May 15, 1951 R. H. DAMON 2,552,886

DISPENSING APPARATUS FOR LIQUID FUELS AND AIR

Filed Dec. 20, 1945 4 Sheets-Sheet 1

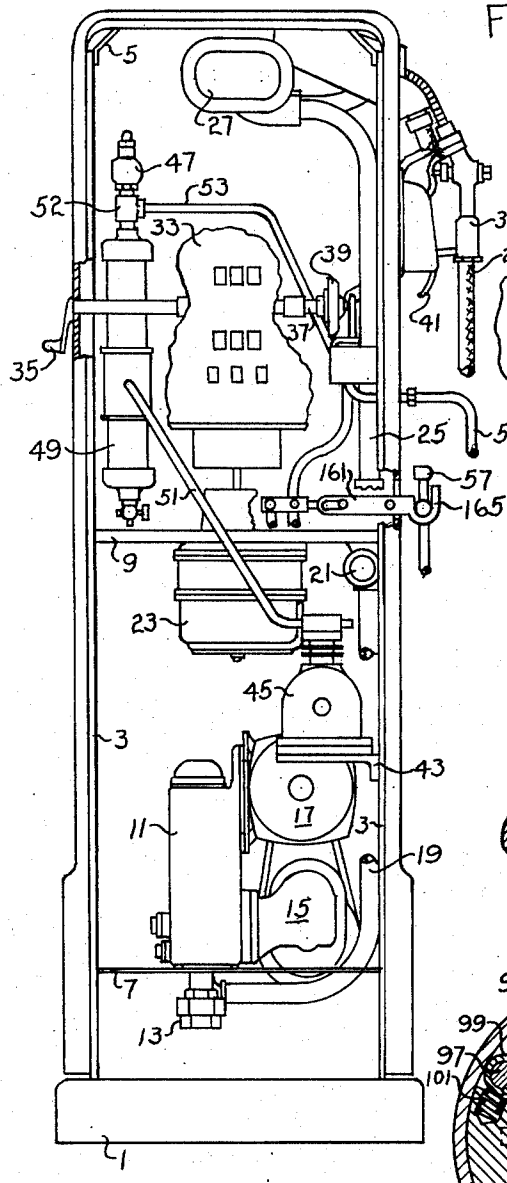


Fig. 1

Fig. 4

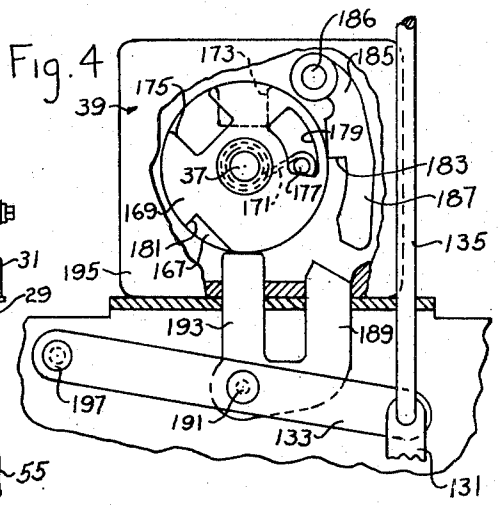
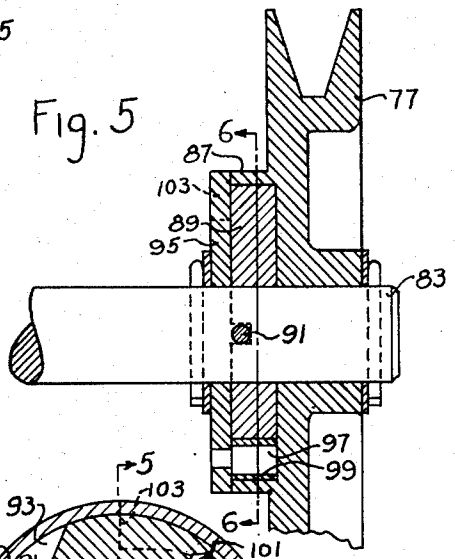


