June 29, 1926. 1,590,426

F. E. DAYTON ET AL

MECHANICAL MOVEMENT

Filed Oct. 11, 1921

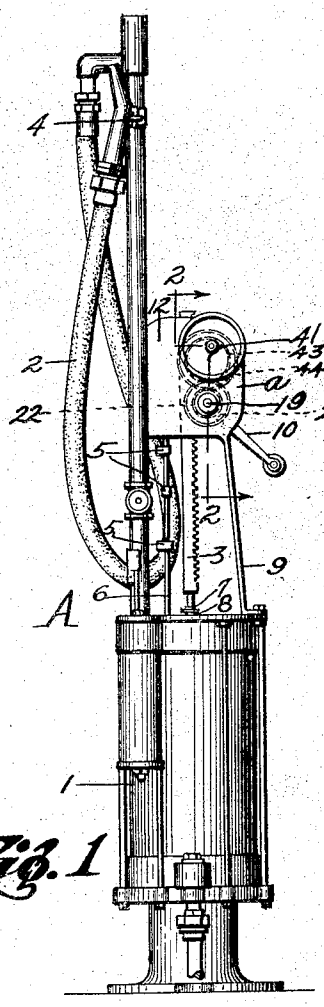


Fig. 1

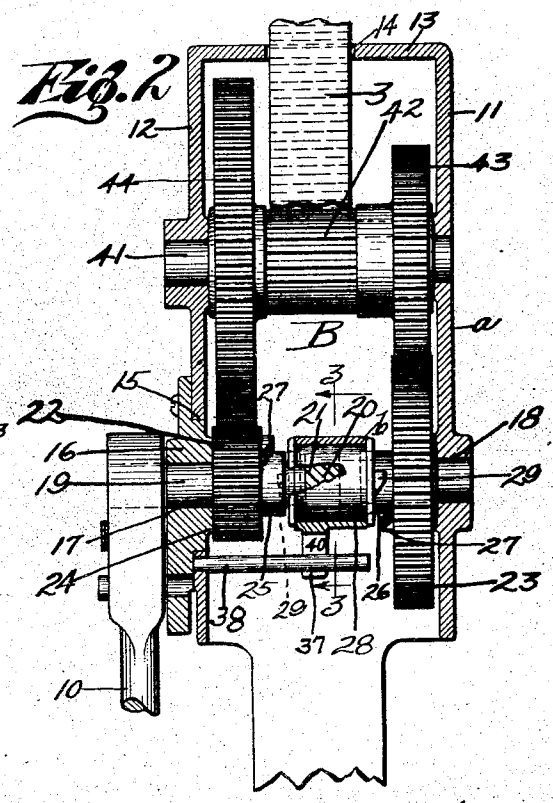


Fig. 2

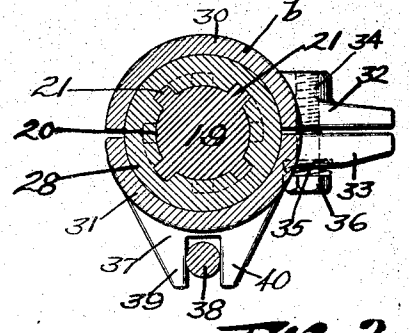


Fig. 3

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UNITED STATES PATENT OFFICE.

FRANK E. DAYTON AND CURTIS H. EDWARDS, OF LOS ANGELES, CALIFORNIA, ASSIGNORS TO THE BOYLE-DAYTON CO., OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

MECHANICAL MOVEMENT.

Application filed October 11, 1921. Serial No. 507,062.

This invention relates to mechanical movements, and particularly that branch of mechanical movements pertaining to quick return motions.

The invention has for an object the provision of a device incorporating the mechanical movement which is simple in construction and positive in its operation.

