

[54] **TWO-NOZZLE SYSTEM FOR LIQUID FUEL DISPENSING APPARATUS**

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[56] **References Cited**

UNITED STATES PATENTS

1,969,360	8/1934	Daley.....	222/75
2,977,970	4/1961	Young	222/26 X
3,295,685	1/1967	Young	210/323

FOREIGN PATENTS OR APPLICATIONS

207,588	8/1922	Great Britain.....	210/340
943,149	4/1956	Germany	222/75

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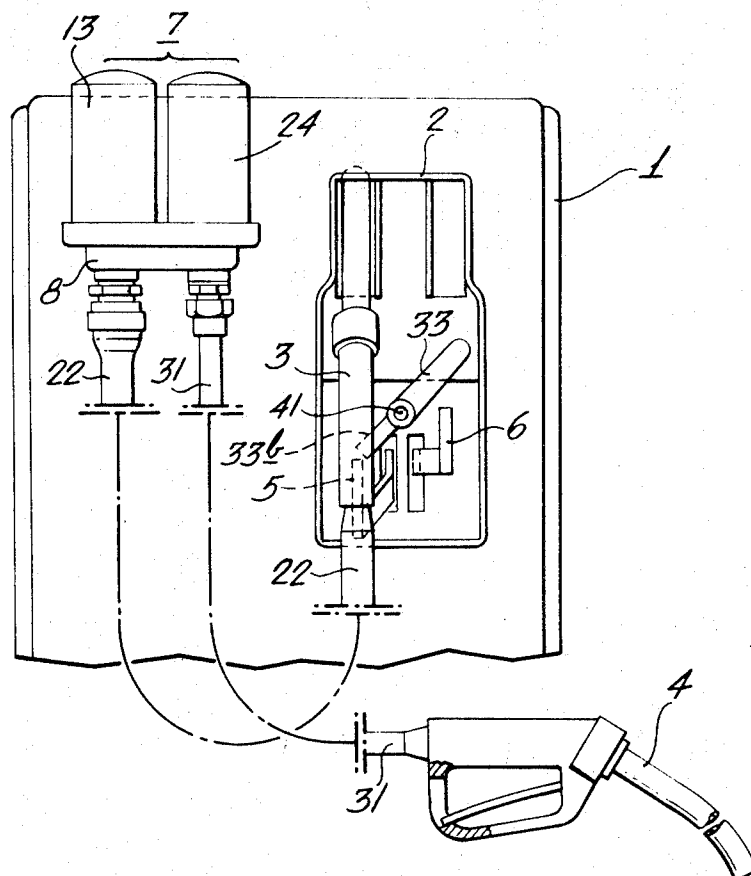
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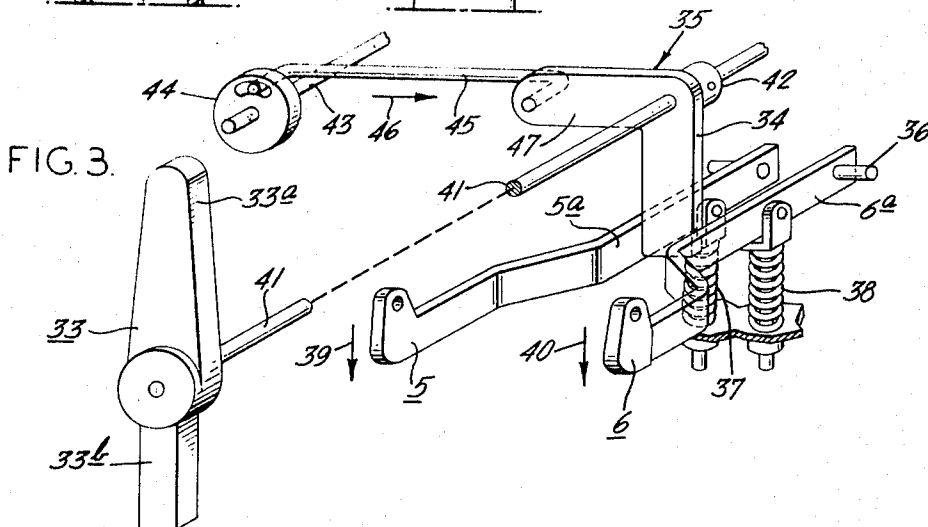
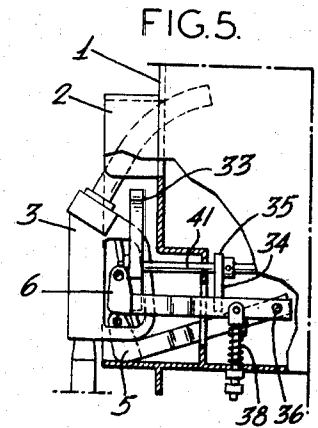
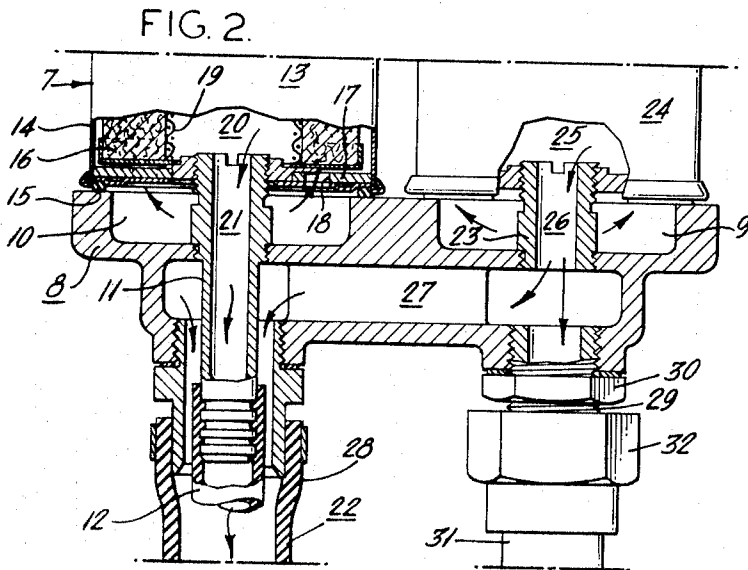
