March 15, 1932. G. B. TROST 1,849,856

FUEL PUMP

Filed May 22, 1930 4 Sheets-Sheet 1

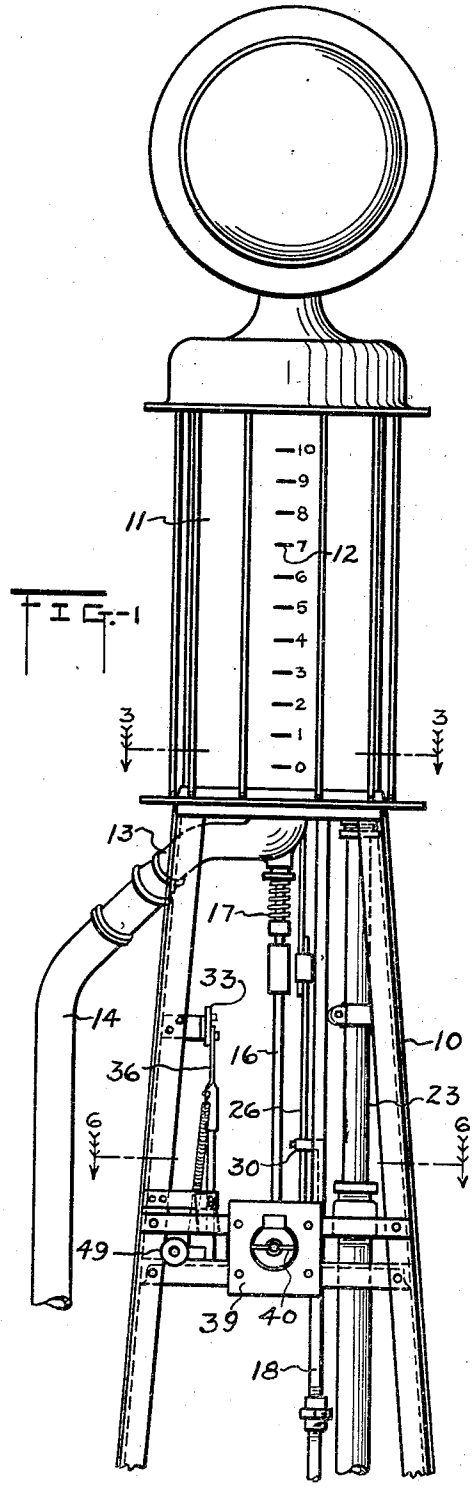


FIG.-1

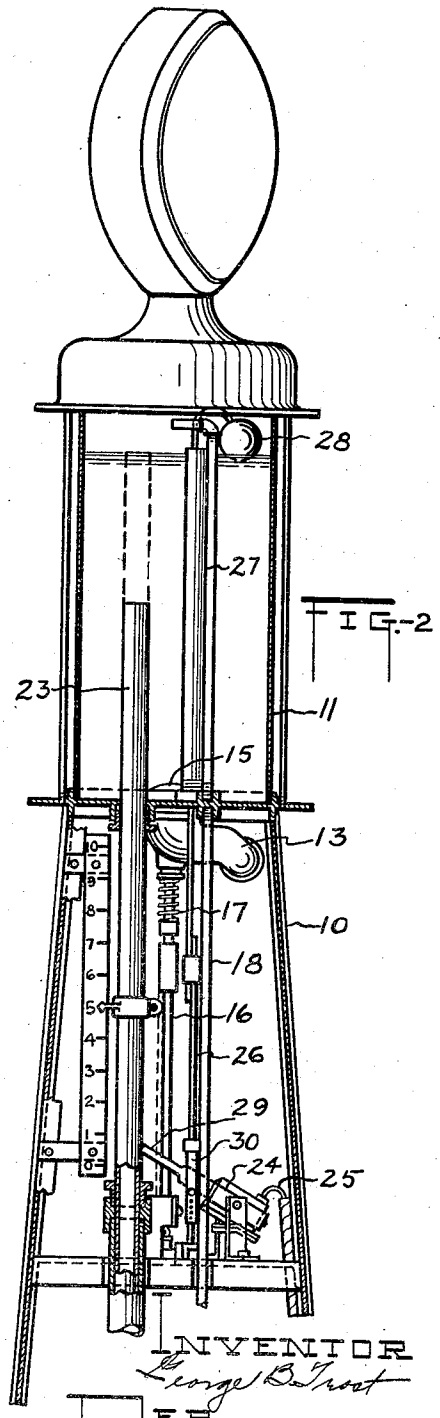


FIG.-2

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FUEL PUMP

