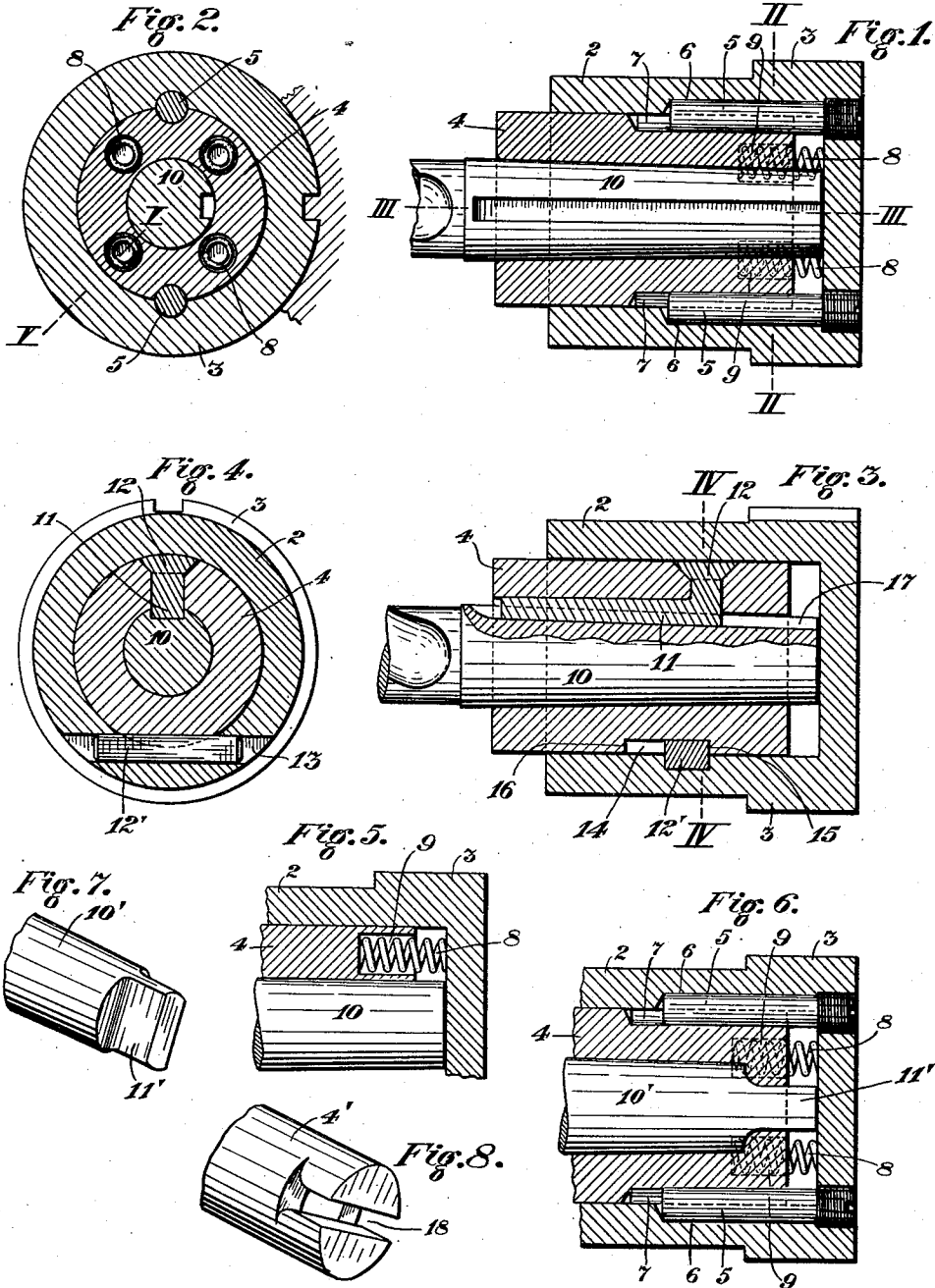


J. W. HARRISON.
DRILL SOCKET.

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Patented July 23, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN W. HARRISON, OF WILMERDING, PENNSYLVANIA.

DRILL-SOCKET.

Specification of Letters Patent. **Patented July 23, 1912.**

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To all whom it may concern:

Be it known that I, JOHN W. HARRISON, a citizen of the United States, residing at Wilmerding, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Drill-Sockets, of which the following is a specification.

My invention consists of an improvement in drill sockets and has for its object to provide a positive engagement between the driving head of a drilling machine and the removable bit or drill, with means for facilitating easy and quick removal of the drill.

The construction is illustrated in the accompanying drawings in which—

Figure 1 is a sectional view through the drill head, the rear portion of the drill being inserted therein, and partly broken away. Fig. 2 is a transverse sectional view on the line II. II. of Fig. 1. Fig. 3 is a view similar to Fig. 1 at right angles thereto, indicated by the line III. III., and illustrating the key engagement between the drill and its embracing bushing. Fig. 4 is a cross section on the line IV. IV. of Fig. 3. Fig. 5 is a sectional detail view indicated by the line V. V. of Fig. 2, illustrating the mounting of one of the pressure springs for the drill embracing bushing. Fig. 6 is a view similar to Fig. 1, showing the adaptation of the invention to a Morris taper shank drill. Fig. 7 is a perspective detail view of the inner end of such drill. Fig. 8 is a similar view of the inner end of the bushing for said drill.

In the ordinary connection between drills and the rotating socket or head therefor, the drill is ordinarily inserted with a taper binding fit and there is usually considerable difficulty in removing the drill from its socket therein.

