Dec. 5, 1933. E. W. DAVIS 1,938,174

DISPENSING APPARATUS

Filed Feb. 20, 1932 2 Sheets-Sheet 1

Fig. 2

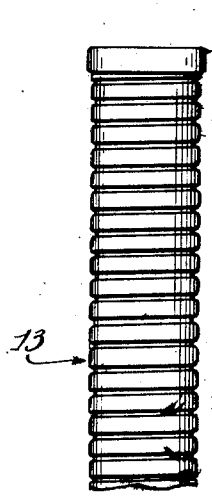


Fig. 1

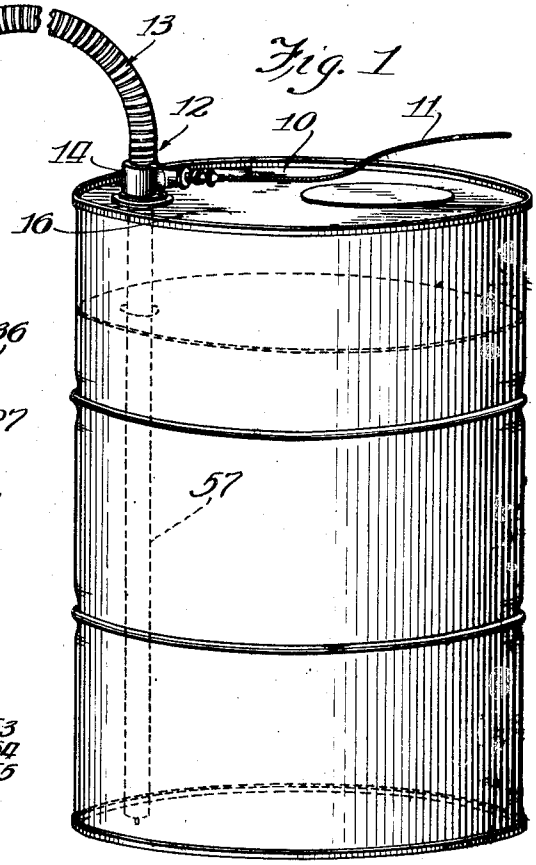
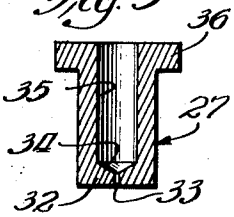


Fig. 5



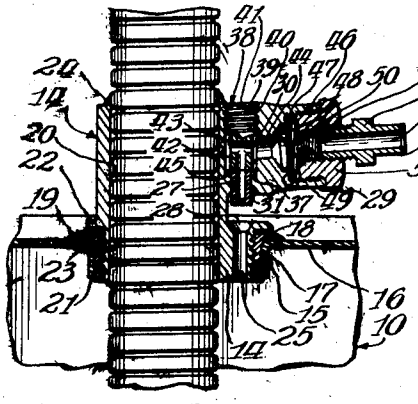
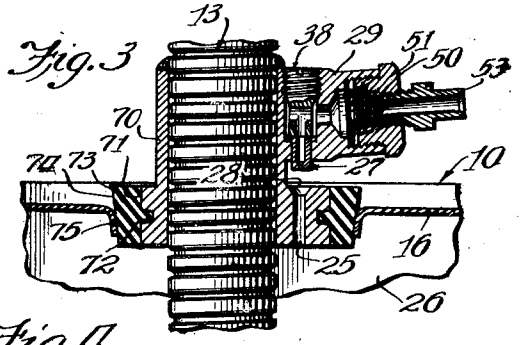


