

Jan. 10, 1950

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2,494,525

POSITIVE ACTION REEL FOR GASOLINE DISPENSERS

Filed July 10, 1945

6 Sheets-Sheet 1

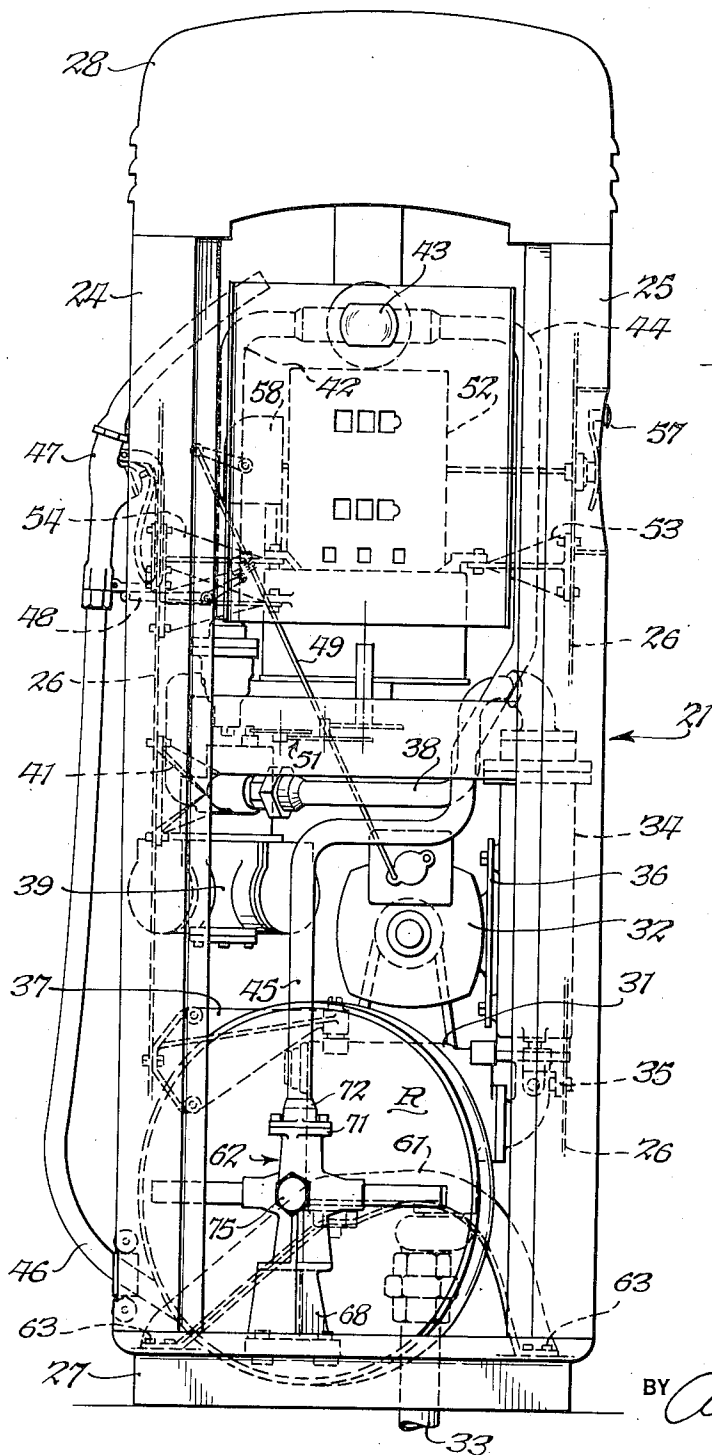


Fig. 1.

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6 Sheets-Sheet 2

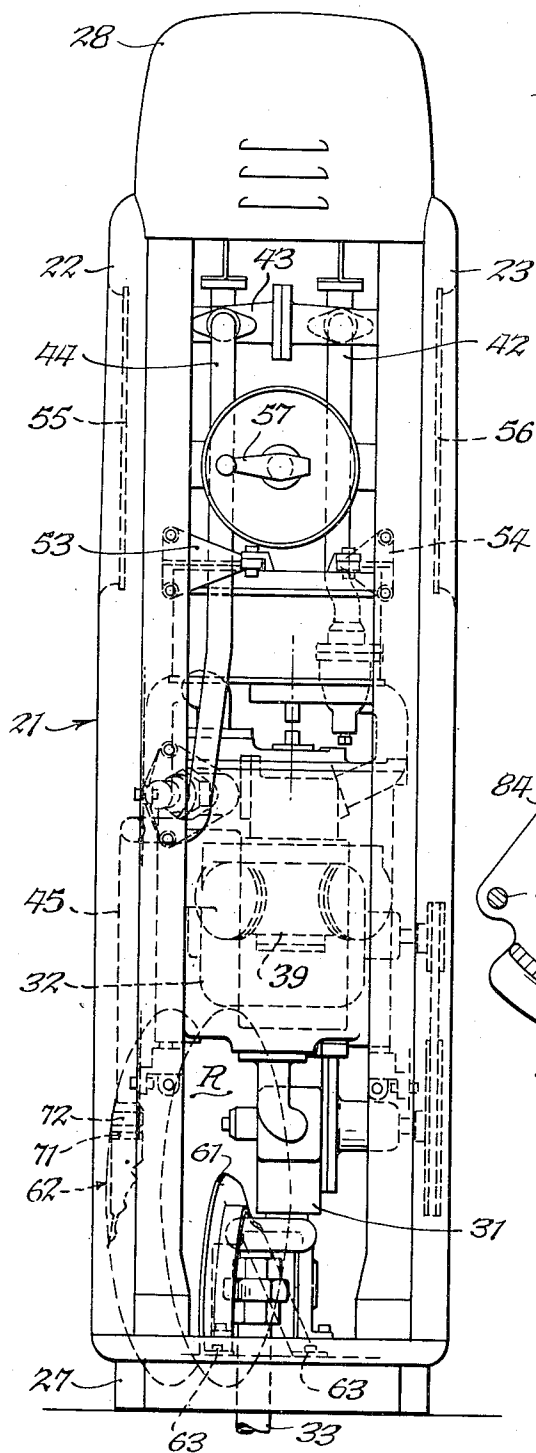


Fig. 2.

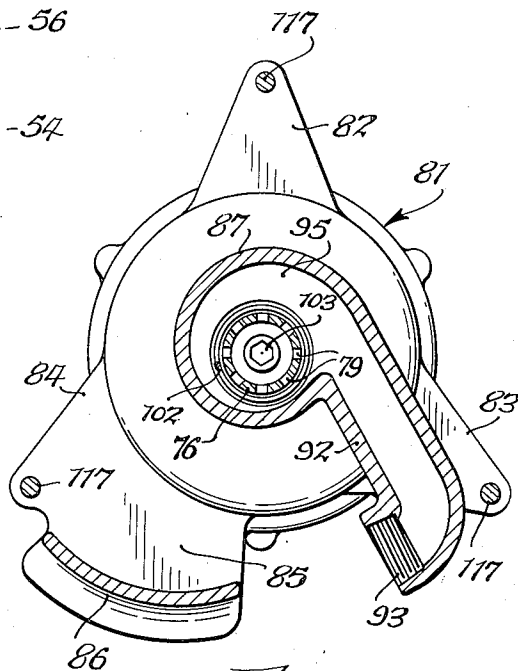


Fig. 7.