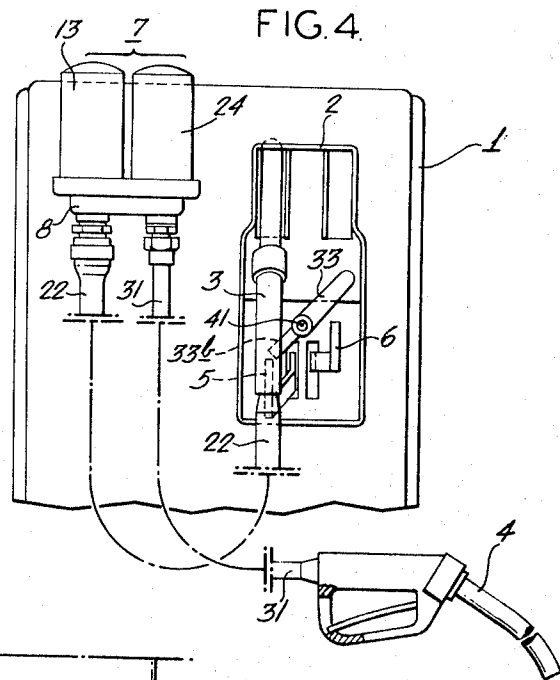
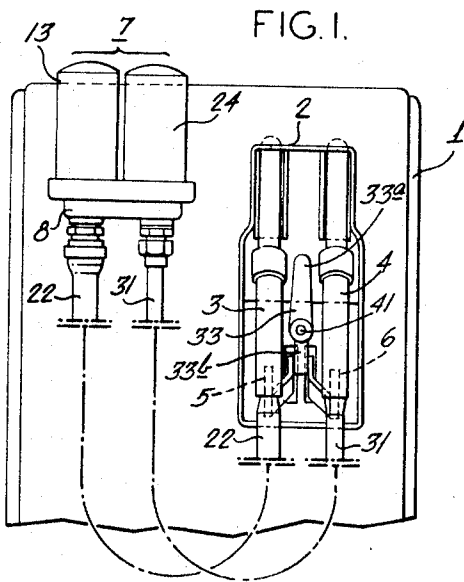
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ABSTRACT

A blending-type liquid fuel dispensing apparatus is provided with two separate nozzles, one a special nozzle for dispensing only low-lead or lead-free (unleaded) fuel, and the other a more conventional nozzle for dispensing blends of this fuel and a highly leaded fuel, as well as the highly leaded fuel alone. The apparatus has an interlocking arrangement which permits either nozzle to be utilized separately, but which prevents utilization of both nozzles simultaneously.

