No. 897,231. PATENTED AUG. 25, 1908.

D. S. WAUGH.

AUTOMATIC FLUID ACTUATED FEED MECHANISM FOR PERCUSSIVE TOOLS.

APPLICATION FILED JULY 20, 1906. 2 SHEETS—SHEET 1.

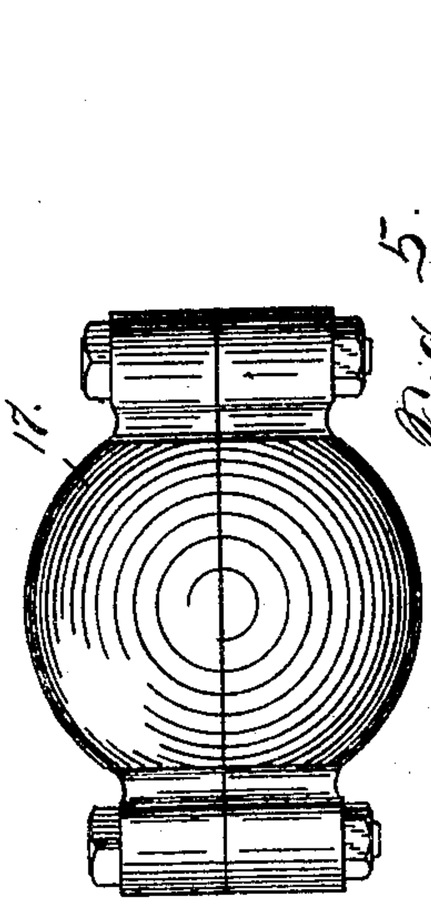

Fig. 5.

Fig. 1.

Fig. 2.

Fig. 4.

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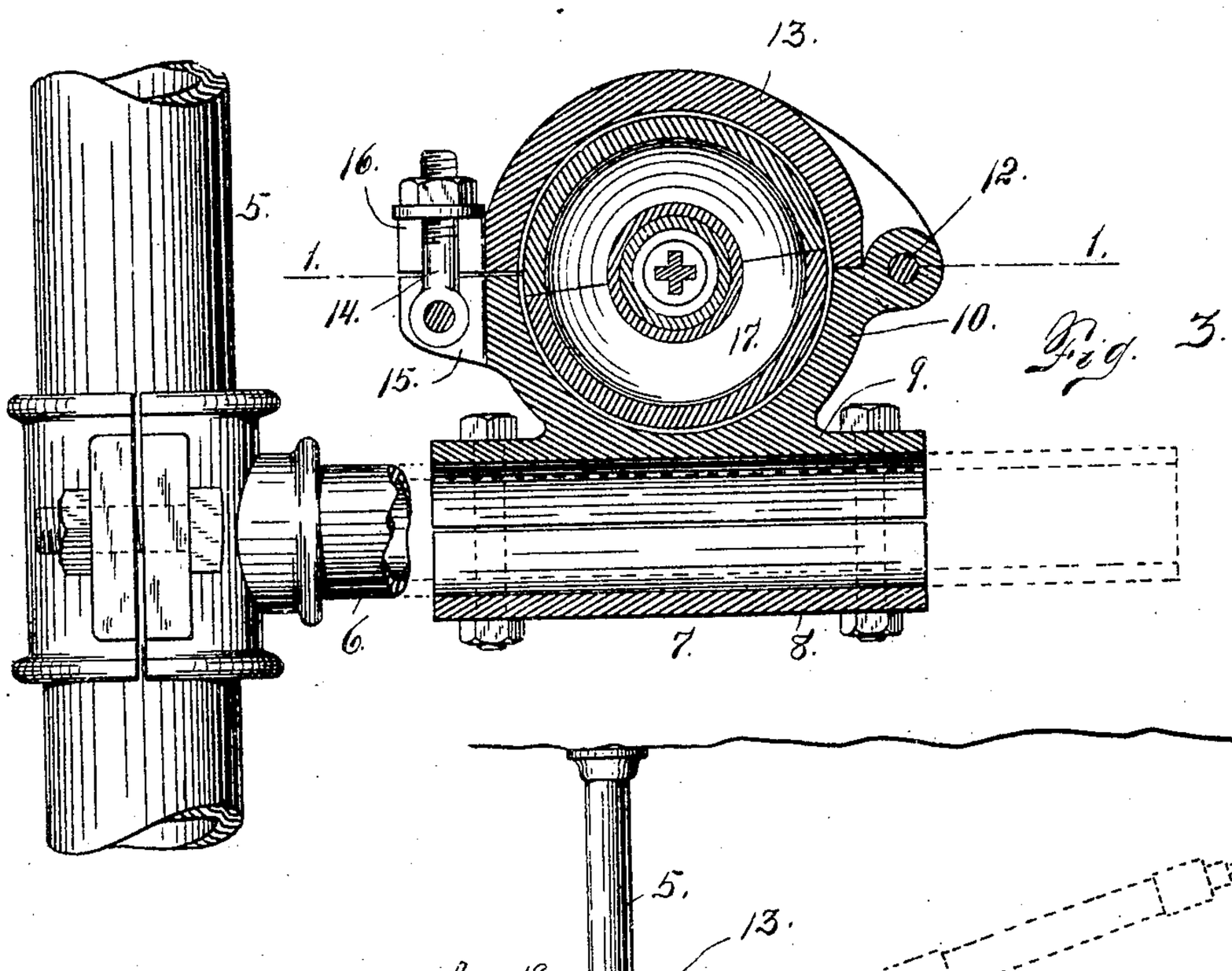

