

No. 654,706.

Patented July 31, 1900.

H. E. BRAYMER.
OIL WELL PUMP.

(Application filed Mar. 26, 1900.)

(No Model.)

Fig. 1.

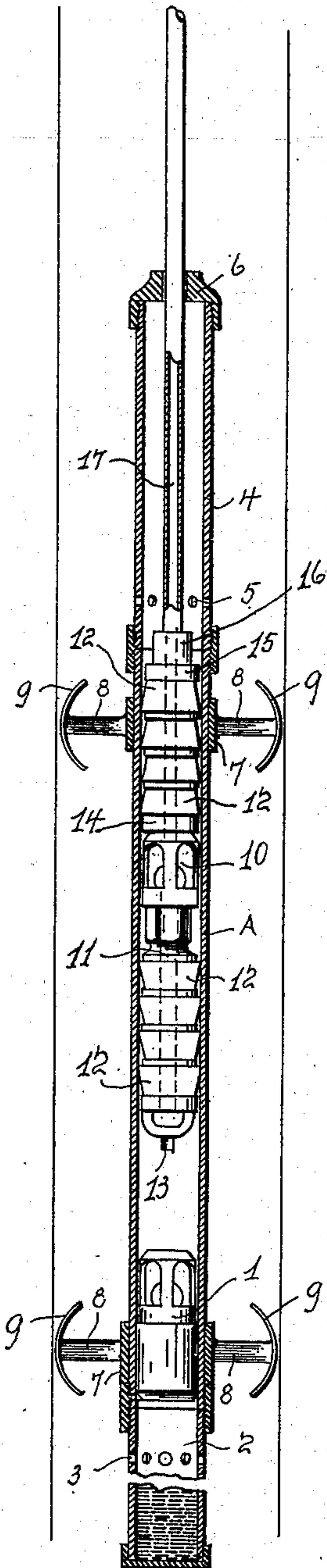


Fig. 3.

