F. F. DAVIS & C. G. HOLT.

MEASURING PUMP.

APPLICATION FILED NOV. 15, 1909.

998,281.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

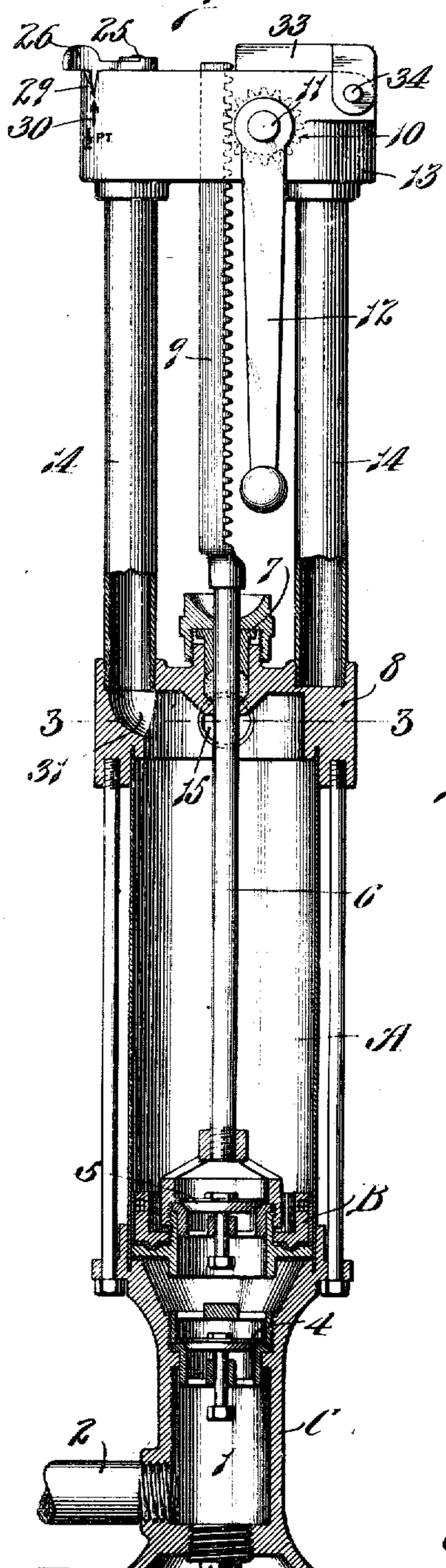


Fig. 2.

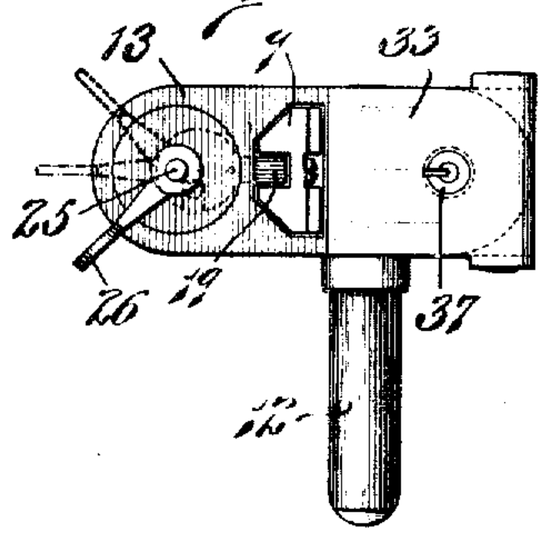
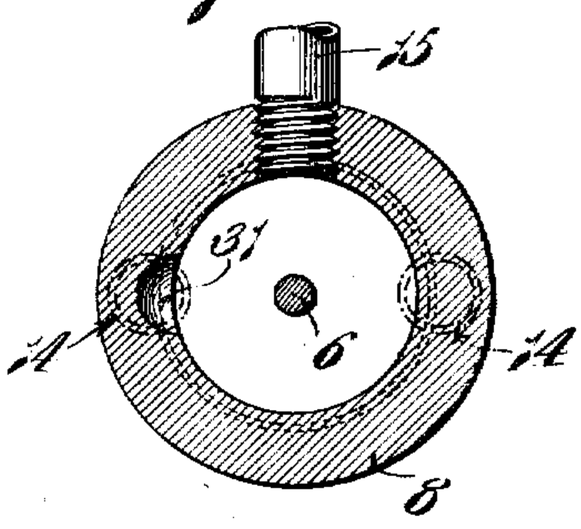


