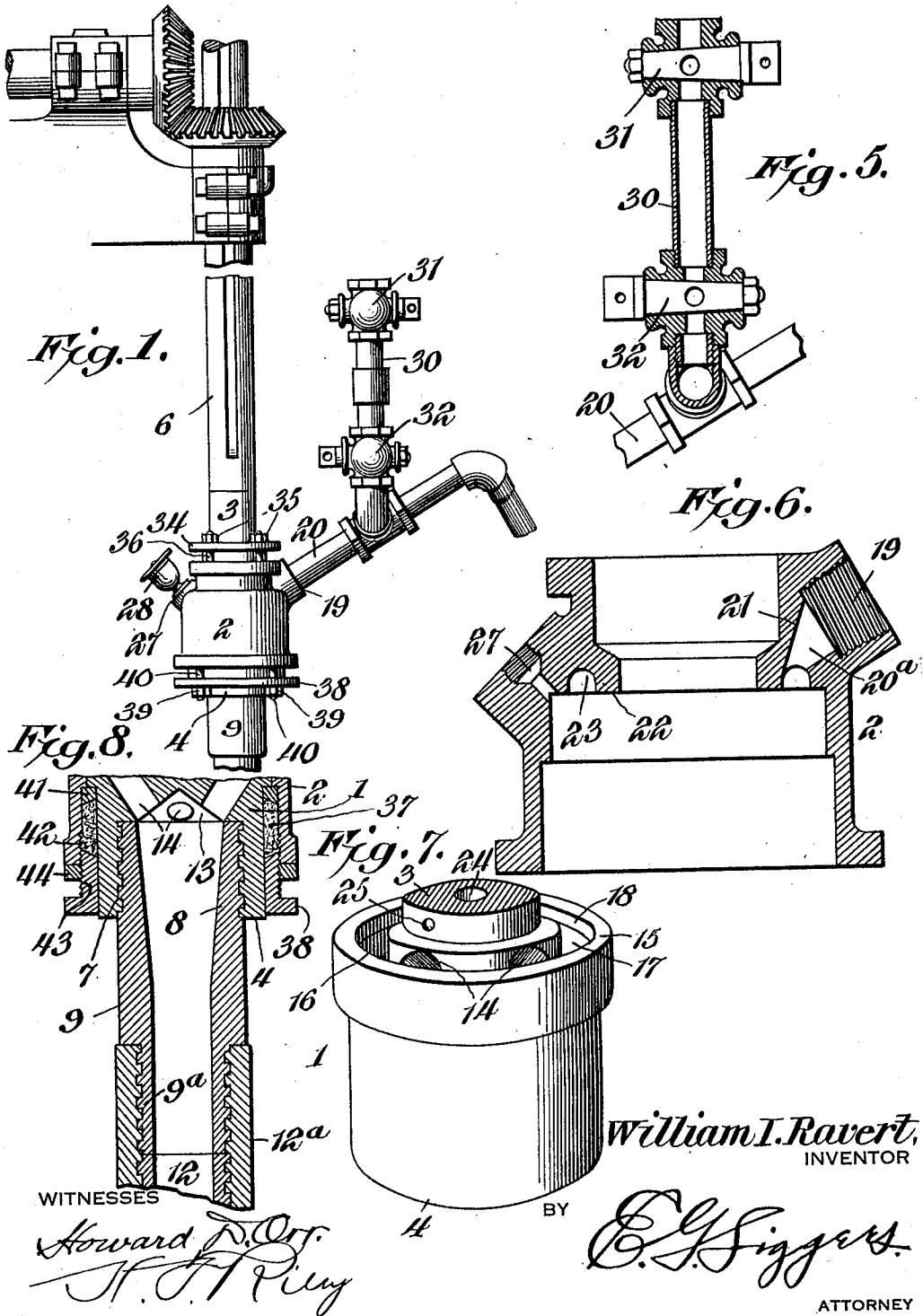


W. I. RAVERT.
 WATER AND SHOT FEED COUPLING.
 APPLICATION FILED SEPT. 12, 1910.

1,026,880.