In practicing the invention we provide a device applicable in one of its embodiments to pumps, such as used for delivering gasoline, oil and similar fluids, and this device is adapted to actuate the plunger for delivering said fluid. When utilizing such a pump it is customary to provide some means for raising the plunger of the pump. This is accomplished by either turning a crank handle or by other mechanical means. If a crank handle is utilized the crank handle is turned a certain number of times in one direction to raise the pump piston, and a reverse movement of the handle allows the piston to descend. It is an object of our invention to incorporate the particular mechanical movement to be described in a suitable device with the handle of the pump and the pump so that a certain number of turns of the handle in one direction will raise the pump piston, and a reverse turning of the handle will lower the piston with a less number of turns of the handle than was required to raise the piston. For instance, it might require twelve turns of the handle to entirely raise the piston and three turns of the handle in a reverse direction to lower the piston. This operation is accomplished without the operator of the pump doing more than turning the handle in one direction or the other.

The invention has for further objects the provision of an improved mechanical movement which will be superior in point of relative simplicity and inexpensiveness of construction, taken in conjunction with utility, durability and general efficiency and serviceability.

With the above mentioned and other objects in view the invention consists in the novel and useful provision, formation, combination and association of the mechanism making up the mechanical movements as illustrated in one of its embodiments in the accompanying drawing, described in the following statement and finally pointed out in claims.

In the drawing:

Figure 1 is a perspective view of a fluid dispenser having in combination mechanism incorporating the invention;

Figure 2 is a fragmentary cross sectional view of the mechanism embodying the invention and taken on the line 2—2 of Figure 1, and looking in the direction of the appended arrows; and,

Figure 3 is a cross sectional view of certain details of the mechanism, taken on the line 3—3 of Figure 2, and looking in the direction of the appended arrows.

Corresponding parts in all the figures are designated by the same reference characters.

The drawing illustrates the invention as being incorporated and in combination with a pump or fluid dispenser A, which dispenser is of the well-known form now commercially used in gasoline and oil supply stations, and includes a cylinder 1, a discharge hose 2 and means such as a rack bar 3 for raising a piston (not shown) located within the cylinder 1, and whereby upon raising the rack bar by mechanism to be described, gasoline will be discharged from the hose 2 through a nozzle 4. In said pump construction stop measures 5 are provided which are carried upon a rod 6, and are adapted to be rotated with the rod 6 so that they may come into position to contact with a flanged member 7 carried on a piston rod 8 connected with the rack bar 3. The first stop measure will represent one gallon of fluid delivered from the pump, and if this stop is turned so as to engage the flange 7, further movement of the rack bar upwardly will be prevented until said stop is so rotated as to allow further movement of the rack bar. Carried upon the top of the pump cylinder by means of brackets 9 is a housing *a*. The rack bar passes within said housing and ordinarily a gear associated with a handle member 10 having its teeth meshing with the teeth of the rack bar causes movement of said rack bar responsive to a turning of the handle. In this construction a certain number of turns of the handle will raise the rack bar and

