

HOLE POSITIONS



When the lathe is used on a jig-boring principle, spinning the boring tool in the work clamped to the vertical slide, there are several possible ways of locating the positions of holes.

Given that the centre distances of the furthest holes are within the range of movement of the vertical slide and cross slide, and that these slides have accurate micrometer collars, the jig-

If it is simply range that is lacking, or if feed screws are inaccurate overall but sufficiently accurate locally, the principle of setting to marked-off centres can be employed. Cross lines will locate each hole-centre on the work, and can be set to a spinning needle-point by reference to the micrometer collars. Naturally, this involves somewhat more preparation of the work than where locating can be done from feed screws and collars; but it is straightforward, and with care accur-

gauges, before coming to the lathe.

Each button is as at A, a short, parallel, thick-walled sleeve with a truly square end abutting to the face of the work-which, of course, must be flat. The bore is clearance for the holding screw; and the hole in the work having been approximately located, drilled and tapped, and the button fitted with washer and screw, the button can then be adjusted for position and held by tightening the screw.

Where there are two buttons, as at B, measurement V over them, gives the centres of the holes. The work can then be adjusted on the vertical slide, or by the feed screws, for the indicator to show a steady reading when its lever arm is turned round a button. With the hole finished, the procedure is repeated for the second one-and for any more there may be. A small mirror is useful for checking the setting-up reading, at positions where the indicator is upsidedown or facing backwards.

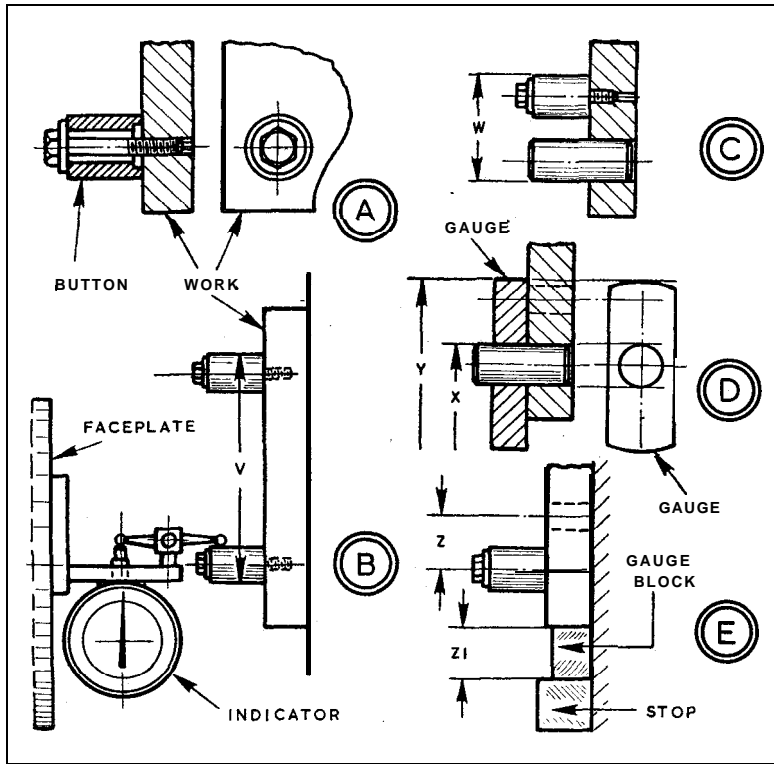
When holes conflict

When two button-located holes come close together, the second button if fitted with the first, may prove an obstruction for tool or swarf, as the first hole is bored. In these cases, fitting the second button afterwards is possible, using a plug in the finished hole, as at C, when measurement, W, over plug and button will locate the centre of the second hole.

The procedure may involve removing the work for setting the button, and this can be avoided by employing a prepared gauge, as at D. Such a gauge can be made from flat bar, drilling and boring or reaming a central hole, mounting by this bore on a spigot on the faceplate, clamping, then turning the ends to radius-when any error of measurement will be halved at the functional centres.

Having bored the first hole, a reading is taken over the plug by dial indicator, as dimension X. Then feed gives a similar reading over the gauge, as dimension Y. The work is initially set, of course, so the hole centres lie on the line of feed.

Alternatively, as at E, a second hole at centres Z may be located by removing a gauge block of the same thickness, Z1, from between a stop and the work, then moving this to the stop. □



boring principle can be continued even to the locating of holes. That is, having settled the position of one hole by any method, the positions of others-can be obtained by appropriate feeds on the screws-afterwards clamping the vertical slide and cross slide.

Where centres of holes are beyond the movement of slides, or where feedscrews are without micrometer collars-or insufficiently accurate, other methods are necessary.

acy should be equal to that of the marking-off.

If, however, it is impossible to rely on the feeds crews, then the tool-maker's button method is essential, using a dial indicator for the actual setting. Accuracy in locating the hole positions will then depend on the precision with which the buttons are set on the work. This can be done in the normal way with micrometers, vernier gauges, block or end