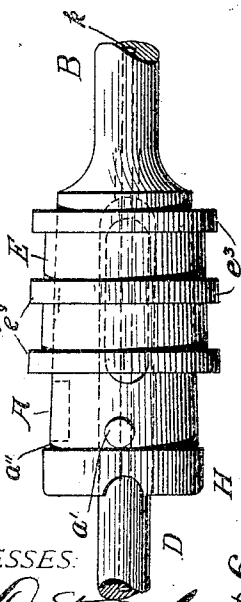


J. C. H. VAUGHT.
CHUCK FOR ROCK DRILLS.
APPLICATION FILED OCT. 31, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

H. G. Winterich
J. M. Bringer

Fig. 6.



Fig. 2.

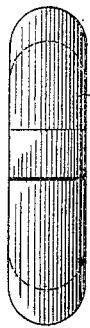


Fig. 3.

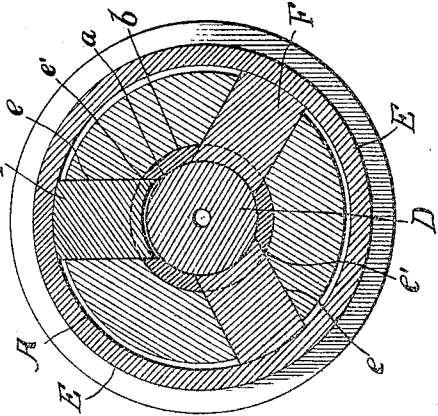
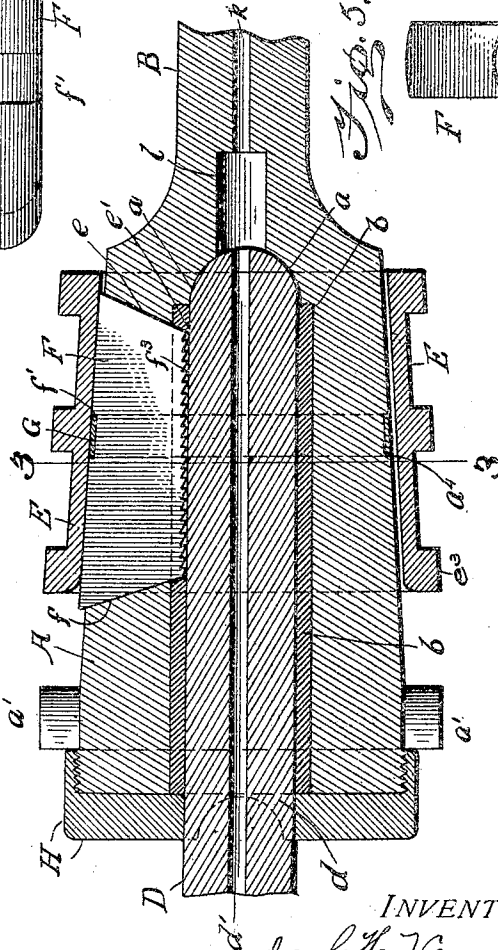
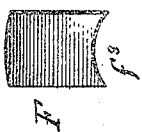


Fig. 5.