Patented May 21, 1912.

2 SHEETS—SHEET 1.



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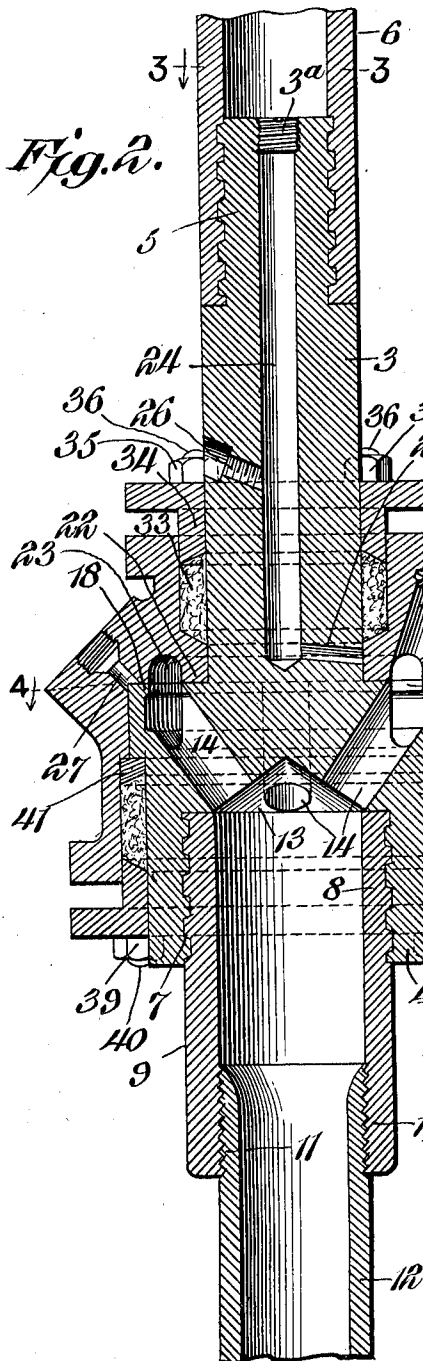


Fig. 3.

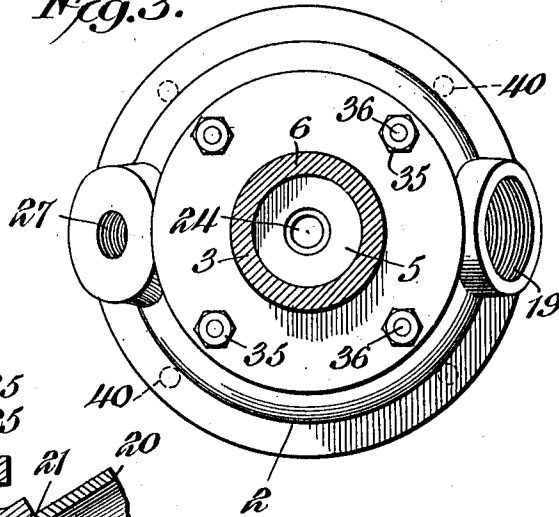
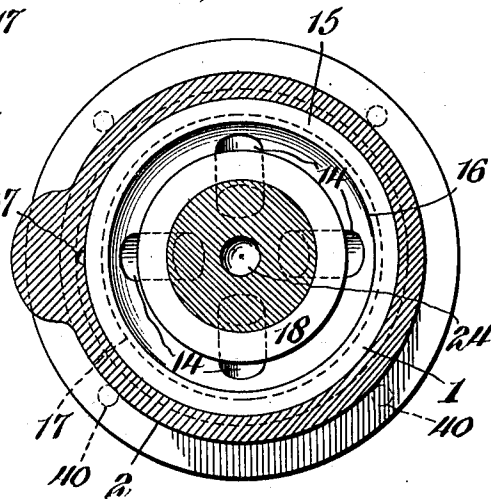


Fig. 4.



WITNESSES

Howard D. Carr.
H. T. Perry

William I. Ravert, INVENTOR,

BY

E. G. Siggers.

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM I. RAVERT, OF LATTIMER MINES, PENNSYLVANIA, ASSIGNOR TO AUGUSTUS W. DRAKE, OF LATTIMER MINES, PENNSYLVANIA.

