A mechanical timer is attached to a pump nozzle which can be set to shut off when a predetermined amount of fluid such as gasoline has been dispensed. The settings can be either by dollar value or by gallonage as desired.

17 Claims, 10 Drawing Figures
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TIMER OPERATED AUTOMATIC SHUT-OFF FOR FLUID DISPENSING PUMPS

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in attachments to fluid pump dispensing nozzle assemblies for controlling the shut off nozzle on either a dollar or gallonage basis and constitutes a continuation-in-part of my application Ser. No. 8,332, filed Feb. 3, 1970, entitled "TIMER OPERATED AUTOMATIC SHUT-OFF FOR FLUID DISPENSING PUMPS," now abandoned.

In the remainder of the specification, reference will be made to gasoline pumps for which the device is intended primarily. However, it is to be understood that the device is equally suitable for use with the dispensing of any liquids by pumps such as fuel oil, diesel oil, water, naptha or the like.

Conventional gasoline pumps include an operating lever which enables the fluid to be pumped by the pump, through a flexible hose and into the container being filled. A pivoted serrated trip lever is provided on conventional pumps which is engaged by the free end of the operating lever. Means are provided within the nozzle to create a back pressure against the operating lever when the fluid within the container reaches the nozzle, thus disengaging the operating lever from the trip lever. However, this is only usable when the tank is being filled completely.

Gasoline and similar fluids are often bought by dollar value or by a predetermined number of gallons rather than completely filling the container and conventional pump nozzles therefore require that the attendant hold the nozzle while the tank is being filled so that he can shut off the supply of gasoline or the like when the required dollar value or gallonage has been reached.

SUMMARY OF THE INVENTION

The use of the present device enables the attendant to preset this dollar value or gallonage on the dial of the device, engage the release lever or link of the nozzle assembly with the trip lever and then attend to other service requirements such as checking the oil, cleaning windshields and windows and the like, secure in the knowledge that when this predetermined dollar value or number of gallons is reached, the pump will automatically shut off.

I accomplish this by providing a mechanical spring driven timer, a housing for the timer, link means operatively connected between the timer and the trip lever and an adjustable control disc or knob which enables the timer to be wound a predetermined amount either set by dollar value or gallonage. The control knob or disc has to be adjustable so that it can be preset for changes in gasoline prices and pump pressures at different stations.

The principle utilized is the fact that gasoline pumps normally deliver gasoline at a constant volume and it will therefor be appreciated that by timing the delivery, reasonable accuracy of volume can be achieved and this, of course, can be related to the cost of gasoline so that, for example, the control disc or knob can be set to deliver $1.00, $2.00, $3.00, $4.00 or $5.00 worth of gasoline as required. Alternatively, of course, the control disc or knob can be set to deliver a predetermined amount of gasoline by gallonage such as 2, 4, 6, 8, 10 or 12 gallons, etc.

The principal object and essence of the invention is therefore to provide a device which is easily attached to existing dispensing pump nozzles having a trip lever thereon so that the operating lever can be released at predetermined increments of gasoline either by dollar or gallonage characteristics as desired.

Another object of the invention is to provide a device of the character herewith described which is simple in construction, easily attached to existing nozzles, and is otherwise well suited to the purpose for which it is designed, inasmuch as it can be attached to existing nozzle assemblies without the necessity of drilling holes in the existing structure.

With the considerations and inventive objects herein set forth in view, and such other or further purposes, advantages or novel features as may become apparent from consideration of this disclosure and the specification, the present invention consists of the inventive concept which is comprised, embodied, embraced, or included in the method, process, construction, composition, arrangement or combination of parts, or new use of any of the foregoing, herein exemplified in one of more specific embodiments of such concept, reference being had to the accompanying figures in which:

FIG. 1 is a side elevation of part of the conventional gasoline nozzle assembly with the device attached.

FIG. 2 is a section along the line 2—2 of FIG. 1.

FIG. 3 is a side elevation of the timer mechanism with one side of the housing removed for clarity and reversed relative to FIG. 1, said timer being in the "off" position.

FIG. 4 is a side elevation of the lever means per se.

FIG. 5 is an elevation showing the setting lever per se.

FIG. 6 is a side elevation of the trigger lever per se.

