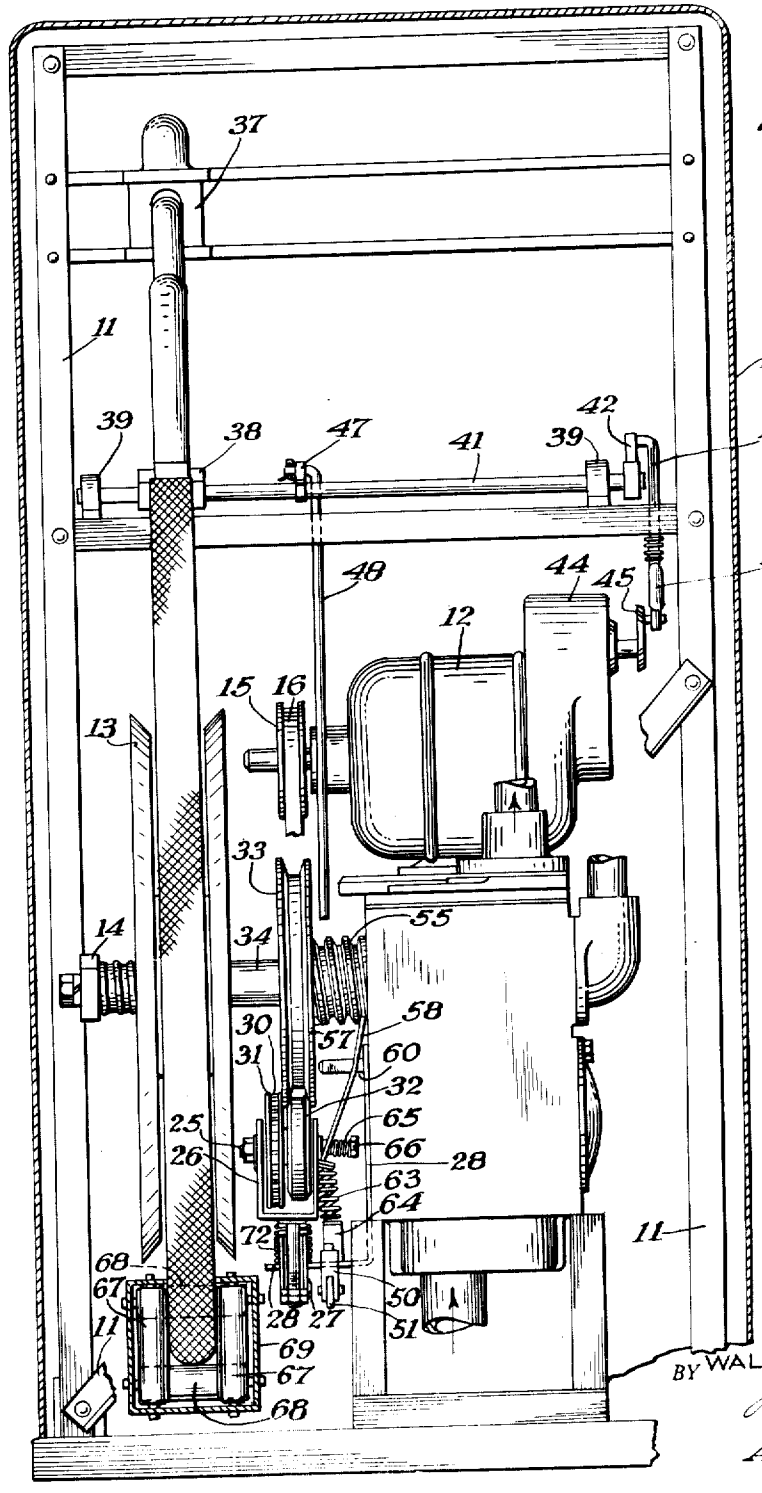
Dec. 11, 1951 W. P. SCHIRMER 2,577,859

HOSE REEL OPERATING MECHANISM FOR GASOLINE PUMPS

Filed Oct. 25, 1947 4 Sheets-Sheet 1

Fig. 1



