

# Machine Your Fishing Reel

*You will be well prepared for the coming season if you start on this smooth-running job now.*

*By Frank E. Shallenberger*

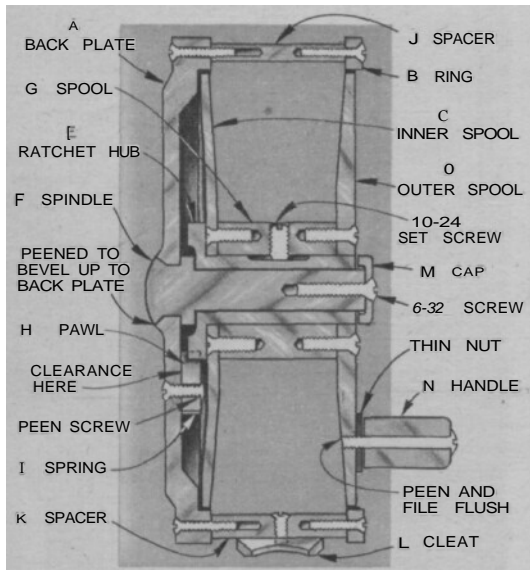
**I**F you're an enthusiastic fisherman and have a lathe in your workshop, we'll say no more. Here is a duck soup assignment just for you! You may want to refine this reel here and there, but it's a top-

notch instrument as it is, and is simply made. The plate, spools and ring were cut from easily worked .125 in. flat surplus aluminum. The back plate was assembled from .125 in. sheets, bolted while machining. But you may prefer .375-in. stock which would eliminate the extra holes around the face.

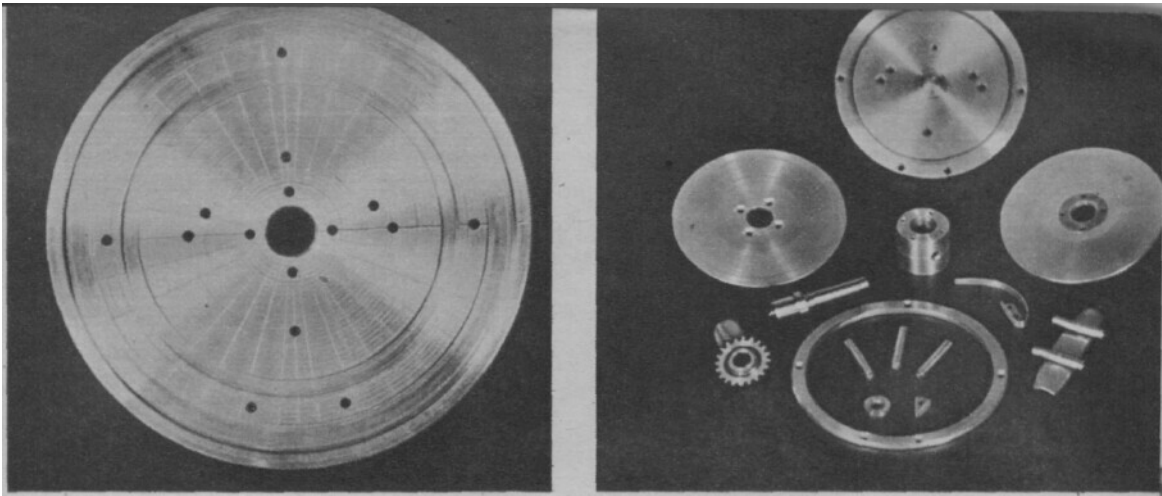
*Fig:* Because perfect alignment is absolutely imperative, construct a simple combination jig and fixture. This insures accuracy, fit and alignment. Use a steel plate about 1/4-in. thick turned to a 5-in. diameter. Face one side. Turn over and clamp in a 3-jaw universal chuck, seating the faced side snugly against the jaw steps and marking the jaw numbers around the rim to enable reclamping later in exactly the same position. Drill a 1/2-in. hole in the center, scribe circles .812 in., 1 1/2 in., 1 3/4 in., 2 in., 2 1/4 in. and 3 1/2 in. in diameter. Using the index head, with tool still set absolutely level with the center, cross-feed by hand scribing two perpendiculars across the plate.

Prick-punch the necessary holes as indicated on parts A, B, C and D. Drill these holes with a No. 33 drill. This completes the layout drill jig, which also acts as the fixture by which the parts are held.

