

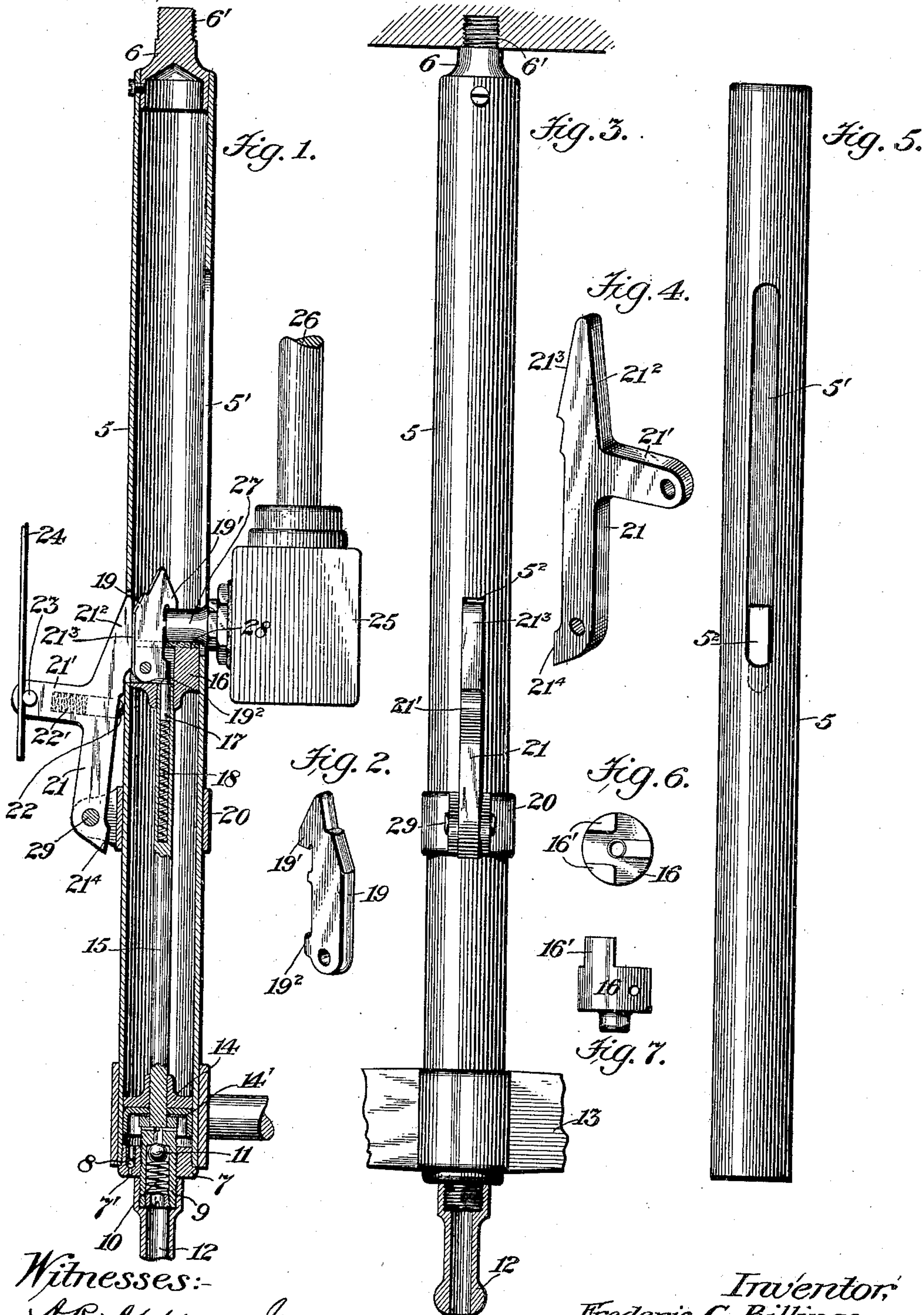
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F. C. BILLINGS.
PUMP.

(Application filed June 21, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 672,435, dated April 23, 1901.

Application filed June 21, 1900. Serial No. 21,046. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC C. BILLINGS, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

One object of the invention is the provision of an improved detachable connection between the piston-rod of the pump and a projection from the cross-head of an engine or other reciprocatory element, so that said piston-rod may be connected or disconnected at will from the means by which it is actuated.

