R. A. DEAN.

PUMP ACTUATING MECHANISM.

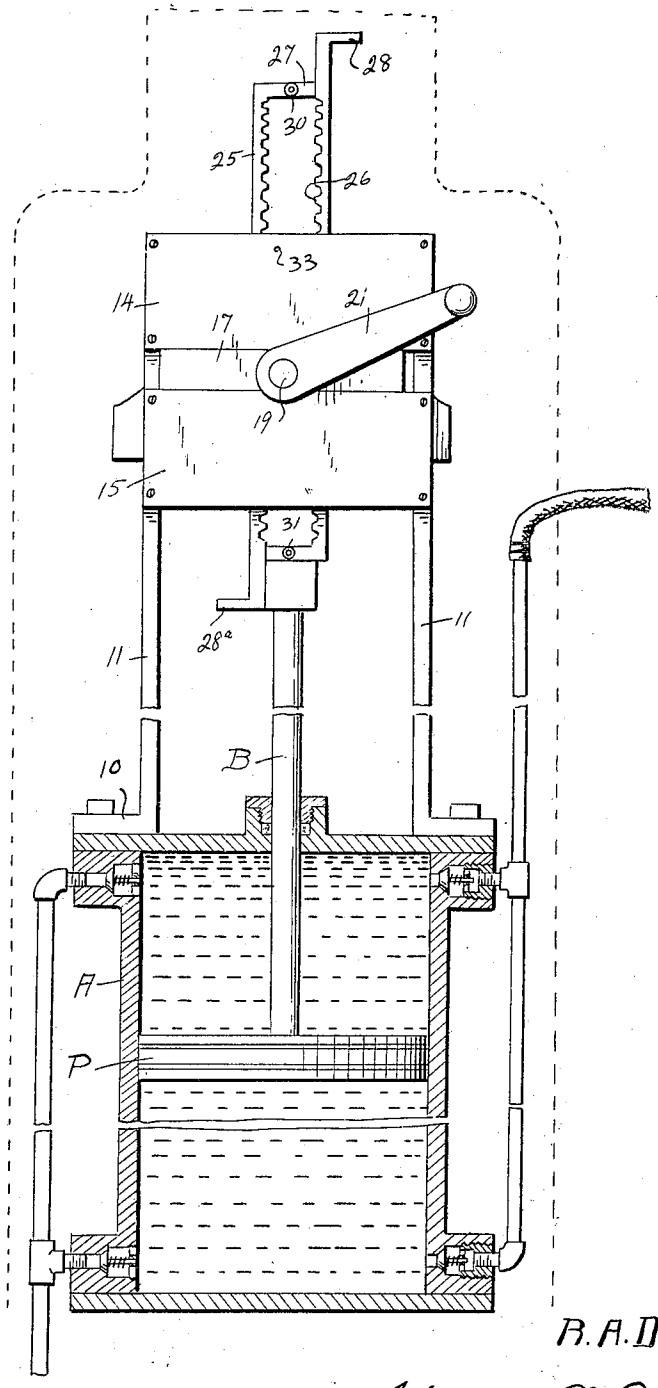
APPLICATION FILED APR. 23, 1919.

1,375,135.

Patented Apr. 19, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 3.

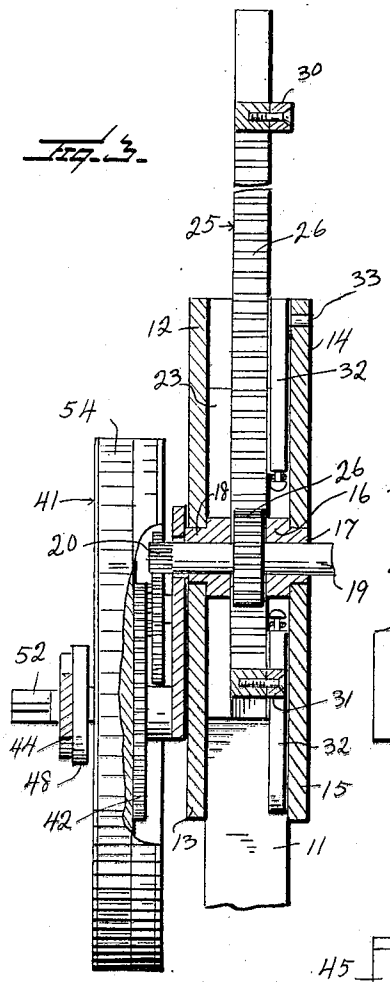


Fig. 2.