Fig. 3



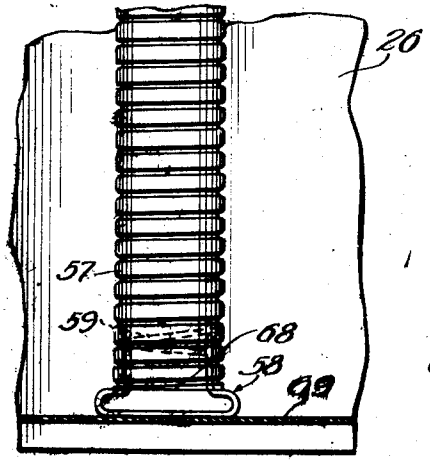
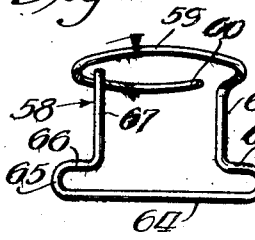


Fig. 4



Inventor:
Ernest W. Davis
By Williamson, Bradbury, McCall & Kimble
Attys

Dec. 5, 1933. E. W. DAVIS 1,938,174

DISPENSING APPARATUS

Filed Feb. 20, 1932 2 Sheets-Sheet 2

Fig. 7

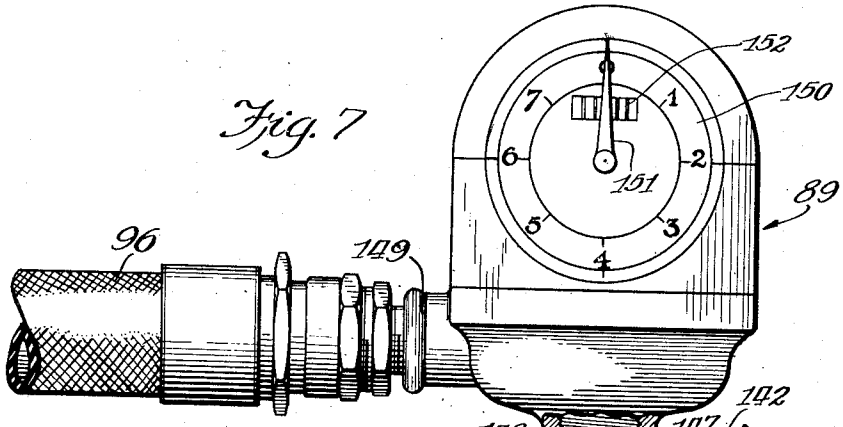
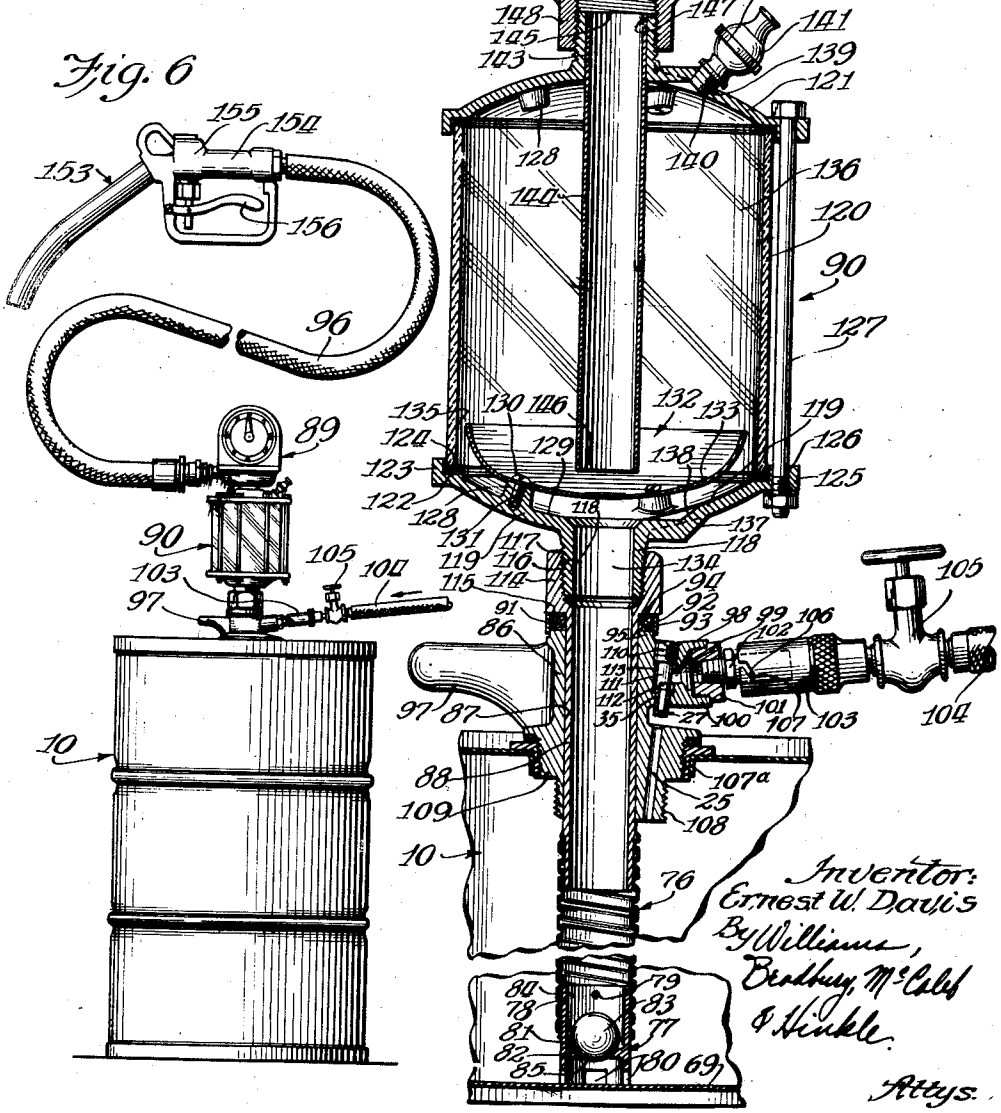


