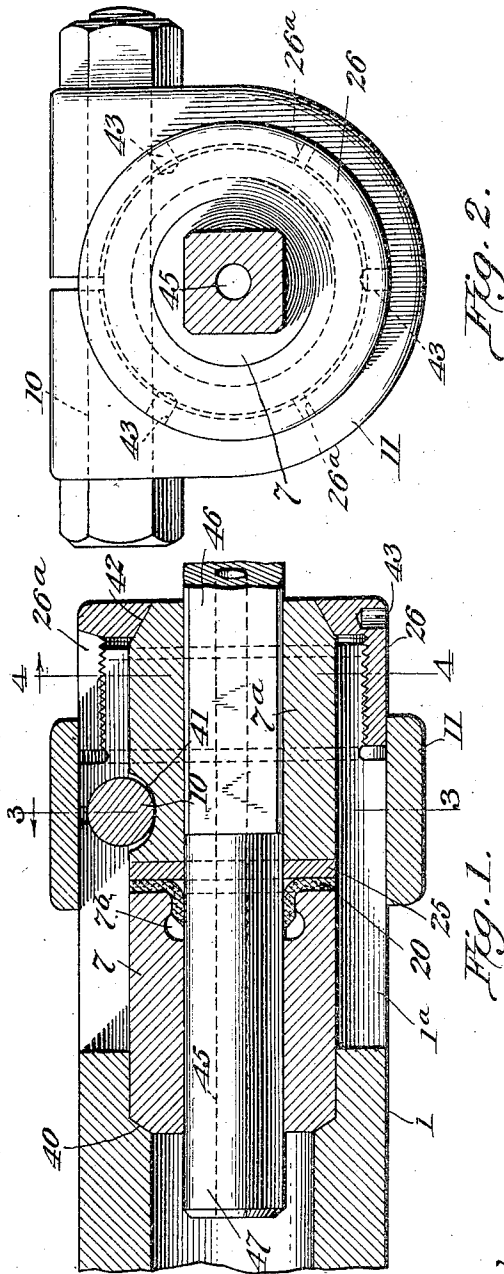


D. S. WAUGH.
 DRILL STEEL HOLDING AND PACKING MEANS.
 APPLICATION FILED NOV. 21, 1908.

942,869.

