

MAKE YOUR OWN STEERING WHEEL

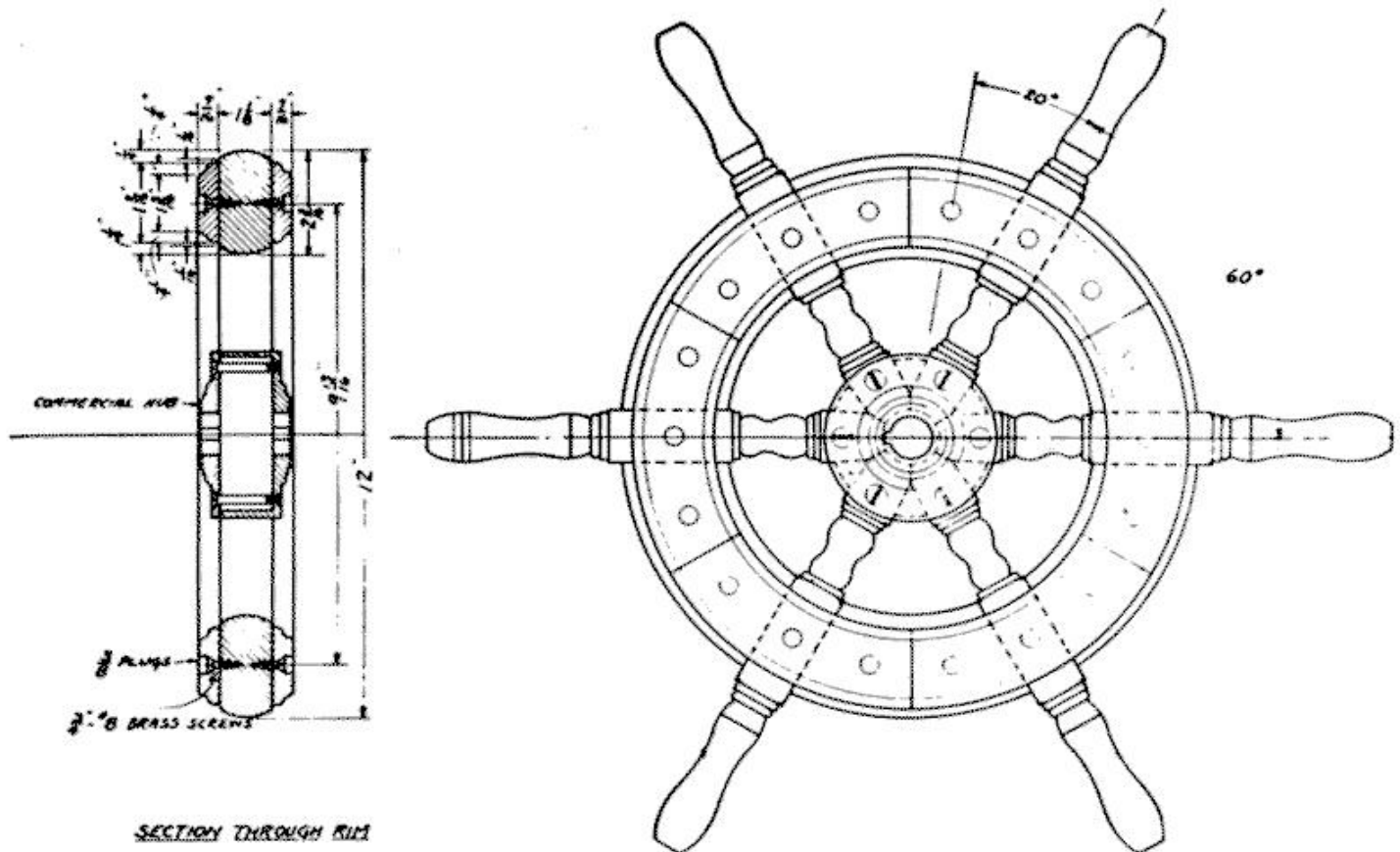


Illustration No. 4

IT is a natural instinct among boatmen, as well as the occasional sailor, when boarding a boat to be first attracted to the steering wheel, especially in a cruiser where the wheel is the center of the boat's running equipment. The desire to steer a boat is as natural as the universal desire to drive a car. This probably accounts for that urge which everyone feels, to grasp the spokes of a wheel and give it a turn or two whether the boat is in the water or on the show-room floor. Furthermore, the least nautical minded of us know and understand the purpose of the steering wheel, whereas we may be totally ignorant of the numerous other gadgets which make up a boat's operating equipment.

For these reasons, no other single item will contribute more to a good first impression than a beautifully stained and varnished wood steering wheel.