Fig. 6



Inventor:
Ernest W. Davis
By Williams, Bradbury, McCaleb & Hinkle.
Attys.

Patented Dec. 5, 1933

1,938,174

UNITED STATES PATENT OFFICE

1,938,174

DISPENSING APPARATUS

Ernest W. Davis, Oak Park, Ill., assignor to Alemite Corporation, Chicago, Ill., a corporation of Delaware

Application February 20, 1932. Serial No. 594,179

10 Claims. (Cl. 221—74)

The present invention relates to dispensing apparatus, and is particularly concerned with dispensing apparatus adapted to be used with a source of air pressure for dispensing lubricant or other liquids from drums or other receptacles utilized for storage or shipment of the commodity.

One of the objects of the invention is the provision of an improved method of dispensing liquids from drums or other containers by means of compressed air or the like, which method is not attended by any danger on account of the pressures generated in the drum or other container. The drums or containers usually employed for shipment or storage of lubricating oil or fuel oils are not capable of withstanding the pressures to which they would be subjected if the usual air line were connected directly to the drum to force the liquid out by air pressure. The pressures which would be generated in the drum would probably break the drum and result in serious injury.

Another object of the invention is the provision of an improved device adapted to be used for transferring oil from a standard drum to a highboy or other receptacle by the use of compressed air in a minimum amount of time and with absolute safety.

Heretofore this operation has been performed with a hand pump, which necessitated prolonged and strenuous exertion, with frequent periods of rest, and the time required to empty a drum was well over an hour, or perhaps considerably longer, depending upon the endurance of the operator.

The present pneumatic transfer is capable of emptying a full sized drum in a little over three minutes, with no exertion on the part of the operator and with very little air consumption.

Another object of the invention is the provision of a pneumatic liquid transferring device of the class described, which is adapted to be used with compressed air and which is so constructed as to definitely limit the pressure in the drum so that there will be no danger of bursting the drum.