the same number of turns in an opposite direction will lower the rack bar the same distance. It is the purpose of this invention to allow the rack bar to be raised by a definite number of turns of the handle 10 to its extreme limit, and a reverse turning of the handle 10 will lower the rack bar with a correspondingly lesser number of turns of the handle than was required to raise the rack bar. The improved mechanism is designated in its entirety as B, and reference to Figure 2 shows that the said mechanism incorporating the improved mechanical movement is located within the housing *a*. In particular the housing comprises two side walls 11 and 12 and a top wall or end wall 13, a bottom wall not being used. The top wall 13 is provided with an opening 14 through which the rack bar 3 passes. The side wall 12 is provided with an opening 15 and a bearing plate 16 has a part received within said opening and a part adapted to engage the outer surface of the side wall 12 and to be held thereto by suitable securing means such as screws. The bearing plate is provided with a bore 17 and the side wall 11 is provided with a bore in alignment, as at 18, with and directly opposite the bore 17. A shaft 19 is received within the bores 17 and 18 and spans the space within the housing *a*. One end of said shaft 19 carries the handle member 10. Carried upon the shaft 19 and at an intermediate portion thereof is a member 20 provided with threads 21. In the drawing said threads are shown as external quadruple square-cut threads. The member 20 is either fixed to the shaft 19 so as to turn with the shaft or it is an integral part of the shaft 19, as illustrated in Figure 3. Loosely carried on the shaft 19 and within the housing *a* is a pinion 22 and a gear 23. That portion of the side 11 surrounding the bore 18 is enlarged so as to form a bearing for the gear 23. The bearing plate 16 is also provided with an enlargement at 24 so as to act as a bearing for the pinion 22. Likewise carried on the shaft 19 and between the member 20, the pinion 22 and the gear 23, are collar members 25 and 26, which collar members are each united to the shaft 19 by suitable means such as pins passing through the same and engaging with the shaft. The pinion 22 and the gear 23 are each provided with outstanding projections or lugs 27. A nut 28 provided with internal threads is received upon the member 20. Said nut is likewise provided at each end thereof with outstanding lugs 29. A friction member *b* is carried upon said nut 28 and said friction member comprises two split rings 30 and 31 with each of said split rings provided with outstanding lugs 32 and 33 and the said lugs provided with screw-threaded bores 34 and 35 adapted to receive a bolt 36. Obviously a turning of the bolt 36 will tighten the split ring members upon the nut 28 so that it will more securely engage the periphery of the nut. The split ring 31 likewise carries an outstanding furcated member 37. The side 12 carries an inwardly projecting rod 38, and both legs 39 and 40 of the furcated member 37 grip opposite sides of said rod 38. Obviously this construction will not permit a rotation of the member *b* when the handle member 10 is turned so as to rotate the shaft 19 and consequently cause a rotation of the member 20 which in turn will cause the nut 28 to reciprocate or move in one direction or the other relative to the member 20. If it were not for the member *b* the nut 28 would of course rotate. Obviously if the handle member were rotated clockwise the member *b* and the nut 28 would be given a translational movement to the left looking in the plane of Figure 2 whereupon the projection 29 would engage the projection 27. The gear 23 would not of necessity rotate as it is loose upon the shaft 19. A reverse movement of the handle 10 would shift the nut and the member *b* to the right so that the projection 29 would engage the projection 27 of the gear 23 and tend to rotate said gear in step with the turning movement of the shaft, leaving the pinion 22 free.

To make use of the mechanism, which is described, so as to actuate or reciprocate the rack bar 3, there is likewise carried within the housing *a* a second shaft 41. Loosely carried upon said shaft is a pinion 42 provided with two hub portions, with the teeth of said pinion in mesh with the teeth of the rack bar 3. Fixedly carried upon the hub portions of the pinion 42 are two gears 43 and 44. Thus, as the pinion 42 is rotated by movement of the rack bar the gears 43 and 44 are likewise turned. If the gear 44 is in mesh with the pinion 22 and the gear 43 in mesh with the gear 23, one or the other of said trains of gears will be actuated upon a turning of the handle 10 in clockwise or counter-clockwise direction. The first train of gears includes the pinion 22 and the gear 44, and the pinion 42; the second train of gears includes the pinion 42 and the gears 43 and 23. If the gear 44 is in a ratio of 3 to 1 with respect to the pinion 22 a turning of the handle 10 clockwise will slowly raise the rack bar 3. If the handle were rotated in an opposite direction the member *b* and the nut 28 would move to the right so that the lug 27 of the gear 23 and the lug 29 would engage each other and permit rotation of the gears 23 and 43 so as to lower the rack 3. If the gears 23 and 43 are in a 1 to 1 relation, obviously then the number of turns of the handle necessary to lower the rack bar 3 would be materially reduced.

A device of this character will be extremely useful in gasoline stations, inasmuch as the gasoline tanks of motor vehicles may be quickly filled without undue effort on the part of the operator.

It will thus be seen that the invention contemplates a suitable clutch which consists of the member *b*, the nut 28 and the member 20, and which clutch is adapted to actuate one or the other of two trains of gears having different gear ratios, and which gears in turn are adapted to actuate another member to cause said member to have a slow movement in one direction and a quick return movement in the other direction.

