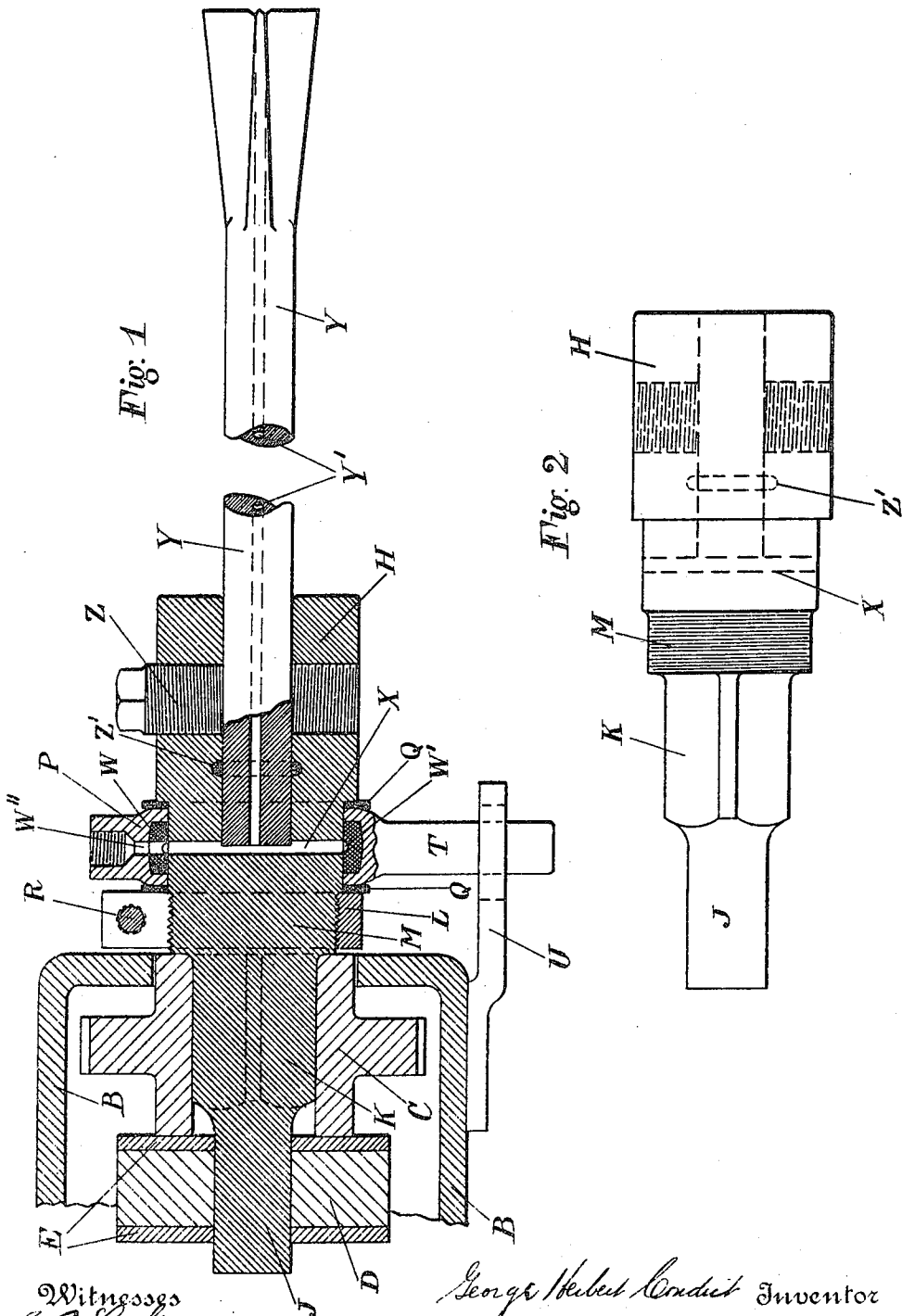


G. H. CONDUCT.
POWER DRILL.
APPLICATION FILED SEPT. 29, 1908.

962,077.

Patented June 21, 1910.



Witnesses
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C. Van Landt

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UNITED STATES PATENT OFFICE.

GEORGE HERBERT CONDUCT, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO WILLIAM DULLES, OF NEW YORK, N. Y.

POWER-DRILL.

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Specification of Letters Patent. Patented June 21, 1910.

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To all whom it may concern:

Be it known that I, GEORGE HERBERT CONDUCT, a citizen of the United States, residing at Plainfield, New Jersey, have invented certain new and useful Improvements in Power-Drills, of which the following is a specification, accompanied by drawings.

The invention was designed particularly in connection with the well known box electric drill, and although it is equally applicable to other forms of drills, particularly to percussion, I illustrate the preferred form of my improvement in connection with so much of the old and well known parts of drill apparatus as is necessary or desirable to show the relation of the improvement thereto.

Hollow drill steels have long been used for the purpose of conducting air or water through the duct or bore in the drill steel to the cutting end of the steel and washing out the accumulating debris so as to increase the efficiency of the tool by enabling it to act upon the bare rock when interfered with by the chips and debris which it forms.

