EXPLODING DESTROYER

designed by E. F. SCOTT

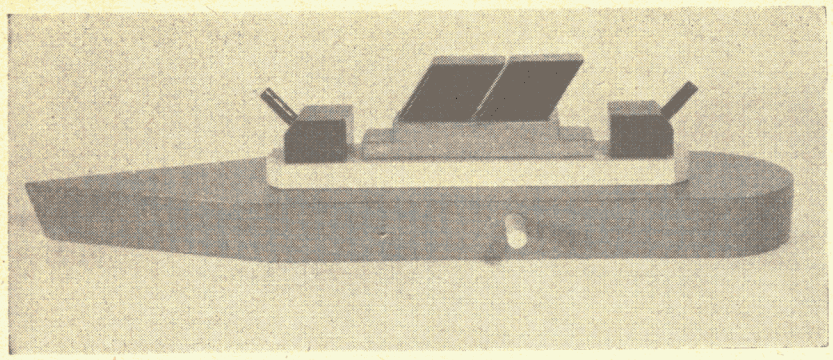

FIG. 1. SIMPLE MODEL WHICH AROUSES CONSIDERABLE INTEREST
Length 11 in., width 2 in., 2⅝ high over-all.

THE WRITER REMEMBERS being given a toy rather like the one illustrated in Fig. 1 when he was a boy over forty years ago, but Mr. Scott assures us that, even today, his classes of younger boys are still greatly interested in it and set about making it with enthusiasm. The making of the toy certainly incorporates a wide range of elementary woodworking operations to assist the boys in developing their skills.

As will be seen from the elevation and plan in Fig. 2 the hull incorporates a rectangular sinking into which is fitted a letter box spring. The parts of the superstructure of the destroyer are just rested in position over the sinking so that, when the plunger in the side of the hull is pressed, the spring is released and the parts of the superstructure are scattered.

The hull

For this a piece of wood is trued up to 11 in. by 2½ in. by ⅞ in. thick, and marked out to conform to the shape shown on the plan in Fig. 2. The pointed bow, semicircular stern and the rectangular sinking are the main parts to be marked out but the centres for the various holes indicated on the elevation in Fig. 2 must also be accurately located.

Cut the sinking in the hull first, finishing it to depth accurately with a router plane. The bow and stern may next be shaped. Notice that the pointed bow is also bevelled on edge but this part of the operation can be omitted if desired.

Next, fine holes must be drilled through the hull to receive two 1¼ in. oval nails to retain the spring in position, and another hole for a 1 in. panel pin in the position indicated on the drawing. A ¼ in. diameter hole must also be drilled through one side of the hull in the position shown on the elevation in Fig. 2 to receive the piece of ¼ in. diameter dowel rod which serves as the spring release plunger.

The simple mechanism of the toy should be apparent from Fig. 2. The two oval nails are driven into the hull from either side to hold the coil of the spring in place or a piece of fine metal rod could be used instead if desired.

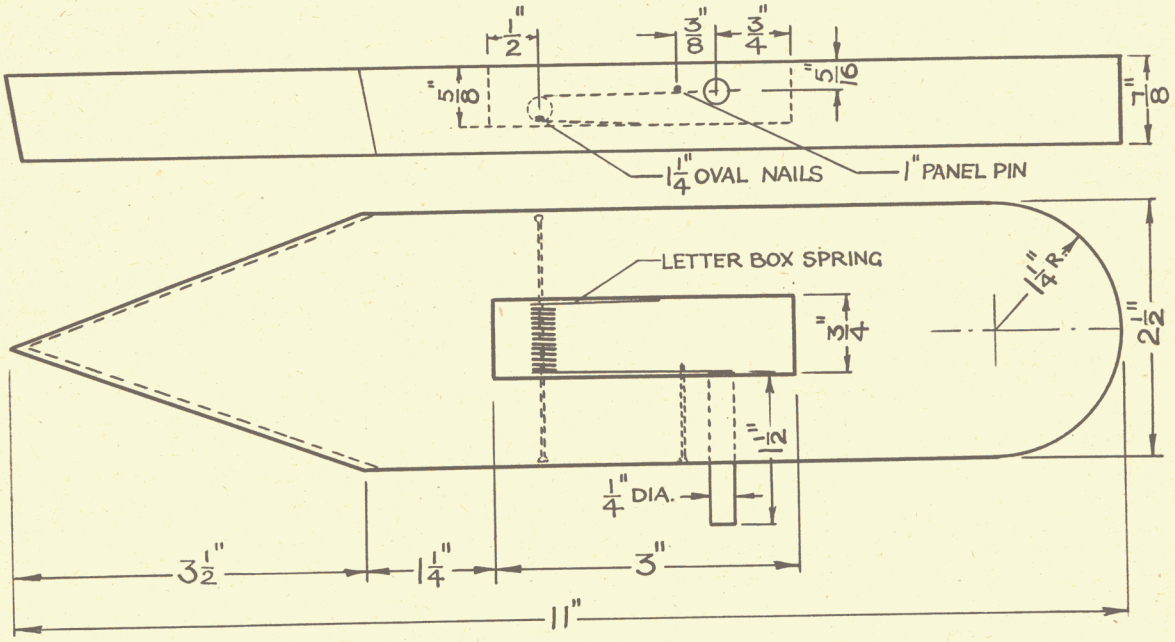

FIG. 2. ELEVATION AND PLAN WITH MAIN DIMENSIONS

The panel pin is then driven in through the side of the hull so that its point projects sufficiently into the sinking in the hull to hold the long arm of the spring in check, When the dowel rod plunger is pressed it forces the spring arm forward to clear the retaining panel pin and so causes it to spring up thereby disturbing the superstructure of the destroyer. Re-setting is done by merely pressing the spring arm into position again beneath the tip of the panel pin.