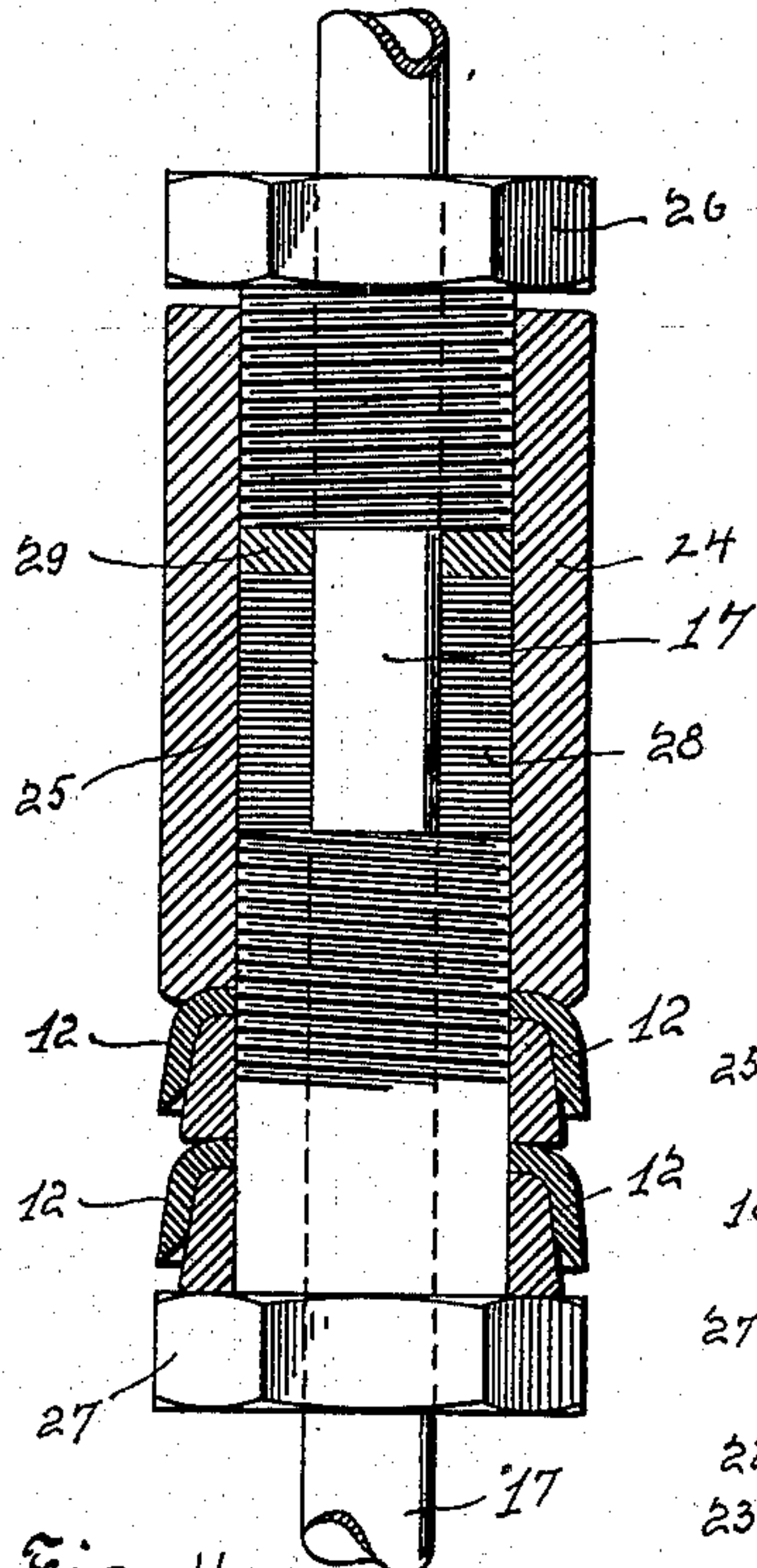


Fig. 2.

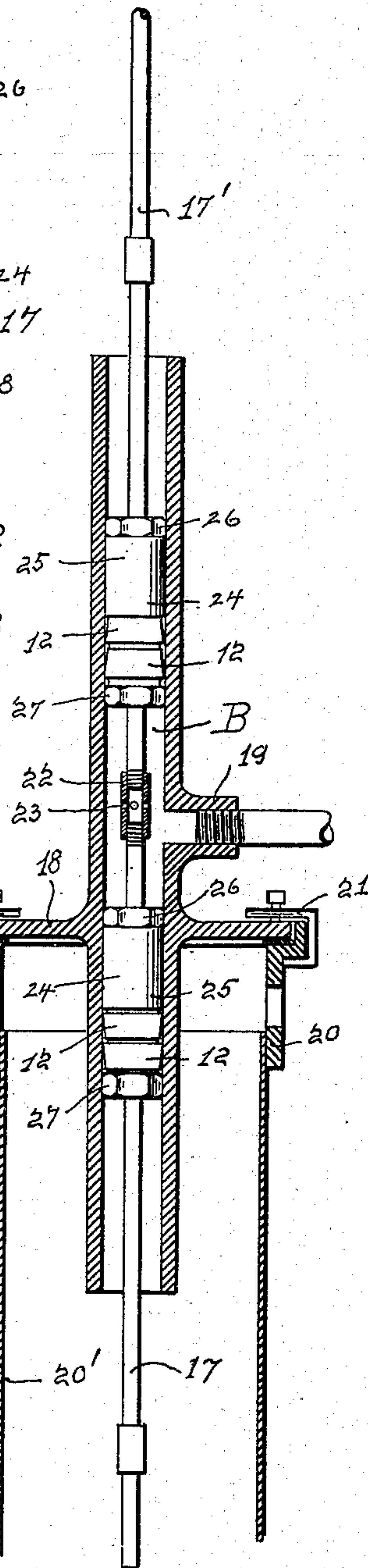
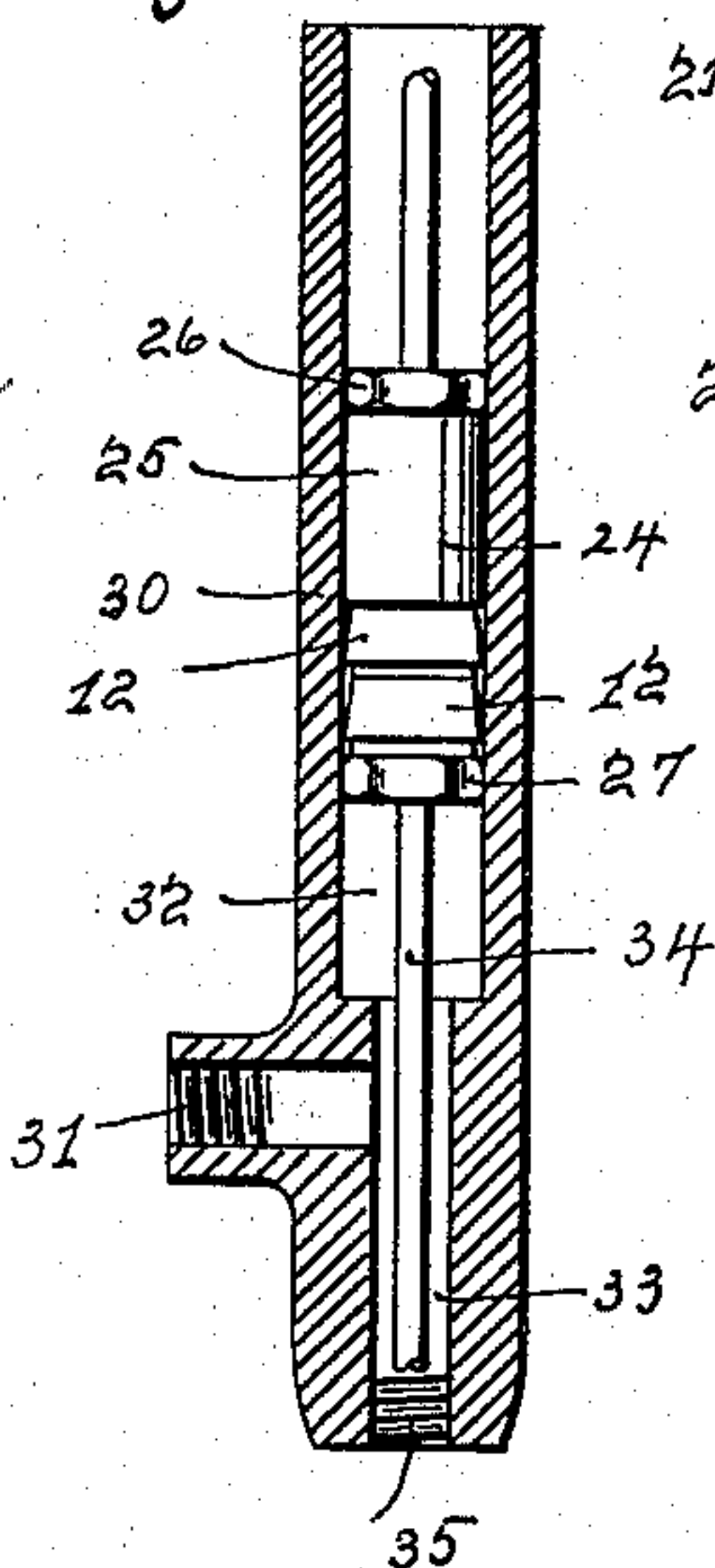


