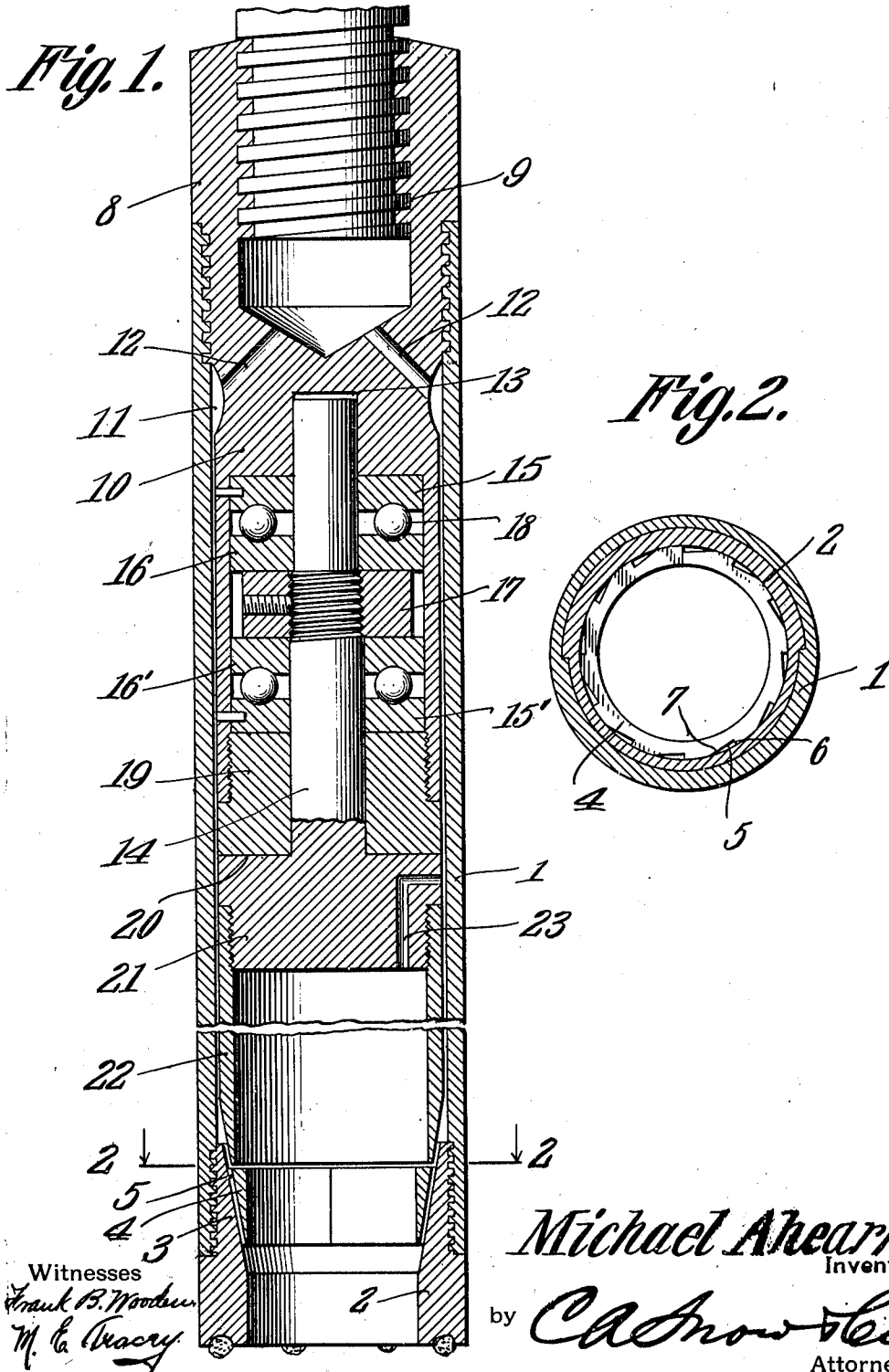


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DOUBLE TUBE CORE BARREL.
APPLICATION FILED SEPT. 3, 1910.