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

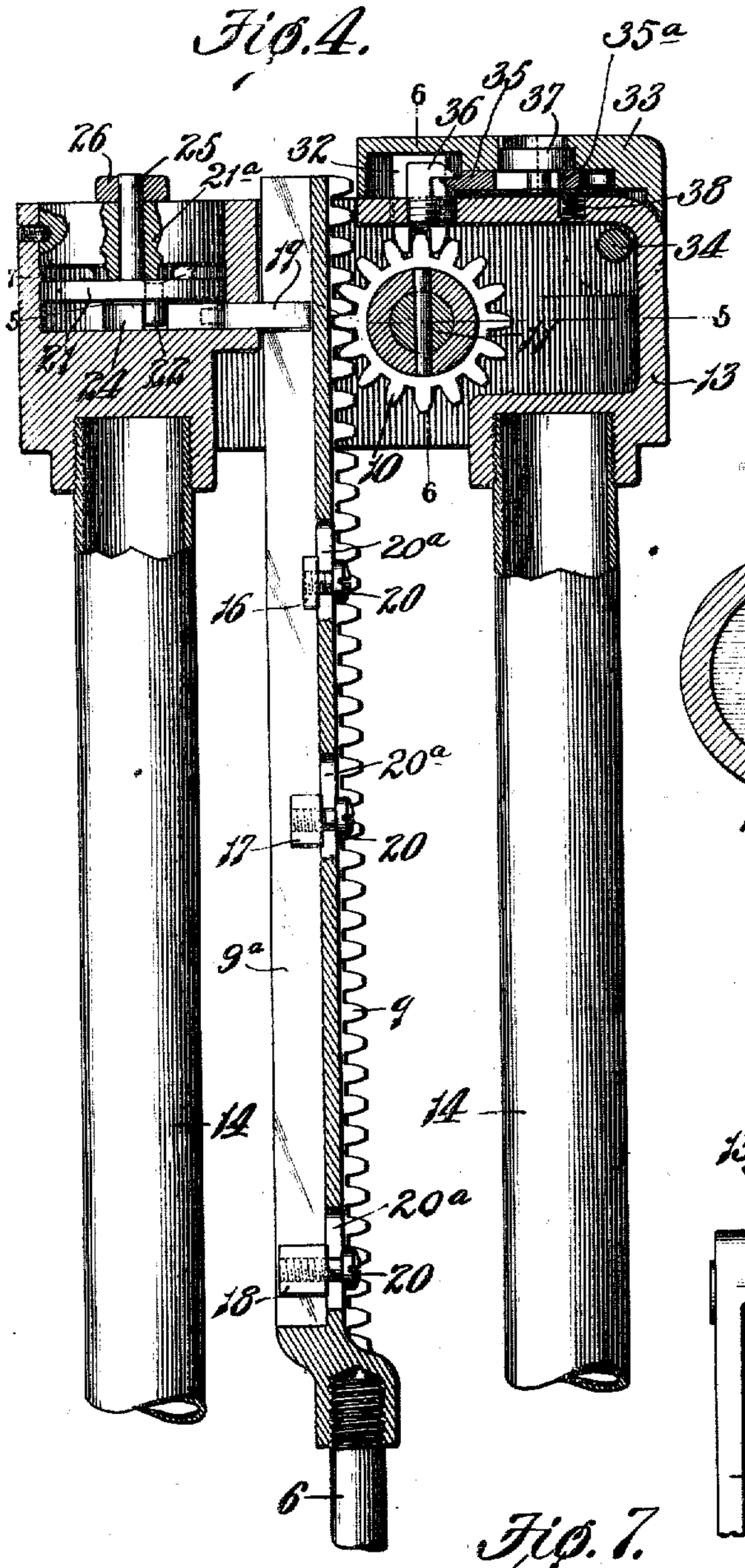
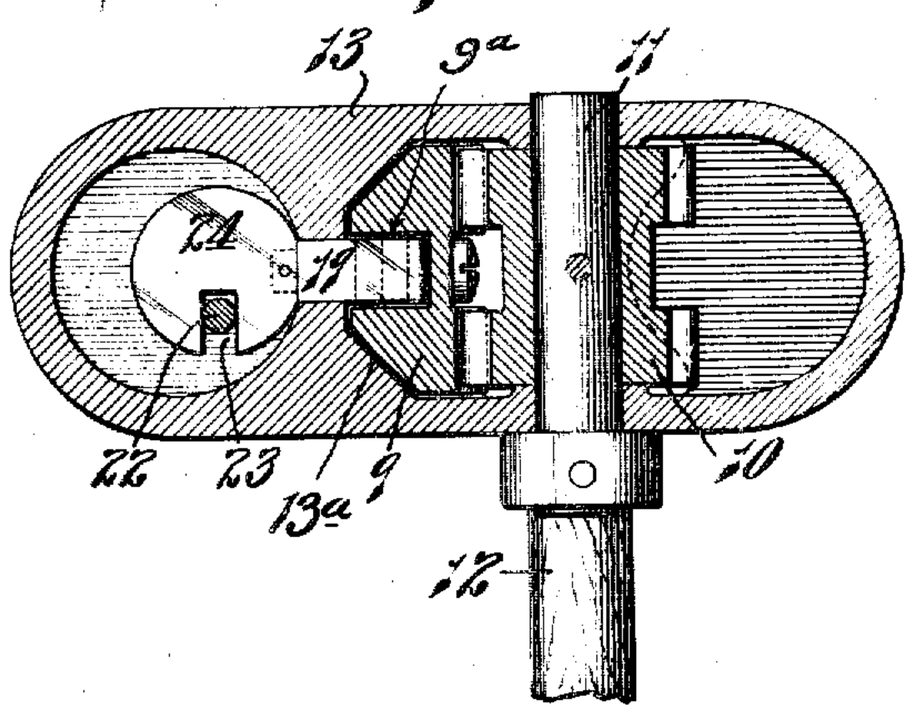


