No. 897,078. PATENTED AUG. 25, 1908.

F. FREEMAN.

VALVE.

APPLICATION FILED APR. 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

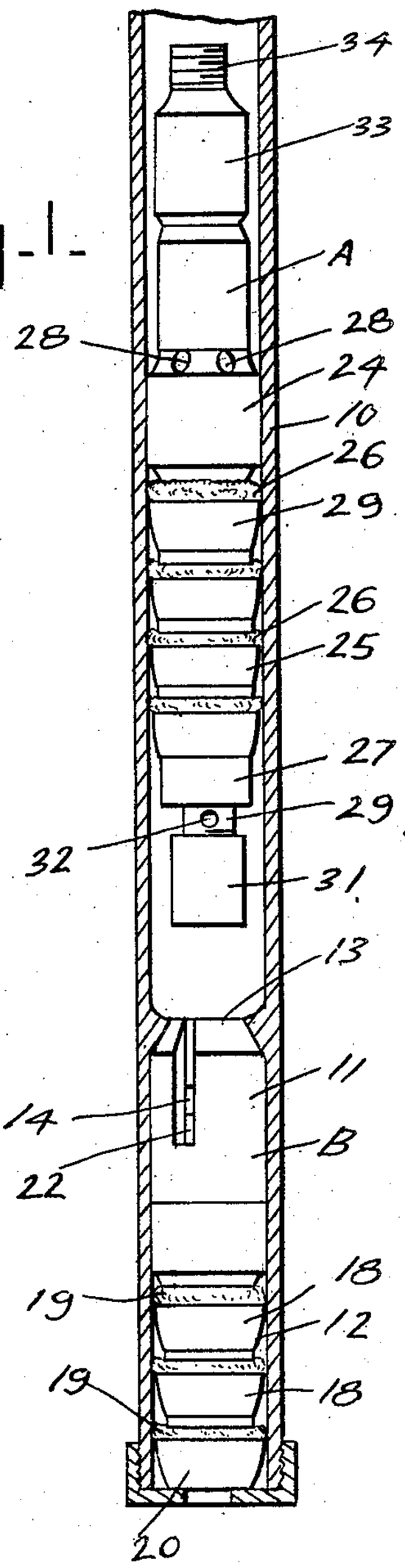


Fig. 4.

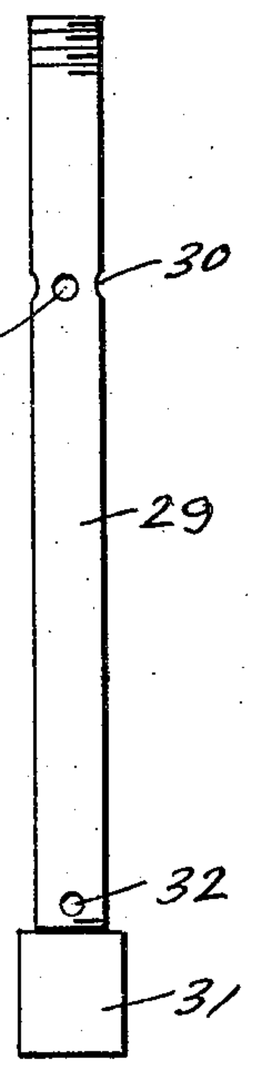
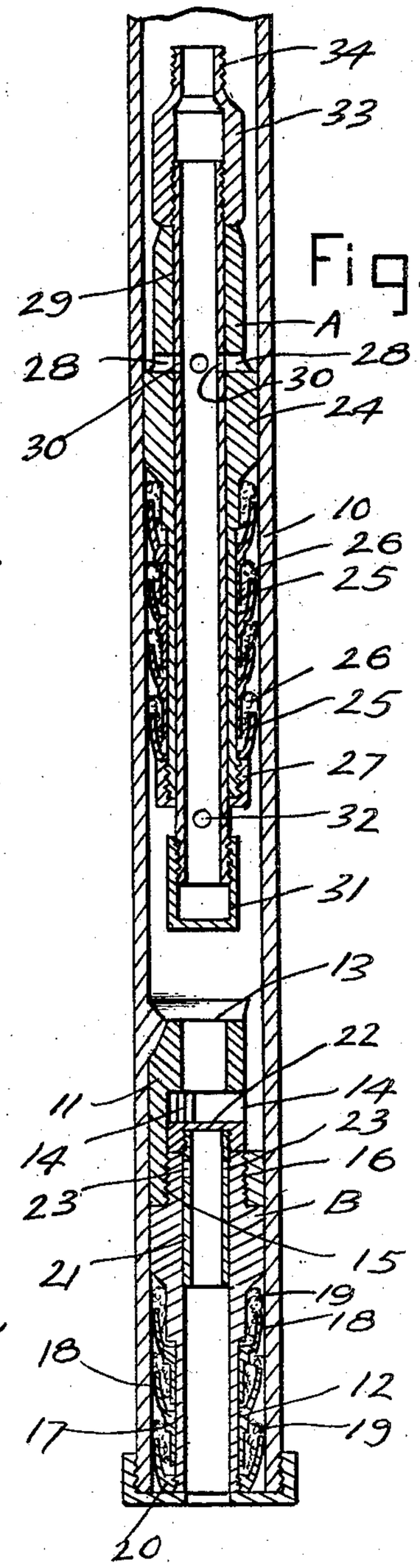