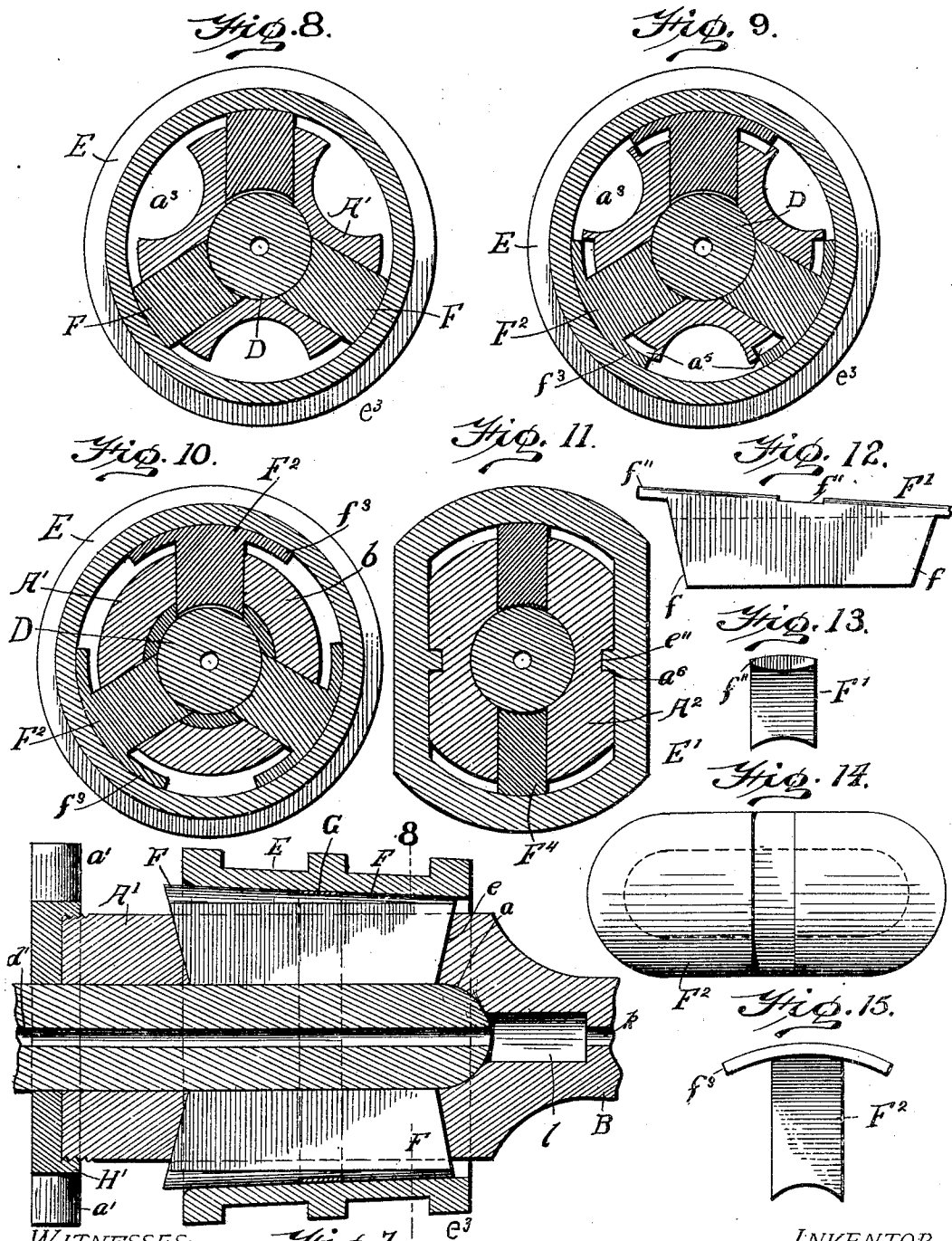
INVENTOR

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J. C. H. VAUGHT.
CHUCK FOR ROCK DRILLS.
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2 SHEETS—SHEET 2.



WITNESSES:

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Fig. 7. 8

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UNITED STATES PATENT OFFICE.

JAMES C. H. VAUGHT, OF DEADWOOD, SOUTH DAKOTA.

CHUCK FOR ROCK-DRILLS.

No. 804,904.

Specification of Letters Patent.

Patented Nov. 21, 1905.

Application filed October 31, 1904. Serial No. 230,803.

To all whom it may concern:

Be it known that I, JAMES C. H. VAUGHT, a citizen of the United States, residing at Deadwood, in the county of Lawrence and State of South Dakota, have invented new and useful Improvements in Chucks for Rock-Drills, of which the following is a specification.

This invention relates to chucks for rock-drills.

10 The object of my invention is to provide simple and effective devices for securing the shank of a drill in the chuck on the piston-rod at a materially-reduced expense for renewal of parts and by means of which the connection and disconnection of the drill and
15 chuck will be greatly facilitated, thereby saving much time and labor in the drilling operation.

