

W. H. LARKEN & J. D. BROODER.

OIL WELL PACKER.

APPLICATION FILED JUNE 27, 1906.

FIG. 6.

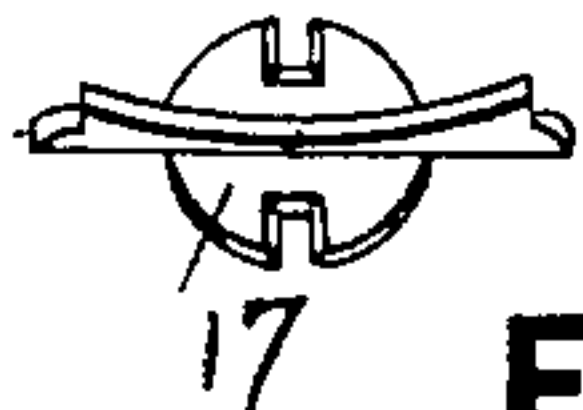


FIG. 1

FIG. 2

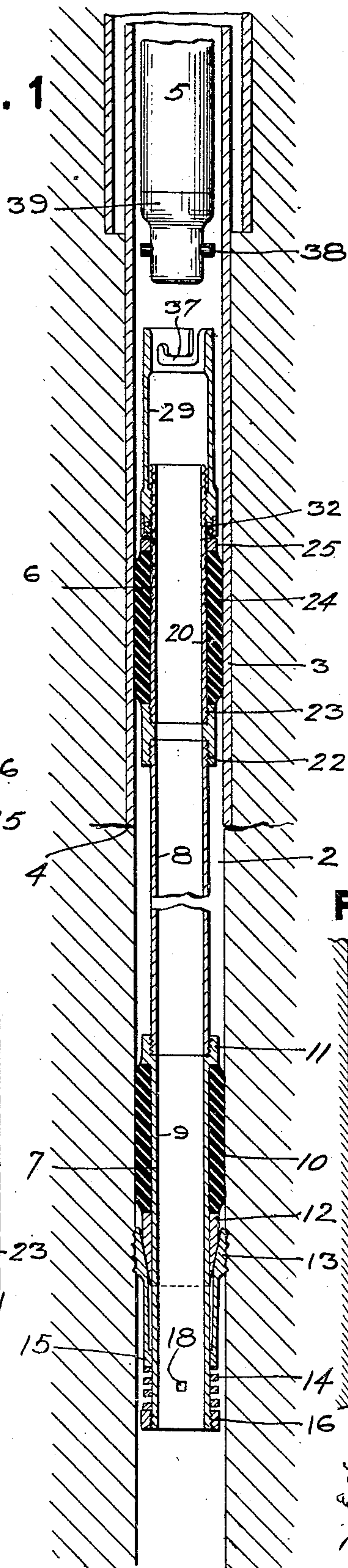
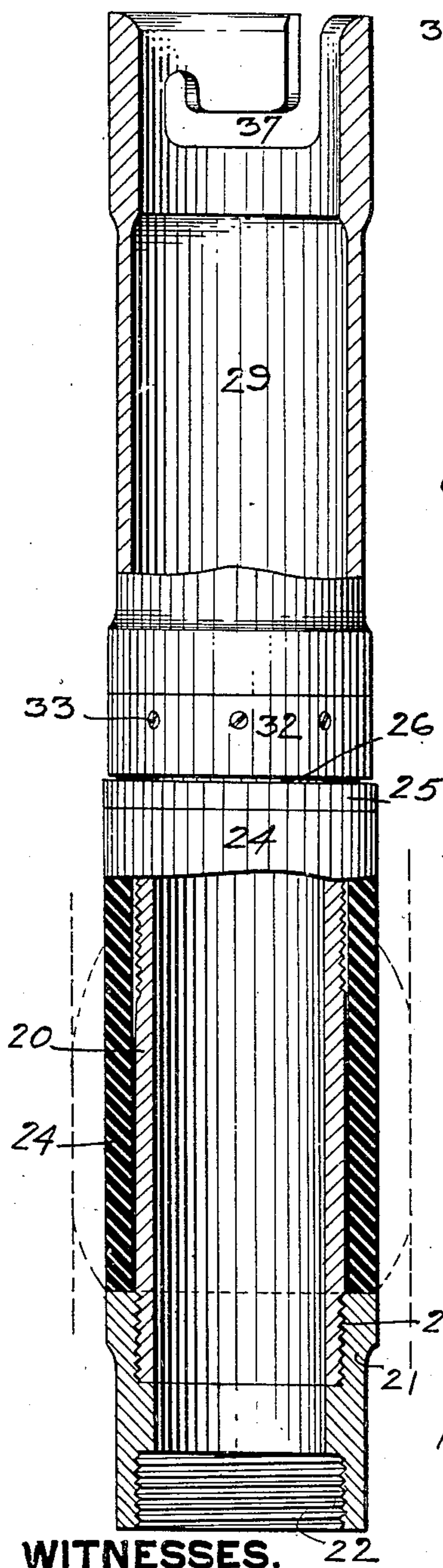


