

F. H. OBER.
PUMP OPERATING MECHANISM.

Patented June 21, 1892.



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UNITED STATES PATENT OFFICE.

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PUMP-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 477,629, dated June 21, 1892.

Application filed November 20, 1891. Serial No. 412,575. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. OBER, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Pump-Operating Mechanism; 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved mechanical power more especially designed for operating pumps, and will be considered in this specification as connected with and operating the piston of an ordinary suction-pump. This mechanism may be actuated by any suitable power, as hand, horse, steam, electricity, &c. The power is applied to a rotary socket swiveled in a suitable stationary support and adapted to receive the head of a spring-clamp composed of twin jaws interiorly threaded to receive a correspondingly-threaded portion of the piston-rod, which passes through the jaws. As the swiveled socket is turned the screw-clamp is rotated and the piston-rod raised to a height nearly equal to the length of the piston's stroke or the depth of its cylinder, when a projection on the piston-rod, which has heretofore moved in a vertical slot formed in a sleeve through which the rod passes, escapes from said slot and engages a catch on the bottom of the clamp and a winding inclined plane formed on top of the sleeve. The rod and the clamp now rotate together, and as the rod's projection or pin travels up the inclined plane at the top of the sleeve the clamp is lifted out of its swiveled socket and the threaded jaws spring open automatically, releasing the piston-rod, which instantly falls by gravity until the piston reaches the bottom of the cylinder. The downward movement of the rod returns the clamp-head to its swiveled socket by virtue of a shoulder formed on the rod and engaging the bottom of the clamp interiorly, which is provided with an aperture, through which the rod passes.

The mechanism will be better understood by reference to the accompanying drawings, in which is illustrated an embodiment of the invention.

In the drawings, Figure 1 is a side elevation of the mechanism, showing the piston-rod lowered and the screw-clamp locked on the rod. Fig. 2 is an elevation showing the rod raised and the clamp unlocked. Fig. 3 is an enlarged fragmentary view of a vertical longitudinal section taken through the upper part of the mechanism on line *y y*, Fig. 4. Fig. 4 is a transverse section taken on the line *x x*, Fig. 3.

In the views, similar reference characters indicating corresponding parts or elements of the mechanism, let the numeral 5 designate the rod connected with the piston located in the cylinder of the ordinary suction-pump; 6, the platform or base located at the surface where it is desired to erect the operating mechanism; 7, the stays secured to said base and having their upper extremities made fast to a suitable stationary top plate, in which is swiveled a rotary socket-head 9, provided with an angular opening 10, in which is received the correspondingly-shaped clamp-head 12, composed of the twin jaws 13, interiorly threaded to receive the correspondingly-threaded portion 5^a of rod 5 and supported upon springs 14, which are connected at their opposite extremities with a base-block 15, with which they may be formed integral or to which they may be attached in any suitable manner.

The base 15 is provided with an opening, through which rod 5 passes, said opening lying directly below and in line with the threaded opening in the clamp-head.

Springs 14 are so constructed and arranged with reference to the clamping-jaws that when the clamping-head is raised out of opening 10 its jaws are opened sufficiently to disengage their threads from the threaded portion of rod 5, thus releasing said rod. Hence the springs normally hold the jaws open when out of the socket-head 9. Supported also upon base 6 and rigidly secured thereto is a sleeve 16, provided with a vertical slot 17, in which travels a horizontal pin or projection 18, made fast to rod 15. Upon the upper extremity of sleeve 16 is formed a winding inclined plane 19. The clamp and sleeve are so located with reference to each other that the base of the clamp is received by the upper extremity of the sleeve. The bottom of this base is provided with a vertical pin, catch, or stop 20, adapted to engage pin 18 of the rod as soon

as the last-named pin reaches the top of the slot.

Rod 5 is provided with a shoulder 25, located between its threaded portion and the base 15 of the clamp. This shoulder is so large that it will not pass through the aperture in the base of the clamp and is so located that as rod 5 falls, after being released from the clamp, the latter is carried downward to the position shown in Fig. 1 by the engagement of shoulder 25 with the base 15.