Fig. 5



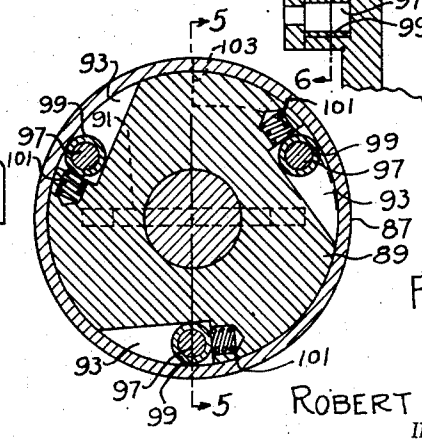


Fig. 6

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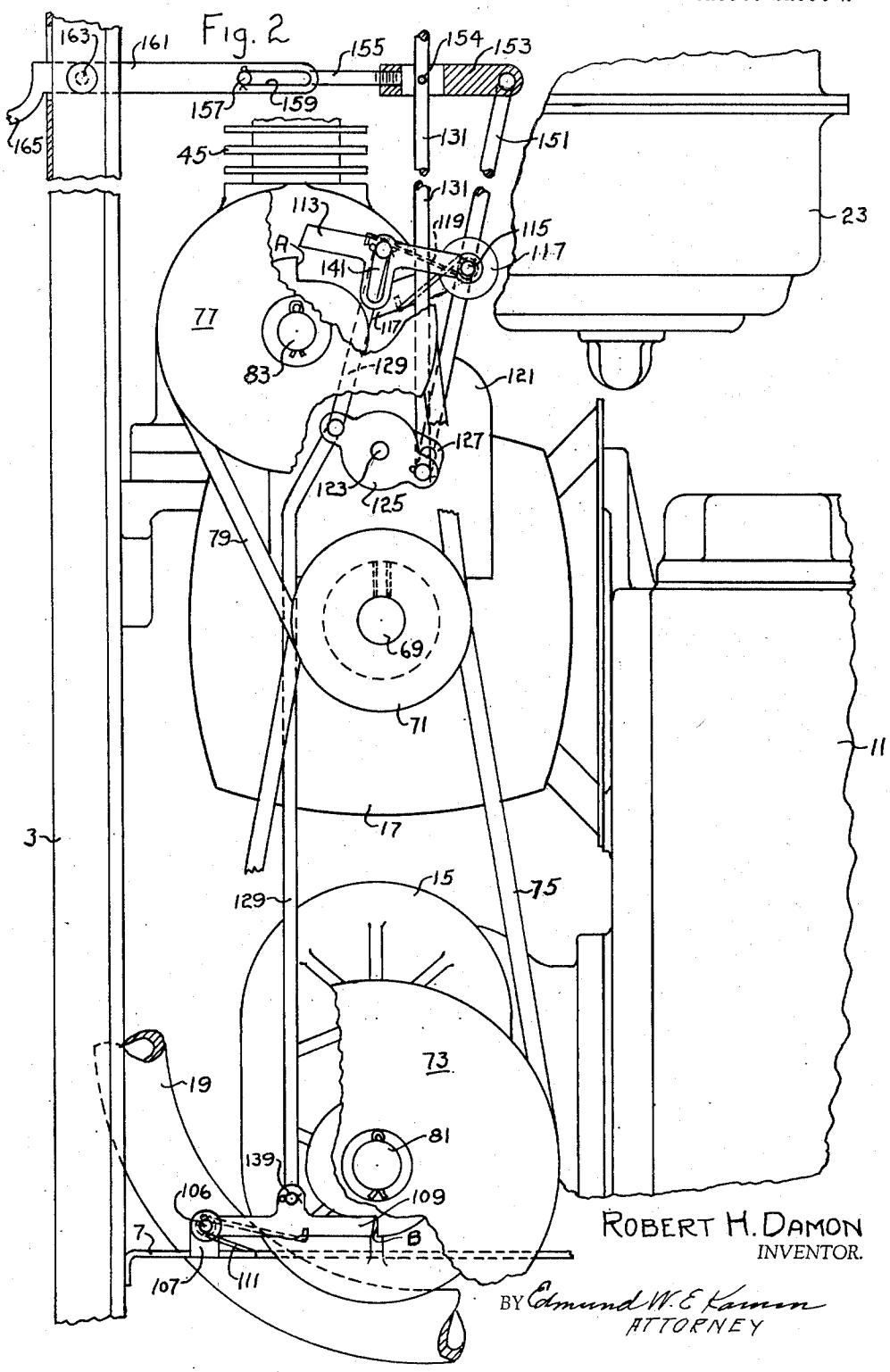
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May 15, 1951 R. H. DAMON 2,552,886