FIG. 3

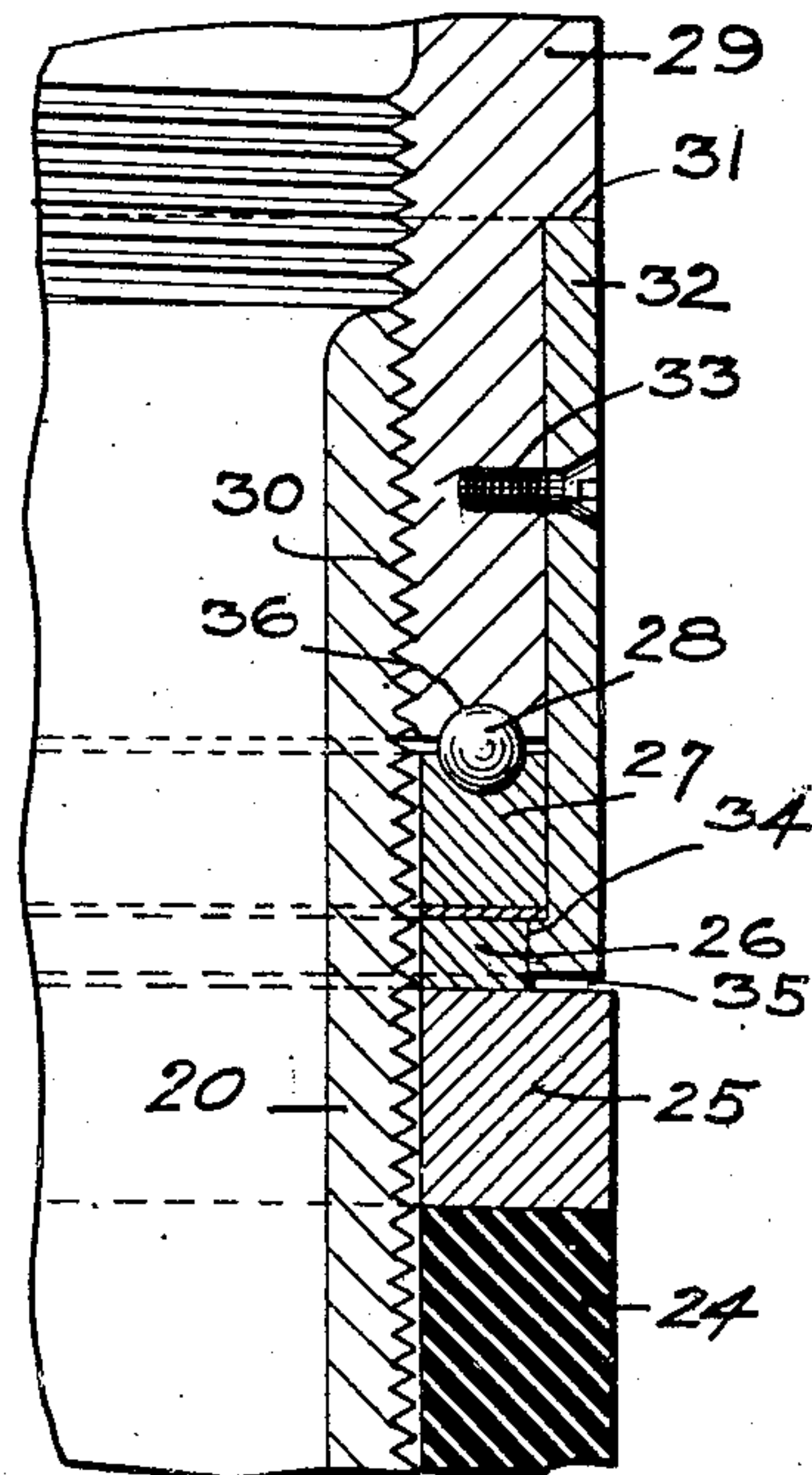
