

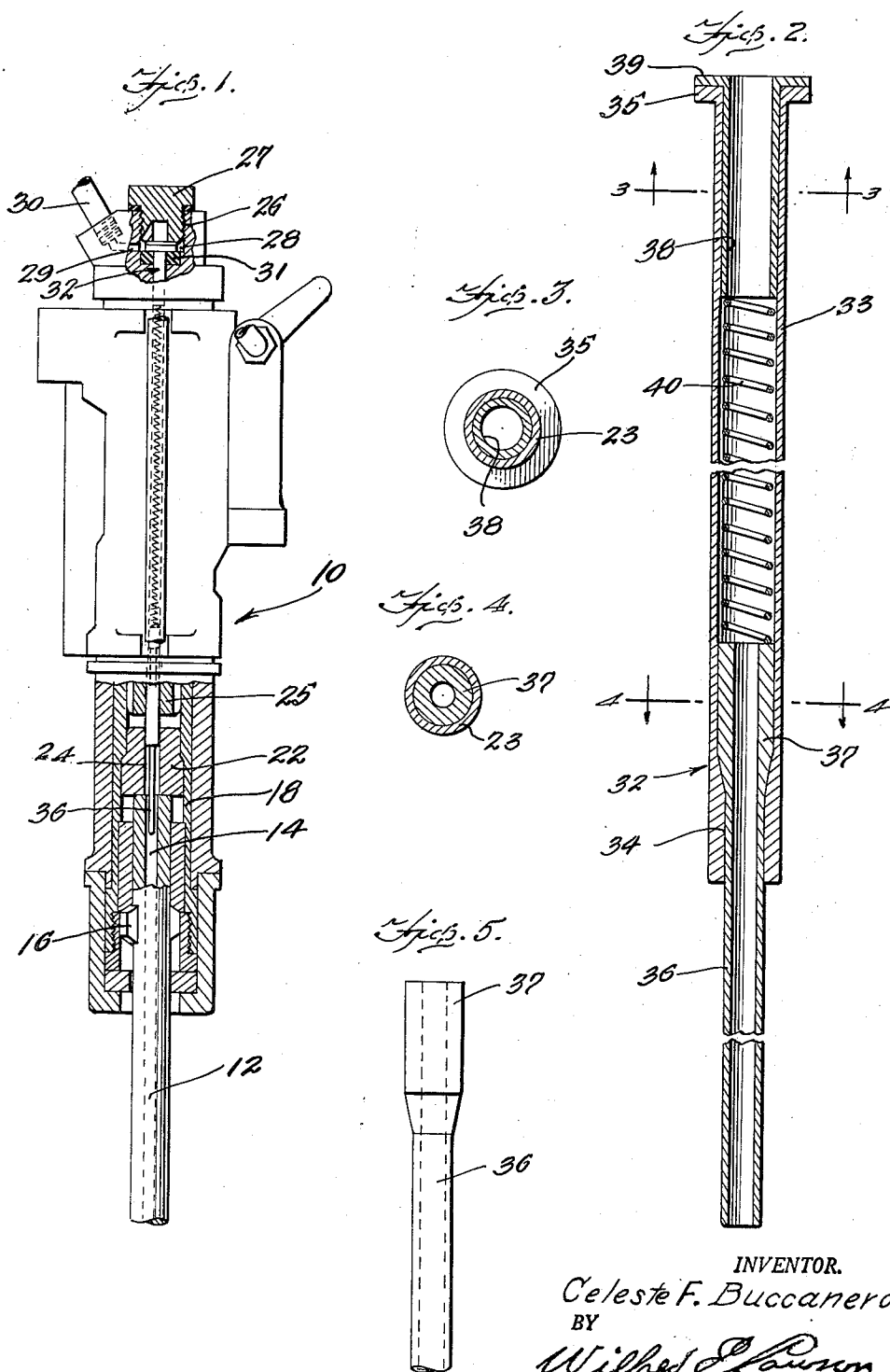
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WATER TUBE FOR FLUID OPERATED ROCK DRILLS

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WATER TUBE FOR FLUID OPERATED ROCK DRILLS

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1 Claim. (Cl. 255—49)

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This invention relates generally to the class of rock drills and is directed particularly to improvements in the fluid conveying cleansing tube with which rock drills of a certain type are equipped for supplying fluid under pressure into a hollow drill steel for the purpose of removing cuttings from the hole being drilled.

In the operation of drills of the character stated it sometimes happens that upon the insertion of the drill steel the water passage of the steel does not properly align with the tip of the water tube or needle whereupon the tip or end of the water tube becomes damaged particularly if the drill is started before the misalignment is discovered, whereupon complete destruction of the water tube occurs. It also may happen that the drill may have inserted into the chuck a drill steel of a type not having a water passage whereupon the same fatal results with regard to the water tube are had.