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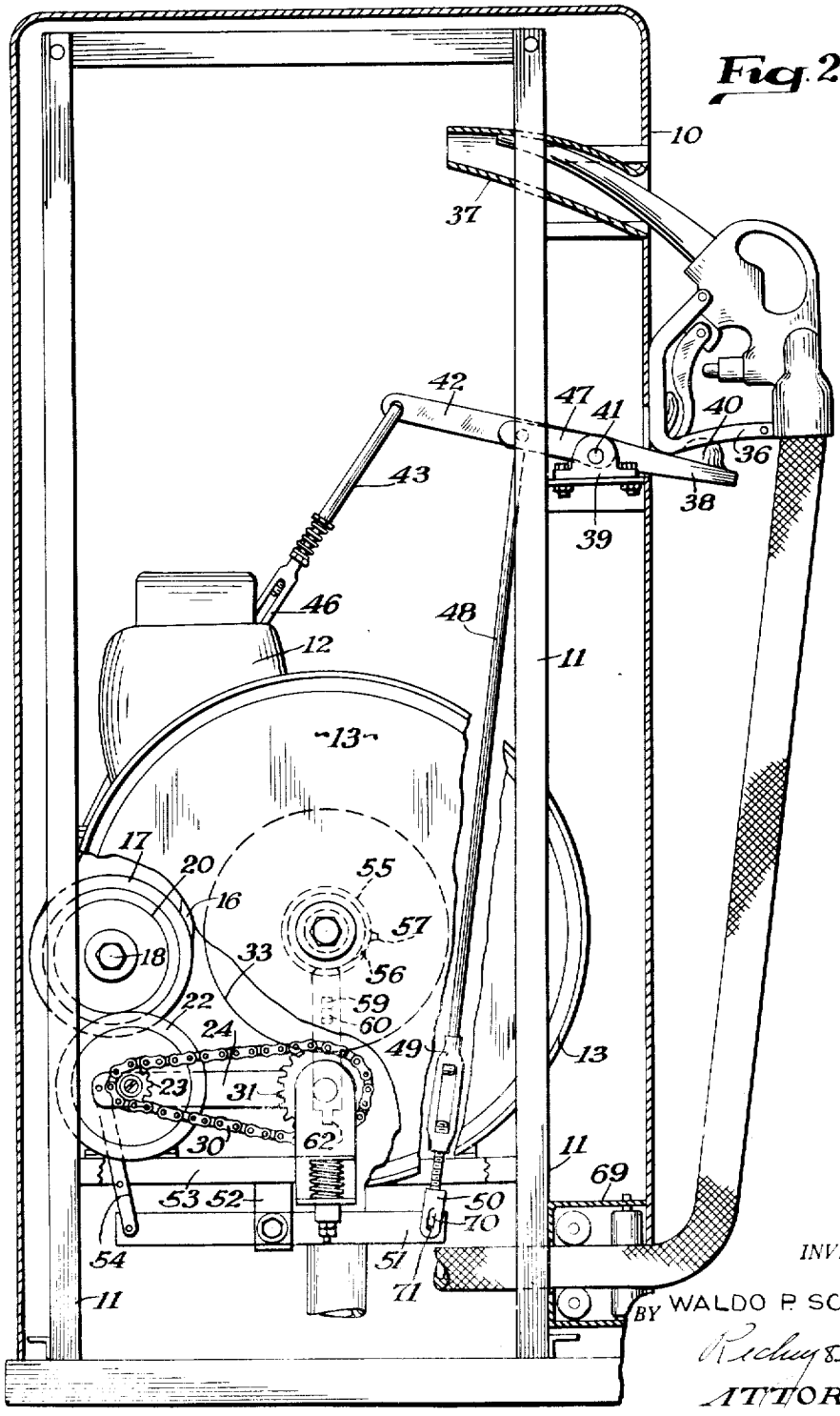
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Dec. 11, 1951 W. P. SCHIRMER 2,577,859