2 Claims, 5 Drawing Figures





TWO-NOZZLE SYSTEM FOR LIQUID FUEL DISPENSING APPARATUS

This invention relates to liquid fuel (gasoline) dispensing apparatus which is capable of dispensing, selectively, both a non-leaded (or low-lead) fuel and a highly leaded fuel, as well as various blends of these two fuels (gasolines).

At the present time, there is being used rather extensively a multi-grade fuel dispensing apparatus which can be adjusted to dispense, selectively, solely a "hi" gasoline (referring to a relatively high octane liquid fuel component), solely a "lo" gasoline (referring to a relatively low-octane liquid fuel component), or a blend of these "hi" and "lo" gasoline components or constituents. An apparatus of this type is disclosed in U.S. Pat. No. 2,880,908 and also in U.S. Pat. No. 2,977,970, both of which are of common ownership with the present application.

Recently, in order to reduce the emission of certain atmospheric pollutants such as carbon monoxide and unburned hydrocarbons from the exhausts of automobile internal combustion engines, the use of a catalytic converter or catalytic muffler on the automobile exhaust has been proposed, and this proposal appears to be meeting with some favor. However, many gasolines being marketed today contain as an additive, for improving the octane rating of the gasoline, a compound of lead, such as a certain type of lead alkyl. These lead anti-knock compounds or octane improvers have a deleterious effect on the catalyst contained in the aforementioned catalytic converter or catalytic muffler, in that they "poison" the catalyst and thereby appreciably reduce its effective life. To maximize the pollutant-reducing effectiveness of the aforementioned catalytic devices by prolonging the life of the catalyst therein, petroleum companies are now producing and marketing various low-lead or unleaded (lead-free) fuels.

To satisfy the call in the market place for non-leaded (unleaded, lead-free) or low-lead fuels, in the multi-grade fuel dispensing apparatus previously mentioned the "lo" gasoline may be a non-leaded or low-lead fuel, the "hi" gasoline then being a highly leaded fuel. So, the customer desiring a non-leaded or low-lead fuel can obtain the same by asking for the grade comprising solely the "lo" gasoline.

This means that the multi-grade dispensing apparatus must be capable of delivering a low-octane, non-leaded or low-lead fuel ("lo" gasoline), as well as a high-octane, highly leaded fuel ("hi" gasoline), without any appreciable mixing, which is to say, without any appreciable contamination of the non-leaded or low-lead fuel by the highly leaded fuel.

According to this invention, two separate hose-nozzle combinations are utilized with a multi-grade fuel dispensing apparatus. One of these combinations is utilized for dispensing only low-lead or lead-free fuel (which is to say, solely the "lo" gasoline), and will be termed the "lo lead" nozzle, it being pointed out that in this situation "lo lead" may include zero lead or "no lead" (lead-free, unleaded) gasoline. This "lo lead" nozzle is fed through a single hose connected to a point in the dispensing apparatus at which only "lo" gasoline is present, so that nothing except low-lead gasoline is ever pumped through this nozzle.

It is contemplated that automobiles equipped with catalytic converters (and which therefore must use low-lead or unleaded fuel) may be equipped with a spe-

cial fillpipe that will accept only a special nozzle dispensing this type of fuel. The "lo lead" nozzle just described would then be of a special design, such as to fit into the special fillpipe on such automobiles.

The remaining one of the two hose-nozzle combinations is utilized for dispensing all of the other grades of fuel (to wit, all of the blends of "lo" and "hi" gasolines, plus "hi" gasoline alone), and will be termed the "hi lead" nozzle. This nozzle is of a fairly conventional type, and is fed through a concentric hose arrangement ("hose-within-a-hose") connected to the output couplings of a dual "final filter," as disclosed in U.S. Pat. No. 3,295,685.

