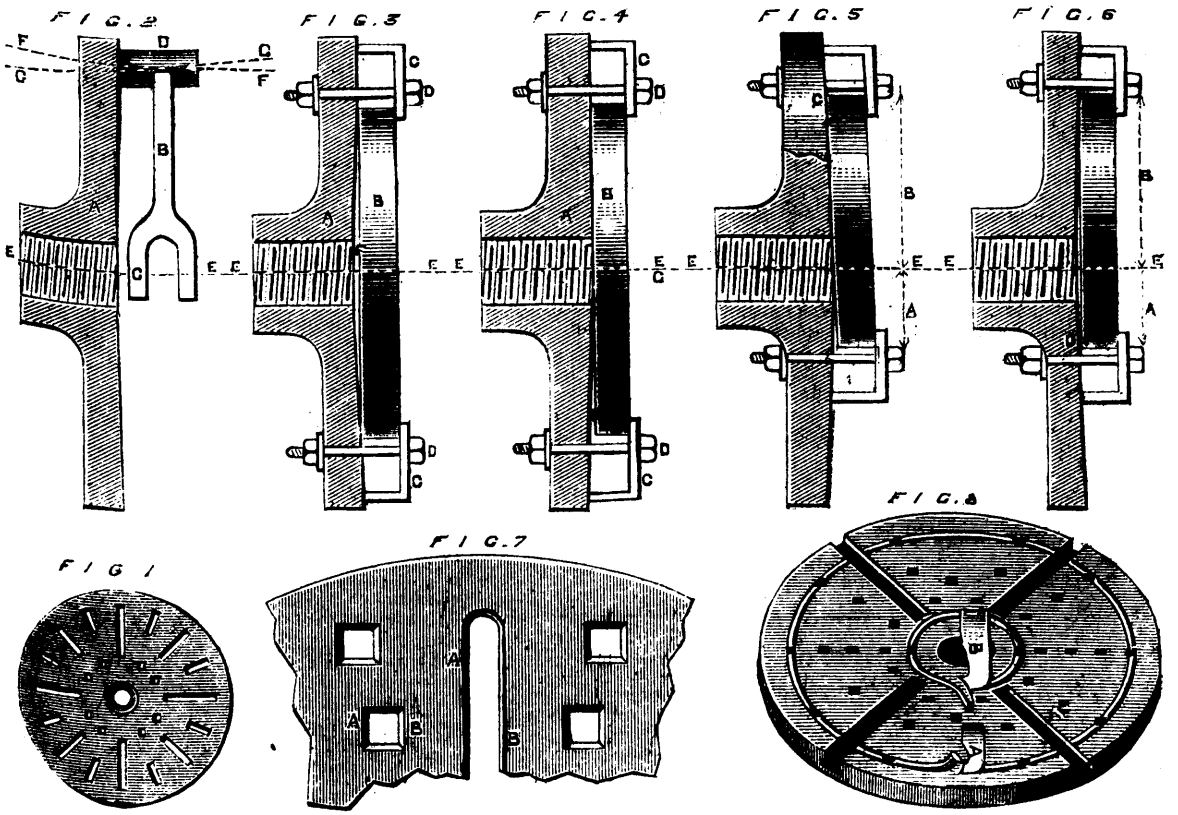

LATHE CHUCK-PLATES.

LATHE CHUCK-PLATE.

By Joshua Rose, M.E.

The chuck-plate is simply a large face plate (its diameter being, usually, nearly as large as the full swing of the lathe). It is provided with radial slots and numerous square holes (as shown in Fig. 1), to receive bolts and other devices employed to clamp work to its radial face. Its radial face should be a true plane (as indeed should the faces of all face plates and chucks), standing at a right angle to the line of centres of the lathe, and should run true. If a face plate is hollow when tested by a straight edge placed across its radical face, work that should be held true by being bolted against its face will not be true unless it is truly cylindrical and is fastened centrally on the chuck-plate.

For example, Fig 2 represents a chuck-plate hollow across the face. A is the chuck-plate shown in section, and B is an arm having a hole through its double eye, C, and one through its hub, D. The centre line of the lathe is denoted by E E, while the centre line of the hole in D is denoted by F. Now, suppose that the hole in D had been bored, and the radial face of D (which is against the chuck-plate) was turned true with that hole, when bolted to the chuck-plate, the centre line of F not being parallel with E, and the latter representing the line of travel of the cutting tool, it is obvious that the hole in C will not be bored parallel to that in D. If the chuck-plate was rounding instead of hollow, a similar error in parallelism would occur, but it would exist in the opposite direction, the centre line of D standing as denoted by the dotted line, G.

It is obvious, therefore, that the face of the plate should be true as tested by a straight edge, and that the plane of its face should stand at a right angle to the line of centres of the lathe. It is better, however, that whatever amount of error there may be should be in hollowness rather than roundness, for the following reasons:—In Fig. 3 is shown a face plate that is hollowing, and in Fig. 4 one that is rounding. Both are shown carrying a truly cylindrical washer, bored true, faced and recessed on one side, and chucked to be turned up true on the other.

A A are the chucks shown in section, and B are the respective discs held to the chuck-plates by the plates, C, and bolts, D, while E represents the lines of centres of the lathe. The face, F, of the washer in Fig. 3 stands at a right angle to E, notwithstanding the hollowness of the chuck-plate, while the face, F, in Fig. 4 may stand at an angle, as shown, in which event truing up the face, G, would leave the washer thinnest at one part of its circumference and thickest on the diametrically opposite side. The truth of the chucking in this case depends on whether the clamps, C, were screwed by the bolts with equal force to the face plate. A hollow chuck-plate will lose this advantage in proportion as the work covers more of one side of the chuck-plate than it does of the other, but in any event it will chuck more true than a rounding one. Suppose, for example, that instead of the discs being chucked concentric to the chuck they were chucked eccentrically, as shown in Figs. 5 and 6, the chucks being the one as much hollowing as the other is rounding. That shown in Fig. 5 would stand out of true to an amount greater than is the chuck in the length of its radius, while that shown in Fig. 6 would be nearer true than is the chuck in the length of its radius, both amounts being in the proportion of the length of the line, A, to the length of the line, B, the line of centres of the lathe being E E.

If either of these errors are known to exist, pieces of paper of sufficient thickness to remedy the error may be placed at C and D respectively. It is better, however, to true up the faces of plates so that the surface of the work bolted against it will be true and stand at a right angle to the line of lathe centres.

In truing up a face plate, the bearings of the live spindle should be adjusted so that there is no play on them, and the screw or other device used to prevent end motion to the live spindle should be properly adjusted.

A bar or rod of iron should also be placed between the lathe centres to further steady the live spindle, and the square holes or radical slots should have the edges rounded or bevelled off as shown in Fig. 7, so that when the tool point strikes the sides, A, of the holes or slot, it will leave its cut