Another object of the invention is the provision of an improved dispensing apparatus of the class described, which is adapted to effect a substantially complete discharge of the liquid from the container and which is adjustable so that it may be used in containers of different sizes to effect a complete discharge.

Another object of the invention is the provision of an improved dispensing apparatus of the class described, which is adapted to be used for the measurement and dispensing of the liquid in the drum so that the device may be used in the selling of the oil or other liquid as well as the transfer from one receptacle to another.

Another object of the invention is the provision of an improved device of the class described, which is sturdy, efficient, economical, and capable of performing its functions for a long period of time without any necessity for repair or adjustment.

Another object of the invention is the provision of a simplified form of the dispensing device which may be so economically manufactured that it may be placed within the reach of a vast number of users, and may also be furnished gratis to a user with the purchase of a predetermined amount of lubricant or other commodity.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the drawings, of which there are two sheets,

Fig. 1 is a front elevational view of a drum equipped with one of the simpler types of dispensing apparatus constructed according to the present invention;

Fig. 2 is a fragmentary sectional view with the drum in section and with parts of the apparatus in section on a line determined by the axis of the discharge conduit, showing the construction of the parts of the dispensing apparatus of Fig. 1;

Fig. 3 is a fragmentary view of a portion of a modified form of dispensing apparatus utilizing a different form of connection between the conduit and container;

Fig. 4 is an elevational view of a spring spacer for use on the inner end of the conduit to prevent the conduit from being closed by flat engagement with the bottom of the container;

Fig. 5 is an enlarged sectional view of the nozzle;

Fig. 6 is an elevational view of another modification, which is the preferred form of the invention, having an indicator for indicating the flow of the liquid and permitting the separation of air bubbles from the liquid, and having a meter for measuring the amount of oil or other liquid dispensed by the device; and

Fig. 7 is a larger fragmentary sectional view, the section being taken on a plane determined by the axis of the discharge conduit, showing the details of construction of the device of Fig. 6.

Referring to Figs. 1 to 4, the simpler type of installation preferably includes a standard metal drum 10 or other closed container, a source of air under pressure connected to the hose 11 and the dispensing apparatus, which is indicated in its entirety by the numeral 12. The dispensing apparatus 12 preferably includes a flexible conduit 13, which may consist of a piece of hose of predetermined length or any flexible tube capable of conveying or transferring the liquid.

In the embodiment of Figs. 1 to 4, the conduit 13 consists of a piece of spiral metal conduit or tubing packed with asbestos. This tubing has the property of flexibility, and to a limited extent is extensible and capable of being made slightly longer or shorter by pulling or pushing on the conduit. The metal conduit 13 is preferably carried by a fitting 14, which is adapted to provide a fluid-tight connection between the conduit and the drum 10.

The drums are customarily provided with a threaded aperture 15, which is closed by a complementary plug. The head 16 of the drum has an aperture bordered by an inwardly extending annular flange 17, which is provided with a metal fitting 18 having a threaded bore 15. The metal fitting 18 is welded to the head of the drum at 19 so as to provide a permanent and fluid-tight joint.

The fitting 14 is provided with an axially extending bore 20 of sufficient size to receive the flexible metal conduit 13. The lower end of the fitting 14 is provided with threads 21 complementary to the threads of the bore 15 and similar in size to the usual plug for the drum.

The fitting is also provided with a radially extending annular flange 22, which is adapted to compress a packing 23 against the usual bung fitting 18 in the drum 10. At the upper end of the fitting 14 the flexible metal conduit 13 is preferably welded to the fitting 14, as shown at 24, to provide a fluid-tight joint at this point. The bore 20 extending through the fitting 14 is preferably located eccentrically with respect to the body of the plug or fitting 14 so as to leave a space at one side of the conduit 13 for the aperture or bore 25. The bore 25 provides communication between the open air outside of the drum and the interior 26 of the drum and is utilized with an air jet from nozzle 27 to produce a predetermined air pressure in the drum. The bore 25 is preferably provided with a tapered portion 28 at its upper end for directing air into the bore 25 and permitting the more efficient use of the jet from nozzle 27.