Patented Dec. 7, 1909
 2 SHEETS—SHEET 1

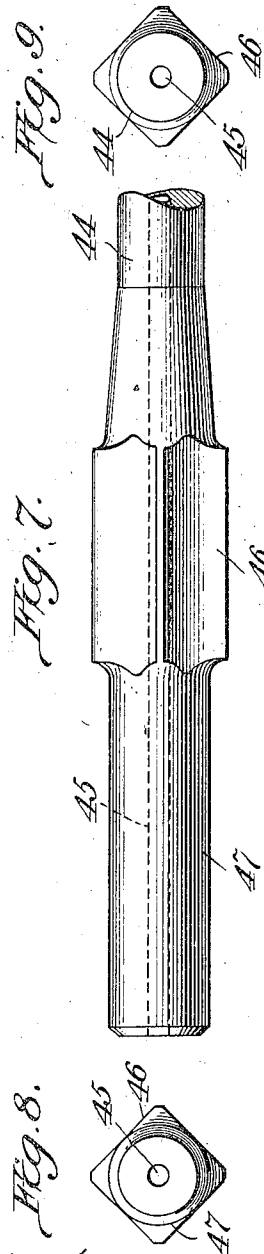


WITNESSES

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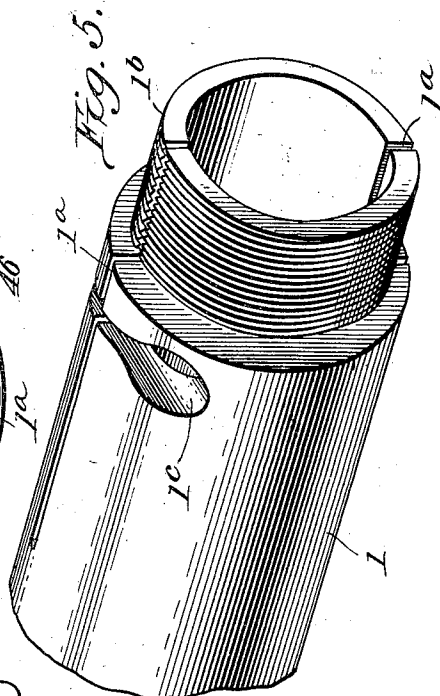
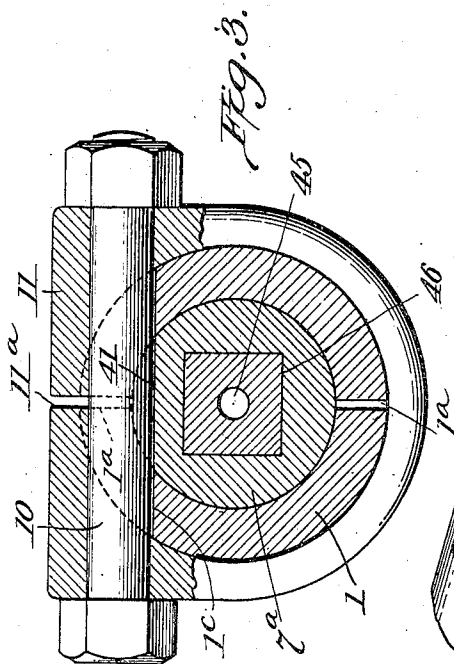
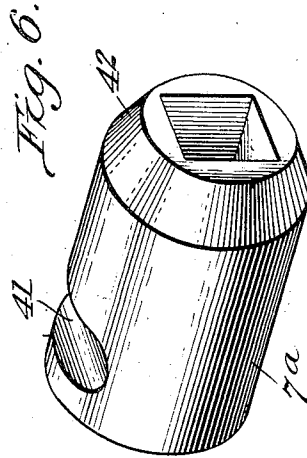
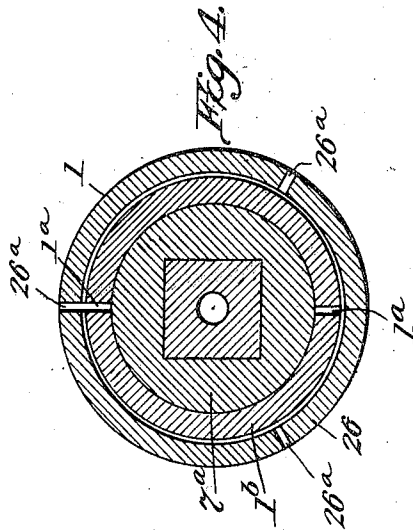


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WITNESSES

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UNITED STATES PATENT OFFICE.

DANIEL SHAW WAUGH, OF DENVER, COLORADO, ASSIGNOR TO THE DENVER ROCK DRILL AND MACHINERY CO., OF DENVER, COLORADO.

DRILL-STEEL HOLDING AND PACKING MEANS.

942,869.

Specification of Letters Patent.

Patented Dec. 7, 1909.

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To all whom it may concern:

Be it known that I, DANIEL S. WAUGH, a citizen of the United States, residing at Denver, in the State of Colorado, have invented certain new and useful Improvements in Drill-Steel Holding and Packing Means, of which the following is a specification.

The present invention relates more particularly to chucks for rock drills, and especially those known as sinkers and drifters, in connection with which fluid is introduced into the drill holes for the purpose of removing the cuttings from the working face of the drill steel. The invention, however, is not necessarily limited to this type of drills.

The primary object of the present invention is to provide a structure in which the drill steel will be effectively held against rotation with respect to the motor, to provide effective means for securing said holding means in place, and to so construct the means that a simple form of cup-packing may be employed, which will not be subjected to the excessive wear ordinarily occasioned upon packing where drill steels that are angular in cross section are employed, the angular portions of which engage the packing.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a longitudinal sectional view through a portion of a rock drilling machine, showing the improved chuck in place, with the drill steel therein. Fig. 2 is an end elevation of the same. Figs. 3 and 4 are respectively, cross sectional views on the lines 3—3 and 4—4 of Fig. 1. Fig. 5 is a detail perspective view of the end of the motor barrel. Fig. 6 is a similar view of the outer chuck section. Fig. 7 is a side elevation of one end of the drill steel. Figs. 8 and 9 are end views thereof.

