Oct. 8, 1929. W. J. MITCHELL 1,730,619

DRILL ROD CLAMP

Filed Jan. 22, 1929 2 Sheets-Sheet 1

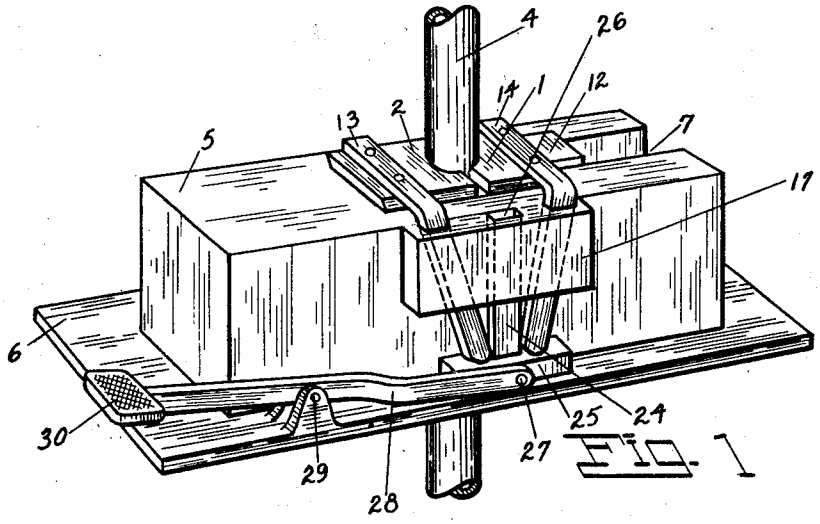


Fig. 1

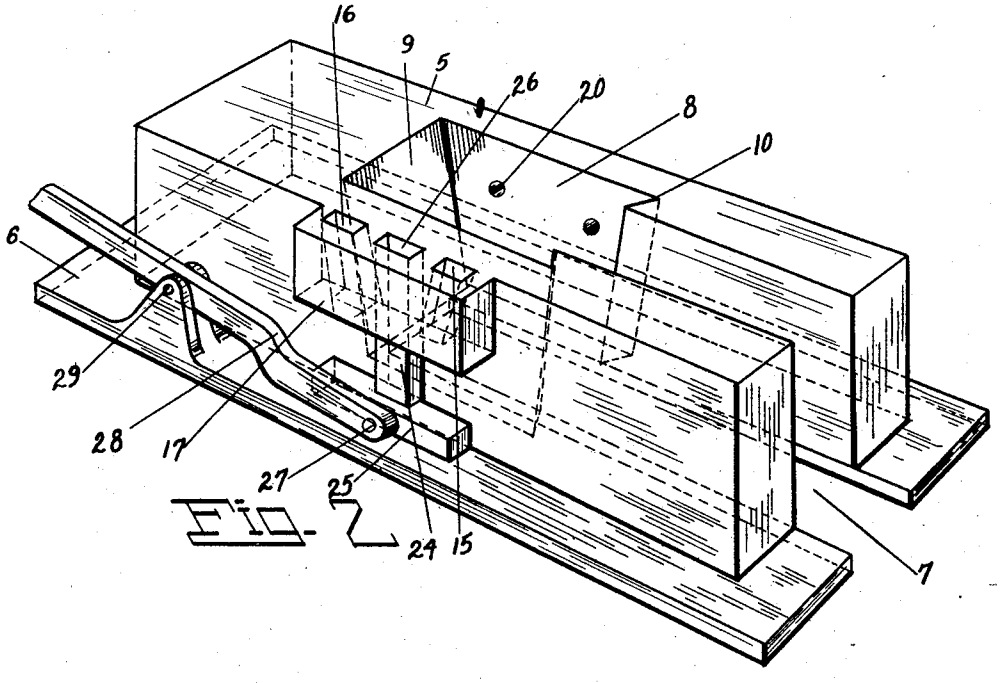


Fig. 2

William J. Mitchell *Inventor*

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DRILL ROD CLAMP

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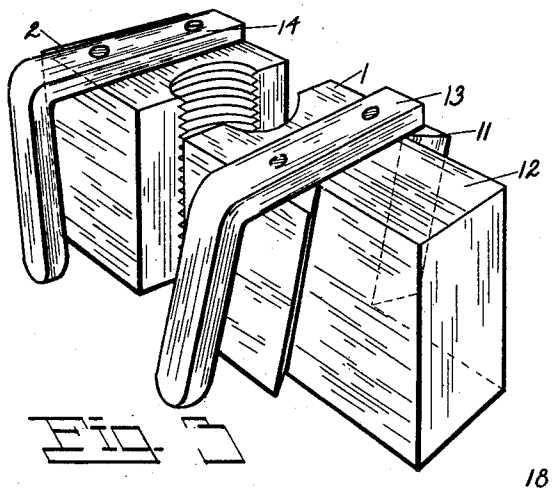


