C. L. FRENCH.

STORAGE APPARATUS FOR LIQUIDS.

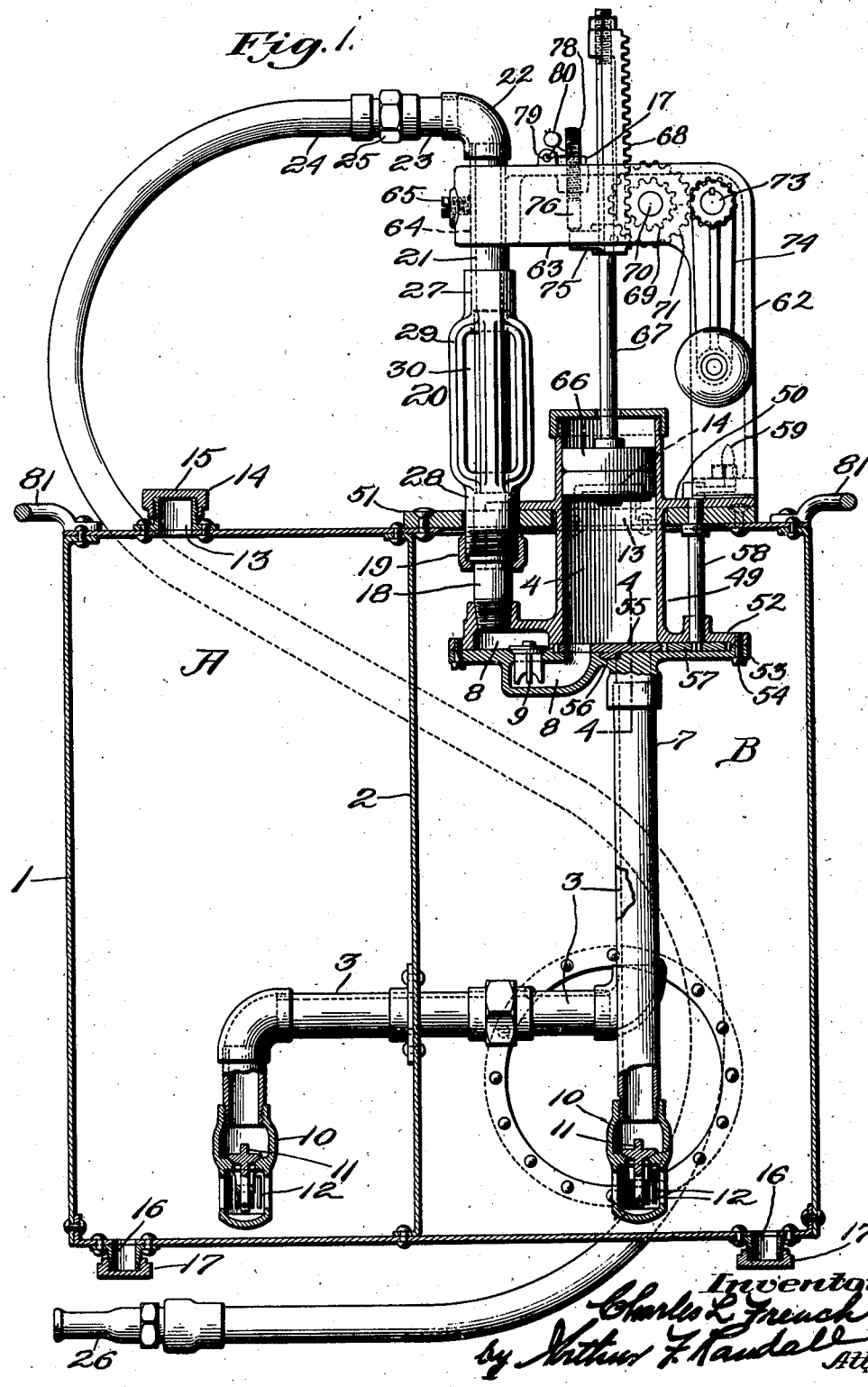
APPLICATION FILED NOV. 18, 1916.

1,327,990.

Patented Jan. 13, 1920.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor:
Charles L. French
by Arthur F. Randall
Atty

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3 SHEETS—SHEET 2.

Fig. 2.