Fig. 2.



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APPLICATION FILED APR. 11, 1907. 2 SHEETS—SHEET 2.

Fig. 3.

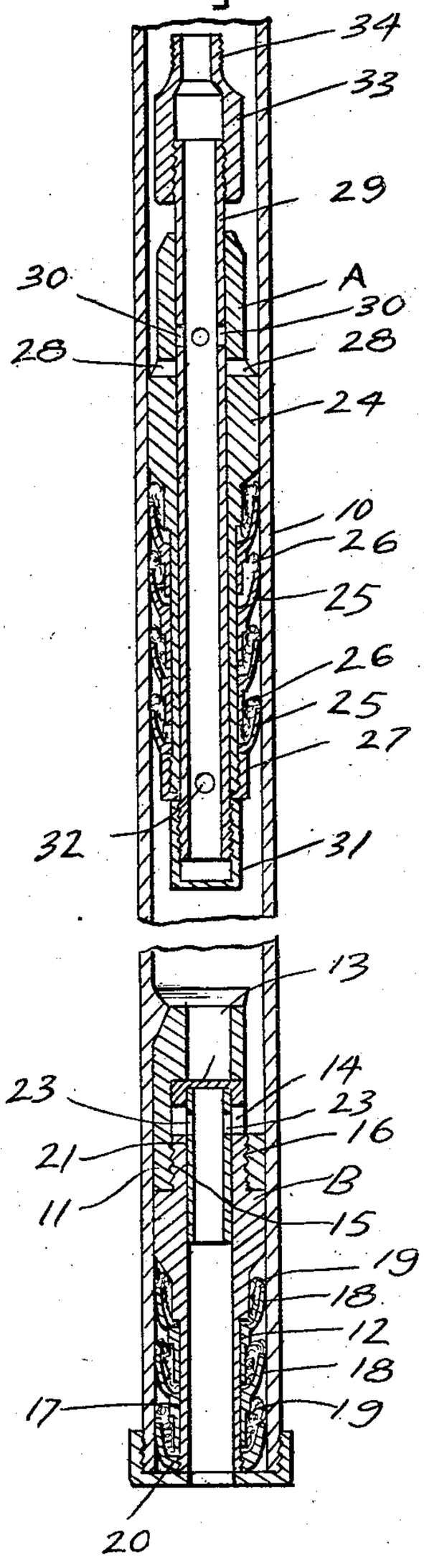


Fig. 6.

