

A. H. TAYLOR
HAMMER DRILL.
APPLICATION FILED FEB. 24, 1909.

992,456.

Patented May 16, 1911.

Fig. 1.

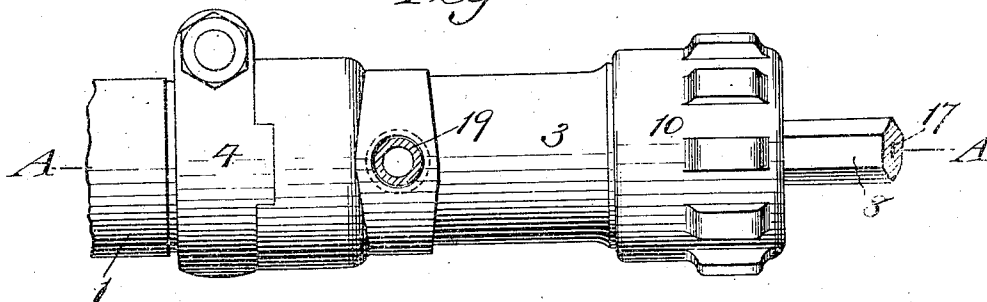


Fig. 2.

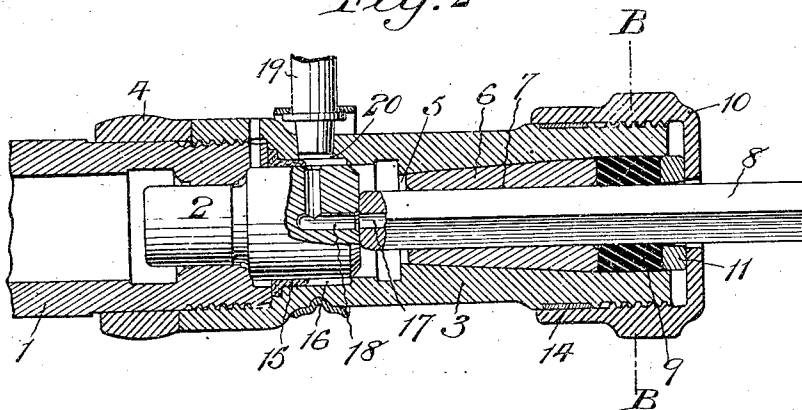


Fig. 3.

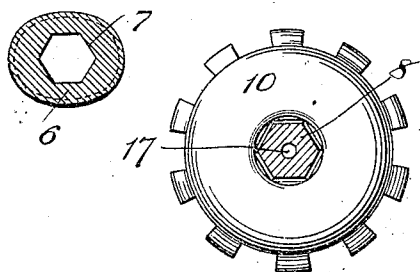


Fig. 4.

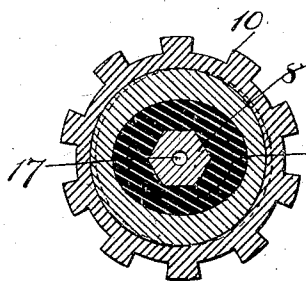


Fig. 5.

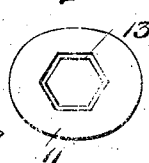


Fig. 6.

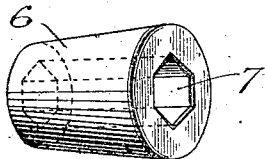


Fig. 7.

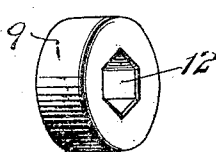
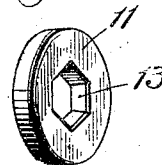


Fig. 8.



Witnesses.
F. George Barry,
Henry Thorne.

Inventor
Albert H. Taylor
by his attorneys
Brown & Howard

UNITED STATES PATENT OFFICE.

ALBERT H. TAYLOR, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

HAMMER-DRILL.

992,456.

Specification of Letters Patent.

Patented May 16, 1911.

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To all whom it may concern:

Be it known that I, ALBERT H. TAYLOR, a citizen of the United States, and resident of Easton, in the county of Northampton and State of Pennsylvania, have invented new and useful Improvements in Hammer-Drills, of which the following is a specification.

This invention relates to improvements in hammer drills and has for one of its objects to provide certain improvements in the construction, form and arrangement of the several parts at the front end of the drill whereby the leakage of the pressure fluid around the drill steel within the front head is prevented thus insuring a constant supply of the pressure fluid to the cutting faces through the drill steel.

A further object is to provide a simple and effective arrangement of the parts whereby the chuck and its holder are interlocked to prevent the bushing from rotating in its holder and also in which the wear between the chuck and its holder may be readily taken up.

In the accompanying drawings, Figure 1 represents in side elevation the front end of a hammer drill embodying this invention, Fig. 2 is a longitudinal central section through the same, taken in the plane of the line A—A of Fig. 1, Fig. 3 is a front end view of the drill, the drill steel being shown in section, Fig. 4 is a transverse section taken in the plane of the line B—B of Fig. 2, Fig. 5 is a view in perspective of the chuck, Fig. 6 is a view in perspective of the elastic washer, Fig. 7 is a view in perspective of the washer protecting plate, Fig. 8 is a cross section through the tapered undivided chuck, and Fig. 9 is a face view of the protecting ring.

The hammer cylinder is denoted by 1 and its anvil block by 2. The front head 3 is screwed onto the front end of the hammer cylinder 1 and is locked in position by a clamping ring 4. The front head 3 is provided with a flaring bore 5 within which is seated a tapered undivided chuck 6 through the bore 7 of which the hollow drill steel 8 is inserted into position to have its end engaged by the anvil block 2. This bore 7 is made to conform to the cross sectional shape of the drill steel.