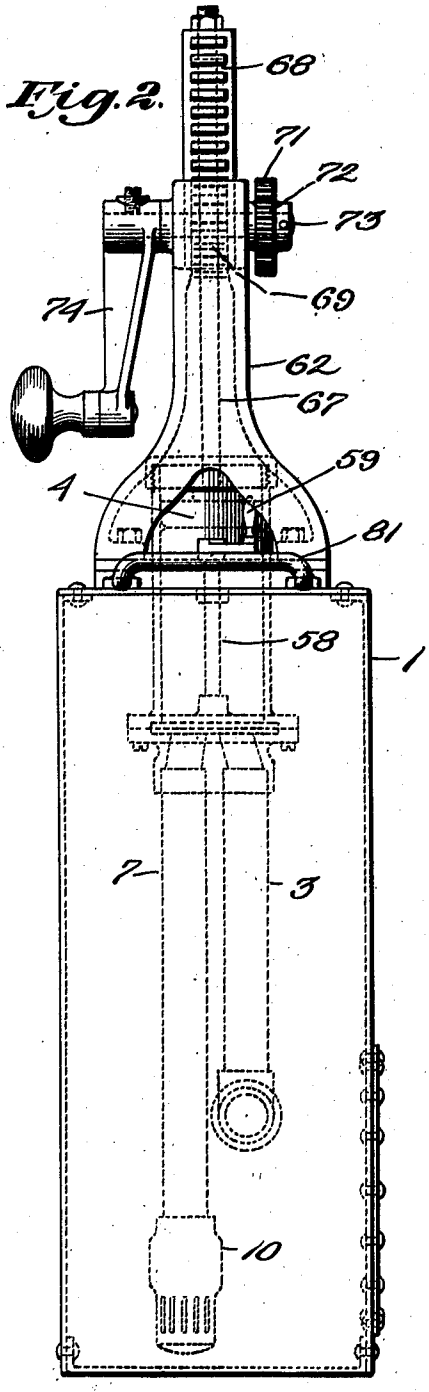


Fig. 3.

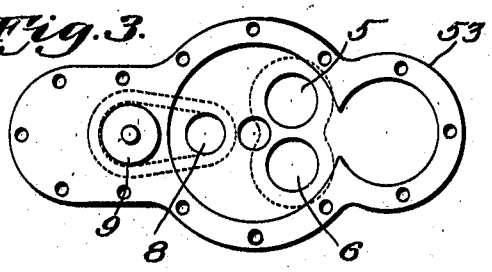


Fig. 4.

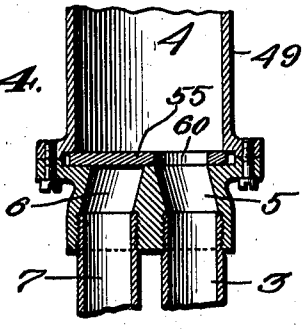


Fig. 5.

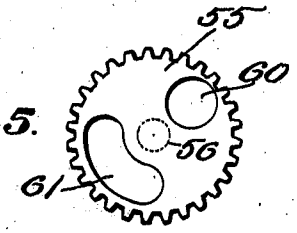
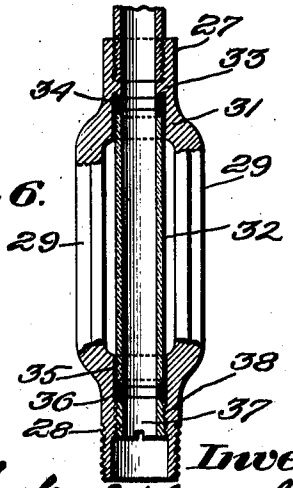


Fig. 6.



Inventor

Charles L. French

by Arthur F. Randall Atty

C. L. FRENCH.

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3 SHEETS—SHEET 3.