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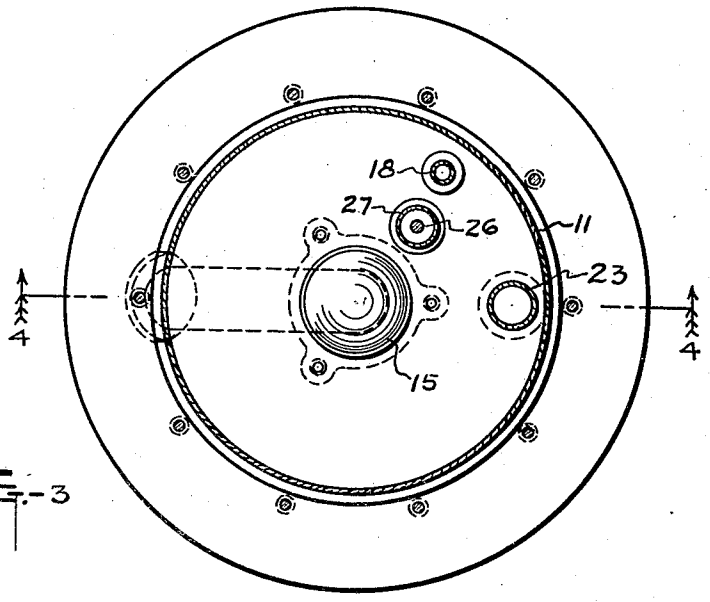


FIG.-3

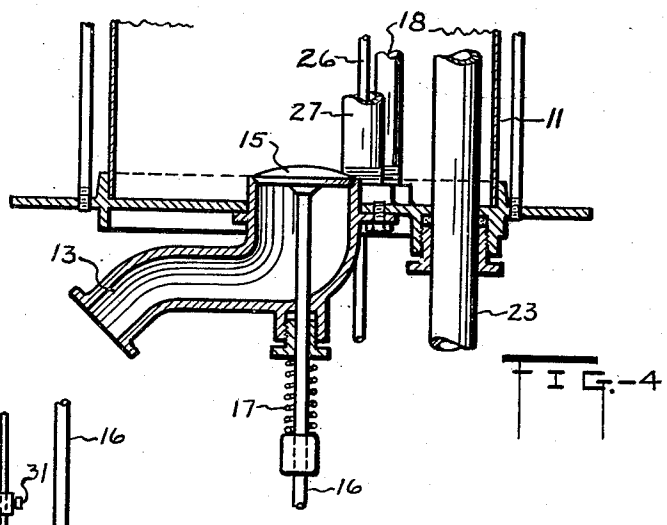


FIG.-4

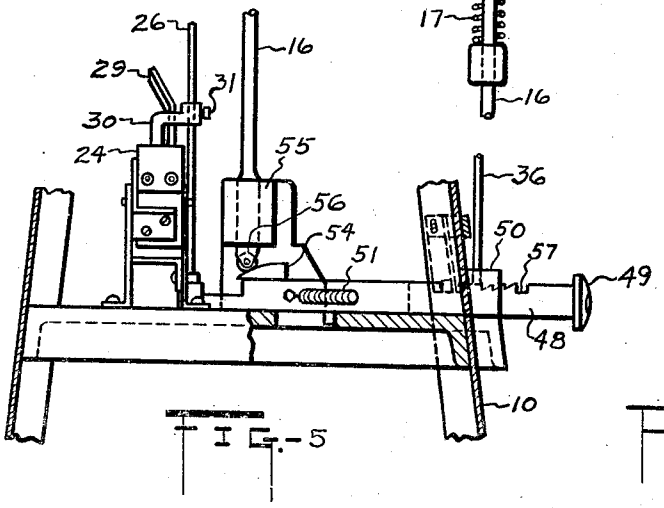


FIG.-5

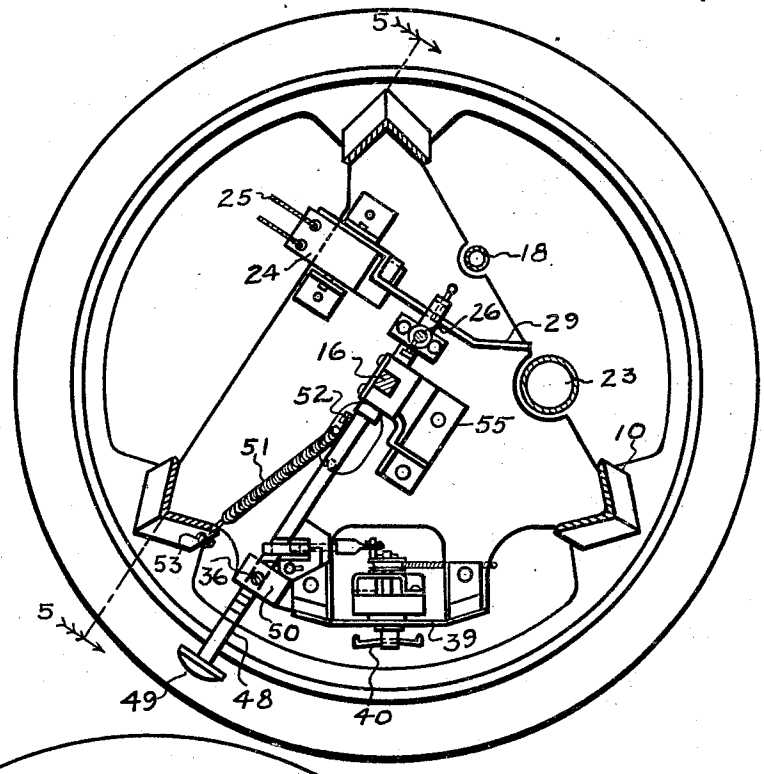
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FUEL PUMP