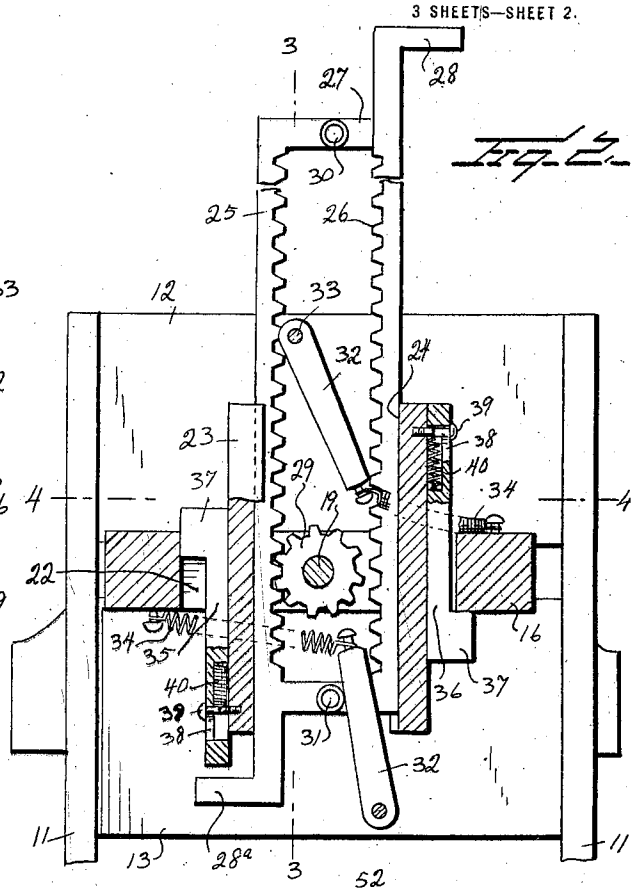


Fig. 4.

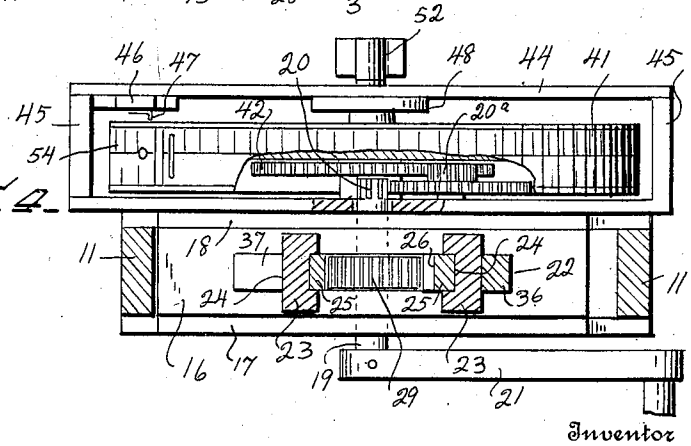
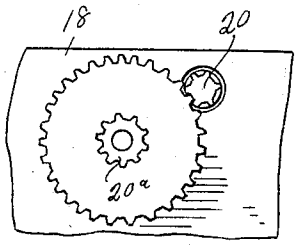


