

How to Make a Turbine Engine

In the following article is described a machine which anyone can make, and which will be very interesting, as well as useful. It can be made without the use of a lathe, or other tools usually out of reach of the amateur mechanic. It is neat and efficient, and a model for speed and power. Babbitt metal is the material used in its construction, being cast in wooden molds. The casing for the wheel is cast in halves--a fact which must be kept in mind.

First, procure a planed pine board 1 by 12 in. by 12 ft. long. Cut off six Pieces

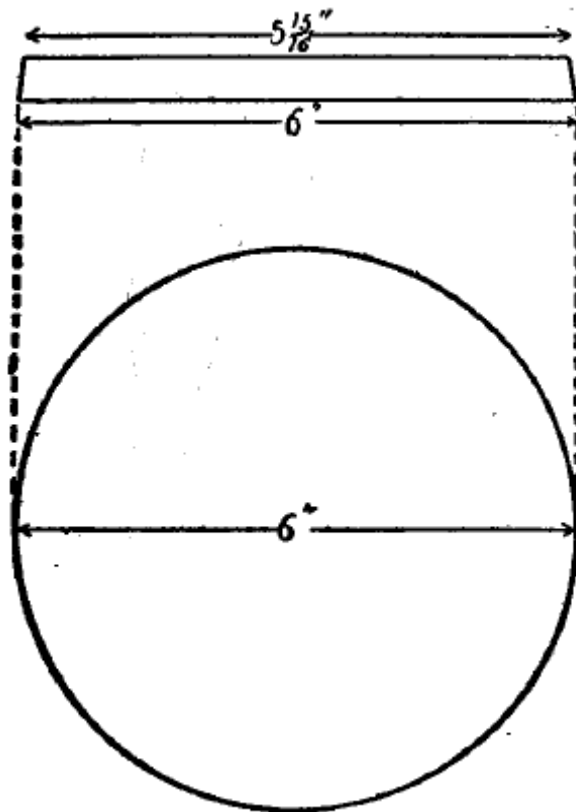


FIG 2

pieces 12 in. square, and, with a compass saw, cut out one piece as shown in Fig. 1, following the dotted lines, leaving the lug a, and the projections B and b to be cut out with a pocket knife. Make the lug 1/4 in. deep, and the projections B, b, 1/2 in. deep. The entire cut should be slightly beveled.

Now take another piece of wood, and cut out a wheel, as shown in Fig. 2. This also should be slightly beveled. When it is finished, place it on one of the square pieces of wood, with the largest side down, then place the square piece out of which Fig. 1 was cut, around the wheel, with the open side down. (We shall call that side of a mold out of which a casting is drawn, the "open" side.) Place it so that it is even at the edge with the under square piece and place the wheel so that the space between the wheel and

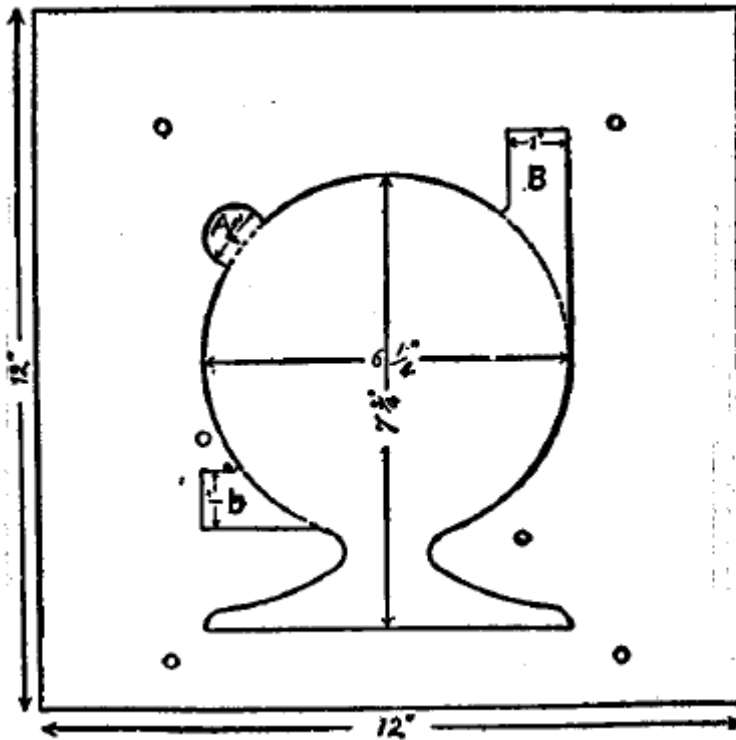


FIG 1

the other piece of wood is an even 1/8 in. all the way around. Then nail the wheel down firmly, and tack the other piece slightly. Procure a thin board 1/4 in. thick, and cut it out as shown in Fig. 3; then nail it, with pins or small nails, on the center of one of the square pieces of wood. Fit this to the two pieces just finished, with the thin wheel down--but first boring a 3/4-in. hole 1/4 in. deep, in the center of it; and boring a 3/8-in. hole

