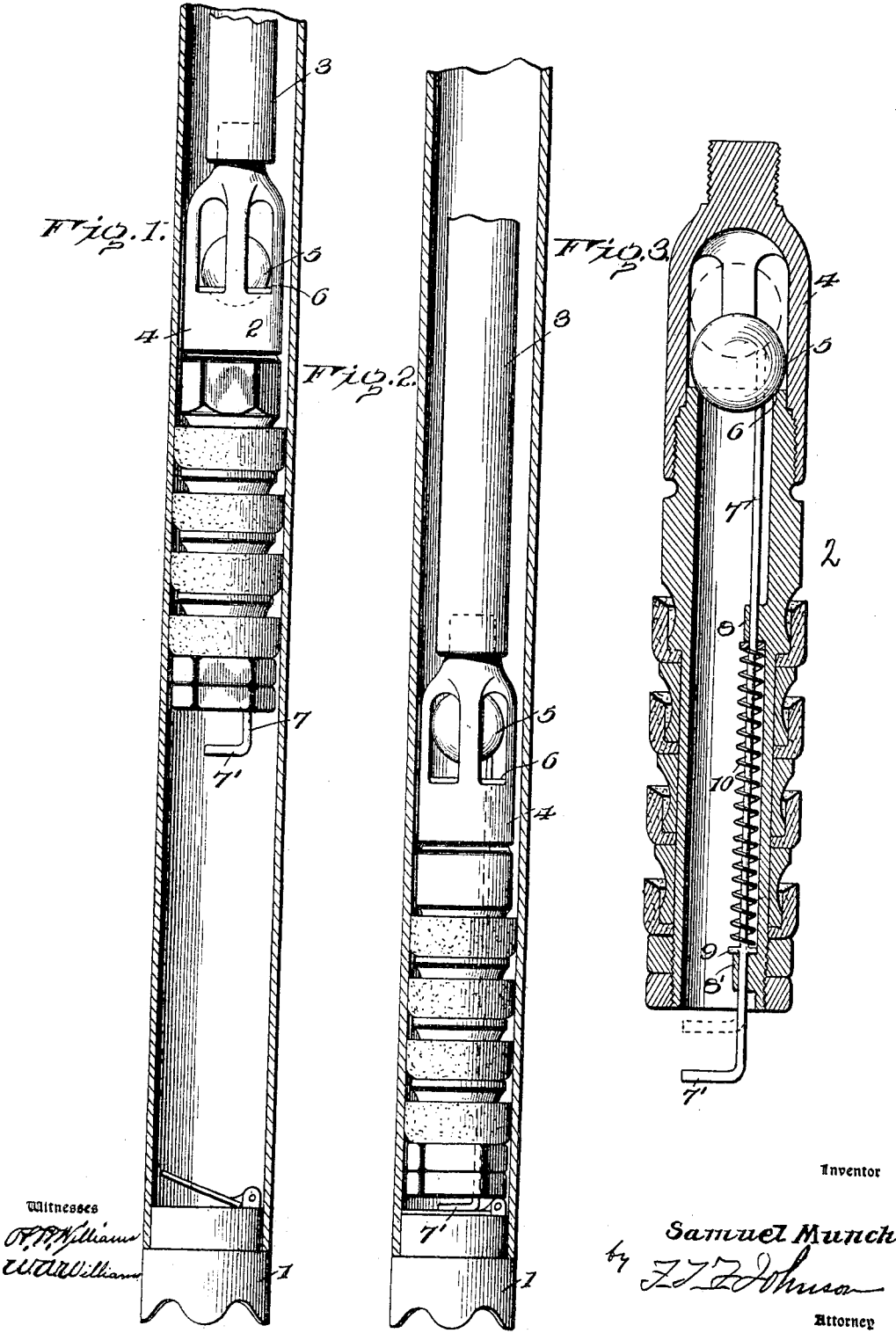


No. 819,077.

PATENTED MAY 1, 1906.

S. MUNCH.
PUMP PISTON.
APPLICATION FILED JULY 1, 1904.



UNITED STATES PATENT OFFICE.

SAMUEL MUNCH, OF FREMONT, OHIO.

PUMP-PISTON.

No. 819,077.

Specification of Letters Patent.

Patented May 1, 1906.