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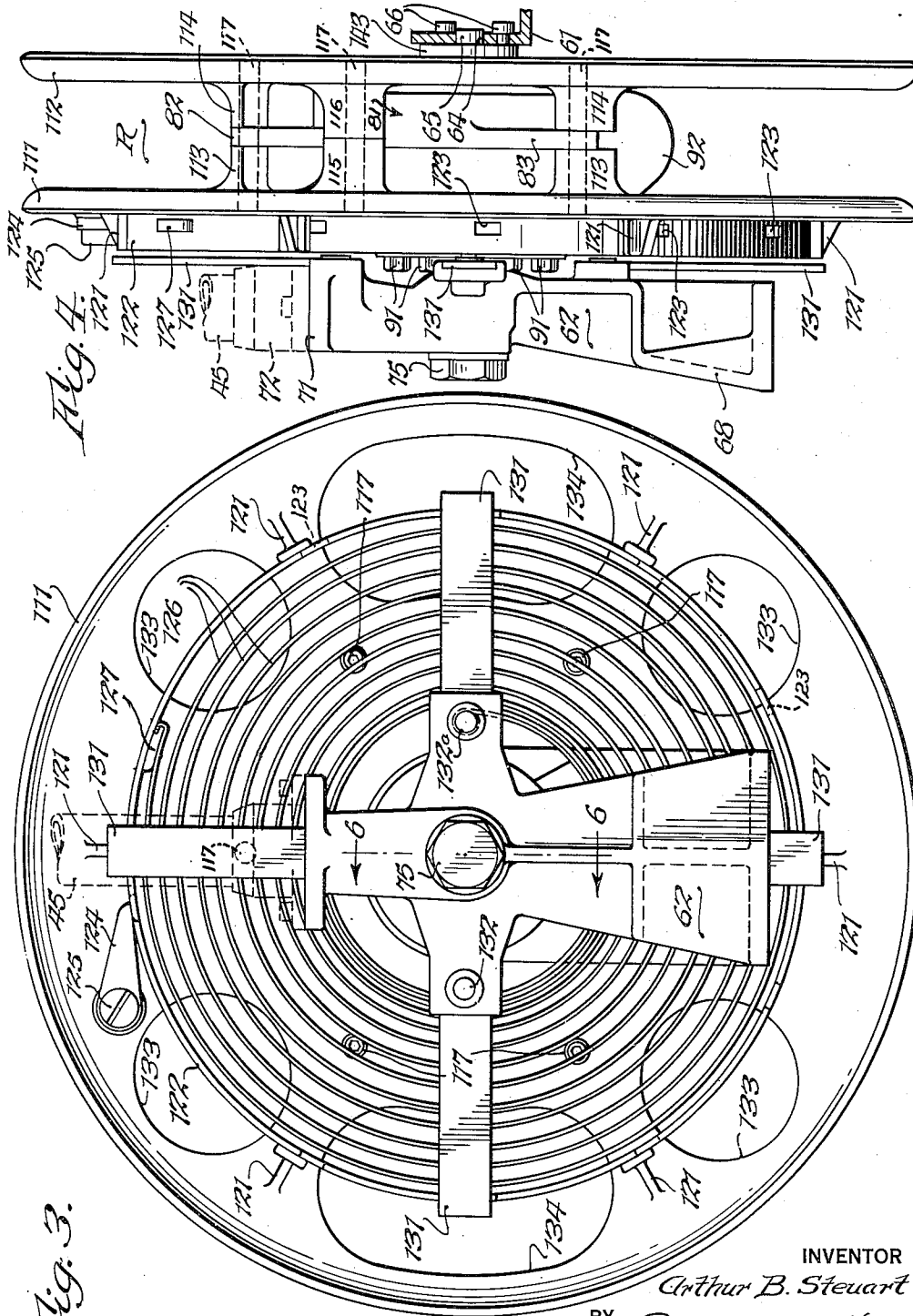
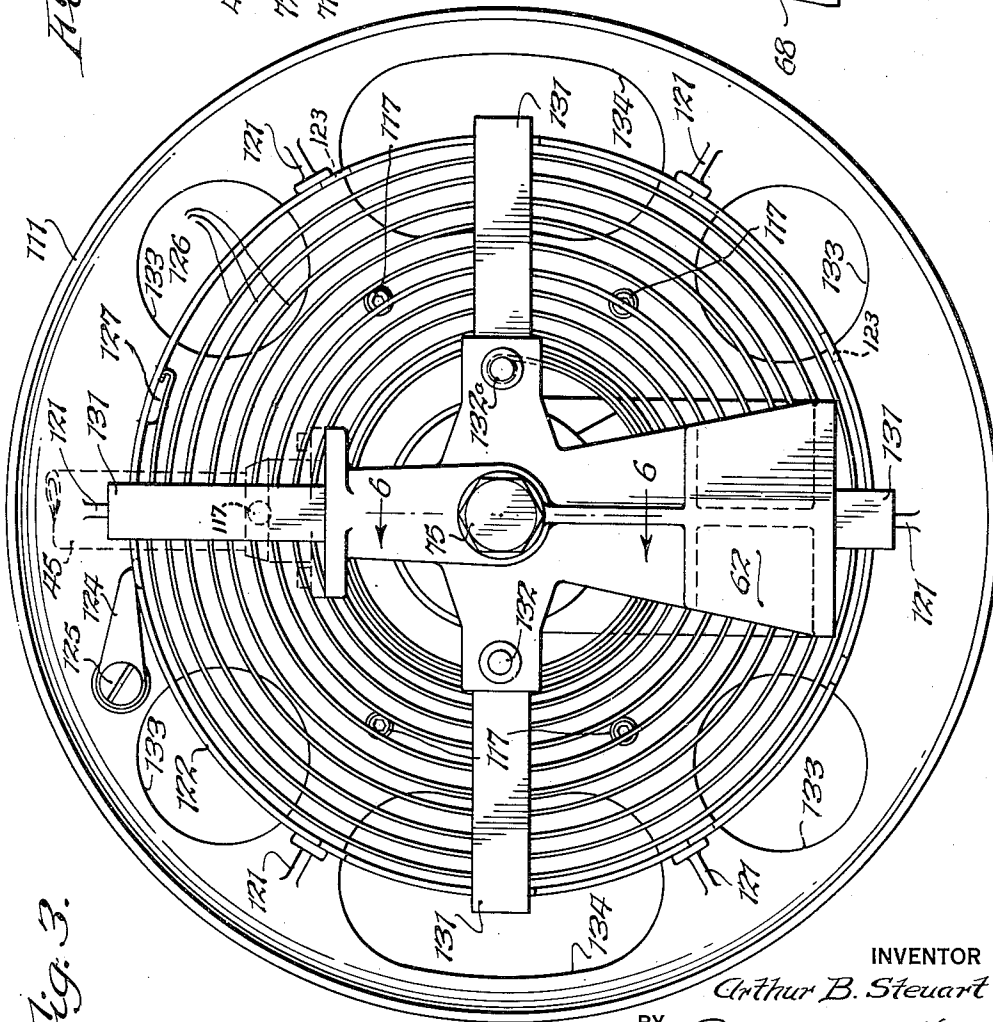
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6 Sheets-Sheet 3



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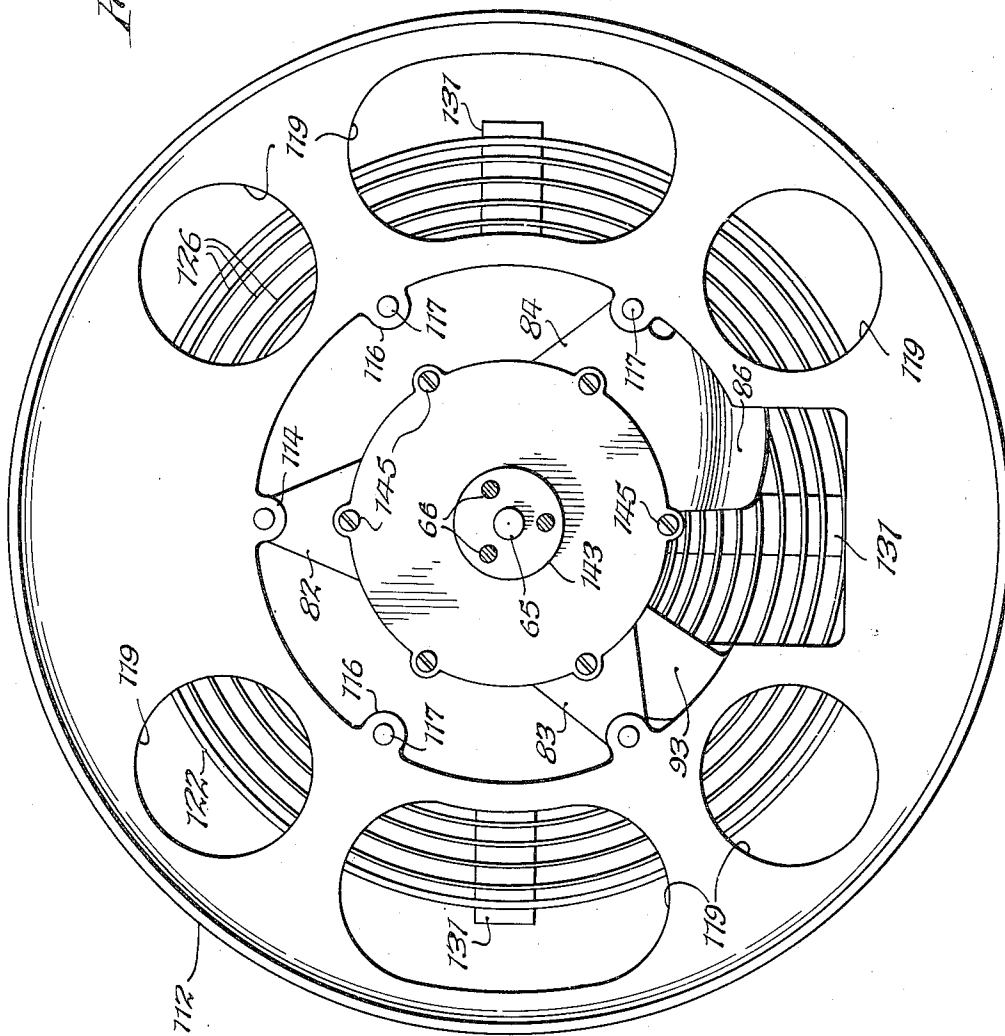
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POSITIVE ACTION REEL FOR GASOLINE DISPENSERS

