

H. J. GORMAN.  
TENSION DEVICE FOR OIL WELL PUMPS.

APPLICATION FILED MAY 23, 1904.

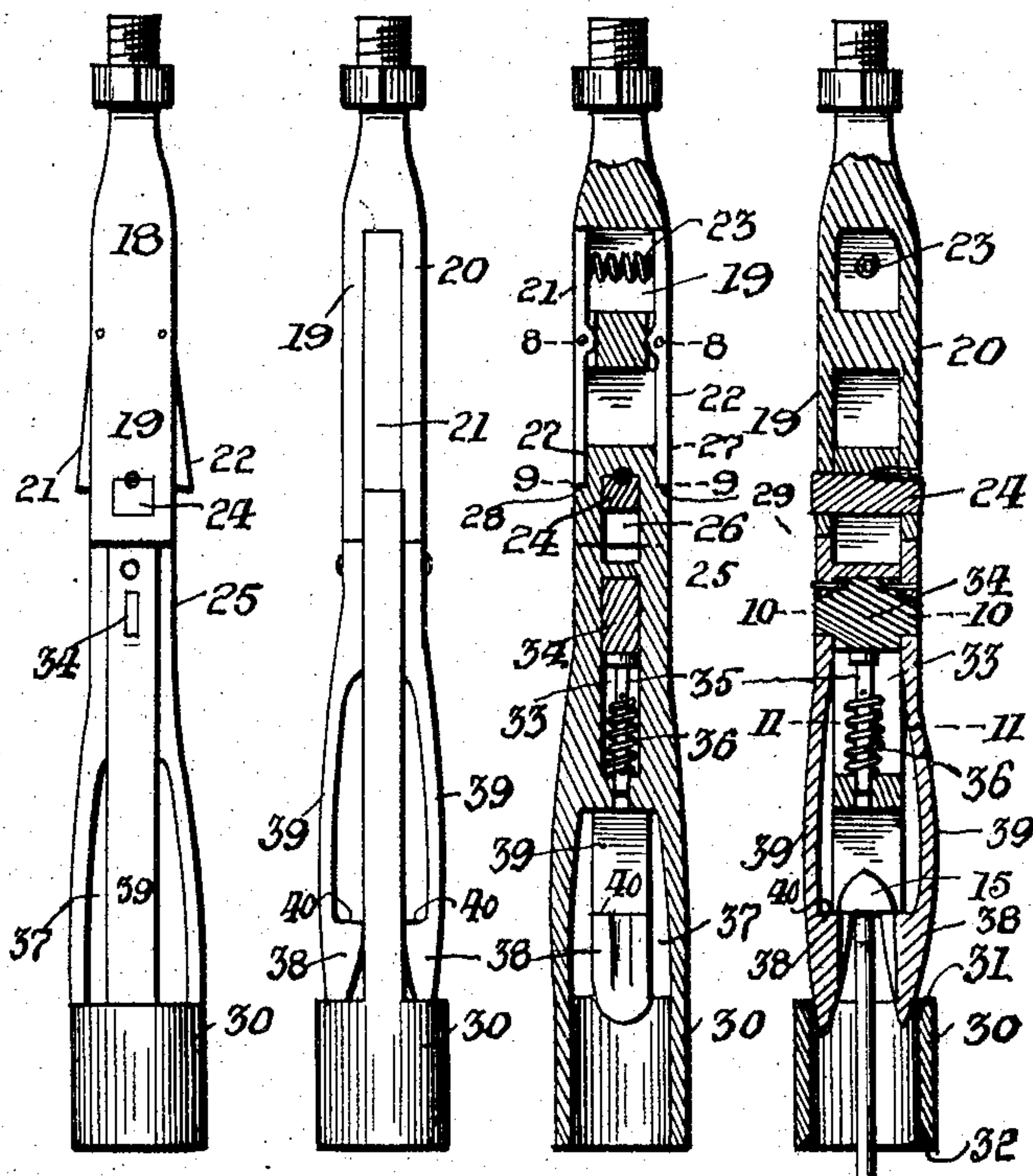
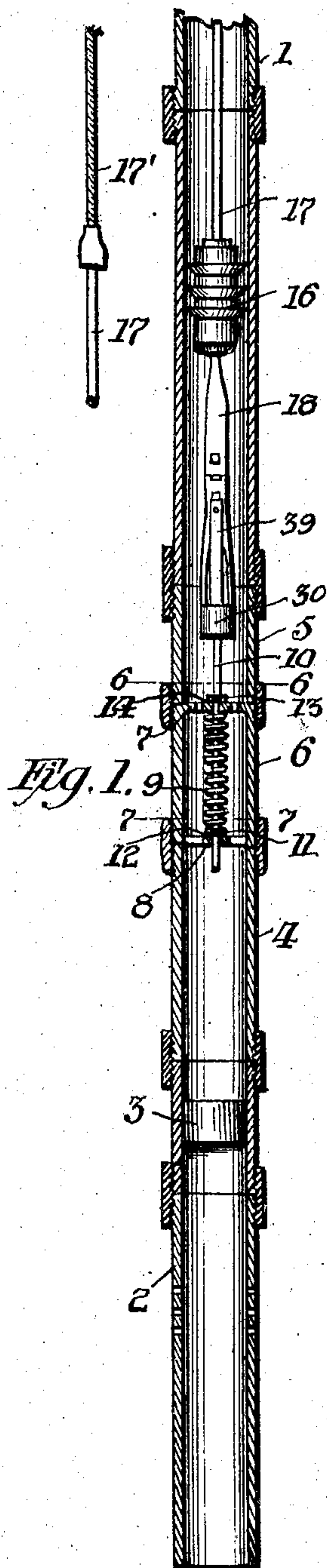