HOSE REEL OPERATING MECHANISM FOR GASOLINE PUMPS

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Fig. 2



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HOSE REEL OPERATING MECHANISM FOR GASOLINE PUMPS

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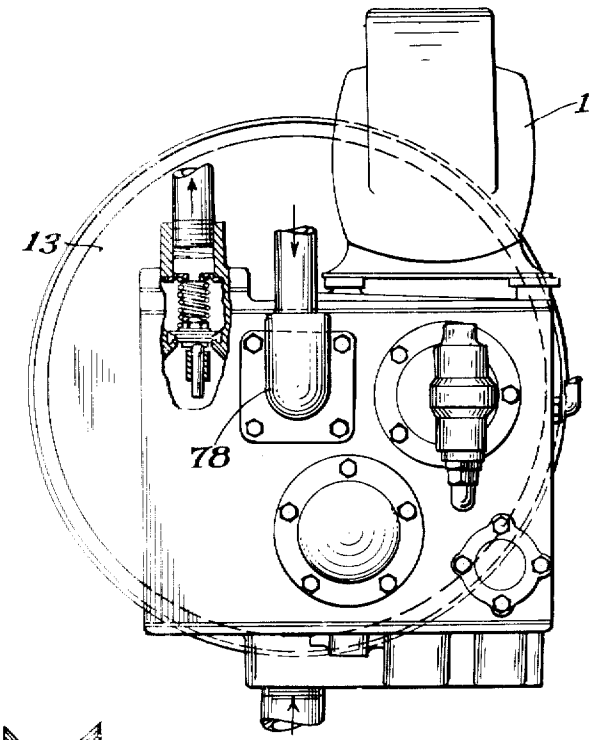


