

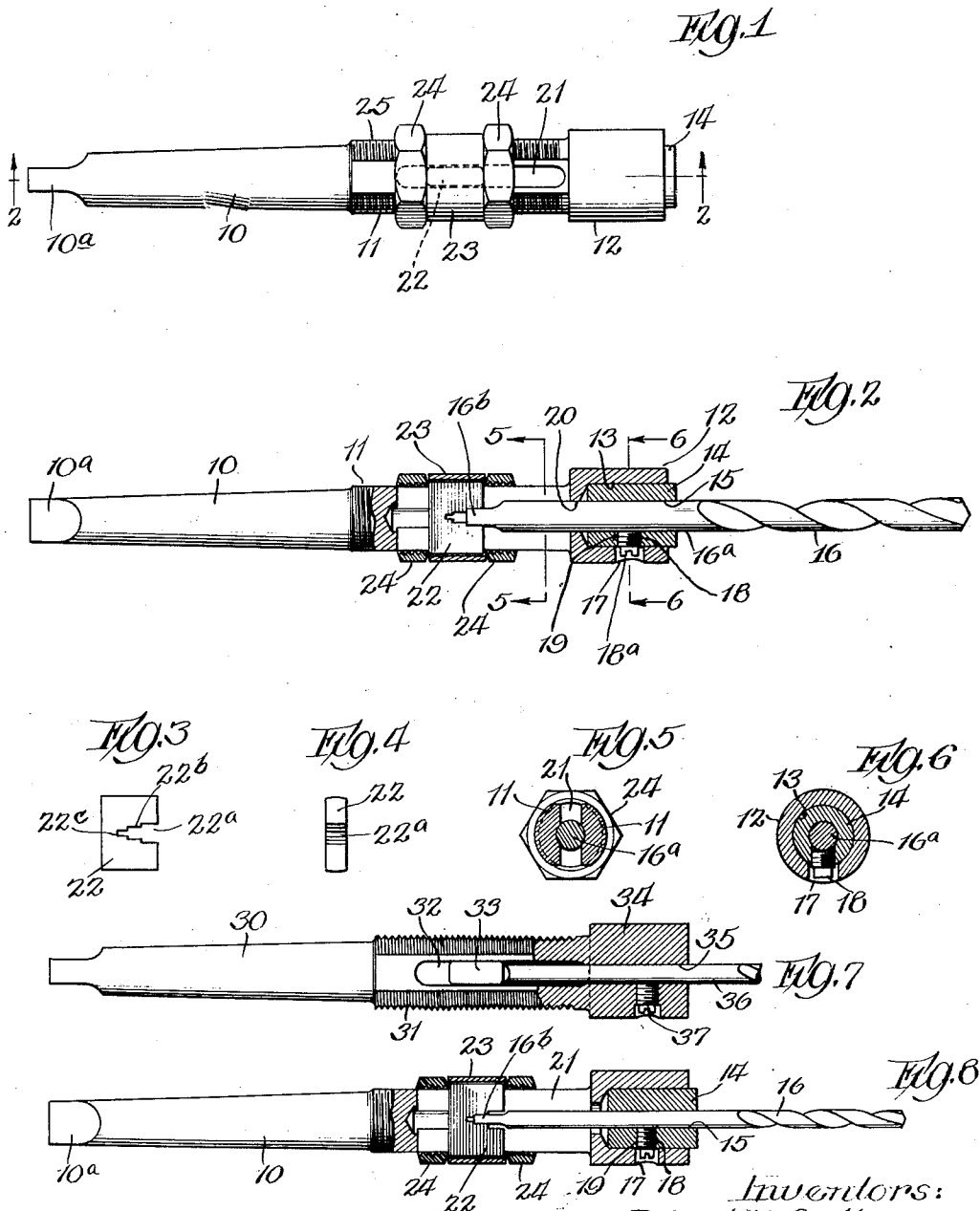
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DRILL HOLDER

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DRILL HOLDER.