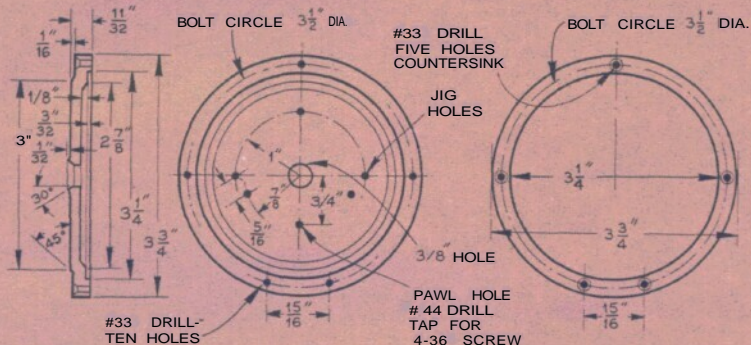
*Back plate:* [Continued on page 160]



SECTION THROUGH REEL  
(BLUEPRINT DETAILS ASSEMBLED)

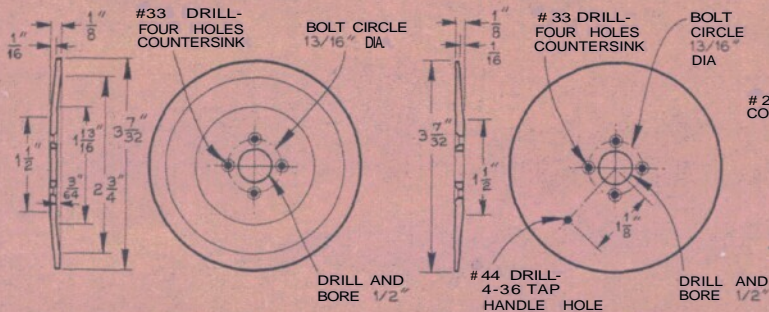


**Left: The 5-in. diameter jig fixture to which all the disks are screwed while machining. Right: Parts ready for assembly.**



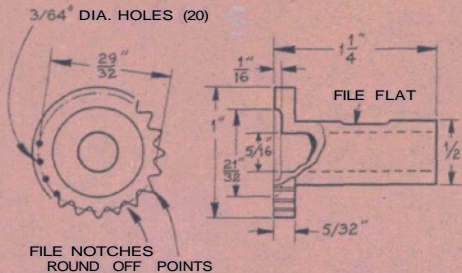
**A BACK PLATE**

**B RING (1/8" FLAT)**



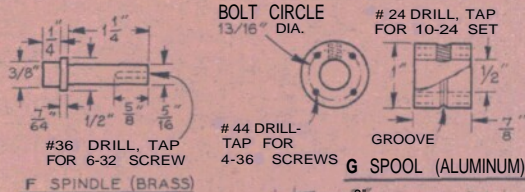
**C INNER SPOOL DISK**

**D OUTER SPOOL DISK**



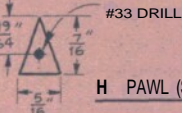
**E RATCHET HUB (STEEL)**

(ENLARGED)



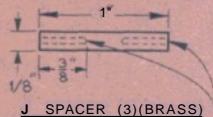
**F SPINDLE (BRASS)**

**G SPOOL (ALUMINUM)**

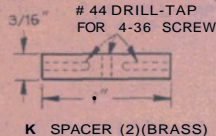


**H PAWL (STEEL)**

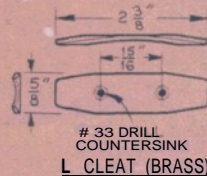
**I SPRING - 24 GA (BERYLLIUM - COPPER)**



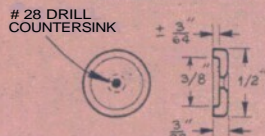
**J SPACER (3)(BRASS)**



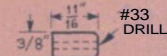
**K SPACER (2)(BRASS)**



**L CLEAT (BRASS)**



**M CAP (ALUMINUM)**



**N HANDLE (ALUMINUM)**

# Machine Your Fishing Reel

[Continued from page 144]

Face one side if necessary. Clamp plate to jig. Using the jig as a guide, drill the holes located .875 in. and 1 in. from the center with a No. 33 drill. Spot the necessary holes around the rim and the hole  $\frac{3}{4}$  in. from the center. After unclamping from the jig, drill these with a No. 44 drill and tap carefully for a 4-36 screw.

