

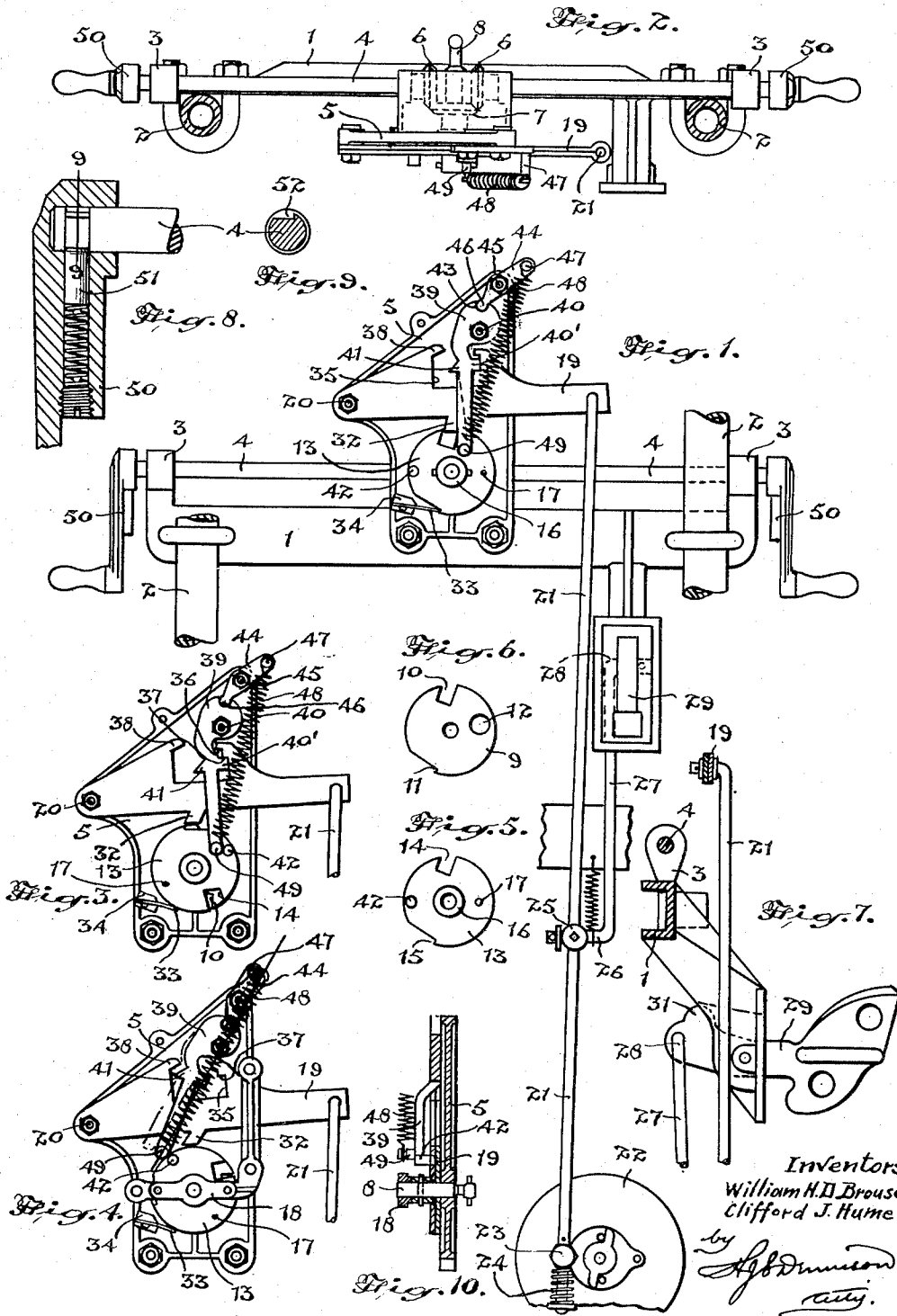
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RESETTING INTERLOCK FOR FLUID DISPENSING PUMPS

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RESETTING INTERLOCK FOR FLUID DISPENSING PUMPS

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The principal objects of this invention are to provide a resetting device which cannot be operated while the pump is operating in dispensing, nor until the dispensing valve is returned to its non-operating position, so that failure to shut off the pump motor or to return the dispensing valve, definitely prevents the resetting and consequent progress of manipulation of the pump.

A further and important object is to provide a locking device which is extremely simple in its construction and not expensive to manufacture and which can be readily adapted to different forms of registering mechanism.