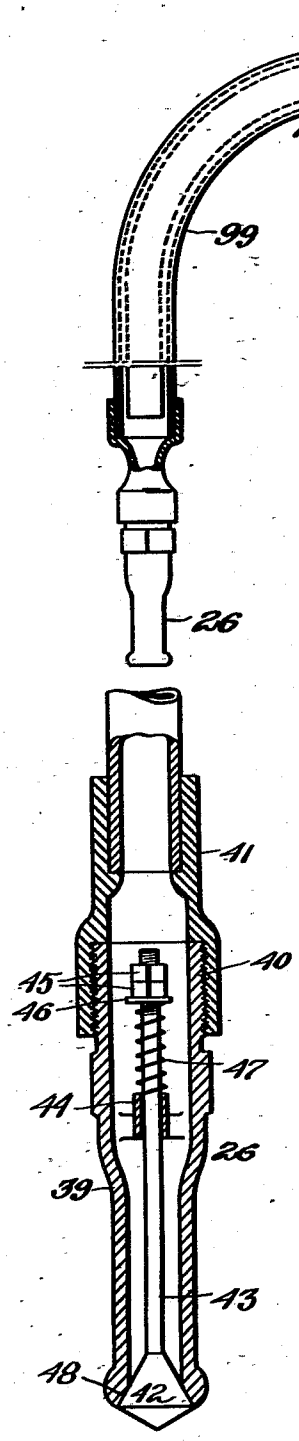


Fig. 7.

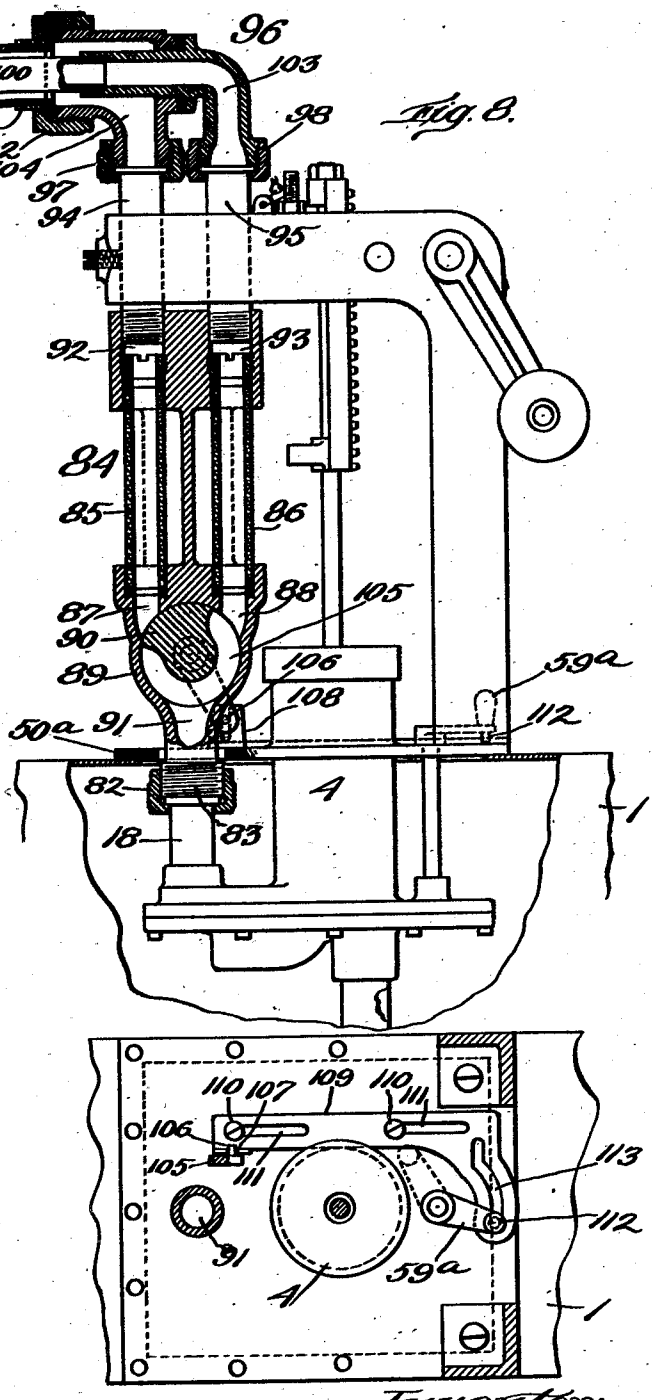


Fig. 8.

Fig. 9.

Inventor:
Charles L. French
by Arthur F. Randall
Atty

UNITED STATES PATENT OFFICE.

CHARLES L. FRENCH, OF CAMBRIDGE, MASSACHUSETTS.

STORAGE APPARATUS FOR LIQUIDS.

1,327,990. Specification of Letters Patent. Patented Jan. 13, 1920.

Application filed November 18, 1916. Serial No. 132,193.

