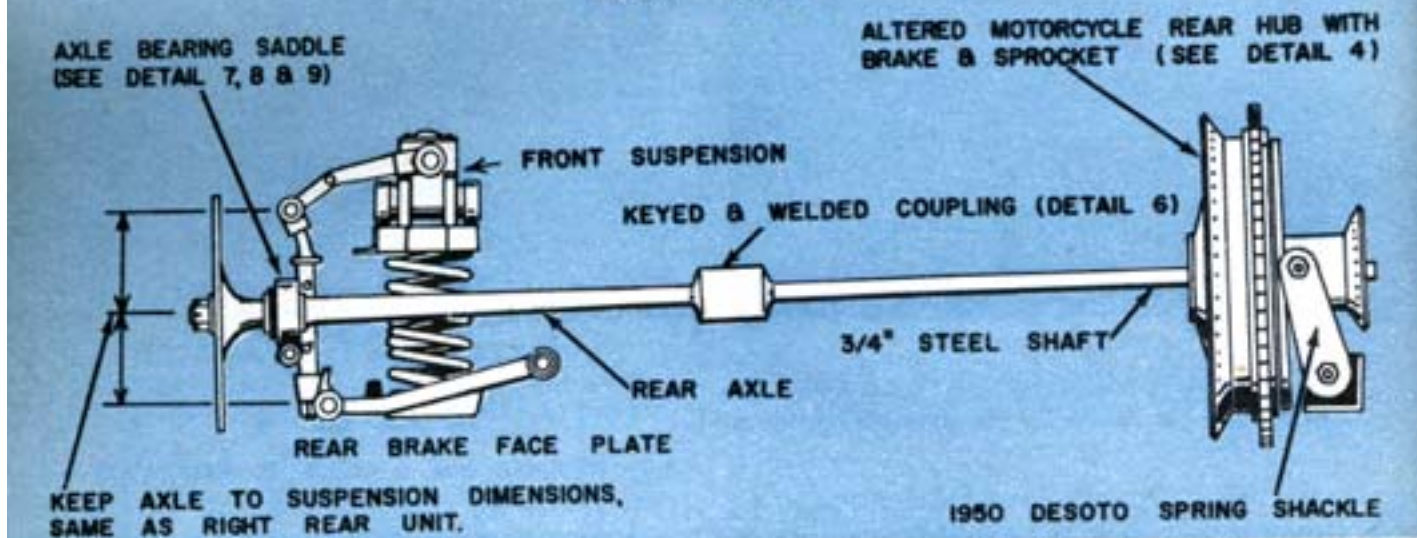
DETAIL NO. 4



NOTE: BEFORE WELDING DRUM TO AXLE SHAFT: COMPLETE B & MOUNT IN CAR DETAIL PARTS NOS. 3, 6, 7, 9, WITH L.R. SUSPENSION PLACE DETAIL 4 ASSEMBLY ON SHAFT & ALIGN WITH OUTPUT TRANSFER SHAFT SPROCKET. MARK & CLAMP IN POSITION. REMOVE AXLE & DRUM FROM CAR & WELD.



DETAIL NO. 5



Close-up of the left front wheel showing re-conditioned suspension, fender bracket.

Left rear suspension showing the altered spindle and the emergency brake ratchet.



pension. See drawings Nos. 7, 8, and 9. This drive arrangement allows high wheel bounce with very little change in rear track.

Engine Starter

Although the kick starter shaft could be lengthened and the pedal mounted on the right rear side of the body, an electric starter is a nice finishing touch. A Ford Consul starter ring gear is welded to the clutch housing. A British or a German starter must be used, since all American starters revolve counter-clockwise. Some American motorcycles have electric starters as optional equipment and of course could be used.

Muffler System

If the motorcycle mufflers are in good shape, there is no problem, but if a new system is needed, four Fiberglas-packed hot rod "racket busters" will do nicely. These units are small and when welded together, two to a side, will make the engine quiet but throaty.