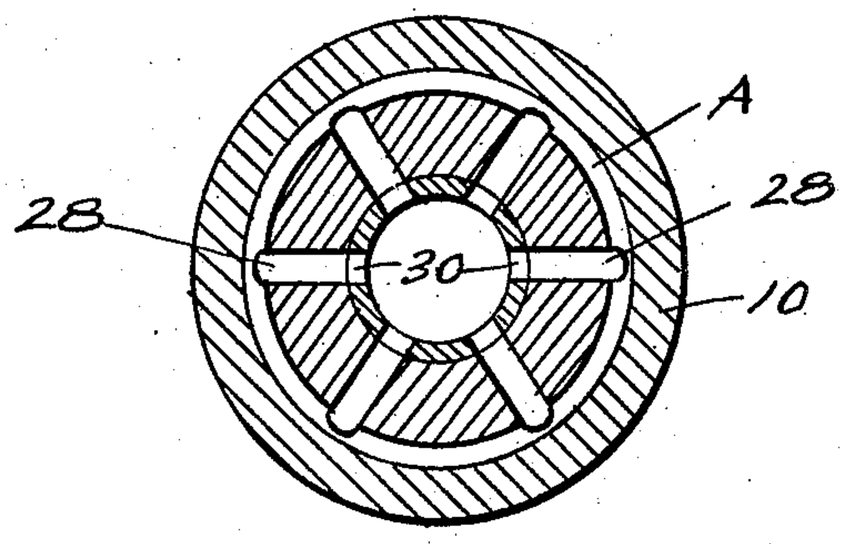


Fig. 7.

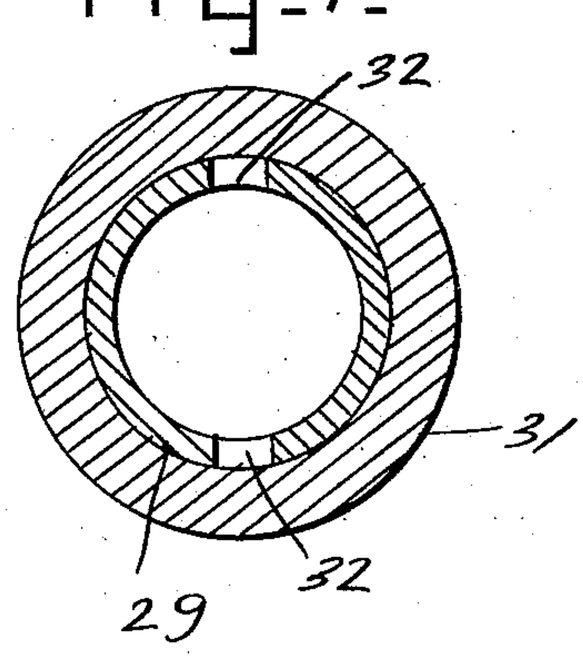
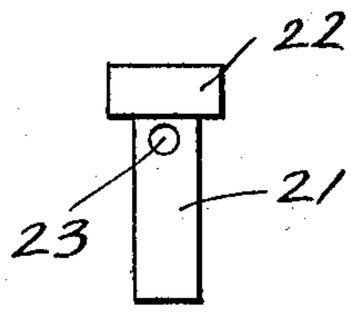


Fig. 5.



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VALVE.

No. 897,078. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed April 11, 1907. Serial No. 367,581.

To all whom it may concern:

Be it known that I, FRANK FREEMAN, a citizen of the United States, residing at Geneva, in the county of Adams, State of Indiana, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valves for oil wells and more specifically to a novel construction of standing valve, the object of the invention being primarily to provide a valve of this class which will be thoroughly efficient in its action and will not be liable to become "hung" while in use.

In the accompanying drawings, Figure 1 is a view in elevation of the piston and standing valves showing the arrangement of the same within the well tubing, Fig. 2 is a vertical sectional view through the piston and standing valve showing the position of the various parts at the downstroke of the plunger. Fig. 3 is a similar view showing the position of the parts at the upstroke of the plunger, Fig. 4 is a detail view in elevation of the piston valve for the plunger, Fig. 5 is a similar view of the piston valve for the standing valve, Fig. 6 is a detail horizontal sectional view through the plunger and taken in a line with the ports at the upper portion of the piston valve therein showing the open position of the valve, and, Fig. 7 is a similar view taken in a line with the ports in the lower end of the piston valve in the plunger.