To all whom it may concern:

Be it known that I, CHARLES L. FRENCH, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Storage Apparatus for Liquids, of which the following is a specification.

My invention relates to storage apparatus for liquids, particularly lubricating oils and the like.

In garages and other places where lubricating oils are stored in bulk and dispensed in small quantities it is practically the universal custom to store the oil in a tank from which it is pumped into a portable measure or other container as required. The top of a storage tank of this kind is usually constructed so that the measure may rest thereon while not in use and also while the oil is being pumped into it, and any oil overflowing from the measure, or dripping from the nozzle from which the oil is discharged by the pump is caught by said top and drains back into the storage tank from which it was pumped. It will thus be clear that such apparatus had the objectionable feature that any dust or other foreign matter deposited upon the top of the tank is washed down into the latter with the oil that drains back and that later this foreign matter is pumped up and delivered into the measure with the oil. Also, such apparatus was objectionable because at garages and the like it often happens that the person delivering oil to a customer will pour the contents of the measure into the engine and then place the measure, wet with oil, down on the ground while he replaces the filling cap and closes the hood of the car. Later when he picks the measure up and deposits it on the tank, the dirt and grit adhering to its bottom is deposited upon the top of the tank from which it is washed down into the supply of oil contained within the latter to be later pumped up with the oil and delivered into the crank case of some engine. Furthermore such apparatus was objectionable for the reason that the tank was a non-portable affair located usually in an out-of-the-way position, within the garage or the like and it was necessary to manually transport the measure from the tank to the car and back to the tank again which not only required an objectionable amount of time and labor, but also resulted in a wastage of oil through the spilling or dripping of oil from the measure both onto the ground and onto the car being supplied.

Another method of storing and handling lubricating oils, particularly at garages, was to employ a storage barrel provided with a faucet and to draw off oil into a hand measure as called for. This method was objectionable for the reason that oil was wasted through dripping from the faucet and because the open hand measures collected dust and grit which eventually mixed with the oil and found its way into the crank case of an engine.

My invention has for its object to obviate the objections pointed out above and to provide an improved storage apparatus for lubricating oils and the like. It is a further object of my invention to provide an apparatus of the character indicated from which a measured quantity of lubricating oil of either one of a plurality of kinds, may be delivered into an engine or other container, preferably by means of a single pump.

To these ends my invention consists of a storage apparatus for lubricating oils and the like embodying the peculiar features of construction and mode of operation set forth in the following description and particularly pointed out and defined in the claims at the close thereof.

In the accompanying drawings:

Figure 1 is an elevation, partly in section, of a storage apparatus for lubricating oils and the like, embodying one form of my invention;

Fig. 2 is a side elevation of the apparatus shown in Fig. 1;

Fig. 3 is a plan view of the lower section of the pump casing hereinafter described;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a plan view of the gear valves hereinafter described;

Fig. 6 is a longitudinal sectional view of the device hereinafter referred to as the "sight feed";

Fig. 7 is a longitudinal sectional view of the hose nozzle of the apparatus shown in Figs. 1 and 2;

Fig. 8 is a partial view of an apparatus embodying another form of my invention; and

Fig. 9 is a partial plan of the parts shown in Fig. 8.

Having reference to Figs. 1 to 7, inclu-

sive, of the drawings, 1 represents a sheet metal tank divided interiorly by a partition 2 so as to provide a compartment A for holding a supply of lubricating oil of relatively light grade and a compartment B for holding a supply of lubricating oil of relatively heavy grade.

Within the compartment A is arranged the inlet end of a supply pipe 3, said pipe extending laterally through the partition 2 and then upwardly to a pump 4 where its discharge end is connected with the inlet port 5 of said pump. The pump 4 is made with two inlet ports 5 and 6, the latter connecting with the upper end of a supply pipe 7 whose lower inlet end is arranged within the compartment B.

The pump 4 is also made with an outlet port 8 within which is arranged a check valve 9 that seats toward the pump 4.

To the lower end of each of the supply pipes 3 and 7 is attached a foot valve casing 10 containing a check valve 11 which opens toward pump 4. The lower or outer end of each casing 10 is closed and below the check valve 11 said casing is made with an annular series of longitudinal inlet slots or slits 12 which serve to strain the oil passing therethrough.

Each compartment A and B is provided at its upper end with a filling port 13 normally closed by a removable cap 14 which may, if necessary, be made with the usual vent port, and at its lower end with a drain port 16 normally closed by a removable cap 17.