DISPENSING APPARATUS FOR LIQUID FUELS AND AIR

Filed Dec. 20, 1945 4 Sheets-Sheet 2

Fig. 2



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DISPENSING APPARATUS FOR LIQUID FUELS AND AIR

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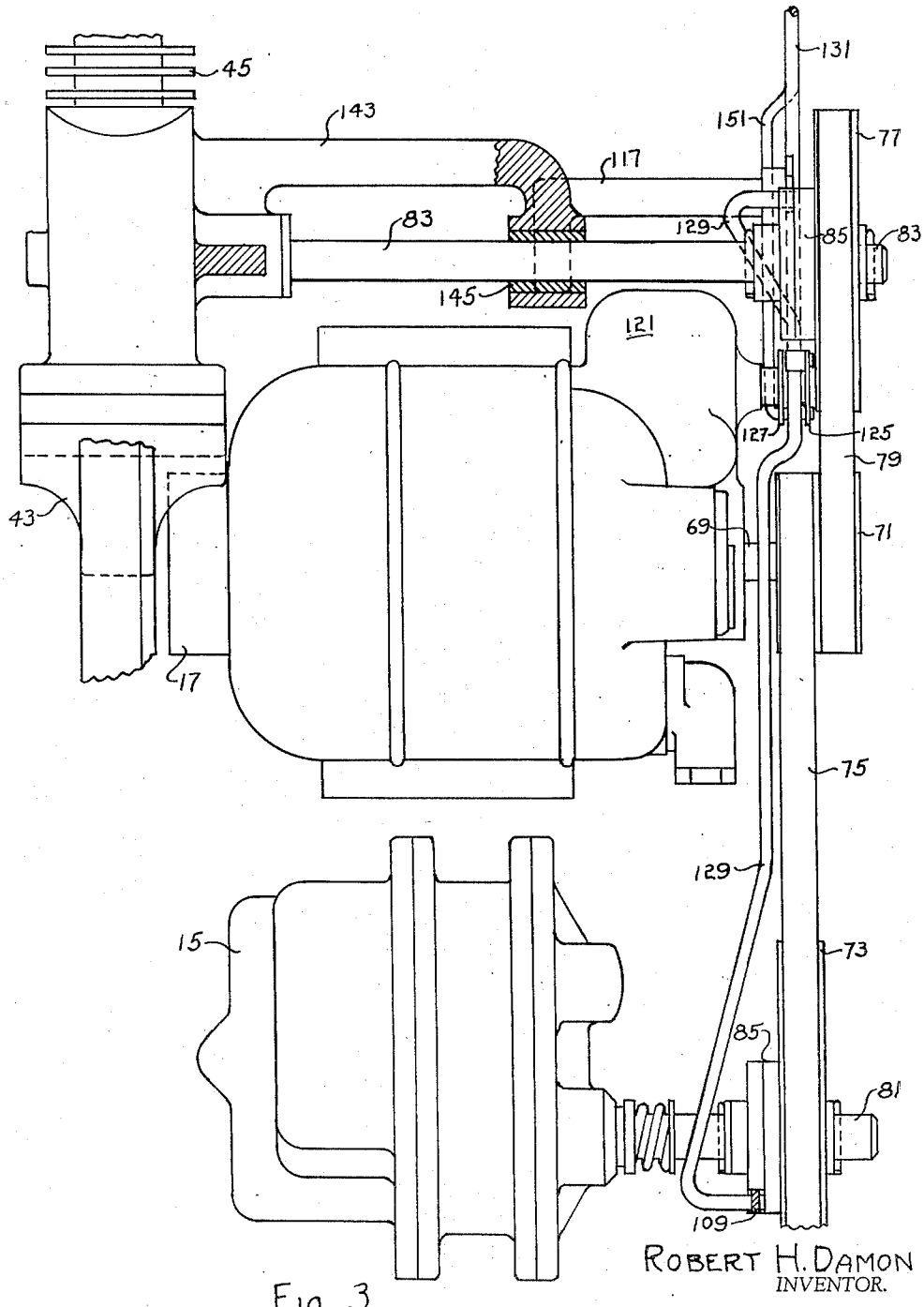


