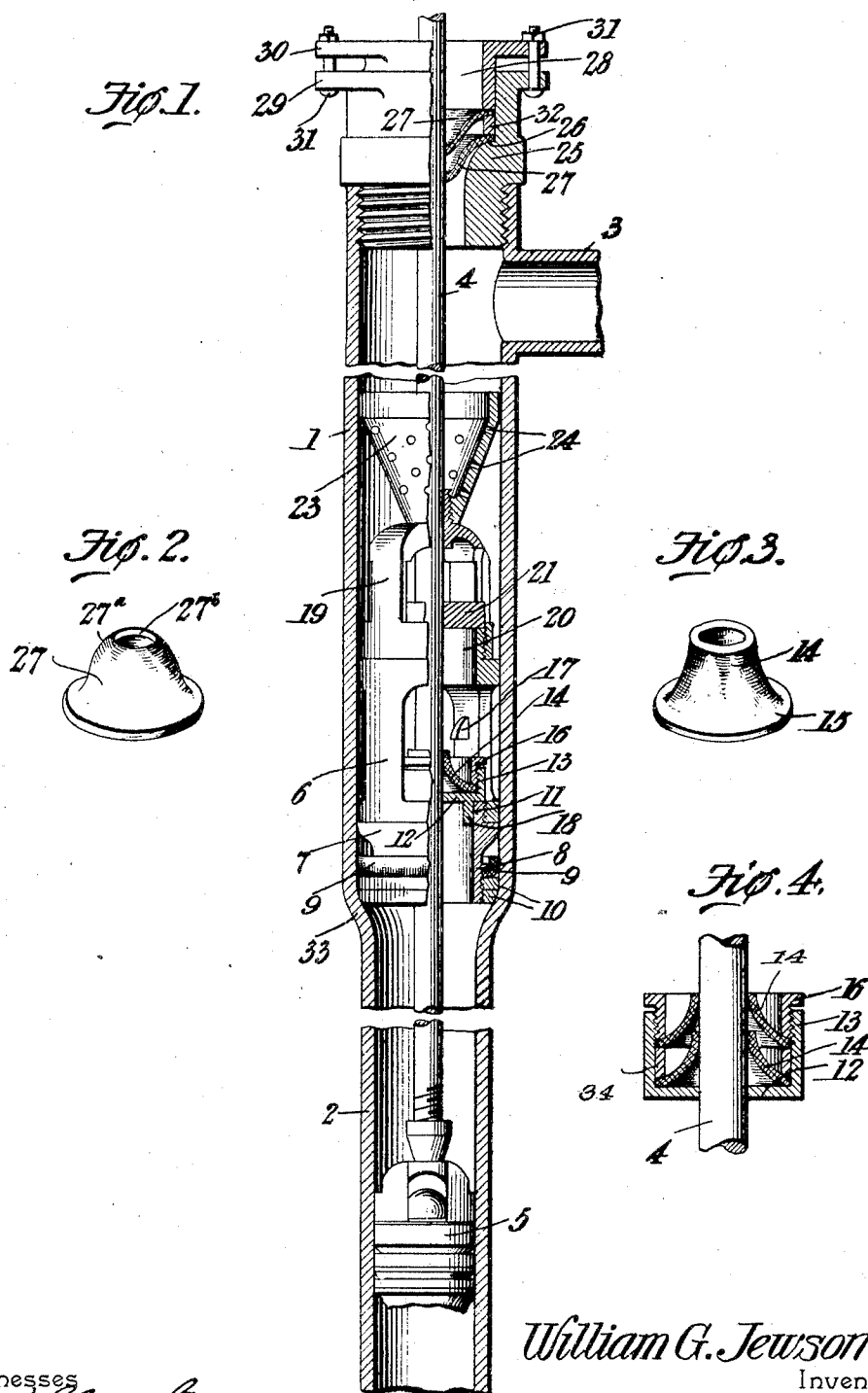


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W. G. JEWSON.
OIL PUMP.

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UNITED STATES PATENT OFFICE.

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OIL-PUMP.

SPECIFICATION forming part of Letters Patent No. 789,430, dated May 9, 1905.

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To all whom it may concern:

Be it known that I, WILLIAM G. JEWSON, a citizen of the United States, residing at North Baltimore, in the county of Wood and State of Ohio, have invented a new and useful Oil-Pump, of which the following is a specification.