FIG. 7 is a view similar to FIG. 3 but showing the device in the "set" or "on" position.

FIG. 8 is an enlarged view of the center portion of the timer showing the setting lever in the "inoperable" position.

FIG. 9 is a side elevation of the shoe component per se.

FIG. 10 is a top plan view of FIG. 6.

In the drawings like characters of reference indicate corresponding parts in the different figures.

DETAILED DESCRIPTION

Proceeding therefore to describe the invention in detail, reference character 10 illustrates generally a conventional nozzle assembly normally used for dispensing gasoline or the like. This nozzle assembly includes a nozzle portion 11 and a hose 12 connected thereto by means of the connector assembly 13.

A guard 14 extends underneath the nozzle portion 11 and operating lever 15 is pivoted (not illustrated) with the guard 14 and is connected to the nozzle so that movement of the lever in the upward direction shown by arrow 16, permits fluid such as gasoline to flow from the pump (not illustrated) through the hose 12 and thence to be dispensed by the nozzle 11.

A trip lever collectively designated 17 is pivoted by pin 18 to the guard 14 as clearly shown in FIG. 1 and this trip lever is provided with serrations or projections 18A, B and C.
Under normal conditions, the free end 19 of the operating lever 15 may be engaged upon any one of the projections 18A, B or C, it being understood that the trip lever is swung downwardly in the direction of arrow 20 so that this engagement can take place. The projections 18A, B or C hold the operating lever in the dispensing position, it being understood that more gasoline is being dispensed when it is resting upon projection 18A than when it is resting upon projection 18C.

When gasoline reaches the nozzle 11 due to the container or tank becoming filled, back pressure causes the operating lever 15 to snap out of engagement with the trip lever 17 so that the gasoline flow is shut off.

However, this only occurs when the tank or container is full and the present device collectively designated 21, permits the operating lever 15 to be shut off when a predetermined gallonage or dollar value has been reached.

The device consists of a substantially cylindrical casing 22 having a portion 23 extending from the perimeter thereof and attached to a clamp assembly 24 by which the assembly may be secured around the hose 12 adjacent the connecting assembly 13. In this connection there is a hexagonal nut 13A connecting the hose to the assembly 13 and the clamp, which is internally serrated as at 25, is designed to clamp around this nut as clearly shown in FIG. 2, it being understood that nut and bolt assemblies 26 clamp the assembly around the nut 13A.

Link means collectively designated 27 extends from the casing 22 through a slot 28 in the wall of the casing as shown in FIG. 3.

This link means takes the form of an elongated link 29 and an external portion 30. The external portion is provided with an arcuately curved wall 31 wider than the link 29 and this engages the external periphery of the casing 22 when in the position shown in FIGS. 1 and 3.

A slotted aperture 32 is formed in one end of the portion 30 and this aperture engages over a pin 33 off-stand from a shoe component collectively designated 34 and shown in detail in FIGS. 9 and 10.

This shoe component attaches the link means 27 to the trigger 17 and comprises a sleeve end 35 which is adapted to slip over the free end 17A of the trip lever 17.

A claw portion 36 is provided which is adapted to engage over the trip lever 17 adjacent the other end 37 thereof and indicated by reference character 38 in FIG. 1.

A resilient or flexible strip 39 connects the claw portion 36 to the sleeve 35 and is curved slightly as shown in FIG. 9. This enables the claw 36 to be snapped into engagement over the lever at 38 thus retaining the shoe component firmly in engagement with the trip lever 17 without the necessity of drilling the trip lever for this attachment.

The timer mechanism collectively designated 21 includes a mechanical timer 40 within the casing which is conventional in construction. This timer mechanism includes a shaft 41 which is provided with a cam plate 42 on the inner end thereof, said cam plate being rotated by shaft 41 which in turn, of course, is rotated by the timer mechanism.

4. The other end 43 of the shaft 41 extends through the wall of the casing externally thereof and is provided with a control knob or disc 44 secured to the shaft so that the shaft can be turned by the control knob thus winding up the timer mechanism to the amount desired.

Means are provided to preset this disc or knob 44 with relation to the shaft 41 so that individual devices can be adjusted to price changes and/or pressure changes of the pump delivering the gasoline or similar fluid.