The metal fitting 14 is preferably provided at one side with a laterally projecting portion 29, which is adapted to enclose a conduit leading from the air hose 11 and to provide a support for the nozzle 27 and associated parts. The lug 29 is formed with a transversely extending bore 30, the axis of which is in substantial alignment with the axis of the orifice 25. At its lower end the bore 30 communicates with a smaller bore 31, which is adapted to receive the nozzle 27. The nozzle 27 may consist of a metal member preferably constructed of steel and of substantially cylindrical form adapted to fit in the smaller bore 31. The lower end of the cylindrical nozzle 27 is provided with an end wall 32 having the nozzle opening 33, which may consist of a very fine cylindrical bore adapted to discharge a minute jet of air at a high velocity. For example, the nozzle orifice 33 may be about 0.025 inches in diameter, being smaller than a pin hole. The nozzle orifice 33 is located substantially on the axis of the aperture in the fitting 14 so that it is adapted to discharge the jet of air at a high velocity into the larger opening, and it will be noted that the nozzle is spaced slightly from the opening 25 and from the frusto-conical portion 28.

The nozzle is preferably provided with a tapered or frusto-conical portion 34 leading to the nozzle opening 33 and with a substantially cylindrical bore 35 leading to the upper end of the nozzle. The nozzle is also provided with an annular radially extending flange 36, which is adapted to be seated upon the annular shoulder 37 at the lower end of bore 30.

The nozzle is preferably held in place by a screw plug 38 having an upper threaded portion 39, which is adapted to be threaded into the threaded portion 40 of bore 30. The plug 38 is preferably provided with a kerf 41 for receiving a screw driver or other tool and at its lower end it is provided with an axially extending bore 42 which communicates with the bore 35 in the nozzle. The bore 42 in the plug 38 communicates with a transverse bore 43 in the plug, the bores 42 and 43 in the plug constituting a conduit for providing communication between the nozzle 27 and the bore 44 which leads to the air line.

The lower end of the plug 38 is provided with a flat annular surface 45 adapted to engage the upper end of the nozzle to secure the nozzle in place. The plug 38 may also be constructed in other shapes adapted to engage the end of the nozzle 27 and to secure it in place without obstructing the flow of air from the bore 44 to the nozzle.

The laterally projecting lug 29 on the fitting 14 is also provided with an enlarged threaded bore 46 communicating with a smaller bore 47 and a tapered aperture 48 leads to the bore 44. Between the bores 46 and 47 there is an annular seat 49, against which is placed a fine metal screen 50 for protecting the air jet from particles of dirt that may be in the compressed air. The screen 50 is circular in shape and slightly larger than the bore 46 so that it may be retained in the bore 46 against the seat 49 by its engagement with the adjacent threads, the screen being pushed into place and held there by the threads.

The bore 46 is adapted to receive a reducing fitting 51 having a smaller threaded bore 52, which is provided with a threaded nipple 53 having an axially extending bore 54 and a cylindrical portion 55 for engagement with the end of a hose. The hose may be secured on the cylindrical portion 55 with a standard hose clamp or a removable nipple may be utilized for engagement with a standard air chuck, but many different forms of air connections may be utilized.