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARLEY E. BRAYMER, OF PRAIRIE DEPOT, OHIO, ASSIGNOR OF ONE-HALF
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OIL-WELL PUMP.

SPECIFICATION forming part of Letters Patent No. 654,706, dated July 31, 1900.

Application filed March 26, 1900. Serial No. 10,131. (No model.)

To all whom it may concern:

Be it known that I, HARLEY E. BRAYMER, a citizen of the United States, residing at Prairie Depot, in the county of Wood and State of Ohio, have invented new and useful Improvements in Oil-Well Pumps, of which the following is a specification.

My invention relates to a pump for oil-wells, and has for its objects to provide an efficient apparatus of the kind at greatly-reduced first cost and that may be economically operated; furthermore, to facilitate the removal of the paraffin sediment from the discharge-conduit; furthermore, to lessen the labor of withdrawing the apparatus from the well, and, finally, to provide a tubular sucker-rod that will perform the functions of both the tubing and solid sucker-rod ordinarily used.

The objects of my invention are accomplished by providing a pump-barrel located and anchored in the bottom of the well and having the usual standing valve, with a reciprocating valve attached to a tubular sucker-rod adapted to deliver the oil through the sucker-rod and through a suitable casing-head barrel into the distributing-pipe system, as hereinafter described.

In the drawings, Figure 1 is a vertical transverse section of the pump-barrel and valves constructed in accordance with my invention and located at the bottom of the well. Fig. 2 is a like view of the casing-head barrel. Fig. 3 is an enlarged view of a packing-head. Fig. 4 is a view of a packing-head employed as a substitute for the stuffing-box when a solid sucker-rod is used.

