No. 668,830. Patented Feb. 26, 1901.

W. C. DOCHARTY & R. WAGNER.

ROCK DRILL CHUCK.

(Application filed June 12, 1899.)

(No Model.)

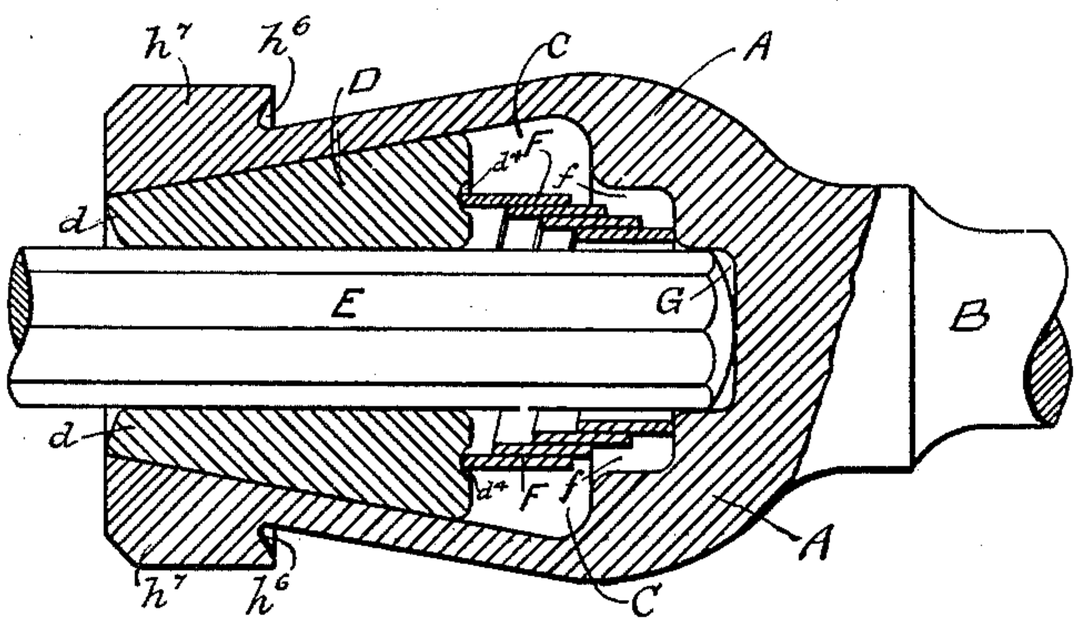

FIG. 1.

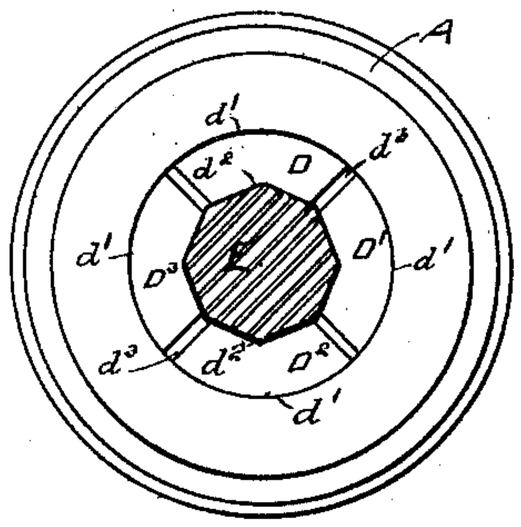

FIG. 2..

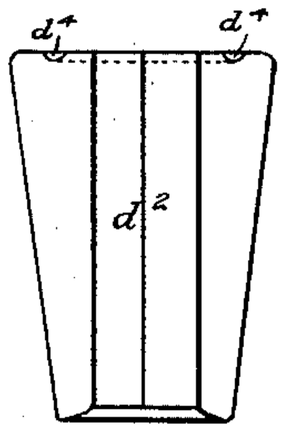

FIG. 3.