The principal features of the invention consist in the novel construction and arrangement of a latch device connected with the pump motor switch and the means for supporting the distributing valve or hose and a rotatable member operated by the shaft for resetting the gauging or indicating mechanism and adapted to control the movement of said latch to positively prevent the operation of the dispensing pump switch until the indicating mechanism has been reset to the zero position, the latch mechanism being provided with a toggle device adapted to hold the latch clear of the rotatable locking member during its rotating movement.

In the accompanying drawing, Figure 1 is an elevational view of my improved resetting interlock showing its operative connection with the pump motor switch and the dispensing valve support.

Figure 2 is a top plan view of the structure illustrated in Figure 1.

Figure 3 is an elevational view of the latch mechanism showing the toggle device in interlocked relation with a member which controls the pump motor switch.

Figure 4 is an elevational view of the latch mechanism showing the toggle member in the released position.

Figures 5 and 6 are elevational details of the pair of discs for locking the latch mechanism.

Figure 7 is an elevational detail of the dispensing valve supporting "hook".

Figure 8 is a longitudinal sectional view through one of the cranks for operating the shaft of the resetting mechanism.

Figure 9 is a cross sectional view through the ratchet end of the shaft taken on the line 9-9 of Figure 8.

Figure 10 is a vertical section through the bracket and discs.

In the dispensing of liquids and particularly that of gasoline it has become very important

that the dispensing mechanism should be equipped with means for protecting both the public and the owner of the station from fraud through the manipulation of the pump by the operator and the most improved forms of such dispensing apparatus are equipped with visible indicators mechanically operated by the measuring mechanism which indicate the exact amount of fluid that has been dispensed and numerous devices have been applied to these mechanisms to endeavor to eliminate fraud on the part of employees.

In the form of the device herein shown a bracket 1 is secured in the horizontal position between the upright members 2 which form part of the frame of the dispensing device. This bracket is provided with lug ends 3 in which are journaled the aligned shafts 4. The inward ends of the shafts 4 are journaled in bearing lugs on a bracket 5 secured to and extending upwardly from the bracket 1 and bevelled pinions 6 are mounted on the inner ends of said shafts and both mesh with a bevel gear 7 fixed to a stub shaft 8 journaled in a bearing in the bracket 5 and arranged in right angular relation to the axes of the shafts 4.

One end of the shaft 8 is adapted to be connected to the indicating or registering mechanism of the pump which is not shown.

Upon the other end of the stub shaft 8, immediately outside the hub of the bracket 5, is rotatably mounted a disc 9, which is formed with a parallel-sided notch 10 in its periphery and a flat notch 11 spaced from the aforesaid notch around the periphery. This disc is also provided with a hole 12.

A disc 13 having notches 14 and 15, corresponding with the notches 10 and 11 in the disc 9, is also provided with a hub 16 which is rigidly secured to the shaft 8. The disc 13 is also provided with a pin 17 which extends into the hole 12 in the disc 9 and is of a much less diameter than the hole and permits a limited movement of the loose disc in relation to the fixed disc a distance substantially equal to the width of the notch 10, so that at certain periods during the operation of the device the perimeter of the disc 9 will close the notch 14 of the disc 13.

A bracket 18 rigidly secured to the bracket 5 forms a bridge over the pair of discs 9 and 13 and supports the end of the stub shaft 8. This bracket also projects vertically upward as shown in Figure 4 and forms a vertical guide for the latch arm 19 which is pivotally mounted on a pin 20 rigidly secured in the bracket 5 at one

side of the vertical centre line through the stub shaft and the discs carried thereby.

The latch arm 19 extends in a substantially horizontal direction across the bracket 5 and the free end thereof has pivotally mounted therein a rod 21 which extends downwardly to the switch of the pump motor 22, the rod extending slidably through the pin 23 of the switch and having a compression spring 24 coiled around its lower end, the rod being free to slide upwardly through the pin, the pressure of the spring serving to operate the switch to open the circuit and stop the motor.

A block 25 is adjustably mounted on the rod 21 intermediate of its length and is secured in adjusted positions by a suitable set screw. This block is secured to the lower cranked end 26 of a rod 27 which extends upwardly and has an upper cranked end 28 pivotally mounted in the inward end of an arm 29 pivotally mounted in a slotted extension 39 from the bracket 1. The end of the arm 29 projecting through the slotted member 30 forms the "hook" upon which the dispensing valve of the dispensing hose is supported when the pump is not in operation. The arm 29 is provided with a projection 31 on its inner top side which engages the top of the slot and limits the upward movement of the rod 27.