Controls

Use of the motorcycle power package is really appreciated at this point. Controls and their linkages are always troublesome at best, but because the bike is already set up for cables, the job is extremely simple. The throttle cable runs from the engine to bulkhead H inside 1/4-in. copper tubing. At bulkheads G and F short lengths of tubing act as guides. At bulkhead E, tubing

DETAIL NO. 7



ASSEMBLED BEARING SADDLE

and a small windshield wiper control pulley are used to drop the cable down to the pedal. The return spring for the system is at the carburetor. The clutch has the same arrangement with $\frac{3}{16}$ -in. steel cable used with two pulleys at bulkhead E. The brake pedal linkage is shown on detail drawing No. 10. The choke arrangement is left as is since it can be reached from the driver's seat. The same applies to a spark control, if the motorcycle originally had one.

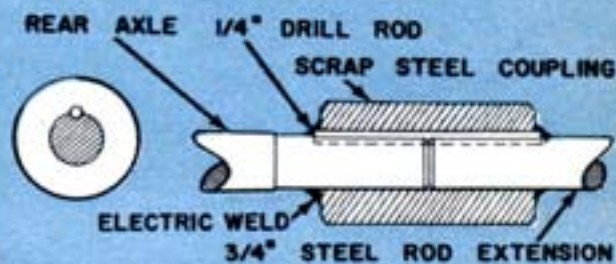
Wiring

All wires run fore and aft along the left frame rail. Since this would be hard to service after the body skin has been installed, a 1955 Pontiac fuse block was used. This allows separate fuses for all lines. Use No. 14 gauge primary wire. Special attention was given so that all wire installed was uninterrupted from source to fuse block and from fuse block to end. Before installing the skin check all lines thoroughly with a light.

Headlights

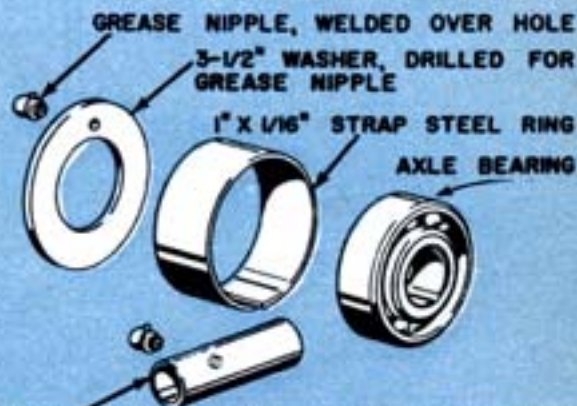
Regarding the use of the spotlight as a headlight, check your state laws governing this. Actually two sealed beams would do just as well. The linkage and folding arrangement for the headlights is quite simple. Two stationary headlights can of course be mounted on the top of the front shock absorbers or the hood. Make sure that the headlight centers are more than 24 inches from the ground. This is the minimum allowed

DETAIL NO. 6



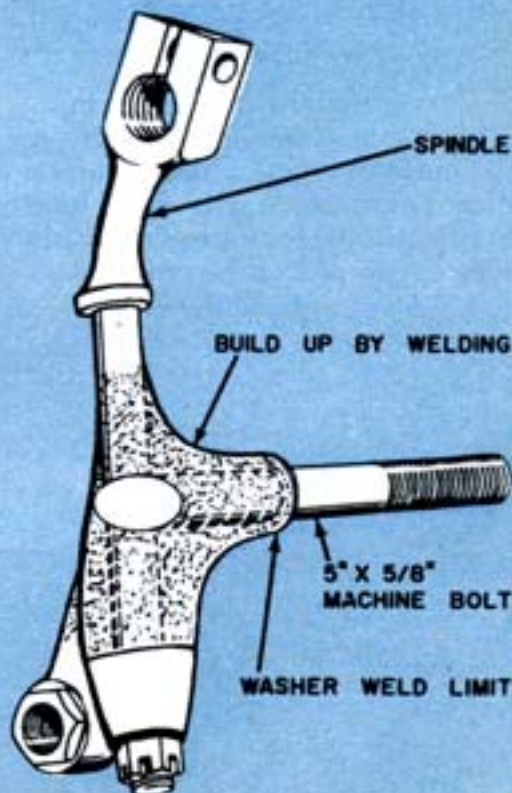
LENGTH OF SHAFT EXTENSION & SPROCKET DRUM LOCATION ON SHAFT DETERMINED BY REAR WHEEL TRACK, ENGINE WIDTH & POSITION OF OUTPUT SPROCKET ON TRANSFER SHAFT.

