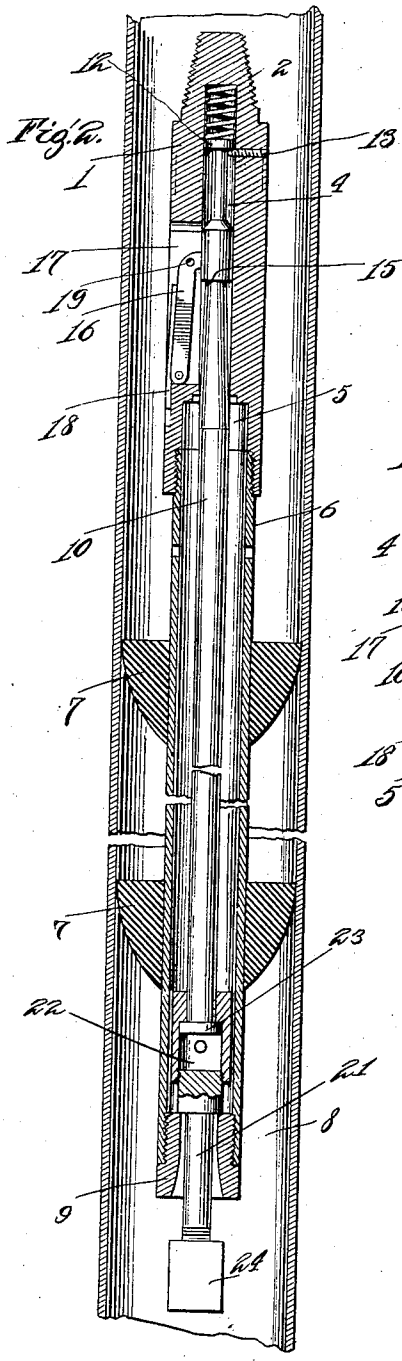
Jan. 3, 1928.

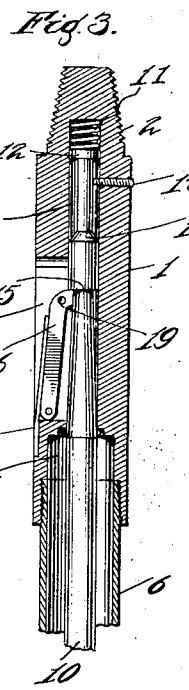
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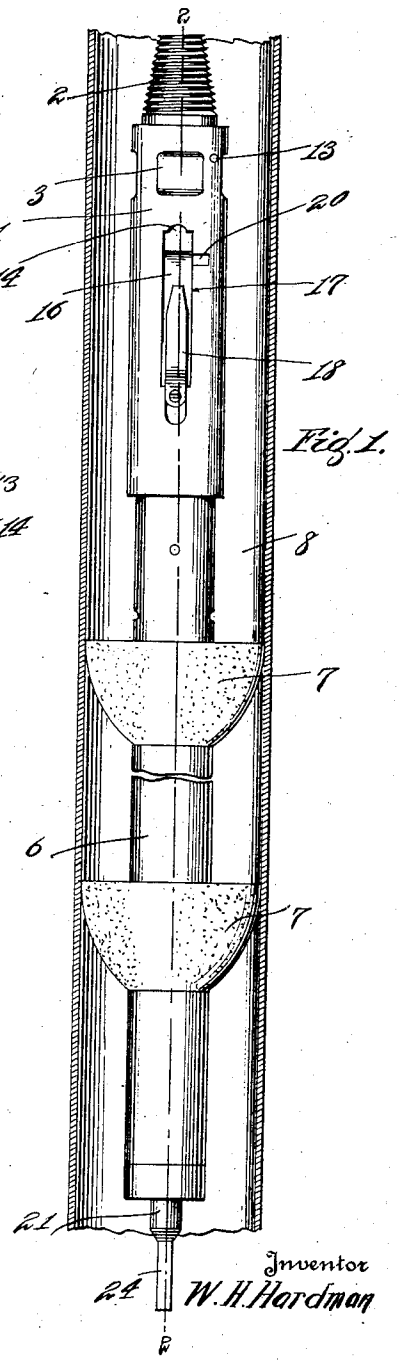
W. H. HARDMAN

OIL WELL SWAB TRIPPING DEVICE

Filed Jan. 7, 1927







Inventor

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Patented Jan. 3, 1928.

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UNITED STATES PATENT OFFICE.

WILBERT H. HARDMAN, OF MORRISON, OKLAHOMA.

OIL-WELL SWAB-TRIPPING DEVICE.

Application filed January 7, 1927. Serial No. 159,672.

This invention relates to swabs for oil wells and has for its object the provision of a simple and efficient mechanism whereby a swab may be released if it should bind in the oil well casing so that the swabbing tool may be withdrawn. The invention is illustrated in the accompanying drawing and will be hereinafter fully set forth.

In the drawing:

Figure 1 is an elevation of a device embodying the invention;

Fig. 2 is a longitudinal section of the same on the line 2—2 of Fig. 1, and

Fig. 3 is a detail section showing the device tripped.