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

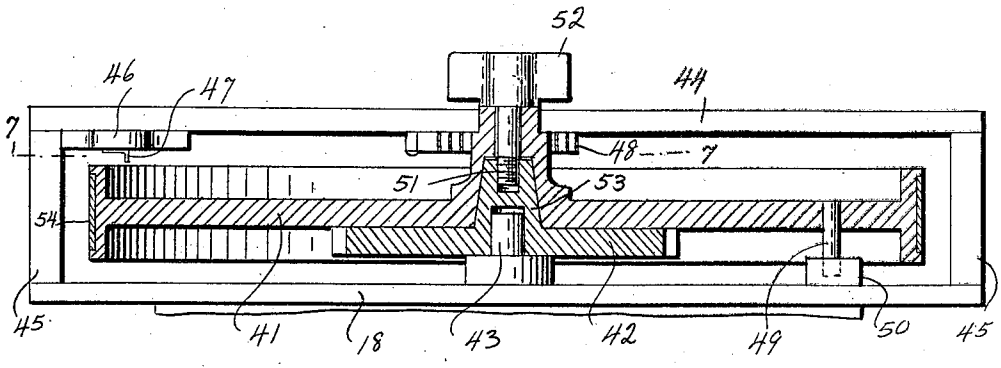


Fig. 8.

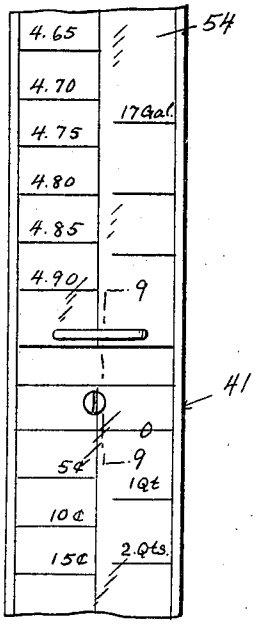


Fig. 7.

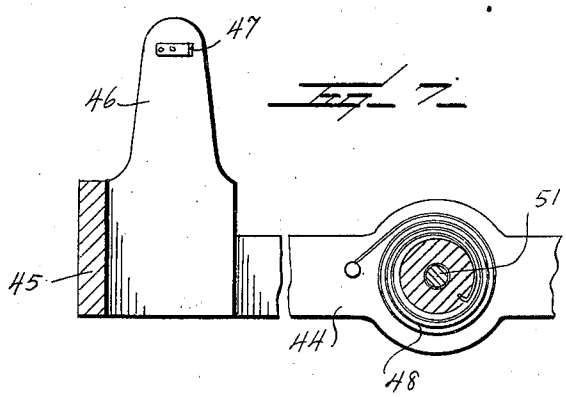
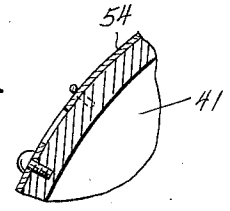


Fig. 9.



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UNITED STATES PATENT OFFICE.

ROBERT A. DEAN, OF TYLER, TEXAS.

PUMP-ACTUATING MECHANISM.

1,375,135. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed April 23, 1919. Serial No. 292,095.

To all whom it may concern:

Be it known that I, ROBERT A. DEAN, a citizen of the United States, residing at Tyler, in the county of Smith and State of Texas, have invented certain new and useful Improvements in Pump-Actuating Mechanisms, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to measuring pumps such as are used for measuring and dispensing gasolene, lubricating oils and other liquids, and particularly relates to a means for securing a reciprocation of the piston of the pump and the measurement of the number of gallons or fractions of a gallon dispensed by the pump.

The measuring pumps that are now in use are operated by turning a crank which causes a movement of the pump piston in one direction and then by reversing the movement of the crank, the pump piston is moved in a reverse direction. In other words, the crank is turned one way in order to discharge the contents of the pump cylinder and then it is turned in the opposite way in order to refill this cylinder.

The main object of my invention is to avoid objections to this character by providing a pump actuating means so constructed that a continuous movement of the crank in one direction will cause a reciprocation of the piston in both directions.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is an elevation of my improved pump operating mechanism, the cylinder of the pump being shown in section;

Fig. 2 is a vertical transverse sectional view of the operating mechanism in position just before the carrier is about to shift;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a fragmentary view of the gears 20 and 20^a and a portion of the casing;

Fig. 6 is a diametrical sectional view of the registering wheel;

Fig. 7 is a fragmentary section on the line 7—7 of Fig. 6;

Fig. 8 is a fragmentary elevation of the periphery of the registering wheel and its strip; and

Fig. 9 is a fragmentary section on the line 9—9 of Fig. 8.