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This invention relates to improvements in drill holders, and its purpose is to provide a simple and compact device adapted to hold drills of different sizes. An important object of the invention is to provide an improved holder for straight shank drills. A further object is to provide improved means for forming a driving connection between the holder and the drill in combination with improved means for holding the drill against longitudinal displacement. A further feature of the invention is the provision of a drill holder comprising interchangeable drill receiving sleeves or collets adapted to accommodate drills of different sizes, a single adjusting means being employed for holding the collet in the drill shank and for securing the drill in the collet. Still another object is to provide a drill holder adapted for use in multiple drilling machines. Other objects relate to various features of the construction and arrangement which will appear more clearly hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings:

Fig. 1 shows a side elevation of the improved drill holder;

Fig. 2 shows a longitudinal sectional view on the line 2—2 of Fig. 1, illustrating a drill in position in the drill holder;

Fig. 3 shows a side elevation of the driving block or key;

Fig. 4 shows an end elevation of the driving block or key;

Fig. 5 shows a transverse sectional view on the line 5—5 of Fig. 2 looking in the direction of the arrows;

Fig. 6 shows a transverse sectional view on the line 6—6 of Fig. 2 looking in the direction of the arrows;

Fig. 7 shows a side elevation of a modified form of construction with the lower portion in longitudinal section, illustrating a method of mounting the drill in the socket member without the use of a collet, and

Fig. 8 is a longitudinal sectional view similar to Fig. 2 showing a smaller sized drill mounted in the holder.

The drill holder of the present invention comprises a tapered shank 10 provided at its upper end with a flattened extremity 10^a, these parts being adapted to engage the chuck of the drilling machine in the usual manner. At its lower end the shank 10 is integrally united with the cylindrical body portion 11 which is connected at its opposite end with the enlarged cylindrical socket member 12. The cylindrical recess 13 which extends inwardly from the end of the socket member 12 is adapted to receive a cylindrical sleeve or collet 14 having a cylindrical bore 15. This bore 15 is adapted to be somewhat closely fitted by the straight cylindrical shank 16^a of a drill 16. A circular aperture 17 is provided through the wall of the socket 12 to receive a set screw 18 which threadedly engages an aperture 19 extending through the cylindrical wall of the sleeve 14. The set screw 18 has a head 18^a adapted to be engaged by a screw driver or the like. This set screw is adapted to be adjusted to engage the shank 16^a to hold the drill in the position within the sleeve or collet 14 and, at the same time, the projection of the set screw into the aperture 17 serves to maintain the sleeve or collet in position within the socket member 12.

The body portion of the drill holder is provided with a cylindrical bore 20 extending upwardly from the recess 13 in the socket member and this bore is intersected above the socket member by a transverse slot or keyway 21 extending completely through the body portion 11. The shank 16^a of the drill extends upwardly into the bore 20 and terminates at its upper end in a flattened extremity 16^b. A driving engagement between the drill holder and the drill is formed by means of a driving block or key 22, having the form illustrated particularly in Figs. 3 and 4, where it is illustrated as a block of rectangular form provided on one side with a series of stepped notches 22^a, 22^b and 22^c which are graduated to receive the flattened extremities 16^b of drills of different sizes. As illustrated in Fig. 2, the drill 16 is the largest size which the holder is adapted to receive and the extremity 16^b thereof fits the largest notch 22^a in the driving block. This key, which is mounted in the transverse slot or keyway 21, has a length slightly greater than the diameter of the body portion of the drill holder and is retained against longi-

tudinal displacement transversely of the drill holder by means of a collar 23 which is mounted on the body portion 11. The collar 23 and the driving block or key 22 are retained against displacement longitudinally of the drill holder by means of two nuts 24 engaging the body portion 11 which is externally threaded throughout its length as shown at 25. By means of this arrangement the driving block 22 may be adjusted longitudinally of the drill holder in the slot 21 in order to accommodate drills of different length and to permit any desired portion of the shank of the drill to project beyond the lower end of the socket member 12.