982,456.

Patented Jan. 24, 1911.



UNITED STATES PATENT OFFICE.

MICHAEL AHEARN, OF DENVER, COLORADO.

DOUBLE-TUBE CORE-BARREL.

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Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed September 3, 1910. Serial No: 580,353.

To all whom it may concern:

Be it known that I, MICHAEL AHEARN, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented a new and useful Double-Tube Core-Barrel, of which the following is a specification.

This invention has relation to double tube core barrels and consists in the novel construction and arrangement of its parts as hereinafter shown and described.

The object of the invention is to provide a core barrel in which two tubes are employed, means being employed for rotating the outer tube, while the inner tube is held stationary. Antifriction devices are interposed between the adjoining members of the two tubes and the adjoining members of the tubes are so fitted together that notwithstanding the fact that water may be forced under pressure between the tubes it can have no ingress to the chamber in which the anti-friction devices are located, thus the said anti-friction devices are protected against the entrance of grit or other foreign substances which have a tendency to wear the same.

A further object of the invention is to so assemble and shape the parts that the inner tube is materially assisted in retaining its stationary position by the column or volume of water under pressure as will be explained hereinafter.

In the accompanying drawing:—Figure 1 is a vertical longitudinal sectional view of the core barrel. Fig. 2 is a transverse sectional view of the same cut on the line 2—2 of Fig. 1.

The outer tube 1 is provided at its lower end with a drill bit 2 of usual pattern. The bit 2 is provided at its upper portion with an annular beveled surface as is usual in such parts and a split ring 4 is adapted to rest against the said annular beveled surface 3. The ring 4 tapers from its upper edge to its lower edge and is provided upon its periphery with a number of grooves 5 each of which is provided with a radially disposed wall 6 and a wall 7 which is located at a tangent to a circle struck from the center or axis of the tube 1. The said grooves extend from one end of the ring 4 to the other and serve as unobstructed water passage-ways as will be explained hereinafter. A coupling plug 8 is inserted in the upper end of the tube 1 and is provided with

a threaded bore 9 which may receive the end of a drill rod. A hood 10 depends from the plug 8 and is slightly less in diameter than the diameter at the inner periphery of the tube 1. The plug 8 is provided with an annular groove 11 which is located at the upper end of the reduced hood 10 and passages 12 extend from the bore 9 to the said annular groove 11. The reduced hood 10 is provided with a centrally positioned bore 13 in which is journaled a stem 14. Ball retaining rings 15 and 15' are located in the hood 10 and are fixed with relation to the same. The stem 14 hereinbefore mentioned is journaled in the said rings 15 and 15'. Rings 16 and 16' are loosely mounted in the hood 10 and loosely receive the stem 14. A collar 17 is fixed to the stem 14 at a point between the rings 16 and 16' and hold the said rings at a proper distance apart. Bearing balls 18 are interposed between the rings 15 and 16 and the rings 15' and 16' and are also located within the hood 10. A plug 19 is screw-threaded in the lower end of the hood 10 and fits snugly against the end of the same. The stem 14 is journaled in the said plug 19. The plug 19 is provided with a smooth or machined lower face 20 and a plug 21 is attached to the lower end of the stem 14 and its upper face fits snugly against the smooth surface 20 of the plug 19. An inner tube 22 is located in the tube 1 and is attached at its upper end to the plug 21, the outer periphery of the inner tube 22 is spaced from the inner periphery of the outer tube 1. The plug 21 is provided with a by-path 23, one end of which communicates with the space between the periphery of the said plug, and the inner periphery of the tube 1 and the other end thereof communicates with the interior of the tube 22.