Referring to these drawings, it will be seen that my actuating device comprises a base 10 having thereon uprights 11, which uprights are connected by transverse members 12 and 13 and 14 and 15 respectively, the members 12 and 13 being vertically spaced from each other, as are the members 14 and 15 for a purpose which will be later stated. Disposed between the uprights 11 and transversely shiftable on guides, is a carrier 16. This carrier may be formed with members 17 and 18 which are disposed in the spaces between the members 12 and 13 and 14 and 15, so that the carrier is supported for lateral shifting movement in the guides thus formed. Extending through the middle of the carrier is a shaft 19 which carries upon it a pinion 20 on the rear face of the frame, and this pinion is adapted to engage with any desired recording or registering wheel, as will be later described. On the front of the machine, the shaft 19 is provided with a crank handle 21 or with other suitable means whereby the shaft 19 may be rotated. The carrier 16 is longitudinally slotted, as at 22, and attached to the back and front of the casing or frame are guides 23 which extend above and below the carrier, and each reduced in thickness at its middle so as to pass through the slot 22. These guides are parallel to each other and are preferably widened at their upper and lower ends and are vertically grooved, as at 24.

Disposed to move vertically through these grooves 24 and the slot 22 in the carrier, is a double rack comprising rack bars 25, having confronting teeth 26, these rack bars being connected at their upper ends, as at 27, in any suitable manner, and the rack bars at their upper extremities having laterally extending portions 28 and 28^a. The lower part 28^a extends in opposite directions from the upper part 28. The shaft 19 carries upon it a pinion 29 adapted to mesh with the rack teeth 26, this pinion having a diameter less than the space between the rack bars, and when the slide 16 is shifted in one direction, the teeth on the pinion 29 will engage with one of the rack bars, and when shifted in the other direction will engage with the other rack bar.

For the purpose of causing the slide 16 to shift when the double rack bar has reached

one end of its stroke, or the other, I provide at the upper and lower ends of the combined rack bars, the outwardly projecting rollers 30 and 31 respectively and pivot upon the member 14 an arm 32, this arm being pivoted at one end, as at 33, and at its other being connected to a relatively strong contractile spring 34 which, in turn, is connected to one end of the sliding carrier 16. This arm 32 extends downward and toward the central line of the rack and is normally, therefore, disposed in the path of movement of the roller 30. When this roller 30 moves downward and the rack reaches a position nearly at the end of its stroke, the roller 30 will engage the arm 32 and shift it laterally and increase the tension of the spring 34, and thus this spring will exert a pull upon the carrier 16, urging it to the left in Fig. 2. A like arm 32 is mounted upon the member 15 and coacts with the roller 31, this arm being also connected by the spring 34 to the sliding carrier, but this spring extending to the opposite end of the carrier to the first named spring 34.

The carrier is locked from longitudinal shifting movement by vertically shiftable latches 35 and 36, each disposed against the outside face of one of the guides 23 and also extending through the slot 22 in the carrier. The latch 35 is provided at its upper end with a head 37 adapted to fit in the end of the slot 22 when this latch is shifted and engage against the end wall of the slot 22 to hold the carrier or slide in its laterally shifted position against the movement in the opposite direction. To this end, the latch extends downward below the slide 16 and is formed with a longitudinally extending slot 38 through which passes a pin 39 acting as a guide pin. The guide 36 has a head 37 at its lower end and this guide is likewise formed with a slot 38 through which passes the pin 39, but the head of this latch is disposed below the carrier 16 and the shank extends upward instead of downward. The lateral prolongations 28 and 28^a of the double rack are adapted to engage respectively with these latches 35 and 36. Springs 40 act to urge the latch 36 upward and the latch 35 downward.