From the foregoing description the operation of the mechanism will be readily understood. The parts being in the relative position shown in Fig. 1, the swiveled socket-head is rotated by applying power to a suitable lever-arm 9^a or in any other suitable manner. As this socket-head is rotated the screw-clamp is turned on the threaded rod and raises said rod until pin 18 reaches the top of slot 17, when said pin engages the pin or catch 20 on the base of the clamp and travels up the winding inclined plane 19, raising the clamp simultaneously to the position shown in Fig. 2 and releasing rod 5, which then falls by gravity to its original position, since the pin 18 has again reached its slot, having traveled entirely around the sleeve. Rod 5 in falling also returns the clamp-head to its original position in the swiveled socket by virtue of the engagement of shoulder 25 with base 15, as heretofore stated. The cylinder-piston has now made one reciprocation, and, the rotation of the swiveled socket-head continuing, rod 9 begins to rise again and the action of the parts as just described is repeated. The rapidity with which the piston travels will of course depend upon the pitch of the thread forming the screw on the rod and its engaging-clamp.

It will be observed that by the use of my improved mechanism it becomes practicable to use a very large cylinder in the pump and to raise the water to a great height with a small amount of power, comparatively speaking, since the piston may be made to travel proportionately slowly; or, if there is ample power at hand, the water may be raised rapidly, even though the piston travels slowly, by making the cylinder of sufficient area in cross-section.

Having thus described my invention, what I claim is—

1. In a pump-operating mechanism, the combination, with a piston-rod provided with a threaded portion, of a rotary socket swiveled in a suitable support, a divided spring clamp-head interiorly threaded to engage the threaded portion of the rod, and suitable means whereby as the rod is elevated the clamp-head is raised out of its socket and the rod released, substantially as described.

2. In a pump-operating mechanism, the combination, with a piston-rod provided with a threaded portion, of a rotary socket swiveled in a suitable support, a spring clamp-head interiorly threaded to engage the thread-

ed portion of the rod and consisting of twin sections located in the rotary socket, and suitable means whereby as the rod is raised the clamp-head is raised out of its socket and the rod released, substantially as described.

3. In a pump-operating mechanism, the combination, with a piston-rod partially threaded, of a rotary socket, a two-part threaded clamp located in said socket and engaging the threaded portion of the rod, springs connected with the parts of the clamp, whereby as the same is released from its socket the parts separate and release the rod, and suitable mechanism for raising the clamp out of its socket when the rod has reached a suitable elevation, substantially as described.

4. In a pump-operating mechanism, the combination, with a piston-rod partially threaded, of the swiveled socket, the clamp-head consisting of two interiorly-threaded jaws located in said socket and engaging the threaded portion of the rod, a base for the clamp connected with the jaws by two springs, said base being provided with an aperture, through which the rod passes, and a slotted sleeve supported upon a suitable base and surrounding the rod below the clamp, said sleeve being provided at its top with a winding inclined plane, the rod being provided with a pin or projection traveling in the slot of the sleeve and adapted to engage a catch or stop on the bottom of the clamp as it leaves the slot, whereby the clamp-head is raised out of its socket and the rod released, substantially as described.

5. The combination, with the threaded piston-rod, of a divided screw-head engaging said rod, a rotary socket engaging the screw-head and suitably swiveled for actuating the same, and spring mechanism adapted to separate the parts of the screw-head and release the rod when said head is raised out of its socket, substantially as described.

6. The combination, with the threaded piston-rod, of the divided screw-head engaging said rod, a rotary socket engaging the screw-head and suitably swiveled for actuating the same, and mechanism adapted to separate the parts of the screw-head and release the rod when said head is raised out of the socket, substantially as described.

7. In a pump, the combination, with the threaded piston-rod, of the screw-head and the rotary socket for giving it the upward movement, the screw-head being divided and having springs connected with its parts, and means for raising the screw-head out of its socket, whereby the rod is released and its downward movement accomplished by gravity, substantially as described.

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

FRANK H. OBER.

Witnesses:

WM. MCCONNELL,
G. J. ROLLAUDET.