The outlet 8 of pump 4 communicates with a flanged nipple 18 fastened by an interiorly threaded coupling member 19 to the lower exteriorly threaded end of a "sight feed" pipe fitting 20 which is interiorly threaded at its upper end to receive the exteriorly threaded end of a pipe 21. At its upper end the pipe 21 carries an elbow 22 from which projects a flanged nipple 23, similar to nipple 18, to which one end of a flexible metallic hose 24 is fastened by means of a coupling member 25. At its free end the hose 24 is provided with a nozzle 26.

The sight feed 20 comprises two tubular end portions 27 and 28 connected by integral longitudinal slats or bars 29 that are separated so as to leave longitudinal sight slots 30 between them. The tubular end portion 27, see Fig. 6, is interiorly threaded near its outer end to receive the threaded end of the pipe 21, and near its inner end is provided with a smooth bore 31 to receive the upper end of a tube 32 of transparent glass, an annular beveled shoulder or shelf 33 being provided upon the interior of said tubular portion at the inner end of the smooth bore 31. The adjacent end of the glass tube 32 is also beveled, but oppositely, and between said beveled end and the shoulder 33 is arranged a packing ring 34 of leather or other suitable material. The lower tubular portion 28 of sight feed 20 is formed near its upper end with a smooth bore 35 to receive the lower end of the tube 32 and another packing ring 36 which is crowded against the lower end of the glass tube 32 by a thimble 37 that is exteriorly threaded to engage threads 38 provided at the lower end of bore 35.

When the pump 4 is operated the oil discharged therefrom is forced upwardly through nipple 18, the glass tube 32, pipe 21 and nipple 23 into hose 24 from which it discharges through nozzle 26. As this discharge passes through the glass tube 32 its color and consistency can be observed by the person purchasing the oil. That is, he can see for himself that he is, or is not, getting the kind of oil he calls and pays for. I consider this sight feed pipe fitting an important independent feature of my invention, it being a new article of manufacture, whose utilitity is not confined to embodiment in a storage apparatus as herein shown. Another important independent feature of my invention resides in the construction of the nozzle 26, whose utility likewise, is not confined to embodiment in a storage apparatus as herein shown. This nozzle comprises a body 39 having its inlet end exteriorly threaded as at 40 to receive upon it the interiorly threaded end of a terminal 41 whose opposite end is mounted upon and soldered to the end of hose 24. At its discharge end and within the mouth thereof is a conical inwardly closing check valve 42 having a stem 43 extending through a guide and spring abutment 44 provided upon the interior of body 39. The inner end of stem 43 is threaded to receive upon it a pair of nuts 45 between which and abutment 44 is arranged a light spring 47 which serves to yieldingly hold the check valve 42 on a seat 48 provided at the mouth of the nozzle. During the forcing stroke of pump 4 the oil is forced through nozzle 39, check valve 42 yielding outwardly under pressure from the oil. As soon as the forcing stroke of pump 4 terminates the spring 47 shoves valve 42 inwardly against its seat so that dripping from the interior of the hose or nozzle is wholly prevented. Thus, not only is wastage of oil prevented, but at the completion of the operation of supplying lubricating oil to the crank case of an automobile engine, the fender and running board of the car are not splashed or soiled with oil as the free end of the hose is removed from the car. Heretofore, when using a hand measure it was almost invariably necessary to wipe drippings off from the car after the filling operation.

The arrangement of the valve 42 immediately at the discharge end of nozzle 26 also

has the important advantage of excluding dust and dirt from the oil passage or port.