Filed July 10, 1945

6 Sheets-Sheet 4

Fig. 5.



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2,494,525

POSITIVE ACTION REEL FOR GASOLINE DISPENSERS

Filed July 10, 1945

6 Sheets-Sheet 5

Fig. 8.

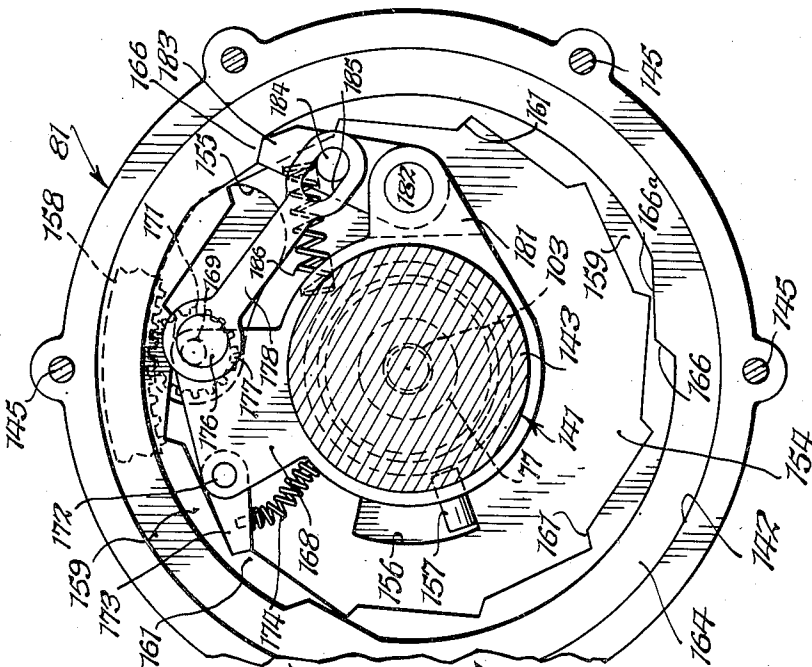
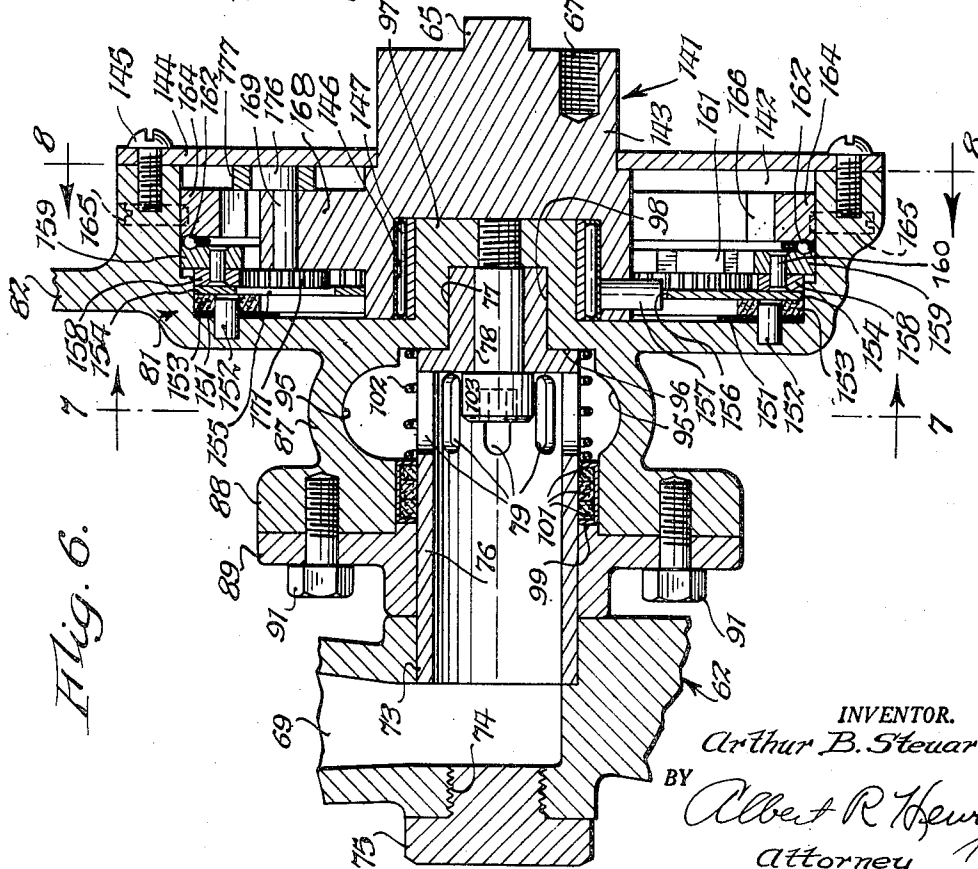


Fig. 6.



