Nov. 14, 1939. J. C. MASON 2,179,557

HYDRAULIC DRILLING JACK

Filed Feb. 23, 1937 2 Sheets-Sheet 1

Fig. 1.

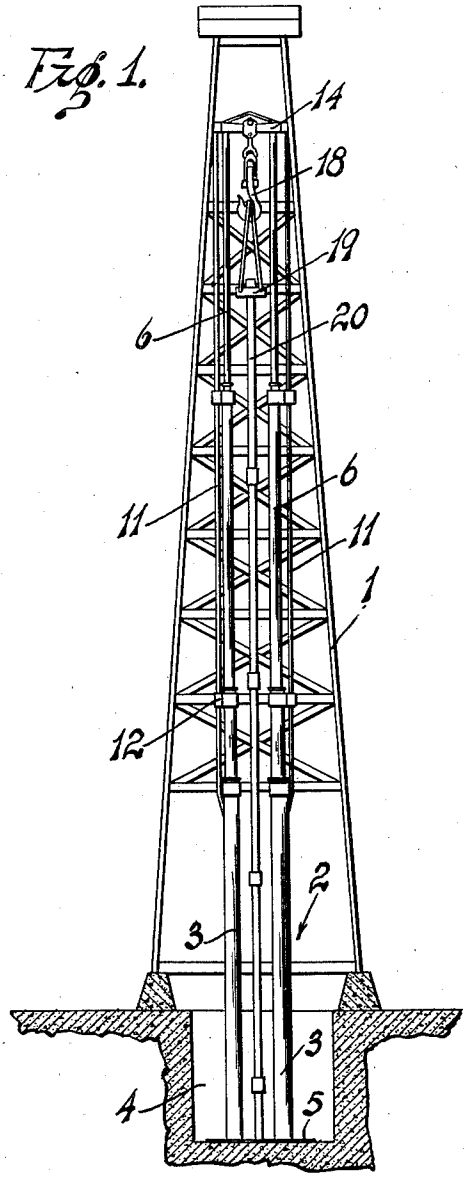


Fig. 2.

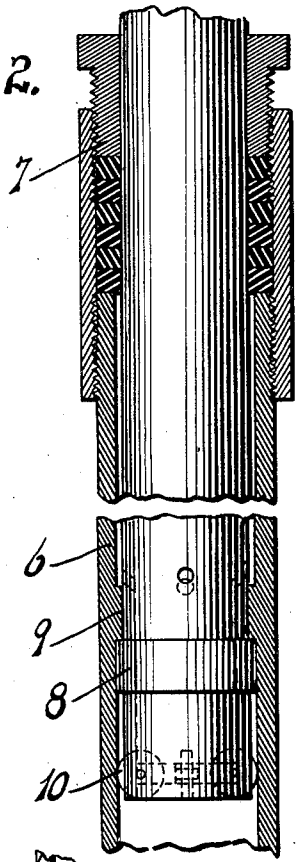


Fig. 3.

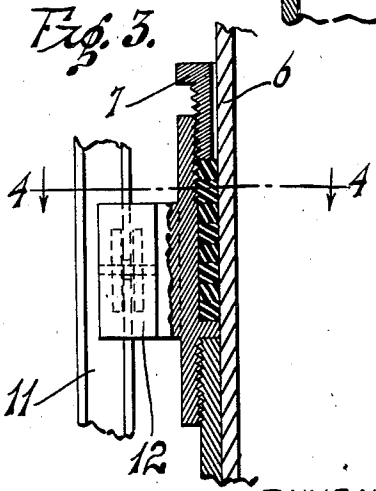
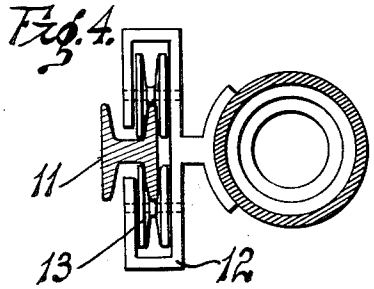


Fig. 4.



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Nov. 14, 1939. J. C. MASON 2,179,557

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Filed Feb. 23, 1937 2 Sheets-Sheet 2

Fig. 5.

