

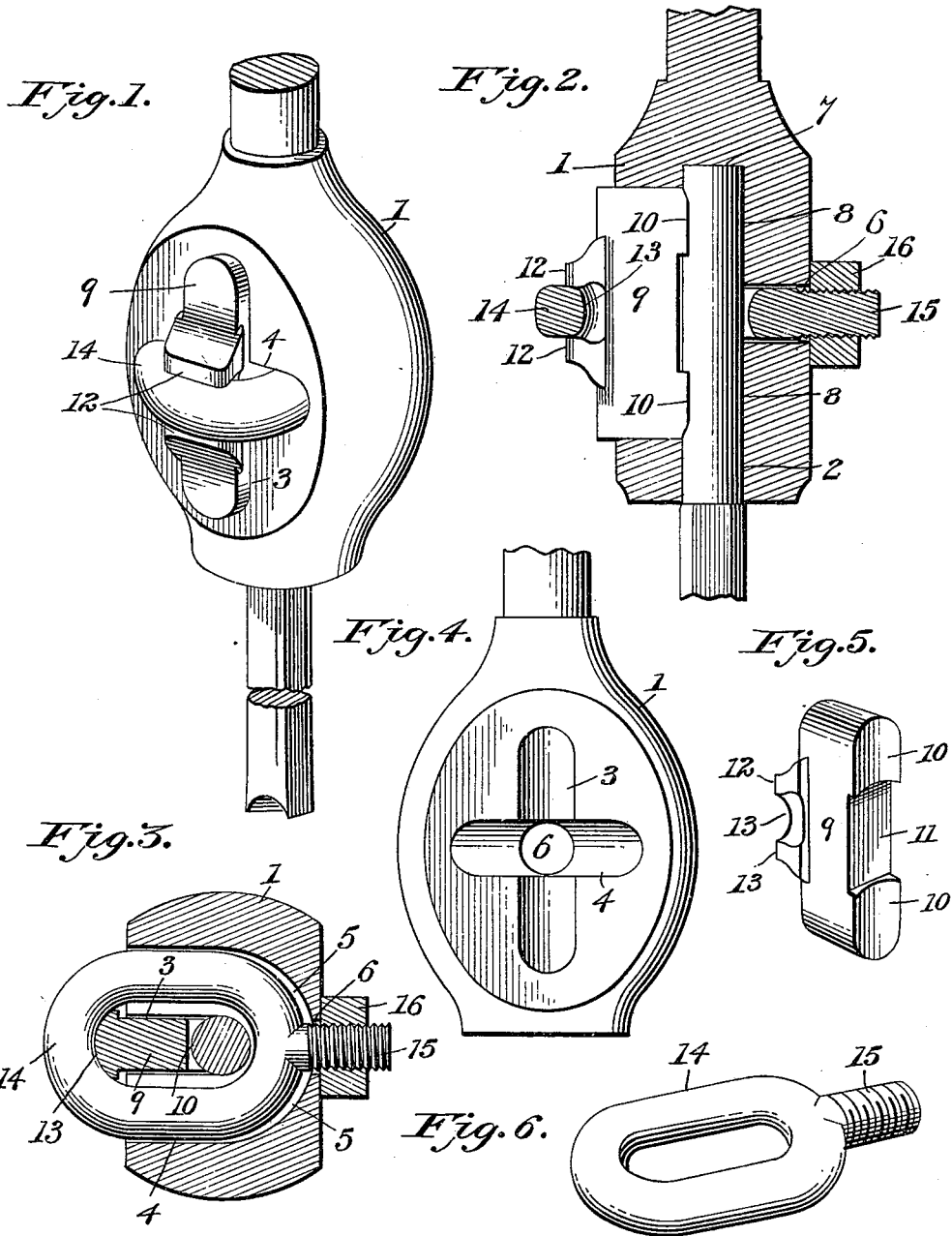
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Patented Mar. 20, 1900.

T. J. KITTO.  
DRILL CHUCK.

(Application filed Oct. 27, 1899.)

(No Model.)



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Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS J. KITTO, OF DOE RUN, MISSOURI, ASSIGNOR OF TWO-THIRDS TO  
G. C. CLEMENTS AND OTTO LOTZ, OF SAME PLACE.

## DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 645,854, dated March 20, 1900.

Application filed October 27, 1899. Serial No. 734,952. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. KITTO, a citizen of the United States, residing at Doe Run, in the county of St. François and State of Missouri, have invented a new and useful Drill-Chuck, of which the following is a specification.

This invention relates to drill-chucks; and the object in view is to provide a simple, durable, and effective chuck and adapted to drills of various sizes. While the drill-chuck is illustrated as of a form especially designed for use in connection with rock-drills, it is to be understood that the chuck hereinafter described may be used for gripping other objects than drills and may be used upon lathes and various other machines, such as are employed by jewelers, silversmiths, miners, and machinists in general.

One of the main advantages of the present invention resides in having a direct grip and a uniform pressure on the drill or the shank thereof, and this pressure is distributed throughout a considerable portion of the drill-shank, so that there is no liability to twist or bend the shank, and at the same time by a slight loosening of the clamping-bolt the drill will be released, and when replaced may be securely held by a slight manipulation of the tightening means.

The detailed objects and advantages of the invention will appear in the course of the subjoined description.

The invention consists in a drill-chuck embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claim.

In the accompanying drawings, Figure 1 is a perspective view of a drill-chuck constructed in accordance with the present invention. Fig. 2 is a longitudinal section through the same, showing the drill in place. Fig. 3 is a transverse section through the same. Fig. 4 is a face view of the chuck-body, showing the intersecting slots or recesses in one side thereof. Fig. 5 is a detail perspective view of the key looking toward the side which contains

the bearing or gripping surfaces. Fig. 6 is a similar view of the eyebolt.

Similar numerals of reference designate corresponding parts in the different figures of the drawings.

The body of the drill-chuck (indicated at 1) has a length somewhat greater than its width, being of oblong form. The drill-body is provided with a central longitudinal bore 2 extending a suitable distance into the same, which bore is in communication with the intersecting slots or recesses comprising a longer branch 3, which extends longitudinally of the body of the chuck, and a shorter branch 4, which extends transversely of the body and which intersects or crosses the branch 3 centrally, being itself centrally intersected by the branch 3.

The transverse branch 4 is deeper than the longitudinal branch or portion 3 of the recess and extends beyond the longitudinal bore 2, terminating in curved shoulders 5, which communicate with a central opening 6, through which the shank of the eyebolt, hereinafter described, passes. The longitudinal portion 3 of the recess terminates in the longitudinal bore 2 and is of approximately the same width as the diameter of the bore 2.

The body of the chuck is also provided with a socket 7, which extends beyond the end of the longitudinal portion 3 of the recess and forms, in fact, a continuation of the longitudinal bore 2, being designed to receive the butt-end of the drill when inserted in the chuck. By reason of the intervention of the transverse portion 4 of the recess two bearing or gripping surfaces 8 are provided on opposite sides of the recess 4, against which the shank of the drill is seated and held in a manner hereinafter described.

The key 9 is of oblong form and corresponds in shape to the portion 3 of the recess, which in reality constitutes a keyway. The key 9 is removably fitted in said keyway, and its inner surface or edge comprises bearing or gripping surfaces 10, which are spaced apart by cutting away the central portion of the inner surface of the key, as shown at 11, the

key being cut away, as described, to prevent any pressure being brought on the drill opposite the space between the bearing-surfaces 8, above referred to, which pressure would subject the shank of the drill to a bending action. The key 9 is also provided upon its outer surface with shoulders 12, spaced apart to form between them a groove 13, which is preferably rounded or concaved, as shown, to form a seat for the eyebolt, by means of which the key is operated.

The eyebolt 14 resembles a link of an ordinary chain, being oblong and of ellipsoidal shape. This link is of a cross-sectional shape and size, adapting it to fit within and fill the transverse portion 4 of the cruciform recess, and said bolt is provided with a threaded shank 15, which passes through the opening 6, hereinabove described, and receives upon its projecting threaded end a tightening device 16, which for convenience and the sake of simplicity is shown in the form of an ordinary nut capable of being operated by a wrench.