Using brass screws in these tapped holes, screw the plate to the jig (which now becomes a fixture). Clamp the jig in the chuck, being careful to maintain the previous alignment. Turn the outside diameter, face, cut the recesses, chamfer the corner, then drill and bore the center hole. Reverse the plate on the jig, chamfer the corners and bore the taper in the center hole.

Remove from jig. Drill and countersink as shown. This completes the back plate.

*Ring:* For ring B, clamp a piece of .125 in. or thicker aluminum sheet to the jig, spot the outside holes with a No. 33 drill, drill with a No. 44 and tap. Screw to jig and bore the  $3\frac{1}{2}$ -in. diameter. Drill out the threads with a No. 33 drill and countersink.

*Spool ends:* The end disks C and D are

next. Drill and tap the inner holes. It is well to drill and tap outer holes in the scrap also for use in the roughing out. This is then cut free when turning the outside diameter as one of the last operations, leaving the spool end clamped to the jig by the inner holes. After turning, complete by drilling out the inner tapped holes with a clearance drill and countersink as indicated. Leave the single crank hole in the outer spool end tapped to receive the handle.

*Spool:* The spool G is made from 1-in. diameter aluminum rod. Chuck, face and drill the center hole. On the end scribe a .812-in. diameter circle, then cut off. Using the circle as a guide, line up with the jig and drill and tap four holes. Then screw to jig, face the other end, turn both diameters, and scribe a .812-in. circle on the other end. If a  $1\frac{1}{2}$ -in. mandrel is available, the piece can be turned on it to insure concentricity. In this case drill screw holes last, using the mandrel to line up center hole of spool with that of the jig. Assemble the spool on the mandrel and dress off any eccentricity of the spool ends.

[Continued on page 165]

# *Your Fishing Reel*

[Continued from page 160]

*Ratchet hub:* Make the ratchet hub E from 1-in. diameter steel bar stock, preferably of carbon content. Rough out the diameters, drill and ream the inside diameter. If a .312-in. mandrel is available, mount the blank on it to turn the 1/2-in. diameter to a snug fit with the spool. Recess the large end. Lightly scribe a .656-in. circle, turning the chuck by hand. Using the lathe index head mark off 20 radial lines crossing this circle. Prick-punch the intersections and drill twenty .047-in. holes. If an index head is not available, lay out in 18 to 22 holes as convenient. Hand-file teeth to rounded V-form as indicated. File a flat for the set screw in the spool hub. Harden if facilities are available, heating to a cherry red and quenching.

*Spindle:* Turn the spindle F from brass to a snug fit in the back plate and a free or running fit in the ratchet hub. Turn between centers to insure concentricity, allowing a little extra length for peening. Assemble with the back plate and peen to fill the taper. After peening, chuck by the spindle shaft to check alignment and face off the peened end to a rounded contour.

*Pawl:* Saw out pawl H and file by hand. Mount temporarily in a hole in the back plate 3/4 in. from the center with a 4-36 screw. Slide the ratchet on the spindle and shorten pawl if necessary to give free click in each direction.

*Spring:* This spring may be made from beryllium-copper, brass or steel. It is bent approximately as shown and adjusted later to the proper tension.

*Handle, Spacers, Cap, Cleat:* The handle N is turned from aluminum bar stock. Spacers J-K from brass, drilled and tapped on both ends. The cap M is turned from steel, and cleat L is made from .062-in. brass strip, cut to shape, drilled, countersunk, bent and filed to a taper on the ends to fit the rod.

*To assemble:* Use 4-36 flathead brass screws. Chuck individually, and file to oval heads. Thread screw for the pawl through the back plate and secure with a nut filed to .047 in. thickness. Peen over to secure the pawl but allow freedom for click effect. Mount the spring and adjust tension, testing with the ratchet hub.

Assemble handle to outer spool end with thin nut for spacer. Peen on inside end and file flush. If necessary, disassemble and dress spool hub to promote accurate alignment of spool ends with back plate and ring. Dress the .047-in. recess in cap to permit a free-running spool without end play and fasten to the spindle with an oval-head 6-32 brass screw. •