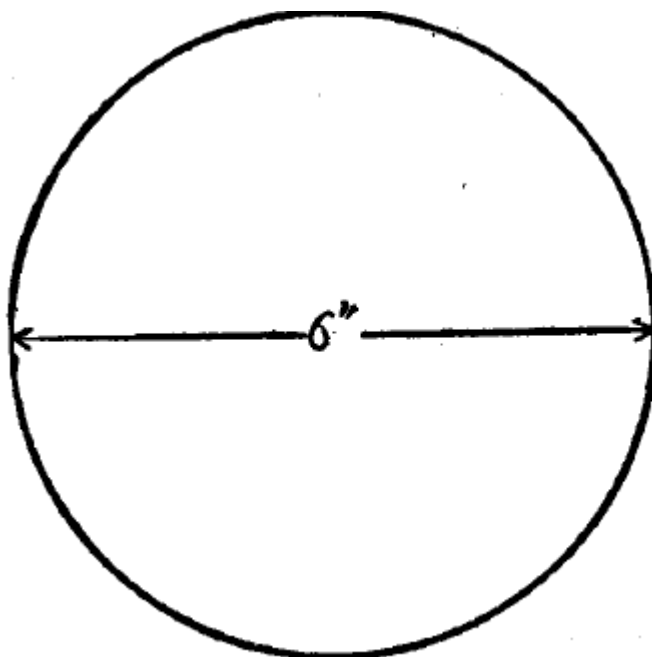


FIG.3

hole entirely through at the same place. Now put mold No.1 (for that is what we shall call this mold) in a vise, and bore six 1/4-in. holes through it. Be careful to keep these

holes well out in the solid part, as shown by the black dots in Fig. 1. Take the mold apart, and clean all the shavings out of it; then bolt it together, and lay it away to dry.

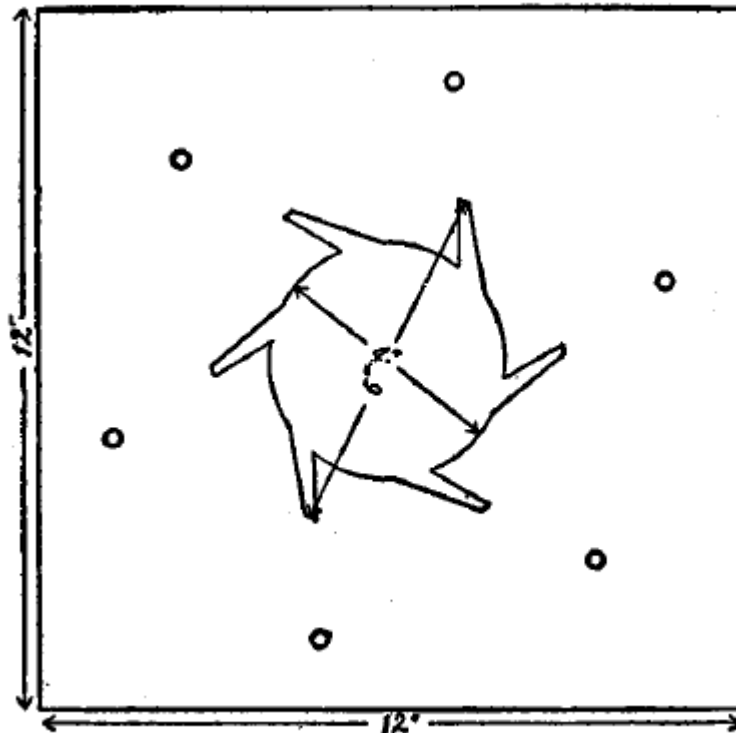


FIG. 4

Now take another of the 12-in. square pieces of wood, and cut it out as shown in Fig. 4, slightly beveled. After it is finished, place it between two of the 12-in. square pieces of wood, one of which should have a $\frac{3}{8}$ -in. hole bored through its center. Then bolt together with six $\frac{1}{4}$ -in. bolts, as shown by the