Referring to the drawings, A is the barrel of the pump, which is formed of a section of tubing of a length adapted to the reciprocation of the working valve and is provided with the usual standing valve 1, secured in the bottom of the barrel. Coupled to the lower end of the barrel A is a tubular anchor 2, constructed of one or more lengths of tubing closed at the lower end and filled with sand or metal, to anchor the barrel at the proper distance above the bottom of the well. Anchor 2 is provided with perforations 3 near its top for the admission of oil to the barrel. To the top of the barrel A is coupled an ex-

tension 4 of tubing of the same size as the barrel to extend it to the desired length above, the lower end of which is provided with perforations 5 and the upper end with a reducer-cap 6, having an orifice adapted to admit the sucker-rod. At intervals throughout the length of the barrel A its extension 4 and its anchor 2 are provided with collars 7, having radial arms 8, provided with vertical crescent-shaped guides 9 at their ends adapted to hold the barrel, its extension, and anchor central within the cavity of the well.

10 is the reciprocating valve, which is a modification of the caged ball-valve in general use in oil-wells, which as usually constructed is provided with a downward tubular extension 11, secured to the lower end of the cage, having a plurality of packing-cups 12 secured therein by the open end piece 13 and forming an entrance-port and packing for the valve. As used in my invention, in addition to the downward tubular extension 11 valve 10 is also provided with an upper tubular extension 14, adapted to threaded engagement with the upper end of the valve-cage, forming an exit-port for the valve, and having a shoulder-flange 15 near its upper end, and with a plurality of packing-cups 12, inverted and held in position between flange 15 and the top of the cage when the extension is secured thereto. The upper end of extension 14 is exteriorly threaded and provided with a coupling 16.

Instead of the solid sucker-rod ordinarily used I employ a tubular rod 17, made of lengths of tubing coupled together with pipe-couplings to form a rod of the requisite length for the well, the lower end of which, extending through the orifice in the reducer-cap 6, is secured to the valve 10 by coupling 16. Thus constructed it is apparent that as valve 10 is reciprocated within the barrel the oil will be lifted and forced upward through the tubular sucker-rod 17, which thus forms a substitute both for the tubing and the solid rod ordinarily employed and renders any other tubing unnecessary, thereby greatly reducing the cost of construction.

As means for delivering the oil as pumped through the tubular sucker-rod 17 I provide at the top of the well a barrel B, having a

supporting-flange 18 and a centrally-located lateral branch 19 for connecting it with the distributing-pipe system, both integral therewith. Flange 18 is adapted seat in the top of the casing-head 20, form a closure therefor, and support the barrel B in a vertical position central thereto, with the lower end of the barrel within the casing 20 and the lateral branch 19 and the upper end above the casing-head. In this position barrel B is secured to the casing-head 20 by clamps 21, adapted to engage flange 18 and the top flange of the casing-head and provided with set-screws adapted to tighten the flange 18 in its seat.

The upper end of the tubular sucker-rod 17 is extended centrally through barrel B and is coupled at the top to a solid rod 17', connected to the pump-jack. The upper length of tubing of sucker-rod 17 is divided into two sections coupled together by an elongated sleeve-coupling 22, having central perforations 23, through which the oil may flow from the sucker-rod into the barrel B. Sleeve 22 is located so that at the center of the stroke of the rod it will be opposite the opening of the lateral branch 19, and at equidistant points above and below the sleeve 22, not less than the length of the stroke of the rod, sucker-rod 17 is provided with packing-heads 24, each comprising a sleeve 25, internally threaded at the ends, externally-threaded plugs 26 and 27, adapted to threaded engagement with the threaded ends of the sleeve and provided with orifices adapted to receive the sucker-rod 17, a compressible cylindrical gland 28, of any suitable compressible material, within the sleeve 25 around the rod and interposed between the plugs, a metallic washer 29, and a plurality of packing-cups 12. Plug 27 is elongated and shouldered to receive the packing-cups 12 and adapted to compress them against the end of the sleeve and engage one end of gland 28 when it is run into the sleeve. By inserting washer 29 within the sleeve at the opposite end of the gland 28 and running down plug 26 thereon the gland 28 may be compressed tightly around the sucker-rod, and thereby frictionally secure the packing-head 24 on the rod at any desired position and will move with it in its reciprocation and pack the barrel. The cups 12 are placed on the plugs 27 in an upright or inverted position, according as required to retain the oil. As used in barrel B the cups on the upper head 24 are inverted, whereby the oil flowing through the perforations of coupling 22 into barrel B is confined between the upper and lower packing-heads 24 and forms a head of oil reciprocating with the heads, which is discharged through branch 19 into the distributing-pipe system.