Fig. 5.



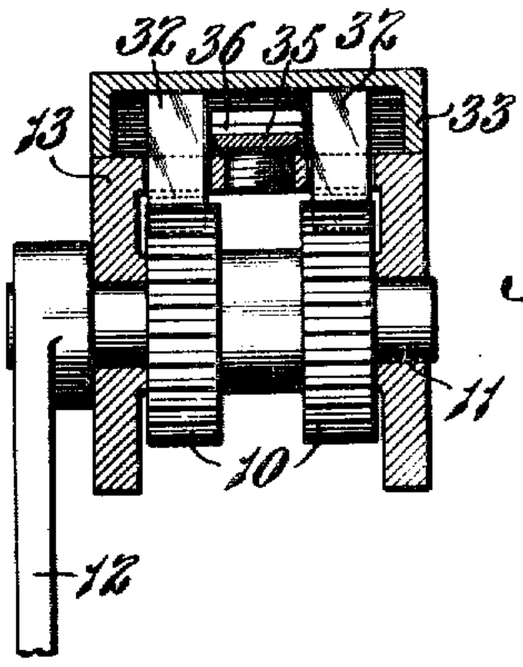
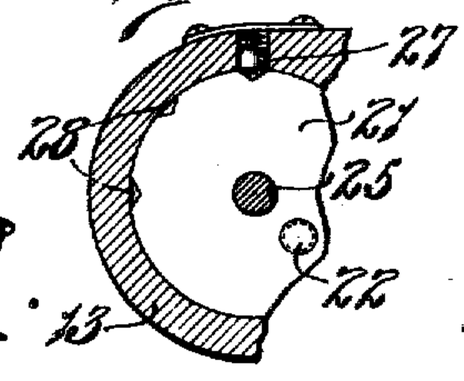


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

FRED F. DAVIS, OF ST. LOUIS, AND CLAUDE G. HOLT, OF WEBSTER GROVES, MISSOURI, ASSIGNORS TO UNITED STATES PUMP AND TANK COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

MEASURING-PUMP.

998,281. Specification of Letters Patent. **Patented July 18, 1911.**

Application filed November 15, 1909. Serial No. 528,127.

To all whom it may concern:

Be it known that we, FRED F. DAVIS and CLAUDE G. HOLT, both citizens of the United States, residing at St. Louis, Missouri, and Webster Groves, Missouri, respectively, have invented a certain new and useful Improvement in Measuring-Pumps, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to measuring pumps.

One object of our invention is to provide a measuring pump which is so constructed that the means which controls the stroke of the piston can be adjusted quickly.

Another object is to provide a compact measuring pump that is durable and which can be operated quickly.