An annular recess 45 is formed in the cover 49 of the casing and frictionally held buttons 46 engage this recess. They can be moved as desired to preset the gallonage or dollar value so that a pointer or indicator 47 on the knob or disc 44 can be rotated the required amount.

Alternatively, around the periphery of the outer surface 49 of the casing, indicia as shown at 50 may be engraved. This indicia is shown marked off in $1.00, $2.00, $3.00 increments. However, it will be appreciated that gallonage can be substituted if desired.

Referring back to FIG. 3, the inner end or lever portion 29 of the link means 27 is provided with an elongated closed ended slot 51 widening out at the inner end 48. A setting lever 52 is pivoted by one end thereof by pin 53 to the casing 54 of the timer and a coil spring 54 is wound around this pivot pin and reacts with the lever normally urging the lever in the direction of arrow 55. Means such as a pin 56 extends from the lever 52 intermediate the ends thereof and is maintained against the cam profile 57 by means of this spring 54.

A further pin 58 extends from lever 52 adjacent the free end thereof and this pin engages within slot 51 of the link means 29.

A shut off recess 59 is provided in the cam profile and positioned so that when pin 56 engages this recess, the timer mechanism is at zero or fully unwound as illustrated in FIG. 3.

A further recess 60 is provided within the cam profile just past the shut off recess 59 and if the control or setting knob 44 is moved in a direction opposite to arrow 61' (see FIG. 3) then the pin 56 is engaged within this disengage recess 60. When in this position, the lever 52 is moved rightwardly with respect to FIG. 3 so that the link means 27 is completely free of engagement with pin 58. This means that the pump can be used in the normal manner, for example, when the customer requires the tank or container to be filled completely. There is enough freedom of movement within the closed ended slot 51 to enable the trip lever 17 to be engaged with the end 19 of the operating lever 15 and to operate in the normal manner. This position is shown in FIG. 8.

When, however, it is desired to dispense by dollar value or by gallonage, the setting knob or disc 44 is rotated in the direction of arrow 61' so that the setting pointer 62 on the control or setting knob 44, coincides with the desired dollar value or button 46.

This, of course, winds the timer mechanism to the predetermined amount and the pin 56 rides upon the cam profile major portion 63. When the end 19 of the operating lever is engaged with the trip lever 17, pin 58 is in the position shown in phantom in FIG. 4. It will be noted that it is just clear of the end 64 of the closed
ended slot 51. At the point it should be stressed that the end 19 of the operating lever is always engaged on the projection 18B of the trip lever 17. This is because the device is preset to operate at a given volume of pump operation which is controlled by the lever 15 engaging this middle projection 18B.

As the trip lever 17 is moved into engagement with the end 19 of the operating lever, the link means 27 is moved outwardly with regard to the casing. A trigger lever 61 is pivoted by a pivot pin 62 on the timer mechanism and is provided with an offstanding pin or projection 63 adjacent the upper or free end 64 thereof which is engageable within the aforementioned slot 51 of the link means 27, said upper or free end being slightly pointed and rounded as shown in Fig. 3. This trigger lever is moved in an arc around pivot 62 in the direction opposite to arrow 55, by the pin 63 being engaged within the closed end of the slot 51.

A trigger 65 is pivoted upon pin 66 to the casing 22 and includes a shank portion 67 having a closed ended slot 68 formed therein and a hook or trigger portion 69 is formed upon the opposite end.

The aforementioned pin 58 of the setting lever engages the closed ended slot 68 of the trigger so that movement of the setting lever from the position shown in Fig. 3 to the position shown in Figs. 7 and 8, rock the trigger lever as clearly shown in Figs. 3 and 7.

When in the position shown in Fig. 3, with the setting lever in the “off” position relative to the cam 57, movement of the link means 27 has no effect upon the trigger lever 65 as the upper end 64 of the trigger lever clears the trigger end 69.

However, if the timer mechanism has been set as aforesaid, the cam takes up a position similar to that in Fig. 7 wherein the pin 56 is riding upon the cam profile major portion 63. This moves the setting lever in the direction opposite to arrow 55 thus drawing or pivoting the trigger lever 65 to the position shown in Fig. 7 so that when the trigger lever 61 is rotated around pivot 62 in the direction opposite to arrow 55, the upper or free end 64 engages the front edge 69' of the trigger end 69 and further pressure allows the trigger lever to move downwardly slightly to clear the trigger end and engage within the trigger taking up the position shown in Fig. 7, against tension of a spring 70 extending between the trigger lever 61 and the casing as clearly shown in the drawings.