Fig. 3

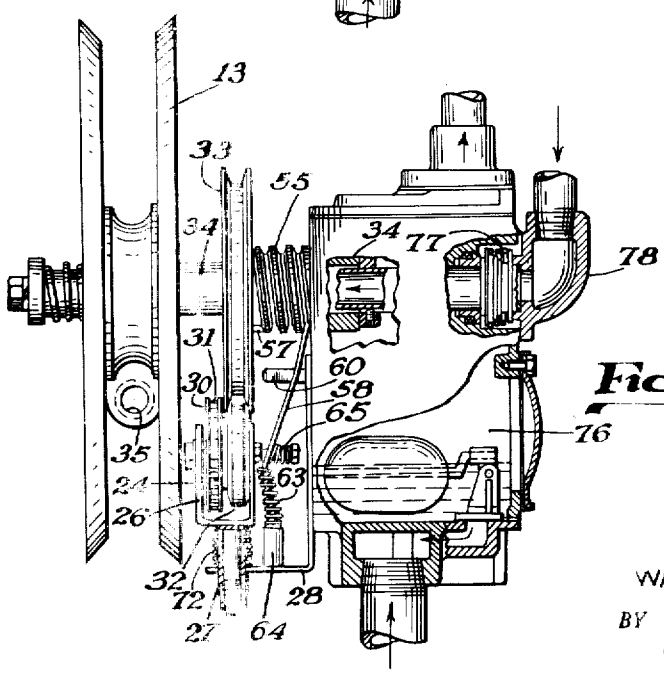


Fig. 4

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HOSE REEL OPERATING MECHANISM FOR GASOLINE PUMPS

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Fig. 6

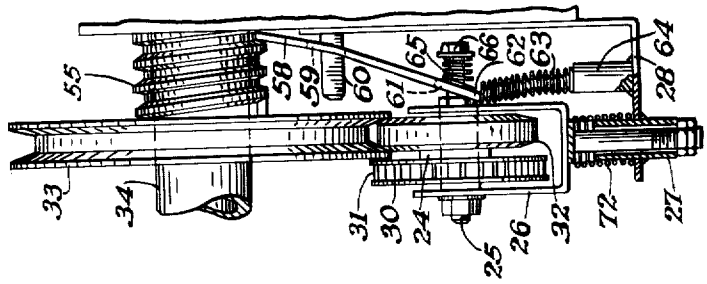


Fig. 7

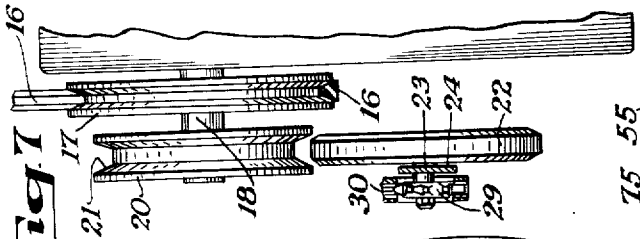


Fig. 8

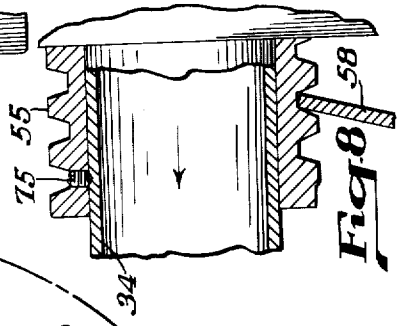
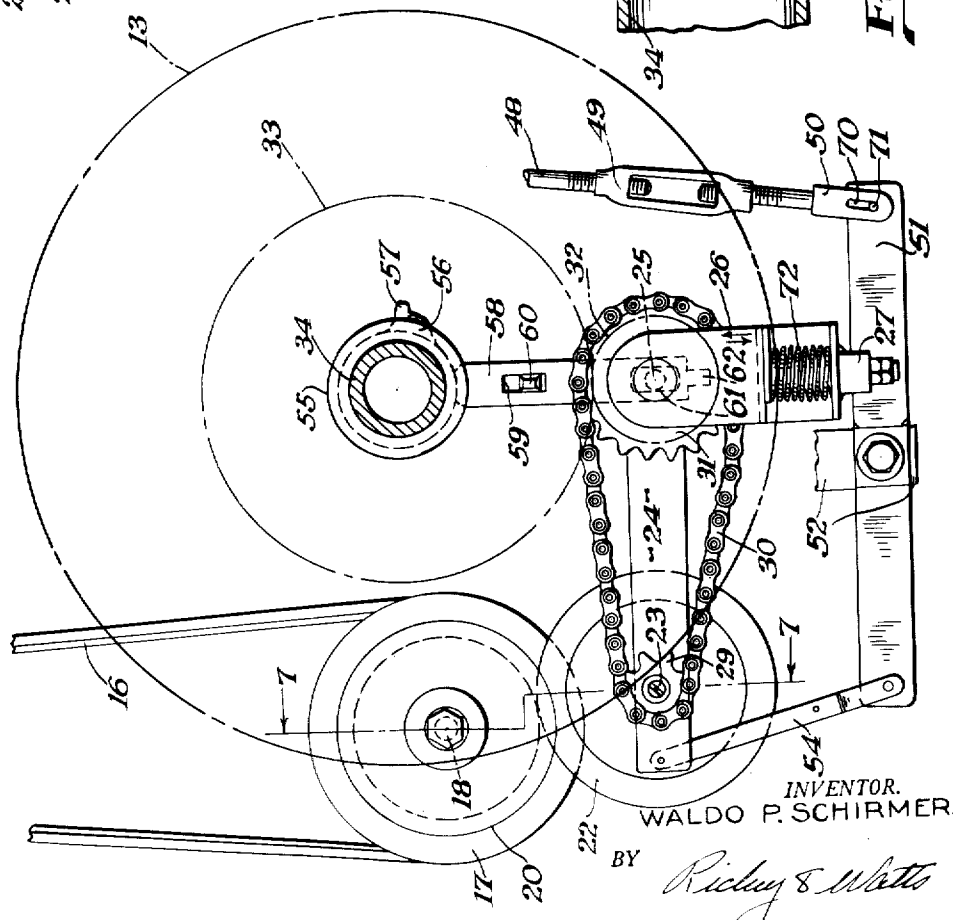


Fig. 5



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UNITED STATES PATENT OFFICE

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HOSE REEL OPERATING MECHANISM FOR GASOLINE PUMPS

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Application October 25, 1947, Serial No. 782,059

13 Claims. (Cl. 222—74)

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This invention relates broadly to gasoline pump hose reels, and, more specifically, to power transmission mechanisms therefor.

