

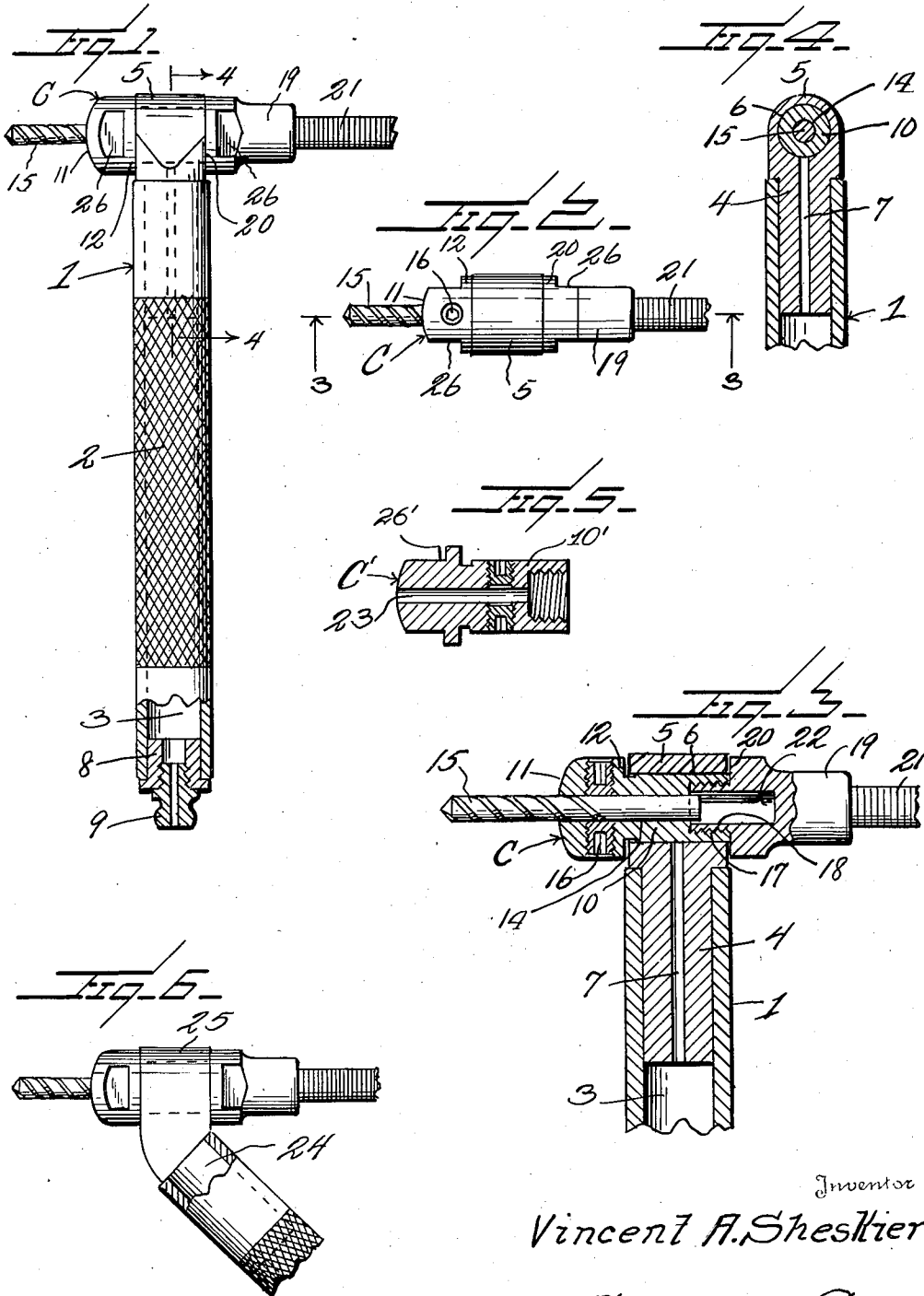
Sept. 5, 1944.

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2,357,773

DRILL HOLDER

Filed June 24, 1942



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2,357,773

DRILL HOLDER

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Application June 24, 1942, Serial No. 448,281

3 Claims: (Cl. 77—15)

This invention relates to a drill holder, and it is an object of the invention to provide a device of this kind including a handle member carrying a head rotatably supporting a collet, and wherein means are provided for effectively lubricating the collet to assure keeping the head cool at all times.