Fig. 3.

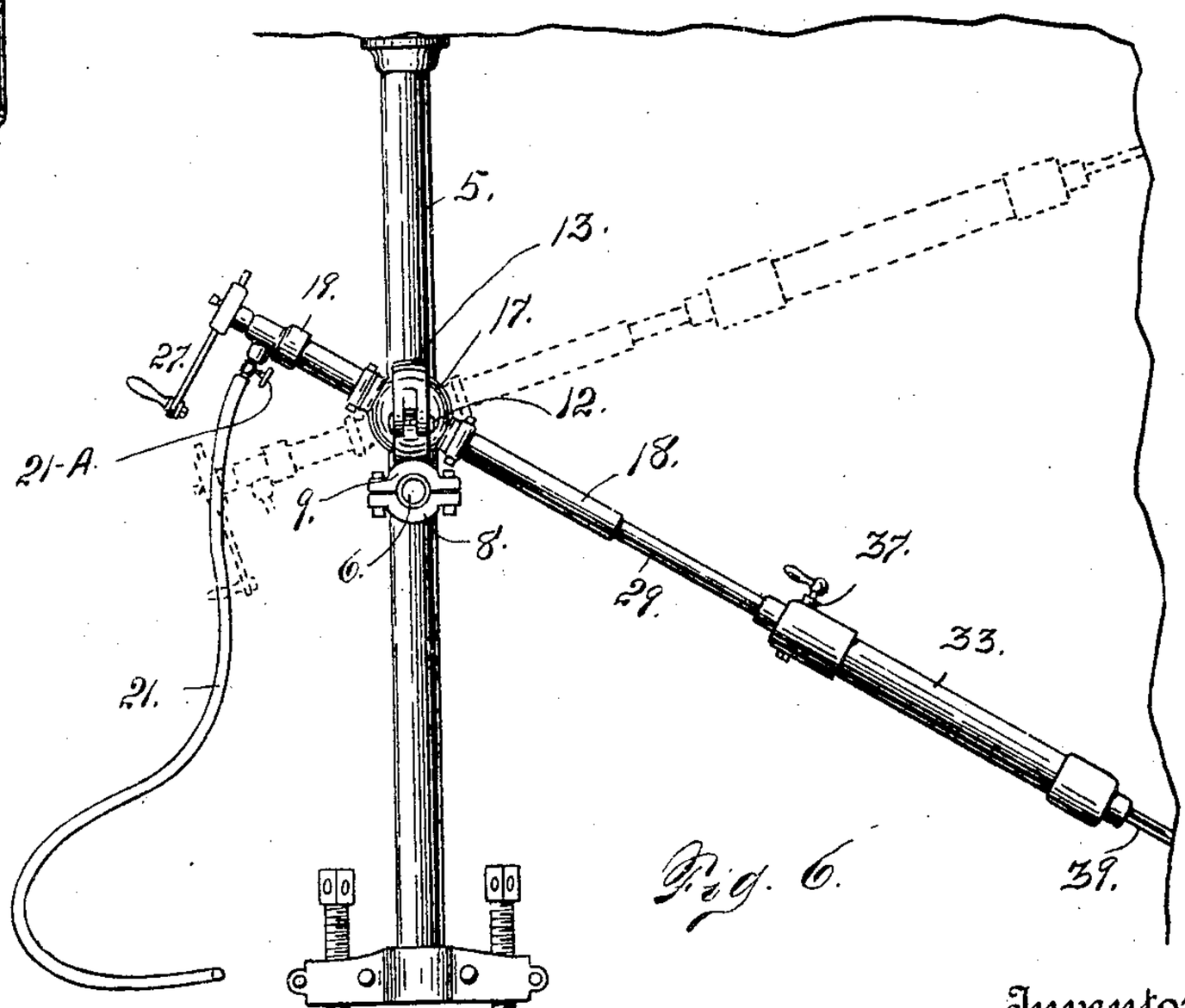

Fig. 6.

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AUTOMATIC FLUID-ACTUATED FEED MECHANISM FOR PERCUSSIVE TOOLS.

No. 897,231. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed July 20, 1906. Serial No. 327,019.

To all whom it may concern:

Be it known that I, DANIEL S. WAUGH, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Automatic Fluid-Actuated Feed Mechanism for Percussive Tools; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to fluid actuated mechanism for percussive tools being more especially intended for those of the hammer class, whether of the larger variety usually termed drills or of the small class generally termed tools. By virtue of my improvement the operating fluid for the tool also performs the feeding function whereby the body of the drill is automatically moved forward longitudinally to hold the bit or cutting device in contact with the material to be penetrated. This feeding function is performed simultaneously with the operation of the drill and the fluid for operating the drill and performing the feeding function, is supplied from a common source. The mechanism is provided with a conduit through which the operating fluid enters and in which a hollow shank upon which the body of the tool is mounted telescopes. The conduit is mounted upon a supporting column to have both a longitudinal and swinging adjustment. By virtue of this swinging adjustment, the drill may be so positioned as to drill a considerable number of holes in the breast of the rock without changing the longitudinal position of the mechanism upon the column.