An object of the present invention, in the light of the foregoing, is to provide an improved water tube or needle for use in fluid actuated rock drills of the character above stated wherein the reduced forward end portion or extension of the water tube is yieldingly held in place so that if misalignment of the drill steel water passage with the forward end of the water tube should occur the said extension or forward end of the water tube will move backwardly and thus avoid being damaged.

Another object of the invention is to provide a water tube of the character stated wherein the extension is freely movable in the body of the tube and is maintained in place by a spring which in turn is held in position by a seating element at the upper end of the tube which is secured in place by the water plug.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawing:

Figure 1 is a view partly in elevation and partly in longitudinal section of a rock drill of one type in which a tube of the character embodying the present invention may be employed, the forward and rear ends of the water tube being shown in elevation.

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Figure 2 is a longitudinal sectional view on an enlarged scale of the water tube per se.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a view in elevation of the rear end portion of the tube tip.

Referring now more particularly to the drawing the numeral 10 generally designates a rock drill of any conventional type which is fluid operated and wherein liquid is conducted through the drill machine into and through the drill steel for washing away the cuttings.

The numeral 12 designates the drill steel which is provided with the longitudinal water passage or bore 14 and which is provided in the conventional manner with lugs 16 by means of which the steel is secured in place by a chuck mechanism 18 of any well known type which serves the function of driving the drill steel 12 which extends into the front end head 20 and of transmitting the rotary movement of suitable rotative mechanism (not shown) to the drill steel.

The numeral 22 designates an anvil block through which a passage 24 is formed for the hereinafter described water tube while the numeral 25 designates the hammer piston which operates upon the block 22.

At the upper or rear end of the machine is a threaded socket 26 which receives the water plug 27. Leading into the socket 26 and communicating with the recess 28 which is formed between the bottom of the recess and the inner end of the plug 27 when the plug is in place, is a water supply passage 29 with which is connected the water pipe 30.

In the bottom of the socket 26 is fixed the packing washer 31 for the purpose hereinafter set forth.

The numeral 32 generally designates the improved water tube constituting the present invention. This water tube comprises the long tubular body 33, the forward end of which is internally reduced in diameter through a portion of its length as indicated at 34.

At its top end the body 33 is encircled by the flange 35.

The numeral 36 designates the tip or extension of the body 33, which tip or extension is, of course, tubular as shown and has its rear end portion of enlarged diameter throughout a portion of its length as indicated at 37, which rear end portion fits snugly in the body 33 as illustrated. The major portion of the extension 36 is of the smaller external diameter as shown

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and this smaller portion projects beyond the forward or lower end of the tube body 33 as illustrated, the constriction 34 in the body being engaged by the enlarged portion 37 and thus preventing separation of the two parts.

Slidably fitted in the upper end of the body 33 is a tubular thimble 38 which has a relatively thin surrounding outer end flange 39 which rests against the flange 35 of the tube body. This thimble 38 has an axial passage therethrough as illustrated and it serves as a seat for the outer end of a compression spring 40 which lies within the body 33 and which has its other end pressed against the inner end of the water tube extension 36 as illustrated.

When the water tube is placed in position in the drill machine the tubular extension 36 extends forwardly through and beyond the anvil block 22 as illustrated and is intended to extend into the water passage 14 of the drill steel 12 when the latter is placed in position. The flange 35 at the outer end of the body 33 is pressed against the packing gasket 31 by the water plug 27 as illustrated. Thus it will be seen that when the water tube is properly placed in position the water may flow into the recess 28 and into the upper end of the water tube for ejection at the tip or extension 36 into the passage of the drill steel.

If by chance when inserting the drill steel, the end of the steel should strike against the end of the extension 36, as might sometimes happen as a result of worn condition of the parts, the forcing of the steel inwardly or the operation of the machine would not damage the water tube because of the fact that the spring 40 will permit the tip 36 to be forced rearwardly. Consequently the operation of the machine may result in the shifting of the extension 36 to bring it into alignment with the water passage 14 of the drill steel whereupon the spring 40 will react to project the extension 36 into the steel.

It will also be readily apparent that if by mistake a drill steel should be inserted which is not provided with a water passage, no damage will be

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done to the extension 36 of the water tube since it will merely be forced back to compress the spring.

It will be seen that there is provided a new and novel water tube which is not only so constructed that it cannot become damaged in the manner stated but also the parts can be easily and quickly assembled or a new tip or extension can be introduced and forced into place readily, if necessary, without having to remove the complete tube from the machine.

I claim:

The improved water tube for a fluid operated rock drill, comprising an elongate tubular body of internally reduced diameter at its forward end, an out-turned annular flange at the rearward end of the body, an elongate tubular extension having a portion of its rearward end of enlarged external diameter to fit snugly within the body against the rearward face of the internally reduced portion of the body, the main portion of the tubular extension extending from the said forward end of the body, a coil spring housed within the body and engaged at one end against the enlarged rearward end portion of the tubular extension, a spring retainer in the form of a tubular thimble slidably engaged in the said rearward end of the tubular body, and an out-turned annular flange at the outer end of the thimble seated on the outer face of the first flange.

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