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FIG.-6



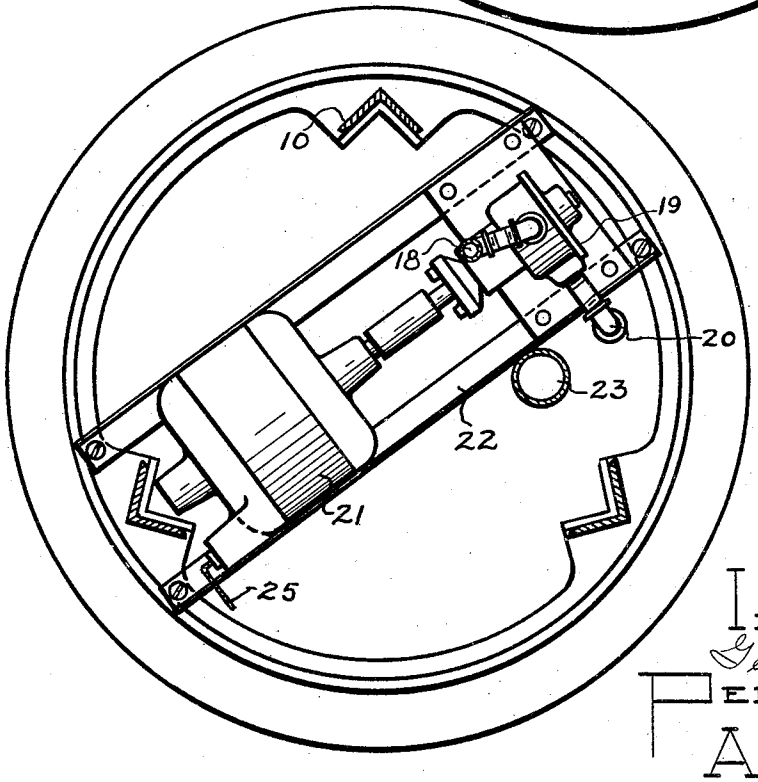


FIG.-7

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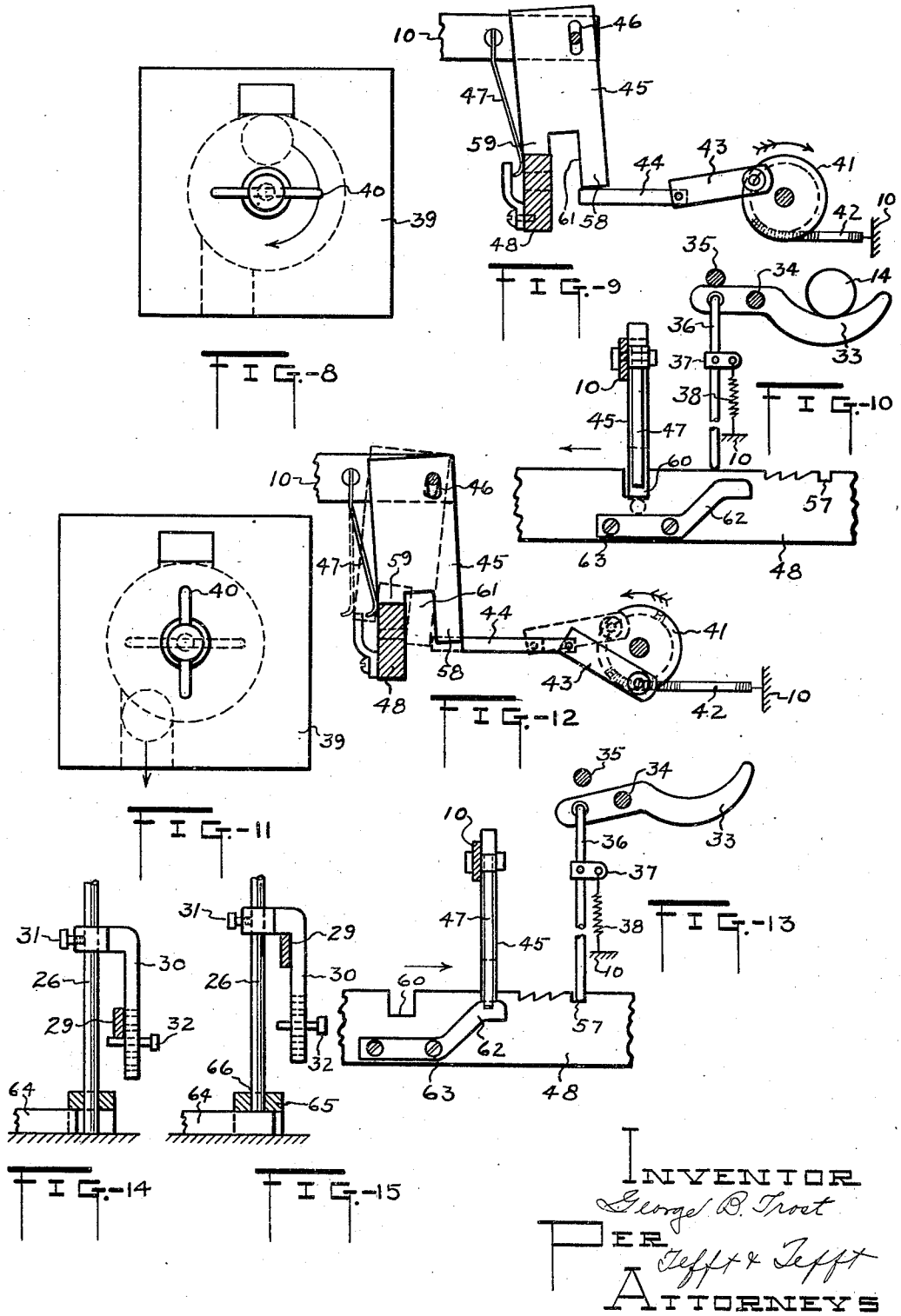