Another object is to provide a measuring pump of novel construction having a compression chamber that permits the piston to move slightly in case the operating means for the piston is actuated when the discharge pipe from the pump cylinder is closed, thereby preventing the piston-operating means from becoming damaged or broken. And still another object of our invention is to provide means of novel construction for locking the piston of the pump.

Other objects and desirable features of our invention will be hereinafter pointed out.

Figure 1 of the drawings is a side elevational view, partly in vertical section, of a measuring pump constructed in accordance with our present invention; Fig. 2 is a top plan view of said pump; Fig. 3 is a horizontal sectional view taken on approximately the line 3—3 of Fig. 1; Fig. 4 is an enlarged vertical sectional view of the piston-operating mechanism and the means which controls the upward stroke of the piston; Fig. 5 is a horizontal sectional view taken on approximately the line 5—5 of Fig. 4; Fig. 6 is a vertical sectional view taken on approximately the line 6—6 of Fig. 4; and Fig. 7 is a horizontal sectional view taken on approximately the line 7—7 of Fig. 4.

Referring to the drawings which illustrate the preferred form of our invention, A designates the cylinder of the pump, and B designates the piston which reciprocates inside of said cylinder. The cylinder is mounted upon a base C which forms the lower head of the cylinder, and said base is provided with a chamber 1 with which the supply pipe 2 communicates. We prefer to provide the base with two openings for the supply pipe, one opening being formed in the side wall of the chamber 1 and the other opening being formed in the bottom of said chamber, as shown clearly in Fig. 1, a plug 3 being provided for closing the opening that is not in service. An inwardly opening check-valve 4 of any preferred design is arranged in the base for controlling the flow of the liquid to the pump cylinder, and an inwardly opening check-valve 5 of any preferred design is arranged in the piston B for controlling the flow of the liquid from the under side of the piston to the upper side thereof. A rod 6 to which the piston is connected, projects upwardly through a stuffing-box 7 in the top 8 of the cylinder, and a rack bar 9 is connected to said piston rod for imparting movement thereto. Said rack bar meshes with a pinion 10 secured to a shaft 11 that is provided with a handle 12 or other suitable operating device, for imparting rotary movement to said shaft. The shaft 11 is journaled in a member 13 carried by standards 14 which project upwardly from the top 8 of the cylinder, and a guideway 13^a is formed in said member 13 for receiving the rack bar 9 to which the piston rod is connected. While we have herein shown a double pinion 10 coöperating with a rack bar having two sets of teeth, we do not wish it to be understood that our broad idea is limited to this exact construction for various other means than that herein shown could be employed for operating the piston of the pump.

When the shaft 10 is turned in one direction the piston will move upwardly and the liquid on the upper side of said piston will be forced out of the cylinder through the discharge pipe 15 that leads from the upper end of the cylinder, the upward movement of the piston also causing a charge to be drawn into the lower end of the cylinder through the opening which the check-valve 4 closes. When the piston moves downwardly the check-valve 5 opens so that the liquid can pass to the upper side of the piston.

One of the novel features of our present invention consists in the means for control-

ling the upward stroke of the piston so as to govern the quantity of liquid that is forced out of the cylinder through the discharge pipe 15. Briefly described, said means consists of a plurality of stops carried by the rack bar 9, and an adjustable device which is adapted to be arranged in different positions for engaging said stops, thus arresting the piston at different points in its travel. In the preferred form of our invention as herein shown, the rack bar 9 is provided with three stops 16, 17 and 18 which project different distances from the rack bar so that they will coöperate with an adjustable device 19 that lies in the path of travel of the rack bar. The stops 16, 17 and 18 preferably consist of blocks of different thicknesses arranged in a groove 9^a on one side of the rack bar 9 and retained in position by means of set screws 20 that pass through elongated slots 20^a in the rack bar, as shown in Fig. 4. The device 19 with which the stops coöperate, is reciprocatingly mounted in the member 13 and projects into the groove in the rack bar so that it will engage one or another of the stops on the rack bar when said bar is moved upwardly. One means that we have found very efficient for adjusting the device 19 consists of a disk 21 rotatably mounted in a bearing 21^a in the member 13 and provided on its under side with an eccentrically disposed pin 22 that projects into a slot 23 formed in the head piece 24 of the device 19, said disk 21 being secured to a shaft 25 that is provided with a handle 26 or other suitable operating device. Movement of the handle 26 causes the device 19 to project farther into or out of the groove in the rack bar, depending, of course, on the direction in which the handle is moved, thus varying the position of said device relatively to the stops with which it coöperates. The stop 16 is arranged on the rack bar in such a position that it will engage the device 19 when a certain quantity of liquid has been forced out of the pump cylinder; say, for example, one-half pint, the stop 17 being arranged in such a position that the upward movement of the piston will be arrested when a different quantity has been forced out of the cylinder, and the stop 18 being arranged in still a different position. The device 19, of course, has to be adjusted whenever it is desired to change the quantity of liquid that is forced out of the cylinder, but the position of the stops on the rack bar is not changed after they have once been set or adjusted in proper position. When the device 19 is adjusted into the position shown in Fig. 4 the piston will be arrested when the stop 16 strikes said device but if it is desired to measure a different quantity; say, for example, one pint, the handle 26 has to be manipulated so as to move the device 19 outwardly far enough to permit the stop 16 to pass said device on the upward stroke of the piston. By moving the device 19 outwardly still farther the stops 16 and 17 will clear it on the upward stroke of the piston, and the piston will be arrested when the stop 18 strikes said device.