In assembling the parts of the drill-chuck the key 9 is inserted through the eye of the bolt, and the bolt, together with the key, then inserted in the respective portions of the intersecting slots or recesses. The butt-end or shank of the drill is then inserted in the longitudinal bore of the drill-body and passed through the eyebolt until its butt-end is received in the socket 7. The nut or tightening device is then applied to the projecting end of the shank of the eyebolt and may be tightened either by hand or by a wrench, which has the effect of drawing the eyebolt farther through the body of the chuck, and thereby forcing the bearing or gripping surfaces to be brought into firm engagement with the drill-shank and forcing said shank into firm engagement with the bearing-surfaces 8 of the drill-receiving bore.

By means of the construction above described it will be seen that by simply loosening the nut or tightening device pressure on the drill-shank is immediately relieved, thus permitting the drill to be extracted from the chuck. When the drill is reinserted, a slight tightening of the nut will effect a firm gripping of the drill-shank, and the drill will thus be firmly secured in place.

In drills of the type above shown and described it has been customary to use in connection with a key a bolt in the form of a staple, having its terminals threaded and passed through the chuck-body, thus necessitating the employment of two nuts, one for each end of the staple-bolt. Under this construction, however, the two nuts are so close together that it is next to impossible to turn them with a wrench, and as a result miners generally use one of the nuts and knock the other off. In using a single nut for tightening the staple the latter soon becomes twisted out of shape and brings an indirect draft and uneven pres-

sure on the key and drill-shank and the chuck as a whole is soon rendered useless. Under the construction described in this application and by reason of the employment of a single centrally-located nut and solid link there is always a direct draft and uniform pressure on the shank of the drill, and as the bearing-surfaces of the key come opposite corresponding bearing-surfaces within the interior of the chuck-body there is no tendency to twist or bend the drill or its shank. The chucks may of course be made in any size to accommodate drills of various sizes, and will also be found useful as a pipe-chuck. The drill-chuck is neat in appearance, simple and durable in construction, and will be found efficient in practice.

I attach especial importance to the construction of the key-block with the transversely-curved gripping-faces 10, which are separated by the intervening recess 11 on the inner side of the key-block. Said key-block is fitted in the longitudinal part or branch of the intersecting slots in such relation that the spaced gripping-faces 10 thereof will be brought into opposing positions relatively to the cross-sectional curved bearing-faces 8 on the inside of the bit-socket. This disposition of the key-block with relation to the body brings the recess 11 thereof in the same transverse plane as the bolt-aperture 6 in the body, and the key-block is adapted for engagement centrally with the elongated eye of the bolt, the shank of which passes through the bolt-aperture and receives the single nut. The key-block is thus arranged to centrally receive the strain or draft of the eyebolt when the nut 10 is tightened, and said key-block operates to distribute the strain uniformly in opposite directions toward its gripping-faces 10. The middle portion of the key-block is out of engagement with the bit or shank by reason of the formation of the recess 11 therein, and this bit or shank is solidly clamped or gripped between the opposing faces 8 of the body and 10 of the key, whereby the bolt does not exert pressure directly on the bit or shank, and the latter is gripped or held in the chuck in a manner to wholly obviate any tendency of the shank to bend by reason of the pressure of the bolt.

Having thus described the invention, what I claim, and desire to secure by Letters Patent, is—

A drill-chuck comprising a body provided in one side with intersecting slots and on the other side of its bit-socket with the cross-sectionally-curved bearing-faces, 8, separated by an intermediate bolt-aperture, a key fitted in the longitudinal slot of the body and provided on its inner side with the cross-sectionally-curved gripping-faces, 10, which are separated by an intervening transverse slot, 11, and are in opposing relation to the bearing-faces, 8, a bit-shank fitted in the socket, a single-shank bolt having an elongated eye arranged to span

the socket and embrace the key and the bit-shank, and a single nut screwed on the shank of the eyebolt, whereby the strain of the bolt is distributed by the recessed key and the bit-shank is solidly clamped between the bearing and gripping faces only of the body and the key, respectively, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS J. KITTO.

Witnesses:

J. M. ELVINS,

POLITTE ELVINS.