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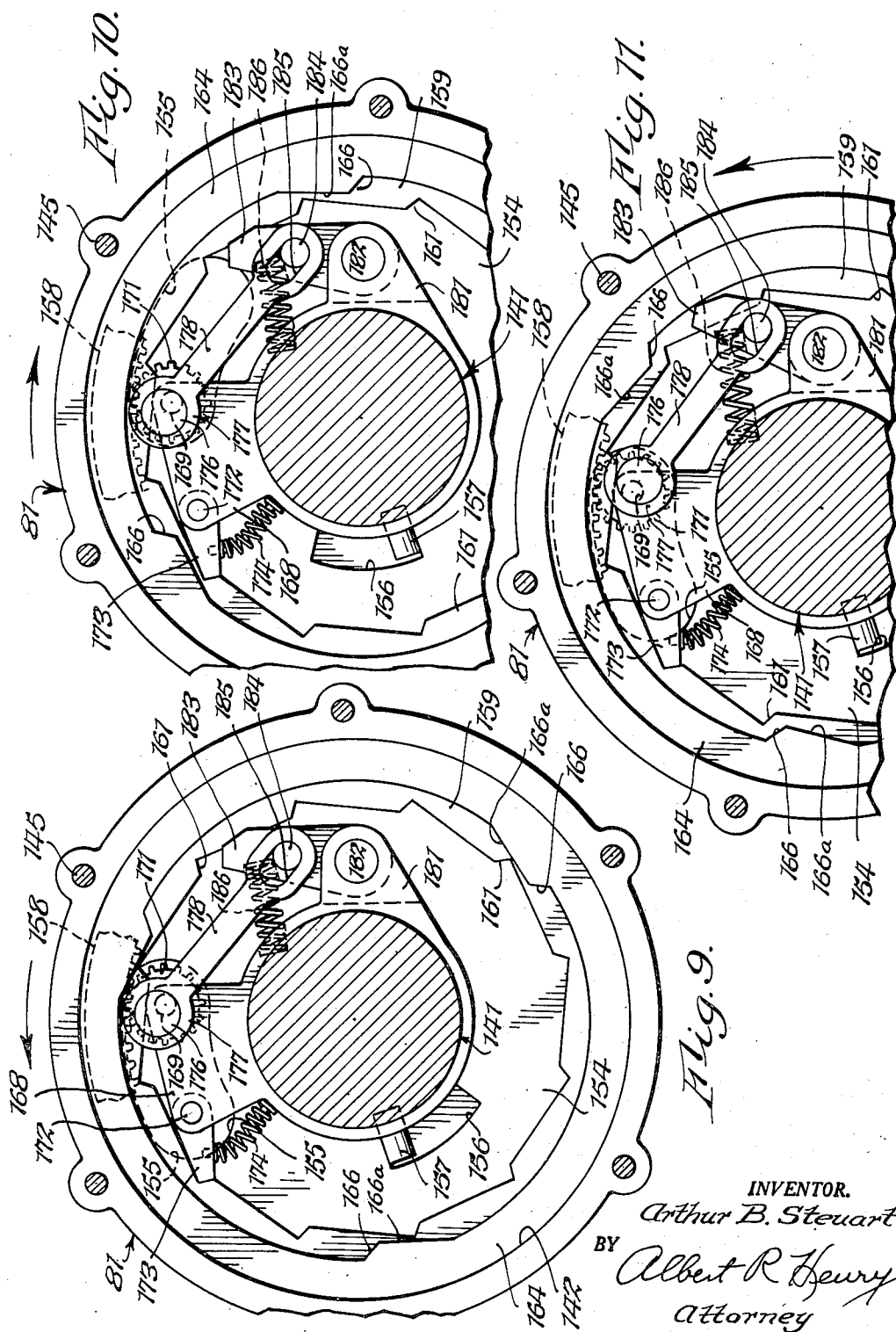
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POSITIVE ACTION REEL FOR GASOLINE DISPENSERS

Filed July 10, 1945

6 Sheets-Sheet 6



UNITED STATES PATENT OFFICE

2,494,525

POSITIVE ACTION REEL FOR GASOLINE DISPENSERS

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Application July 10, 1945, Serial No. 604,148

18 Claims. (Cl. 299-78)

1

This invention relates to apparatus useful in dispensing gasoline and other liquids, and it has particular reference to the provision of an improved reel upon which the dispensing hose may be coiled when not in use.

The invention is primarily concerned with the provision of an improved hose reel in which there is provided mechanism which either positively locks the reel against retrograde movement, or which positively unlocks the reel so that a spring motor, or other retracting means, may exert its influence to the extent desired. One of the objectives of the invention is attained by mechanism so organized that a limited unwinding movement of the reel causes a latch member to be shifted into a position of disengagement, while a subsequent unwinding movement, after an interval of rest, causes the latch member to be shifted into a position preventing reverse rotation of the reel. Stated otherwise, successive pulls on the free end of a hose, to cause rotation of the reel, automatically set a latch member alternatively into positive locking and unlocking positions, and the engagement or disengagement of the latch is independent of the speed of rotation, or the actual force applied. With such means at hand, the hose may be released from tension while in use, and it may be restored to the reel merely by applying a slight tug to it, after the dispensing operation is completed.

It is believed that, in this aspect, the principle of the invention differs from that of known types of reels embodying a self-retracting feature. In some of the prior proposals, it has been suggested to incorporate manually actuated locking devices, while in others it has been proposed to utilize centrifugally actuated fingers whose disengagement depends upon the speed of rotation of the reel. As distinguished from proposals of this nature, the reel of the present invention, in its preferred form, embodies a latching means which is both automatic and fully positive in its operation.

Other features of the reel of the present invention have to do with the manner in which the reel is constructed to house the latching mechanism, to store the hose, and to supply the liquid from a stationary conduit to the hose itself. The nature of these improvements will be made apparent as this description proceeds.

While reels embodying the features just referred to may be utilized for a great variety of purposes, and are by no means restricted to any specific use, they find one practical application in the dispensing of gasoline or like liquid at

2

retail sales. It has heretofore been proposed to include a hose reel in the cabinets and apparatus commonly employed for transferring gasoline from a storage tank to an automobile, but the reels heretofore available have been found defective for such service. It is believed that those acquainted with the operating problems and conditions encountered in this service will readily appreciate the advantages of the present invention, and will recognize the features of novelty attending the combining of the improved reel with such dispensing equipment. For illustrative purposes, therefore, the present invention will be presented with this case in mind.

Various other objects of the invention, and the advantages to be derived from the attainment thereof, will appear from a perusal of the following description of a typical embodiment, illustrated in the accompanying drawings, wherein:

Fig. 1 is a front elevation of an improved gasoline dispensing cabinet, with portions of the casing removed, and showing how the reel of this invention may be organized with the elements of the dispenser;

Fig. 2 is a side elevation of the equipment shown in Fig. 1;

Fig. 3 is a side elevation of the reel, viewed from the spring motor side;

Fig. 4 is an end elevation of the reel;

Fig. 5 is an elevation taken from the opposite side of the reel;

Fig. 6 is an enlarged axial section taken through the hub portion of the reel, and disclosing the positive locking mechanism, taken along the line 6-6 of Fig. 3;

Fig. 7 is a view partially in section and partially in elevation of one end of the hub structure, taken substantially along the line 7-7 of Fig. 6;

Fig. 8 is a view from the other end of the hub structure, taken substantially along the line 8-8 of Fig. 6, and showing the mechanism in locking position; and

Figs. 9, 10, and 11 are views similar to Fig. 8, but showing the positions taken by the mechanism at various stages through a complete cycle of operation.

Referring first to Figs. 1 and 2, there is herein shown an improved gasoline dispensing apparatus in which the reel may be mounted. This apparatus comprises a sheet metal cabinet 21 having front and back walls 22 and 23 and end walls 24 and 25, secured to a frame indicated in part by the reference numeral 26, all of which is mounted on a hollow base casting 27. The upper portion

of the cabinet is capped by a sheet metal dome 28 which, if desired, may carry any suitable legend or trade-mark insignia.

A pump 31, mounted within the cabinet, is adapted to be operated by a motor 32 to induct gasoline from a supply tank (not shown) through a suction pipe 33, and to deliver the liquid into an air separator 34 located to one side of the casing and mounted on the frame 26 by brackets 35. The motor 32 may be directly mounted on the separator 34 by a plate 36, and the pump 31 may also be mounted between the separator and the opposite portion of the frame by a bracket 37. It will be seen that this method of mounting the various elements of the dispensing system shifts them from the conventional centralized locations to provide a clear space adjacent the bottom of the cabinet, and that it also interconnects such elements into a somewhat unitary sub-assembly.

The outlet end of the air separator 34 is connected to a transversely extending liquid conduit 38, herein shown as being formed from tubing, which extends to the inlet side of a liquid meter 39, mounted on the frame 26 by brackets 41. Liquid passing through the meter is carried upward through tubing 42 into a sight glass 43 whose windows are visible through the side walls 22 and 23. The liquid then flows downwardly through tubing 44, 45, into an inlet conduit for a hose reel R, which is adapted to carry a length of hose 46. As best shown in Fig. 1, the outer portion of the hose is normally displayed outside of the cabinet 21, being supported by a valved discharge nozzle 47 from a hook 48.

The hook or nozzle support 48, in a manner heretofore known in the art, is of the type adapted, by its movement, to control the operation of the motor 32 through suitable linkage 49. In order to determine the amount of gasoline flowing through the dispenser, the meter 39 is connected, through a train of gears 51, to the operating spindle of a register 52 mounted on brackets 53 and 54 in the upper portion of the cabinet 21. The faces of the register are visible through the side walls of the cabinet through windows 55 and 56. After each operation of the apparatus, the register may be reset to a zero position by means of a reset crank 57, enforcement of the reset operation being mandated by an interlocking device 58 of known type.