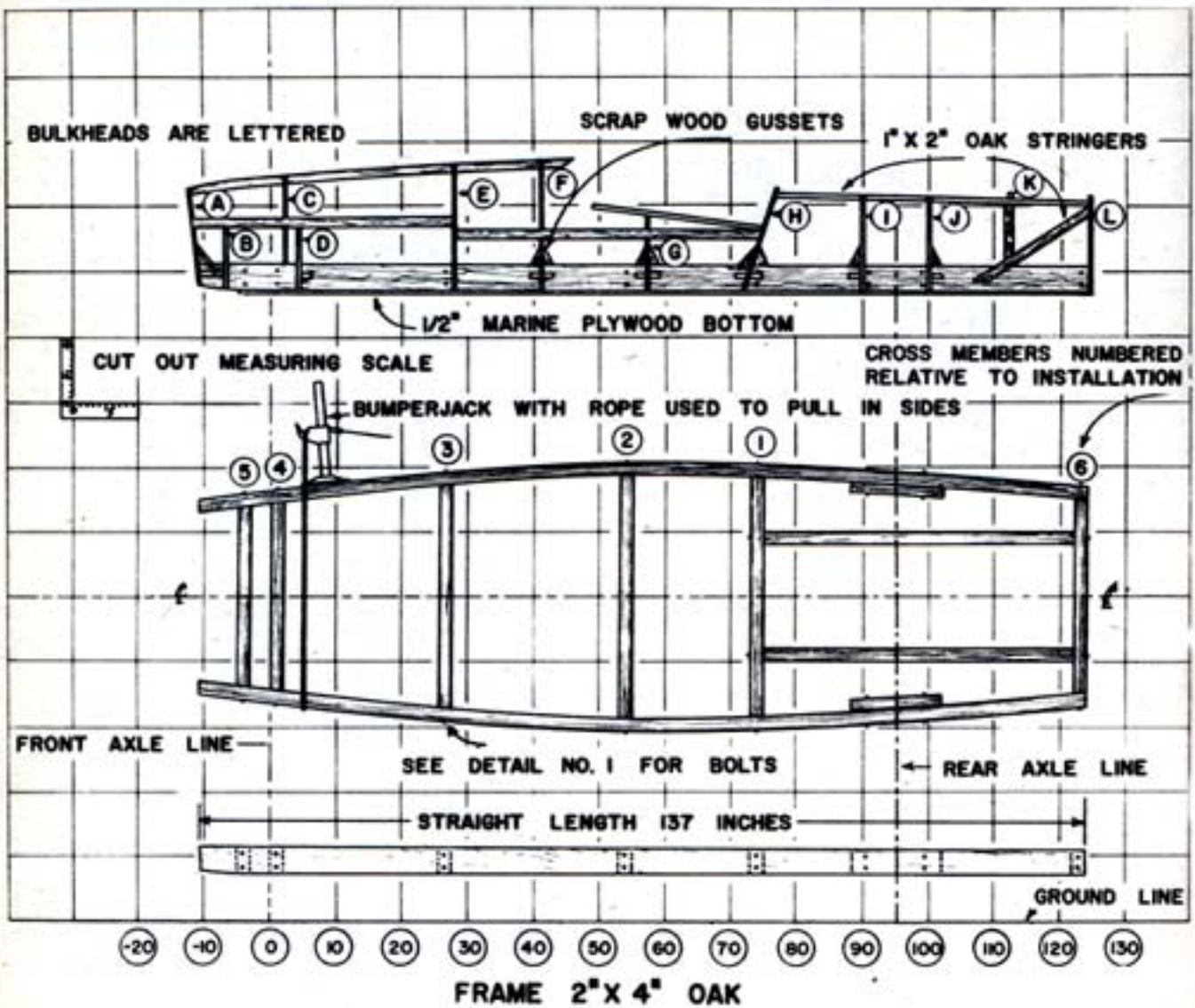
DETAIL NO. 8



$\frac{1}{2}$ " WATER PIPE 2- $\frac{1}{2}$ " LONG. DRILL TO ACCEPT $\frac{5}{8}$ " MACHINE BOLT. $\frac{1}{8}$ " HOLE FOR GREASE NIPPLE....

DETAIL NO. 9





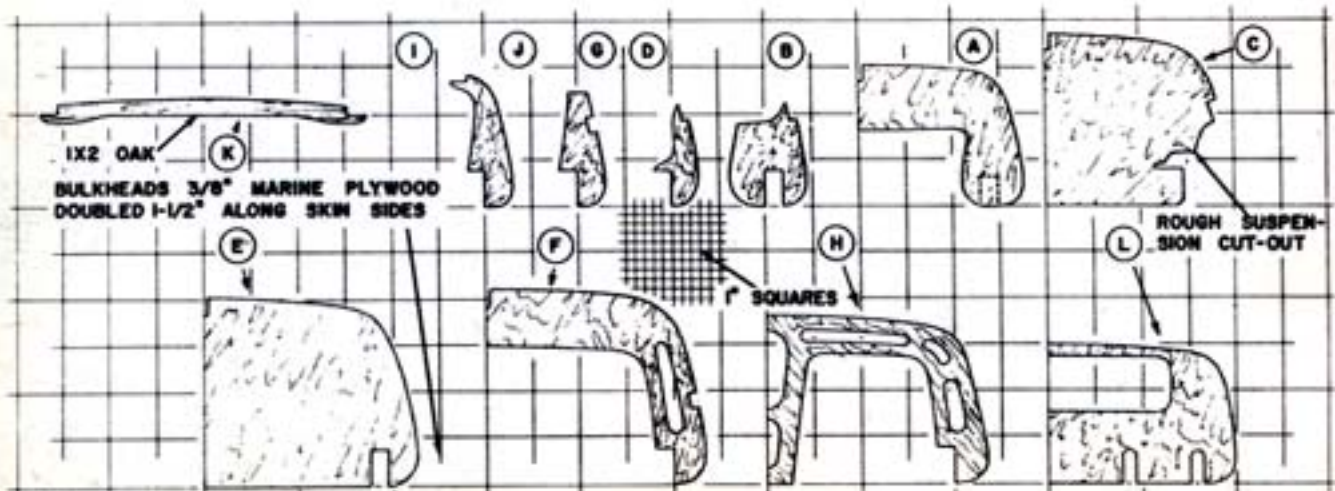
by all states. Folding and control linkage is shown in detail drawing No. 11.