WATER AND SHOT FEED COUPLING.

1,026,880.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed September 12, 1910. Serial No. 581,547.

To all whom it may concern:

Be it known that I, WILLIAM I. RAVERT, a citizen of the United States, residing at Lattimer Mines, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Water and Shot Feed Coupling, of which the following is a specification.

The invention relates to a water and shot feed coupling.

The object of the present invention is to improve the construction of the means for introducing shot and water into the drill rods of a core drill machine, and to provide a simple, durable and efficient coupling of comparatively inexpensive construction, adapted to be arranged at the lower end of the drill spindle for connecting the drill rods with the same, and capable of enabling both water and shot to be introduced into the drill rods below the drill spindle and the drilling machine, thereby preventing the water from wetting the machine and the operator, and also eliminating all liability of chilled shot getting into the drilling machine and damaging the same.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings:—Figure 1 is a side elevation of a water and shot feed coupling, constructed in accordance with this invention, and shown applied to a drill spindle. Fig. 2 is an enlarged vertical sectional view of the same. Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 2. Fig. 4 is a similar view on the line 4—4 of Fig. 2. Fig. 5 is a vertical sectional view of the upright branch of the water pipe. Fig. 6 is a detail sectional view of the outer central shell. Fig. 7 is a detail perspective view of the rotary coupling member. Fig. 8 is a detail sectional view, showing a threaded gland secured within the rotary coupling member by a lock nut.

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

The specification is a disclosure of one

form of the invention, while the claims define the actual scope of the invention.

In the embodiment of the invention illustrated in the accompanying drawings, the water and shot feed coupling comprises in its construction a rotary coupling member 1, and a stationary outer shell 2 in which the member 1 rotates. The rotary coupling member is composed of an upper stem 3, and a lower enlarged socket 4. The upper terminal portion 5 of the stem 3 is reduced and threaded to screw into the lower end of a drill spindle 6 of the ordinary construction, and the socket 4 has a cylindrical interiorly threaded opening 7, extending upwardly from the lower end of the rotary coupling member and receiving the upper threaded end 8 of a reducing sleeve 9, which is interiorly threaded at its lower end 10 to enable it to be coupled to the upper threaded end 11 of an ordinary tubular drill rod 12, or it may be exteriorly threaded as shown at 9^a to enter an ordinary tubular drill rod coupling 12^a, as illustrated in Fig. 8 of the drawings.

The upper end 13 of the opening is tapered or conical, and the rotary coupling member is provided at the top of the enlarged socket portion with a plurality of downwardly and inwardly inclined passages 14, preferably circular in cross section and communicating at their lower ends with the opening of the socket and with the interior of the reducing sleeve and the tubular drill rod 12. The rotary coupling member is also provided at the shoulder 15, formed by the enlarged socket portion, with an annular groove 16, connecting the several passages and having in its outer wall an annular recess 17, forming an overhanging top wall or shoulder 18, adapted to prevent shot when introduced into the coupling from working upward between the bearing surfaces of the rotary coupling member and the outer shell. The outer shell is seated upon the shoulder 15, and it is provided above the same with a threaded opening 19 for the connection of a water pipe 20, and it has a tapered radially arranged passage 20^a, extending downwardly and inwardly from the threaded opening and communicating with the groove and the passages of the

rotary coupling member. The tapered passage 20^a, which is arranged at a greater inclination than the water pipe 20, presents an inner inclined face or wall 21 to the shot, when the same is fed into the water pipe by the means hereinafter described, and the shot striking the inclined surface 21 rebounds at an angle and drops down into the groove 16 of the rotary coupling member. The outer shell 2 is preferably cylindrical, and the upper and lower portions of its central coupling member receiving openings are of a diameter to fit the stem and the socket portions of the said coupling member, and it has a horizontal shoulder 22 to fit against and rest upon the shoulder 15 of the rotary coupling member. The outer shell or casing is provided in the shoulder 22 with an annular channel groove 23, located above the annular groove 16 of the rotary coupling member and cooperating with the same to form an annular channel or passage, which extends around the coupling and connects the radially arranged passages 14 with the inlet passage 20^a of the coupling. By this construction water may be freely pumped through the tubular drill rods, and shot may be readily introduced into the same.