This invention relates to pumping apparatus, and while capable of general application is particularly designed for use in connection with oil-wells, and has for its object to provide a novel arrangement of valve mechanism whereby the standing valve may be lowered into the well-casing with the plunger and the polish-rod and may be readily withdrawn from the well with the polish-rod without interfering with the casing and without requiring any manipulation of the polish-rod other than to merely withdraw the latter from the well.

It is another object of the invention to provide a novel form of standing valve which is arranged to snugly hug the polish-rod under the pressure of the oil, so as to obviate leakage around the polish-rod and to automatically take up wear of the valve.

It is furthermore designed to provide a novel form of stuffing-box for the upper extremity of the well-casing to prevent leakage at the top of the casing and to have the packing element of the box arranged to be held in snug engagement with the polish-rod by the pressure of the oil, whereby wear upon the packing is effectually taken up.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is an elevation of a portion of a pumping apparatus including the features of the present invention, parts being broken away to illustrate the assemblage of the various parts of the device. Fig. 2 is

a detail perspective view of one of the packing elements of the stuffing-box. Fig. 3 is a detail perspective view of the form of packing element employed in the standing valve. Fig. 4 is a detail sectional view illustrating a standing valve having a plurality of packers.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

To adequately illustrate the application and operation of the present invention, there has been shown in the accompanying drawings a well-casing 1 of usual form and a portion 2 of the cylinder or working barrel which is commonly located at the bottom of the well. From the upper portion of the casing 1 extends a lead-pipe 3 to carry off the oil which is elevated by the pump, there being the usual polish-rod 4, working in the casing, and provided at its lower end with any common or preferred form of plunger 5, which is detachably threaded to the lower end of the polish-rod.

It is customary to have the standing valve mounted upon the cylinder or working barrel, wherefore it is necessary to remove the barrel to have access to the standing valve for repairs, or some complex mechanism is employed for removing the valve when it is desired to have access thereto. In view of this difficulty it is proposed to have the standing-valve mechanism mounted independently of the working barrel and above the same and to arrange for lowering and withdrawing the standing valve with the plunger. In carrying out this object there is provided a main cage 6, which has a detachable tubular base member 7, threaded into the bottom of the body of the cage and provided with a reduced lower portion which has an intermediate annular flange 8 and is externally screw-threaded below the flange. A flexible cup 9, preferably of leather, is fitted upon the lower end of the base member 7 and against the flange 8, which maintains the upper free edge of the cup spaced from the cage and in intimate engagement with the inner walls of the well-casing. A pair of clamping-nuts 10 are fitted to the screw-threaded lower extremity of the base,

so as to clamp the cup against the flange 8, and thereby provide an oil-tight joint at the bottom of the cage to prevent the downward escape of oil from above the standing-valve mechanism. The upper edge 11 of the removable base 7 of the cage constitutes a valve-seat for the check-valve member, which is made up of a disk 12, having a central opening for the reception of the polish-rod and provided with an upstanding peripheral flange 13, thereby providing a cup-shaped member. Within this cup-shaped valve member a packer member 14 is fitted in the form of a hollow truncated cone formed of leather, the lower peripheral edge of the packer being flared outwardly to form an annular flange 15 to fit snugly within the flange 13 and upon the bottom of the body of the valve, the upstanding or bulged reduced portion of the packer fitting snugly the polish-rod. An externally-screw-threaded nut 16 is fitted into the screw-threaded flange 13 of the body of the valve, so as to bear against the flange 15 of the packer, and thereby hold the latter upon the valve. It will of course be understood that the hollow plug or nut 16 is removable for convenience in replacing the packer when worn. The upward play of the valve is limited by a stop projection or shoulder 17, carried by each of the upstanding members of the cage. The valve is guided in its vertical play by means of suitable projections working within the detachable base member 7, one of which projections has been shown at 18.