Gas Tank and Fuel Pump

The gas tank used was built up from two round five-gallon drums and a one-gallon paint can. The filler neck and cap are from the motorcycle tank. The gauge is an old carburetor float. See

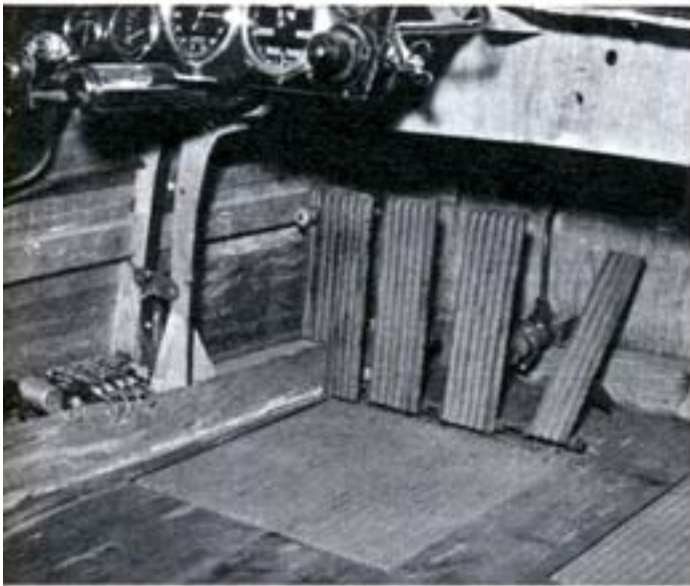
detail drawing No. 12, on page 131.