The cylinder 49 of pump 4 is cast with an integral flange 50 near its upper end which rests upon and is secured to a bed plate 51 fastened by rivets to the top wall of tank 1. At its lower end the cylinder 49 is cast with an integral flange 52 to which a lower pump section 53 is fastened by screws 54. Between the lower end of cylinder 49 and section 53 is a rotatable valve 55 herein shown as a gear formed upon its under side with a centrally disposed trunnion 56 journaled in a bearing provided in section 53. This gear valve 55 meshes with a pinion 57 having a square hole at its center which receives the square lower end of a vertical shaft 58 journaled in bearings provided on flanges 50 and 52. The upper end of shaft 58 projects above flange 50 and has fixed thereto a handle 59 by means of which shaft 58 can be manually rotated. The engagement of this handle with suitable stops when swung in either direction limits the turning movement of shaft 58 in either direction. The three ports, 5, 6 and 8, open into cylinder 49 immediately below the gear valve 55 and the latter is made with two ports 60 and 61 extending therethrough, the port 60 coöperating with the two inlet ports 5 and 6 and the port 61 coöperating with the outlet port 8. When the handle 59 occupies a position at the limit of its movement in either direction the port 60 registers with one of the inlet ports 5 or 6 while the adjacent portion of the gear valve completely closes the other of said pair of ports so that the suction stroke of the pump lifts oil from only one of the compartments A or B. The outlet ends of the two ports 5 and 6 are disposed close together so that when desired the port 60 may be placed in an intermediate position to maintain both ports 5 and 6 partially open so that the suction stroke of pump 4 lifts oil from both compartments A and B simultaneously in proportions determined by the selected position of gear valve 55. Thus with only two sources of supply, viz., the contents of compartments A and B, a customer may be served either with light oil, heavy oil, or oil of any selected intermediate grade.

When the handle 59 is swung from one extreme position to the opposite, its movement acts through shaft 58, and pinion 57 to rotate gear valve 55 an angular distance equal to the angular distance between the centers of inlet ports 5 and 6 and the engagement of handle 59 with its stops serves to position the port 60 in register with one or the other of said inlet ports. The port 61 of gear valve 55 is of accurate form and of such angular length as to always maintain the outlet 8 open.

Secured to the top of flange 50 is a post 62 made with a laterally extending arm 63 provided near its ends with a vertical opening 64 through which the pipe 21 extends, said arm being rigidly fastened to said pipe by means of a set screw 65.

The pump cylinder 49 contains a double acting piston 66 secured to the lower end of a piston rod 67 to the upper end of which is rigidly secured a rack 68. The rack 68 extends through an opening provided vertically through the arm 63 and is guided in its vertical movement by the sides of this opening. Mounted within the arm 63 is a pinion 69 in mesh with rack 68, said pinion being fixed on a shaft 70 carrying at its rear end a gear 71 located outside of arm 63. The gear 71 is driven by a pinion 72 fastened on the rear end of a shaft 73 which has fixed to its forward end a crank handle 74. By means of crank handle 74 and the train of gears connecting it with the rack, the piston 66 may be forcibly raised and lowered. During each up stroke of piston 66 check valve 9 closes and oil is drawn through one or the other, or both, of the ports 5 and 6 into cylinder 49, and during each down stroke of the piston the oil thus drawn into the cylinder is forced past check valve 9 through sight feed 20 and hose 24, the check valves 11 of the foot valves 10 preventing the passage of the oil back down through pipes 3 and 7.

During each suction stroke of piston 66 the check valve 42 coöperates with check valve 9 in preventing back flow through outlet 8, and as will be clear the check valve 9 is not wholly essential when the nozzle 39 provided with a check valve 42 is used.

The pump 4 herein shown is a measuring pump, that is, each forcing stroke delivers a measured volume of oil, and in order to meet the requirements under which such pumps are permitted to be used it is necessary to so construct it that its delivery may be accurately adjusted and sealed. To this end the rack 68 is made with a lug 75 which by engagement with the end of a stop screw 76 limits the upward movement of the piston, the downward movement of the piston being limited by the engagement of the latter with the gear valve at the lower end of the cylinder 49. The screw 76 is mounted in the arm 63 with provision before sealing for adjustment in a direction parallel with the direction of movement of the piston 66, and is provided with a lock nut 77. For sealing I provide the upper end of screw 76 with a plurality of transverse perforations 78 and after the screw 76 has been accurately positioned the lock nut 77 is tightened and then a wire is passed through one of the perforations of the screw and through a perforated lug 79 integral with arm 63, the ends of said wire being permanently fastened together by a seal 80.

The apparatus described above is designed particularly for use as an attachment to a portable gasolene tank such as is shown and described in my application No. 78,829, filed February 17, 1916, said tank being of a type that is in common use at garages and like places. To adapt my present apparatus for attachment to a tank of this kind I provide, at each end of the top of tank 1 a handle 81 which projects beyond the side thereof, and to attach the present apparatus to the portable tank referred to the tank 1 is lowered within one of the bail-shaped handle bars of the portable tank where it will be supported by the handles 81 resting on the side bars of the bail-shaped handle. When the tank 1 is in this position, or when otherwise placed so that the level of its contents is at times above the nozzle 26, the spring 47 will prevent automatic siphoning of the oil out of tank 1.

