ECONOMICAL AND ACCURATE MANUFACTURE OF DRILLING TEMPLATES

The manufacture of a drilling template becomes an expensive item when a large number of accurately spaced holes have to be drilled. A typical example of the use of such templates is in the drilling of a condenser tube plate, where there are two distinct processes; the drilling of the tube holes and the drilling of the collar stud holes on the periphery.

Recently, Devonport Yard was faced with the problem of replacing the defective tube plates of H.M.S. *Offa*. The drilling of the condenser tube holes in the plate was carried out by means of a drilling jig which had 60 guide holes drilled to dimensions taken from the ship's drawings. There was no particular difficulty in carrying out this part of the work, nor was the manufacture of the jig expensive in relation to the number of holes to be drilled. The need for accurate drilling of the holes for the collar studs securing the tube plates and end cover flanges to the condenser shell flanges required greater care, but the method employed was effective and cheap.

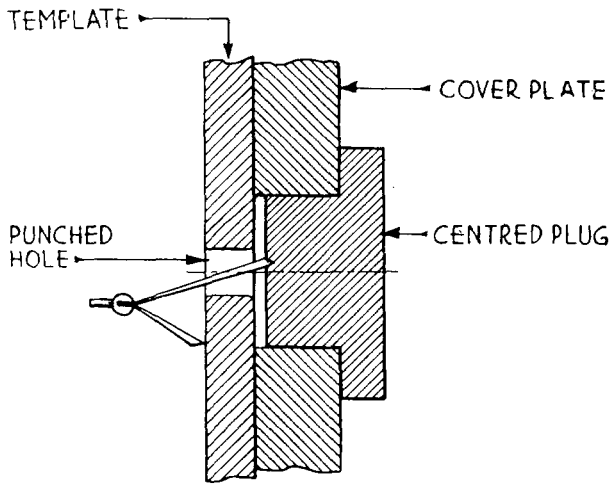

FIG. 1

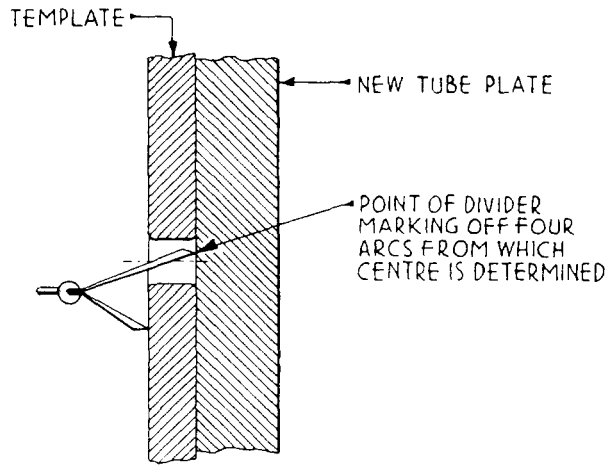

FIG. 2

The simplest expedient, that of marking circles on a suitable template through the end cover flange holes, is liable to inaccuracy and necessitates the drilling of each hole on a separate template for each end cover. The method adopted by Mr. A. Lee, Foreman, Engineering Department, involved no drilling and only required the punching of holes in the template. These holes were smaller than those in the end cover flanges and located only sufficiently accurately to take in the centre of each hole of these flanges.

After these holes were punched out, the template was placed against the end cover and a cylindrical plug (Fig. 1) fitting the flange holes in the cover, with a pop mark accurately centred at the end, was inserted in each hole in turn. A circle was scribed on the previously whitewashed template by means of an odd-leg

pair of dividers, the point of the long leg being placed in the centre pop mark of the plug.

The centre for drilling each stud hole in the tube plate was then accurately marked off direct on the tube plate by striking the usual four arcs of circles from the scribed circle on the template, using four positions on the scribed circle as centres (Fig. 2). The same template was then used for the second end cover after obliterating the markings used for the first.

It is possible sometimes to use the cover as a drilling template, but one of the advantages of the template procedure lies in the portability of the template. When the saving in expense by only punching instead of drilling the template is also taken into account the method just described has considerable advantages when manufacturing a new condenser tube plate for a large condenser.