An electric fuel pump is used. Since all motorcycles have a gravity feed the pump is mounted inside the passenger compartment on the right side and is visible from the driver's seat, so that the fuel flow can be checked while running. See photo.



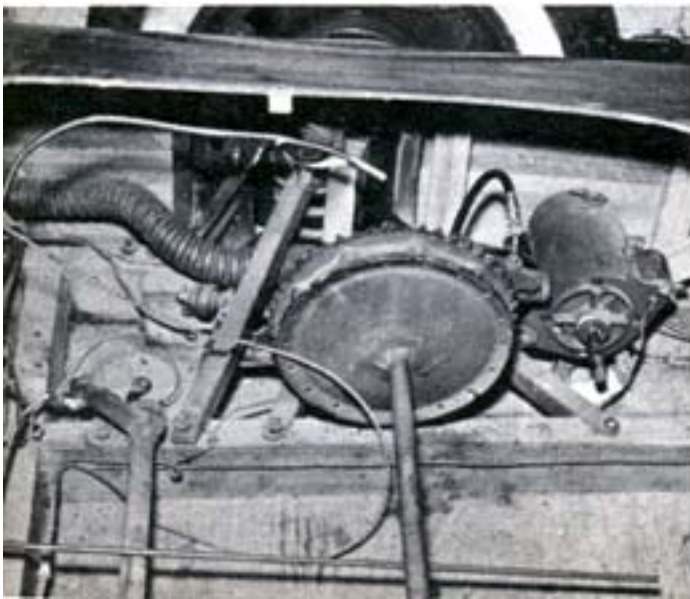


Rear of car showing Ford bumper guards and reverse power motor. The spare fits under the tail of car