In the operation of the equipment just described, the service station attendant removes the hose nozzle 47 from its support 48, actuates the support to start the motor 32, and then withdraws enough hose from the reel to enable the insertion of the nozzle end into the filling opening of the passenger car. As the gasoline flows through the system, upon manually opening the nozzle valve, the meter 39 operates the register 52 to reflect the quantity of gasoline delivered. Thereafter the operator lets the hose 46 run back on the reel R a suitable distance, and replaces the nozzle 47 on its support to deenergize the motor and thereby stop the operation of the pump.

It will, of course, be understood by those skilled in the art that in a general sense, dispensers including the foregoing elements are old, and that the features of novelty herein presented are concerned in one aspect with the way in which the components are organized in and with the cabinet, and, in another aspect, with the construction of the reel R itself.

As best shown in Figs. 1, 2, and 4, the reel R

consists generally of a rotatable structure having a hub and side walls, which is mounted at an angle to the walls of the cabinet 21 between two bracket members 61 and 62 respectively. The bracket 61 is formed as an arched angle iron section whose ends bear on the base casting 27 and are secured thereto by suitable bolts 63. This bracket is formed with a bearing aperture 64 (Fig. 4) in which is centered a projection 55 formed on a portion 143 of a hub piece 141 of the reel R (see also Fig. 6). The bracket is also formed with other apertures adapted to receive screws 66 entering tapped openings 67 in the hub piece to secure it against rotation.

The bracket 62 (see also Figs. 4 and 6) is formed as a casting having a base section 68 adapted to be bolted to the base casting 27, and with an upper cored section having a bore 69 and a pad 71 to which is bolted an inlet fitting 72 connected to the end of the tubing 45. The mid portion of the bracket 62 is transversely bored to provide a socket 73 adapted to be concentrically aligned with the bearing aperture 64 on the bracket 61, and an access opening 74 which is subsequently tapped to receive a threaded plug 75. A hollow fixed axle 76, formed at its inner end with a reduced concentric portion 77 having a bushed bore 78, is shrunk, brazed, or otherwise tightly fitted into the socket 73 to provide a supporting member for the reel R proper. A series of circumferentially spaced elongated apertures 79 are also formed in the mid portion of the axle 76 to provide a passage for the flow of liquid.

The reel R may be further described as including a main spider or hub casting (Figs. 4, 6, and 7) and side plates (Figs. 3, 4, and 5) which extend outwardly of the main casting on either side thereof to provide a region for carrying the convolutions of a coiled hose, as well as spring motor mechanism for retracting the hose when the mechanism is so set as to permit retrograde rotation.

The main hub or spider casting includes a generally cylindrical block 81 from which extend three equally spaced extension members 82, 83, and 84 disposed in substantially the central plane of the casting. The members 82 and 83, as shown in Fig. 7, are triangular in shape, while the member 84 is formed with a circumferentially extending flanged section 85 having an arcuate outer margin 86 to serve as a guide for the inner end of a hose. The flanges of the section 85 extend from both sides of the center line of the member 84 to preserve a desirable symmetry. The cylindrical block merges, at one side, into a slightly eccentric boss 87 having a flared and bored outer end 88, adapted to receive a removable end plate 89 which may be secured by bolts 91. The boss 87 is formed with a tangential spigot portion 92 whose outer end 93 is turned toward the flanged section 85 and is tapped to receive a fitting secured to the inner end of the hose 46. The spigot also curves from the boss 87 toward the center line of the casting, so as to bring the tapped end 93 in line with the flanged margin 86.

The eccentricity of the boss 87, the length of the spigot 92, and the heights of the members 82, 83, and 84 are so proportioned with respect to each other that a length of flexible hose having one end joined to the end 93 will coil nicely around the marginal portion 86 and pass just beyond the extremities of the members 82 and 83, so that, upon completing one turn, the next convolution of the hose will overlap the first. This construction

enables liquid to flow under pressure through portions of the hose remaining on the reel after a suitable length has been withdrawn, without danger of pinching the hose or otherwise interfering with satisfactory operation.

The fluid path from the tubing 45 and the bore 69 of the bracket 62 may now be further described, reference primarily being had to Figs. 6 and 7. The boss 87 is internally cored to provide a cavity 95 communicating with the spigot 92, the inner end wall of the boss being defined by the radially located pad 96. The cylindrical block 81 is centrally formed with a stud 97 which is concentrically bored and counterbored to form a socket 98. The fixed axle 76 projects into the boss 87 for such distance that its discharge apertures communicate with the cavity 95, and the reduced portion 77 fits within the socket 98 to cause the end of the axle 76 to abut the pad 96. The end plate 89 bears on the outer surface of the axle with a running fit, and it is provided with a shoulder 99 engaging packing members 101 which are pressed between the axle and cavity wall by a coiled spring 102, whose opposite end engages the pad 96. A bearing stud bolt 103 having a threaded extremity, and which is accessible through the opening 74 when the plug 75 is removed, passes through the bushing 78 of the reduced axle section 77 for engagement in a companion tapped aperture formed in the stud section 97.

As thus far described, it will be seen that the main casting, comprising the cylindrical portion 81 and the boss 87, is rotatably mounted on the fixed axle 76 between the end plate 89 at one side, and the socket 98 on the other which has a running fit over the reduced portion 77. Liquid entering the axle 76 through the bore 69 therefore flows into the cavity 95 through the apertures 79, and thence to the hose 46 through the spigot 92. While the parts 89, 87, 81, 97 and 103 are all fixedly interconnected, and therefore are constrained to rotate together, leakage of liquid from the cavity 95 is precluded by the spring-pressed packing 101 on the one hand, and the substantial sealing of the cavity on the other hand by the engagement of the reduced portion 77 in its socket 98.

The extension members 82, 83, and 84, in addition to being of such height as to accommodate the inner convolutions of the hose, also provide means for mounting the side plates of the reel on the hub casting. As best shown in Fig. 4, the two side plates, respectively generally designated by the reference numerals 111 and 112, are of circular form and of appreciably greater diameter than the hub member itself. The inner faces of the side plates are formed with horizontally extending short fingers 113 and 114, spaced at intervals of 120°, and with inwardly extending long fingers 115 and 116 equally located on the same radius between two of the short pairs. Each of these fingers is drilled and tapped to receive a through bolt 117, and the difference between the lengths of the long and short fingers is such that when the short fingers are abutted against the members 82, 83, and 84, the long fingers abut each other.

The side plates 111 and 112 are accordingly mounted on the main spider or hub casting by aligning pairs of short fingers with apertures formed at the apices of the members 82, 83, and 84, and inserting through bolts 117. The several fingers thereby provide a base member upon which the hose may be coiled. Inasmuch as the

member 84 is provided with a flanged guide portion 86 for the hose, it will be apparent that no pair of long fingers is required between the members 83 and 84, although of course as many pairs of fingers may be employed as conditions suggest.

The end plate 112, shown in side elevation in Fig. 5, is cut away centrally to provide an aperture to clear the cylindrical block 81 formed on the main casting, and it is also reduced in weight by additional openings 119 formed in the side wall. The other end plate 111 is of somewhat different construction, as it is utilized to carry a spring motor mechanism, thereby making the reel self-retracting when its locking member is in disengaged position.

Referring to Figs. 3 and 4, the outer face of the end plate 111 is formed with a series of concentrically arranged brackets 121 within which is positioned a circular hoop 122 whose periphery is formed with spaced slots 123. A pawl 124, pivotally mounted on the outer face of the plate 111 by a screw 125, is adapted to drop into whatever slot 123 that may be aligned therewith, thus securing the hoop 122 against rotation relative to the end plate as long as the pawl is engaged. A spiral spring 126 is positioned within the hoop 122, having its outer end secured thereto by means of a catch 127 mounted in the hoop periphery. The inner end of the spring 126 is connected to the bracket 62, so that, upon rotation of the end plate 111 and interconnected portions of the reel, a tension is built up in the spring tending to restore the reel to a neutral or starting position.