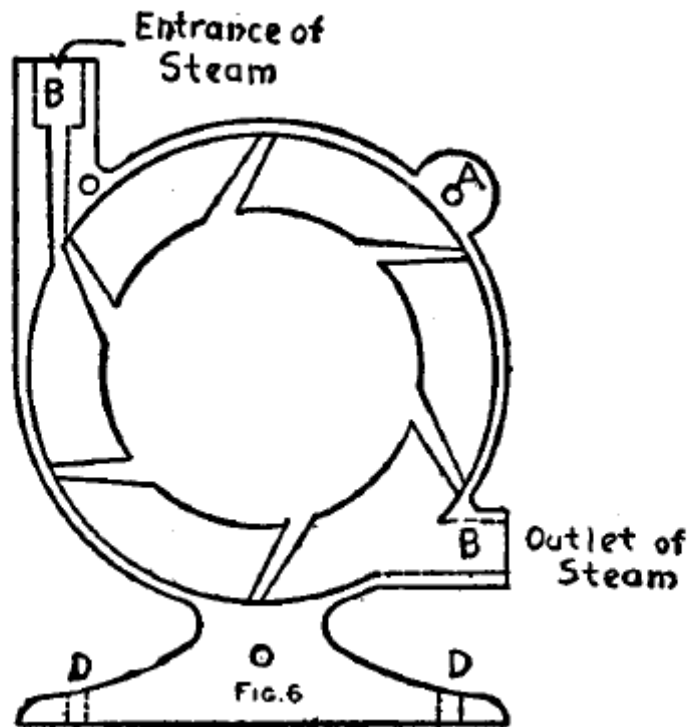
black dots in Fig. 4, and lay it away to dry. This is mold No.2.

Now take mold No.1; see that the bolts are all tight; lay it on a level place, and pour babbitt metal into it, until it is full. Let it stand for half an hour, then loosen the bolts and remove the casting.

Now cut out one of the 12-in.-square pieces of wood as shown in Fig. 5. This is the same as Fig. 1, only the one is left-handed, the other right-handed. Put this together in mold No.1, instead of the right-handed piece; and run in babbitt metal again. The casting thus made will face together with the casting previously made.

Pour metal into mold No.2. This will cast a paddle-wheel, which is intended to turn inside of the casting already made.

If there should happen to be any

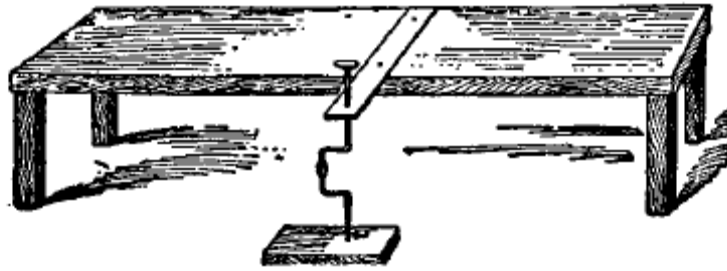


holes or spots, where the casting did not fill out, fill them by placing a small piece of wood with a hole in it, over the defective part, and pouring metal in to fill it up.

If you cannot obtain the use of a drill press, take an ordinary brace, fasten a 3/8-in. drill in it, and bore a hole through the end of a strip about 2 in. wide and 16 in. long; put the top of the brace through this hole, and fasten the other end of the strip to a bench, as shown in illustration. Find the center of the paddle-wheel, place it under the drill, true it up with a square; and drill it entirely through. Find the centers of the insides of the other two castings, and drill them in the same manner.

A piece of mild steel 5 in. long, and 3/8-in. in diameter must now be obtained. This is for a shaft. Commencing 1-1/2 in. from the one end, file the shaft off flat for a distance of 1 in. Then cut a slot in the paddle-wheel, and place the shaft inside of the paddlewheel, with the flat part of the shaft turned to face the slot in the wheel. Pour metal into the slot to key the wheel on to the shaft.

The paddle-wheel is now ready to be fitted inside of the casing. It may be necessary to file some of the ends off the paddles, in order to let the paddle-wheel go into the casing. After it is fitted in, so that it will turn easily, place the entire machine in a vise, and bore three 1/4-in. holes, one in the lug, one in the projections, B, b, and the other in the base, as shown by the black dots in Fig. 6. Also bore the port-hole in projection B, and the exhaust hole in projection b, and two 1/4-in. holes at d, d, Fig. 6. Cut out a piece of gasket and fit it between the two castings. Then bolt the castings together, screw down, and connect to the boiler.



Using the Brace

The reader must either cast a pulley out of babbitt metal, or else go to a machinist and get a collar turned, with a boss and a set screw, and with three small screw holes around the edge. Cut out a small wood wheel and screw the collar fast to it, fasten it to the shaft of the turbine and turn on the steam. Then take a knife or a chisel, and, while it is running at full speed, turn

the wheel to the shape desired.

Your turbine engine is now ready for work, and if instructions have been carefully followed, will do good service.