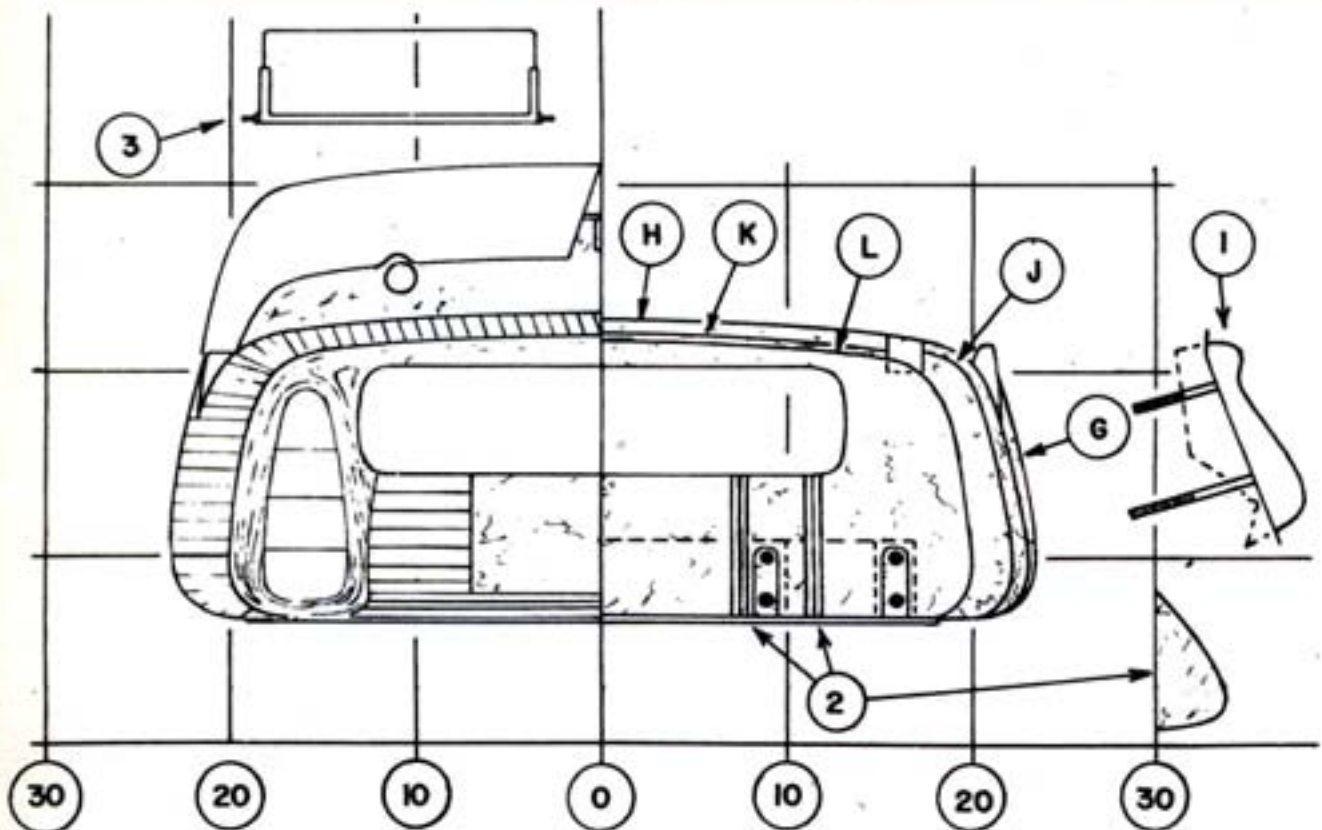
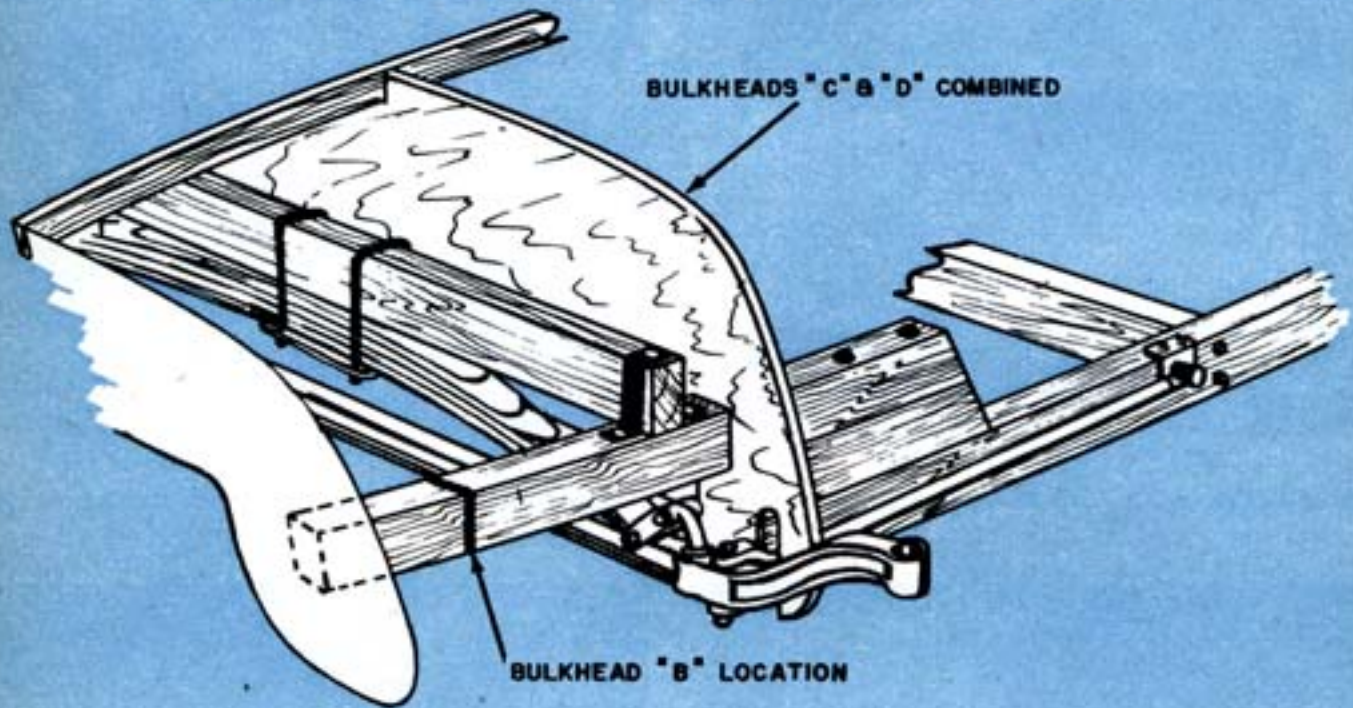