FIG.-8 FIG.-9 FIG.-10 FIG.-11 FIG.-12 FIG.-13 FIG.-14 FIG.-15

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Patented Mar. 15, 1932 1,849,856

UNITED STATES PATENT OFFICE

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FUEL PUMP

Application filed May 22, 1930. Serial No. 454,554.

This invention relates to fuel pumps and more particularly to pumps automatically operated by means of a coin controlled device.

One of the objects of the invention is in the provision of a fuel pump adapted to be automatically operated by means of a coin control device, said device comprising mechanism for preventing replenishment of the fuel container until said container has been originally drained.

Another object lies in the provision of a coin controlled fuel pump, said pump including mechanism operating automatically to first drain the pump and thereafter operating to replenish the pump preparatory to a subsequent operation of the coin control device.

Still another object lies in the provision of a coin controlled fuel dispensing device, said dispensing device comprising mechanism for preventing operation of the pump unless operated in a determined manner, said mechanism automatically operating to prevent replenishing of the pump until a complete cycle of operation has occurred.

A further object lies in the provision of a fuel pump adapted to be coin controlled, there being included mechanism operating in connection with the coin control means for preventing replenishing of the pump as well as operation of the coin control mechanism for subsequent operation until the fuel container has been completely drained and the coin control mechanism and operating means returned to a position satisfactory for a subsequent proper operation of the pump.

Other objects will appear in the following specification, taken in connection with the annexed drawings, in which—

Fig. 1 is an elevational view of the pump;

Fig. 2 is a similar view from a different angle;

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 6;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1;

Fig. 7 is a plan view of the pump operating mechanism, including the electric motor and fuel replenishing means;

Fig. 8 is a detailed elevational view of the coin control mechanism;

Fig. 9 is a detail showing of a portion of the coin control and pump-operating mechanism;

Fig. 10 is a detail showing of the fuel hose hanger member showing its connection with the pump operating mechanism;

Fig. 11 is another elevational view of the coin control device showing a different position of operation;

Fig. 12 is a detail showing similar to that of Fig. 9 but disclosing the coin control mechanism and pump operating control means in another of its positions;

Fig. 13 is another detail showing of the operating relationship of the pump hose supporting mechanism and the fuel pump operating means;

Fig. 14 is a detail showing of the electrical control mechanism for the fuel replenishing pump and power means; and

Fig. 15 is a similar view showing said mechanism in a different operating position.

Before referring to the drawings, it might be stated that the present invention is directed to the mechanism for controlling a conventional fuel pump by automatic means initially operated by a coin control mechanism.

The structural features of gasoline fuel pumps are well known to the public, and their operation is generally associated with a paid operator, who removes the hose from its support and places same in the opening in the motor vehicle gas tank and thereafter manually operates means for placing the desired amount of fuel in the tank. Applicant, recognizing the fact that such operation of a gasoline pump must necessarily be attended by considerable overhead, has devised mechanism which permits the operation of a fuel pump by means of a coin control member. In other words, the owner or operator of the motor vehicle may drive his machine to a point adjacent the pump, thereafter acting as the operator for filling his gas tank with the desired quantity of gasoline.