One of the objects of the invention is to provide a power take from the motor customarily employed in a gasoline filling station pump for operating a hose reel during the retractive cycle thereof.

Another object of the invention is to provide an automatic clutch control mechanism for disengaging the driving connection between the motor and the reel when the free end of the hose is brought into proximity with its holder.

Another object of the invention is to provide mechanism to facilitate the operation of the motor switch, when, and only when, the hose nozzle is removed from the supporting frame therefor.

Another object of the invention is to provide mechanism for driving the reel from the pump motor during the period in which the gasoline is by-passed and recirculated through the pump.

Another object of the invention is to provide mechanism for resetting the clutch control element by the movement of the reel during the withdrawal of the hose therefrom.

Another object of the invention is to provide a clutch which will assure an effective drive after engagement thereof, but afford sufficient initial slippage, when the parts are brought together, to prevent undue shock upon the static parts of the transmission.

Another object of the invention is to provide mechanism to arrest the movement of the reel, after a predetermined number of convolutions of the hose have been wound thereon.

A further object of the invention is to provide a friction driving mechanism for the reel which will accommodate independent movement of the parts thereof in the event the free end of the hose or an unwound portion thereof becomes entangled or restrained from retractive movement during the winding cycle of the reel.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which, considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

Referring to the drawings:

Fig. 1 is a vertical section through a gasoline pump, embodying the improved reel and driving connections therefor;

Fig. 2 is a similar section of the pump assembly taken at right angles to the view illustrated in Fig. 1;

Fig. 3 is an end elevational view of the pump and motor assembly;

Fig. 4 is a front elevational view of the pump and driving connections for the reel;

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Fig. 5 is a front elevational view, shown upon an enlarged scale, of a fragmentary portion of the driving connections to the reel;

Fig. 6 is a detail elevational view of certain of the parts shown in Fig. 5;

Fig. 7 is a sectional view of the driving connections, the section being taken on a plane indicated by the line 7—7 in Fig. 6; and

Fig. 8 is a detail view of the clutch throwout worm illustrating the mounting thereof upon the reel shaft.

Referring first to Fig. 1, the pump housing 10, which may be of any conventional form, is secured to a structural steel frame 11 formed for the support of the pump and motor 12, a hose reel 13 and the bearings 14 for the driving connections between the motor and the reel. The pump, which has been chosen herein merely for the purpose of illustration, may be of any commercial form that embodies a by-pass valve to facilitate the circulation of the gasoline through a chamber therein when the motor is running and the delivery nozzle on the hose is closed. Since the pump per se, and driving connections therefor, form no part of the present invention, a detailed description thereof is deemed unnecessary herein.

The electric motor 12 is provided with a pulley 15 having a V belt 16 thereon which is entrained with a pulley 17 mounted on a shaft 18 constituting the driving element for the pump. The shaft 18 is further provided with a friction drive wheel or sheave 20 formed with a tapered groove 21 in the circumference thereof which is machined for driving engagement with a spool or clutch member 22 (Fig. 7). The side walls of the spool 22 are of complemental configuration to the inclined driving faces 21 of the sheave 20, and the spool is formed from a material having a high coefficient of friction, in order to assure an effective driving connection with the sheave when the parts are engaged. The spool 22 is mounted on a shaft 23 journaled in an arm 24 which is pivotally supported upon a shaft 25 mounted in a yoke 26. The yoke is retained by a post 27 mounted for vertical movement in a guideway secured in a bracket 28 fixed upon the housing of the pump. The shaft 23 is provided with a sprocket 29, having a chain 30 thereon which is roved over a sprocket 31 keyed to the shaft 25. The shaft 25 is provided with a spool 32, similar in form to the spool 22, and adapted for engagement in the grooved face of a sheave 33 keyed upon a tubular shaft 34, which supports the hose reel 13. The hub of the reel 13 is formed with an elbow 35 coupled in fluid communication with the tubular shaft 34, which in turn is coupled with the delivery passageway in the pump. The free end of the hose is provided with a discharge nozzle of conventional form having a trigger

guard 36 thereon, which in the present case is employed to effect the suspension of the end of the hose upon the pump.