An interlocking arrangement permits use of either nozzle separately, but prevents use of both simultaneously.

A detailed description of the invention follows, taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a partial side elevation of the housing of a dispensing apparatus utilizing the present invention, showing both nozzles in their rest positions;

FIG. 2 is a fragmentary vertical section through a filtering arrangement employed in the present invention;

FIG. 3 is an isometric view, partially exploded, of the pump control mechanism of the invention;

FIG. 4 is a view generally similar to FIG. 1 but showing the parts in a different position, wherein one of the nozzles is in a position for dispensing; and

FIG. 5 is a view, partly broken away, looking at FIG. 4 from one side thereof.

Referring now to the drawings, and first to FIG. 1 thereof, the numeral 1 denotes a portion of the side wall (housing) of a gasoline dispensing apparatus, for example, of the proportioning type disclosed in U.S. Pat. Nos. 2,880,908 and 2,977,970. A dual boot or holster 2, which is constructed and arranged to accommodate therein two dispensing nozzles 3 and 4 in side-by-side relation (when in their rest positions), is attached to the outside of wall 1. The dual boot 2 is similar in construction to the single boot conventionally used (in that the dispensing nozzles rest therein in vertical positions, with their snouts or dispensing ends uppermost), but the boot 2 can accommodate two nozzles, as previously stated, each in a respective pocket in the boot. A hook 5 (referred to further hereinafter) is mounted adjacent one pocket of boot 2, for reception of nozzle 3, and a hook 6 (also referred to further hereinafter) is mounted adjacent the other pocket of boot 2, for reception of nozzle 4. Hooks 5 and 6 have an upwardly extending portion which is adapted to enter a slot in the body of the corresponding nozzle (as is conventional in devices of this type), an initial upward movement of the nozzle being required to remove either nozzle from its rest position in the boot 2.

The "hi lead" nozzle 3, which is used for the dispensing or delivery of various blends of the two gasoline components, as well as for the delivery of the "hi" gasoline alone, may have the construction indicated generally in U.S. Pat. No. 2,977,970 previously mentioned, but in addition it is provided with automatic shut-off mechanism, such as disclosed in U.S. Pat. Nos. 2,582,195 and 3,062,247.

The "lo lead" nozzle 4, which is used solely for the dispensing of "lo" gasoline (which, as previously stated, is a low-lead or unleaded gasoline) may have an internal construction such as shown in U.S. Pat. Nos.

2,582,195 and 3,062,247. However, nozzle 4 is a special nozzle, whose snout or spout is designed to fit into a special fillpipe which may be built into automobiles with catalytic converters or catalytic mufflers (and which must therefore be fueled only with a low-lead or unleaded gasoline).

A dual "final filter," denoted generally by numeral 7, is mounted on the side wall 1 of the gasoline dispensing apparatus. As disclosed in U.S. Pat. No. 3,295,685 previously mentioned, this filter receives the "hi" gasoline and the "lo" gasoline components separately, from the two separate components or chambers of a so called blend control valve located in the housing of the dispensing apparatus, and separately filters them. Refer now to FIG. 2, which shows the lower portion of such a dual filter.

A cast, machined body, denoted generally by numeral 8, serves as a base or support for the filter, and contains internal passages for the two fluids, to wit, the "lo" gasoline and the "hi" gasoline. In the filter base 8, there is a continuous annular recess 9, open at its upper end, at one side of the casting, this recess being one of two similar recesses provided in the casting and serving as an inlet passage for the filtering element which filters the "hi" gasoline, the "hi" gasoline reaching recess 10 from the dispensing apparatus housing in a manner more particularly described in U.S. Pat. No. 3,295,685.