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

In the embodiment disclosed, the motor barrel is designated by the reference numeral 1, and operating therein is the usual reciprocatory piston (not shown). The end of the barrel in which the chuck is placed is longitudinally split, as shown at 1^a, and has a reduced portion 1^b that is threaded. Fit-

ted into the said split end is a chuck comprising sections 7 and 7^a. The inner section 7 extends into the barrel beyond the slits 1^a, and is snugly fitted therein with a ground joint 40 so that no leakage can occur. This inner section has a bore therethrough that is circular in cross section. It is furthermore provided in its outer end with an annular recess of seat 7^b. The outer section 7^a also fits snugly within the end of the barrel, and has an outer tapered end 42 projecting therefrom. This section 7^a has a bore therethrough that is angular in cross section, preferably square, though any polygonal configuration may be employed. Interposed between the sections is an ordinary cupped washer 20 having a bore or opening therethrough that is circular in cross section, a washer 25 being also preferably interposed between the packing and the outer chuck section 7^a.

For the purpose of effectively retaining the chuck in position, a cap 26 is employed that is threaded on the reduced portion 1^b, and has a tapered opening in its end that receives the beveled portion 42 of the outer section. This cap has suitable sockets 43 to receive a spanner ring, and the threaded flange thereof is longitudinally split, as shown at 26^a. The diameter of the cap 26 is preferably slightly greater than the diameter of the barrel 1.

In order to hold the cap 26 against accidental displacement and also effectively secure the chuck sections in place, with the outer section held against rotation in the barrel, a clamping ring 11 is employed that is split, as shown at 11^a. This ring engages the inner end of the cap which it surrounds and also the barrel. A draw bolt 10 passes transversely through the split portion of the ring, and said bolt also extends through a transverse opening 1^c in the barrel, and a transversely disposed socket in the outer chuck section 7^a. It will be evident therefore that when the bolt 10 is tightened, the flange of the cap 26 will be brought down flush with the outer face of the barrel, and the whole will be clamped upon the chuck, while the engagement of the draw-bolt 10 with the outer section of said chuck, positively prevents the rotation of the same in the barrel.

In connection with this structure, a drill

steel 44 is provided with a longitudinal channel 45 through which the fluid is carried to eject cuttings from the drill hole. This drill steel has a portion 46 that is angular in cross section, said angular portion conforming to and fitting in the angular bore of the chuck section 7^a. The inner end 47 of said drill steel is circular in cross section, and passes through the packing washer 20 and through the inner section 7 of the chuck.

With this structure, it will be evident that leakage is effectively prevented and the wear on the packing 20 will not be excessive inasmuch as it bears against a circular surface. However, if wear does occur, it will be seen that such wear will be taken up by the pressure against the packing washer, the socket 7^b constituting a pressure chamber in which the fluid may enter, holding said washer at all times against the drill steel. The said steel cannot rotate in the chuck, nor can said chuck rotate in the barrel, the parts thus being effectively held against relative rotation and yet permitting the necessary longitudinal movements of the drill steel.

From the foregoing it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a drilling machine, the combination with a motor barrel, of a chuck located at one end of the same and comprising separate sections having bores therethrough of different cross sectional configuration, a packing washer interposed between the sections, and means detachably associated with the sections for holding the same in place.

2. In a drilling machine, the combination with a motor barrel, of a chuck located at one end of the same and comprising separate sections having bores therethrough of different cross sectional configuration, a packing washer interposed between the sections, and means detachably engaging one of the sections for holding said sections in place.

3. In a drilling machine, the combination with a motor barrel, of a chuck located at one end of the same and comprising separate sections having bores therethrough of different cross sectional configuration, a packing washer interposed between the sections, and a cap detachably mounted on the barrel and detachably engaging the outer section only of the chuck.