When the hose is not in use, the end of the nozzle is supported in a thimble 37 mounted in the upper end of the pump housing 10, the trigger guard or frame 36 being retained by a lever 38 fulcrumed in a bracket 39 supported by the frame 11. The outer end of the arm is formed with a boss 40 adjacent the end thereof which is engaged with an opening in the trigger guard to prevent displacement thereof when the hose is suspended in its idle position. A shaft 41 constituting the fulcrum for the lever 38 (Fig. 1) is provided with an arm 42, which is operatively connected through a rod 43 with the switch 44 for the motor 12. A plate 45, apertured to facilitate adjustment of the linkage, is mounted on the motor switch, and supports a slotted yoke 46, constituting a lost motion mechanism to override excessive movement of the rod 43. The inner end of the yoke is bored for sliding engagement upon the rod 43 and is retained in its distended position by a spring mounted in telescopic engagement with the rod. The shaft 41 is provided with a second lever 47, having the end thereof drilled for the reception of a push rod 48 which is provided with a turn buckle 49 in the lower end thereof to facilitate lineal adjustment thereof. The turn buckle is connected with a slotted clevis 50 mounted on a rocker arm 51, which is fulcrumed in a bracket 52 supported by a cross member 53 (Fig. 2) in the frame 11. The outer end of the rocker arm 51 is coupled with a link 54 connected to the arm 24 to effect the oscillation thereof about its pivotal support upon the shaft 25 consequently the actuation of the lever 38.

The shaft 34 is provided with a worm 55 (Figs. 1, 4, and 6), the inner convolution thereof terminating in a lift cam 56, with a stop lug 57 adjacent the crest thereof. The worm 55 is engaged with a follower 58 comprising a bar formed with an arcuate end configured for engagement with the root of the worm thread, a rectangular slot 59 intermediate the ends thereof, guided upon a post 60 in the pump housing, a second rectangular slot 61 engaged with the shaft 25, and a shouldered end portion 62 engaged within a compression spring 63. The base of the spring is supported on a post 64 welded or otherwise secured to the bracket 28. The follower is urged inwardly toward the spool 32 by a compression spring 65 mounted on the shaft 25, and is adjustably retained thereon by a nut 66.

As the hose is retracted from the reel 13, the body thereof is guided by a pair of vertically disposed rollers 67 and a pair of transverse rollers 68 mounted in top and bottom portions of a cage 69 supported by the frame 11.

The worm 55 is mounted for rotative adjustment upon the shaft 34 by set screws 75 or an equivalent locking device so that the translation of the follower may be varied to compensate for modifications in the length of the hose, such, for example, as might occur when a worn end section is cut therefrom.

As will be seen in Fig. 4, the pump housing is formed with an air separator float chamber 76 having the reel shaft 34 in the upper portion thereof, and a packing gland 77 therefor to provide a seal between the end of the shaft and a fixed elbow 78 that leads from the meter (not shown). With such construction it will

be readily recognized that any fluid that may escape through the packing 77 will flow into the chamber 76 and enter the circulatory system of the pump and separator during the operation thereof.