Having briefly outlined my improved construction, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a longitudinal section taken through the main conduit and the hollow shank which telescopes therein. In this view the drill body connected with the said shank is not illustrated. This view may also be said to be a section taken on the line 1—1 Fig. 3, the fastening bolt for locking the clamping members together, being shown in a different position. Fig. 2 is an elevation partly in section showing the drill body and a portion of the hollow shank with which it is connected, the latter being shown in section. Fig. 3 is a section taken on the line 3—3 Fig. 1. Fig. 4 is a cross section taken on the line 4—4 Fig. 1, the parts being shown on a larger scale. Fig. 5 is a detail view of the two-part ball which is clamped to the conduit in which the hollow shank telescopes. Fig. 6 is an elevation illustrating the manner of operating a tool equipped with my improvements.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the supporting column which may be mounted in the usual manner. To this column is secured a lateral extension 6 to which is clamped a sleeve 7 composed of two parts 8 and 9. Formed integral with the part 9 is a clamping member 10 to which is hinged as shown at 12, the other clamping member 13. Upon a lug 15 of the clamping member 10 is pivotally connected a fastening bolt 14 which when the clamping members are locked in the clamping position, engages a slotted lug 16 formed on the member 13. The clamping members 10 and 13, surround a ball or spherical member 17 composed of two parts clamped to the conduit 18. By virtue of this arrangement there is a universal joint connection between the column 5 and the conduit 18, thus making it practicable to swing this conduit together with its telescoping shank and the drill body, both upwardly and downwardly as well as in a direction passing around the column, within a considerable range of movement.

