No. 896,051. PATENTED AUG. 11, 1908.

F. M. ASHLEY.

DRILL CHUCK.

APPLICATION FILED JAN. 6, 1906.

Fig. 1.

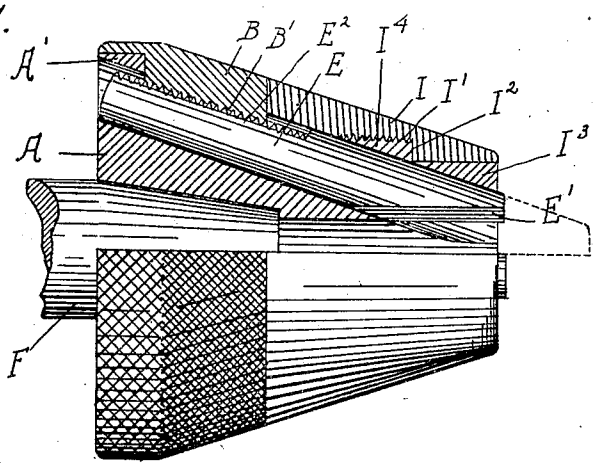


Fig. 2.

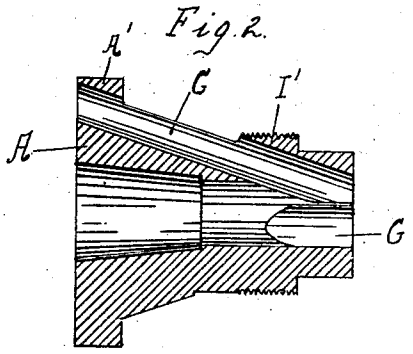


Fig. 3.

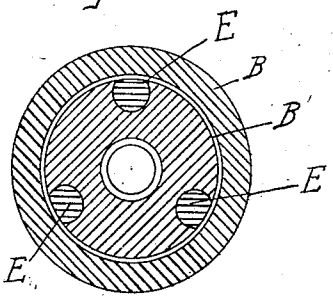
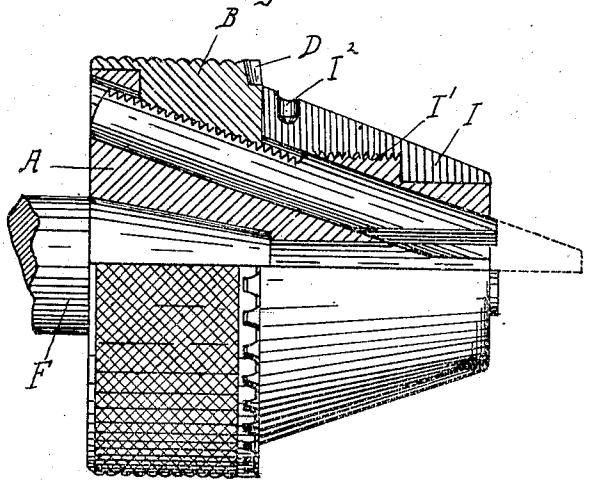


Fig. 4.



Witnesses

L. H. van Haaften.

Virginia Geis.

Inventor

Frank M. Ashley

UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF NEW YORK, N. Y.

DRILL-CHUCK.

No. 896,051. Specification of Letters Patent. Patented Aug. 11, 1908.

Application filed January 6, 1906. Serial No. 294,877.

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Drill-Chucks, of which the following is a specification.

My invention relates to drill chucks and particularly to that type in which the jaw members move at an incline to the axis of the chuck.

The object of the invention is the production of a chuck of the type referred to, which will not only be of simple construction and convenient of manipulation, but will at the same time be extremely durable and highly efficient in use.

With the above and other purposes in view, the novel chuck in the form disclosed herein comprises a body containing guideways for the jaw members, said guideways being at an inclination to the axis of the chuck and open at the periphery of the rear portion of the body but extending below the surface of the body at the forward portion thereof, said forward portion being externally threaded and presenting a shoulder against which latter a ring bears when engaged with the body threads, the ring serving in connection with a limiting stop on the rear portion of said body to confine a revoluble sleeve on said rear portion, said sleeve being in one piece and having integral threads engaging with those of the jaw members in the guideways. By this arrangement, the ring has a positive bearing on and firm connection with the body, while the configurations of the ring interior and the exterior of the forward portion of the body are such that the ring so reinforces the metal at the closed tops of the guideways against lateral thrust incurred by the jaw members, that the ring coöperates with the forward portion of the body to provide a uniform thickness of metal to resist said lateral thrust throughout the closed parts of the guideways.

In the accompanying drawings forming part of this specification,—Figure 1 is a longitudinal view, partly in section, of one form of my chuck, and illustrating the means used to hold the sleeve in operative position on the chuck body. Fig. 2, is a central longitudinal sectional view on a reduced scale, of the chuck body shown in Fig. 1. Fig. 3, is a cross sectional view of the chuck shown in the first figure, taken in a plane through the center of the sleeve. Fig. 4, is a longitudinal view, partly in section, disclosing a construction of the chuck wherein the sleeve is provided with a rack at its forward end and the ring has provision whereby a pinion key may be engaged to operate the sleeve.