Operation: When the attendant removes the nozzle from the lever 38, he may start the motor and thus effect the operation of the pump by elevating the lever 38 to the position where the end wall of the slot 70 in the clevis 50 is engaged with a pin 71 in the lever arm 51, such movement effectuating the rotation of the shaft 41 and the actuation of the switch 44. Thereafter the attendant may withdraw the hose from the reel 13, thus causing the rotation of the worm 55, and the consequent translation of the follower 58 inwardly toward the pump, as illustrated in Fig. 6. The length of the hose and the ratio between the diameter of the reel and worm are so proportioned that the follower will come to rest within the last convolution of the worm when the hose is fully withdrawn from the reel.

When the attendant is ready to rewind the hose he may elevate the free end of the lever 38 still further, so that the end wall of the slot 70 in the yoke 50 will rock the arm 51 about its fulcrum and thus cause the elevation of the link 54 and corresponding movement of the arm 24, forcing the spool 22 into engagement with the sheave 20, which is driven by the belt 16 from the motor. Since rotative movement is transmitted from the sheave 20 to the spool 22, the chain 30 on the sprocket 23 will cause the rotation of the sprocket 31, which in turn will effect the rotation of the spool 32, sheave 33, and consequent retractive rotation of the reel. During this rotative cycle of the reel, the follower 58 will be drawn by the threads of the worm 55 toward the sheave 33, until the end portion thereof rides the cam 56, whereupon the lift of the cam will force the follower downwardly overcoming the effort of a spring 72, until the end wall of the slot 61 in the follower 58 engages the shaft 25 and effects the disengagement of the spool 32 with the sheave 33, thus breaking the driving connection to the reel. As the attendant replaces the nozzle upon the lever 38, the depression of the free end thereof will reset the arm 51 to the position illustrated in Fig. 2, and also oscillate the rod 41 to a position which will cause the movement of the arm 43 to open the switch 44 to the electric motor.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. In combination, a housing, a drive motor therein, a delivery hose, mechanism operated by said motor for winding the hose upon a reel comprising a rotative member driven by the motor, a clutch engageable therewith, an arm for the support thereof, a second clutch on said arm, power transmission means between the first- and second-named clutches, a second rotative member engageable with the second clutch, a hose reel connected with the second rotative member, a lever fulcrumed on the pump housing for the

support of the free end of the hose, and linkage connected to the lever and said arm for controlling the driving connections from the motor to the reel.

2. In combination, a housing, a drive motor therein, a delivery hose, mechanism operated by said motor for winding the hose upon a reel comprising a rotative member driven by the motor, a clutch engageable therewith, an arm for the support thereof, a second clutch on said arm, power transmission means between the first- and second-named clutches, a second rotative member engageable with the second clutch, a hose reel connected with the second rotative member, means associated with the reel to disengage the second clutch subsequent a predetermined number of revolutions thereof, and means operatively connected with the first clutch for the control of the power transmission to the reel.

3. Mechanism for winding a length of hose upon a reel comprising a motor, a rotative member driven thereby, a clutch engageable therewith, an arm for the support thereof, a second clutch on said arm, power transmission, means between the first- and second-named clutches, a second rotative member engageable with the second clutch, a tubular shaft in fluid communication with the pump, supporting the second rotative member, a reel mounted thereon in fluid communication with said shaft, a length of hose on said reel, a worm on said shaft, a worm follower engageable with the second clutch, and a cam on the end of said worm acting on the follower to disengage the second clutch.

4. Mechanism for winding a hose upon a reel comprising a motor, a rotative member driven thereby, a clutch engageable therewith, an arm for the support thereof, a second clutch on said arm, power transmission, means between the first- and second-named clutches, a second rotative member engageable with the second clutch, a hose reel connected with the second rotative member, a hose thereon, a lever fulcrumed on the pump housing for the support of the free end of the hose, means controlled by the rotation of the reel to actuate the second clutch, and means controlled by the lever to actuate the first clutch.

5. Mechanism for winding a hose upon a reel comprising a motor, a rotative member driven thereby, a clutch engageable therewith, an arm for the support thereof, a second clutch on said arm, power transmission, means between the first- and second-named clutches, a second rotative member engageable with the second clutch, a hose reel driven thereby, a hose coupling on the hub of the reel, fluid connections between the hose coupling and the pump, a hose on said coupling, a manual control mechanism for the actuation of the first clutch, and means for the automatic disengagement of the second clutch when a predetermined length of hose is wound upon the reel.