An elastic washer 9 is located within the flaring bore 5 of the front head and is in-

terposed between the outer end of the chuck 6 and a nut 10 having a screw threaded engagement with the outer end of the said front head. To protect the elastic washer 9 from injury when the drill steel is inserted into position, a ring 11 is interposed between the outer end of the elastic washer 9 and the nut 10. The bore 12 of the elastic washer 9 is made to conform to the cross sectional shape of the drill steel as is also the bore 13 of the protecting ring 11. This bore 13 is also made flaring so as to facilitate the insertion of the drill steel 8 into position.

The chuck 6, elastic washer 9 and protecting ring 11 are interlocked against rotary movement with respect to the front head 3 as, for instance, by making the chuck, the elastic washer and the ring elongated in cross section and making the flaring bore 5 of the front head to conform to the said parts.

The nut 10 is yieldingly held in any of its rotatively adjustable positions, as, for instance, by providing an expanding band spring 14 interposed between the periphery of the front head and the inner wall of the nut 10.

A cup washer 15 is located around the head of the anvil block 2 to form a fluid tight packing to prevent the pressure fluid from working back into the hammer cylinder. A pressure fluid chamber 16 surrounds the head of the anvil block 2. The bore 17 of the hollow drill steel 8 is in open communication at all times with this chamber 16 through a duct 18 in the head of the anvil block. A pressure fluid supply pipe 19 is secured to a hole 20 in the side wall of the front head in communication with the chamber 16.

In operation, the nut 10 is unscrewed sufficiently to release the pressure upon the elastic washer 9. The drill steel 8 may then be inserted into position. The nut 10 is then screwed up sufficiently to expand the elastic washer 9 to form a fluid tight packing around the drill steel. This pressure also serves to drive the chuck 6 inwardly into its seat within the flaring bore 5 of the front head so that all wear between these parts is taken up.

What I claim is:—

1. A suitable holder, a chuck therein, a drill steel, an elastic washer, a nut engaging

the holder for causing the washer to grip the steel and a protecting ring interposed between the washer and nut, said protecting ring having its bore made flaring so as to facilitate the insertion of the drill steel into position.

2. A suitable holder having a flaring bore, a tapered chuck and an elastic washer both seated therein, a drill steel, a nut engaging the holder for forcing the chuck and washer inwardly to take up wear on the chuck and to cause the washer to grip the steel.

3. A suitable holder having a flaring bore, a tapered chuck and an elastic washer and a protecting ring, all seated therein, a drill steel and a nut engaging the holder for forcing the chuck, washer and ring inwardly to take up wear on the chuck and to cause the washer to grip the steel.

4. A suitable holder having a flaring bore, a tapered chuck seated therein and having an interlocking engagement with the holder against rotary movement with respect thereto, a drill steel, an elastic washer and a nut engaging the holder for forcing the chuck and washer inwardly to take up wear on the chuck and to cause the washer to grip the steel.

5. A suitable holder having a flaring bore, a tapered chuck and an elastic washer both seated therein, and having an interlocking engagement with the holder against rotary movement with respect thereto, a drill steel and a nut engaging the holder for forcing the chuck and washer inwardly to take up wear on the chuck and to cause the washer to grip the steel.

6. A suitable holder having a flaring bore, a tapered chuck, an elastic washer and a protecting ring all seated therein, and having an interlocking engagement with the holder against rotary movement with respect thereto, a drill steel and a nut engaging the holder for forcing the chuck, washer and ring inwardly to take up wear on the chuck and to cause the washer to grip the steel.

7. In a hammer drill, a front head having a pressure fluid chamber therein, an anvil block, a chuck seated in the front head, a hollow drill steel in open communication with the said chamber, an elastic washer sur-

rounding the drill steel, means for causing the washer to grip the steel to prevent the leakage of the pressure fluid around the steel and a washer surrounding the head of the anvil block for preventing the leakage of the pressure fluid to the hammer cylinder.

8. A suitable holder having a flattened flaring bore and a flattened tapered chuck seated therein.

9. A suitable holder having a flaring bore, a tapered undivided chuck seated therein and means for forcing the chuck inwardly to take up wear thereon.

10. A suitable holder having a flaring bore, a tapered undivided chuck seated therein and a nut engaging the holder for forcing the chuck inwardly to take up wear thereon.

11. A suitable holder having a flaring bore, a tapered undivided chuck seated therein, a nut engaging the holder for forcing the chuck inwardly to take up wear thereon and means for locking the nut to the holder against unintentional displacement.

12. A suitable holder having a flaring bore, a tapered undivided chuck seated therein and interlocked against rotary movement with respect thereto, and means for forcing the chuck inwardly to take up wear thereon.

13. A suitable holder having a flaring bore, a tapered undivided chuck seated therein and interlocked against rotary movement with respect thereto and a nut engaging the holder for forcing the chuck inwardly to take up wear thereon.

14. A suitable holder having a flaring bore, a tapered undivided chuck seated therein and interlocked against rotary movement with respect thereto, a nut engaging the holder for forcing the chuck inwardly to take up wear thereon and means for locking the nut to the holder against unintentional displacement.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this twentieth day of February 1909.

ALBERT H. TAYLOR.

Witnesses:

RUSSELL H. WILHELM,
CHAS. B. BRUNNER.