The superstructure

The parts for this are shown in Fig. 3.

Part (A) is 6 in. by 1 in. by $\frac{3}{8}$ in. and has the corners bevelled off as shown.

Part (B) is $3\frac{1}{4}$ in. by $\frac{7}{8}$ in. by $\frac{1}{2}$ in. and has recesses sawn out from each end.

Parts (C) and (D) are the funnels and guns, and, as these are rather small to handle, Mr. Scott suggests that it is better to organise the boys in pairs so that one can make four guns while the other makes four funnels. In this way longer pieces of wood can be used. For the four funnels a piece of wood 7 in. by $\frac{7}{8}$ in. by $\frac{5}{8}$ in. will be required and $\frac{1}{8}$ in. by $\frac{1}{8}$ in. chamfers taken of the corners as shown. The angle required for sawing the individual funnels to length can be set on a bevel square and the ends finished by glasspapering them flat and smooth.

Cutting List	*Long in.*	*Wide in.*	*Thick in.*
1 hull	$11\frac{1}{2}$	$2\frac{3}{4}$	$\frac{7}{8}$
1 part A	$6\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{8}$
1 part B	$3\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$
2 parts C	$3\frac{1}{2}$	$1\frac{1}{8}$	$\frac{5}{8}$
2 parts D	$2\frac{1}{2}$	$1\frac{1}{8}$	$\frac{5}{8}$
1 dowel	2	$\frac{1}{4}$ dia.	
2 dowels	$2\frac{1}{2}$	$\frac{3}{16}$ dia.	
1 letter box spring			
2 $1\frac{1}{4}$ in. oval brads			
1 1 in. panel pin			

Allowances have been made in lengths and widths. Thicknesses are net.

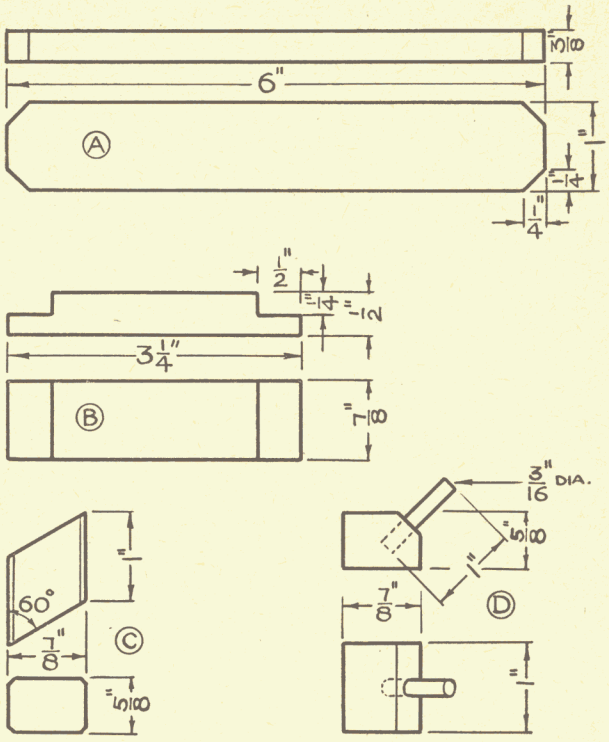

FIG. 3. SIZES OF SUPERSTRUCTURE

For the four guns a piece of wood $4\frac{1}{2}$ in. by $\frac{7}{8}$ in. by $\frac{5}{8}$ in. and a piece of $\frac{3}{16}$ in. diameter dowel rod $4\frac{1}{2}$ in. long will be needed. Chamfer one edge of the piece of wood as shown, mark the lengths for each of the four guns and drill the holes to receive the barrels before cutting the four pieces. The barrels can then be cut to length and glued into the holes.

If the various parts are painted in different colours the attractive toy will be complete. (108-467)

THE STORY OF BORING TOOLS

(*Continued from page* 76)

and was used later by the Romans, and up to modern times by the Chinese and Japanese.

Another boring tool used since the Stone Age, and still fairly common among primitive peoples like the Eskimos and the natives of New Guinea, is the pump drill. Here the motive power is applied through a cord attached to the ends of a stock which moves up and down the upright shaft. The cord winds and unwinds itself round the shaft, assisted by a stone or metal flywheel (Fig. 10).

In spite of its name, which suggests a Greek origin, the Archimedean drill (Fig. 11) is a comparatively modern tool, making its first appearance in a Marples catalogue of 1864, and in German lists of about the same date. In its earliest form the shaft consisted of a spiral of twisted wires, with the nut moved backwards and forwards by a small turned handle set at an angle. This was simplified by the English and Americans to the present round nut working on a solid steel shaft, while the "Yankee" reciprocating drill has a double spiral which gives a continuous rotation in either direction.

The earliest pattern of breast drill (Fig. 12), which was invented about 1800, probably in France or South Germany (Holtzapfel, in 1846, called it a "French brace"), had a large head and a very small crank driving two bevel gear wheels with a ratio of 1:1, and no handle at the side. By the middle of the nineteenth century the gear ratio was raised to about 4:1, and a second handle fitted at right angles to the frame (Fig. 13). The bit was fixed with a small thumbscrew. Modern breast drills have two positions of the gears for fast and slow speeds, and the crank handle can be extended for extra power. The drills, with a round shank, are held in a three-jaw Barber chuck (Fig. 14). These tools have now been largely superseded by the portable electric drill. (113-393)

We regret that in our February number we gave a wrong address for John E. Wright & Co. Ltd., who supply materials for dyeline printing. The following is the correct address: Blue Print House, 115 Huntingdon Street, Nottingham.