The prime object of the invention is to overcome the tendency of the drill steel to break after being in use for a short time. Apparently even a slight change of stresses and strains in the drill steel produced by boring a hole at right angles to the drill to conduct the water or cleansing fluid into the central duct of the drill steel is sufficient to cause the drill steel to break at that point after comparatively short use. I have discovered that if the drill steel, which is furnished from the manufacturer with the central duct in it, is not impaired by any material change of form other than the forging and sharpening of its cutting end, that the defects mentioned are done away with. Even the squaring of the rear end of the drill steel to facilitate its being turned while at work impairs the durability of the steel and in the preferred form of my invention I entirely avoid such changes.

The preferred form of the invention contemplates providing the drill steel with a holder which may be rigidly attached to its rear end and which receives the blows of the hammer of the drill. This holder has ducts communicating with the duct in the drill steel without necessitating any change or modification of the drill steel. The holder is provided with fluid connections for

conducting the water to the drill steel without interfering with the rotation of the holder. Preferably the holder is provided with a socket for receiving the rear end of the drill steel and one or more set screws for rigidly securing the drill steel in place in the holder. Preferably also it is provided with a packing surrounding the drill steel in the socket for preventing the escape of water around the drill steel. Preferably also it is provided with a non-rotating collar containing water ducts which communicate with the water duct or ducts in the holder. Preferably also the holder is provided with a polyhedral portion or other means for engaging and driving it by the usual rotating gear or chuck member of the drill body.

A preferred example of my improvement is illustrated in the accompanying drawings, wherein—

Figure 1 is a longitudinal central section on the axis of the drill; and Fig. 2 is a detached view of the principal part of the holder.

A portion of the frame of the drill body is shown at B, the rotating gear for turning the drill steel holder and drill at C, and the elastic hammer cushion at D interposed between the two steel washers E.

The drill steel holder is marked H. Its rear end J projects through the cushion D to receive the hammer blows in place of receiving them directly upon the drill steel. The portion K of rectangular section is received and fits within the rotating member C of the drill body so as to be driven by it, which latter forms a chuck. At L is a split screw-threaded sleeve which is screw-threaded onto the portion M of the holder and provides a shoulder for confining the non-rotating sleeve P of the water supply system. This sleeve P fits upon a smooth portion of the holder and is confined between the loose collars or washers Q which in turn are confined between the shoulder of the forward end of the holder and the split collar or ring L, which last is secured against being unscrewed by the violent vibration by screwing up the set-screw R, causing the collar L to bind tightly upon its screw-threads. The sleeve P has an arm T projecting downward and free to play within a hole or bifurcation in a projecting arm U secured to the frame B of the drill. This arm T prevents any considerable rotation of the sleeve P and

may if desired be also relied upon to prevent the holder K dropping out from the body of the drill when the drill is directed downward; or other well known means may be provided for this purpose. The rearward movement of the holder K is limited by the shoulder between the portions K and M coming against the drill body.

The sleeve P is provided with an internal packing W preferably Babbitt metal, which is grooved or channeled at W' to form an annular duct, into which leads the radial duct W'' which is enlarged and screw-threaded, as shown, to afford connection with any suitable flexible water supply pipe. In communication with the duct W' is a diametrical duct X through the axis of the holder. The holder is bored lengthwise to form a socket extending in the front of the holder and intersecting the duct X so as to receive water from it. The drill steel Y having the central duct Y' approximately fits the socket of the holder, as shown in Fig. 1, and is rigidly secured thereto by the set screw Z. A packing ring Z' in an annular recess, as shown, prevents the water from escaping around the outside of the drill steel.

Parts of the drill body which do not add to an understanding of the invention have been omitted for clearness, such for example as the journal bearings of the gear-wheel C.

The operation of the apparatus illustrated will be understood as follows: The drill steel Y is inserted in the socket in the position shown in Fig. 1 and the set-screw Z secures it. The wash water flowing through the ducts W'' and W' passes into the duct X and thence through the duct Y' in the drill steel and to the cutting end of the drill. The holder is rotated by means of the gear wheel C without disturbing this water connection, for the arm T prevents the rotation of the sleeve P with the holder while allowing all the vibratory movement and dancing that are necessary to the free and proper action of the drill.

I claim independently of the particular forms and designs of the parts illustrated and for substantially the purposes described, the following invention:

1. In combination in a drill, a drill-steel holder mounted to allow longitudinal play and having a recess for receiving the drill and a transverse duct leading to said recess, means for rotating the holder, means for securing the drill-steel in said recess, packing for surrounding the drill steel in the recess, a sleeve mounted on and movable with the holder but free to turn thereupon and having ducts in continuous connection with said transverse duct, means for confining the said sleeve upon the holder, and means for limiting the rotatory motion of the sleeve.

2. In combination in a drill, a drill-steel holder mounted to allow longitudinal play and having means for rotating it, a recess for receiving the drill steel, and a transverse duct leading to said recess, means for securing the drill-steel therein, packing for surrounding the drill steel in the recess and a sleeve mounted on and movable with the tool holder but free to turn thereupon and having ducts in continuous connection with said transverse duct.

3. In combination in a drill, a tool holder having a recess or socket for the drill steel, and a transverse duct leading thereto, a sleeve which is carried by and mounted on the tool-holder and has an annular duct in continuous connection with said transverse duct, and a duct leading to said annular duct, means for securing a drill-steel within the recess or socket, and packing within the recess for surrounding the drill-steel.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses, September 24th, 1908.

GEORGE HERBERT CONDUCT.

Witnesses:

E. VAN ZANDT,
E. P. LA GAY.