No one will dispute the fact that cast bronze or galvanized

iron wheels are every bit as strong and serviceable as a wood wheel of the same size. But the feel of a wood wheel certainly gives the impression of greater power and control. This is probably due to its bulk; but, whatever the reason, this added satisfaction derived from the sense of touch is almost as great as the appeal to the eye.

Wood wheels are comparatively expensive, and not without reason. The actual value of materials generally used, including mahogany, locust and teak, is not great; but the time and care required to shape, fit and assemble the various parts explain the greater cost over the average cast metal wheel.

If you own or have access to a medium size home-workshop lathe, with a little care and patience you have the means for turning out a wood wheel of which you will be forever justly proud. The spokes, of course, can be turned on the smallest of lathes; but the rim, which in a 20 inch wheel is 12 inches in diameter, will require clearance for a face-plate 11 1/2 inches

in diameter. Even a small lathe will take care of this if there is provision for attaching the face-plate to the outer end of the headstock spindle so that the work overhangs the end of the workbench. A tool rest can be built up of wood and if rigidly braced will serve very well. It is essential that the lathe be adjusted to turn not more than about 700 r.p.m. for the rim; and, if the headstock is not too light, this speed will cause no vibration.

The illustrations show two 20 inch wheels made by the author of ordinary boat (Philippine) mahogany. By actual check the spare time consumed for the plugged wheel was a little over 20 hours. This was a first attempt and you may be sure that no unusual skill was brought into play. The mahogany, which was used for both spokes and rim parts, cost just 54 cents in a local lumber yard. This was for a piece 1 1/8 inches thick by 8 inches wide and 48 inches long at 16 cents a board foot. The brass hub cost \$2.50 and three dozen brass screws and boat plugs about 40 cents, so that the total cost of materials was not over \$3.50.

If you are fortunate enough to be able to get some of the finer furniture woods, such as Honduras mahogany, teak, or black walnut, by all means use them. As you will note, all the parts can be gotten out of 1 1/4 inch thick stock which when dressed measures 1 1/8 inches. The length and width of stock is not important since all of the parts are small.

The face-plate is made up of a single piece of straight grained wood about 7/8 inch thick and is screwed to the lathe face-plate after having been sawn to an approximate circle. The edge and face are then turned in the lathe to furnish a true surface for holding the members of the wheel.

The face-plate must be removed from the lathe for fastening the members, and it is best, if your lathe is not quite accurate, to mark a point on both the spindle and the plate so that in replacing, the surface will be in the same position as when first turned.

In order to insure accurate fitting throughout, you will need a template. This should be made of thin stiff cardboard, celluloid, or other thin material. It should be the same diameter as the face-plate, 11 1/2 inches. By means of dividers or a 30-60 triangle divide the template into six segments. These are the centerlines of the spokes and should be numbered for identification. Lines are drawn parallel to these centerlines and spaced to equal the thickness of the square portions of the spokes. Holes are accurately located for holding screws 20 degrees apart and on a 9 13/16 inch diameter. By locating every third hole on the intersection of this circle and the spoke centerlines the remaining holes may

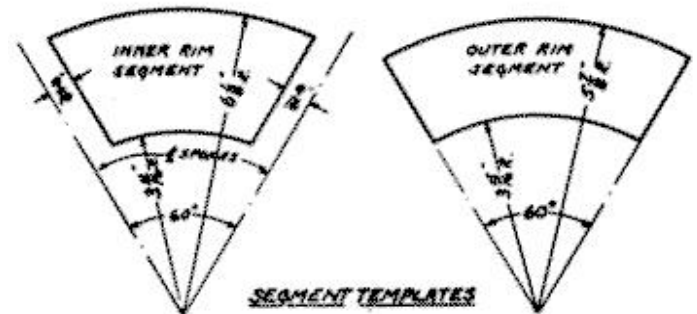
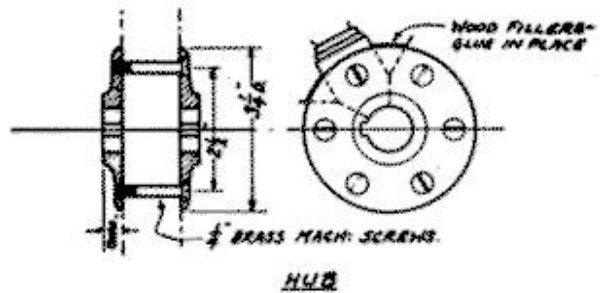
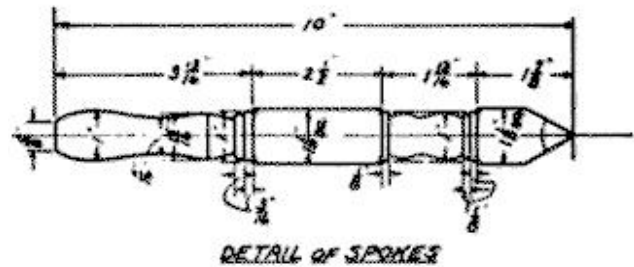


Illustration No. 5

be easily found with dividers.