It will be understood that when the dispensing valve is hung on the "hook" end of the arm 29, the inner end is lifted upwardly, pulling upwardly on the rod 27, which in turn pulls upwardly on the rod 21 to operate the switch to cut out the motor when the dispensing valve is lifted from the hook the operator pushes upwardly on the hook, swinging it on its pivot, thereby pushing downwardly on the rod 27 and consequently on the rod 21 to close the switch and start the motor.

The latch arm 19 is provided with a downwardly extending lug 32 which is adapted to simultaneously enter the notches 10 and 14 of the discs 9 and 13 when said notches are in alignment and when they are in alignment and in proper relation to the lug 32, a spring latch 33 in the form of a flat spring secured to a lug 34 on the bracket 5, engages the notches 11 and 15 of said discs, abutting the shouldered ends thereof.

The stub shaft 8 of the registering mechanism is so related to the discs that they will be in the position described only when the registering mechanism has been returned to the zero position.

The upward portion of the latch arm 19 is cut away to form an enlarged recess 35, one side of which is provided with two stepped notches 36 and 37 and the opposite side of the recess is formed with an upwardly sloping inward toothed projection 38.

A latch 39 pivotally mounted on a pin 40 secured in the bracket 5 above the latch arm 19, is provided with a squared toothed extension 40' which is adapted to co-operate with the notches 36 and 37 and opposite the tooth 40' is a bevelled tooth 41 which is adapted to engage the bevelled tooth extension 38 of the latch arm when the latch 39 is moved so that the tooth 40' is out of the path of engagement with the projections of the notches 36 and 37. The latch is offset outwardly past the tooth 41 as illustrated in Figure 10 to pass over the latch arm 19 and to extend outside of the outer disc 13 and the disc 13 is provided with a pin 42 which is adapted, upon the rotation of the disc, to engage the latch and swing it on its pivot.

The latch 39 is provided with a notch 43 in its upper end which is in the form of a part circular socket.

A short lever 44 pivotally mounted on a bolt 45 secured in the bracket 5 at its upper end, is provided with a rounded end 46 which extends into the rounded notch 43, forming a toggle joint and the outer end of the lever 44 is provided with a pin 47, to which is secured one end of a coiled tension spring 48, the other end of which is secured to a pin 49 projecting from the offset end of the latch 39.

It will be seen on reference to Figures 1 and 3 that the tension of the spring 48 holds the toggle composed of the latch 39 and lever 44, so that the tooth 40' will be held by spring tension against the notched side of the recess 35 and that upon the lifting of the latch arm the said tooth will spring into the notches 36 and 37.

Upon the rotation of the discs 9 and 13 the pin 42 moves into engagement with the offset end of the latch 39, swinging it upon its pivot and consequently swinging the lever 44 until the spring 48 moves slightly over the dead centre line as is illustrated in Figure 4. The spring thus holds the latch away from the notched side of the recess, but when the latch arm 19 is moved downwardly the bevelled tooth 38 of said latch arm engages the bevelled tooth 41 of the latch and swings it on its pivot to throw the spring over the dead centre and the latch then snaps back into position, engaging the projection above the notch 36.

The shafts 4 of the reset mechanism are each provided on their outer ends with a ratchet crank 50 which is provided with a spring plunger 51 engaging an annular peripheral recess in the end of the shaft which securely holds the crank on the shaft and the recess is provided with a notch 52 forming a ratchet which is engaged by the plunger when the crank is turned in the proper direction to rotate the shaft.

The separate remotely located cranks are conveniently arranged on either side of the pump standard so that the reset mechanism may be operated from either side, but when either shaft is turned the bevel pinion on the inner end rotates the bevel gear 7 on the stub shaft. The reset mechanism in itself, forms no part of the present invention and is not shown herein but reference may be had to Patent No. 2,026,959, January 9, 1936, wherein such a mechanism is shown and described.

The attendant operating pump is supposed to place the valve of his dispensing hose on the hook end of the arm 29 before operating the reset mechanism and by doing so he tilts the arm 29 on its pivot to pull upwardly on the rod 27 and through it to operate the rod to open the switch of the pump motor. He then turns one of the crank members and through the reset mechanism referred to rotates the stub shaft 8 and disc 13 fixed thereon.

The pressure of the spring latch 33 against the perimeter of the discs 9 and 13 does not affect the rotation of the disc 13, which is fixed to the shaft 8, but it does retard the movement of the disc 9 until the pin 17 secured to the disc 13 engages the side walls of the hole 12 in the disc 9 and the pin then causes the disc 9 to turn with the disc 13, but the lost motion between these two discs moves the notches 10 and 14 out of alignment so that the disc 9 closes the notch 14 and coincidentally the notches 11 and 15 are moved out of register the one with the other.