My invention has in view to provide means for separating the bushing from the drill longitudinally whereby to lessen its binding engagement thereon and for such purpose the bushing, in rotating driving engagement with the head, is so constructed as to be capable of being forced backwardly against spring pressure for separation, while in the normal connection and operation of the device it is held in binding engagement with the drill.

In the drawings illustrating the preferred constructions, the drill head 2, generally

cylindrical in form, is provided with an inner enlarged base 3 adapted to be secured in the rotatable head of the drilling machine in any suitable manner as by a key or set screw. Within the head 2 is mounted a cylindrical bushing 4 in rotative engagement with the head 2 by means of intervening pins or keys 5, 5, fitted into suitable receiving cavities 6 and 7 respectively of the head 2 and bushing 4. The cavity 7 in bushing 4 is of sufficient length to permit of backward movement of the bushing and is normally pressed outwardly by means of a plurality of springs 8. Said springs extend into receiving sockets 9 in the rear end of the bushing and bear by their rear ends against the inner face of head 3. The drill shank 10 is, as usual, tapered and adapted to fit snugly within the interior of the bushing 4 and is held therein against rotation by a key 11. Said key is fixedly held in the side of bushing 4, in the manner shown in Fig. 3, by an off-set riveted terminal 12, or in any other suitable manner. The bushing 4, having a limited range of longitudinal movement, is retained in its relative position to head 2 by means of a transverse key 12' extending through a socket 13 in head 2 and a registering socket 14 in the bushing 4. Said socket 14 is of sufficient length to permit of the necessary backward movement of the bushing to relieve it from binding engagement with the drill shank, having shoulders 15, 16, at each end, shoulder 15 retaining it against undue outward movement in normal position to receive the drill shank. The drill shank is inserted in registering engagement with key 11, by its key-way 17, and springs 8 normally hold the bushing outwardly. In such position the device is in proper assembled form for operation. When it is desired to remove the drill for any reason, the outer end of bushing 4 is tapped backwardly by a hammer or other suitable instrument, the inner end of the drill shank 10 bearing against the inner face of the head 3. By this construction the bushing is easily separated from binding engagement with the drill shank which may be then readily removed.

Figs. 6, 7 and 8 illustrate the construction as adapted to the use of a tapered drill shank 10' having a flattened terminal 11' which is used in place of the key 11. In such case the bushing 4' is provided across its inner end with a transverse recess or

socket 18, inwardly beyond the main shank receiving cavity into which extends the terminal 11', when inserted, and which bears against the inner face of the bushing head 2.

In other respects the construction and operation are the same as above described.

What I claim is:

1. In a drill socket, the combination of a rotatable head embodying an abutment for the inner end of a tool shank, a longitudinally movable bushing in rotatable engagement therewith provided with a gripping and releasing drill socket for a tool shank having an opening through its inner end adjacent the said abutment, and spring mechanism normally pressing the socket outwardly from the head, substantially as set forth.
2. In a drill socket, the combination of a rotatable head embodying an abutment for the inner end of a tool shank, a longitudinally movable bushing in rotatable engagement therewith provided with a gripping and releasing drill socket for a tool shank having a rotating key and an opening through its inner end adjacent the said abutment, and spring mechanism normally pressing the socket outwardly from the head, substantially as set forth.
3. In a drill socket, the combination of a rotatable head embodying an abutment for the inner end of a tool shank, a longitudinally movable bushing in rotatable engagement therewith provided with a tapered gripping and releasing drill socket for a tool shank having an opening through its inner end adjacent the said abutment, and spring mechanism normally pressing the socket outwardly from the head, substantially as set forth.
4. In a drill socket, the combination of a rotatable head embodying an abutment for the inner end of a tool shank, a longitudinally movable bushing in rotatable engagement therewith having a limited range of longitudinal movement within the head and provided with a gripping and releasing drill socket for a tool shank having an opening through its inner end adjacent the said abutment, and a key, and a plurality of springs seated in the rear end of the bush-

ing and bearing against the inner end of the head, substantially as set forth.

5. In a drill socket, the combination of a rotatable head, embodying an abutment for the inner end of a tool shank, a longitudinally movable bushing in rotatable engagement therewith having a limited range of longitudinal movement within the head and provided with a gripping and releasing drill socket for a tool shank having an opening through its inner end adjacent the said abutment, and a key, and a plurality of springs seated in the rear end of the bushing and bearing against the inner end of the head, substantially as set forth.

6. In combination, a rotatable head having a cylindrical cavity and embodying an abutment for the inner end of a tool shank, a cylindrical bushing in said cavity provided with a tapered gripping and releasing socket for a tool shank having an opening through its inner end adjacent the said abutment, means providing for rotatable engagement between the head and bushing and for limited longitudinal movement of the bushing within the head, and spring mechanism normally pressing the bushing outwardly from the head, substantially as set forth.

7. In combination, a rotatable head having a cylindrical cavity and embodying an abutment for the inner end of a tool shank, a cylindrical bushing in said cavity provided with a tapered gripping and releasing socket for a tool shank having an opening through its inner end adjacent the said abutment, means providing for rotatable engagement between the head and bushing and for limited longitudinal movement of the bushing within the head, spring mechanism normally pressing the bushing outwardly from the head, and a tapered shank drill rotatably inserted in said socket, substantially as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOHN W. HARRISON.

Witnesses:

C. M. CLARKE,
FREDK. STAUB.