

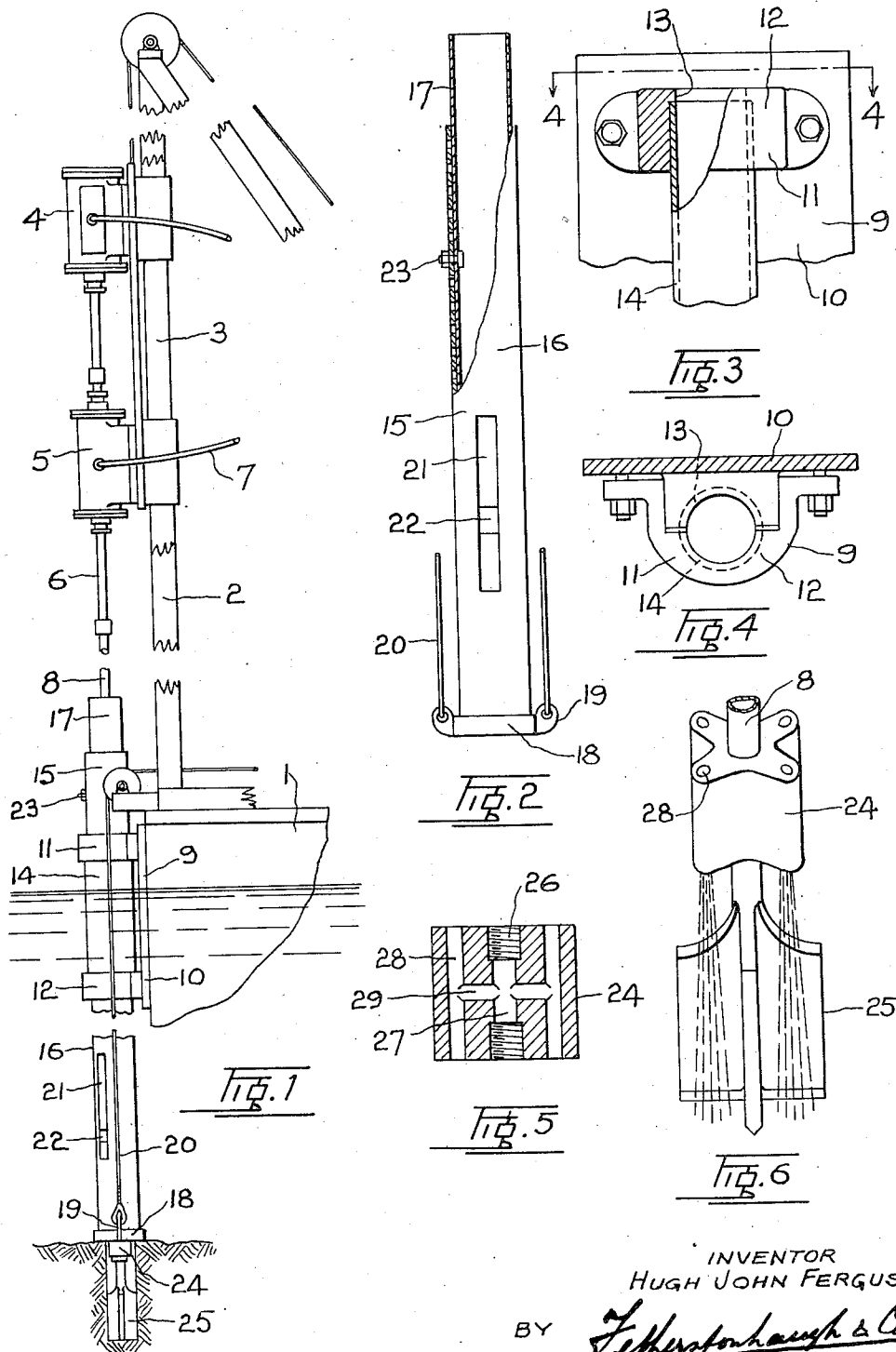
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H. J. FERGUSON

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SUBMARINE DRILL

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INVENTOR
HUGH JOHN FERGUSON
BY *Fetherstonhaugh & Co*
ATTORNEYS

UNITED STATES PATENT OFFICE

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SUBMARINE DRILL

Hugh John Ferguson, Vancouver, British
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3 Claims. (Cl. 255—51)

My invention relates to improvements in submarine drills the objects of which are to provide means for enclosing the lower end of the drill rod and bit; to provide an outlet at a suitable point above the sea floor for the discharge of cuttings from the drill; to provide means for keeping the face of the drill bit free from cuttings, and to provide means for maintaining the drill rod enclosing means in alignment with said drill rod during the drilling operation.

The invention consists essentially of a tubular drill rod equipped with a drill bit and a member above the bit adapted to direct streams of water from the interior of the drill rod lengthwise of the drill bit, of enclosing said drill rod and bit and of a tubular member surrounding the rod, said tubular member being provided with a vertically adjustable opening for the discharge of cuttings from the drill bit, as will be more fully described in the following specification and shown in the accompanying drawing, in which:—

Fig. 1 is a side elevational view of a drilling machine fitted with the invention.