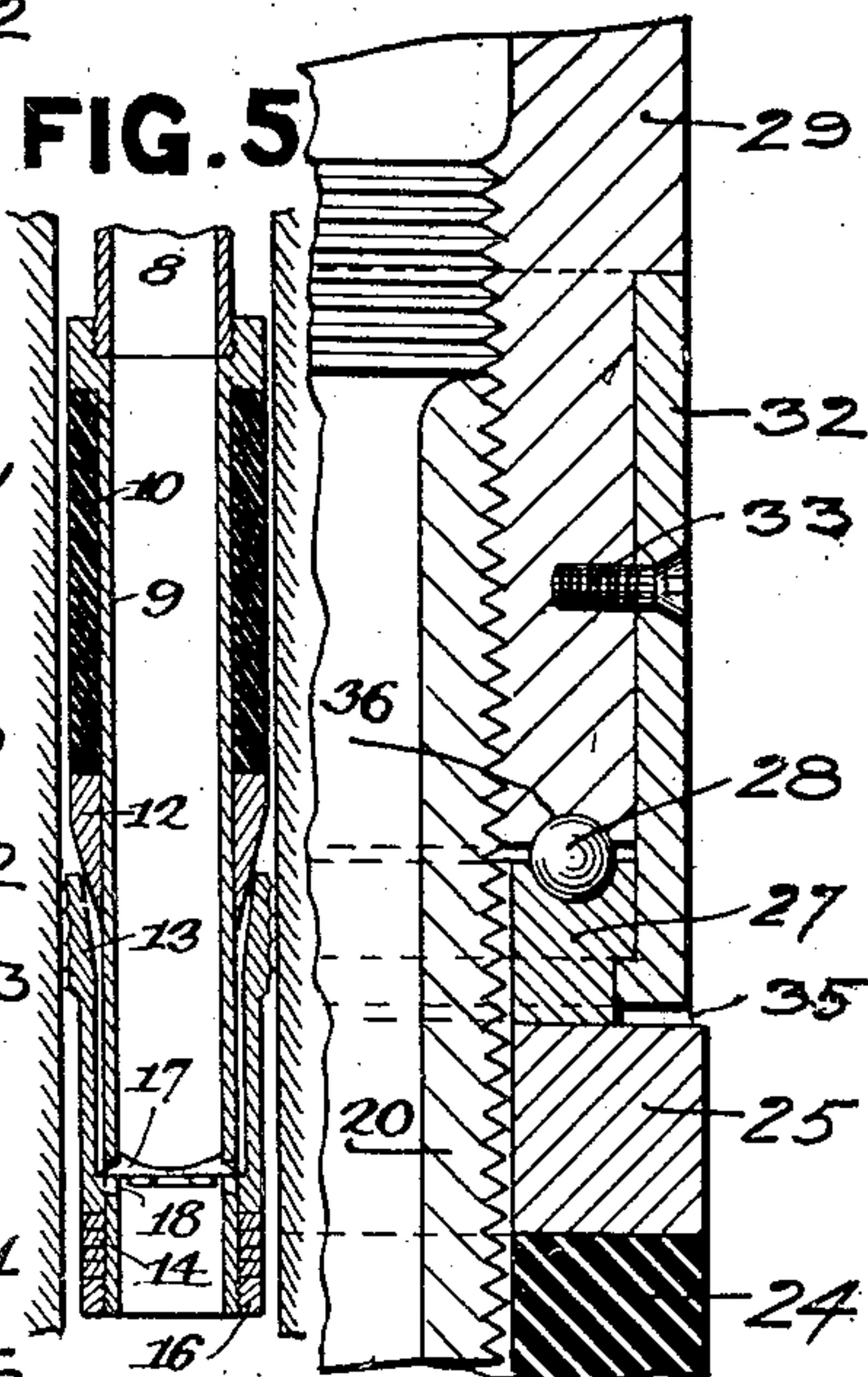


FIG. 4

FIG. 5



WITNESSES.