The bracket 62 is provided with four equally spaced radial arms 131 slightly spaced from the outer edge of the hoop 122, and secured to the bracket by suitable bolts or screws 132. These arms project just beyond the periphery of the hoop, and thus prevent the spring 126 from slipping sideways out of place. One securing bolt, such as that designated by the reference numeral 132a, projects inwardly toward the center of the hoop 122, to provide an anchoring point for the inner end of the spring 126. As with the end plate 112, the plate 111 is cut away centrally to provide clearance around the main hub casting, and it is also formed with suitable apertures 133, 134.

After the parts are assembled, the pawl 124 is moved to a disengaging position, and the hoop 122 is then rotated within the brackets 121 to impart as much tension to the spring as may be required to assure the return of the hose to an inactive position, such as that indicated in Fig. 1. When the hose is withdrawn from the reel, the rotative motion causes the coils of the spring to be compacted and thus placed under a tension, thereby to make the reel self-retracting when the hose (and the locking mechanism) is released.

As previously pointed out, the spring 126 constantly tends to restore the reel and hose to its initial or neutral position, and, therefore, unless a latching member is provided to overcome this tendency, the attendant is constantly subjected to the strain of holding the hose during a dispensing operation. In order to lock the reel in any desired position, there is accordingly provided the positive latching mechanism, best shown in Fig. 6 and Figs. 8 to 11 inclusive.

Referring primarily to Fig. 6, it will be recalled that the main spider or hub casting, including the cylindrical portion 81, is rotatable with respect to the bracket 62 and the fixed axle 76, as well as the previously referred-to hub piece mounted on the bracket 61 through the projection 65 and the screws 66. The hub piece itself, generally desig-

nated by the reference numeral 141, is formed with a generally cylindrical body portion which extends into a substantially cylindrical cavity 142 formed in the casting portion 81, and a reduced section 143 which projects from the cavity through a cover plate 144, secured to the casting 81 by screws 145. The reduced section in turn is mounted on the bracket 61 in the manner previously described. The inner end of the hub piece 141 is formed with a socket 146 which is mounted over the stud 97 through a roller bearing 147, thus permitting the stud and connected main casting 81 to have free rotative movement with respect to the hub piece 141. The latching mechanism proper is contained within the cavity 142, being connected between the hub piece 141 and the walls of the cavity itself.

As viewed from left to right in Fig. 6, the elements within the cavity 142 comprise a plurality of slightly curved, circumferentially spaced, spring leaves 151 which are held on the inner wall of the cavity by dowel pins 152. The projecting ends of the dowels also support a brake ring 153 consisting of an annulus of cork or other suitable material which may be faced with or mounted on a light metal annulus. The brake member, of course, is provided with uniformly arranged apertures to receive the dowels 152. It will be obvious that the springs 151 constantly thrust the brake ring 153 to the right, and that these parts are always constrained to rotate with the main casting of the reel.

A circular plate 154, preferably made of brass or other material having a relatively low coefficient of friction, is positioned against the right hand face of the brake ring 153. This plate is formed with an arcuate slot 155, to provide suitable clearance for a pinion 171 about to be described, and with a segmental slot 156 spaced from the arcuate slot, into which extends a radially positioned pin 157, secured to the hub piece 141. It may be noted here that the plate 154 may rotate with the hub casting 81, or it may be relatively stationary with respect thereto, depending upon the conditions as more fully described later. The extent of movement of the plate 154 is limited by the engagement of the pin 157 with the radial walls of the slot 156.

The next element to be seen in Fig. 6 is an internal ring gear 158, to which is secured, by rivets 160, a timing ring 159, which, as shown in Fig. 8, is cut on its inner periphery to provide a suitable number of ratchet teeth 161. The number herein illustrated is twelve, spaced at regular intervals of thirty degrees, but it is to be understood that the number of teeth may be varied over wide limits. The right hand surface of the timing ring 159 is formed with a groove or race to receive ball bearings 162, which, as illustrated, may be retained in a cage ring. As in the case of the plate 154, the ring gear 158 and the timing ring 159 may rotate with, or have relative movement with respect to, the main spider casting.

The ball bearings 162 bear in a companion groove or race formed on the inner surface of a locking ring 164, secured to the casting portion 81 by set screws 165, and formed on its inner periphery with three equally spaced ratchet teeth 166 which face in the same direction as the teeth 161 on the timing ring. This completes the identification of the parts which are annularly mounted within the cavity 142. Co-operating elements are mounted on the hub piece 141.

The hub piece 141 is formed with an upstand-

ing segmental boss 168 lying within the apertures of the rings 159 and 164, and formed with a bore at one side constituting a bearing for a pinion shaft 169. The left hand or inner end of the shaft 169 has keyed thereto the pinion 171 which partially enters the arcuate slot 155 on the brass ring 154, and which also meshes with the teeth of the internal ring gear 158. The opposite corner of the boss 168 receives a pin 172 to which is pivotally connected a pawl 173, adapted to engage the teeth 161 on the timing ring 159, and normally urged into engaging position by a spring 174, interposed between the pawl and the adjacent surface of the hub piece 141. The opposite end of the shaft 169 is formed with an eccentric 176, over which is fitted a strap portion 177 of a pitman 178.

The hub piece 141 is formed with a second boss 181, underlying the locking ring 164, which is bored to receive a pin 182 pivotally supporting a pawl 183 adapted to engage the teeth 166 of the locking ring. The pawl is provided with a projecting pin 184 which fits into a slot 185 formed on the opposite end of the pitman 178. The pawl 183 is normally urged into engaging position by a coiled spring 186, similar to the spring 174. Inasmuch as there must be relative movement between the pawl 183 and the locking ring 164 during unreeling action—the locking ring being pinned to the rotatable reel portions and the hub piece 141 being fixed—the outer end of the pitman 178 is slotted, thereby to permit the oscillating movement of the pawl 183 while the pitman 178 is relatively fixed.

It will be appreciated that, whenever there is relative rotation between the ring gear 158 and the pinion 171, to cause rotation of the pinion together with shaft 169 and eccentric 176, then the pitman 178 will also travel back and forth to pull the pawl 183 inwardly, or away from the teeth 166, or to release the slot 185 from the pin 184, so that the pawl may return to engaging position. This motion, which provides for either positive engagement or disengagement, is utilized to lock or to release the reel, the control over the action being effected through the other parts contained in the cavity 142. With the nature and organization of the several elements in mind, the action may best be described by reference to Figs. 8, 9, 10, and 11, which illustrate relative positions occurring during a cycle of operation.

In these figures, the direction of rotation for an unreeling movement of the hose is counter-clockwise, while the retrograde or rewinding motion is accordingly clockwise. In Fig. 8, the pawl 183 is shown as engaging a tooth 166 on the locking ring 164, and, inasmuch as the locking ring 164 is connected to the rotary portions of the reel, while the pawl is connected to the stationary hub piece 141, it is apparent that with the parts in this position, no retrograde or clockwise rotation is possible. The pawl 183 positively holds the rotary members from movement in this direction. On the other hand, the reel may be rotated in the unwinding or counter-clockwise direction, as in this event the pawl 183 will simply oscillate about the pin 182 and click over the cam surfaces 166a of the teeth. When in this condition, the hose may be released from tension without being retracted.

Assuming the parts are in the positions as shown in Fig. 8, and that a suitable portion of the hose 46 has been withdrawn, consideration will be given to the effect of further withdrawing the hose. As the reel rotates in the direction

of the arrow, as shown in Fig. 9, the brake band 153, pressed by the springs 151, presses against the brass plate 154 and therefore exerts a thrust against the ring gear 158 and timing ring 159. As the interconnected gear and ring 159 are thrust against the locking ring 164 through the bearings 162, the frictional engagement through the brake band causes the plate 154, ring gear 158, and timing ring 159 to rotate with the brake and main hub casting. Such rotation, of course, enforces the rotation of the pinion 171 on its own axis, and thereby the rotation of the shaft 169 and the eccentric 176.

This rotary motion causes the pitman 178 to move upward and inwardly with respect to the pins 182 and 184, thereby to pull the pawl 183 into a position where it will not engage the teeth 166 on the locking ring. The reel is thus unlocked, so that it may now rotate clockwise to rewind the hose, as well as counterclockwise. Obviously, if the brake band 153 continued to cause rotation of the pinion 171, then the continued rotation of the reel would restore the pawl 183 to its locking position, and it would be a matter of some uncertainty to determine whether the parts were locked or unlocked.