The rotary coupling member is provided in its upper stem portion 3 with a longitudinal bore 24, connected at its lower end by a smaller transverse bore 25 with the bearing surfaces of the coupling above the shot and water passages, and closed at its upper end by a threaded plug 3^a. The stem 3 is also pierced by a threaded transverse bore 26, located above the bore 25, preferably at the opposite side thereof and adapted to permit the lubricant to be introduced into the vertical longitudinal bore of the stem by any suitable means. The threads of the bore 26 will enable an oil cup to be mounted on the rotary coupling member, if desired. The outer shell is provided with an inclined lubricant passage 27, communicating with the bearing surfaces of the outer shell and the rotary member beyond the said annular channel, and located below the top of the same and adapted to lubricate the surfaces below the passages for the introduction of water and shot. The enlarged threaded upper portion of the oil passage 27 is adapted to enable an oil cup 28 to be mounted on the outer shell, as clearly illustrated in Fig. 1 of the drawings. The outer shell is preferably enlarged at the threaded opening 19 and also at the threaded portion of the oil passage 27 to secure the requisite strength.

The water pipe, which in practice is connected with a suitable pump, is provided with an upright branch 30, having upper and lower valves 31 and 32, adapted to be alternately opened to enable shot to be fed through the coupling to the drilling tool.

The coupling is equipped at the top of the outer shell with a stuffing box, and the central opening of the outer shell is enlarged at a point above the shoulder 22 to receive suitable packing material 33, which is engaged by a metallic gland 34, adjustably secured in place by nuts 35, mounted on threaded studs 36 and engaging the upper gland 34. The studs 36 are suitably fixed to the outer shell and extend upwardly therefrom through suitable perforations of the gland 34. The lower edge of the upper metallic gland 34 is beveled, and the lower wall of the packing space or recess is also beveled, and a wedging action is thereby produced on the packing. The coupling is also equipped at the bottom of the outer shell with a stuffing box, the central opening being enlarged for the reception of the packing 37, which is engaged by a lower gland 38, secured to the outer shell by nuts 39. The nuts 39 are mounted on studs 40, fixed to the outer shell and piercing the lower gland. Instead, however of securing the metallic glands 34 and 38 of the upper and lower stuffing boxes by means of studs and nuts, the rotary coupling member may be interiorly threaded, as shown at 42 in Fig. 8 of the drawings to receive an exteriorly threaded gland 43, which is secured by a lock nut 44. Also any other suitable means may be employed for adjustably connecting the metallic glands with the rotary coupling member. The lower portion of the rotary coupling member is exteriorly reduced at the stuffing box, and a metallic follower 41, consisting of a ring is arranged in the packing space between the rotary member and the outer shell, as clearly illustrated in Fig. 2 of the drawings. The lower face of the follower ring is beveled, and the inner edge of the gland is also beveled to produce a wedging action on the packing.

While the water and shot feed coupling is designed particularly for use in connection with the core drilling machine described and claimed in a co-pending application, filed Sept. 12, 1910, serial No. 581,554, it will be clear that it is equally applicable to various drilling machines, equipped with a rotary drill spindle and is adapted to enable various substances to be introduced into the tubular drill rods, as the exigencies of the drilling may require, and the coupling may be applied to various other machines with rotary tubes into which various substances are to be introduced.

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

1. A water and shot feed coupling for drilling machines including a rotary coupling member having a socket at the bottom and provided above the same with an annular groove and having a plurality of radi-

ally arranged inclined passages extending from the groove to the socket, and an outer shell fitted on the rotary coupling member and provided with a tapered inlet communicating with the groove of the rotary coupling member and having an inclined inner wall arranged to be struck by the shot to cause the latter to rebound and positively fall into the annular groove.