From the foregoing it will be seen that the pump can be adjusted quickly and easily to deliver different quantities of liquid by simply changing the position of the device 19. It will, of course, be understood that various other means than that herein shown could be employed for adjusting the device 19 without departing from the spirit of our invention which consists broadly in providing a pump with an adjustable device that is adapted to be arranged in different positions so as to coöperate with a plurality of stops carried by a member that moves with the piston of the pump. It is preferable to provide the rack bar with stops of different thicknesses, as herein shown, but the same result could be obtained in various other ways without departing from the spirit of our invention.

Any suitable means can be used for locking the mechanism which controls the device 19, such, for example, as a spring-pressed pawl 27 that coöperates with notches or recesses 28 in the periphery of the disk 21, as shown in Fig. 7. Said pawl exerts sufficient pressure on the disk to hold the device 19 in the position to which it has been moved, but it does not positively lock said disk and consequently a slight pressure on the handle 26 will cause the disk to be released from the pawl 27. If desired, an index or scale can be arranged adjacent the path in which the operating device for the disk travels so as to aid the operator in setting the disk 19. In the construction herein shown the handle 26 is provided with a pointer 29 that cooperates with a scale 30 on the side face of the member 13 in which the disk 21 is mounted, but it will, of course, be obvious that various other means could be employed for this purpose.

The standards 14 which support the member 13 in which the pinion 10 and device 19 are mounted, are hollow, as shown in Figs. 1 and 4, and a duct 31 is formed in the upper head-piece 3 of the cylinder so as to establish communication between the interior of the cylinder and the interior of the standard that communicates with said duct. The object of constructing the pump in this manner is to provide an expansion chamber or air chamber at the upper end of the cylinder which permits the piston to move slightly in case the operating mechanism for same is actuated when the discharge pipe 15 is closed, thereby preventing said piston-operating mechanism from becoming damaged or broken. That is to say, with a pump

of the character herein described, there is no danger of stripping the rack bar or the pinion in case the handle 12 is turned when the discharge pipe from the cylinder is closed for there is sufficient air in the hollow standard that communicates with the duct 31 to permit the piston to move upwardly slightly and thus compress the air in said standard.

In Figs. 4 and 6 we have illustrated in detail a means of novel construction for positively locking the piston-operating mechanism so as to prevent the pump from being operated or tampered with by an unauthorized person. Said means comprises one or more dogs 32 that are adapted to engage the teeth on the pinion 10, a movable member which carries said dogs, and means for locking said member in such a position that said dogs positively hold the pinion from moving. In the construction herein shown the dogs 32 are carried by a housing 33 that is hinged or pivotally connected at 34 to the member 13, and said housing is provided with a key-controlled latch 35 of any preferred design that is adapted to engage a stationary catch 36 on the upper side of the member 13. The latch 35 is slidingly mounted in a pocket on the under side of the housing 33, and said housing is provided with a rotatable key plate 37 through which a key can be inserted so as to engage the wall of a slot 35^a in the latch 35 and move it out of contact with the catch 36 when the key and key plate are rotated. As soon as the latch has been disengaged from said catch the housing is thrown upwardly by means of a coiled expansion spring 38 mounted in a pocket on the upper side of the member 13, the upward movement of said housing causing the dogs 36 to pass out of engagement with the teeth of the pinion.