Accordingly, the plate 154 is provided with the segmental slot 156, subtending an arc of thirty degrees to conform to the spacing of the teeth 161 on the timing ring 159, in which is located the fixed pin 157 on the hub piece 141. After a limited rotation, therefore, the upper side of the slot strikes the pin 157, and, because it can move no farther, the plate 154 is brought to a stop, and simply slides over the brake band 153, which then functions in the manner of a slipping clutch. At the same time, the ring gear 158 and timing ring 159, which had been rotating with the plate 154, also come to a stop, the plate 154 acting as a brake surface for these last mentioned elements, while the ball bearings 162 relieve any tendency for rotation with the locking ring 164. During the same interval of movement, the rotation of the timing ring 159 causes it to advance one tooth's distance, thus permitting the timing pawl 173 to engage the next tooth, and maintain the correct relative positions of the ring 159 and the plate 154 for successive motions.

Stated otherwise, upon an initial rotary movement in an unwinding direction, the rotation of the ring gear 158 causes a rotation of the pinion 171, thereby to move the pitman 178 and locking pawl 183 into a disengaged or unlocked position. After this action has taken place, the stop comprising the pin 157 and the upper wall of the slot 156 becomes effective, thus imposing a positive brake upon further rotation of the plate, ring gear and pinion, which positive brake overcomes the action of the friction clutch or brake 153, in itself responsible for the initial rotary motion.

As long as the reel continues to rotate in a counterclockwise or unwinding direction, no further changes take place with respect to the relative positions of the latching mechanism. When the tension on the hose is released, however, the spring 126, now under considerable tension, will cause the reel to rotate in a clockwise direction, thereby restoring the hose. When this action occurs, the pressure of the brake band 153 on the plate 154 causes the plate to rotate in a clockwise direction, to restore the slot 156 to the position shown in Fig. 8, which position is also shown in Fig. 10. However, the timing pawl 173, which is mounted on the stationary

piece 141, engages a tooth 161 of the timing ring 159 to prevent rotation of the ring, and therefore rotation of the ring gear 158. The locking action of the pawl 173 is positive, and the plate 154 therefore slides back to its former position, being carried by the clutch disc 153. The retrograde movement therefore does not impart any motion to the pinion 171 and the pitman 178, and accordingly the locking pawl 183 remains in its disengaged position.

The main spider casting and attached end plates may therefore continue to rotate in a clockwise direction as much as may be desired or occasioned by the spring 126, thus restoring the hose 46 to its initial position. The speed of rotation may be as much as the tension of the spring 126 dictates, or it may be made less by imparting a slight pull on the free end of the hose, but the disengagement of the locking pawl will continue as long as the direction of rotation is retrograde, and this condition is independent of the speed.

When the hose is again pulled out, or the reel is again rotated in a counterclockwise direction, the locking pawl 183 is positively returned to its engaging position. This is illustrated in Fig. 11. As the reel is rotated, the plate 154, ring gear 158, and timing ring 159 are again initially dragged along in the same direction until the pin 157 again engages the upper end of the slot 156. The pinion 171 is also rotated, thereby causing a movement of the pitman 178 through the other half of its path of motion, thus restoring the pawl 183 to the position shown in Fig. 8. After this motion takes place, the further rotation of the ring gear and pitman is prevented, in the manner previously described. If the hose 46 should now be released, retrograde rotation can occur only through so much of the arc between the teeth 166 as will cause the adjacent tooth to engage the pawl 183, the reel thereupon being locked against further clockwise rotation. As shown in Fig. 11, a clockwise movement of about thirty degrees can occur before the locking pawl strikes a tooth 166, during which motion the plate 154 will also rotate, thus moving the parts as shown in Fig. 11 to the position shown in Fig. 8.

It will thus be seen that each unwinding movement of the reel, following a period of rest when the hose is relieved of tension, automatically conditions the reel for locking or unlocking with respect to rewinding rotation. Unwinding rotation is possible at all times. When the reel is in use, the hose may be pulled out for whatever length is desired, and the attendant then need only to release the tension. If he should find that the reel does not lock after a few inches have been recoiled, then he has only to tug again, and this next action of course will cause the pawl 183 to move to locking position. After the dispensing operation is completed, the attendant merely tugs on the hose in an unwinding direction, thereby to disengage the latch 183, and he may then let the hose run back into the cabinet as much as he desires. Any length of hose may be allowed to remain out of the cabinet, as it is only necessary to impart a further slight tug to restore the pawl 183 to its locking position.

Inasmuch as the reel is constantly conditioned to rotate in one direction, the hose can not be locked in the cabinet against withdrawal. Similarly, since the mechanism causes some slight retrograde movement to shift the plate 154 with respect to the ring gear 158, it will be apparent

that the pawl 183 cannot be thrown to engaging position with the hose completely extended, there always remaining a slight amount of play in order to effect the necessary motion to effect unlocking. The teeth on the timing gear, it will be noted, are a whole multiple of the teeth on the locking ring, and the actual number of teeth illustrated have been found suited for reels used in service station equipment.

Obviously, the specific mechanism illustrated may be modified in many respects without departure from the principles of the invention, and therefore it is intended that the foregoing description of one embodiment shall be taken as exemplary, and not as limiting the scope of the invention. It will also be apparent that while the reel of the present invention has been described with reference to apparatus for dispensing gasoline, the reel may be utilized for many other purposes.

It is therefore desired that the invention should be measured by the following claims, in which are set forth the various parts and combinations of which the foregoing description is explanatory.

I claim:

1. A reel having a rotatable hub and a relatively fixed axle, a ratchet member having teeth and a pawl interconnected between the hub and axle, a movable link connected to the pawl and adapted when actuated to move the pawl successively into positions of engagement and disengagement with said teeth, gearing interconnected between the hub and axle and to said link for operating said link and thereby said pawl as said hub is rotated with respect to said axle in one direction and means interconnected between the hub and axle to forestall the operation of the gearing when said hub is rotated in the other direction.

2. A reel having a rotatable hub and a relatively fixed axle, a ratchet member having teeth and a pawl interconnected between the hub and the axle, a movable link connected to the pawl and adapted when actuated to move the pawl successively into positions of engagement and disengagement with said teeth, a clutch member frictionally connected to the link and adapted upon limited rotation of the hub in one direction to actuate said link and thereby said pawl, a stop for overcoming said frictional connection after said hub has been rotated a limited distance, and a positively engaging member kinematically interconnected between the hub and axle and to said link for overcoming said frictional connection when said hub rotates in the other direction.

3. A reel having a rotatable hub and a relatively fixed axle, a ratchet mechanism having teeth and a pawl interconnected between the hub and axle, a movable link connected to the pawl and adapted when actuated to move the pawl successively into positions of engagement and disengagement with said teeth, intermeshing gears respectively carried by the hub and axle and connected to said link, whereby upon rotation of the hub said gears are operated to actuate the link and thereby move the pawl, a friction member interposed between the gears and the hub for driving the gears when said hub is rotated, and a positive stop member connected between the hub and axle and to said gears to overcome the force of the friction member when said hub is rotated in one direction, whereby actuation of the link occurs only upon movement of the hub in the opposite direction.

4. A reel having a rotatable hub formed with

a cavity, a friction clutch mounted in said cavity for rotation with the hub, an axle member for the hub, said axle member having a part positioned in said cavity, a ratchet member having teeth and a pawl mounted in said cavity and between said hub and axle member, a link connected to the pawl and a gear connected to the link, a second gear meshing with the first named gear, a frictional connection between said clutch and one of said gears, whereby upon rotation of the hub said clutch imparts driving force to said gears, and a positive brake member mounted between said hub and said axle member for overcoming the force of the clutch when said hub is rotated in one direction only.

5. A reel having a rotatable hub member formed with a cavity, a relatively stationary hub piece having a part mounted in said cavity, a ratchet having teeth and a movable pawl disposed in said cavity and interconnected between the hub member and hub piece, a link connected to the pawl, a friction clutch mounted in the cavity, a pinion gear and a ring gear respectively carried by the hub piece and hub member, one of said gears being connected to the pawl and the other of said gears being frictionally engaged by the clutch, whereby upon rotation of the hub member a driving force is imparted to said pawl, and a second ratchet mounted in said cavity having teeth and a pawl interconnected between the hub member and hub piece, and to said ring gear to prevent rotation of the latter and thereby overcome said friction clutch when said hub member is rotated in one direction.