4. In a drilling machine, the combination with a motor barrel, of a chuck fitted thereto and comprising inner and outer sections, the inner section having a bore that is substantially circular in cross section, the outer section having a bore that is angular in cross section, a packing washer interposed between the sections, and means detachably mounted on the barrel and detachably engaging the outer section to hold the chuck in place.

5. In a drilling machine, the combination with a motor barrel, of a chuck fitted thereto and comprising inner and outer sections, the inner section having a bore that is substantially circular in cross section, the outer section having a bore that is angular in cross section, a packing washer interposed between the sections and having a bore substantially circular in cross section, and a cap detachably fitted on the end of the barrel and engaging the outer end of the outer section.

6. In a drilling machine, the combination with a motor barrel, of a chuck fitted thereto and comprising inner and outer sections, the inner section having a bore that is substantially circular in cross section, the outer section having a bore that is angular in cross section, a packing washer interposed between the sections, and a clamp surrounding the barrel and including a portion that passes transversely therethrough and engages the chuck to hold the same in place.

7. In a drilling machine, the combination with a motor barrel, of a chuck fitted thereto and comprising inner and outer sections, the inner section having a bore that is substantially circular in cross section, the outer section having a bore that is angular in cross section, a packing washer interposed between the sections, a split clamp collar surrounding the barrel, and a draw bolt engaging the collar, the barrel and the outer section of the chuck.

8. In a drilling machine, the combination with a motor barrel having its outer end split, of a sectional chuck located in said end, a washer interposed between the sections of the chuck, and means for clamping the split end of the barrel upon the chuck sections.

9. In a drilling machine, the combination with a motor barrel having its outer end split, of a sectional chuck located in said end, a washer interposed between the sections of the chuck, and a contractible clamp for compressing the split end of the barrel upon the chuck sections.

10. In a drilling machine, the combination with a motor barrel having its outer end split, of a sectional chuck located in said end, a washer interposed between the sections of the chuck, and a clamp for compress-

ing the split end of the barrel upon the chuck sections, said clamp including an element that engages the outer chuck section.

11. In a drilling machine, the combination with a motor barrel having a split end, of a chuck fitted into said end and comprising inner and outer sections, the inner section having a bore therethrough that is substantially circular in cross section, the outer section having a bore that is substantially angular in cross section, a packing washer interposed between the sections, and means for clamping the split end of the barrel upon the chuck.

12. In a drilling machine, the combination with a motor barrel having a split end, of a chuck fitted into said end and comprising inner and outer sections, the inner section having a bore therethrough that is substantially circular in cross section, the outer section having a bore that is substantially angular in cross section, a packing washer interposed between the sections, a split clamp collar surrounding the end of the barrel, and a draw bolt engaging the collar, the barrel and passing through the outer section of the chuck.

13. In a drilling machine, the combination with a motor barrel, of chuck sections located therein, a washer interposed between the sections, a retaining cap detachably fitted on the motor barrel, and a clamp surrounding said motor barrel and cooperating with the cap to hold it in place.

14. In a drilling machine, the combination with a motor barrel having one end longitudinally split, of chuck sections located therein, a washer interposed between the sections, a retaining cap detachably fitted upon the motor barrel and having portions longitudinally split, and a clamp for compressing the cap upon the barrel and the barrel upon the chuck sections.

15. In a drilling machine, the combination with a motor barrel, of chuck sections located therein, a washer interposed between the sections, a retaining cap detachably threaded upon the barrel and engaging the outer section, said cap being longitudinally split, and a clamping ring surrounding the end of the barrel and engaging the cap to hold it in place.

16. In a drilling machine, the combination with a compressible motor barrel, of a chuck located therein and comprising an inner section having a bore substantially circular in cross section and an outer section having a bore angular in cross section, a packing washer interposed between the sections and having a bore circular in cross section, and means for compressing the barrel upon said sections, said means including a compressible cap detachably fitted on the barrel, and a clamping ring surrounding said cap and barrel.