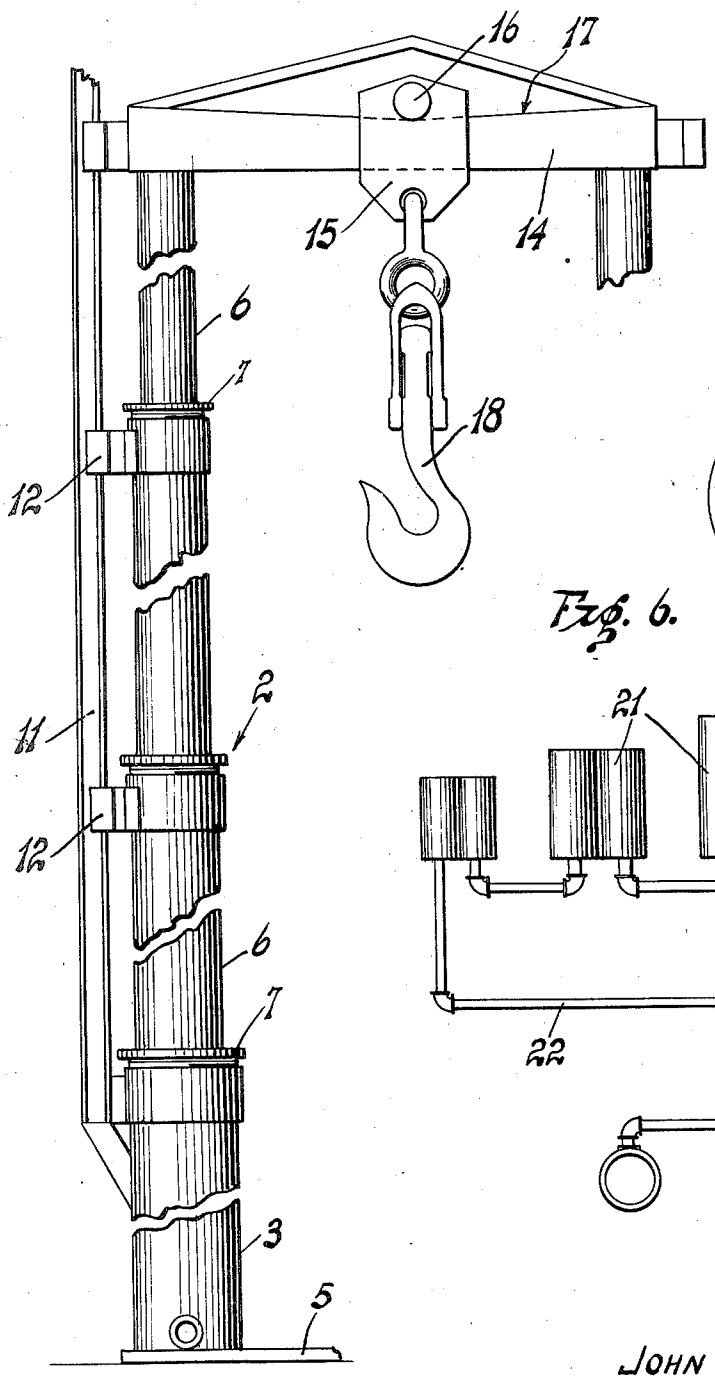


Fig. 6.

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HYDRAULIC DRILLING JACK

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Application February 23, 1937, Serial No. 127,054

2 Claims. (Cl. 254—30)

In hydraulic jacks heretofore in use, a single lift type was employed which necessitated the boring of deep holes below the derrick into which the jack was set, the reason for this construction being, that in a single lift type of jack, great length is required in the stationary member in order to elevate the blocks to the top of the derrick.

An object of my invention is to provide a multiple lift type of jack, the stationary part of which need not be set a great distance into the ground and still a sufficient lift is provided so that the blocks can be raised approximately to the top of the derrick.

Another object of my invention is to provide a novel means of guiding the movable sections of the jack so that the sections will move easily and in proper alignment when fluid pressure is applied to them.

Still another object is to provide a novel and simple jack construction which can be easily installed without requiring extensive excavation or drilling and which will operate effectively for the intended purpose.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed discription and the appended claims.

In the drawings:

Figure 1 is a side elevation of my jack in position in a derrick.