The template lines and screw centers can now be transferred to the face-plate, also the spoke numbering. All this should be done very carefully since the correct fit of all parts is dependent on the accuracy of these guides.

The mahogany rim pieces are now roughly cut to size. Templates of cardboard will save time in laying out the shapes. Two will be required: one for the six center rim pieces which are 1 1/8 inches thick and one for the 12 outer rim pieces which are 1/2 inch thick in the rough. The center pieces are fitted between the spokes and the outer pieces lap over both the spokes and the center pieces with joints staggered. The 1/2 inch members may be gotten out by ripping the 1 1/8 inch stock in halves or you may purchase material finished to 1/2 inch thickness.

An excess of about 1/8 inch is allowed on both outer and inner circumferences of all rim pieces for fitting and turning down. The ends of each segment must be sanded to exactly

60 degrees with each other as shown. A sanding disc attached to the lathe will make light work of this. The angles can easily be checked with a sliding T bevel, set to 60 degrees with a triangle.

Fastening screw holes are now drilled in the face-plate according to the template locations. After setting the thicker center rim pieces with their ends accurately lined up with the spoke lines they may be clamped and screwed to the face-plate from the back. Be sure the points of the screws penetrate no more than half the thickness of the segments since the holding screws for the outer rim pieces will come at these points also.

The inner and outer circumferences and the outer surfaces are now turned and completely sanded to the dimensions shown.

The next step is to apply one set of outer rim pieces to the finished center segments. This should be very carefully done (as should be the location of the fastening screws) by means of the template. The easiest way is to hold them in place with very small amounts of thin glue. After the glue has dried the template may be laid over the whole and screw holes located. True centering of the template is assured if the face plate is set in the lathe and the template diameter (11 1/2 inches) scribed with a pencil. Counterbore the screw holes 3/16 inches for receiving the plugs after final assembly, and securely screw in place.

This set of outer segments is now turned, sanded, numbered, and removed.

The opposite set of outer rim pieces is made up in the same way except that they are fully glued in place and permanently fastened with brass screws and plugged before turning. This set will not be removed.

The six spokes are now turned to size and completely sanded in the lathe. If the spoke stock is exactly 1 1/8 inches square great care must be exercised to locate the lathe centers in the exact centers of the spoke ends. You may wish to vary the design of the spokes to suit your own taste. Be sure, however, to maintain the locations of the square portions. After turning, the spokes must be sawn to exact lengths and the inner ends cut and sanded to 60 degrees. The guide lines on the face-plate can be used to check these angles before assembly.

Before removing the segments from the face-plate the spokes are put in place, glued and permanently fastened from one side.

The partly assembled wheel may now be removed and the remaining set of outer segments glued and fastened. These should be assembled with the numbers in rotation as turned,

and if the screw holes have been carefully laid out they should correspond with those used for holding the center segments to the face-plate. All screw heads are covered with boat plugs 3/8 inches in diameter. White holly will make the best appearance but, if not obtainable, a very light colored white pine will be almost as good.

If you have had sufficient experience with a lathe you may feel capable of attempting some inlay instead of the white plugs on the second set of outer rim segments. These are not removed after turning and a groove or a series of concentric grooves may be turned with a narrow square-edge chisel and white holly or other wood strips glued in and finished off. In that event, of course, the exposed screw heads are covered with plugs of a wood to match the wheel rim.

You can have brass hub plates made up as shown or a complete hub may be purchased in a marine supply house for about \$2.50. If you make up your own hub follow the detail shown for sizes. To assemble, drill out the center of the six spokes with a wood bit slightly larger than the bore of hub. Clamp the hub plates as near the center as possible and slip the wheel over a shaft supported in a vise. Rotate the wheel to check the center and shift the hub plates to correct locations. The spokes may then be drilled, the back plate tapped, and the six countersunk brass screws put in and tightened. Cut off the excess length of screws,peen slightly to lock, and file down hush. A very satisfactory keyway can be cut with saw and file if sufficient care is used in locating it parallel with the bore. If one of the ready-made hubs is used the assembly is greatly simplified since the two halves are connected by lugs passing between the spokes and the whole must therefore come together in line. The keyway is already cut in the brass portions and it is only necessary to cut away the wood between with saw and chisel.

The finish of the wheel will be left to your own judgment but it is suggested, in view of the handling and exposure, that four or five coats of good spar varnish be applied with careful rubbing between each coat.

The 20-inch wheel illustrated is large enough for cruisers up to 30 or 32 feet. However, if your lathe is large enough and you want a larger wheel, the dimensions given can be proportionately increased for any desired diameter.