A further object of the invention is the provision of a movable latch carried by the piston-rod and improved means for forcing said latch into such position that it will engage with and be actuated by a projection from a cross-head or other reciprocatory body.

A further object of the invention is the provision of improved means for throwing the latch out of engagement with the projection on the reciprocatory body when the device for forcing said latch into contact with said projection is withdrawn.

Referring to the drawings, Figure 1 is a longitudinal vertical section of an air-pump cylinder, showing my improvement in connection therewith. Fig. 2 is a perspective view of a latch employed in connection with the piston-rod. Fig. 3 is a side elevation of an air-pump cylinder, showing a device for forcing the latch to its operative position. Fig. 4 is a perspective view of a latch-operating lever. Fig. 5 is a side view of the cylinder detached from its connections, illustrating the slot in which the projection from the cross-head or other reciprocatory body operates. Figs. 6 and 7 are respectively plan and side views of the cross-head of the piston-rod in which the latch is mounted.

Like numerals designate similar parts throughout the various views.

Referring to the drawings, the numeral 5 designates a pump-cylinder, shown as formed of a plain piece of tubing, slotted for a portion of its length at 5' and closed at the top by a head 6, having a threaded extension 6', and at the bottom by a head 7, the latter be-

ing perforated at 7' to permit an inrush of air to the cylinder as the piston is withdrawn.

Located over the perforation 7' is a ball-valve 8, opening inward, for preventing the expulsion of air through said perforation upon the forward stroke of the piston, and threaded into the head 7 is a tube 9, containing a spiral spring 10 and a ball-valve 11, opening outward, so that on the forward stroke of the piston air will be forced through said tube into a nipple 12, to which a connection may be attached for conveying the air expelled by the pump to the desired place.

At one end the pump-cylinder 5 is fitted in the sleeve of a bracket 13, by means of which it may be secured to a frame, and at the opposite extremity of the cylinder the end 6' of head 6 is adapted to be threaded into a nut formed in a part of said frame.

Fitted in the cylinder 5 is a piston 14, to which the usual cup-shaped packing 14' is secured, and projecting from the piston is a piston-rod 15, having a tubular end, on which is fitted a cross-head 16 of peculiar construction. Mounted within the tubular portion of the piston-rod is a plunger 17, normally forced outward by a spring 18, and pivoted between lugs 16' of the cross-head 16 is a latch 19, having a hook 19' at one end and a nose 19² at the other end, against which the spring-actuated plunger 17 bears. In the cylinder 5, on the side opposite to that having the long slot 5', a short slot 5² is formed, and the slot is so located that when the piston is at the limit of its forward stroke the cross-head 16 will be opposite thereto, as shown in Fig. 1.

Pivoted between ears formed on a sleeve 20, secured to the cylinder 5, is a lever 21, having an arm 21', located at an angle thereto, and a forward extension 21², the inner face of which is flat, and this lever is formed with a socket intermediate its length, in which a short plunger 22 and a coiled spring 22' are placed, the tendency of the plunger, which bears against the cylinder, being to force the flat face 21³ of the lever away from the slot 5², and consequently out of contact with the back of the latch 19, thereby permitting said latch to be thrown up by the plunger 17 in the piston-rod to disengage it

from the piston-actuating mechanism about to be described.

Projecting from the arm 21' of lever 21 is a pin 23, against which bears an arm 24, connected to any suitable device by which it may be operated to force the lever inward and cause it to come into contact with and actuate the latch 19.

Designated by the numeral 25 is the cross-head of an engine, (or it may be any other reciprocatory body,) actuated by a pitman 26 and carrying a laterally-projecting stud 27, over which the latch 19 may be hooked, as shown in Fig. 1. To prevent injury to the cross-head 16 by the impact of the stud 27, a strip 28 of leather or other suitable material may be secured on the top of said cross-head, as illustrated in Fig. 1.