Above the main cage 6 there is an upper or supplemental cage 19, which is threaded upon the upstanding reduced annular flange 20 at the top of the cage 6, whereby said flange constitutes a seat for the valve 21, which works in the cage 19. This valve 21 may be a duplicate of the valve described for the lower cage, but has been shown in the accompanying drawings merely as a disk having a central opening for the reception of the polish-rod. The top of the upper cage 19 is provided with an upstanding externally-screw-threaded tubular stem or nipple, and an open-ended inverted substantially conical rivet-catcher 23 is detachably threaded upon this stem or nipple, with its upper end of a diameter to have a working fit in the well-casing and designed to catch foreign matter—such, for instance, as bolts, rivets, nuts, and the like—which may fall into the open top of the casing. This rivet-catcher is of skeleton formation or provided with perforations 24 to permit of the passage of the oil, but small enough to prevent obstructions from passing therethrough and clogging the valve mechanism.

The upper open end of the casing is normally closed by a stuffing-box 25, which is threaded thereinto and has its lower portion increased in thickness to produce an inner annular

shoulder 26 for the support of an inverted substantially conical packer 27, similar to that hereinbefore described, there being a gland 28 fitted into the top of the stuffing-box to retain the packer 27 in place. The stuffing-box and the gland are provided with corresponding arms or flanges 29 and 30, which are pierced by bolts 31 to detachably hold the gland in place. If desired, a plurality of packers 27 may be employed, in which event an spacing-ring 32 should be interposed between the outer peripheral edges of the packers.

In fitting the present apparatus into a well-casing the two cages 6 and 19, with their valves and the rivet-catcher 23, are connected in the manner hereinbefore described, after which the polish-rod 4 is passed through the standing-valve mechanism, and the plunger 5 is then screwed upon the lower end of the polish-rod, when the apparatus may be lowered into the casing, the latter being provided with a constricted portion 33 to produce an inner annular shoulder against which the lower end of the standing-valve mechanism is adapted to strike and support the same in an elevated position above the working barrel, into which the plunger 5 is lowered and operates. The stuffing-box 25 is of course fitted in place over the top of the polish-rod after the latter and the valve mechanism have been fitted into the casing.

When the pump is in operation, the plunger 5 elevates the oil, which in turn elevates the check-valves 12 and 21, so as to permit of the oil passing upwardly through the cages and the rivet-catcher 23 and out through the lead-pipe 3, said check-valves 21 and 12 operating to prevent the return of the oil.

It will here be noted that there is a slight difference between the forms of the packers for the stuffing-box and the valve, which resides in having the extremity of the packer 14 tubular in shape in order that it may slide upon the polish-rod when elevated under the upward pressure of the oil, while the packer 27 has a well-defined end 27^a, through which the opening 27^b is formed to receive the polish-rod, whereby the walls of the opening 27^b more snugly embrace the polish-rod than the tubular portion of the packer 14. The packer 27 may grip the polish-rod very snugly, for the reason that said packer member is stationary, while the polish-rod is forcibly moved through the packer; but the packer 14 of the valve 12 must fit the rod with sufficient looseness to permit of the elevation of the valve. However, in each instance the pressure of the oil against the exterior walls of the packers operates to maintain the free ends of the packers in sufficient intimate engagement with the polish-rod to prevent leakage and to take up wear in an automatic and effective manner.

If desired, the valve 12 may be provided with a plurality of packers 14, as shown in

Fig. 4 of the drawings, in which event a spacer-ring 34 should be interposed between adjacent packers, so as to maintain the same separated.

5 Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 1. A check-valve including a cage having a valve-seat, a cup-shaped valve-body supported upon the seat, a hollow truncated conical packer fitted in the body, a removable plug to retain the packer in the body, and a stop carried internally by the cage in the path of the valve-body.

15 2. The combination with a casing, of a cage supported therein and provided with an internal valve-seat, a cup-shaped valve-body supported upon the seat and provided with a central opening, a plunger-rod working through the opening, a hollow truncated conical packer fitted in the body with its smaller end embracing the rod, a removable plug to retain

the packer in the body, and a stop carried internally by the cage and located in the path of the body to limit the movement thereof. 25

3. A check-valve including a cup-shaped body having an opening in the bottom thereof, a hollow truncated conical packer fitted in the body, and a removable plug to retain the packer in the body. 30

4. A check-valve including an internally-screw-threaded cup-shaped body having an opening in the bottom thereof, a hollow truncated conical packer fitted in the body, and a screw-threaded retaining-plug to hold the packer in the body. 35

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM G. JEWSON.

Witnesses:

ADAM EXLINE,
WILLIAM B. WILSON.