It is also an object of the invention to provide a holder of this kind including a collet adapted to detachably hold a drill so that upon breakage of the drill or for other reasons, such drill can be readily replaced.

A still further object of the invention is to provide a holder of this kind including a collet to receive a drill, said collet being provided with means to permit the drill to be selectively adjusted, whereby the length of the drill protruding from the collet may be adjusted to the exact depth of the hole to be drilled, thereby avoiding the danger of drilling through and having the drill become unmanageable.

An additional object of the invention is to provide a holder of this kind of a character which permits the drill to be set in a manner to assure a true running hole, so that the hole that is drilled maintains a tolerance of not more than one-thousandth of an inch.

A still further object of the invention is to provide a holder of this kind which enables the drilling of holes into small and otherwise inaccessible spots.

The invention has for an additional object to provide a holder of this kind which provides for the use of interchangeable collets and wherein each of such collets can be conveniently applied or removed without necessitating displacement of the drill with respect to the collet.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my drill holder whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawing, wherein:

Figure 1 is a view in elevation with a portion in section of a drill constructed in accordance with an embodiment of my invention, the flexible operating shaft being shown in fragment.

Figure 2 is a view in top plan of the device illustrated in Figure 1.

Figure 3 is an enlarged sectional view taken substantially on the line 3—3 of Figure 2 with parts in elevation.

Figure 4 is a detailed sectional view taken substantially on the line 4—4 of Figure 1.

Figure 5 is a sectional view taken longitudinally through a second collet having a bore of a diameter different from the bore of the collet shown in Figures 1 to 4, and

Figure 6 is a fragmentary elevational view, with a portion broken away, illustrating a holder constructed in accordance with another embodiment of the invention.

In the embodiment of the invention as illustrated in Figures 1 to 4, 1 denotes an elongated tubular handle member of desired dimensions and open at its opposite ends. This member 1 is preferably of metal and has a major portion 2 of its periphery knurled.

Forced into one end portion of the bore 3 of the handle member 1 is an elongated stem 4 radiating from a bearing head 5, said stem 4 and head 5 being preferably integral and made of phosphor-bronze.

The bore 6 of the head 5 is disposed axially at right angles to the axis of the stem 4 and said stem 4 has disposed axially therethrough a lubricating port 7, one end of which opens directly into the bore 6 of the head 5 and the other end being in open communication with the bore 3 of the handle member 1.

The bore 3 of the handle member 1 outwardly of the applied stem 4 provides a reservoir for a suitable lubricating grease or material, and the outer end of the bore 3 has snugly fitted therein a sleeve 8 into which threads from without a fitting 9 for coupling with a suitable grease gun or the like whereby lubricant may be forced up through the handle member 1 and through the port 7 into the bore 6 of the head 5 to lubricate the shaft 10 of the applied collet.

The shaft 10 is of a length substantially co-extensive in length with the length of the bore 6 and the head 11 of the collet has an inner flat face 12 surrounding the shaft 10 for contact with an end of the bearing head 5 to limit the extent of insertion of the shaft 10 into the bore 6 of the head 5.

The shaft 10 and the head 11 of the collet C have disposed axially therethrough a bore 14 in which is snugly and freely inserted the rear end portion of a drill 15. This drill 15 is adapted to have its forward or working end portion projected outwardly in advance of the head 11 of the collet C in accordance with the depth of the hole to be drilled and said drill 15 is effectively held or locked in its selected endwise adjusted position by the Allen nuts 16 threading radially through

the head 11 of the collet C for binding contact with the inserted portion of the drill 15.

The end portion of the bore 14 of the collet C remote from the head is enlarged, as at 17, and threading into such enlarged portion 17 is an axial extension 18 carried by the inner face 20 of a tail-piece 19. This inner face 20 of the tail-piece is substantially flat and surrounds the extension 18 and has close contact with the adjacent or free end of the shaft 10 of the collet C. This tail-piece 19 is fixed to an end portion of a flexible shaft 21 for rotation therewith. This flexible shaft 21 is adapted to be suitably coupled to the chuck of a drill motor of any preferred type and which in itself forms no part of the present invention.