It is true that a gasoline pump operated by

a coin control necessarily places certain manual labor upon the owner of the motor vehicle, who must remove the cap from the fuel tank, place the nozzle of the gasoline hose therein, thereafter placing a coin in the coin control member and operating the coin handling lever.

Although such manual operation is not necessary when receiving gasoline from a manually operated pump, nevertheless it must be remembered that by the obvious reduction of the necessary overhead that must be added to the price of the gasoline when delivered by a paid operator, the owner of the motor vehicle is materially aided in the reduced cost at which he may obtain his fuel. Further, gasoline stations are in practically every instance closed during the evening and night hours, thus opening a field for a coin controlled gasoline pump, which materially aids and assists that portion of the public which must refill their motor vehicles during the evening and night hours.

Referring to the pump structure herein shown, a rather standard type of gasoline pump has been disclosed, although it is apparent that applicant's coin-controlled pump operating mechanism might just as well be applied to pump structure of a different type. In the present instance, a visible type of gasoline pump has been shown comprising a framing structure 10 supporting in a conventional manner a visible fuel container 11 graduated in the usual manner, as shown at 12. A fuel outlet or drain pipe 13 has connected thereto the flexible hose 14 which has the conventional nozzle member, not shown, adapted to be placed in the motor vehicle tank prior to the draining of the gasoline container. In the drain is disposed a valve 15 spring tensioned upon its seat by means of the stem 16 and coil spring connecting portion therefor 17. The valve stem 16 has been extended in the present instance, as will be later described, to connect the operation of the valve 15 with the coin controlled mechanism for the pump.

Means for refilling the container 11 when drained is provided in a vertically positioned fuel delivery tube 18, suitably supported in the framing of the pump, said tube being connected at its lower end to a fuel pump 19 shown in Fig. 7, said pump being of any desired structure but necessarily connected by means of the tube 20 to a fuel reservoir, not shown.

Means for operating the pump 19 is, in the present instance, accomplished by the electric motor 21 suitably supported, as is the pump 19, to a support 22 connected to the pump framing structure 10. Obviously, any type of motor drive might just as well be used for replenishing the fuel pump 19. It is apparent, however, that when energized the electric motor will operate the pump 19 to force gasoline through the vertical tube 18 into the visible container until the motor is de-energized. The visible container 11, as previously described, is graduated for various volumes of fuel, and there is provided therein an overflow or return pipe 23 open at its upper end within the visible container. This over-flow pipe is adapted to return any gasoline that is forced into the container above the upper end thereof directly to the main fuel container, not shown.

This pipe 23 is of a telescoping nature, as shown in Fig. 2 of the drawings and may be raised or lowered, as desired, with the result that the pump may be set manually for any desired volume of fuel. It is apparent from the drawings that the pipe may be set either at the level shown in Fig. 2, which is for ten gallons, or for five or any other volume desired.

The pump mechanism heretofore described is practically conventional to manually operated gasoline pumps and further, it will be noted that there is provided a pivoted switch member 24 which has electrical connection 25 with the electric motor 21. This switch is controlled by means of a vertically disposed rod 26, which projects upwardly within the visible container and is surrounded by the column 27, which has a water-tight connection with the base of the container. This rod 26 is secured at its upper end to a float member 28 operated obviously by the volume of gasoline within the container. The switch 24 has an operating arm 29 which is adapted to be moved in one directon, namely, downwardly, to accomplish the energizing of the electric motor, with the resultant pumping of the gasoline into a visible container; and may be moved in the other direction into an elevated or off position, which de-energizes the motor upon the filling of the visible container to the proper volume. The connection between the switch operating arm 29 and the rod 26 is shown in Figs. 14 and 15, in which a switch operating bracket 30 has an adjustable set screw connection 31 with the rod 26, said bracket having an adjustable switch operating pin 32 disposed in the lower portion thereof. It is apparent, as far as the operation of the switch mechanism is concerned, that when the float moves downwardly, as must necessarily be the case as the gasoline is drained from the container, finally the switch arm 26 will be contacted by the switch operating bracket 30 and moved to such downward position as will energize the electric motor, thus operating to replenish the visible container. Similarly, when the visible tank has been replenished with a certain volume of fuel, the float will elevate the rod 26, finally causing the pin 32 to elevate switch arm 26 to a position which opens the electric circuit to the motor and stops the flow of gasoline.