It is now the common practice to secure a
20 drill in a chuck by means of a gib or key, a U-shaped bolt, and two nuts, involving much loss of time in changing drills, as it takes much time to loosen the nuts for removing a drill and more time to tighten the nuts after
25 a new drill has been placed in a chuck. Further, on account of the vibration the nuts are constantly working loose and require frequent tightening. By means of my improvements these difficulties are overcome, and by
30 dispensing with U-shaped chuck-bolts much expense is saved for their renewal, due to their frequent breakage. By use of my improved construction chuck-wrenches are also dispensed with, saving cost of the same.

35 The matter constituting my invention will be set forth in the claims.

I will now describe the details of construction by reference to the accompanying drawings, in which—

40 Figure 1 represents a top plan view of a piston-rod and chuck. Fig. 2 represents a longitudinal section, on enlarged scale, showing my improved construction of chuck. Fig. 3 represents a transverse section on line 3 3.
45 Fig. 4 represents a top plan view of a gib. Fig. 5 represents an end view thereof. Fig. 6 represents part of a spring holding-band. Fig. 7 represents a longitudinal section showing a modified construction of chuck. Fig. 8
50 represents a transverse section thereof on line 8 8, Fig. 7. Figs. 9, 10, and 11 represent similar sections showing modifications. Figs. 12 and 13 represent, respectively, a side ele-

vation and an end view of a modified form of gib. Figs. 14 and 15 represent, respectively, 55 a top plan view and end elevation of a modified construction of gib.

Referring now to Figs. 1, 2, and 3, the body portion A of the chuck is made slightly cone-shaped, with its largest end outward, and is 60 forged with or otherwise secured to the piston-rod B, which is connected to the piston-head C in any well-known manner. The body A is made with a longitudinal socket *a* and provided with a steel bushing *b* for receiving 65 the shank of the drill D. The bushing is preferably used in practice, though it is not shown in all the figures of drawings illustrating my chuck. Longitudinal slots *c*, with parallel sides and outwardly-flaring ends, are 70 cut in the body, and similar slots *c'* are cut in the bushing for receiving the holding-gibs F. Two, three, or four of these gibs may be used; but I generally prefer to use three of them, as shown in Fig. 3. 75

The gibs F are made with parallel opposite sides and tapering outer faces to correspond with the cone shape of the body A and are of sufficient depth or diameter between the inner and outer faces to project about three 80 thirty-seconds of an inch above the face of the body when they bear upon a drill-shank which fills the socket, as indicated in Figs. 2 and 3. They have inclined ends *f*, corresponding approximately to the flaring ends 85 of the slots *c* and *c'*, so that they are prevented from falling through the slot when the shank is removed; but sufficient play is provided between them and the body to permit them to be forced against the drill-shank. The 90 gibs are provided in their outer faces with shallow transverse grooves *f'*, corresponding with a circular groove *a'*, which is cut into body to receive a spring-band G, which may be of steel or rubber, for holding the gibs 95 in the slots when the sleeve or collar E is not in place. The inner curved face of one or more of the gibs is preferably provided with alligator-teeth *f''*, as shown in Fig. 2, to prevent the shank from being jerked out of the chuck 100 when it happens that the drill while in operation does not strike against the rock, and thereby force the sleeve to crawl up on the gibs. The sleeve E is made tapering like the frustum of a cone, corresponding with 105 the cone-shaped body A, and is preferably

turned out of steel and provided with circular strengthening-ribs e^3 to prevent it from bursting.

As the drill is driven forward by the reciprocating piston and the cutting end strikes the rock, coming to a sudden stop, the sleeve will be caused to crawl up on the outwardly-projecting gibs and force them to engage and grip the drill-shank and hold it securely in its socket. The body A is provided near its outer end with two or three short pins or studs a' or with two or more recesses a'' , Fig. 1, for applying an arm and clamp wrench to force the sleeve backward out of engagement with the gibs. Should the piston cease to revolve during its reciprocating movement, the workman can, by striking the studs a blow, start it again to revolve. The workman frequently strikes the front end of the chuck with a hammer to drive it backward, and thereby batters it. For the purpose of protecting it I cut a screw-thread on the end of the body A and apply thereto a screw-threaded cap H, which when worn can be replaced by a new one.