In the form of my invention shown in Figs. 8 and 9 the flanged outlet nipple 18 of pump 4 is connected by a coupling 82 with the exteriorly threaded lower end 83 of a double sight feed fitting 84 comprising two transparent glass tubes 85 and 86. The lower ends of said tubes are connected, respectively, by ports 87 and 88 with a valve chamber 89 within which is mounted a rotatable valve 90. A port 91 leading from valve chamber 89 through the lower exteriorly threaded portion 83 communicates at its lower end with nipple 18. At their upper ends the glass tubes 85 and 86 communicate, respectively, with ports 92 and 93 into the upper ends of which are screwed two flanged nipples 94 and 95. The flanged upper ends of the nipples 94 and 95 are fastened to a pipe fitting 96 by coupling members 97 and 98. To this pipe fitting 96 are also fastened the ends of two flexible hose 99 and 100, the end of the hose 99 having a flanged member 101 permanently secured thereto which is clamped to fitting 96 by a coupling 102, while the end of hose 100 is permanently soldered or sweated within the end of a conduit 103 communicating at its opposite end with nipple 95. The nipple 94 communicates through a conduit 104 with the anchored end of hose 99, the free end of said hose being equipped with a nozzle 26 like that shown in Fig. 7 and described above.

When the parts of the apparatus are being assembled the hose 100 is threaded into the hose 99 and when the two hose are in place the free end of hose 99 terminates just back of nozzle 26.

The stem of valve 90 has an arm 105 fastened thereto carrying a pin 106 occupying a slot 107 provided in a lug 108 projecting from a slide 109. The slide 109 is fastened to the top of pump flange 50^a with provision for limited movement thereon by two screws 110 extending through slots 111 provided in said slide.

The grade selecting handle 59^a of the apparatus shown in Fig. 8 is provided with a stud 112 extending downwardly into a slot 113 formed in slide 109 and when said handle is swung from its full line position to its dotted line position, or vice-versa, said stud acts against the side of slot 113 to shift slide 109 endwise on flange 50^a to the limit of slots 111, and said slide acts through lug 108, pin 106 and arm 105 to reverse the position of valve 90.

When the valve 90 occupies the position shown in Fig. 8 the port 87 leading to the glass tube 85 and hose 99 is closed to the discharge and port 88 leading to glass tube 86 and hose 100 is open to said discharge. When handle 59^a is swung into the position indicated by dotted lines and valve 90 is reversed port 87 leading to tube 85 and hose 99 is opened to the discharge and port 88 closed.

When, with the apparatus shown in Figs. 1 and 2, the handle 59 is reversed to shift the inlet of the pump 4 from one grade of oil to the other, say from heavy to light, there remains in hose 24, sight feed 20 and outlet 8 a quantity of heavy oil that is discharged from the hose with the light oil desired. This however will not in all cases, be objectionable for the reason that in practice the combined volumetric capacities of hose 24, sight feed 20 and outlet 8 is very small compared with the measured volume delivered by pump 4.

In the form shown in Figs. 8 and 9, however, a separate delivery conduit and hose is provided for each grade of oil and there is practically no mixing of the two, the volume left in nozzle 26 and that portion of the outlet between valve 90 and pump 4 being negligible.

There is in common use at the present time what is known as a curb apparatus for delivering gasolene to automobiles, said apparatus being commonly located on the sidewalk in front of a garage and near the curb so that automobiles can be supplied without requiring their entering the garage. Such apparatus is necessarily made so as to occupy as little space as possible and heretofore have been constructed so as to provide only for delivering gasolene. The compactness and peculiar construction and mode of operation of the pumping and delivery devices of the lubricating oil apparatus above described make is especially adaptable as an addition to a gasolene curb apparatus of the kind referred to, and the addition of a lubricating oil supplying apparatus thereto is very desirable for the reason that a gasolene purchaser usually replenishes his supply of lubricating oil at the same time that he re-

plenishes his supply of gasolene. The methods heretofore employed required the garage man to make a special trip to and from the garage and to use an open measure such as referred to above. By the addition of an apparatus such as herein shown and described a measured quantity of lubricating oil can be quickly pumped directly into the crank case of the automobile engine.