Fig. 2 is a partly fractionated elevation of the enclosing tube.

Fig. 3 is an elevational view of the bearing in which the enclosing tube is mounted.

Fig. 4 is a plan view taken on the line 4—4 of Figure 3.

Fig. 5 is a sectional view of the water jet coupling.

Fig. 6 is a perspective view of the water jet coupling and the drill bit.

In the drawing like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates a scow or vessel upon which is erected a derrick 2 having a pair of spaced vertical guides 3. Slidably mounted upon the guides 3 is a drilling engine 4 of any suitable type and also a water box 5. The piston rod of the engine connects with a hollow rod 6 which passes through the water box 5 and is equipped with a port, not shown, for the purpose of admitting water under suitable pressure from a pipe 7 to the hollow drill rod 8 which is connected to the hollow rod 6 of the water box. This portion is customary equipment, hence further description is not considered to be necessary.

Secured to the side wall of the scow 1 or to the base of the derrick is a slide bearing generally indicated by the numeral 9, see Figures 3 and 4. This bearing consists of a bed plate 10 having spaced pillow blocks 11 which are covered by caps 12 having at their outer ends an inwardly turned flange 13, which is adapted to abut the end of

a sleeve 14 mounted within the pillow blocks. Slidably engaged by the sleeve 14 is a telescopic member 15 which is aligned with the drill rod 8 and in which said drill rod is operated. The telescopic tubular member 15 consists of two pipes 16 and 17, the latter being inserted within the former, the pipe 16 is provided at its base with a collar 18 having eyed lugs 19 for the attachment of hoisting lines 20 and is provided adjacent its base with an elongated opening 21. The inner pipe 17 is provided with a relatively small opening 22 in its side wall which registers with the opening 21 of the pipe 16 and may be set at any position of the height of the opening 21 by clamping the pipes 16 and 17 together with a bolt 23. 15

Fitted to the lower end of the drill rod 8 is a flushing device 24, see Figures 5 and 6, which consists of a block of metal preferably of substantially similar cross section to that of the drill bit 25, that showing being in the form of a horizontal cross. Threaded recesses 26 are formed in each end to engage the threads of the drill rod and drill bit and a central bore 27 extends from one recess to the other. Each wing of the cross is provided with a vertical passage 28, each of which communicate with the bore 27 through a transverse passage 29. 25

The drill 25 is of cross section and is so connected to the flushing device that the vertical passages 28 align with the spaces between the cutting edges of the drill bit 25 as indicated by dotted lines in Figure 6. 30

It will be obvious that the drill bit and the flushing device may be made as a single unit if desired. 35

Having thus described the several parts of my invention I will now explain its use.

The telescopic member 15 is so adjusted that the lower end of the tube 16 may rest on the bottom and the tube 17 raised to dispose the opening 22 above the level of the silt overlying the bottom. The drilling engine 4 is set in motion to operate the drill bit 25 and water is turned on through the water box 5 into the drill rod 8, thence downwards through the flushing device from which jets of water are directed parallel to the drill rod, one set of jets impinging on the rock being cut by the drill to disturb the cuttings formed thereby, and the other set of jets serving to carry said cuttings in an upward direction that they may pass outwards from the telescopic member 15 through the registering openings 21 and 22. The telescopic member 15 being held in the slide bearing 9 is free to move in a vertical direction, but is held against sidewise movement, thus 55

preventing any bending strain from developing on the drill rod while the drill bit is in contact with its work.

I am aware that prior to my invention submarine drills have been operated and the cuttings have been washed clear by a jet of water, therefore I do not claim such a combination broadly, but

What I do claim as my invention and desire to secure by Letters Patent, is—

1. In a submarine drill employing a hollow drill rod and a drill bit having a cutting edge, a flushing device comprising a coupling interposed between the rod and the drill bit, said device having radial webs and a water passage in each web extending parallel to the axial passage and being in communication therewith.

2. In a submarine drill employing a hollow drill rod, a drill bit having means for directing a stream of water supplied through the drill rod

to impinge upon the face of the work cut by the drill bit, a tubular enclosing member for the drill bit adapted to rest on the sea floor, said tubular member having a side opening adjacent its lower end and means for adjusting the position of said opening with respect to said lower end.

3. In a submarine drill employing a hollow drill rod, a drill bit having means for directing a stream of water supplied through the drill rod to impinge upon the face of the work cut by the drill bit, a telescopic tubular enclosing member for the drill bit adapted to rest on the sea floor, said tubular member consisting of two sections each having a side opening adjacent its lower end, means for securing the sections against telescopic movement, said tubular member being slidably mounted in a bearing whereby said member is free to move in alignment with the drill rod and is held against lateral movement.

HUGH JOHN FERGUSON. 20