The operation of my improved pump is as follows: Normally the latch 19 will be thrown out of connection with stud 27, projecting from the reciprocatory element 25, by the spring-actuated plunger 17, located in the tubular portion of the piston-rod, this action being permitted by the slot 5² in cylinder 5 and always occurring when the piston 14 is at the limit of its working stroke, as shown in Fig. 1. Should it be desired to connect the cross-head 16 of the piston-rod with the stud 27, lever 21 is thrown inward, either by hand or by the arm 24, to the position shown in Fig. 1, and this action causes the flat side 21³ of said lever to come into contact with the back of pawl or latch 19, tilt said pawl on its pivot, and throw the hook 19' thereof over the stud 27. (See Fig. 1.) During the movement of the cross-head the pawl or latch bears against the cylinder-wall, and is thereby held in engagement with the stud 27. When the parts are thus connected, said stud, traveling in the slot 5' of the cylinder as the cross-head 25 reciprocates, will actuate the piston-rod and cause the pump to do its work. When it is desired to stop the action of the pump, arm 24 is withdrawn, thereby leaving the lever 21 free to be oscillated on its pivot by the spring-actuated plunger 22, bearing against the outer wall of the cylinder. The end of said lever is then thrown out of the slot 5², and the latch 19 will be thrown to its inoperative position by the spring-actuated plunger 17 when the cross-head reaches the position shown in Fig. 1, the back of said latch then entering the slot 5² in said cylinder. When the pump is not in operation, the stud 27 reciprocates idly in the slot 5' of the cylinder.

At its lower end, adjacent to its pivotal point 29, lever 21 is provided with a projecting portion 21⁴, having a flat inner face, which is adapted by contact with the sleeve 20 to limit the outward movement of said lever.

My invention is not limited to the particular devices shown for connecting the cross-head 16 to the stud 27, nor is it limited to the precise details of mechanism illustrated and described.

Having described my invention, what I claim is—

1. In a pump, the combination with a slotted cylinder, of a piston fitted within said cylinder, a cross-head attached to the piston-rod, a latch pivoted to said cross-head, a reciprocatory element, said latch bearing against the wall of the cylinder and being held thereby in engagement with the reciprocatory element, and means for normally throwing said latch to an inoperative position, when it registers with the slot in the cylinder.

2. In a pump, the combination with a slotted cylinder, of a piston mounted within said cylinder, a cross-head connected to the piston-rod, a latch pivoted to said cross-head, a reciprocatory element, said latch bearing against the wall of the cylinder and being held thereby in engagement with the reciprocatory element, means for normally throwing said latch to an inoperative position when it registers with the slot in the cylinder, and means acting through said slot for forcing said latch to its operative position.

3. In a pump, the combination with a cylinder, of a piston mounted within said cylinder, a piston-rod having a tubular portion, a cross-head attached to said piston-rod, a spring-actuated plunger mounted in the tubular portion of the piston-rod, a latch pivoted in said cross-head and having a projection in contact with the spring-actuated plunger, said latch being adapted to be connected to a reciprocatory element, and means for throwing said latch to its operative position against the action of said plunger.

4. In a pump, the combination with a cylinder of a piston movably mounted within said cylinder, a piston-rod having a tubular portion, a cross-head connected with said tubular portion, a spring-actuated plunger mounted within said tubular portion, a latch pivoted to the cross-head and having a nose in engagement with the plunger, and a device for tilting said latch on its pivot against the action of said spring-actuated plunger, and thereby to connect it to a reciprocatory element.

5. In a pump, the combination with a slotted cylinder, of a piston mounted within said cylinder, a cross-head attached to the piston-rod, a latch movably mounted on the cross-head, a reciprocatory element, means for throwing the latch out of engagement with said element, and a lever projecting through the slot in the cylinder into the path of the latch to cause the latch to engage said reciprocatory element.

6. In a pump, the combination with a longitudinally-slotted cylinder, of a reciprocatory element having a stud working in the slot of said cylinder, a piston within the cylinder, a cross-head attached to the upper end of the piston-rod, a latch pivoted to said cross-head, and having a nose at one end and a hook at the other end, a spring-actuated plunger mounted within a tubular portion of the pis-

ton-rod, said plunger being in engagement with the nose of the latch, a lever pivotally connected to the cylinder and having a portion for actuating the latch, and means for
5 actuating said lever.

7. In a pump, the combination with a longitudinally-slotted cylinder, of a reciprocatory element, having a stud working in a slot of said cylinder, a piston within the cylinder, a
10 cross-head connected to the upper end of the piston-rod, a spring-actuated plunger mounted within a tubular portion of the piston-rod, a latch pivoted in the cross-head and having

a hook at one end adapted to engage the stud on the reciprocatory element, and a nose at
15 the other end in engagement with the spring-actuated plunger, a lever pivoted to the cylinder and carrying a spring-actuated plunger, said lever having a flat face adapted to actuate the latch, and means for actuating
20 said lever.

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