The extension 18 has disposed axially there-through a bore 22 which is continued for a considerable distance within the tail-piece 19 and, as is particularly illustrated in Figure 3 of the drawing, this bore 22 is of a material diameter so that the inserted end portions of drills of different sizes may be readily received therein in order to allow for the desired endwise adjustment of the drill 15.

In practice, it is the purpose to furnish with each of the handle members 1 a series of collets each of which has a bore therethrough in accordance with a particular size of drill. In Figure 5 of the drawing is illustrated a collet C' constructed substantially the same as the collet C except that the bore 23 thereof is of a diameter less than the diameter of the bore 14 of the collet C. Also, in this form, the Allen screws are set in the shaft portion 10' and will therefore be housed in head 5.

It is intended that with each handle member 1 a set of at least five collets be supplied for use in connection with drills of different sizes and it is believed to be obvious that the diameter of the bore 22 of the tail-piece 19 is large enough to receive the inserted end portions of any one of such different drills, thus making it necessary only to use a single tail-piece 19.

In the embodiment of the invention as illustrated in Figure 6, the general construction is the same as comprised in the first embodiment except that the stem 24 of the bearing head 25 is angularly related with respect to the axis of the head 5 to permit the use of the holder in places which would not otherwise be accessible by the tool as comprised in the first embodiment.

In view of the foregoing it is believed to be obvious that the holder is of a type employing the use of interchangeable collets C and that in connection with each of such collets C the extended length of the applied drill 15 can be easily adjusted by proper manipulation of the Allen screws 16, such adjustment being facilitated by the bore 18 in the tail-piece 19.

The head 11 of the collet C and the tail-piece 19 are provided with milled flats 26 so that the assembly of the collet and tail-piece one with respect to the other and with respect to the bearing head 5 may be facilitated by the use of wrenches. Such flats are also shown in the collet C', at 26'. It is to be further and particularly pointed out that the major radius of the head 11 of the collet C and of the tail-piece 19 is less than the mean radius of the bearing head 5, so

that the periphery of the head 11 and of the tail-piece 19 during a working operation will not touch the work and thus eliminate the damage which would otherwise occur.

It will also be noted that the Allen screws 16 do not protrude into the bore 14 of the collet C but merely touch the applied drill 15 and hold it from slipping in or out. This assures trueness in the hole that is being drilled.

It is also to be emphasized that the bore 14 of the collet C is of the exact diameter as the end portion of the drill inserted therethrough. This further insures trueness in the hole that is being drilled on account of the elimination of any over-size in the bore 14 with respect to the drill 15.

From the foregoing description it is thought to be obvious that a drill holder constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

What I claim is:

1. A drill holder comprising a tubular handle member, a bearing head having a stem fitting within an end portion of the tubular handle, said bearing head having a cylindrical opening therethrough, the stem of the bearing head having an axially disposed port affording communication between the interior of the tubular handle and with the bore of the bearing head, said tubular handle constituting a reservoir for lubricant, a collet having a shaft fitting between the bore of the bearing head, means for holding a drill to the collet, and means coupled to the outer end portion of the shaft of the collet for rotating the collet.

2. A drill holder comprising a bearing head having a cylindrical bore, a collet including a head and shaft, the shaft rotatably extending within the bore of the bearing head, said head and shaft of the collet having a bore extending entirely and axially therethrough to freely receive an end portion of a drill, and a tail-piece engaged with the end portion of the shaft of the collet remote from the head of the collet, said tail-piece having a bore with which the bore of the collet communicates, said bore of the tail-piece being also adapted to receive the inserted end portion of the drill, said tail-piece providing means for coupling the shaft of the collet to a source of power for rotating the collet.

3. A drill holder, comprising a tubular handle member, a bearing head having a stem fitting within an end of the tubular handle, a collet having a reduced shaft forming an annular bearing shoulder, said shaft being rotatably fitted in said bearing head and having the shoulder rotatably engaging the head, the shaft at its free end having an interiorly threaded socket, a tail-piece having a threaded stem adapted for engagement in said socket and having a shoulder at the inner end of this stem for turning engagement against the side of the bearing head opposite the first shoulder, means coupled with said tail piece facilitating the application of rotary power thereto and to the collet, and said collet having an axial bore for the reception of a drill.

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