It is believed that the operation of the device will be obvious from the description above given.

It is obvious that many changes and variations and modifications may be made in departure from the particular description and showing of the accompanying drawing, in adapting the invention to varying conditions and requirements of use and service, without departing from the true spirit of the invention.

Having thus disclosed our invention, we claim and desire to secure by Letters Patent:

1. The herein disclosed mechanical movement including a housing, a first and second train of gears within said housing, and a first and second shaft member for said gears; said first and second trains of gears each having a gear member loosely carried on the first shaft; there being a clutch member on said first shaft between said gears and adapted to move so as to engage one or the other of said gears to turn the same responsive to a turning of said first shaft; there being a pinion carried on said second shaft having the teeth of the same engaging the teeth of the member to be reciprocated, and two gear members joined with said pinion, each gear meshing with one of the gears on said first shaft; said means for turning the first shaft comprising a handle; said clutch including a part joined with said shaft and turning therewith, and a member carried on said part and adapted to be reciprocated upon a turning movement of said part; there being means for preventing turning of said last named member during its reciprocation; said member for preventing rotation of the member to be reciprocated including a ring in frictional engagement with the periphery of said member to be reciprocated; said ring member being provided with a bifurcated part and a member carried by the housing received within said bifurcation for guiding said ring in its movement and preventing rotation thereof.

2. The herein disclosed mechanical movement including a housing, a first and second train of gears within said housing, and a first and second shaft member for said gears; said first and second trains of gears each having a gear member loosely carried on the first shaft; there being a clutch member on said first shaft between said gears and adapted to move so as to engage one or the other of said gears to turn the same responsive to a turning of said first shaft; there being a pinion carried on said second shaft having the teeth of the same engaging the teeth of the member to be reciprocated, and two gear members joined with said pinion, each gear meshing with one of the gears on said first shaft; said means for turning the first shaft comprising a handle; said clutch including a part joined with said shaft and turning therewith, and a member carried on said part and adapted to be reciprocated upon a turning movement of said part; there being means for preventing turning of said last named member during its reciprocation; said member for preventing rotation of the member to be reciprocated including a ring in frictional engagement with the periphery of said member to be reciprocated; said ring member being provided with a bifurcated part and a member carried by the housing received within said bifurcation for guiding said ring in its movement and preventing rotation thereof; said member to be reciprocated being provided with means adapted to engage one or the other of said gears carried on the first shaft to turn one or the other of said gears; said member to be reciprocated turning when engaging one or the other of said gears.

3. The herein disclosed mechanical movement, including a shaft, a pair of gears of different sizes loosely mounted on said shaft, a second shaft, three gears secured on said second shaft two of which are in mesh respectively with the gears on said first shaft, a screw on said first shaft between the gears on said shaft, a nut on said screw, oppositely disposed dog teeth on each end of said nut, dog teeth on each of the gears on said first shaft for alternately engaging the teeth on the ends of said nut as said shaft is rotated in one direction or the other, a friction ring surrounding said nut, means for clamping said ring on said nut with varying tension, and means for preventing rotation of said ring.

4. The herein disclosed mechanical movement, including a housing provided with an opening, a bearing in said housing opposite said opening, a bearing fitted in said opening and detachably secured to said housing, a shaft journaled in said bearing, a pair of gears loosely mounted on said shaft, a second shaft journaled in said housing, three gears secured on said second shaft, two of which mesh with the gears respectively on said first shaft, a screw on said first shaft between the gears thereon, a nut on said

screw, oppositely disposed dog teeth on the ends respectively of said nut, dog teeth on each of said gears on said first shaft for alternately engaging the teeth on the ends of said nut as said first shaft is rotated in one direction or the other, a friction ring surrounding said nut, a bifurcated lug on said ring, and a rod associated with the housing and extending through said bifurcated lug to prevent said ring from turning.

In testimony whereof, we have signed our names to this specification.

CURTIS H. EDWARDS.
FRANK E. DAYTON.