The construction of the chuck may be modified, as shown in Fig. 7, in which the body A' is made cylindrical, of the same diameter from end to end, and the gibs made with inclined outer faces and of increased diameter between their inner and outer faces, so as to project a greater distance above the face of the body, as shown in Figs. 8, 9, and 10. The cap H' is provided with lugs or studs a' or may be of increased diameter to furnish a bearing for a jaw wrench or lever to be used in forcing the sleeve E out of engagement with the gibs. Part of the metal of the body A may be milled out, as indicated at a^3 , Figs. 8 and 9, to make the chuck lighter.

The gibs F' may be modified in construction by providing them with end flanges f'' , as shown in Figs. 12 and 13. Another modified gib F² is made with a flange f^3 entirely around it at the outer face, as shown in Figs. 14 and 15. These flanges furnish a convenient means for handling the gibs when placing them in or removing them from the slots in the chuck, and in case they are used the metal may be milled out, forming recesses a^5 to receive them, as shown in Fig. 9.

The chuck may be further modified in construction, as shown in cross-section in Fig. 11. In this form the body A² has flattened sides, and the sleeve E' is made with corresponding flattened sides, and two opposite gibs F⁴ are used. The flat sides are provided with longitudinal guide-grooves a^6 , in which slide the tongues e' , projecting from the inside of the sleeve. When the sleeve is forced downward, it forces the gibs inward equally, causing the drill to center. The gibs are provided with longitudinal teeth to prevent the drill-shank from turning in its socket. This form of chuck is more especially adapted for drill-presses such as are used in machine-shops.

By making shanks and chucks of different sizes one may reduce from the largest to the smallest size drill.

In order to supply water to the drill-point to wash out dust from the hole, I propose to introduce water through the rifle-bar, the piston, rod, and hollow drill. I drill a hole h about one-fourth of an inch in diameter in the piston and rod from the socket in the chuck to a point x in the cylinder.

A hole d' is bored in the drill and its shank. A recess l is made in the chuck at the connection of the piston-rod, into which is placed a rubber tube for making a tight joint at the juncture of the drill-shank and its socket or the duck's nest.

When a chuck constructed as shown in Fig. 7 is used, a worn or cracked sleeve E may be readily removed by first moving it back off from the gibs, then taking out the gibs and sliding the sleeve off from the front end of the chuck. Of course the cap H' will first be removed.

By the operation of the drill the sleeve E is automatically driven onto the outer inclined faces of the gibs, thereby keeping them forced into engagement with the drill-shank and holding it in its socket. When a drill is to be removed and replaced by a new one, the operation can be quickly performed by forcing the sleeve back off from the gibs by means of an arm and clamp wrench, used as a lever and bearing on a stud a' or in a recess a'' , when the gibs will be released and the drill-shank can be taken out and another inserted in the socket. The machine being started, the sleeve is driven onto the gibs, causing them to grip the shank with little loss of time.

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

1. A drill-chuck, comprising a body having a longitudinal socket, to receive the shank, and a longitudinal slot, a gib in the slot adapted to bear at its inner face on the shank and having a longitudinally-tapered outer face projecting beyond the face of the body and a flange projecting from said face and a sleeve engaging said tapered face of the gib, substantially as described.

2. In a drill-chuck, the body having a bearing for the jaw of a wrench or lever, a socket and a slot leading thereto, in combination with a gib and a sleeve engaging the same, said bearing being adjacent to the outer end of the sleeve whereby a lever device may be applied for forcing the sleeve off from the gib, substantially as described.

3. The combination with a chuck, having means for holding a drill-shank, of a removable cap applied to the outer end of the chuck for protecting it, substantially as described.

4. In a drill-chuck, the body having near its outer end, one or more projecting studs, a socket and slot, in combination with a gib and

a sleeve engaging the same, said stud serving as a bearing for application of a lever device to remove the sleeve, substantially as described.

- 5 5. In a drill-chuck, the body having opposite flattened sides provided with longitudinal grooves, and opposite slots, in combination with gibbs in the slots, and a sleeve having flat-

tened sides and tongues sliding in said grooves, substantially as described. 10

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

JAMES C. H. VAUGHT.

Witnesses:

E. W. HANGLE,
A. G. ALLEN.