The manual or reset turning of the stub shaft returns the registering mechanism to a zero position if it is turned far enough, but if the operator stops the return mechanism any place short of the full position of return to zero, the notch 14 will remain closed and the latch arm cannot be moved downwardly to start the pump motor. It is necessary therefore for the operator to continue the operation to carry the disc 13 around until the notch 10 of the disc 9 is moved into alignment with the downwardly projecting lug 32 on the latch arm 19 and in doing this the notch 14 in the disc 13 is carried past the engaging lug and the latch arm still cannot be operated and it is necessary for him to release the pressure on the operating crank and the stub shaft automatically turns backward through a spring action, which is part of the standard recording mechanism, bringing the notches 11 and 15 into stop contact with the spring latch 33 to prevent further return movement and thereby arrest the discs 9 and 13 with their notches 10 and 14 in transverse alignment.

The latch arm 19 may then be swung downwardly so that its lug 32 enters the aligned notches 10 and 14 and this downward movement starts the motor.

If the operator, after starting the motor, attempts to lift the latch arm 19 through the medium of the hose hook and the connecting rod 21, the latch 39 immediately snaps into the notch 36 and this action occurs before the lug 32 on the latch 19 is withdrawn from the notches in the discs 9 and 13, consequently the operator cannot manipulate the resetting mechanism of the indicator and if he moves the arm 19 still farther in order to clear the notches 10 and 14 to release the indicator resetting mechanism, the tooth 40' of the latch enters the notch 37 and in this position the motor will be shut off. It then becomes necessary for the operator to again manipulate the indicator resetting mechanism to release the latch and he is back to the position where he started. The arrangement of the parts is such that latch 40' enters notch 36 before the switch is opened and the switch is opened before lug 32 leaves notches 10-14. The lug 40' therefore prevents the machine being reset and the notch 36 prevents a second down movement of lever 19 which prevents motor being restarted until the up movement of 19 is completed, unlatching the discs and latching 40' into notch 37.

The latch arm 19 cannot be lowered to start the motor until the discs 9 and 13 are revolved through one revolution of the resetting mechanism which unlatches 40' from notch 37 by the action of the pin 42 on disc 13 engaging latch 39. It will be fully understood that as this latch mechanism is enclosed within the casing of the pump standard, the operator cannot gain access to the latch mechanism in any way to disconnect the motor-operating mechanism from it and while the parts are connected in the manner described it becomes absolutely impossible for the operator to start the motor and to serve gasoline from the pump unless the recording mechanism has been returned to zero.

It will of course be appreciated that the parts of this mechanism are of a very simple nature and they are of such a rugged construction that they are not likely to get out of order even with rough handling and it will be remembered that the only point of contact that the operator has is through the manipulation of the hook arm 29

which is the only part extending beyond the casing of the pump structure.

The downward movement of this arm 29 is limited by the stop member on its inner end and its upward movement is exerted against the latch arm 19 and latch 39 which are of a rugged structure and cannot be injured.

The use of a cushion spring in the connection between the motor switch and its operating rod relieves the motor switch from any undue stress and also obviates the necessity of very close adjustment.

What we claim as our invention is:—

1. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a member displaceable to permit a dispensing operation, means dependent on the displacement of said member for locking the resetting means only when the indicator has been returned to zero, and means for locking the said member from displacement until the indicator is returned to zero.

2. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a latch arm adapted to be displaced to permit a dispensing operation, manually operable means for operating said latch arm, means rotatably connected with said resetting means to interlock with said latch arm dependent on said displacement of the latch arm, and means operable by said rotatable means for locking said latch arm from displacement into locking engagement with said rotatable means until the reset mechanism has been returned to zero.

3. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, including a shaft, a disc mounted on and rotatable with said shaft and having a notch in the periphery, liquid dispensing control means including a motor control switch, a latch arm operatively connected with said motor control switch and having a locking lug to enter the notch in said disc to lock the disc and concurrently close the motor control switch, means for locking said latch arm in a position with its lug clear of said disc to prevent closing of the motor control switch until the reset means has returned to zero position, and means operated by said disc for releasing said latch arm lock when the said zero position is reached.

4. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator including a shaft, a disc mounted on and rotatable with said shaft and having a notch in the periphery, a second disc rotatable on said shaft also having a notch in its periphery and a hole in its face, a pin secured on the first-mentioned disc extending loosely into said hole to carry the second-mentioned disc with the first-mentioned disc after a lost motion therebetween, liquid dispensing control means including a displaceable control member having a lock portion adapted to simultaneously enter the respective notches in said discs when they are brought into alignment to lock the resetting means and permit displacement of the control means to operative position, a spring latch engaging the peripheries of said discs and operating to align the notches to receive the lock portion of said control member, means for locking said control member clear

of said discs, and means connected with said first-mentioned disc adapted to release the latter locking means when the discs are rotated to a position where their notches are aligned to receive the lock portion of said control member.

5. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator including a shaft, liquid dispensing control means including a motor control switch, a pair of discs mounted on said shaft having alignable notches in their peripheries, means for effecting the aligning of said notches, a latch arm operatively connected with the motor control switch and having a lug to extend into the aligned notches to permit switch-closing displacement of the latch arm, a latch spring held to interlock with said latch arm to hold it raised, a pin mounted on one of said discs adapted to engage said latch and move it to a release position, and means for returning said latch to an interlocking position following the switch-closing movement of the latch arm.

6. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator including a shaft, liquid dispensing control means including a motor control switch, a pair of discs mounted on said shaft having alignable notches in their peripheries, means for effecting the aligning of said notches, a latch arm operatively connected with the motor control switch and having a lug to extend into the aligned notches to permit switch-closing displacement of the latch arm, said latch arm being formed with an opening provided with notches in the side wall, a latch toothed to engage in said notches, a lever having an operative toggle connection with said latch, a tension spring connecting the outer ends of said latch and toggle lever, and means on the latch arm for engaging said latch to release the toggle to bring the latch into interlocking relation with the notched portion of said latch arm.

7. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, a stationary bracket, a latch arm mounted on said bracket for pivotal movement only, means rotatably connected with the resetting means and arranged for direct interlocking contact with said latch arm, a pump motor control switch, a rod forming a direct operative connection between said switch and latch arm, a movable dispensing hose "hook" member, and means connected with said "hook" member for operating the switch rod coincident with the movement of the hook.

8. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, a latch arm, means operatively connected with the resetting means adapted to interlock with said latch arm to arrest the manually operable means, a pump motor control switch, a rod pivotally connected with said latch arm and operable to swing said latch arm into or out of interlock relation with said second-mentioned means and slidably connected with the pump switch, a compression spring encircling said rod and engaging the switch arm to form a yieldable operative connection between the rod and switch whereby the switch will not act to limit the displacement of the rod and latch arm connected thereto, a dispensing hose "hook" member, and means con-

nected with said "hook" and operatively connected with said switch rod.

9. A resetting device for the indicator of a liquid dispenser comprising a bracket to be mounted within a dispenser pump structure, a shaft connected with the indicator device, crank means for manually operating said shaft in one direction, a notched locking member mounted on the indicator shaft for rotation therewith, fluid dispensing control means including, a latch arm controllably co-operating with said notched locking member to enter the notch thereof and thereby render said control means effective, means for controlling the co-operative relation of said latch arm with said notched locking member, said means including, a member selectively rotatable with or in relation to said notched member to prevent or permit entry of the arm in the notch, latching means for locking said latch arm out of contact with said notched locking means, and means operated by the notched locking member for releasing said latch from the latch arm.

10. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a lock member displaceable to permit a dispensing operation, manually operable means for operating said member, means rotatably connected with said resetting means to interlock with said lock member dependent on said displacement of the latter, and means for delaying displacement of said lock member until the reset mechanism has been returned to zero.

11. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a lock member displaceable to permit a dispensing operation, manually operable means for operating said member, means rotatably connected with said resetting means to interlock with said lock member dependent on said displacement of the latter, and means co-operatively associated with the aforesaid means having a lost motion operative connection with said latter means for delaying displacement of said lock member until the reset mechanism has been returned to zero.

12. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a lock member displaceable to permit a dispensing operation, manually operable means for operating said member, a rotatable member operatively connected with said reset means and having locking co-operation with said lock member on said displacement thereof, and means including a second rotatable member having a lost motion rotatable drive connection with the first-mentioned rotatable member and co-operating therewith and with said lock member to prevent said displacement of the latter until the reset mechanism has been returned to zero, said lost motion connection permitting the first-mentioned rotatable member to be manipulated a predetermined degree relative to the other rotatable member at the completion of the reset operation.

13. A resetting device for the indicator of a liquid dispenser comprising manually operable means for resetting the indicator, liquid dispensing control means including a latch arm adapted to be displaced to permit a dispensing operation, 75

manually operable means for operating said latch arm, means rotatably connected with said resetting means to interlock with said latch arm dependent on said displacement of the latch arm, and means including toggle means co-operatively interposed between said latch arm and rotatable means and operable by said rotatable

means for locking said latch arm from displacement into locking engagement with said rotatable means until the reset mechanism has been returned to zero.

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