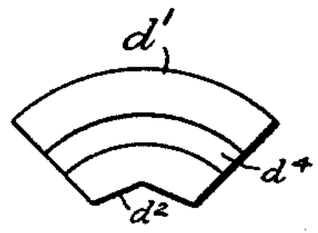

FIG. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM CLARK DOCHARTY AND REINHARD WAGNER, OF NEAR GERMISTON, SOUTH AFRICAN REPUBLIC, ASSIGNORS TO CHAPIN & MANION, LIMITED, OF JOHANNESBURG, SOUTH AFRICAN REPUBLIC.

ROCK-DRILL CHUCK.

SPECIFICATION forming part of Letters Patent No. 668,830, dated February 26, 1901.

Application filed June 12, 1899. Serial No. 720,236. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM CLARK DOCHARTY, a subject of the Queen of the United Kingdom of Great Britain and Ireland, and REINHARD WAGNER, a subject of the Emperor of Germany, both residing on the property of the Simmer and Jack Proprietary Mines, Limited, near Germiston, in the South African Republic, have invented new and useful Improvements in and Relating to Rock-Drill Chucks, (for which we have applied for Letters Patent in the South African Republic, No. 1,863, dated April 19, 1899,) of which the following is a specification.

This invention has reference to the chucks or heads of rock-drilling machines or to the device which forms the connection between the rock-drill or other boring-tool and the piston-rod or other reciprocating member of the rock-drilling machine.

It has for its object to provide an efficient chuck of simple and cheap construction capable of being operated with facility to securely hold the drill in the desired position and to release the same when it is required to remove the drill to substitute another therefor.

In order that our invention may be clearly understood, we append hereto an explanatory sheet of drawings, marked with letters of reference corresponding to the following description thereof.

In the drawings, Figure 1 represents a longitudinal sectional elevation of a chuck constructed in accordance with our invention, showing a drill secured in position therein. Fig. 2 is a front elevation of same. Fig. 3 is a view from the inside of one section of the tapered bush or of one of the wedge-shaped dogs or gripping-jaws detached; Fig. 4, an elevation of same from the inner end.

A designates the body of the chuck, which in the construction illustrated is formed in one piece with the piston-rod B of the rock-drilling machine; but it will be evident that it may be formed as a separate or independent part, if preferred or found more convenient in practice, and be provided with any suitable means for attaching it to the extremity of the piston-rod B. While we prefer to give it a more or less conical formation externally, as shown, it may assume any other desired form.

The body A is constructed with a central, preferably conical, cavity or recess C, expanding inwardly or with the diameter gradually increasing as it recedes from the exterior.

D D′ D^2 D^3 are the several sections of the tapered bush or the wedge-shaped gripping jaws or dogs, arranged within the cavity C. These several sections are tapered toward their forward extremity *d* and rounded on their outer surface *d′* to correspond to the conical cavity C, in which they can slide longitudinally within certain limits. When assembled within the body, these sections form a bush or lining inclosing and gripping the end of the drill E on all sides. The inner parallel faces are formed with a shallow V-groove d^2 to accommodate the edges or corners of the drill E. The drill is shown of octagonal section and the several sections of the bush or the gripping-jaws grooved accordingly; but it will be obvious that they may be readily constructed to accommodate any other section of drill-steel. We prefer to employ four gripping-jaws or to split the bush up into four equal sections D D′ D^2 D^3; but more or less may be used, if desired. The jaws are so constructed and arranged that when gripping the end of the drill a small amount of space or clearance is left between them, as at d^3, Fig. 2, and they are secured in position within the chuck-body, in the event of the drill being removed, by being forced forward until they bear and bind upon one another.

