

HANDCRAFT

# Christmas Gifts to Make

Construct doll carriage, decorative door stop, steam-driven PT boat or glass-bead microscope in your workshop at home from easily obtained materials.

By JOSEPH H. KRAUS

► THIS CHRISTMAS season will find store shelves bare of many gifts we would like to give. Makers of toys and luxury gifts especially have turned to more serious business. But similar gifts can be made at home that are, in addition, useful scientific exercises in the use of tools and explain scientific principles.

For little sister, a doll carriage can be made almost entirely from odds and ends of wood. Tack together two boards 28 inches long and 8 inches wide so both of them can be shaped at the same time. An ordinary straight saw and a little work with a knife or rasp will shape the sides as shown in the diagram. Use a jig or band saw if you have one available. When the job is completed, separate the pieces which are to form the sides.

The doll carriage should be 12 inches wide. The inside compartment is made of three pieces of wood arranged as shown in the diagram and nailed in place.

The springs are constructed from egg box wood. Make about six strips one-and-one-quarter inches wide. Soak them in water. Apply a water soluble glue to them. Place one strip on top of the other and bend into a form made by driving nails into a board. The diagram also illustrates how this is done. A single egg box strip will not be long enough, so add another to it, making the ends abut. Be sure that the joint of one strip does not meet a joint in the other strip. Set these springs aside in the form for at least three days to dry thoroughly.

The axles are ordinary half-inch dowel rods which are nailed to wooden strips three inches wide. A spool such as is used for heavy cord is cut in half and the halves are used as bearings for the wheels. If you can't get spools perhaps you have a friend who would turn them on a lathe. The wheels are turned from wood or may be made from small peach basket bottoms sanded on the face and edges. These wheels run on the wooden spool bearings as illustrated. A cotter pin or a bent nail passing through a hole in the wooden axle prevents the wheels

from coming off. Oil put on the bearing parts will make the wheels turn more easily.

The handles of the doll carriage are made in forms just as were the springs. These are  $\frac{3}{8}$ -inch dowels soaked in hot water and bent. The handles are attached to the sides of the carriage by straps of tin cut from an old can. Better straps, called B-X cable straps or pipe straps, are available for a few cents from any hardware store. The cross-bar is a broomstick drilled so that the two side bars can be inserted.

The hood of the carriage can be made either from wooden hoops shaped from an old egg box or they can be formed from discarded wire coat hangers. The covering of the hood is any suitable material. A small hem should be sewed to cover the first hoop. The middle hoop may be attached and held in position with a few stitches. If the hoops are of wire, small eyes are turned in the lower ends to encircle a short bolt or wing nut.

The entire carriage should be lined with some soft material like cotton and covered with fabric or cloth which should extend one inch over the outside edges. Imitation tufting can be produced by tacking ornamental nails here and there on the inside.

The whole carriage should then be

given one or two coats of paint. Imitation wheel spokes should be painted on the wooden disks.

Mother or sister would like the decorative door stop shown in the diagram. Mount a doll's head on a cork, and fit it into a bottle filled with sand. Now make a flowing gown attached around the neck of the doll head which is long enough to cover the bottle. The waist of the figure can be tied securely to the bottle. Instead of using a ready-made doll's head you can model one yourself out of clay, bake it in the oven, and then paint on the features. Or try making a cloth head, such as from the end of a child's stocking. A face can be outlined with colorful thread.

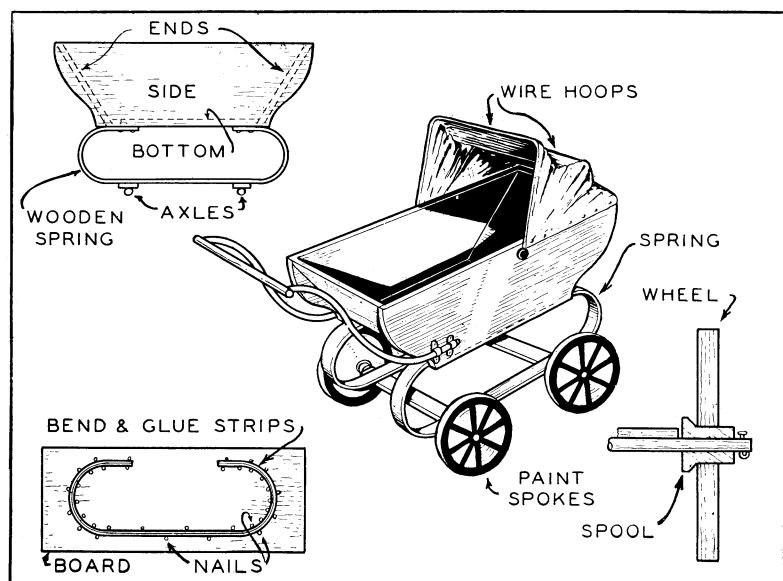
This makes an ornamental, well-weighted door stop for the bedroom or elsewhere in the home.