The overflow pipe 23 insures the maintenance of a determined volume of gasoline within the visible container. It is apparent from the above description that the float 28 has not a wide degree of movement, and it would seem at first glance that after a short downward movement of the float, the fuel pump might be energized to cause replenishment of the visible container before same is drained. This is not the case, however, as will be seen from a consideration of Figs. 14 and 15, wherein it appears that a member is inserted beneath the lower end of the rod 26 which prevents downward movement thereof to a point that would operate the switch until said member is removed therefrom. Such member will be later described in connection with the description of the coin controlled operating mechanism, and it is desired at this time merely to call attention generally to such structure to obviate any suggestion of mis-description of the operation of the pump.

The hose 14 is adapted, when the pump is inactive, to be positioned upon a supporting member 33, said member being pivoted at 34 and maintained in a normal position by an abutment portion 35. In Fig. 10, the hose 14 is shown in its inactive position disposed upon the pivotal support 33 therefor.

To the opposite end of the supporting member 33 is connected a rod 36, to which is fixedly secured a laterally disposed bracket 37, which in turn has a connection with a tension member 38 normally operating to move the opposite end of the support 33 downwardly. The weight of the hose is such as to overcome such tension and to normally maintain the support in the position shown in Fig. 10. Such spring tension, however, is operable upon elevation of the hose from the support to move said member to a downward position, as shown in Fig. 13 of the drawings.

The lower end of the rod 36 is adapted, as will later be described, to be seated in the receiving slot in a portion of the pump operating mechanism for the purpose of locking said member against lateral movement until the hose has again been placed upon its support, this of course following the draining of the visible container.

The relationing of the pump support with the pump operating mechanism will be later taken up in detail following a description of such portions.

Now, with respect to the coin control mechanism and automatic operation of the pump, a coin operated mechanism 39 is shown particularly in Figs. 6, 8 and 11 of the drawings. The means for receiving the coin has not been shown in absolute detail, inasmuch as any coin receiving or coin control mechanism might obviously be used.

The present mechanism comprises, however, the manual control lever 40 normally, of course, not operative until a coin has been inserted in the mechanism 39, said lever, however, being connected with a rotatable member 41, which in turn is spring tensioned as at 42 in such manner that the rotatable member 41 will always be returned to its normal position.

The rotatable member 41 has pivotal link connections 43 and 44, the link 44 in its inactive position riding beneath the lower end of a locking member generally referred to at 45, which controls the movement of the pump operating bar and mechanism later to be described.

This locking member 45 has a slip pivotal connection 46 with the pump frame, said locking member normally being held in the position shown in Fig. 9 in a displaced lateral position by means of a spring tensioning member 47 similarly connected and tensioned with respect to the pump frame 10.

Referring now to Fig. 12 and assuming that the operator has placed a coin in the coin control member 39, and moved the operating handle in a clockwise manner, as indicated by the arrows in the drawing, it will be noted that the member 41 has been rotated first in the clockwise manner to the full line position shown in Fig. 12 and thereafter, when released, due to the tensioning of the member 41, permitting same to rotate in the counter-clockwise direction as indicated by the arrow in Fig. 12, with the result that the link 44 will, during its return movement, contact the side of the locking member 45 and force same against the tension of the spring 47 to the dotted line position shown in Fig. 12.

It is thought apparent from the above description that the position of the locking member 45 has been materially changed to permit operation of the pump operating bar and mechanism now to be described.

Following the insertion of the coin and the movement of the handle 41 first to the right and then, upon release to the left, the operator may now grasp the pump control bar 48, having the handle portion 49 thereon. This bar 48 is shown in cross section in Figs. 9 and 12, previously described, although perhaps the best showing of this bar is in Figs. 5 and 6, wherein it is shown carried in a suitable support 50, which permits inward and outward movement, said movement, however, being controlled by means of the coil spring 51 which is secured at 52 to the inner end of the bar and at its opposite end 53 to the pump framing. In other words, the coil spring always has a tendency to withdraw the bar outwardly.

Upon the inner end of the bar 48 is disposed a cam face 54 which is adapted upon inward movement of said bar to contact and elevate the stem 16 controlling the operation of the gasoline container valve 15. As a matter of fact, the lower end of the stem is guided

in a supporting member 55 and there is a roller 56 pivoted in the lower end of the valve stem, thus insuring ease of operation of the respective parts. Obviously, inner manual projection of the bar 48 operates to elevate the valve stem 16, thus removing the valve 15 from its seat and permitting gasoline within the visible container to flow through the hose 14 and thence into the vehicle container.

We now return to the description of the supporting member for the gasoline hose and its connected parts, which includes the tension rod member 36. This rod 36 is adapted, when inactive, to rest upon the inner side of the bar 48. However, when the hose has been removed from the support, due to the tension of the spring 38, the rod 36 is forced downwardly and upon manual movement of the pump control bar 48 inwardly, the lower end of the rod 36 will finally be received in a receiving portion or locking notch 57, as shown in Fig. 13. Thus, it is apparent in the first instance that the control bar 48 will, upon inward movement, be locked by the rod 36 and withdrawal thereof prevented until the flexible hose has drained the visible tank and been placed upon support 33, this placement obviously acting to elevate the locking member 36.