A hose nipple 11, which has grooves at its lower end for enabling clamping of a hose 12 thereto, is threadedly mounted in an aperture provided in the bottom wall of recess 10. The upper end of nipple 11 carries external threads for cooperation with a female threaded fitting provided at the center of the base of a filter cartridge denoted generally by numeral 13. The filter cartridge 13 is of the so-called "spin-on" type, and is manufactured as a complete unit including an outer housing 14, a bottom sealing gasket 15, and interiorly mounted solid filtering material 16. The gasket 15, when the cartridge is screwed home, seals against the upper surface of the cylindrical wall defining recess 10. The filter cartridge 13 performs the function of filtering of the "hi" gasoline (high-octane fuel component) which is fed into recess 10. The bottom plate 17 of the filter cartridge 13 overlies the upper end of recess 10, and this bottom plate has therein a plurality of apertures 18 through which the fluid flows, it being then directed to flow radially outwardly to the radially outer surface of the filtering material 16. It then flows radially inwardly through this material, and through a foraminous inner partition 19 into a central opening 20 which communicates at its lower end with the upper end of the bore 21 in nipple 11. The filtered "hi" gasoline (highly-leaded fuel) then proceeds downwardly through bore 21 and into the housing end of the central tube 12 of a concentric dispensing hose 22 ("hose-within-a-hose") whose central tube 12 is clamped and sealed to the lower end of nipple 11. The opposite end of hose 22 is connected to nozzle 3, as in U.S. Pat. No. 2,977,970.

This filtered hi fuel component then flows through the central tube 12 of hose 22 to the "hi lead" dispensing nozzle 3, where it may be mixed with the "lo" gasoline to provide a blended fuel product, which is then dispensed via nozzle 3 into the customer's tank. Alternatively (as governed by the grade selection made in the gasoline dispensing apparatus), solely this "hi" gas-

oline may be fed through tube 12 and nozzle 3 into the customer's tank.

A short nipple 23 is threadedly mounted in an aperture provided in the bottom wall of recess 9. The upper end of nipple 23 carries external threads for cooperation with a female threaded fitting provided at the center of the base of a filter cartridge denoted generally by numeral 24. The filter cartridge 24 is preferably of exactly the same construction as filter cartridge 13, previously described, and operates in exactly the same fashion. The filter cartridge 24 performs the function of filtering of the "lo" gasoline (low-octane fuel component) which is fed into recess 9. The bottom plate of filter cartridge 24 overlies the upper end of recess 9. The "lo" gasoline flows in a radially inward direction through the filtering material contained in cartridge 24. The filtered fluid flows into central opening 25 of cartridge 24 and thence into the upper end of the bore 26 in nipple 23.

The lower end of bore 26 opens into one end of a transversely extending internal passageway 27 provided in casting 8, this passageway 27 extending from nipple 23 in a transverse direction and terminating at a location adjacent nipple 11, below the lower face of recess 10. The outer tube 28 of dispensing hose 22 is coupled (by means of a suitable threaded fitting) into a pipe-threaded aperture in the lower wall defining passageway 27. The center lines of this last-mentioned aperture and of the aperture into which nipple 11 is threaded are collinear, and the diameter of the aperture for tube 28 is considerably in excess of the O.D. of nipple 11, so as to provide an annular space surrounding nipple 11. Nipple 11 extends through the aperture for tube 28, and this last-mentioned aperture communicates at its upper end with passageway 27.

From the lower end of bore 26, the filtered "lo" gasoline (low-lead or unleaded fuel) flows through passageway 27 from right to left in FIG. 2, and then flows around the outside of nipple 11 into the housing end of the outer tube 28 of hose 22. This filtered fuel component then flows through the outer tube 2 of dispensing hose 22 to the nozzle 3, where it may be mixed with the "hi" gasoline to provide a blended fuel product, which is then dispensed via "hi lead" nozzle 3 into the customer's tank.

The description of FIG. 2 up to this point covers essentially the same structure as disclosed in U.S. Pat. No. 3,295,685. According to the present invention, a completely separate stream of "lo" gasoline (i.e., a stream of low-lead or unleaded gasoline which does not mix in any way with the "hi" or highly leaded gasoline) is abstracted and fed to the special nozzle 4. A threaded aperture is provided in the lower wall defining passageway 27, approximately in axial alignment with nipple 23, and in this last-mentioned aperture there is threadedly mounted a short pipe nipple 29, locked in place by means of a lock nut or jam nut 30. The housing end of a single lightweight hose 31 (three-fourths inch in diameter, for example) is fastened to the outer end of nipple 29 by means of a suitable threaded coupline 32, and the nozzle end of hose 31 is connected to the special "lo lead" dispensing nozzle 4.