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To all whom it may concern:

Be it known that I, SAMUEL MUNCH, a citizen of the United States, residing at Fremont, in the county of Sandusky and State of Ohio, have invented certain new and useful Improvements in Pump-Pistons; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in pump-pistons for use in pumping oil and other deep wells, and refers more particularly to means for automatically opening the piston-valve when the same has become "set" or "stuck" and also when the standing valve has lost its priming by reason of an insufficient flow of oil from the well therethrough to permit the oil above said piston-valve to flow back therethrough and reprime said standing valve, said means being adapted to open the piston-valve at the downstroke when the normal stroke of said piston is changed and to be automatically withdrawn from contact with said piston-valve at the upstroke of said piston to permit the closing of said valve.

Heretofore great trouble and inconvenience have been experienced in deep-well pumping, especially in oil-wells, wherein the depth ranges from five hundred to eighteen hundred feet, with the operation of the piston-valve. It is a very common experience with operators of oil-wells for the piston-valve to become set or stuck, and when such condition arises the pumping, of necessity, is discontinued, and the pump remains idle until a sufficient quantity of oil has flowed up through the standing valve and into the barrel of the piston to open the valve of said piston, which in many cases requires from one hour to days, and even longer, depending, of course, on the pressure in the well. If, however, for any reason the pressure of oil in the well is not sufficient to raise or open the piston-valve, it becomes necessary to remove said valve from the well and repair it. This is not only a very troublesome operation, but entails expense and loss of time. By the use of my invention, however, this trouble, expense, and loss of time is obviated, as by merely lengthening the piston-rod of the pump my inven-

tion, which is located in the piston-barrel, is brought into action and opens the piston-valve on the downstroke of said piston, and either permits the oil to flow up therethrough or, if the well is pumped off, permits the oil above the piston-valve to flow back and prime the standing valve, when pumping can again be immediately resumed. It will be evident that the length of time required to put the pump in working condition by my invention when stopped on account of the valve becoming set or stuck or when the standing valve has lost its priming will be but a few minutes, as the only thing necessary to be done is to lengthen the piston-rod, which is done by letting said rod down a few inches or until the barrel of the piston rests on the casing of the standing valve, located immediately below it.

The invention consists in the novel construction, arrangement, and combination of the several parts of the device, as hereinafter described, illustrated in the drawings, and particularly pointed out in the claims.

In the drawings, Figure 1 is a view in elevation of the pump-piston and standing valve in a well-casing and showing one end of my improved valve-lifting device projecting from the bottom of the piston-barrel. Fig. 2 is a view similar to Fig. 1, except that the bottom of the piston-barrel is in contact with the casing of the standing valve and showing the valve of said piston held open by means of my improved valve-opening device. Fig. 3 is a vertical sectional view of the piston, showing my valve-opening mechanism mounted in the barrel thereof below the valve.

Referring to the drawings, the numeral 1 indicates the casing of the standing valve, 2 the piston, and 3 the piston-rod.

The numeral 4 indicates the cage for the piston-valve, 5 the valve therein, and 6 the valve-seat for said valve.

The numeral 7 indicates my valve opening or lifting rod, which is mounted within the piston-barrel below the valve-seat 6 in suitable guides or brackets 8 8', and on this rod 7 is a suitable lug or collar 9, secured thereon in any suitable manner.

The numeral 10 indicates a suitable coiled spring surrounding the rod 7 between the guide or bracket 8 and the lug or collar 9 and is for the purpose of holding the upper end of the rod 7 normally below the valve-seat 6, so that it will not interfere with the working of

said piston-valve. This spring 10 is also for the purpose of withdrawing positively the rod 7 from contact with the piston-valve to permit its closing. It is evident that other means may be employed to positively withdraw said rod from the piston-valve, and I therefore do not wish to be understood as limiting myself to this spring for the purpose stated. As shown in the drawings, the rod 7 projects from the bottom of the piston-barrel and is preferably provided with a curved or bent end 7', as shown.