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UNITED STATES PATENT OFFICE.

WILLIAM H. LARKIN, OF BUTLER, AND JOHN D. BROODER, OF KANE, PENNSYLVANIA.

OIL-WELL PACKER.

No. 859,304.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed June 27, 1906. Serial No. 323,751.

To all whom it may concern:

Be it known that we, WILLIAM H. LARKIN, a resident of Butler, in the county of Butler and State of Pennsylvania, and JOHN D. BROODER, a resident of Kane, in the county of McKean, State of Pennsylvania, have invented a new and useful Improvement in Oil-Well Packers; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to packers for oil, gas and like deep wells, its object being to provide a packer which may be lowered on a string of tubing down through the casing and be packed at a point in the well below the casing and at a point within the casing, so as to shut off any leakage occurring at the bottom of the casing.

To these ends our invention comprises the novel features hereinafter set forth and claimed.

In the accompanying drawing Figure 1 is a sectional view in elevation of a portion of a well with our improved packer therein; Fig. 2 is an enlarged view partly in section of the upper packer; Fig. 3 is an enlarged detail view showing the ball bearing construction; and Fig. 4 is a modified form. Fig. 5 is a sectional view of the lower packer taken at the opposite angle to that shown in Fig. 1; and Fig. 6 is a view of one of the disks.

In oil and deep wells of this character a leak is liable to occur just below the casing where it rests upon the surrounding rock, and in order to shut off the water at this point it has been necessary heretofore to lower a string of tubing with the packers thereon and pack the well at points above and below the leak, the string of casing on which the packers were lowered being allowed to remain within the well. By our invention, however, we provide for the shutting off of the water at such point and provide for the withdrawal of the tubing upon which the packers were lowered.

In the drawing the numeral 2 designates an oil or like well and the numeral 3 designates the casing which rests upon the shoulder 4 formed in the well. It is at this point that the leakage is liable to occur and the well must be packed at points above and below this shoulder 4. To accomplish this we lower by means of the tubing 5 the packers 6 and 7 which are connected by the proper sections of tubing 8. The lower packer 7 may be of what is known as the disk type, which comprises the packer body 9 with the rubber sleeve 10 interposed between the threaded collar 11 and the cone 12. The wedge arms 13 are adapted to engage the cone 12 and the walls of the well so as to sustain the packer and distend the rubber sleeve 10. Below the arms 13 is the spring 14 which is adapted to force up the arms 13, said spring being interposed between a ring 15 connecting the lower ends of said arms and the threaded collar 16. In order to hold the arms 13 down so that they will not engage the walls of the well in lowering the packer 7 a disk 17 is employed

which engages the spring 14 and passes through openings 18 in the packer body. As soon as the packer 7 has been brought to the point where it is desired to pack, a weight of any desired character is dropped down through the tubing and this weight breaks said disk and frees the spring 14 so that it carries up the arms 13 to engage the sides of the well to prevent the further movement of the packer. The construction of this packer 7 known as the disk packer, is an old and well known device and we do not make any claim to its construction.

The packer 6 comprises the body portion 20 to the lower end of which is secured the collar 21, the threaded portion 22 of which engages the tubing 8, while the threaded portion 23 engages the body 20 of the packer. Surrounding the body 20 of the packer is the rubber sleeve 24 which is interposed between the collar 21 and the loosely mounted ring 25. Resting on the ring 25 is the washer 26 preferably of brass. A ball-race 27 is located above the washer 26, said ball-race having the balls 28 therein.