Now it will be obvious that when the carrier 16 is shifted toward the left in Fig. 2, the head 37 of the latch 35 will be engaged in the end of the slot 22 and will hold the carrier laterally shifted against any movement toward the right and this will hold the pinion 29 in engagement with the rack teeth of the left hand rack bar. If the crank be given a clockwise rotation, the double rack bar will be shifted upward until such time as the projection 28^a engages the lower end of the latch 35. It then acts to shift this latch upward and before the head of the latch has passed the upper face of the carrier 16, the roller 31 engages the lower arm 32 and shifts it toward the right which increases the tension on the corresponding spring 34 so that as soon as the latch head 37 rises above the upper face of the carrier 16, the carrier will be shifted to the right, carrying the pinion 29 to the the right and engaging it with the right hand set of rack teeth and a continuation of the clockwise movement of the crank handle 21 will, therefore, cause the rack to move downward. As soon as the rack has reached its uppermost position and the carrier 16 has been shifted to the right, the head 37 of the right hand latch 36 will be shifted into the slot 22 to hold the carrier to the right until the rack has moved its full distance downward. It will thus be obvious that a continuous rotation of the handle 21 will cause a reciprocation of the double rack. This double rack may be connected in any suitable manner to the cylinder of a pump, and I do not wish to be limited to any particular manner of connecting the double rack to the cylinder of the pump. I have illustrated a cylinder A having its piston rod B connected to the rack, but I do not wish to be limited to any particular means of connection or any of the other details of construction, as it is obvious that the double rack might be connected either directly to the piston P of the cylinder or through intermediate gearing thereto.

Mounted upon the rear of the supporting frame or casing and specifically upon the member 18, is a registering wheel, designated generally 41. I have shown this registering wheel as being provided with a loose gear wheel 42 adapted to engage with the pinion 20^a driven from pinion 20 on the shaft 19, but I do not wish to be limited to this, as any other means of engaging this pinion 20 to the registering wheel 41 may be used. This registering wheel is mounted on a stub shaft 43 which, at its rear end, is engaged with and supported on the member 18 and which rotatably supports the gear wheel 42 and an integral cone clutch 53. A cross bar 44 is supported by brackets 45 extending outward from the member 18. One of these brackets carries an index supporting member 46 having an index pointer 47. Attached to the cross bar 44 is one end of a coiled spring 48, the other end of which is connected to the hub of the registering wheel so as to urge the registering wheel in one direction. The registering wheel is provided with a stop 49 which engages with a stop 50 carried on the member 18, thus limiting the registering wheel to one complete rotation. The coiled spring 48 will tend to rotate the registering wheel into a position where the stops 49 and 50 are in engagement with each other. The gear wheel 42 is loose upon the

shaft which carries the registering wheel, but I have provided means whereby this gear wheel may be operatively engaged with the registering wheel or disengaged therefrom, said means comprising a head 52, a screw shank 51, and a cone clutch 53. When this head 52 is rotated in one direction, it will disengage the gear wheel 42 from the registering wheel, and when rotated in the other direction it will engage these two wheels.

The perimeter of the registering wheel is provided with graduations. Preferably, these graduations are arranged in two series, as indicated in Fig. 8. One column or series will have graduations thereon indicating gallons as, for instance, from 0 to 17¾ gallons or fractions of a gallon, if desired, while the other column will contain therein the total cost of the gallons of gasolene, arranged coördinately to the gallon graduations. The cost graduations will, of course, be based upon a certain definite price of gasolene or other commodity per gallon and strips 54 of suitable material having thereon these graduations will be provided covering the gasolene at different prices, which will be adapted to be applied to the periphery of the recording or indicating wheel and removed therefrom. I do not wish to be limited to any particular means for holding these graduated strips in engagement with the periphery of the wheel, but I have illustrated a strip which is overlapped at its ends and detachably engaged with the wheel by means of a screw. Any other suitable arrangement, however, may be provided.