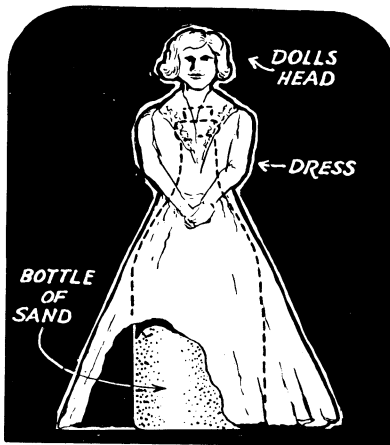
## Make a PT Boat

It's fun to build a steam-driven PT boat that would delight any boy.

The illustration represents a boat approximately 15 inches long made from a piece of two-inch by four-inch lumber. On this board roughly sketch the shape of the hull; then drill a series of holes as illustrated at C. Either a small drill as shown in the diagram or a much larger one can be used. After drilling the holes, remove the center area of the wooden block. Clean up with chisel or rasp.

Now cut the outside approximately to shape. Gently slope the sides inward





and downward until you get a construction that somewhat resembles a boat. Lightly tack a piece of wood 1/4-inch thick to the bottom of the boat and continue the shaving and sanding operations. Now make a deck piece to fit the top of the boat and drill two holes in this so that the deck and superstructure will fit on the two flat staffs made from nails at the front and rear.

Cut blocks of wood similar to D and E to represent the superstructure and whittle two pieces of broomstick, as shown at F, to represent the anti-aircraft gun turrets. Glue and nail these pieces to the top. A cold casein glue is best. The four torpedo tubes can be made from dowels or wire package handles.

**Paint All the Parts**

Give all of the parts a coat of paint, perhaps battleship gray, and let the parts dry. Then paint the inside of the bottom and the bottom of block C again, and while the paint is still wet, nail these parts together. Apply a thick coat of paint along the inside seams and set aside to dry.

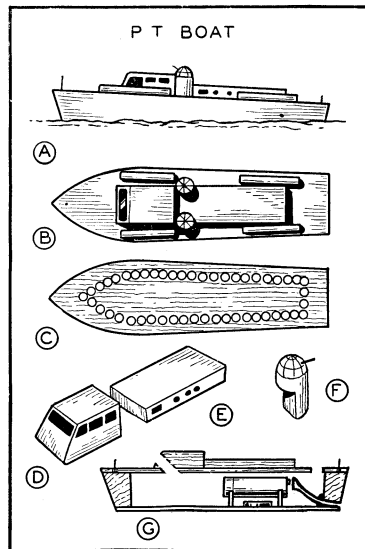
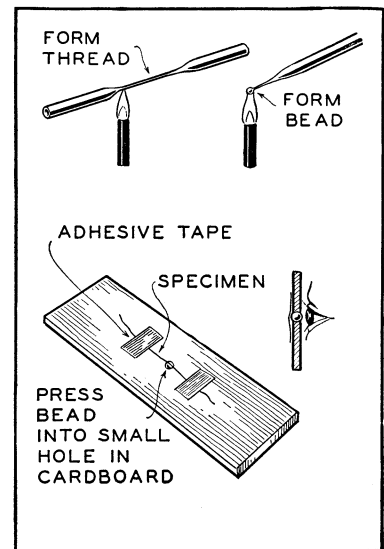
One of the simplest of steam power drives can be made from a small tomato paste can. When opening such a can, punch a small hole through the top near one edge. Shake out the contents and

wash out the inside of the can by submerging it in a bowl of water and squeezing the sides. This causes the air bubbles to escape and water to enter.

After the can is clean, solder a small piece of copper tubing about 1/8-inch wide inside the hole in the can. Bend another piece of copper tubing, approximately as shown in the diagram and flare the upper end. You can get a short length of such a tube from the local garage man's junk pile. The flare on the end can be made with a flaring tool or the end can be enlarged by using a punch or working a nail introduced at an angle around the copper tubing.

If the copper tube refuses to yield, heat it red hot in the flame of a gas stove, plunge immediately into cold water to soften it again and repeat the manipulations.

Pass the tube through a hole near the bottom of the stern of the boat. Now arrange the can on a small wire or tin support. A piece of tin cut from a can should be bent into a square U shape. Semi-circular cuts of the proper size to hold the boiler should be made. The fuel



container is a cap from an old preserve jar. The inside of the boat should be lined with sheet asbestos.

In operation, the can is half filled with hot water. No more than a half teaspoonful of solid alcohol which can be bought at the 5-and-10-cent store is put in the cover. Light the fuel and when the water boils, the steam will be driven into the copper pipe. In doing so, the steam will carry some air down with it. This steam and air mixture drives the boat forward, though probably at a very slow speed.

**Supply Ballast**

This boat will require some sort of a ballast to settle it well in the water. For ballast you can use stones, sand or a handful of old nails. Note also that you will have to build up around the copper pipe with white lead, putty or thick paint to eliminate any leakage at this point.

If alcohol is to be used as a fuel, ven-

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tilation must be provided. This is best accomplished by cutting a hole from the cabin window to the interior and cutting a vent at the rear as illustrated at G.