It is thought clear that following the insertion of the coin in the control mechanism by the operator and movement of the handle 40 first to the right and then, upon release, automatically to the left, the operator actually moves the control bar inwardly to commence operation of the pump, namely, with elevation of the valve to permit flow of the fuel from the visible container into the tank of his vehicle. Of course, it is necessary in the first instance, for the operator to remove the hose from its support 33 and place the nozzle thereof, not shown, in the motor vehicle tank opening.

Now, with respect to the operation of the coin control mechanism and the bar 48, it is found that the previously described locking member 45 has a downwardly projecting portion 58, which as previously described had an operative connection with the link 44, said member 45 also having a shorter downwardly projecting portion 59, which during inactivity of the pump was adapted to be received in a locking notch 60 in the bar 48. Such position of the portion 59 with respect to bar 48 obviously prevents movement of the latter to an inward position, which would of course elevate the valve for the visible container. However, following the insertion of a coin in the member 39 and manual movement of the lever 40 to the right and then automatically to the left, it is apparent that the locking member 45 is moved to the dotted line position shown in Fig. 12, whereupon the portion 59 is removed from the notch 60 and the operator may then force the bar 48 inwardly with a resultant elevation of the valve 15, due to contact of the cam 54 with roller 56.

Coincident with this operation, however, it is apparent that the lower end of rod 36 will be received in the notch 57 in the bar and hold bar 48 in the fixed inward position. Also, coincident with the inward movement of the bar 48, which of course is through the opening 61 in the locking member 45, a second cam member 62 secured as at 63 to the side of the bar, will operate upon final inward movement of the member 48 to ride against the lower side of that portion 59 of the locking member 45, and thus elevate same slightly, such forward movement being permitted by the before mentioned sliding pivotal connection 46 of the locking member 45 with the pump framing. This slight upward movement of the locking member 45 permits the link 44, which previously in its operation forced the locking member 45 laterally against the tension of the spring 47, to resume its inward position, as shown in Fig. 9 of the drawings, namely, beneath the lower end of the portion 58 of the locking member 45. This operation insures the movement of the coin control mechanism to a position preparatory for a subsequent operation thereof as well as a subsequent operation of the pump.

The inward movement of the operating member 48 is also related to the operation of the pump as follows: When the operator inserts his coin and thereafter moves the handle to the right, thus permitting automatic return of the handle under spring tension to the left, he thereupon forces the manual pump control bar 48 inwardly, and thus immediately starts draining of the gasoline in the visible container into his tank.

Although the float 28 will immediately start to move downwardly, nevertheless the extreme inner end 64 of the control bar 48 will assume a position beneath the lower end of the rod 26, which as previously described is connected with the float 28, thus as the float moves downwardly, the rod 26 in connection therewith will soon abut the upper side of that portion 64, which as previously described is at the extreme inner end of the bar 48. This obviously prevents further descent of the float, irrespective of the gasoline within the visible container and also prevents such movement of the bracket 30 upon the switch arm 29 as will throw said switch arm to a position that will close the circuit to the electric motor and start movement of the pump to replenish the container.

As shown in Figs. 14 and 15, the inner end 64 of the bar 48 is carried in a guide member 65 which is apertured at 66 to receive the lowermost end of the rod 26. It is thus apparent that there can be no replenishing of the visible container until the bar 48 has been manually returned to an outer position, which will withdraw the end 64 thereof from be-

neath the rod 26. Obviously, there can be no withdrawal of the bar 48 until the hose 14 has been replaced upon the support 33, inasmuch as the rod 36 has become locked by projection of its lowermost end into the notch 57. However, upon draining of the visible container and replacement of the hose 14 upon the support 33, the rod 36 will be withdrawn from the notch 57 and thus the spring 51, which is connected to the bar 48, will immediately withdraw said bar automatically to an outer position.

Immediately upon withdrawal of the portion 64 of the control bar from beneath the rod 26, said rod will drop into the position shown in Fig. 14. Obviously, this rod 26 will drop because there is no volume of liquid in the visible container to maintain the float in an elevated position. It is just as obvious that this final drop of the rod 26 will, through its before mentioned connected parts, operate to move the switch arm 29 downwardly, thus closing the electric circuit to the motor, which in turn operates the fuel pump 19 to replenish the visible container through the pipe 18. When the visible container has again been replenished to a point of almost total volume, the rod 26 will be gradually elevated until, as shown in Fig. 14 the pin 32 will carry the switch arm 19 upwardly to a position to open the circuit to the electric motor. The switch, however, is not opened by the upward movement of the rod 26 induced by the float 28 until the visible tank has been filled to its desired volume. Of course, any volume of fuel in excess of the determined amount is carried off by the overflow pipe 23.