Referring more specifically to the drawings the numeral 10 denotes the well tubing, the reference character A the plunger in general, the reference character B the standing valve in general.

The standing valve comprises a cylindrical sectional casing including the upper member 11 and the lower member 12. The upper section 11 comprises a hollow cylindrical member the bore of which is reduced at and adjacent its upper end as at 13 and this section is provided with a plurality of ports or openings 14. The inner periphery of this member at its lower end is screw threaded as at 15 and is adapted for threaded engagement upon the reduced screw threaded end 16 of the lower section 12. This section 12 also has its lower end portion reduced as at 17 and engaged upon this reduced portion 17 are a number of cups 18 between which are received packing rings 19, the cups being held upon the said reduced portion of the lower section by means of a jam nut or collar 20 which has a threaded engagement upon the lower end of the said reduced portion 17.

The bore in the lower section 12 is of less diameter than the bore in the upper section 11 and mounted slidably in the bore in the lower section 12 is a hollow valve stem 21 at the upper end of which is formed an integral head 22 which fits exactly within the bore 15 in the upper section 11 and this valve stem is provided with ports 23 which open through the wall of the same at diametrically opposite points.

The packing rings are such size that they fit exactly in the well tubing as does also the upper section 11 for a purpose to be hereinafter described.

The plunger comprises a tubular casing which is enlarged adjacent its upper end as at 24 and located upon the main portion of this tubular member below the enlarged portion thereon is a plurality of cups 25 between which are seated packing rings 26, these cups and rings being held in position by means of a threaded collar 27 which has a threaded engagement upon the lower end of the body portion of the member.

A number of ports 28 open radially through the enlarged portion 24 of the tubular member and slidably mounted in the bore in this member is a hollow valve stem 29 which is provided adjacent its uper end with ports 30 which when the stem is lowered, aline with certain of the ports 28, these ports being closed by the inner periphery of the bore in the tubular member when the valve stem is raised. At its lower end the valve stem 29 is provided with a head 31 which is integral therewith and is adapted at times to abut the lower end of the tubular member. Ports 32 are formed through the valve stem adjacent this head and are adapted to be closed by the wall of the bore in the tubular member when the stem is raised and at the same time that the ports 30 are closed.

A sleeve member 33 has a threaded engagement upon the upper end of the valve stem 29 and this sleeve portion is reduced at its upper end and is screw threaded as at 34 for the connection therewith of the pump rod (not shown).

From the foregoing description of my invention it will be observed that on the down-

stroke of the plunger, any oil contained in the well tube between the plunger and the stand valve will be forced through the ports 32, up through the valve stem 29, and through the ports 30 therein from which it flows from the parts 28 and into the well tube it being understood that the valve stem in the stand valve will be seated. At the upstroke of the plunger, the same will work as a suction valve for drawing the oil up through the standing valve, through the ports 23 in the stem thereof and by way of the ports 14, pass the head 22 and through the open upper end of the said valve.

What is claimed is—

1. A standing valve of the class described comprising a pair of connected sections, the said sections being each provided with a bore and one of said sections being provided with ports communicating with its bore, the bore of said section being enlarged throughout a portion of its extent, and a plunger consisting of a hollow perforated stem and a cap, said plunger being slidable in the bore of the other one of said sections and having its cap end movable in the enlarged portion of the bore of the first mentioned section.

2. A standing valve of the class described comprising a pair of hollow cylindrical sections, one of said sections being formed with ports communicating with its bore and a plunger slidable in the bore of the other section and provided also with ports, the said ports serving to establish communication between the bores of the two sections when the plunger is at one limit of its movement.

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

FRANK FREEMAN.

Witnesses:

M. T. ATWOOD,

JOHN LIECHTY.