The slight downward movement of the trigger lever is permitted due to the fact that pin 62 is mounted in a relatively small closed ended slot 62' formed in the trigger lever and the angle of inclination of the spring 70 moves it upwardly into the original position as soon as it clears the end of the trigger portion 69.

When in this position, a projecting shoulder 71 on the underside of the portion 29 of the link means 27, engages a timer mechanism actuating lever 72 which starts the timer mechanism. This forms part of the timer mechanism and is not believed necessary to show same in detail. However, in essence, this lever 72 is normally engageable with one of the gears 73 of the timer mechanism, being held there by means of a small tension spring (not illustrated) situated internally of the timer. When the shoulder 71 engages this lever it moves it away from the gear against the tension of the spring and allows the timer mechanism to operate.

When released, as will hereinafter be described, the spring pulls the lever 72 into engagement with the gear and stops the timer.

As the timer, together with the cam plate 42 is being rotated by the timer mechanism in the direction opposite to arrow 61, gasoline or similar fluid is being discharged and as soon as the cam plate 42 rotates so that pin 56 of the setting lever snaps into the recess 59, the setting lever pivots in the direction of arrow 55 thus rotating the trigger lever 67 in the opposite direction and returning it to the position shown in Fig. 3. This releases the upper end 64 of the trigger lever and allows spring 70 to move to pivot it also in the direction of arrow 55 and in so doing, pin or projections 63 moves the link means 27 inwards with respect to the casing. The release of the trigger lever 61 causes the projection 63 to snap against the closed end of the recess 51 thus ensuring that the link means moves inwards or to the left with respect to Figs. 3 and 7. This pulls the trip lever 17 free of the end 19 and the normal spring control within lever 15 snaps this lever shut so that no further gasoline or similar fluid is dispensed.

In operation, the control knob or disc 44 should be turned counterclockwise to the amount of gasoline or fluid being dispensed, that is required either by gallonage or by dollars. It is preferable to dial past the indicated amount and then to reverse the knob 44 to the correct position. The lever 15 is moved upwardly and the trip lever 17 is moved firmly towards same so that the end 19 of the lever 15 engages the center notch 16B. This has set the trigger lever within the trigger end 69 and has started the timer mechanism due to the engagement of the shoulder 71 with the timer lever 72.

As soon as the necessary amount has been dispensed, pin 56 engages notch 59 and the mechanism is shut off as hereinbefore described.

If on the other hand, a request has been made to fill up the container or tank, then the knob 44 is rotated in an anticyclenwise position so that the pin 56 engages the inoperative recess 60. This permits the lever means 27 to be moved freely without setting the trigger mechanism or in any way interfering with the timer mechanism. Under these circumstances, of course, the end 19 may be engaged within any of the notches 18A, B or C and the dispenser will shut off in the usual manner when the container is full.

It is of course desirable to set the markers 46 so that the nozzle shuts off just prior to the amount which can then be topped up manually.

Various modifications can be made within the scope of the inventive concept which is herein disclosed and/or claimed.

What I claim as my invention is:

1. In a fluid dispensing pump such as a gasoline pump which includes a flexible hose connection to the pump, a dispensing nozzle assembly connected to the hose, an operating lever for opening and closing the nozzle assembly and a serrated trip lever on said nozzle assembly selectively engageable with the end of said operating lever for holding the lever in the “on” position; a timer-operated automatic shut-off assembly detachably securable to said nozzle assembly, said timer-operated assembly including a casing, a timer mechanism in said casing, means external of said casing to wind said timer mechanism and to set said timer mechanism at selected
increments of operation between the zero operating position and the maximum operating position, and link means operatively connected between said timer mechanism and the serrated trip lever to move said trip lever out of engagement with said operating lever when said timer mechanism is at the zero position, said timer mechanism including a cam plate rotatable by said timer mechanism, a spring loaded setting lever pivoted in said casing by one end thereof, means intermediate the ends of said setting lever engageable with the profile of said cam plate, said link means including a closed ended slot, a pin on said spring loaded setting lever adjacent the other end thereof engageable within said slot, a shut off recess on the profile of said cam plate, said spring loaded setting lever moving said link means relative to said trip lever when said means intermediate the ends of said spring loaded setting lever engage said shut off recess.