6. Mechanism for winding a hose upon a reel in a gasoline pump comprising a motor, a switch therefor, a first clutch driven by the motor, a second clutch driven by the first clutch, a reel driven by the second clutch, means driven by the clutches for disengaging the second clutch, and means for disengaging the first clutch and actuating the switch to stop the motor.

7. Mechanism for winding a hose upon a reel in a gasoline pump comprising a motor, a switch therefor, a first clutch comprising a sheave driven by the motor and a clutch member engageable therewith, a second clutch driven by the first clutch, a reel driven by the second clutch, a worm rotatable with the reel, a follower engaged with the worm and the second clutch, a cam on the worm engageable with the follower to disengage the second clutch, and a manually operated lever coupled with the motor switch and the first clutch for the simultaneous control thereof.

8. Mechanism for winding a hose upon a reel in a gasoline pump comprising a motor, a switch therefor, a first clutch comprising a sheave driven by the motor and a clutch member engageable therewith, a second clutch driven by the first clutch, a reel driven by the second clutch, a hose coiled on said reel and connected to the hub thereof, a worm rotatable with the reel, a follower engaged with the worm and the second clutch, means urging the second clutch member into driving relation, a cam on the worm engageable with said follower for disengaging the second clutch, means on the follower to support the end thereof in thread-chasing engagement with the worm as the hose is drawn from the reel, and linkage for the control of the motor switch and first clutch.

9. Mechanism for winding a hose upon a reel in a gasoline pump comprising a motor, a pump driven thereby, a transmission mechanism driven by the motor, a clutch therein, a reel driven through said clutch, a hose on said reel in fluid communication with said pump, a clutch throwout mechanism associated with said reel, and means for operating said throwout mechanism when a predetermined number of convolutions of hose is wound upon the reel.

10. Mechanism for winding a hose upon a reel in a gasoline pump comprising a motor, a pump driven thereby, a transmission mechanism driven by the motor, a clutch therein, a reel driven through said clutch, a hose on said reel in fluid communication with said pump, a clutch throwout mechanism associated with said reel, a threaded member on said reel, a follower thereon coacting with said clutch throwout, said threaded member being proportioned relative to the coilable length of the hose to operate the clutch throwout when said hose is wound upon the reel.

11. A power transmission mechanism for winding a gasoline hose upon a reel comprising a motor, a sheave having a V groove therein driven by the motor, a spool having a circumferential V face thereon engageable with the groove in said sheave, a rocker arm for the support thereof, linkage connected therewith for moving said rocker to effect the engagement or separation of the spool and sheave, a second spool on said arm, gearing entrained with the first- and second-named spools, a second sheave engageable therewith, a shaft for the support thereof, a hose reel thereon, and mechanism on the shaft driven by said gearing to effect the engagement or separation of the second spool with the second sheave.

12. A power transmission mechanism for winding a gasoline hose upon a reel comprising a driving sheave having a V groove in the circumferential face thereof, a spool having a tapered circumferential face of complemental configuration with the V groove, means for moving the spool into and out of engagement with the sheave, a second spool having a tapered circumferential face intergeared with the first-named spool, a second sheave having a groove in the circumferential face thereof engageable with the second spool, a hose reel driven thereby, means urging the second spool into engagement with the second sheave, and means on the second sheave driven

by the first sheave for moving the second spool out of engagement with the second sheave.

13. A hose retracting mechanism comprising a housing, a frame for the support thereof, a pump unit thereon having an air separator chamber therein, an electric motor operatively connected to said pump, a hose reel supported on said frame, a hollow drive shaft therefor mounted in said air separator chamber, and in fluid communication with said pump, a packing gland in said chamber contiguous the end of said shaft, driving connections between said motor and said reel, a clutch in said driving connections, and means on said shaft controlled by the manual manipulation of the reel for actuating said switch.

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