Fig. 2. Fig. 3. Fig. 4. Fig. 5.

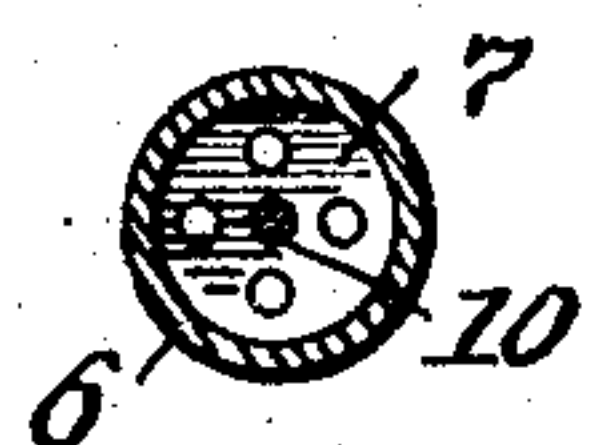


Fig. 6.

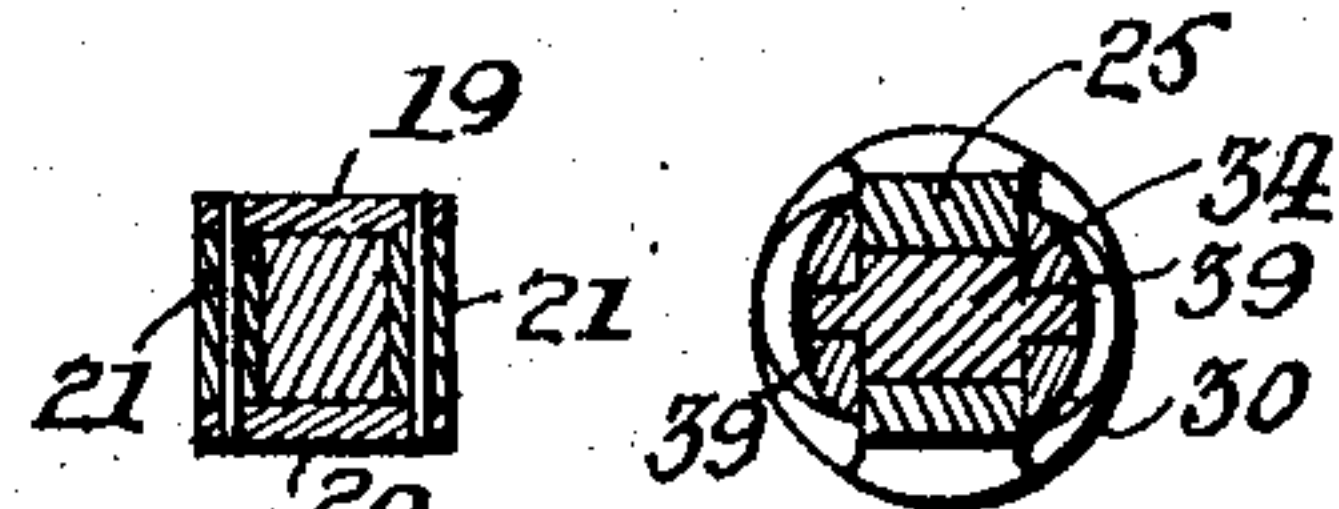


Fig. 8. Fig. 10.