Referring to Figs. 1 to 3, inclusive, A indicates the body of the chuck which is smallest in diameter at its front end and provided with three longitudinally extending guideways G, equi-distant from each other and at an incline to the axis of the chuck. Located in each of these guideways, is the shank E of a member provided with a jaw E′ at its front end. The jaw shanks are each provided with a thread E^2 which engages with a thread B′, formed in the interior surface of the sleeve B. The sleeve B, can be slipped on the front portion of the chuck body and manipulated to fit in sliding engagement with the outer surface of the rear portion of the body, and the threaded part of each jaw shank projects above the periphery of the body to mesh with the thread B′ of the sleeve, so that when the latter is rotated, the shanks will move in the guideways to open or close the jaws in a manner well understood. The rearward movement of the sleeve on the body, is determined by a limiting stop A′, on the rear portion thereof. The retaining ring I, is screwed to the forward portion of the body at I′ and coacts with the stop A′, to hold the sleeve B, in position and also serves as a reinforcement for the body, when the jaws are under strain.

It will be noted that the forward portion of the body embodies an annular shoulder I^2 which results in a forward section I^3, and a section I^4 in different longitudinal planes as indicated, the section I^3, of the more reduced diameter having a plain peripheral surface, while the corresponding surface of the section I^4, is threaded. It will be observed that while the rear portion of the body, with the exception of the stop A′, is conical, the peripheral surfaces presented by the sections I^3, I^4, are parallel. The presence of the shoulder I^2, in connection with the planes occupied by the peripheral surfaces of the sections I^3, I^4, with respect to the inclined guideways, results in a tapering reduction of the body metal above each guideway, in the direction of the rear of each of the sections I^3, I^4, and this in itself would present weak parts for resisting the lateral thrust pre-

viously alluded to. Such difficulty is obviated by configurating the ring interior so that it closely conforms to the exterior of the forward portion of the body, and said ring is otherwise so conditioned that the metal of the ring plus the body metal above each guideway, will result in an amount of metal of uniform thickness longitudinally throughout the forward part (and as shown, to the rear) of each guideway, thus providing an adequate reinforce to coöperate in resisting lateral thrust.

Manifestly the retaining ring is the sole medium for maintaining the sleeve and jaw members in operative relation with respect to the chuck body. Therefore, by detaching said ring, the chuck may be taken apart without trouble and without the use of tools.

In Fig. 4, the retaining ring I^x contains a socket bearing I^z within which is engaged the end of a wrench, so that a pinion thereon will mesh with a rack D, on the front end of the sleeve B^x, to permit the latter to be operated to close or open the jaws of the chuck as desired.

From the foregoing description, it will be appreciated that the purposes and advantages of the novel chuck, previously set forth in the statement of invention, are realized in a practical manner.

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

1. A drill chuck comprising a body provided with guideways at an inclination to its axis, said guideways being open at the peripheral surface of the rear portion of the body and extending beneath the surface of the forward portion thereof, said forward portion having externally an annular shoulder to the rear of which is ring-engaging provision, threaded jaw members in said guideways, a sleeve having threads meshing with those of the members, a separate sleeve retaining ring overlying the forward portion of the body and conditioned to be held in position by the engaging provision on said forward portion, said ring having an internal shoulder firmly bearing against the shoulder of said portion.

2. A drill chuck comprising a body having a conical surface at its rear portion tapering forward, and a forward portion of less diameter than the small end of the conical portion, said body having converging guideways opening laterally into the conical surface and extending below the surface of the forward portion in lines parallel with said conical surface, threaded jaws in said guideways, a threaded ring surrounding the conical portion and engaging the threads of the jaws, and a sleeve secured on the forward portion and arranged to abut against the ring.

3. A drill chuck comprising a body provided with guideways at an inclination to its axis, said guideways being open at the peripheral surface of the rear portion of the body and extending beneath the surface of the forward portion thereof, said body portion being tapered at its rear end and having its forward end formed with parallel sides and provided with a thread, threaded jaw members in said guideways, an integral sleeve having threads meshing with those of the members, and a retaining ring having an internal thread engaging said thread formed on the body portion and abutting said sleeve to maintain same in operable relation on said body portion.

4. A drill chuck comprising a body having a conical surface at its rear portion tapering forward, and a forward portion of less diameter than the small end of the conical portion, said body having converging guideways opening laterally into the conical surface and extending below the surface of the forward portion in lines parallel with said conical surface, said forward portion having parallel sides, threaded jaws in said guideways, a threaded ring surrounding the conical portion and engaging the threads of the jaws, and a sleeve secured on the parallel sides of the forward portion and arranged to abut against the ring.

5. A drill chuck comprising a body having a conical surface at its rear portion tapering forward, and a forward portion of less diameter than the small end of the conical portion, said body having converging guideways opening laterally into the conical surface and extending below the surface of the forward portion in lines parallel with said conical surface, the forward portion of said body having parallel sides and of less diameter than said conical portion, having a thread formed thereon, and having a portion of still smaller diameter at its forward end, threaded jaws in said guideways, a threaded ring surrounding the conical portion and engaging the threads of the jaws, and a sleeve having an internal thread engaging the thread on said body portion and abutting said ring and embracing said smaller parallel portion, for the purpose set forth.

Signed at New York in the county of New York and State of New York this 4th day of January A. D. 1906.

FRANK M. ASHLEY.

Witnesses:
A. T. Scharps,
A. M. Lynch.