Frequently with curb apparatus of the character referred to, there are several cars in line waiting to be supplied, and sometimes the operator of a waiting car will become impatient at the delay occasioned by serving a preceding car with lubricating oil and drive off to another station so that the dealer loses a customer. With my apparatus incorporated in the curb apparatus a customer may be quickly served without keeping others waiting as long as has heretofore been necessary.

By delivering the lubricating oil directly from a hose into the crank case of an automobile it is kept free and clear from dust, grit and water which finds its way into the oil when open measures are used, particularly in stormy weather. Moreover, the purchaser has heretofore had to rely upon the honesty or care of the garage man to secure the kind and quantity of oil ordered, whereas with my apparatus the oil is delivered in accurately measured quantity within view of the purchaser and the latter can see through the sight feed whether or not he is getting the oil he orders. The purchaser will have reasonable confidence in making his purchase from an officially sealed pumping apparatus bearing in effect the seal, or in fact the trade mark, of a standard oil of recognized high quality, so that the substitution of another inferior oil in said apparatus would render the dealer liable for damages.

Lubricating oils are comparatively heavy and flow slowly, particularly in cold weather, and when using open measures the purchaser does not get full measure as a rule for the reason that the garage man invariably does not wait for the measure to completely drain. By having the complete measured volume delivered under pressure as with my apparatus this objectionable feature is obviated.

More or less of the contents of the measure is also lost through spilling and drippings, both of which are avoided by the use of a hose provided with a nozzle such as described above.

Furthermore, with my apparatus the floor or ground is not soiled by drippings and spilling as with open measures.

What I claim is:—

1. An apparatus for storing and delivering lubricating oils and the like having, in combination, a pump; a plurality of reservoirs for holding oils or the like of different kinds; supply conduits connecting said pump with the reservoirs; delivery conduits connected with said pump, and means for selectively controlling said supply and delivery conduits.

2. An apparatus for storing and delivering lubricating oils and the like, having in combination, a measuring pump; two reservoirs for holding oils or the like of different kinds; supply conduits connecting said pump with said reservoirs; means through which said supply conduits are selectively controlled so that oil may be pumped from either reservoir to the exclusion of the other or simultaneously from both reservoirs in definite proportions, and two flexible delivery hose connected with said pump, one of said hose being arranged within the other.

3. An apparatus for storing and delivering lubricating oils and the like having in combination, a measuring pump; two reservoirs for holding oils or the like of different kinds; supply conduits connecting said pump with said reservoirs; means through which said supply conduits are selectively controlled so that oil may be pumped from either reservoir to the exclusion of the other or simultaneously from both reservoirs in definite proportions; two flexible delivery hose connected with said pump one of which is arranged within the other; a nozzle secured to the delivery end of the outside hose having an outwardly opening check valve seated within the mouth of its port, and a spring for holding said valve normally closed.

4. An apparatus for storing and delivering lubricating oils and the like having in combination, a measuring pump; two reservoirs for holding oils or the like of different kinds; supply conduits connecting said pump with said reservoirs, means through which said supply conduits are selectively controlled so that oil may be pumped from either reservoir to the exclusion of the other or simultaneously from both reservoirs in definite proportions; two separate delivery conduits connected with said pump, one for each kind of oil, and means for controlling said delivery conduits according to the kind of oil being pumped.

5. An apparatus for storing and delivering lubricating oils and the like, having in combination, a measuring pump; two reservoirs for holding oils or the like of different kinds, supply conduits connecting said pump with said reservoirs; means through which said supply conduits are selectively controlled so that oil may be pumped from either reservoir to the exclusion of the other or simultaneously from both reservoirs in definite proportions, said means including a manually adjustable control member; two

separate delivery conduits connected with said pump, one for each kind of oil; and means connected with said control member for controlling said delivery conduits so as to open and close them to the discharge from said pump in accordance with the kind of oil being pumped.

6. A sight feed for apparatus of the character indicated comprising a body having provision at one end for attachment to a single conduit and provision at its opposite end for attachment to two conduits; conduits extending through said body each made up in part of a glass tube that is exposed to view from the exterior, and means for controlling said conduits so that they can be opened and closed to the discharge from a pump.

In testimony whereof I have affixed my signature.

CHARLES L. FRENCH.