In the use of this device, the gage wheel will be disposed with the stops 49 and 50 bearing against each other and with the pointer 47 pointing at zero on the strip on the periphery of the gage wheel. The clutch formed by the cone 53 and screw-threaded shank 51 will be loosened. Now if it be desired to serve a customer with the liquid for which the pump is designed, the head 52 is turned to engage the gage wheel or recording wheel with the gear wheel 42. Then the crank handle 21 is rotated in a clockwise direction and this causes, as before stated, a reciprocation of the rack bar and the reciprocation of the pump piston until the desired quantity has been dispensed. The rotation of the shaft 19 will cause a corresponding rotation of the gage wheel against the action of the spring 48 and when the dispensing operation has been finished, the pointer 47 will indicate on the gage wheel the number of gallons or fractions of a gallon which have been dispensed and the cost thereof at a certain definite market price per gallon. When the customer has been served and the calculation made, the engagement between the gear wheel 42 and the gage wheel 41 is released, whereby the spring 48 will act to return the gage wheel to its zero position. I have illustrated a very simple means of connecting the gage wheel to the gear wheel 42 and driving this gage wheel, but it will be understood that other means might be provided for this purpose, and that I do not wish to be limited to this particular arrangement of gearing. Furthermore, it will be seen that a recording register may be easily applied to the machine adapted to be operated by the gage wheel or by its driving mechanism which will indicate the total number of gallons dispensed to all customers during a certain definite period or time. I have not illustrated this, however, as it is an obvious arrangement.

It will be seen that I not only show the amount pumped in gallons and fractions of a gallon, but also in dollars and cents. The device is suitable for dispensing gasolene, coal oil, lubricating oils, or any other liquid that is sold by the gallon or by a greater or less measure, and that the measuring gage could be graduated to suit the use to which the pump is intended to be placed. For dispensing coal oil or lubricating oil where only relatively small quantities are sold, there would be no necessity for the gage wheel showing more than five gallons or so, as this is as much as is usually sold at one time. At gasolene stations, however, the gage wheel or register could be made of a much greater capacity. The graduated gage strip or indicating strip which is disposed upon the periphery of the record wheel may be made of celluloid, thin sheet metal or other suitable material which would not be likely to become damaged from hard usage. Preferably, rubber buffers will be disposed upon the stops 49 and 50 to reduce the shock when the stops come together. I do not, of course, wish to be limited to the particular form of supporting frame of this mechanism, as it is obvious that it may be mounted in frames or housings of different characters, and also obvious that the gage wheel might be mounted within a housing provided with a display opening through which the periphery of the wheel could be read. Of course, a double acting pump is designed to be used with this device which will eject oil from the cylinder on one side of the piston, while drawing oil into the pump barrel of the cylinder on the opposite side of the piston. With the constructions as now in use, it is necessary, as before stated, after moving the piston in one direction to eject a measure of oil, to reverse the piston in order to fill the barrel. This takes time, and this time is saved in my construction by providing a mechanism which causes a complete reciprocation of the

piston upon a continuous rotation of the operating crank.

I claim:—

1. A mechanism of the character described comprising a rack having opposed rack teeth, a carrier having a slot through which the rack passes, said carrier being shiftable transversely of the rack, a rotatable pinion mounted on the carrier and engageable with one or the other of the sets of rack teeth, locking members mounted on each side of the rack and urged into position between the ends of the slots and the rack to thereby hold the carrier from return movement after it has been shifted in one direction, means acting upon a predetermined movement of the rack in one direction urging the carrier in one direction and shifting one of the locking members out of its locking position and shifting the other member into locking position, and means acting upon a predetermined movement of the rack in the other direction urging the carrier in a direction opposite to that in which it was first urged and shifting the last named member out of its locking position and shifting the other locking member into operative position.

2. A mechanism of the character described comprising a reciprocatable rack having opposed rack teeth, a carrier having a slot through which the rack passes, the carrier being slidable transversely of the rack, a pinion mounted on the carrier and engageable alternately with one or the other of the sets of rack teeth, coiled springs attached to opposite ends of the carrier and extending toward the rack, said springs being normally slack, means for placing a tension on one of said springs when the rack has shifted to one extremity of its movement to thereby urge the carrier in a direction to carry the pinion from engagement with one set of rack teeth to the opposite rack teeth, means for placing the other spring under tension when the carrier has moved a full stroke in the opposite direction to thereby reverse the movement of the carrier and the pinion, and latches holding the carrier shifted in one or the other of its positions, one of said latches being released and the other shifted into operative position upon the arrival of the rack at opposite ends of its stroke.