Fig. 3

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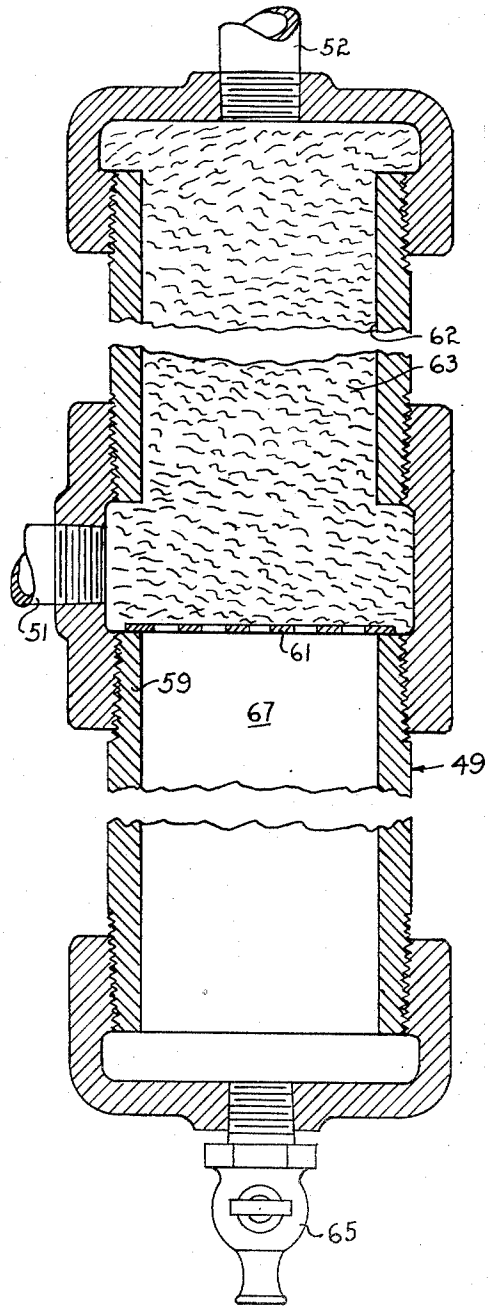
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DISPENSING APPARATUS FOR LIQUID FUELS AND AIR

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Fig. 7



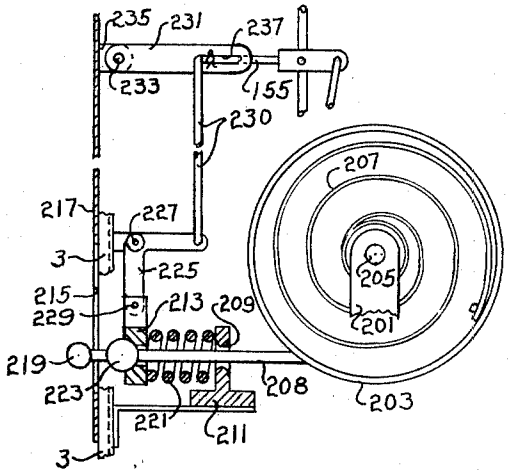


Fig. 8

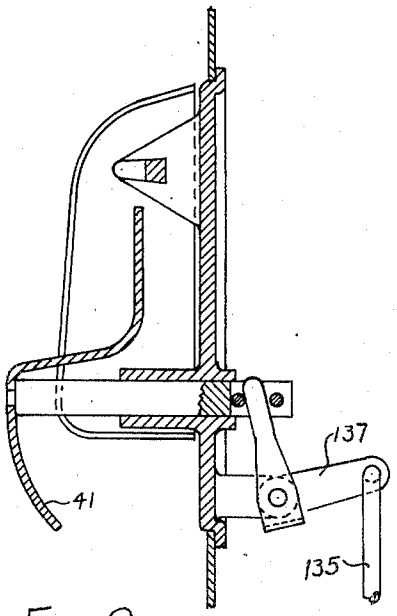


Fig. 9

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Patented May 15, 1951 2,552,886

UNITED STATES PATENT OFFICE

2,552,886

DISPENSING APPARATUS FOR LIQUID FUELS AND AIR

Robert H. Damon, Chicago, Ill., assignor to Bowser, Inc., Fort Wayne, Ind., a corporation of Indiana

Application December 20, 1945, Serial No. 636,205

11 Claims. (Cl. 222—34)

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This invention reates to a dispensing apparatus which is adapted to dispense either fuel or compressed air at the will of the operator while at the same time retaining all of the safeguards against inaccurate measure which are afforded the operator and the public. More specifically, it relates to a gasoline dispenser which has incorporated in it an air compressor and in which controls are furnished which permit operation of either the gasoline dispenser or the compressor, but not both.