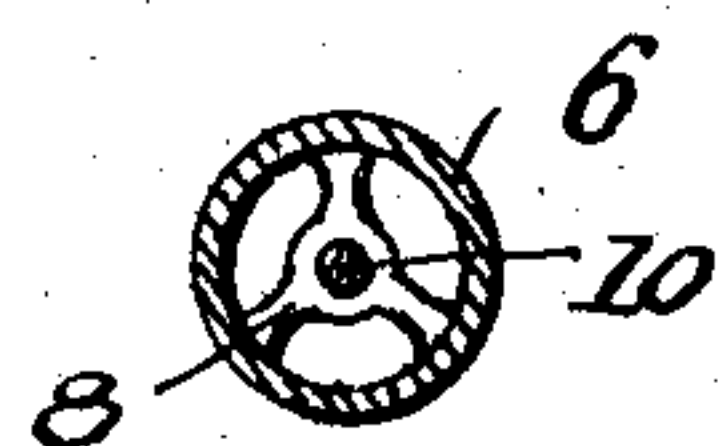


Fig. 7.

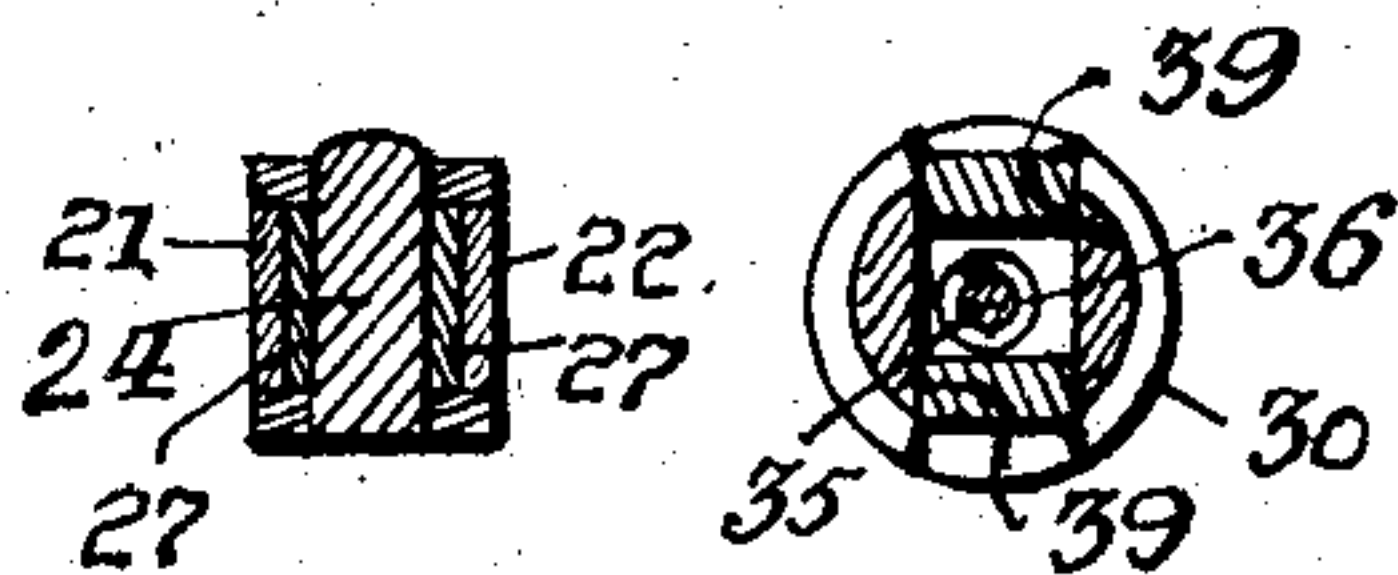


Fig. 9. Fig. 11.