It is pointed out that only the "lo" gasoline flows out of filter cartridge 24 and through bore 26 into passageway 27, so that only the "lo" (unleaded or low-lead) gasoline can flow into hose 31 and thence into the "lo lead" dispensing nozzle 4. Nozzle 4 is thus capable of

dispensing only the low-lead or unleaded gasoline, and no mixing with, or contamination by, the highly leaded gasoline can take place.

The arrangement previously described for the "lo lead" nozzle 4, including items 29, 30, etc., requires drilling and tapping the filter base 8. In some cases, this might be inadvisable because the filter base, so modified, might not support the hose 31.

An alternative might be to utilize, instead of the simple threaded fitting illustrated for coupling the outer tube 28 of hose 22 into an aperture in the lower wall defining passageway 27, a tee fitting, with the hose 31 then being coupled by means of a suitable elbow to the side outlet of this tee. If this were done, the filtered "lo" gasoline could flow through passageway 27 and then by way of the aforementioned tee into hose 31, and thence into the "lo lead" dispensing nozzle 4.

Instead of the concentric dispensing hose 22 described above, a twin hose arrangement, or side-by-side hose arrangement, can be used for "hi lead" dispensing nozzle 3, as disclosed in my copending application, Ser. No. 63,827, filed Aug. 14, 1970.

As disclosed in U.S. Pat. No. 3,295,685, a protective metal cover can be used to surround the filter cartridge 13 and 24, but this cover has been omitted from the drawings.

An interlocking arrangement is provided, which will permit either nozzle 3 or nozzle 4 to be used separately, but which will prevent use of both nozzles simultaneously. Refer now to FIG. 3, which is a somewhat exploded view of the interlocking arrangement. The nozzle hook members 5 and 6 extend through suitable slots provided in the apparatus housing, the outer ends of these hooks being so located with respect to the dual holster 2 that the respective nozzles 3 and 4 may be supported thereon when in their rest positions, as previously stated. Hook 6 is made wider than hook 5, as illustrated in FIG. 3, the nozzle 4 having a slot of greater width than that in nozzle 3, such as to fit on hook 6; the (narrower) slot in nozzle 3 will fit on hook 5, but not on hook 6. Thus, the "hi lead" nozzle 3 cannot be positioned on hook 6, but only on hook 5; this has the effect of assuring that the "lo lead" nozzle 4 will be positioned only on its proper hook 6 when in rest position.

Outside the apparatus housing, the hooks 5 and 6 are horizontally spaced apart sufficiently to accommodate the respective nozzle bodies, and also to provide for the positioning therebetween of a pump switch operating lever 33, to be later detailed; however, inside the housing, the inner ends 5a and 6a of the hook members 5 and 6 are considerably closer together, such as to lie closely adjacent the respective opposite edges of the depending leg 34 of a pivotally mounted L-shaped member 35, the hook portions 5a and 6a lying adjacent the lower end of the leg 34.

Inside the apparatus housing, each of the hook members 5 and 6 is pivotally supported at its inner end for independent movement by means of a respective journaled horizontal shaft one of which is illustrated at 36, such that the outer ends of these members are capable of independent vertical movement (which is to say, the bodies of these members are mounted to be rotatable about axes determined by the respective horizontal supporting shafts). The outer end of each hook member is biased upwardly by means of a separate spring. A coiled compression spring 37 bears against a fixed abutment in the housing and against an intermediate

point along the length of hook member 5. A similar compression spring 38 bears against a fixed abutment in the housing and against an intermediate point along the length of hook member 6. Thus, springs 37 and 38 normally bias the respective hook members 5 and 6 to their "up" positions illustrated in FIG. 3.

In FIG. 3, the hooks 5 and 6 are illustrated in their lifted or raised positions, as they would appear with the nozzles 3 and 4 off the respective hooks; hook 5 is adapted to be moved downwardly in the direction 39, against the bias of spring 37, by the weight of nozzle 3 when it rests on this hook, and hook 6 is adapted to be moved downwardly in the direction 40, against the bias of spring 38, by the weight of nozzle 4 when it rests on this latter hook. In the position illustrated in FIG. 3, the side of hook portion 5a lies closely adjacent one side of leg 34 and thus prevents any rotation of member 35 in the clockwise direction; likewise, in the FIG. 3 position the side of hook portion 6a lies closely adjacent the opposite side of leg 34 and thus prevents any rotation of member 35 in the counterclockwise direction. Therefore, when both nozzles are off their hooks it is impossible to rotate member 35 from the neutral position illustrated in FIG. 3.