It is an object of the invention to provide a combined fuel and compressed air dispenser which is operated by a single motor.

Another object of the invention is to provide a fuel dispenser and an air compressor with means for selectively actuating one or the other.

Still another object of the invention is to provide means insuring that the fuel dispenser is disabled before the air compressor is activated.

Yet another object of the invention is to provide means for disabling the air compressor before said fuel dispenser is activated.

Still another object of the invention is to provide an interlocked clutching mechanism so that the fuel dispenser cannot be operated until the register thereof is reset.

Yet another object of the invention is to provide a control system whereby the motor switch will be actuated by either the fuel dispenser or air compressor controls.

It is another object of the invention to provide a fuel dispenser and air compressor drive and control system whereby the entire output of the motor may be utilized for either function.

Still another object of the invention is to provide a fuel dispensing and air compressing mechanism in the usual fuel dispenser chassis.

These and other objects will become apparent from a study of this specification and the drawings which are attached hereto and made a part hereof and in which;

Figure 1 is an elevation showing the fuel dispensing apparatus and the air compressing apparatus in their relative positions.

Figure 2 is an enlarged elevation of the apparatus of Figure 1 viewed from the rear thereof and showing especially the control linkages.

Figure 3 is an elevation of the apparatus of Figure 2 viewed from the left thereof.

Figure 4 is an elevation with parts broken away showing the interlock mechanism.

Figure 5 is a sectional view taken on line 5—5 of Figure 6 showing one of the control clutch assemblies.

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Figure 6 is a sectional view taken on the line 6—6 of Figure 5 showing a control clutch.

Figure 7 is a sectional view of the air drier.

Figure 8 is an elevation of an air hose reel and the modified control mechanism utilized therewith.

Figure 9 is a side elevation of the fuel hose hook and control actuator.

Referring now to Figure 1 the numeral 1 represents the base to which are attached the frame uprights 3, top 5, pump support 7, and meter supports 9. An air separator 11 is supported on 7 and has attached to it a suction stub 13, a pump 15, an electric motor 17 and a discharge pipe 19. The latter is connected through a combined check and relief valve 21 with a meter 23. The discharge pipe 25 connects the meter with the discharge sights 27 which empty into the usual wet hose 29 which terminates in the valved nozzle 31.

Meter 23 drives a register 33 which may be of any desired type and which is fitted with a resetting mechanism operated by crank 35. The resetting shaft also actuates the shaft 37 of the interlock mechanism 39 so that the nozzle support 41 may be actuated after resetting to initiate the dispensing of fuel.

A bracket 43 is attached to members 3 and supports an air compressor 45 which discharges into an air cleaner 49 through tube 51. Air passes from the cleaner by way of a T 52, tube 53 to the air hose 55 which is fitted with a chuck 57. A pressure relief valve 47 is provided on the T 52.

Reference to Figure 7 will show that the cleaner comprises a tube 59 having a perforated partition 61. The chamber 62 above the partition being filled with bronze wool 63 or similar material for removing any oil, water or foreign matter which may have become entrained in the air. A cock 65 is provided in the lower chamber 67 to drain off accumulated material.

Referring now to Figures 2 and 3, the motor shaft 69 carries a double grooved pulley 71 from which power is transmitted to the pump pulley 71 from which power is transmitted to the pump pulley 73 by a V-belt 75 and to the air compressor pulley 77 by a belt 79. The pulleys 73 and 77 are adapted to rotate freely upon the pump and compressor shafts 81 and 83 respectively and are selectively connected thereto by roller clutches 85 which are identical in construction, and consequently only one is described and shown in Figures 5 and 6. The pulleys are held on their respective shafts by means of a washer and a cotter pin.

Using for example the compressor pulley 77 and shaft 83, the pulley is provided with an axially extending flange 87 which is adapted to enclose a driven member 89 fixed to the shaft by a key 91. The member is provided with a plurality of V notches 93. A control plate 95 is loosely mounted on shaft 83 and carries a plurality of axially directed pins 97 which enter the notches and which carry rollers 99. The member carries a plurality of springs 101 which bear on the rollers and urge them into the wedge shaped opening between the wall of the notch and the cam. The plate is notched at 103 to receive the control pawl 105 described below.