17. In a drilling machine, the combination with a motor barrel longitudinally split, of a chuck located in the split end of the barrel and comprising inner and outer sections, the inner section having a bore that is circular in cross section, the outer section having a bore that is angular in cross section, a cap detachably threaded on the end of the barrel and engaging the outer section, said cap being longitudinally split, a split clamping ring surrounding the barrel and cap, and a draw bolt engaging the ring and passing through the barrel, said bolt engaging the outer section.

18. In a drilling machine, the combination with a motor barrel, of a chuck fitted thereinto and comprising inner and outer sections, the inner section having a bore therethrough that is substantially circular in cross section, the outer section having a bore that is angular in cross section, a packing washer interposed between the sections and having a bore substantially circular in cross section, means detachably mounted on the barrel and detachably engaging the outer section to hold the chuck in place, and a drill steel having an angular portion located in the angular bore of the outer section and having a portion that is circular in cross section, said latter portion extending through the washer and into the inner chuck section.

19. In a drilling machine, the combination with a motor barrel, of inner and outer chuck sections located therein, the inner section having a bore that is substantially circular in cross section and having a socket in its outer end surrounding the bore, the outer section having a bore that is angular in cross section, a cupped packing interposed between the sections and engaging in the socket, means for holding the chuck in place, and a drill steel having an angular portion located in the angular bore and having a circular inner end that passes through the washer and engages in the inner section of the chuck.

20. In a drilling machine, the combination with a motor barrel, of a chuck located therein, a compressible cap upon the barrel engaging the chuck, and means surrounding the cap for compressing the cap.

21. In a drilling machine, the combination with a compressible motor barrel, of an incompressible chuck located therein, a compressible cap upon the barrel, and means for compressing the cap upon the barrel and thereby the barrel upon the chuck.

22. In a drilling machine, the combination with a motor barrel having a split end, of a chuck located in said end, a split cap engaged with the split end of the barrel and with the chuck, and means surrounding the cap for compressing the cap.

23. In a drilling machine, the combination with a barrel, of a chuck comprising inner and outer sections, the outer section project-

ing beyond the barrel, a packing washer interposed between the sections, a compressible cap surrounding the end of the barrel having the chuck and engaging the outer section of the chuck, and means for compressing the cap.

24. In a drilling machine, the combination with a motor barrel having a compressible end, of a chuck fitted into said compressible end, and a clamp for compressing the barrel, said clamp including a portion surrounding said barrel and including a portion that passes transversely therethrough and engages the chuck to hold the same in place.

25. In a drilling machine, the combination with a motor barrel, of a chuck fitted therein, a split clamp collar having a portion surrounding the barrel, and a draw bolt engaging the collar and passing transversely through the barrel in rear of its front end, said portion interlocking with the outer portion of the chuck, and leaving the bore of said chuck unobstructed to permit the free sliding movement of the tool bit.

26. In a drilling machine, the combination with a motor barrel, of a chuck located therein, a retaining cap detachably fitted on the motor barrel, and a clamp surrounding said motor barrel and engaging the cap.

27. In a drilling machine, the combination

with a motor barrel having one end longitudinally split, of a chuck located therein, a retaining cap detachably fitted upon the motor barrel and having portions longitudinally split, and a clamp for compressing the cap upon the barrel and the barrel upon the chuck.

28. In a drilling machine, the combination with a motor barrel, of a chuck located therein, a retaining cap detachably threaded upon the barrel and engaging the chuck, said cap being longitudinally split, and a clamping ring surrounding the split end of the barrel and engaging the cap.

29. In a drilling machine, the combination with a motor barrel longitudinally split, of a chuck located in the split end of the barrel, a cap detachably threaded on the end of the barrel and engaging the outer section, said cap being longitudinally split, a split clamping ring surrounding the barrel and cap, and a draw bolt engaging the ring and passing through the barrel, said bolt engaging the chuck.

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

DANIEL SHAW WAUGH.

Witnesses:

FREDRIC J. PALMA,
JAS. R. EHUENDORF.