The outer length of conduit 13 may be long enough to reach to an adjacent container, or it may be of considerable length, depending upon the uses to which the device is to be put. The outer end of the conduit is preferably finished with a metal ring 56 which protects the end of the flexible metal conduit and prevents the spiral parts of the conduit from being torn apart in use. The inner length 57 of the conduit 13 is preferably as long as the depth of the deepest drum or receptacle in which the device is to be used, since the conduit should extend to the bottom or lowermost part of the drum. This end of the conduit is preferably provided with a spring spacer, shown in Figs. 2 and 4, and indicated in its entirety by the numeral 58. The spring spacer 58 may consist of a resilient wire having a cir-

cular portion 59, the loose end 60 of which extends in such direction as to trail the rest of the wire when the wire spacer 58 is being threaded into the lower end of the spiral conduit 13. Thus the end 60 extends in a counterclockwise direction from the axially extending straight portion 61, and, if desired, it may be sharpened so as to engage the inner wall of the conduit.

The circular loop 59 is preferably slightly larger in diameter than the diameter of the spiral grooves which are formed inside of the flexible metal conduit 13 so that the loop 59 resiliently engages the inside of the conduit. The straight portion 61 extends axially of the circular loop 59 at one side and is provided with a laterally bent portion 62 and a downwardly extending curved portion 63. The wire spacer may be provided with a substantially straight bottom portion 64, a similar curved portion 65, an inwardly extending portion 66, and an upwardly extending end 67.

It will be evident that when the wire spacer 58 is assembled with a flexible metal conduit 13, as shown in Fig. 2, the circular loop 59 may be threaded into a spiral groove in the conduit. The trailing end 60 follows the loop without substantial interference with the rotation of the spring, and the spring may be threaded home to the position shown in Fig. 2. In this position the end of the conduit engages the outwardly extending portions 62, 66, and the open end 68 of the conduit is spaced from the bottom 69 of the drum 10 a distance which is equal to the distance between the portions 62—66 of the wire and the portion 64 of the wire. The open end 68 of the conduit can never come into flat engagement with the bottom 69 of the drum to effect a complete closure, and the end of the conduit is always maintained open so as not to interfere with the flow of the oil or other liquid into the conduit.

The inner length 57 of the conduit is preferably made long enough to extend to the bottom of a standard drum with which it is intended to be used, and a conduit of this type is naturally resilient and slightly extensible and contractible so that the wire 58 engages the bottom of the drum and causes the conduit to contract, if necessary, to adapt its length to the depth of the drum.

In smaller or shorter drums, the conduit may also curve after its end hits the bottom so that the length of the conduit is adapted to the drum automatically when the conduit is placed in the drum. The conduit does not curve so readily, however, as to permit the end to curve upward, and the conduit is stiff enough to maintain its end at the bottom of the drum at all times.

It should also be noted that the spring spacer 58 is adapted to be permanently retained in the end of the conduit at all times because the loose end 60 of the circular loop 59 tends to frictionally engage the inside of the conduit in such manner that it is difficult to rotate the spring in a counterclockwise direction. The spring 58 is thus easily threaded into the conduit, but only removed with difficulty or by intentionally prying the end 60 of the spring away from the wall of the tube.

Referring to Fig. 3, this is a modification in which the fitting for the apparatus is adapted to cooperate with a receptacle not having a threaded bore. In this embodiment, the fitting 70 may be provided with a lower cylindrical portion 71 having an annular groove 72. A rubber plug 73 has an inner surface complementary to the exterior of the fitting 70 and has a tapered or frusto-conical outer surface 74 adapted to effect a fluid tight wedging engagement with the smooth aperture 75 in the drum. The modification of Fig. 3 may be utilized with drums that do not have threaded bores or with wooden barrels or other receptacles which are not provided with threaded fittings. It will be evident, therefore, that various forms of fluid tight connections may be provided between the conduit and the receptacle.