The operation of the device is as follows: The piston is set in the well-pipe so that the distance between its bottom and the top of the casing of the standing valve 1 will be greater at the end of the downstroke than the length of the projecting portion of the rod 7. In this position the piston is worked until its valve 5 becomes set or stuck, which may result from many causes, such as "gumming" or a failure of the well to flow sufficiently to open the standing valve and fill the space between said valve and the piston and other obstacles of this character frequently encountered in deep-well pumping. When the valve 5 "sticks" and refuses to work, all that is necessary is that the piston-rod be lengthened a distance sufficient to permit the bottom of the piston-barrel to rest on the top of the casing of the standing valve, when the rod 7 will be pushed up against the action of the spring 10 and raise or open the piston-valve 5 and permit the oil to rise there-through, or, in the event of the flow of the well being insufficient to prime the standing valve, to permit the oil above the piston-valve to flow back between the two valves, and thus prime the pump, when the pumping of the well may be continued with but a few minutes' loss of time instead of an intermission of from one to ten days, and perhaps longer, or the necessity of entirely removing the piston from the well, as has heretofore been the case.

Having thus fully described my invention, what I claim is—

1. In a pump for oil and other deep wells, the combination with a valved piston, of a rod located therein below the valve thereof and having its lower end projecting downward therefrom, said rod being adapted, when the normal position of the piston-stroke is changed, to be thrust upward to open the piston-valve, and means also located in said piston for automatically withdrawing said rod from contact with said valve on the upstroke of the piston.

2. In a pump for oil and other deep wells, the combination with a valved piston, of a spring-restrained rod located therein below the valve thereof, said rod being adapted, when the normal position of the piston-stroke is changed, to cause the opening of the piston-valve on the downstroke of the piston,

and to be automatically withdrawn from contact with said valve to permit its closing on the upstroke of said piston.

3. In a pump for oil and other deep wells, the combination with a valved piston, and a standing valve therefor, of a rod located in said piston below the valve thereof and projecting downward therefrom, said rod being adapted, when the normal position of the piston-stroke is changed, to contact with the casing of the standing valve on the downstroke of said piston and thrust upward to open said piston-valve, and means located in said piston for automatically withdrawing said rod from contact with said piston-valve as the end of said rod is withdrawn from contact with the casing of said standing valve, to permit the closing of said piston-valve.

4. In a pump for oil and other deep wells, the combination with a valved piston, of a rod located therein below the valve thereof, guides in said piston in which said rod is mounted, and a spring also located in said piston for holding said rod, normally, out of contact with the piston-valve, said rod being adapted, when the normal position of the piston-stroke is changed, to be thrust upward against the action of said spring to open said valve, and to be withdrawn from contact with said valve by the action of said spring when the thrust is removed.

5. In a pump for deep wells, the combination with a valved vertically-reciprocating piston, of a rod located therein below the valve having its lower end free and projecting downward therefrom, said rod being in such position that upon downward movement of the piston in excess of the normal pumping movement it will be thrust upward relatively to the piston to open the piston-valve and being subjected to a downwardly-acting force sufficient to automatically withdraw it from contact with the valve on the upstroke of the piston.

6. In a pump of the class described, the combination with a reciprocating piston having a bottom provided with a guide-opening, of a valve movably mounted in the piston, a stem slidably mounted in the guide-opening and depending below the bottom, said stem when elevated in the piston being arranged to raise the valve, means located in the path of movement of the stem for effecting the movement of said stem with respect to the piston, said stem normally reciprocating with the piston toward and from the said moving means and engaging the latter on an abnormal movement of the piston, and means carried by the stem and movable into and out of engagement with a portion of the piston to limit the relative movement of said stem and piston.

7. In a pump of the class described, the combination with a reciprocating piston having a bottom provided with a guide-opening,

of a valve movably mounted in the piston, a stem slidable in the guide-opening and depending below the bottom, said stem when elevated in the piston being arranged to raise the valve, means located in the path of movement of the stem for effecting the movement of the same with respect to the piston, said stem normally reciprocating with the piston and having its lower end movable toward and from said moving means and arranged to abut against the same upon the abnormal movement of the piston, and a stop carried by the stem and movable into and out of engagement with the bottom of the piston to limit the relative movement of said stem and piston.

8. In a pump of the class described, the combination with a reciprocatory piston having a bottom provided with a guide-opening,

of a valve movably mounted in the piston, a stem slidable in the guide-opening and depending below the bottom, said stem normally reciprocating with the piston, and when elevated in said piston being arranged to raise the valve, means located in the path of movement of the stem for effecting the movement of the same with respect to the piston, and spaced stops carried by the lower portion of the stem on opposite sides of the bottom and movable into and out of engagement with said bottom to limit the relative movement of the stem and piston.

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

SAMUEL MUNCH.

Witnesses:

JOHN J. LEHMANN,

ALBERT GROSSENBURLY.