As respects the operation of applicant's pump, it is clear that same is such as to obviate the necessity of an attendant at a gasoline filling station. The driver of a motor vehicle drives his car to a position adjacent the pump. He then gets out of his car removes the cap from the gas tank, removes the hose 14 of the pump from its support 33 and places the nozzle thereof in the opening of the tank. He then places the proper coin in the coin control member 39 and manually moves the handle 40 in a clockwise direction, thereafter releasing same, with the result that the handle will be moved in a counterclockwise direction, due to the spring 42 in connection with the rotatable member 41.

The action of the link member 44 has been previously described, the same operating to move the locking member 45 laterally against the tension of the spring 47 as a matter of fact to the dotted line position shown in Fig. 12. The motor vehicle operator may now grasp the handle 49 of bar 48 and force said bar inwardly. Bar 48 is immediately locked in its innermost position, due to the fact that the rod 36 in connection with the support 33 for the hose, immediately drops into the notch 57. Also, the cam 54 on the bar 48 elevates the stem 16 and of course the valve 15 of the visible container, permitting the gasoline in the container to flow through the hose into the vehicle tank. At the same time, the cam 62 on the bar 48 rides against the under side of the portion 59 of locking member 45 and elevates same slightly to permit the link 44 to assume a position beneath the portion 58 of locking member 45, and thus positioning the coin control mechanism for a subsequent proper operation of the pump.

The extreme inner end of the bar 48, namely member 64, rides beneath the lower end of the rod 26 in connection with the float, which prevents the latter from moving sufficiently downwardly to close the electric connection through the switch 24.

The operator is not able to withdraw the bar 48 because of its locked position and thus must of necessity drain the visible tank prior to replacement of the hose upon its support 33. However, when the tank has been drained and the hose replaced upon its support 33, rod 36 will be removed from its locking notch 57 and the tension spring 51 will return the bar 48 to its outer position, it being apparent that the moment the bar 48 has assumed its outer position, the locking member 45 will immediately be forced laterally by means of spring 47 to a position where the portion 59 thereof will be disposed in the locking notch 60 in the bar 48. This immediate locking of the bar 48 upon its retraction prevents further operation of the pump until same has not only been replenished but until another coin has been placed in the coin control mechanism. Simultaneously with the automatic withdrawal of the bar 48 by means of the spring 51, the rod 26 in connection with the float member drops sharply with the result that the switch arm 29 is moved downwardly to energize the electric motor, with a consequent operation of the pump 19 and replenishing of the visible container.

Inasmuch as the float 28 does not elevate the rod 26 until the visible container has been almost entirely filled, not only is the switch arm 29 prevented from being moved upwardly to a position to stop the flow of gasoline but also a subsequent complete inner movement of the rod 48 is prevented because the end 64 of said rod would project against the lower end of the rod 26.

It is apparent from the above description that an operator is thus prevented from losing his money in case a coin is inserted in the coin control mechanism and the respective operating portions moved prior to a complete replenishing of the visible container.

What I claim is:

1. A fuel pump comprising a container, drain mechanism therefor, a hose member connected to the drain mechanism, a tensioned pivotal support for the hose, and electrically controlled mechanism for replenish-

ing the pump, including a switch and float member for operating same and coin control mechanism for operating the pump including a bar member for operating the drain mechanism for the pump connection between the coil control mechanism and bar preventing movement of the bar until operation of the coin control mechanism, locking means for the bar in connection with the pump hose support and mechanism including operative connections between the float portion and bar member for replenishing the container immediately following movement of the bar to such position that the container drain mechanism is closed.

2. A fuel pump comprising a container, a drain valve therefor, a hose connected to said drain valve, a pivotal support for the hose, a float member in said container, and electrically controlled mechanism for replenishing said container controlled by said float member and mechanism for operating said pump including a manually operable bar member movable to a position to elevate said drain valve, coin control mechanism controlling the movement of said bar, locking means in connection with the hose support for holding said bar in such position that the drain valve is maintained in an open position as long as the hose is removed from the support and connecting means between the float and manually operable bar member for replenishing the container immediately upon movement of the bar to a position to close the drain valve.

3. A fuel pump comprising a container, a drain valve therefor, a hose connected to said drain valve, a pivotal support for the hose, a float member in said container, and electrically controlled mechanism for replenishing said container controlled by said float member, and mechanism for operating said pump including a manually operable bar member for elevating the drain valve, coin control mechanism normally holding said bar in locked position but operating upon the insertion of a coin to permit movement of said bar to a drain-valve-elevating position, connecting means between the hose support and bar operating to maintain the bar in a drain valve opening position as long as the hose is removed from the support and mechanism controlled by movement of the float and operation of the bar to replenish the container following initial draining thereof and replacement of the hose upon the support.

In testimony whereof I have hereunto affixed my signature.

GEORGE B. TROST.