When nozzle 3 is resting on hook 5, this pivoted hook member moves downwardly as at 39 so that the upper face of this member clears the bottom of leg 34 and thus does not interfere with rotation of member 35 in the clockwise direction. When nozzle 4 is resting on hook 6, this pivoted hook member moves downwardly as at 40 so that the upper face of member 6 clears the bottom of leg 34 and thus does not interfere with rotation of member 35 in the counterclockwise direction.

A shaft 41 is suitably journaled for rotation in the apparatus housing, and on the outer end of this shaft (outside of the apparatus housing) there is rigidly secured a pump switch operating lever 33, by means of which shaft 41 may be manually rotated. The outer end of shaft 41 is located equidistantly between the outer ends of hook members 5 and 6 (see FIG. 1). Lever 33 includes an elongated manually operable handle 33a which extends radially in one direction with respect to shaft 41, and a locking dog member 33b which extends radially with respect to shaft 41, in a direction diametrically opposite from handle 33a.

Near its inner end, shaft 41 is firmly secured (as by means of a collar 42 which is integral with or fixedly secured to member 35, at the corner or vertex of the "L," and which is pinned to shaft 41) to member 35, so that this member can be rotated, in one direction or the other (from the neutral position illustrated in FIG. 3, and corresponding to a "switch off" position), by manipulation of handle 33a (this, of course, assumes that member 35 is free to rotate at the time). Member 35 is thus rotatable about a horizontal axis determined by the center line of shaft 41.

The gasoline dispensing apparatus includes one or more pumping devices for pumping liquid fuel, as is conventional in such apparatus, and these devices are driven by means of one or more electric motors, which latter are controlled as to energization by means of a switch. The pump motor control switch (not shown) is operated by a rotatable shaft 43 to which is fastened a disk 44. One end of a link rod 45 is coupled eccentrically to disk 44 (e.g., by means of a pin and slot pivotal coupling), to enable rotation of shaft 43 in response to translational movement of the rod. In FIG. 3, the parts

are illustrated in the position corresponding to "motor off." From this position, movement of rod 45 in the general direction of arrow 46 will result in turning the pump motor "on," for the pumping of gasoline, by rotation of shaft 43 in the clockwise direction.

The other end of link rod 45 (opposite disk 44) is pivotally connected to the outer end of the outstanding leg 47 of member 35. In the neutral position of the parts illustrated in FIG. 3, the center lines of leg 47 and of rod 45 are collinear and extend substantially horizontally, while the center line of leg 34 extends substantially vertically.

The handle 33a of lever 33 extends substantially vertically when this lever is in the neutral position, as illustrated in FIGS. 1 and 3; it is possible to rotate this handle either clockwise or counterclockwise (through an acute angle) from this substantially vertical position, to turn the pump motor "on."

FIGS. 4 and 5 illustrate an operation of the dispensing apparatus wherein "lo lead" nozzle 4 has been removed from its hook 6 for use, and wherein the operating handle 33a has been rotated clockwise from its approximately vertical neutral position illustrated in FIGS. 1 and 3, to turn the pump motor "on." (How this turning-on is effected will be described later.) In the "on" position illustrated in FIGS. 4 and 5, the handle 33a obstructs entry of nozzle 4 into boot 2. As a result, the nozzle 4 cannot be returned to its rest position (on hook 6) until the handle 33a has been returned to its vertical or neutral position, to turn the pump motor "off."

Similarly, when "hi lead" nozzle 3 is removed from its hook 5 for use, the operating handle 33a may be rotated counterclockwise from its approximately vertical neutral position, to turn the pump motor "on." In this "on" position of the handle, the handle 33a would obstruct entry of nozzle 3 into boot 2, preventing the return of this nozzle to its rest position until the handle 33a is returned to its vertical or neutral position, to turn the pump motor "off."