6. A reel having a rotatable hub member and a relatively stationary hub piece, a pawl carried by the hub piece and a ratchet tooth member carried by the hub member, a pitman mounted on the hub piece and connected to the pawl at one end, a pinion connected to the pitman at its other end, a ring gear carried by the hub member and meshing with the pinion, clutch means carried by the hub member and normally engaging the ring gear, whereby upon rotation of the hub member said pawl is moved with respect to the ratchet tooth member, and an overrunning clutch member interposed between the hub member and the hub piece for overcoming the force of said first named clutch means when said hub is rotated in one direction.

7. A reel having a rotatable hub member and a relatively fixed hub piece, a friction clutch carried by the member, a ring gear carried by the member and frictionally engaged by said clutch, a pinion carried by the hub piece and meshing with the gear, a pitman eccentrically connected to the pinion, a ratchet-tooth member carried by the hub member and a cooperating pawl connected to the pitman, and an overrunning positive clutch interposed between the hub member and hub piece and having one of its parts connected to the ring gear.

8. A reel having a rotatable hub member and a relatively fixed hub piece, a stop ratchet having a tooth member and a pawl interconnected between the hub member and hub piece, a friction clutch carried by the hub member, a ring gear mounted on the hub member and engaged by the friction clutch, a pinion carried by the hub piece and meshing with the gear, a pitman eccentrically connected to the pinion and to the pawl of the stop ratchet, a limit stop member associated with the friction clutch to restrict the movement of the ring gear when the hub member is rotated, and an overrunning clutch member disposed be-

tween the hub member and the hub piece and connected to the ring gear to prevent rotation of the ring gear by the friction clutch in one direction.

9. A reel having a rotatable hub member and a relatively fixed hub piece, a spring pressed friction clutch carried by the hub member, a slotted plate disposed adjacent the clutch and engaged thereby, a stop pin on the hub piece engaging the plate and limiting the movement thereof, a ring gear mounted on the hub member and engaged by the plate, a stop ratchet comprising teeth connected to the hub member and a cooperating pawl connected to the hub piece, a pinion mounted on the hub piece and meshing with the ring gear, a connection between the pinion and the pawl to move said pawl with respect to said teeth upon rotation of the hub member, friction clutch, and plate, and an overrunning clutch interposed between the hub member and hub piece and connected to the ring gear to prevent operation of the pawl through said pinion when the hub is rotated in one direction.

10. A reel having a rotatable hub member formed with an annular cavity, a friction clutch, slotted plate, ring gear and timing ratchet ring mounted in said cavity, a fixed connection between the gear and ratchet ring, a stop ratchet ring annularly mounted in said cavity in non-frictional engagement with the timing ratchet ring, a hub piece extending into said cavity, pawls carried by said hub piece adapted to engage the teeth of the timing and stop ratchet rings, a pinion meshing with the ring gear and rotatably mounted on the hub piece, a link eccentrically connected at one end to the pinion and at the other end to the pawl of the stop ratchet ring, and a stop pin on the hub piece extending into the slot of said plate.

11. A reel having a rotatable hub member and a relatively fixed axle member, a toothed ratchet ring connected to the hub member, a cooperating pawl pivotally connected to the axle member, a link mounted on the axle member and having a pin and slot connection with said pawl, whereby said pawl may oscillate upon relative rotation of the ring while said link remains relatively stationary, a clutch member carried by said hub member and operatively connected to said link thereby to shift the link and the pawl upon rotation of the hub member in one direction, and an overrunning constantly engaged second clutch for overcoming the force of the first named clutch when said hub member is rotated in the other direction.

12. A reel having a rotatable hub member and a relatively fixed axle member, a pair of ratchet tooth rings carried by the hub member, cooperating pawls mounted on the axle member, means for urging the pawl on one of said rings into constant engagement with the teeth thereof, means operative upon rotation of the hub member in one direction for intermittently and sequentially shifting the other of said pawls into engaging and disengaging position with the teeth of the other of said rings, whereby upon rotation of the hub member in said one direction said hub member is conditioned for rotation or non-rotation in the opposite direction, the teeth of said constantly engaged ratchet ring being a whole multiple of the teeth of the other ratchet ring.

13. A reel having a rotatable hub member and a relatively fixed hub piece, said hub member being formed with an annular cavity and an axially positioned stud projecting into said cavity,

said relatively fixed hub piece being formed with a socket concentrically positioned over said stud, a bearing interposed between the stud and socket, a boss on the hub piece and extending radially with respect to said cavity, a pinion shaft mounted in the boss, a stop ratchet ring mounted in the cavity and annularly positioned with respect to the boss, a pawl mounted on the hub piece adapted to engage the teeth of the ratchet ring, a link connected between the shaft and the pawl, a pinion mounted on the opposite end of the shaft, and means interposed between the boss and the walls of the cavity for intermittently rotating the pinion in one direction upon rotation of the hub member, thereby to shift said pawl into alternate positions of engagement and disengagement with the teeth of the ratchet ring.

14. A reel having a rotatable hub member and a relatively fixed hub piece, said rotatable hub member being formed with a cavity into which said hub piece extends, means in said cavity for alternately securing the rotatable hub member against rotation in one direction and for rotation in such direction, a stud concentrically located on the rotatable hub member, a socket formed in the hub piece having bearing engagement with the stud, a socket formed in said stud concentric with the first named socket, and a hollow shaft extending into said second socket.

15. A reel comprising a main spider member including a substantially cylindrical portion and an axially located hollow boss portion, a cavity formed in said cylindrical portion and extending to one side thereof, a stud formed on said cylindrical portion projecting axially into the cavity, a hub piece formed with a socket extending into said cavity and having bearing engagement with the stud, means mounted between the hub piece and the walls of the cavity for releasably locking the main spider member against rotation in one direction, a second socket formed in the stud, an axial bore formed in said hollow boss portion, a fluid outlet formed on the hollow boss portion, a relatively fixed tubular axle extending into the hollow boss portion, said axle having an inner end having bearing engagement with the second socket, apertures formed in said axle to provide fluid communication from the exterior thereof to said fluid outlet, and packing means interposed between the bore of said hollow boss and said tubular axle.

16. A reel comprising a main spider member including a substantially cylindrical portion and an axially located hollow boss portion, an axle member extending into said hollow boss portion axially of the cylindrical portion, said axle being tubular to admit fluid to said hollow boss portion, a spigot formed on said boss and turned axially of the spider member to direct its discharge end toward said cylindrical portion of said spider member, radially located flanges on said cylindrical portion at substantially the central plane of said spider member, and side plates extending radially outwardly of the spider member connected to said flanges, the discharge end of said spigot being disposed in the plane of said radially located flanges.

17. A reel having a main spider portion, relatively fixed axle members extending into the spider portion from opposite sides thereof and providing bearing means for said spider portion, one of said axle members being tubular, a spigot formed on the spider member in fluid communi-

15

cation with said tubular axle, said spigot having an outlet end disposed circumferentially of the spider, equally spaced radial flanges on the spider, one of said flanges being circumferentially elongated and formed with a curved outer surface contiguous with the end of said spigot, side plates mounted on said flanges in spaced relation, and a spring motor carried by one of the side plates.

18. A reel having a main spider formed with radially extending flanges, a pair of side plates having inwardly directed fingers abutting said flanges, bolts passing through the fingers and flanges to mount said side plates, a plurality of circumferentially spaced brackets formed on the outer face of one of the side plates, a hoop supported by said brackets, said hoop being formed with a plurality of peripheral slots, a pawl mounted on said one plate and adapted to enter one of the slots, a coiled spring mounted inside the hoop and having one end connected to the hoop, and relatively stationary means having a part entering the spider and rotatably support-

16

ing the same adjacent the outer surface of said one plate, said stationary means being provided with a member to engage the opposite end of the spring and with means retaining said spring in the hoop.

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