Pivotally mounted at 106 on an ear 107 on the support 7 is a pawl 109 which is normally urged in a counter-clockwise direction by a spring 111, in which it disconnects the pump clutch. A second pawl 113 is pivotally mounted at 115 on a bracket 117 on the compressor and a spring 119 urges it in a counter-clockwise direction toward engagement with its control plate.

A switch 121 is mounted on a motor and is provided with an operating shaft 123. Mounted on this shaft for free rotation is a double armed lever 125. A second lever 127 is fixed to the shaft and serves to actuate it to close or open the switch. A rod 129 is connected at its lower end to the pawl 109 and at its upper end to the pawl 113 and intermediate its length it is connected to one arm of lever 125. The other arm of the lever is connected to the rod 131 which is connected at its upper end to the interlock lever 133 (Figure 4) which is actuated by the link 135, bell crank 137 and the hose hook 41, subject to control by the interlock mechanism (Figure 9). The connection 139 of rod 129 with link 109 is a simple pivotal connection without any appreciable lost motion, whereas the connection 141 between the rod and pawl 113 is preferably a lost motion connection since the compressor may be stopped with the notch A of the control disc displaced with respect to the pawl.

A bearing bracket 143 extends from the compressor body and supports outboard bearing 145 for shaft 83. A further extension 117 of the bracket supports the pivot 115 of pawl 113.

The switch lever 127 is connected by a rod 151 to one end of a yoke 153 which is pinned to rod 131 by pin 154. A rod 155 is screwed in the other end of the yoke and carries a hooked end 157 which enters a slot 159 in the air hose lever 161, which is pivoted at 163 on the frame. The outer end is formed as a hook 165 to support the hose.

The interlock mechanism comprises a reset shaft 37 which has a notched disc 167 fixed to it and a second notched disc 169 freely rotatable on it. A spring 171 anchored to each of the discs tends to rotate them relative to each other to separate the notches 173—175. Pin 177 in disc 167 extends through an opening 179 in 169 and limits this rotation. A peripheral notch 181 is formed in disc 169 and is adapted to be engaged by pawl 183 on lever 185 pivoted at 186. A depending arm 187 on the pawl is adapted to be actuated by a cam 189 mounted at 191 on the interlock lever 133. A seeker 193 adapted to enter the aligned notches 173—175 is integral with the cam. The cam and seeker are guided in openings in the housing 195. The interlock lever is pivoted on a frame member at 197. The notches are slightly wider than the seeker 193 for a purpose to be disclosed.

Operation

Assuming that the dispenser is in the inactive condition depicted in Figure 1, in which both the air hose and the fuel hose are hung up. The switch is off and the clutch control is in the condition shown in Figure 2. That is, the rod 131 is down and the latch 113 is lifted from its control plate while clutch pawl 109 is positioned in holding relation with notch B of its control plate. The compressor 45 is clutched to shaft 83 while the pump 15 is declutched from shaft 81.

Under this condition, if it is desired to use the air service, the air hose is removed from the hook 165 and the hook is raised or rotated clockwise (Figure 2). This rotates rod 155 and yoke 153 counter-clockwise, pulls up on rod 151, rotates lever 127 counter-clockwise and starts the motor 17.

The motor drives clutch shell 87 which drives the core 89 by reason of the fact that the rolls have been jammed into the notches 93 by the springs 101, and the compressor shaft is accordingly driven.

Air is compressed in the pipe 51, cleaner 49, pipe 53 and hose 55. As the air passes through the cleaner it traverses the wool 63 therein where water, oil and other foreign matter are removed. As these liquids accumulate, they gravitate into chamber 67 where they may be drawn off through cock 65. The relief valve 47 will blow off air if the pressure in the system becomes excessive.

Rotation of the hose hook 165 in the counter-clockwise direction will open the switch.

Should it now be desired to dispense fuel, it is first necessary to operate the reset crank 35. This actuates shaft 37 and discs 169 and 167 in a counter-clockwise direction (Figure 4) until pawl 183 is received in notch 181 of disc 169. When this occurs the disc 169 stops with notch 175 in alignment with seeker 193. Further rotation of the shaft moves disc 167 relative to disc 169 until pin 177 strikes the other end of the opening 179 when it too stops. The notch 173 will then also be aligned with the seeker so that the lever 133 can be raised by the hose hook 41, crank 137 and rod 135.