3. A mechanism of the character described comprising a rack having oppositely disposed rack teeth, a carrier having a slot through which the rack passes, said carrier being shiftable transversely of the rack, a pinion mounted on the carrier and engageable alternately with one or the other of the sets of rack teeth, locking members mounted on each side of the rack and alternately shifted into locking position to hold the carrier in shifted position as the rack reaches one end or the other of its stroke, means for shifting the carrier when the rack reaches one end or the other of its stroke comprising coiled contractile springs attached to opposite ends of the carrier, pivoted arms disposed above and below the pinion and connected at their free ends each to one of the coiled springs, and means on opposite ends of the rack engageable with one or the other of said arms as the rack reaches the end of its stroke to oscillate the engaged arm and increase the tension on the spring and thereby shift the carrier.

4. A pump actuating mechanism comprising a supporting frame, vertical guides mounted in the supporting frame, a carrier slidingly mounted on the supporting frame for longitudinal movement at right angles to said guides, a double-toothed rack having opposed rack teeth movable between said guides at right angles to the carrier, a pinion mounted upon the carrier and engageable with one or the other set of rack teeth, arms pivotally mounted upon the frame and having springs connected to their free ends and to relatively opposite ends of the carrier, said springs when placed under tension urging the carrier in one or the other direction, latching members alternately engageable with the slide and acting to hold the slide in one or the other of its shifted positions, means urging said latching means into engagement with the slide, means at opposite ends of the rack engaging said arms to shift them to thereby increase the tension of the springs connected thereto and thereby shift the carrier in a direction to carry the pinion out of engagement with one set of gear teeth into engagement with the other set of gear teeth.

5. A pump actuating mechanism comprising a rack having opposed sets of rack teeth, a carrier disposed at right angles to the stroke of the double rack and shiftable longitudinally, a pinion mounted on the carrier and engageable with one or the other of the sets of rack teeth, means for rotating said pinion, a supporting frame for the carrier, and upper and lower arms each pivoted at one end and operatively connected to the carrier, and means mounted upon the ends of the rack acting to alternately shift said arms as the rack reaches the end of its stroke to thereby shift the carrier in one direction or the other.

6. A pump actuating mechanism comprising a supporting frame, a longitudinally movable rack having opposed facing rack teeth, a carrier slidably mounted on the frame and having a slot through which said rack passes, the carrier sliding at right angles to the path of movement of the rack, a pinion mounted upon the carrier and engageable with either of the sets of rack teeth as the carrier is shifted, guides between

which the rack passes, said guides extending up and through the slot of the carrier, latches having shanks disposed through the slot of the carrier and at opposite ends thereof and bearing against the guides, each latch having a head, one of the latches having its head at one end and the other having its head at the opposite end, means urging the latches in a direction to carry the heads against the carrier, studs projecting from opposite ends of the double rack, arms disposed on opposite sides of the carrier, each arm being pivoted at one end to the frame, and the free ends of the arms extending toward the carrier at an inclination to and across the path of travel of said studs, the free ends of the arms being connected to relatively opposite ends of the carrier by contractile springs to thereby urge the carrier in one direction or the other as the rack reaches the end of a stroke, and means carried by said rack for shifting an active latching member into its inoperative position to permit the shifting of the carrier to thereby shift the pinion from its engagement with one set of rack teeth into engagement with the other set of rack teeth and thereby reverse the movement of the rack.

7. The combination with a double acting reciprocating pump, of an actuating device therefor including a reciprocating element, a manually rotatable element, and means causing a reciprocation of the element upon a continuous rotation of the rotatable element in one direction.

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

ROBERT A. DEAN.

Witnesses:
FRED L. GILLIAM,
W. J. STEPHENS.