The tool of the present invention embodies a head 1 which is constructed at its upper end with a threaded stud 2 or otherwise formed whereby it may be secured to the drilling rod, and it may be formed with the usual wrench seats 3. This head 1 has a longitudinal bore, indicated at 4, which is expanded at its lower end 5 to receive the upper end of a swab-carrying tube 6 whereby the tube may be secured in the head, the swab rubbers 7 being mounted on said tube to bear against the casing 8 in the usual manner. The lower end of the tube 6 is closed by a plug 9 bored centrally to admit liquid, and extending axially through the tube is a rod 10 having its upper end reduced whereby it may extend into the bore 4 of the head and have sliding movement therein, an expansion spring 11 being fitted in the upper extremity of the bore to bear upon the upper end of the rod and tend constantly to maintain the rod in a lowered position. The upper extremity of the rod is enlarged to define an abrupt annular shoulder 12 beneath which is engaged the end of a set bolt 13 mounted in the head to normally support the rod, as shown in Fig. 2. Below the bolt, an annular shoulder 14 is formed on the rod, the space between the shoulders 13 and 14 being sufficient to accommodate the movement of the rod when the device is tripped as hereinafter described. The diameter of the rod below the shoulder 14 is approximately equal to the diameter of the bore of the head providing a smooth surface terminating at a lower abrupt shoulder 15 and presenting a bearing for the working end of a latch 16. The head is provided with a longitudinal slot 17 in which the latch is pivoted at its lower end, and a leaf spring 18 is secured to the head so as to extend over the latch and bear thereon to hold the upper free end of the latch against the rod. When the device is tripped, the latch engages under the shoulder 15, and, to facilitate its release, a socket 19 is provided in the side of the latch near its upper end to aline with a transverse recess 20 in the head whereby any convenient pointed tool may be engaged with the latch to move the same against the force of the spring. A valve stem 21 is extended axially through the plug 9 and has its upper end secured in a cap 22 which is slidably mounted upon the lower end of the rod 10 about an annular flange 23 formed upon the lower extremity of the rod, as shown in Fig. 2. The valve stem projects below the plug and is equipped with an enlarged foot 24, the upper end of the stem being enlarged and constituting the valve head or valve proper.

In the normal operation of the device, the rod is supported by the shoulder 12 resting on the end of the bolt 13, the spring 11 acting to maintain the engagement and the latch being inactive, as shown in Fig. 2. Should the swab stick, for any reason, the entire device is lowered to the bottom of the well and the foot 24, by reason of its impact with the bottom, will move upwardly relative to the tube, this upward movement being imparted to the rod 10 by the head or upper end of the valve stem against the force of the spring 11 so that the shoulder 15 will ride past the end of the latch which will then spring into place below the shoulder, as shown in Fig. 3. The rod and valve will then be held in raised position so that the liquid will be permitted to flow downward and relieve the pressure above the swab which may then be raised. When the latch is released by engagement of a tool in the socket 19 as above described, the spring 11 at once expands and resets the parts in the normal positions shown in Fig. 2. In the normal position, the valve seats on the plug 9 on the up stroke of the tube but moves upward relative thereto on the down stroke of the tube to effect the pumping action in an obvious manner.

The tool is very simple in construction and the several parts are compactly arranged. It may be produced at a low cost and in use proves efficient for the purpose for which it is designed. It will be under-

stood that the invention may be embodied in swabs of various styles.

Having thus described the invention, I claim:

1. A swabbing tool comprising a head, a rod slidably mounted in the head, and a latch mounted in the side of the head and engaging the rod to releasably support the same.

2. A swabbing tool comprising a head, a tube depending from the head, a rod slidably mounted in the head and extending into the tube, a valve swiveled upon the lower end of the rod, annular shoulders upon the rod at the upper end thereof, a latch pivotally mounted in the head normally free of the rod and adapted to engage under the lower shoulder, and a supporting element in the head normally engaging under the upper shoulder.

3. A swabbing tool comprising a head, a rod slidably mounted in the head, means in the head normally supporting the rod in a lowered position, means at the lower end of the rod to effect relative upward movement of the same, and means in the head to support the rod in its raised position.

4. A swabbing tool comprising a head, a rod slidably mounted in the head, means normally supporting the rod in a lowered position in the head, a valve at the lower end of the rod having an elongated stem adapted to effect relative upward movement of the rod, and means in the head to support the rod in raised position.

5. A swabbing tool comprising a head, a rod slidably mounted in the head and provided with vertically spaced shoulders, an expansion spring housed in the head and bearing on the rod to lower the same, a supporting element in the head normally engaging under the upper shoulder on the rod to support the rod in lowered position, and a latch mounted in the head and yieldably held to the rod to engage under the lower shoulder on the rod and support the rod in raised position, the latch and head being constructed to receive a latch-releasing tool.

In testimony whereof I affix my signature.

WILBERT H. HARDMAN. [L. S.]