During the drilling operation, the plug 8 is rotated and at the same time water is forced through the drill run, (not shown) into the bore 9 of the said plug 8. From the bore 9 the water passes through the passages 12 into the annular recess provided at the upper end of the hood 10. The water passes down through the space between the outer periphery of the hood and the inner periphery of the tube 1 and past the peripheries of the plugs 19 and 21 down through the space between the outer periphery of the tube 22 and the inner periphery of the tube 1 thence down through the grooves 5 provided in the periphery of the

split ring 4 to the point where the bit 2 is operating upon the rock. By reason of the fact that the upper face of the plug 21 fits snugly against the lowermost face 20 of the plug 19 it is impossible for the water or grit carried thereby to pass between the said plugs and flow into the interior of the hood 10. At the same time the water may flow through the by-path 23 into the interior of the inner tube 22. By reason of the fact that the inner periphery of the tube 22 comes in contact with the periphery of the core which is being formed in the rock by the bit 2 sufficient friction is afforded to hold the tube 22 stationary while the tube 1 rotates. At the same time the column of water contained within the tube 22 above the core also adds friction which tends to hold the said core 22 stationary. Inasmuch as streams of water are passing down along the side of the ring 4 through the grooves 5 provided in the periphery thereof, said streams will have a tendency to hold the ring 4 in a stationary position, and consequently the ring will have no tendency to grind or wear the side of the core being formed in the rock. The ring 4 is more effectually held in a stationary position by reason of the fact that the recesses 5 are provided with radially disposed walls 6 which are at those sides of the recesses 5 toward the direction from which the outer tube 1 is rotated. Therefore it will be seen that a simple and effective means is provided for preventing the ingress of water and grit to the cavity in the plug which houses the anti-friction devices between the attached parts of the inner and outer tubes, and furthermore means is provided for economically and effectually holding the inner tube in stationary position, while the outer tube is rotated and also for holding the gripping or split ring in a stationary position while the adjacent outer tube and bit are rotated.

45 Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A core barrel comprising inner and outer spaced tubes, a plug having a bore and attached to the outer tube and having a hood projecting into the same and spaced from the same, said plug also having a passage leading from its bore into the space between the hood and the outer tube, a plug closing the end of said hood, a stem journaled in the last said plug, anti-friction devices located within the hood and serving as bearings for the stem and a plug attached to the

stem and fitting snugly against the lower end of the plug which closes the end of the tube, the inner tube being connected with the last mentioned plug.

2. A double core barrel comprising spaced inner and outer tubes, a hollow plug located at the end of the outer tube and having a depending hood which projects into the outer tube, said hood having its outer periphery spaced from the inner periphery of the outer tube, said plug having a passage leading from its interior into the space between the periphery of the hood and the outer tube, anti-friction devices located in the hood, a plug closing the end of the hood a stem journaled in said last mentioned plug and having bearings upon the anti-friction devices, a plug attached to the stem and closing the end of the inner tube, the last mentioned plug having a by-pass leading from its exterior into the interior of the inner tube, the adjacent faces of the plug which closes the end of the hood and the plug which is attached to the stem fitting snugly against each other.

3. A double core barrel comprising spaced inner and outer tubes, a bit attached to the outer tube below the lower end of the inner tube, said bit having at its upper end portion an internal bevel, a ring located in the upper portion of the bit and adapted to bear against the bevel thereof, said ring having grooves provided upon its periphery and extending from one end of the ring to the other end and forming unobstructed passage-ways.

4. A double core barrel comprising inner and outer spaced tubes, a bit attached to the lower end of the outer tube and provided at its upper end with an internal bevel, a ring located in the upper end portion of the bit and adapted to bear against the bevel thereof, said ring having upon its outer periphery grooves, which extend from one end of the ring to the other and form unobstructed passage-ways, each groove having a wall which is radially disposed and another wall which is tangentially disposed with relation to a circle struck from the centers of the tubes.

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

MICHAEL AHEARN.

Witnesses:

JAMES LAUGHLIN,
BEN. BURDER.