An extension sleeve 29 is internally threaded and engages the threaded portion 30 of the body 20. This extension 29 is cut away as at 31 to receive the sleeve 32 secured thereto by the screws 33. This sleeve 32 has the inwardly projecting flange 34 which is adapted to engage the ball-race ring 27. This sleeve 32 does not rest upon the ring 25 but a space 35 is left between the lower end of said sleeve and the ring 25 so that the turning of said extension 29 does not create any friction between said sleeve and the ring 25.

An annular groove 36 is formed in the lower face of the extension 29 to receive the upper portion of the friction balls 28.

At the upper end of the extension 29 is the bayonet joint slot 37 which is adapted to be engaged by the corresponding bayonet joint lugs 38 on the connection 39 secured to the lower end of the tubing 5.

The packers 6 and 7 together with the connecting casing 8 are lowered into the well by means of the tubing 5 which engages the extension 29 by means of the bayonet joint connection, and when the packers have been brought to the proper position the lower packer 7, as above described, is packed by dropping a weight to break the disk 17, whereupon the weight of the tubing being lowered acts to pack the packer 7 securely in place. In order to pack the upper packer the tubing 5 is turned and the extension 29 with it. As the extension 29 is turned it screws down upon the body 20 of the packer and the rubber sleeve 24 is distended so as to be forced out against the walls of the casing 3. The ball bearing permits the ready movement of the sleeve 29 so as to force out the packer, and as the lower end of the sleeve 32 is not in frictional contact with the ring 25 no friction is created at this point, while the brass washer 26 reduces the friction between the lower

end of sleeve 29 and the ring 25. In this way the packer 6 is properly packed, and when packed by turning the tubing 5 and lifting up thereon the tubing 5 is disengaged from the extension 29 and the tubing 5 may then be withdrawn from the well, leaving the packers securely packed in position at the desired points.

In Fig. 4 we have illustrated a modified form of our invention in which the washer 26 is dispensed with, the construction in other respects being the same as that above described.

In case it is desired to remove the packers from the well it is only necessary to lower the string of tubing 5 and connect up the bayonet joint, whereupon by rotating the tubing 5 the upper packer 6 is unpacked. It will be apparent from the construction of the packer 7 that while it cannot be lowered after once set it can be raised. As a consequence, after the upper packer 6 has been unpacked by drawing up on the tubing 5 the lower packer will be drawn up at the same time as the wedge arms 13 will be carried down by contact with the walls of the well and allowed to be moved upward.

What we claim is:

1. In a packing device for oil and like wells, the combination of a body-portion, an elastic sleeve, an abutment below said sleeve, a rotary extension above said sleeve, a ring between said rubber sleeve and said extension, a sleeve on said extension having a shoulder, and a ball bearing interposed between said shoulder and the lower

end of said extension, a space being left between the lower end of said second sleeve and said ring.

2. In a packing device, the combination of a body portion, an elastic sleeve, an abutment below said sleeve, a rotary extension above said sleeve, a ring at the upper end of said rubber sleeve, a ball-race ring above said first ring, balls interposed between said ball-race ring and the lower end of said extension, and a sleeve on said extension having a shoulder engaging the ball-race ring, a space being left between said second sleeve and said first ring.

3. In a packing device, the combination of a body portion, an elastic sleeve, an abutment below said sleeve, a rotary extension above said sleeve, a ring at the upper end of said rubber sleeve, a ball-race ring above said first ring, balls interposed between said ball-race ring and the lower end of said extension, a washer between said rings, and a sleeve on said extension having a shoulder engaging the ball-race ring, a space being left between said second sleeve and said first ring.

4. In a packing device for oil or like wells, the combination of a body portion, an elastic sleeve, an abutment below said sleeve, a rotary extension above said sleeve, a sleeve on said extension having an inwardly projecting portion, and a ball bearing supported by said inwardly projecting portion and interposed between the lower end of said extension and said elastic sleeve.

In testimony whereof, the said WILLIAM H. LARKIN and JOHN D. BROODER have hereunto set their hands.

WILLIAM H. LARKIN.

Witnesses:

ROBT. D. TOTTEN,
ROBERT C. TOTTEN.

JOHN D. BROODER.

Witnesses:

JOHN F. WILL,
J. R. KELLER.