2. A water and shot feed coupling for drilling machines including a rotary coupling member provided with an annular groove and having a plurality of passages extending downwardly from the groove, and an outer shell arranged on the coupling member and having an opening for the attachment of a pipe and provided with a tapered inlet passage extending from the said opening and communicating with the groove of the rotary coupling member and having an inclined inner wall arranged at an angle to the pipe opening and adapted to be struck by the shot and cause the latter to rebound and positively fall into the annular groove.

3. A water and shot feed coupling for drilling machines including a rotary coupling member having an annular groove recessed at the outer wall to form an upper overhanging shoulder to prevent the shot from rising and escaping from the annular groove, said upper member being also provided with passages extending downwardly from the groove, and a stationary outer shell fitted on the rotary coupling member and having an inlet communicating with the annular groove.

4. A water and shot feed coupling for drilling machines including a rotary coupling member having an annular groove recessed at the outer wall to form an upper overhanging shoulder to prevent the shot from rising and escaping from the annular groove, said rotary member being also provided with passages extending downwardly from the groove, and a stationary outer shell fitted on the rotary coupling member and provided with an inlet communicating with the annular groove and having an inclined inner wall arranged to direct shot downwardly and adapted to cause the same to rebound and fall into the groove.

5. A water and shot feed coupling for drilling machines including an inner rotary coupling member provided with an annular groove having an annular recess in its outer wall forming an over-hanging shoulder to prevent the balls from rising and escaping from the annular groove, said coupling member being also provided with inclined passages extending downwardly and inwardly from the groove, and an outer stationary shell fitted on the coupling member and provided with an annular groove registering with the groove of the coupling member and coöperating with the same to form

an annular passage, said outer shell having an inlet tapered at the inner portion and communicating with the said annular passage and presenting an inner inclined wall.

6. A water and shot feed coupling for drilling machines including an inner rotary coupling member having a lower enlarged portion forming an upper shoulder and provided with a socket, said coupling member being also provided in the said shoulder with an annular groove and having means for preventing shot from rising and escaping from the annular groove and provided with an inclined passage extending from the groove to the socket, and an outer stationary shell fitted on the coupling member and supported by the shoulder thereof and having an inlet communicating with the groove of the coupling member.

7. A water and shot feed coupling for drilling machines including a rotary coupling member consisting of an upper stem portion and a lower enlarged portion forming a shoulder at the lower end of the stem and having a socket, said coupling member being provided in the said shoulder with an annular groove and having an over-hanging shoulder at the outer wall of the groove to prevent the shot from rising and escaping and provided with a plurality of radial passages extending downwardly and inwardly from the said groove through the top wall of the socket, and an outer stationary shell provided with a longitudinal opening having upper and lower portions of different diameters and forming an intermediate shoulder which is seated upon the shoulder of the rotary coupling member, said outer shell having an inlet and provided in its shoulder with an annular groove registering with the groove of the coupling member and co-acting therewith to form an annular passage.

8. A water and shot feed coupling for drilling machines including a rotary coupling member provided at the bottom with a socket or opening and adapted to be connected with a tubular drill rod, and provided with a plurality of passages inclined inwardly and communicating at their lower ends with the said socket or opening, said rotary coupling member having an annular groove connecting the inclined passages at the top, and a stationary outer shell fitted on the rotary coupling member and having an inclined inlet for delivering shot to the annular groove, the inner portion of the inlet being reduced in diameter and arranged at a greater inclination than the outer portion of the inlet.

9. A water and shot feed coupling for drilling machines including a rotary coupling member provided at the bottom with a socket or opening and adapted to be connected with a tubular drill rod and pro-

vided with a plurality of passages inclined inwardly and communicating at their lower ends with the said socket or opening, said rotary coupling member having an annular
5 groove connecting the inclined passages at the top, and a stationary outer shell fitted on the rotary coupling member and provided with an inlet pipe located above the annular groove and arranged at an inclination there-

to, and communicating with the groove for 10 introducing shot into the same.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM I. RAVERT.

Witnesses:

VALENTINE PFROMM,

WALTER H. DIETRICH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