2. The device according to claim 1 in which said means intermediate the ends of said spring loaded setting lever takes the form of a pin extending from the surface thereof, and a disengage recess on said cam profile engageable by said last mentioned pin to operatively disconnect said timer mechanism from said link means.

3. The device according to claim 1 which includes means for connecting said link means to said trip lever, said means for connecting said link means including a shoe component pivotally connected to one end of said link means externally of said casing, said shoe component including a sleeve portion engageable over the free end of said trip lever and a claw portion engageable over said trip lever adjacent the other end thereof and a resilient strip connecting said sleeve portion to said claw portion whereby said claw portion snaps into engagement with said trip lever.

4. The device according to claim 2 which includes means for connecting said link means to said trip lever, said means for connecting said link means including a shoe component pivotally connected to one end of said link means externally of said casing, said shoe component including a sleeve portion engageable over the free end of said trip lever and a claw portion engageable over said trip lever adjacent the other end thereof and a resilient strip connecting said sleeve portion to said claw portion whereby said claw portion snaps into engagement with said trip lever.

5. A timer assembly for gasoline dispensing pump nozzle assemblies having a trip lever pivoted thereto and an operating lever selectively engageable by one end thereof, to said trip lever, comprising in combination a casing, means to detachably clamp said casing around said nozzle assembly, a spring operated mechanical timer mechanism in said casing, means externally of said casing to wind said timer to a plurality of incremental positions between zero and fully wound, means to preset said last means within limits, and link means operatively connected between said timer mechanism and said trip lever to move said trip lever relative to said operating lever when said timer mechanism is in the zero position, said timer mechanism including a cam plate rotatable by said timer mechanism, a spring loaded setting lever pivoted in said casing by one end thereof, means intermediate the ends of said setting lever engageable with the profile of said cam plate, said link means including a closed ended slot, a pin on said spring loaded setting lever adjacent the other end thereof engageable within said slot, a shut off recess on the profile of said cam plate, a spring loaded setting lever moving said link means relative to said trip lever when said means intermediate the ends of said spring loaded setting lever engage said shut off recess.

6. The device according to claim 5 in which said means intermediate the ends of said spring loaded setting lever takes the form of a pin extending from the surface thereof, and a disengage recess on said cam profile engageable by said last mentioned pin to operatively disconnect said timer mechanism from said link means.

7. The device according to claim 5 which includes means for connecting said link means to said trip lever, said means for connecting said link means including a shoe component pivotally connected to one end of said link means externally of said casing, said shoe component including a sleeve portion engageable over the free end of said trip lever and a claw portion engageable over said trip lever adjacent the other end thereof and a resilient strip connecting said sleeve portion to said claw portion whereby said claw portion snaps into engagement with said trip lever.

8. The device according to claim 6 which includes means for connecting said link means to said trip lever, said means for connecting said link means including a shoe component pivotally connected to one end of said link means externally of said casing, said shoe component including a sleeve portion engageable over the free end of said trip lever and a claw portion engageable over said trip lever adjacent the other end thereof and a resilient strip connecting said sleeve portion to said claw portion whereby said claw portion snaps into engagement with said trip lever.

9. The device according to claim 5 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

10. The device according to claim 6 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

11. The device according to claim 7 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin
means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

12. The device according to claim 8 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

13. The device according to claim 1 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

14. The device according to claim 2 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

15. The device according to claim 3 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

16. The device according to claim 4 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

17. The device according to claim 5 which includes a trigger lever pivoted by one end thereof, pin means extending upon one side of said trigger lever engageable within the closed ended slot of said link means, a trigger pivoted to said casing having a shank portion and a trigger end, said setting lever having further pin means adjacent the free end thereof, said further pin means engaging said shank portion for partially rotating said trigger, said trigger end engaging the free end of said trigger lever when said timer is set and said operating lever is engaged by said trip lever.

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