Fig. 1

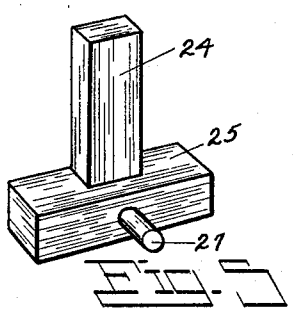


Fig. 5

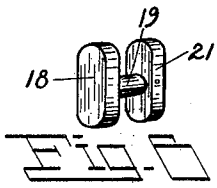


Fig. 6

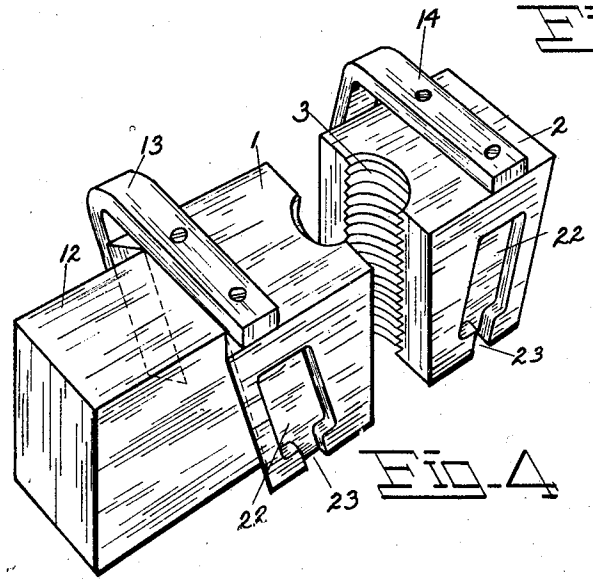


Fig. 4

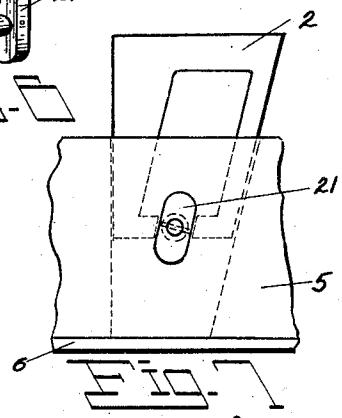


Fig. 7

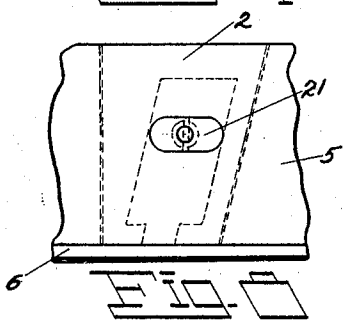


Fig. 8

William J. Mitchell *Inventor*

By *Herbert E. Smith*

Attorney

Patented Oct. 8, 1929 1,730,619

UNITED STATES PATENT OFFICE

WILLIAM J. MITCHELL, OF SPOKANE, WASHINGTON

DRILL ROD CLAMP

Application filed January 22, 1929. Serial No. 334,298.

My present invention relates to an improved drill rod clamp of the type employing two gripping jaws for supporting the drill rod and in which the drill rod is supported by, or depends upon its weight, for its support in the jaws of the clamp-head, and the clamp is so constructed that the jaws may slide in the head for the purpose of gripping the rod.

The device of my invention is particularly designed for use in the operation of drilling oil wells, artesian wells &c. where a rotary drill rod is employed, and the drill rod is lengthened by the addition of sections thereto to compensate for the growing depth of the well. Before an additional joint is inserted the driving head is removed, and before such removal the rod is temporarily clamped by the device of my invention while the changes are being made. In carrying out my invention, the appliance or device may with facility be slipped into operative position with relation to the drill rod, the jaws are readily adjusted for frictional engagement with the rod to secure a grip thereon, and the parts are held or retained in locked position while the required changes are being made in the drill rod. After the changes have been made, the jaws are with convenience released and the clamp device is quickly removed from its operative position, in order that time may be saved in the required changes, and that the drilling operations may proceed with dispatch.

The invention consists in certain novel combinations and arrangements of parts as will hereinafter be more fully set forth and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a perspective view of the clamp device of my invention showing its use in connection with a drill rod.

Figure 2 is a perspective view of the clamp head, the jaws being omitted, and showing the releasing mechanism for the jaws.

Figure 3 is a perspective view of the gripping or clamping jaws, detached, and as seen from the releasing side of the jaws.

Figure 4 is a perspective view of the two jaws, as seen from the side opposite to that of Figure 3 and illustrating the retaining recesses in the jaws.

Figure 5 is a perspective view of the releasing bolt for the jaws. Figure 6 is a perspective view of the retaining button for the jaws. Figure 7 is a side view of a part of the head showing one of the jaws with its locking button turned to release position, and Figure 8 is a similar view with the locking or retaining button turned to retaining position.

In carrying out my invention I utilize the pair of jaws 1 and 2 having the complementary curved and toothed gripping faces for frictional engagement with the drill rod 4.

The two jaws are supported in the rectangular clamp head 5 that is provided with a supporting plate or base plate 6, and at one end the head and plate are fashioned with an open slot 7, so that the head may be slipped or slid into operative position with relation to the drill rod that is to be clamped, and with equal facility the head may be withdrawn from the rod when not to be used.