The sleeve or collet 14 may be interchanged with other sleeves or collets having bores 15 of different diameters in order to accommodate drill shanks of different sizes. The flattened extremities of a number of different sizes of drills may be accommodated by the stepped notches in a single driving block 22, but this block may be interchanged with others having similar recesses of different sizes. In Fig. 8 an arrangement is shown in which the sleeve 14 has a smaller bore than that illustrated in Fig. 2, and the flattened extremity of the drill engages the intermediate recess 22^b in the driving block. When it is desired to remove a drill and change a collet 14 for another one of a different size, the set screw 18 is first moved outwardly until the drill is released after which the set screw is adjusted inwardly into the bore 15 of the collet until the head of the set screw lies inwardly of the outer peripheral surface of the collet whereupon the collet may be readily removed. A single fastening device thus serves the double function of holding the drill in the collet and maintaining the collet in position in the socket member of the drill holder. The driving block 22 may be readily adjusted longitudinally of the drill holder and this member serves both to impart the driving force to the drill and to maintain the drill against longitudinal displacement in an upward direction due to the pressure of drilling.

In Fig. 7 of the drawings there is illustrated a modified form of construction comprising a shank 30, a cylindrical body portion 31 threaded throughout its length and provided with a longitudinal slot 32 to receive a driving block 33, all of these parts being similar to the corresponding features of the form of the invention previously described. The driving block is held in position by means of a collar and nuts as in the form shown in Fig. 1, but these parts are not illustrated in this view. This embodiment differs in that the socket member 34 carried at the lower end of the body portion 31 is provided with a bore 35 adapted to

receive a single size of drill 36 which is held in position longitudinally by a set screw 37 passing through the side of the socket member. In this form the driving block 33 can be formed to receive the extremity of a single size of drill.

An advantage of this invention is that the drill holder is very compact in construction and thus lends itself to use in multiple drilling machines where a plurality of drills are operated simultaneously, and it is often necessary to locate the drills very close together, the distances between drill centers being frequently as small as five-eighths or three-fourths of an inch, for example. The present invention permits this close spaced arrangement of the drills without interfering with a ready adjustment of the drills in the drill holders.

Although a single embodiment of the invention has been shown and described for purposes of illustration, it will be understood that it may be constructed in various other forms without departing from the scope of the appended claims.

We claim:

1. A drill holder comprising a socket member having a longitudinal bore adapted to receive a straight shank drill provided with a non-circular extremity, said holder being provided with a longitudinal slot intersecting said bore, a driving block mounted in said slot and having a notch adapted to be engaged by said non-circular extremity, a collar surrounding said holder and said block, and nuts threadedly engaging said holder at opposite ends of said collar to hold said block and said collar in adjusted position longitudinally of said holder.

2. A drill-holder comprising a hollow body member adapted to receive a drill; a combined drill rotating and backing block translatable mounted in said body member and having a portion projecting outwardly therefrom; a drill centralizing collet removably secured in the drill receiving end of said body member; and nuts threaded upon said body member and located at opposite sides of the projecting portion of said block and adapted to adjust said block axially of said body member and to hold it in its adjusted positions.

3. A drill-holder comprising a body member formed with an intermediate portion and terminating at its forward end in a head; a collet non-rotatably secured in said head; means to prevent relative rotation between said collet and a drill fitted therein; a drill backing-block translatable but non-rotatably carried by said intermediate portion and adapted to determine the axial position of the drill; and means, independent of the means for preventing rotation of the drill in the holder, to shift said block axially of the body member.

4. A drill-holder combining a body-member; means adjacent the forward end of said body-member to prevent relative rotation between said body-member and a drill inserted therein; a combined drill rotating and backing-block translatably but non-rotatably carried by said body-member and formed with a drill-receiving notch, said block serving to determine the axial position of a drill and to prevent relative rotation between said drill and said body member; and means to shift said block axially of said body-member without affecting the drill holding means at the forward end of said body member.

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