A pump of the construction herein described is compact and durable, and the means which controls the upward movement of the piston is so designed and arranged that it can be operated easily. The expansion chamber that communicates with the cylinder reduces the liability of breakage of the piston-operating mechanism, and the locking mechanism for the piston-operating means is so designed that it securely locks the pump and prevents an unauthorized person from manipulating the pump.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A pump provided with a piston, mechanism for operating said piston, a plurality of stops carried by one element of said operating mechanism and projecting outwardly different distances from said element, said stops being arranged in alinement with each other, and an adjustable device arranged in alinement with said stops and adapted to be moved into position for engaging one or another of said stops so as to limit the movement of the piston.

2. A pump provided with a reciprocating piston, a piston-operating mechanism comprising a rack bar having elongated openings, a plurality of spaced stops adjustably mounted in the elongated openings in said rack bar and projecting outward different distances therefrom, a member provided with a guideway through which said rack bar passes, a reciprocating device carried by said member and adapted to coöperate with the stops on said rack bar to limit the movement of the piston, and an oscillating element carried by said member and eccentrically connected to said device for changing the position of same relatively to the stops on said rack bar.

3. A pump provided with a reciprocating piston, an operating mechanism for said piston comprising a rack bar, a plurality of spaced stops on said rack bar that project outwardly different distances therefrom, said stops being adapted to be adjusted longitudinally of the rack bar, a member having a guideway through which said rack bar passes, a device slidingly mounted in said member and adapted to coöperate with the stops on said rack bar, said device being provided at one end with a head, and an adjustable element rotatably mounted in said member and eccentrically connected to the head on said device.

4. A pump provided with a reciprocating piston, a rack bar connected with said piston and provided on one side with an elongated slot or channel, a plurality of spaced stops arranged in said channel and projecting outwardly different distances from the bottom wall of the channel, said bottom wall being provided with elongated openings, bolts passing through the elongated openings in said bottom wall for adjustably connecting said stops to said rack bar, a stationary member through which the rack bar passes, a reciprocating device mounted in said stationary member and projecting into the channel in said rack bar, and means for moving said device into and out of the path of movement of said stops.

5. A pump provided with a reciprocating piston, a rack bar connected with said piston, a toothed actuating element meshing with said rack bar, a stationary member through which said rack bar passes, a movable housing carried by said member and provided with a dog that engages said toothed actuating device, and means for locking said housing in its closed position.

6. A pump provided with a reciprocating piston, a rack bar connected with said piston, a toothed actuating element meshing with said rack bar, a stationary member through which said rack bar passes, said

member being provided with a catch, a movable housing carried by said member and provided with a dog that engages said toothed actuating device, and a key-controlled latch carried by said housing and cooperating with the catch on said stationary member.

7. A pump provided with a cylinder, a reciprocating piston arranged in said cylinder, a rack bar connected with said piston, standards projecting upwardly from the top of the cylinder, a stationary member carried by said standards and provided with a guideway through which said rack bar passes, a manually-operated pinion journaled in said member and meshing with said rack bar, a locking device coöperating with said pinion, a plurality of spaced stops on said rack bar, arranged in longitudinal alinement with each other, a device carried by the member through which the rack bar passes and arranged at approximately right angles to said member and means for adjusting said device to different positions for engaging one or another of the stops on said rack bar.

8. A pump comprising a cylinder, a piston arranged in said cylinder and provided with a rod that projects upwardly through the top of the cylinder, a rack bar connected to said rod, standards connected to the top of the cylinder and carrying a member having a guide through which the rack bar passes, an operating mechanism journaled in said member for actuating said rack bar, means carried by said member for locking said operating mechanism, one of said standards being provided with an air chamber that communicates with the cylinder, a plurality of spaced stops of different thicknesses on said rack bar arranged in longitudinal alinement with each other, an adjustable device carried by the member mounted on said standards for coöperating with the stops on the rack bar to limit the movement of the piston, and means for moving said device into and out of the path of said stops.

In testimony whereof, we hereunto affix our signatures, in the presence of two witnesses, this twelfth day of November, 1909.

FRED F. DAVIS.
CLAUDE G. HOLT.

Witnesses:
WELLS L. CHURCH,
GEORGE BAKEWELL.