First pedal is foot rest, then clutch, brake and accelerator. The fuel pump is at the extreme right

Sprocket wheel transmits power to left rear wheel. Right: Knobs control switch, headlights, starter



OPTIONAL INSTALLATION — FORD TRANSVERSE FRONT END



- ① 1952-54 FORD BUMPER GUARDS ALTERED AND RECHROMED
- ② REAR BODY SECTIONS - 4 USED.
- ③ WINDSHIELD 1/4" X 1/2" BRASS CHANNEL, 5/16" BOLTS BRAZED ON.

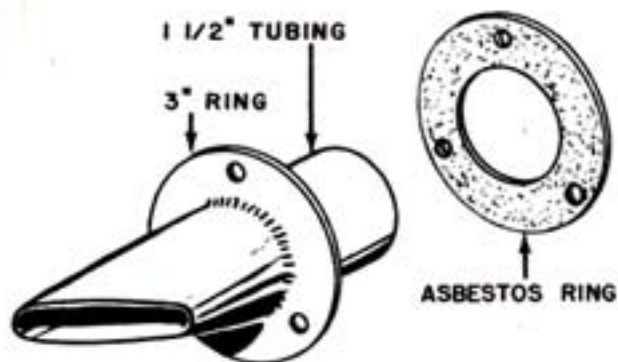
Body Skin

Applying the 1/4x1-in. mahogany strips looks much harder than it actually is. Remember they're only an inch wide, so handling is easy no matter how long they are. Start by standing the body almost upright on either the two right or two left wheels. Nail supports to the bottom so that it can't fall down. Lay your first strip against the plywood bottom. The second strip is placed along a line level with the top of the frame from bulkhead D to I. This will assure you that the strips are parallel to the ground on the sides of the body.

All strips are butt-glued against each other and glued and tacked with brads to the bulkheads. Now start laying the strips down from the one at the top of the frame to the one next to the plywood. By measuring along the edge of bulkhead G you will determine the number of strips needed. Take this as your basic figure to determine the amount of taper for each strip. Cut and lay your second strip along the one parallel to top of frame. Mark it where it passes over each bulkhead. Measure the gap between the two strips in place at each bulkhead and divide this total by the number of strips needed. This will tell how much to taper the strip from one bulkhead to the next.