A socket 8 is fashioned in the head, opening at the top and bottom thereof and provided with converging end walls as 9 and 10, the former being a flat face and the latter fashioned as undercut or dovetail grooves, one at, each side of the inner end of the slot 7, and the two jaws 1 and 2 are designed to seat in the socket. The jaw 2 has a flat, inclined outer face complementary to the face or wall 9 of the socket, and the other jaw 1 has at opposite sides undercut ribs 11 complementary to the grooves 10 and adapted to slide in the grooves. The jaw 1 has a narrow rectangular tongue 12 projecting from the ribs 11 which tongue moves within the slot 7 for guiding the movement of the jaw 1 as it moves up or down in the recessed head. The converging ribs and grooves and the faces of the jaw 2 and the complementary face of the socket, due to frictional contact

and the weight of the rod when the latter is clamped in the jaws, cause the jaws to grip the rod, and the heavier the weight of the rod the greater is the frictional grip of the jaws on the rod.

The jaws are released from the rod through pedal operated mechanism that lifts the jaws upwardly and away from the rod, and for this purpose the two jaws are provided with inclined guide arms 13 and 14 that converge on the same lines or are parallel with the converging lines of the two jaws. These arms are rigid with their respective heads and the arms are spaced from the alined sides of the heads so that they can fit into and be guided by the respective slots 15 and 16 in the side block 17 of the head. The block has a depth of approximately, the depth of the upper half of the head and the slots are spaced apart and arranged on converging lines complementary to the converging members of the jaws and the head.

Excessive upward or downward movement of the jaws within their supporting head is prevented by the use of a pair of turn buttons, one for each jaw and comprising a retaining head 18 on one end of a shank 19, that is journaled in a hole 20 in the wall of the socket, and the other end of the shank is provided with a turning head or handle 21 exterior of the head. Each jaw has an oblong recess 22 in its face and an opening or slot 23 is provided at the lower end of each recess, said slot being of sufficient width to permit the shorter axis of the retaining button 18 to pass therethrough as indicated in Figure 7. Thus the jaw is slipped down through the top of the socket in the head, as indicated in Figure 7, and then after the jaw has reached its operative position, the retaining head of the turn button is turned to right angles, as in Figure 8 with the longer axis of the retaining button or head across the width of the recess 22. The retaining head thus permits the required range of movement of the jaw, but also prevents its displacement due to excessive upward or downward movement. When the jaws are to be removed, the turn button is turned to position in Figure 7 to permit such removal.

For releasing the jaws from their grip on the rod I utilize a vertically disposed bolt 24 having a cross head 25, and a pin or trunnion 27 projecting from the cross head. The bolt is arranged in inverted position, to slide in a guide slot 26 located in the block 17 between the two inclined slots 15 and 16, and the upper face of the cross head is designed to frictionally engage the lower free ends of the arms 13 and 14 of the jaws, for the purpose of lifting the jaws as the bolt is elevated.

A lifting lever 28 is pivoted at one end on the pin 27 with its fulcrum pivot 29 in a bracket on the base plate 6, and the free end of the lever is formed as a pedal 30.

It will be apparent from an inspection of Figure 1 that as the pedal 30 is depressed the bolt and its cross head are elevated, and by the loose, frictional contact of the cross head with the two converging arms, the jaws are lifted to move on diverging lines and thus release their grips on the rod. The retaining heads 18 of the turn buttons permit this required movement, and if desired, after the jaws have been released from the rod, the turn button of the jaw 1 may be turned to release position in Figure 7 so that the jaw 1 may be lifted bodily from the socket, leaving an unobstructed slot 7 so that the clamp device may be slid away from the rod to permit the required operations.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:—

1. The combination in a rod clamp with a pair of jaws adapted to move upwardly on diverging lines, and a socketed head for the jaws, of guide arms on the jaws and guides therefor on the head, a lift bolt having a cross head for contact with said arms, and means for lifting the bolt.

2. The combination with a head having guide slots and a socket, a pair of jaws in the socket adapted to move upwardly on diverging lines, and guide arms on the jaws slidable in the slots, of a slide bolt supported intermediate of the arms and provided with a cross head for contact with the ends of the arms, and a pivoted pedal lever for lifting the bolt.

3. The combination with a head having a socket therein formed with an end slot, said socket having a tapered wall, and undercut tapered grooves at the junction of the slot with the socket, of a pair of gripping jaws one of which has a face complementary to the tapered wall, undercut tapered ribs on the other jaw for co-action with said grooves, a tongue on the latter jaw movable in the slot, and means for lifting the jaws.

4. The combination, in a rod clamp with a socketed head and a pair of opposed gripping jaws therein, and means for lifting said jaws, of a retaining device for each jaw comprising a turn button having a retaining head, and said jaws each having a wide groove in one face and a narrower, open slot communicating therewith, whereby the turn buttons may be engaged in the grooves or detached therefrom.

In testimony whereof I affix my signature.

WILLIAM J. MITCHELL.