The locking dog member 33b of lever 33 is so constructed and arranged that, when lever 33 is rotated from its neutral position, dog 33b will rotate into a position wherein it overlies a portion of the body of the unused nozzle, adjacent its hook, and thus prevents the vertical movement of this nozzle body which would be required to remove it from the boot 2. Thus, this locking dog 33b locks the unused nozzle on its hook (i.e., in its rest position) while the other nozzle is in use. This is illustrated, for example, in FIG. 4, wherein the dog 33b has been rotated into a position such as to prevent removal of the unused nozzle 3 from its hook 5. An analogous action takes place when nozzle 3 is being used; in this latter case, the dog 33b is rotated into a position such as to prevent removal of the unused nozzle 4 from its hook 6.

Refer again to FIG. 3. As previously described, when both nozzles 3 and 4 are off their respective hooks 5 and 6, rotation of member 35 in either direction is prevented, due to the blocking of rotary movement of this member by hook portions 5a and 6a. Since, as will become apparent hereinafter, the pump switch shaft 43 is rotated only in response to rotation of member 35, the pump motor cannot be turned "on" if both nozzles are off their respective supporting hooks.

Assume now that "lo lead" nozzle 4 is removed from

its hook 6 for use, as illustrated in FIGS. 4 and 5, "hi lead" nozzle 3 remaining in its rest position in boot 2, on its hook 5. Then, the pivoted hook member 5 remains in its "down" position (due to the weight of the nozzle 3), wherein the upper face of this member is below the bottom of leg 34. This permits member 35 to be rotated (by means of handle 33a and items 41 and 42) in the clockwise direction from neutral, about the center of shaft 41; this rotation of the handle 33a is illustrated in FIG. 4. When member 35 rotates in the clockwise direction (from the neutral position illustrated in FIG. 3, wherein leg 47 is substantially horizontally disposed), the free end of leg 47 moves in an arcuate path, upwardly and toward the right (viewed in FIG. 3). The link rod 45 then has a component of motion in the direction 46, rotating disk 44 and switch shaft 43 clockwise, turning the pump motor "on." From this "on" position, rotation of member 35 in the counterclockwise direction, back to its neutral position (by manual rotation of handle 33a back to its neutral position, wherein this handle extends substantially vertically, as in FIG. 1), causes rod 45 to move back toward the left, rotating disk 44 and shaft 43 counterclockwise and returning the pump motor to "off."

An action somewhat similar to the foregoing takes place when "hi lead" nozzle 3 is removed from its hook 5 for use, "lo lead" nozzle 4 remaining on its hook 6. The pivoted hook member 6 then remains in its "down" position, which permits member 35 to be rotated in the counterclockwise direction, from neutral, by means of handle 33a. When member 35 so rotates in the counterclockwise direction, the free end of leg 47 again moves in an arcuate path, but this time downwardly and to the right. Rod 45 again has a component of motion in the direction 46, rotating disk 44 and switch shaft 43 clockwise, turning the pump motor "on." From this latter "on" position, rotation of member 35 in the clockwise direction, back to its neutral position (by manual rotation of handle 33a back to neutral) causes rod 45 to move back toward the left, rotating disk 44 and shaft 43 counterclockwise and returning the pump motor to "off."

The invention claimed is:

1. In a dispensing apparatus adapted to dispense selected blends of first and second liquids or either liquid alone, a pair of dispensing nozzles, means for supplying only the first liquid to one of said nozzles, means for supplying both the first and second liquids to the other of said nozzles, and means operative upon removal of both nozzles from a rest position for locking said dispensing apparatus against operation, thereby to prevent utilization of both nozzles simultaneously.

2. In a dispensing apparatus adapted to dispense selected blends of first and second liquids or either liquid alone, a pair of dispensing nozzles, means for supplying only the first liquid to one of said nozzles, means for supplying both the first and second liquids to the other of said nozzles, pumping means for said liquids, manually operable means for causing energization of said pumping means, individual supports for supporting each of said nozzles in a rest position, and means operative upon removal of both nozzles from their supports for preventing operation of said manually operable means, thereby to lock out said pumping means.

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