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# UNITED STATES PATENT OFFICE.

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## TENSION DEVICE FOR OIL-WELL PUMPS.

SPECIFICATION forming part of Letters Patent No. 790,122, dated May 16, 1905.

Application filed May 23, 1904. Serial No. 209,279

*To all whom it may concern:*

Be it known that I, HUGH J. GORMAN, a subject of the King of Great Britain, residing at Smithfield, in the county of Wetzel and State

of West Virginia, have invented certain new and useful Improvements in Tension Devices for Oil-Well Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to tension devices for oil-well pumps, and has for its object the provision of a novel device for maintaining the cable used in operating the pump of an oil or other well at a tension, so as to insure the efficient operation of the working valve in all conditions.

My invention consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed.

I have illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of part of the casing of an oil-well with my improvements applied thereto. Fig. 2 is a side elevation of the movable parts of the tension device, showing the same in unlocked position. Fig. 3 is an edge elevation showing the same in locked position. Fig. 4 is a sectional view taken centrally through Fig. 3, the parts being in position to permit the withdrawal of the tension device from the well. Fig. 5 is a vertical sectional view taken through the center of Fig. 3 on a line at right angles to that on which Fig. 4 is taken, the parts in the view also being shown in position to permit withdrawal from the well. Fig. 6 is a transverse sectional view on the line 6 6 of Fig. 1. Fig. 7 is a transverse sectional view on the line 7 7 of Fig. 1. Fig. 8 is a transverse sectional view on the line 8 8 of Fig. 4. Fig. 9 is a transverse sectional view on the line 9 9 of Fig. 4. Fig. 10 is a similar view on the line 10 10 of Fig. 5. Fig. 11 is a transverse sectional view on the line 11 11 of Fig. 5, Figs. 2 to 11 being taken on an enlarged scale.

The well casing or tubing 1 carries at its lower end a section of tubing 2, called the "anchor," and in the tubing 1 above the anchor is located the standing valve 3, which is of the ordinary construction and need not, therefore, be particularly described, it being sufficient to

state that it permits the oil to pass upwardly into the tubing and prevents it from descending therethrough. The tubing above the standing valve is composed of the sections 4 5, between which is located a section of tubing 6, corresponding in size to the tubing 4 5, the said section 6 being provided with spiders 7 and 8, between which is located a spiral spring 9, that surrounds a rod 10, a collar 11 being interposed between the lower end of the spiral spring 9 and the lower spider 8 and secured upon the rod by a set-screw 12. A similar collar 13 is fastened upon the rod 10 by a set-screw 14 above the upper spider 7, and the upper end of the rod 10 carries a cone-shaped head 15.

A working valve or piston 16, which is of the usual construction, and it is therefore not necessary that it be specifically described, is carried on a rod 17, to which the pump-cable is attached. The working valve or piston has a screw-threaded hole in its lower end that receives a screw on the end of a bifurcated member 18, between the legs 19 20 of which are pivotally arranged two plates 21 22, having a spring 23 interposed between their upper ends, so that the lower ends of said plates will tend to spring inwardly. The lower ends of the legs 19 20 embrace the flat-sided upper end of a latch member 25, which has formed near its upper end and extending between its flat sides a rectangular slot 26, through which passes a square block 24, that is seated in square holes located near the lower ends of the legs 19 20. The edges of the latch member 25 are cut away at the upper end, as shown at 27, and in one position of the parts the lower ends of the spring-pressed plates 21 22 bear against the cut-away portion of the edges of the latch member and bear upon the shoulders 28 29 at the bottom of such cut-away portion, and in another position of the parts these plates bear against the edges of the latch member below said shoulders.

The latch member 25 has a cylindrical lower end 30, the circular cavity in which is outwardly tapered at both ends, as shown at 31 32, and the latch member is formed with a slot 33, in which is located a sliding block 34, that rests upon a sliding pin 35, which is pressed upwardly by a spiral spring 36. The latch



member is also formed with a slot 37 above the cylindrical lower end thereof that receives the heads 38 38 of spring-latches 39 39. The heads 38 are tapered on their outer sides, and the tapered outer sides of the heads bear against the tapered upper edge 31 of the cylindrical end of the latch member, and the said heads are formed with shoulders 40, which at one position of the latches engage the cone-shaped head 15 of the rod 10.