Referring to Figs. 6 and 7, these figures illustrate a modification which is the preferred embodiment of the invention and which includes additional features over the simpler type of device already described. In this embodiment the dispensing apparatus is also preferably provided with a length of flexible metal conduit 76 inside the drum 10. The lower end of the metal conduit 76 may be provided with a valve fitting 77 of substantially tubular form. The upper cylindrical end 78 of the valve fitting may be secured in the flexible metal conduit 76 by welding, soldering or other convenient fastening means, such as a transverse pin 79. The lower end of the tubular valve fitting 77 is provided with a plurality of longitudinally extending slots or apertures 80 adapted to permit the liquid to flow into the valve fitting when the valve fitting engages the bottom 69. In between its ends, the valve fitting 77 is provided with an inwardly extending annular flange 81, which may be formed with a curved valve seat 82, which is substantially complementary to a portion of the ball 83. The ball 83 is adapted to fall into place against the seat 82 by gravity to close the lower end of the conduit 76 against back flow of the liquid, but the ball 83 may be lifted by the pressure of the liquid tending to flow upward in the conduit 76 so as to permit flow in one direction.

The transverse pin 79 is spaced sufficiently from the ball 83 to permit the ball to rise off its seat 82, and the pin may extend through the conduit 76 as well as the fitting, being provided with a head at one end and being riveted over at the other end. The ball 83 is, of course, slightly smaller than the bore 84 in valve fitting 77 so that the liquid may flow about and past the ball when the ball is lifted off the seat 82. In some embodiments of the invention a spring may supplement the action of gravity on the ball 83 in closing the opening 85 which is surrounded by seat 82.

In this embodiment the cast metal fitting 86 is preferably provided with an axially extending cylindrical bore 87 for rotatably receiving a metal tube 88, which is connected to the conduit 76 and which supports the meter 89 and indicator 90. The tubular metal member 88 may extend into the flexible metal conduit 76 at the lower end of the tube, and these elements may be secured together by welding or other permanent fastening devices. The upper end of the fitting 86 is provided with a substantially flat seat 91 for engaging a packing 92 of rubber or other suitable material, and the packing 92 may be surrounded by a sheet metal sleeve 93 having an inwardly extending flange 94 resting on the top of the packing.

The sleeve 93 may telescopically engage a complementary cylindrical portion 95 on the fitting 86 so that the weight of that portion of the apparatus carried by the tubular member 88 is brought to bear upon the packing 92. The packing 92 is confined between the tube 88, sleeve 93, seating surface 91, and the lower surface of flange 94, and provides a substantially fluid tight rotat-

ing connection between the tubular member 88 and the fitting 86.

The hose 96, meter 89 and indicator 90 may rotate freely with respect to fitting 86 and drum 10, thereby placing the hose in better position to dispense the liquid to any predetermined point and locating the meter so that it can always be read while manipulating the hose 96.

The present fitting 86 is provided with a laterally projecting handle lug 97 and a conduit lug 98, which may both be utilized in securing the fitting in the drum. The conduit lug 98 is similar in shape to the one previously described, and is provided with a screen 99 located in conduit 100. The reducing bushing 101 in this embodiment is provided with a pin fitting 102 of any standard type, but which preferably has a quickly removable connection to the coupler 103 carried by the end of the air hose 104.

An air valve 105 is also interposed between hose 104 and the coupler 103 so that the air pressure may be shut off at any time. The coupler 103 is provided with a bayonet slot 106 adapted to receive a transverse pin 107 carried by the pin fitting 102 and the coupler 103 may be provided with appropriate packing, or a cup leather, to effect a fluid tight connection with the pin fitting 102.

In this embodiment the nozzle 27 and the aligned aperture 25 in the fitting 86 may be substantially as described in the preceding embodiment. The bore 25 is substantially longer than the one previously shown for the reason that the fitting 86 is provided with two threaded portions 107^a and a smaller portion 108 so that the fitting 86 may be utilized with threaded bores of different sizes. The annular shoulder 109 between the threaded portions 107, 108 is adapted to engage the packing when the reduced threaded portion 108 is threaded into the fitting of the drum.

The nozzle retaining plug 110 of this embodiment is similar in construction to the one previously described, except for the fact that it is provided with a reduced cylindrical portion 111 and one or more slots 112 in its lower end. This forms an annular space in the bore 113 surrounding the reduced cylindrical portion 111 and communicating with bore 100, which also communicates with the bore 35 in the nozzle 27 through the slots 112.