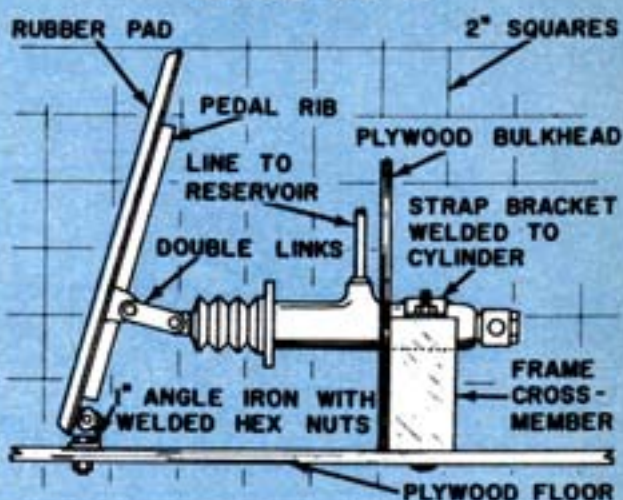
Bevel the upper edge of the third strip and taper the lower edge with a plane to the correct amount as determined by your figures. Do the bottom curve first on both sides. Any minor gaps between strips won't be noticed here. For a filler, save all shavings and mix into a paste with glue.

After the two bottom curves are done, return the body to its normal position on



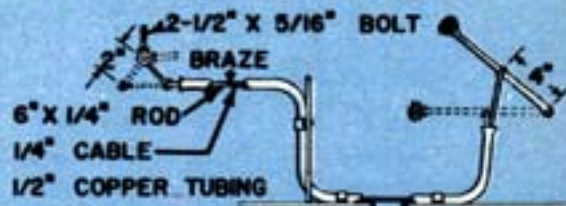
September, 1956

DETAIL NO. 10



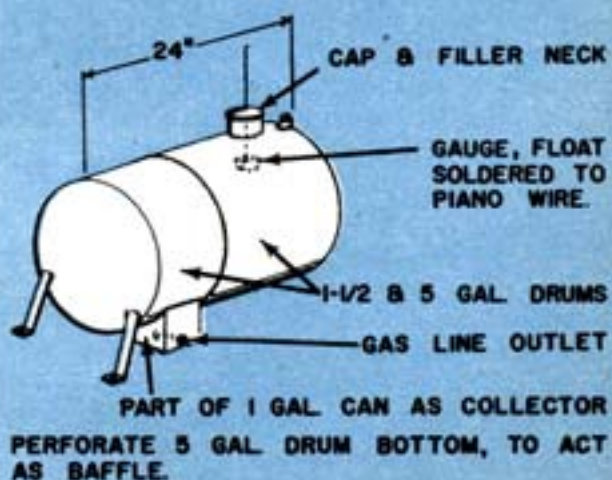
17

DETAIL NO. 11 HEADLIGHT LINKAGE



SEE DETAIL NO. 13 FOR TURNING LINKAGE

DETAIL NO. 12



131

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MI's Speedball Special

[Continued from page 132]

is recommended. It can probably be rented or borrowed from the local body shop over the weekend and with it the entire body can be shaped in less than a day. The nose piece is notched out so that a radiator hose can be nailed in place and covered with the inside turned out of an old innertube.

Before shaping, remove all brads used to hold strips in place while the glue was drying. After shaping the body, No. 5, 3/4-in. flathead brass screws are used to hold the strips to the bulkheads.

Body Finish

After power sanding, hand sand the body with No. 60 paper. Then apply a sealer, sanding between each third coat. Next apply spar varnish inside and out. If desired, it can be compounded and waxed.

Seats

These are made up of 3/8- and 1/8-in. steel rod. The 12-ft. lengths of 3/8 in. and 8 lengths of 1/8-in. rod used for both seats.

This car has been subjected to all kinds of tests, short of a collision. It was left completely exposed to snow and rain for long periods and has stood up perfectly. To allow for water to pass through the car, small 3/8 in. drain holes were drilled at each corner in the bottom of the car. By placing the car on a slight incline, any accumulated water will drain out. The bottom of the car should be undercoated with a body deadener. This will protect all hard-to-check places from dryrot or warping.

Acceleration through the gears is exceptional. The best way it can be described is with only the driver, it's very close to a motorcycle carrying two people. Top speed with the Ariel engine is well over 90 mph. With a big Harley or Indian, it should break 100. •

An enlarged drawing of these plans is available for \$2.80 from Automotive Associates, at 412 E. 51st St., New York 22, N. Y.