The diagrams at A and B show the side and top views of the boat. Windows are made with black paint at the appropriate places or by sticking pieces of cellophane or celluloid directly to the side of the ship with glue. The lines on the anti-aircraft gun turrets are ruled with a black pencil and the anti-aircraft gun is an ordinary finishing nail driven into the wood. The head is cut off and the end is filed straight. The PT boat is now ready for its trial excursion.

### Homemade Microscope

A grain of pollen, a moth's wing or a fly's leg may be greatly magnified by means of a microscope which you can make at home. The only materials required to make this microscope, which is really a very powerful magnifying glass, are a piece of glass tubing and a Bunsen burner. The flame of an ordinary kitchen gas range may also be used.

If you have a broken glass drinking straw, hold an end with the fingers of each hand so that the center is directly over one of the flames of the gas range or Bunsen burner. Rotate the tube until the part above the flame gets hot and soft. Remove the tube from over the flame and immediately pull both ends apart. This will produce an extremely fine thread of glass.

Break the thread in the middle with your fingers and insert the tip of the glass thread in the flame. Break off the tiny bead which forms on the end. Make other beads in a similar fashion.

### Make a Pin Hole

Cut some cardboard from a stiff shoe or candy box into strips measuring about one by three inches. In the center of each strip punch a pin hole. Make sure that the hole is perfectly clean when you look through it. Now insert one of the glass beads you have just made into the hole in the cardboard, pushing it about flush with the cardboard itself. If the bead is tipped, have the tip extend sideways.

You now have a very powerful magnifier with which tiny objects will be enlarged greatly. Attach an animal hair to the back of the cardboard with a piece of adhesive tape. Scotch tape will be found excellent for this purpose. Stretch it directly across the center of the bead and fasten it down at the other end. Now look at the hair. In a similar way attach a fly's wing, leg or other parts of

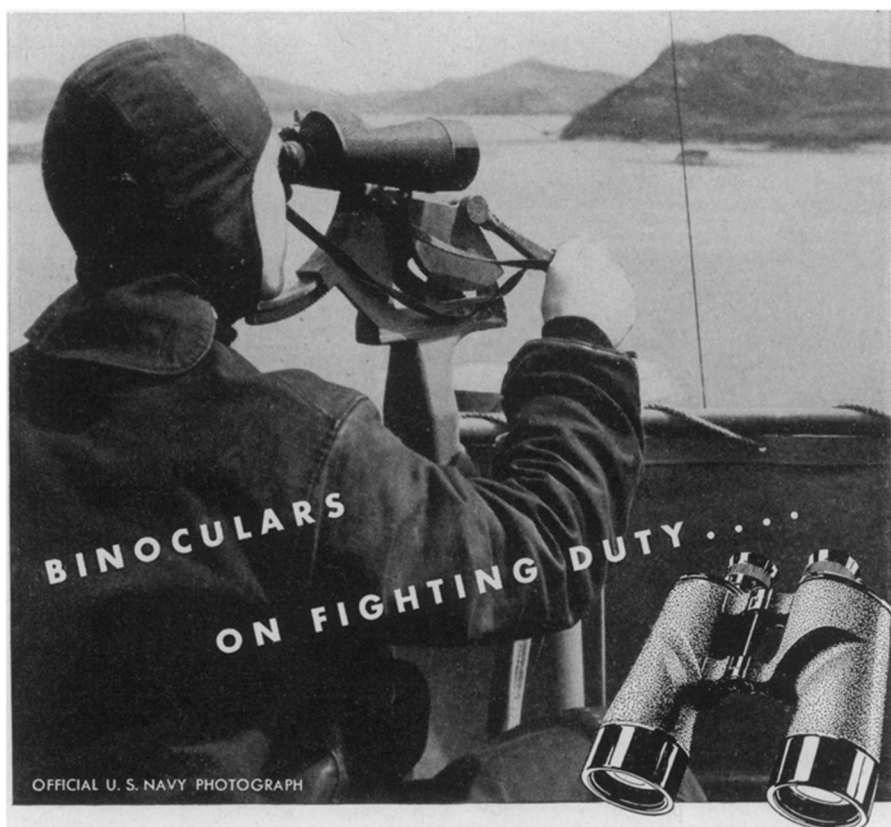
the fly's anatomy to the back of the cardboard. Make an infusion of hay or grass, a lettuce leaf or a banana skin by putting a teaspoonful of the material in a glass of water and setting it aside for a week or ten days. Remove a single drop of the mixture with an eye dropper and apply it directly to the lens.

If tiny slipper-shaped animals such as are found in stagnant waters are present and if your lens has the proper focus, you will see tiny creatures moving back and forth across your line of vision. You should treat several of the beads in this

way to select the one which gives you the best results.

You can use this microscope to examine the pollen grains which cause hay fever; to study the mold on bread, specimens of flour and face powders. Many permanent slides may be made by attaching the specimens directly to the cards. Use celluloid cement for small objects. It will not hurt if cement is applied directly to the lens. In this case the object should be imbedded in the cement immediately.

*Science News Letter, November 6, 1943*



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