When this occurs the seeker enters both notches and cam 189 rotates lever 185 to withdraw pawl 183 from notch 181. Since the notches 173—175 are wider than the seeker, the disc 169 will be rotated slightly by spring 171 to displace notch 181 beyond pawl 183.

Lifting lever 133 also causes lifting of rod 131 which rotates lever 125 counter-clockwise (Figure 2). This pulls rod 129 down and rotates pawl 113 counter-clockwise if the control plate notch A is in the right position, or if it is not, then the pawl will rest on the periphery of the plate and the lost motion connection will permit the rod 129 to complete its movement to rotate pawl 109 clockwise to free it from notch B.

When this occurs, the control plate of the pump clutch is freed and the pulley 73 is clutched to shaft 81.

Simultaneously, the yoke 153 is rotated counter-clockwise about the point 157 by the upward movement of rod 131, rod 151 is lifted and, lever 127 is rotated counterclockwise to close switch 121.

The motor starts and the pump is driven. If the pawl 113 was not seated in notch A, then the compressor is rotated a partial revolution until the pawl seats and stops the control plate, withdrawing the rolls 99 from the notches 93 and

declutching the shaft. Thus only the pump will be actuated.

Liquid will be drawn up through suction stub 13, pump 15 and be passed through the air separator 11, meter 23, sight glasses 27, hose 29 and nozzle 31 to the receptacle.

When delivery is completed, the operator will push in on the hose hook 41 and hang up the nozzle.

This reverses the rotation of bell crank 137, drops rod 135, rotates lever 133 clockwise and withdraws seeker 193 from the notches 173—175 so that spring 171 will rotate the discs relative to each other so that the notches are blocked and the reset crank must be again actuated before the hose hook can again be moved.

Rotation of lever 133 also drops rod 131, rotates lever 125 clockwise which raises rod 129 and sets pawl 109 against the control plate of the pump clutch. The pawl must enter notch B before rod 129 and all the associated parts can move appreciably. Consequently the pump clutch is at once declutched.

This movement of rod 129 moves pawl 113 out of notch A on the compressor clutch and the pulley 77 is clutched to shaft 83.

At the same time, the rod 155 and yoke 153 are rotated clockwise about point 157, rod 151 is depressed, lever 127 is rotated clockwise and the motor switch is opened to stop the motor.

Thus it will be seen that the air compressor is always conditioned for operation when the fuel dispenser is idle and is declutched when the fuel dispenser is being used. Conversely, if the fuel dispenser is in use the compressor is declutched so that only one unit will be connected to the motor at a time. The only exception being that both may be connected for a partial revolution when switching from compressor to pumping.

It will also be seen that by reason of the interlocking mechanism and the clutch control system, no fuel can be dispensed unless the register has been reset to zero.

Modified hose handler

Instead of hanging the air hose on a hook outside of the housing it may be desired to coil it upon a reel in the space below the pump support 7.

In such a case, as is shown by Figure 8, support means 201 are mounted on the base 1 and a reel 203 is mounted on an axle 205 held by the supports. A spring 207 is anchored at one end to the supports and at the other on the reel to rotate the reel counterclockwise.

The hose 208 extends through a hole 209 in a guide bracket 211, through collar 213 and through an opening 215 in the housing 217 so that the chuck 219 is within reach of the operator. A spring 221 urges the collar away from bracket 211 while a ball 223 on the hose pulls the collar toward the bracket when the spring 207 rewinds the hose.

A bell crank 225 is pivotally mounted at 227 on the frame and has one arm connected at 229 to the collar while the other arm is connected by means of a rod 230 to a lever 231 which is pivoted at 233 on a clip 235 on the housing. The other end of the lever is connected by a slot 237 to the rod 155 and the remainder of the switch actuating mechanism.

Operation

In this modification, as the air hose is withdrawn from the housing, the pressure of ball 223 in collar 213 is relieved and spring 221 expands to rotate bell crank 225 clockwise. This pulls down on link 230 and rotates lever 231 clockwise to rotate rod 155 and the yoke 153 counterclockwise as described above, so as to close switch 121 to start the motor.

If the hose is released, spring 207 will rotate reel 203 counter-clockwise to take up the hose and when the ball 223 strikes collar 213 the parts move reversely to open the switch.