To what I will term the rear extremity of the conduit 18, is secured a coupling head 19 provided with an inlet port 20 with which a flexible tube 21 may be connected for introducing the actuating fluid. Through an extension 22 of the coupling 19, passes a journal 23 forming a part of a rod 24 whose body portion is angular, preferably cruciform in cross section (see Figs. 3 and 4). To the outer extremity of the journal 23, is secured a holder 25 through which is passed the bar 26 of a hand crank 27. This bar is adjustable in the holder by means of a set bolt 28. Mounted to telescope in the conduit 18 is a hollow shank 29 in whose rearward extremity is inserted a plug 30 whose exterior is slightly cone-shaped to fit the hollow shank

which is correspondingly fashioned for the purpose. This plug 30 is held in place from the rear by means of a screw plug 31 threaded into the shank and provided with a gasket 32 which forms a fluid tight joint between the hollow shank and the main conduit. The plugs 30 and 31 are apertured to receive the rod 24, the openings in the plugs being so shaped that the turning of the rod 24 also rotates the shank 29 within the conduit. The construction is also such that the hollow shank is allowed to slide longitudinally on the rod 24 whereby the body of the drill may be forced forwardly when in operation. To the forward extremity of the hollow shank 29 is connected the body of the drill or tool 33, the said body portion having an interiorly threaded socket 34 in which the rear extremity of the shank is threaded. The rear extremity 35 of the drill casing is provided with a port 36 communicating with the hollow conduit, for the purpose of admitting operating fluid to the body of the casing 33 of the tool. This port 36 is controlled by a valve 37.

The plugs 30 and 31 are provided with an orifice 38 through which the operating fluid passes from the main conduit 18, into the hollow shank 29 behind the plug 30. Thus when the tool is in operation, the hollow shank 29 is filled with the operating fluid which acts to drive the shank together with the drill body forwardly until the bit 39 engages the breast of the rock or the bottom of the hole in which the drill bit is working. The operating fluid after leaving the port 20, enters a chamber 40 in the rear of the plug 31 and at the same time passes through the orifice 38 into the hollow shank.

The forward extremity of the cruciform rod 24 is provided with a head 24^A in the rear of which is placed a rubber buffer 24^B. This head and buffer form a stop which engage the plug member 30 and limit the forward movement of the shank and drill body whereby the shank is prevented from escaping from the hollow conduit in which it telescopes.

Having thus described my invention, what I claim is:

1. In automatic feed mechanism for percussive tools, the combination of a main fluid conduit, a hollow shank telescoping therein, the rearward extremity of the shank being provided with a plug, means for delivering operating fluid to the rearward extremity of the conduit, the plug of the hollow shank being provided with an orifice for the passage of fluid, a guide rod supported by said plug and passing into the hollow shank and provided with a stop at its forward extremity to limit the forward movement of the shank, a tool casing connected with the shank, the said casing being in communication with the fluid passing through the hollow shank.

2. In apparatus of the class described, the combination of a hollow conduit, a shank mounted to reciprocate in said conduit, a tool casing connected with the forward extremity of the shank and movable therewith, the rear extremity of the shank being provided with a plug, a guide rod passing through the said plug and provided with a stop at its forward extremity to limit the forward movement of the shank and casing, a suitable support for said rod carried by said conduit, the rear extremity of the rod protruding from the conduit and being journaled in said support, and means connected with the said rod to permit rotation of the shank and its connections, the rod where it passes through the plug of the shank being constructed to cause the shank and rod to rotate in unison.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL S. WAUGH.

Witnesses:

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A. J. O'BRIEN.