F is a strong, preferably involute, spring located at the rear of the jaws D D′ D^2 D^3 and fitting within an annular recess *f*, formed at the bottom of the conical cavity C, which acts to keep the spring central. The spring F completely surrounds or encircles the inner extremity of the drill and is preferably arranged with its base or convolution of greatest diameter bearing on the inner ends of the jaws D D′ D^2 D^3 and the other end bearing against the chuck-body within the recess *f*,

so that as the jaws are depressed or forced inward the spring F is placed in compression to act to force the jaws outward when released. The inner ends of the jaws are formed with a curved groove d^4, in which the spring F rests. As the jaws are forced inward the tendency of the spring F to expand or spread at the base keeps the jaws tight against the walls of the cavity C, and thus causes them to leave and release the drill. In place of the involute spring, which, however, we at present prefer, a spiral, helical, or other like spring may be substituted therefor.

G is an inner annular recess formed in the body A in the center of the recess *f* to receive the extremity of the drill. When placed in position in the chuck, the drill E is passed between the jaws and through the open center of the spring F until the extremity enters the recess G and abuts against the body A, thus taking up the thrust direct and preventing any appreciable amount of concussion being transmitted to the gripping-jaws.

What we claim, and desire to secure by Letters Patent, is—

1. A rock-drill chuck comprising a body formed with a taper cavity widest at its inner end, a series of correspondingly-tapered gripping-jaws arranged in said cavity, and a single spring interposed between the bottom of the cavity and the inner ends of said jaws and engaging all of the jaws, and tending to force them outward to close on the drill.

2. A rock-drill chuck comprising a body formed with a taper cavity for the reception of gripping-jaws, and with a recess in rear of the cavity and forming a continuation of the same for the inner end of the drill, a series of tapered jaws mounted in said cavity and a single involute spring seated in said cavity in rear of the jaws with its base or convolution of greatest diameter bearing on all of the jaws at their inner ends, said spring arranged to surround the inner end of the drill when the latter is seated in the recess.

3. A rock-drill chuck comprising a body formed with a taper cavity widest at its inner end, a plurality of correspondingly-tapered gripping-jaws arranged in said cavity and formed in their inner ends each with a groove, and an involute spring seated in said cavity in rear of said jaws with its convolution of greatest diameter engaging in the grooves in the jaws; whereby when the jaws are forced inward to release the drill the engaging convolution of the spring in expanding will separate the jaws and disengage the drill.

4. In a rock-drill chuck, in combination, the body A formed with an inwardly-expanding conical cavity C, the sectional taper bush or wedge-shaped gripping-jaws D D′ D^2 D^3, tapered and rounded on their outer surfaces d' to fit and slide within the cavity C and shaped on their inner faces d^2 to accommodate the extremity of the drill or tool, the involute or like spring F arranged at the rear of the several jaws or sections D D′ D^2 D^3 and concentric with the drill or tool, the curved grooves d^4 formed in the inner ends of the jaws to receive the end of the spring F, the recess *f* for the spring F formed at the bottom of the cavity C to maintain the spring central, the cavity G formed within the recess *f* and beyond the spring to receive the extremity of the drill when in position within the chuck substantially as described and shown.

5. In combination, the piston-rod B of the rock-drilling machine, the body or main part A of the chuck formed on the extremity thereof, the inwardly-expanding conical cavity C of the body A the wedge-shaped gripping-jaws or sectional conical bush D D′ D^2 D^3 constructed to fit and slide within the cavity C and to embrace the extremity of the drill, the involute spring F encircling the drill with its base or convolution of greatest diameter bearing against the inner ends of the several gripping jaws or sections of the conical bush, the curved grooves d^4 provided in the inner ends of the jaws in which the spring rests, the recess *f* for the spring formed at the bottom of the conical cavity C, the cavity G formed within the recess *f* and beyond the spring F to accommodate the end of the drill, the flange h^7 of the body A forming the projection or groove h^6 substantially as described and shown.

In witness whereof we have hereunto set our hands, at Johannesburg, in the South African Republic, this 2d day of May, 1899, in the presence of the subscribing witnesses.

WILLIAM CLARK DOCHARTY.
REINHARD WAGNER.

Witnesses:
K. M. GIBSON,
CHAS. OVENDALE.