Of course, suitable locking means may be provided to prevent unauthorized access to the hose if desired.

It is obvious that various changes may be made in the form, structure and arrangement of parts without departing from the spirit of the invention. Accordingly, applicant does not desire to be limited to the specific embodiment disclosed herein primarily for purposes of illustration; but instead, he desires protection falling fairly within the scope of the appended claims.

What I claim to be new and desire to protect by Letters Patent of the United States is:

1. In a dispensing apparatus the combination of a pump, an air compressor, a motor, a switch for the motor, and first clutch means for connecting said motor to said pump, additional clutch means for connecting said motor to said compressor, control means for simultaneously actuating said first clutch means to connect said pump to said motor, said switch to start said motor and said additional clutch means to declutch said compressor.

2. In a dispensing apparatus the combination of a pump, an air compressor, a motor, a switch for the motor, and first clutch means for connecting said motor to said pump, additional clutch means for connecting said motor to said compressor, control means for simultaneously actuating said first clutch means to connect said pump to said motor, said switch to start said motor and said additional clutch means to declutch said compressor, a resettable register driven in accordance with the liquid dispensed by said pump, means for resetting said register, an interlock mechanism connected to said resetting means and said control means for preventing said operation of said control means until said register has been reset.

3. In a dispensing apparatus the combination of a motor, a switch for the motor, a pump, an air compressor, drive means including a first releasable clutch connecting said motor and pump, additional drive means comprising a second releasable clutch for connecting said motor and compressor, clutch control means mounted for movement between pumping and compressing positions, said means including means connecting said control means and clutches for operation by the former when in pumping position to render said first clutch effective and to release said second clutch, and when in compressing position, to release said first clutch to render said second clutch effective and to open said switch.

4. In a dispensing apparatus the combination of a motor, a switch, a pump, an air compressor, drive means including a first releasable clutch connecting said motor and pump, additional drive means comprising a second releasable clutch for connecting said motor and compressor, clutch control means mounted for movement between pumping and compressing positions, said means including means connecting said control means and clutches for operation by the former when in pumping position to render said first clutch effective and to release said second clutch, and

when in compressing position to release said first clutch, render said second clutch effective and open said switch, and additional means operable at will when said means occupies the compressing position for closing said switch.

5. In a dispensing apparatus the combination of a motor, a pump, an air compressor, drive means including a first releasable clutch connecting said motor and pump, additional drive means comprising a second releasable clutch for connecting said motor and compressor, clutch control means mounted for movement between pumping and compressing positions, said means including means connecting said control means and clutches for operation by the former when in pumping position to render said first clutch effective and to release said second clutch, a meter connected to the pump, a resettable register driven by the meter, and interlocking means connected with said register and said control means to prevent movement of the latter to pumping position until said register is reset.

6. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when said support is in starting position.

7. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, a switch for controlling the motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when said support is in starting position, and connection between said operable means and said switch for simultaneously closing said switch.

8. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, a switch for controlling the motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when said support is in starting position, and connection between said operable means and said switch for simultaneously closing said switch, an air hose support device, means connecting said device to operate said switch, said connecting means being rendered effective only when said nozzle support is in its stopping position.

9. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, a switch for controlling the motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting

said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when said support is in starting position, and connection between said operable means and said switch for simultaneously closing said switch, an air hose hook, means connecting said hook to operate said switch, said connecting means being rendered effective only when said nozzle support is in its stopping position.

10. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, a switch for controlling the motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when support is in starting position, and connection between said operable means and said switch for simultaneously closing said switch, an air hose, a reel for said hose, means for winding the hose on the reel, a member operable in response to the movement of said hose, and means connecting said member to operate said switch, said connecting means being rendered effective only when said nozzle support is in its starting position.

11. In a dispensing apparatus, the combination of a fuel pump, an air compressor, a motor, a switch for controlling the motor, releasable clutch means for connecting said motor and pump, a second releasable clutch means for connecting said motor and compressor, a fuel nozzle support movable to starting and stopping positions, means operable by said support for clutching said pump to the motor and declutching said compressor when support is in starting position, and connection between said operable means and said switch for simultaneously closing said switch, an air hose, a reel for said hose, means for winding the hose on the reel, a member operable in response to the movement of said hose, and means connecting said member to operate said switch.

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