Figure 2 is a fragmentary longitudinal sectional view of a section of the jack.

Figure 3 is a fragmentary longitudinal sectional view of the jack showing a fragment of the guiding beam.

Figure 4 is a sectional view taken on a line 4—4 of Figure 3.

Figure 5 is a fragmentary side elevation of my jack on an enlarged scale.

Figure 6 is a diagrammatic plan view of the jack and pumping equipment.

Referring more particularly to the drawings, the numeral 1 indicates a derrick of usual and well known construction. The jack 2 is adapted to extend upwardly within the derrick and as shown in Figure 1, the bases 3 of the jack are fastened securely in relatively shallow excavation 4, below the floor of the derrick.

With my jack, as will be subsequently described, it is not necessary to have a deep excavation. The usual cellar below a derrick is deep enough to accommodate the foundation for the jack. The jack is preferably mounted securely in the cellar 4, on a bed plate 5, which rests on a concrete foundation or piers, thus holding the bases 3, in parallel alignment. As previously stated each lift of the jack consists of a stationary base and a plurality of telescoping and extensible lift sections 6. Each of the lift sections extend through a packing gland 7, which packs off each lift section and prevents leakage. Each lift section is provided with a collar 8, adjacent the lower end thereof, which engages an inwardly extending shoulder 9, in the co-acting section thus, limiting the upward movement of each lift section. A roller guide is also provided adjacent the lower end of each lift section consisting of a plurality of rollers 10, journaled in the one lift section and engaging the inner wall of the co-acting section. A further external guide is provided for the movable sections of the jack, consisting of vertical guide beams 11, which are secured at the lower end to the bases 3 and at the upper end to a suitable transverse member of the derrick 1. A plurality of arms 12, are fixedly secured to the various lift sections 6, and each of the arms carry rollers 13, which engage both sides of the beam 11, thus effectively guiding the lift sections in their vertical movement.

A header beam 14, is fixedly secured to the upper ends of the upper-most lift section 6. This header beam extends horizontally between the extensible jacks and this beam carries a rider 15. A roller 16, is journaled in the rider and this roller rides on the upper surface of the beam 14. For the purpose of centralizing the rider, the upper surface 17, of the header beam slopes from both sides toward the center as shown in Figure 5. A hook 18, is carried by the rider 15 and this hook engages and supports an elevator 19, the elevator in turn grasps the pipe or casing 20, for the purpose of elevating or lowering the same in the well. A multi-stage pump 21, forces fluid under pressure through the pipe 22, past the control valve 23 and thence into both of the lifts of the jack, through the manifold 24.

When lowering the jack, the control valve 23 is so adjusted that fluid drains from the jack into the pipe 25, and thence into the supply tank 26. The weight of the stand of pipe supported by the jack, is sufficient to telescope the lift sections 6 and eject the fluid from the jack. The pipe is thus gradually lowered into the well as required in certain operations, for example, the drilling of an oil well.

The various lift sections are preferably tubular in form and are closed at one end so that a head is provided against which the fluid under pressure, can operate to extend the jack.

Having described my invention, I claim:

1. A hydraulic drilling jack comprising a pair of parallel lifts, each lift including a stationary base fixedly supported below a derrick, a plurality of telescopically mounted lift sections rising from each base, a header beam supported by the uppermost of said lift sections, a hook swung from the header beam, a vertical guide beam fixedly mounted adjacent said lift sections and an arm on each of the lift sections engaging the guide beam, and stop means engageable by each of the lift sections whereby the upward movement thereof is limited, and roller guides adjacent the lower end of each of the lift sections, said roller guides engaging the wall of the adjacent section.

2. A hydraulic drilling jack, adapted for use in a derrick, comprising a pair of parallel lifts, each lift including a stationary base fixedly supported below the derrick, a plurality of telescopically mounted lift sections rising from each base, a header beam supported by the uppermost of said lift sections, and attached thereto, a hook swung from the header beam, a vertical guide beam fixedly attached at its lower end, to the bottom lift section, the upper end of the beam being attached to the derrick, and an arm on each of the lift sections engaging the guide beam, and stop means engageable by each of the lift sections, whereby the upward movement thereof is limited, and roller guides adjacent the lower end of the lift sections, said roller guides engaging the wall of the adjacent section.

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