When it is desired to lift the pumping apparatus from the well for any purpose, the tubular sucker-rod 17 is drawn upward until the cage of valve 10 is on a level with the perforations 5 in the extension 4, in which posi-

tion the oil remaining in the sucker-rod 17 will flow back into the well, after which the sucker-rod may be further lifted, and when the coupling 16 at the top of valve 10 comes into contact with the reducer-cap 6 of extension 4 the barrel A, together with its anchor 2, will be lifted with it, the arms and guides of the collars 7 serving to keep it centrally within the cavity of the well and preventing it from catching in any inequalities in its wall, as the entire apparatus is thus lifted to the top of the well. In like manner the barrel A and its anchor may be again lowered into its position in the bottom of the well. By uncoupling the top of the tubular sucker-rod 17 from the solid rod 17' a small rod may be lowered through the sucker-rod, which being reciprocated therein will readily dislodge any paraffin sediment deposited on the wall of the tube.

Fig. 4 shows a modified form of casing-top barrel by which when attached to a well having stationary tubing a packing-head 24 may be substituted for the ordinary stuffing-box and the necessity for a polished rod avoided. In this modified form the barrel 30, having a lateral branch 31, an enlarged orifice 32 above the branch, and a reduced orifice 33 at the lower end corresponding in diameter with the tubing of the well and having the lower end 35 internally threaded to receive a nipple by which it may be connected to the top of the tubing of the well, is substituted for the T and pipe ordinarily employed, and upon the solid sucker-rod 34, within the enlarged orifice 32, a packing-head 24, with the packing-cups inverted, is secured in the manner hereinbefore described, which, moving with the rod as it reciprocates, packs both the barrel 30 and the rod 34. By this construction the use of a stuffing-box and a polished rod is avoided and the construction cheapened.

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

1. In an oil-well pump, the combination of a pump-barrel having a lower and an upper extension, the lower extension being weighted within to adapt it for an anchor for the barrel, and perforated, and the upper extension being perforated above its connection with the barrel and provided with a cap having a reduced orifice; spiders secured at intervals to the pump-barrel and its extensions; a standing valve in the lower end of the pump-barrel; a reciprocating valved piston within the pump-barrel, comprising a central cage inclosing a valve and upper and lower tubular extensions of the cage, forming exit and entrance ports of the valve, each provided with a plurality of packing-cups, the cups of the lower extension being faced upward and those of the upper extension being faced downward and adapted to pack the valved piston thus formed within the barrel-cylinder; a casing in the top of the well; a casing-head secured to the top of the casing; a casing-head bar-

rel secured to and supported by the casing-head, having a lateral branch for connecting the barrel to the distributing-pipe system; a tubular sucker-rod extended through the casing-head barrel into the pump-barrel, through the cap of the upper extension thereof, said sucker-rod being formed of coupled lengths of tubing, the upper length of which is divided into two sections coupled together with a perforated sleeve-coupling within the casing-head barrel; packing-heads secured on the sucker-rod within the barrel, above and below the perforated sleeve-coupling; a solid rod coupled to and closing the upper end of the sucker-rod, adapted to connect it with the pumping-jack, and a coupling within the pump-barrel adapted to couple the lower end of the sucker-rod to the reciprocating valved piston, as and for the purpose described.

2. In an oil-well pump, the combination of

a casing-head top having a barrel provided with a lateral branch, a packing-head movable therein, and comprising a tubular sleeve internally threaded at both ends, externally-threaded plugs adapted to threaded engagement with the ends of the sleeve and provided with orifices to receive a sucker-rod, a compressible cylindrical gland within the sleeve around the rod, interposed between the plugs and adapted to be compressed thereby to frictionally secure the sleeve to the rod, and packing-cups upon one of the plugs and adapted to be compressed thereby against the sleeve to pack the barrel.

In witness whereof I have hereunto set my hand this 20th day of March, A. D. 1900.

HARLEY E. BRAYMER.

Witnesses:

FRANKLIN S. MACOMBER,
HERMAN H. MARTIN.