The parts being constructed and arranged in the above-described manner are placed in the position shown in Fig. 2—that is, with the latch member pushed up between the legs 19 20 of the bifurcated member 18 and with the lower ends of the spring-plates 21 22 resting on the edges of the latch member below the shoulders 28 29. In this position of parts the heads 38 38 of the latches 39 39 will be drawn up in the slot 37 and the outer sides of the heads will bear against the inwardly-tapered upper edge of the cylindrical end 30. The working valve or piston and the parts above described are now let down into the well, and when the lower end 30 of the latch member reaches and rests upon the spider 7 the weight of the parts above will force down the member 18, and the legs 19 20, bearing against the end of the latches 39 39, will force the same downwardly, and the tapered surface of the upper edge of the cylindrical lower end 30 will cause the heads of the latches to move inwardly, and the shoulders 40 will pass under the cone-shaped head 15 of the rod 10, and upon traction being exerted upon the cable by which the working valve or piston is supported the rod 10 will be drawn upwardly and compress the spiral spring 9, which will therefore impose traction upon the cable and maintain the same taut. The first portion of the upward movement of the cable will draw the member 18 upwardly, and while the latch member 30 remains stationary the upward movement of the member 18 will allow the lower ends of the spring-plates 21 22 to engage the shoulders 28 29, and this engagement will prevent the member 18 from again descending upon the latch member. During this operation the entrance of the heads 38 into ring 30 forces the shoulders 40 of said heads toward each other so as to be engaged by the head 15 of the rod 10, in which position the parts are held during the normal operation of the pump. The cable being maintained in a taut condition, the pumping is proceeded with in the ordinary manner.

When for any reason it is desired to withdraw the working valve or piston and attached parts from the well, the cable is allowed to relax and the latch member 18 to descend, whereupon the sliding pin 35 will be pressed upwardly by the spiral spring 36 and will force the block 34 upwardly and draw the heads of the latches upwardly and allow the same to spread apart, so as to disengage them

from the head of the rod 10, this position of parts being shown in the sectional views, Figs. 4 and 5, whereupon the entire device may be drawn up out of the well with the working valve.

The rod 17, which is connected to the working valve, acts as a sinker when the cable 17' is being lowered into the tubing, and in the attached view of Fig. 1 is shown the upper end of the rod 17 and the cable 17'.

Having described my invention, I claim—

1. In a device of the character described, the combination with a working valve, a cable to which said valve is attached, a bifurcated member attached to said valve, pivoted plates carried by said bifurcated member, a latch member carried by said bifurcated member and movable relatively thereto, latches arranged on said latch member and movable lengthwise thereon, said latch member being formed with inclined surfaces abutting the free ends of said latches, a spring adapted to move said latches in the latch member, the said pivoted plates engaging the said latches when the same are at their lowered position in the latch member.

2. In a device of the character described, the combination of a well-casing, a spring-restrained rod arranged in said casing, a head carried by said rod, a latch member having a hollow head with inclined surfaces at its upper edge, latches carried by said latch member and movable relatively thereto, said latches having heads adapted to engage the head on said rod and inclined surfaces bearing against the inclined surfaces in the end of the latch member, a bifurcated member connected to said latch member and slidable thereon, spring-pressed plates pivotally secured to said bifurcated member and adapted to alternately engage said latches and shoulders formed on said latch member.

3. In a device of the character described, the combination of a cable, a bifurcated member carried by the cable, a latch member slidably mounted on said bifurcated member, spring-latches carried on said latch member and movable thereon, a spider arranged in the well-casing, a rod sustained in said spider and having a head, a spring engaging said rod, means whereby when the bifurcated member is lowered it will move the spring-latches in position to engage the head on said rod, means whereby the elevation of the bifurcated member will lock the spring-latches in engagement with the head on the rod, and means whereby when the bifurcated member is again lowered, the head on the said rod will unlock the spring-latches.

In testimony whereof I affix my signature in the presence of two witnesses.

HUGH J. GORMAN.

Witnesses:

GEORGE BEHRMAN,  
WILLIAM P. CRIM.