This form of the apparatus may also be provided with the simple type of flexible discharge hose shown in Fig. 1, or merely with the hose 96 shown in Fig. 6, but it preferably includes the indicating apparatus 90 and meter 89, as shown in Fig. 1.

The upper end of the tube 88 is preferably provided with an enlarged hexagonal portion 114 and with an annular seat 115 adapted to rest upon the flange 97 of sleeve 93 which engages the packing 92. The hexagonal portion 114 is provided with a threaded bore 116 for receiving the complementary threaded end 117 of conduit 118 which is carried by the base 119 of the indicator 90. The tube 88 is thus placed in direct communication with the interior of the indicator 90 and is adapted to support the indicator 90, which carries the meter 89 at its upper end.

The indicator 90 may be formed of a cast metal base 119, a transparent or translucent cylindrical casing 120, and a cast metal cover plate 121. The base 119 and cover plate 121 are preferably constructed out of identical castings in order to effect standardization as far as possible and to eliminate the necessity for making two entirely different parts.

The base 119 comprises a slightly cupped cast metal member formed with a centrally located axially extending tubular conduit 118. The casting is substantially circular in plan and is provided with a substantially flat annular seating surface 122 and bordered by an axially extending cylindrical flange 123. The flange 123 is adapted to engage outside of the cylindrical glass casing 120, while the seating surface 122 may receive a packing 124 of rubber or other suitable material for engaging the open end of the glass 120. At regularly spaced points about the periphery of the base 119 it is provided with radially projecting lugs 125, each of sufficient size to be provided with an axially extending bore 126. Any number of lugs 125 and bores 126 may be provided for receiving the rods or bolts 127, but three or more rods are preferably employed, and the rods are preferably quite close together about the periphery of the glass to insure a fluid tight connection and a firm construction as well as to provide protection for the glass 120.

The casting for the base 119 is preferably provided with a plurality of inwardly projecting lugs 128 symmetrically located in the cupped formation 129 of the base for receiving screw bolts 130. The lugs 128 are provided with threaded bores 131 and are utilized for securing in place a baffle 132 which may also serve as a pan for collecting any sediment that may be deposited in the interior of indicator 90. The baffle 132 is, therefore, made of substantially cup shape with a rounded bottom 133, and the bottom 133 is secured to the base 119 by the screw bolts 130. The lugs 128 support the cup shaped baffle 132 in spaced relation to the inner surface of the base 119 so as to permit the flow of lubricant or other liquid out of the bore 134 in a radial direction underneath the baffle 133. The baffle 133 is of slightly less diameter than the inner diameter of the glass casing 120, providing an annular space 135 between the baffle and the glass to permit the liquid to flow upward into the indicator chamber 136.

It will be noted that the lugs 128 are also present on the casting which is utilized for the cover of the indicator 90, since the same casting may be utilized in both of these positions. The casting is also provided with a flat surface 137 on the outside of a flat portion 138 in the wall, which is adapted to be formed with a threaded bore 139. The bore 139 may receive the threaded end 140 of a valve or petcock 141, which is normally retained in closed position, but which may be opened by means of the thumb piece 142 to permit the escape of air bubbles which might accumulate in the upper part of the indicator chamber 136.

The bore 143 in the cover 121 is provided with a depending tubular member 144 which may have a fluid tight frictional fit in the bore 143. The tubular member 144 is open at its upper end 145 and at its lower end 146, the lower end preferably extending into the cup shaped baffle 132.

The path of flow of the oil or other liquid is so directed by the baffle 132 and other parts that the oil flows out from under the baffle at all sides against the glass wall 20 and upward into the chamber 136. Before the oil can pass

out of the indicator it must go down into the cup shaped baffle 132 and pass into the lower end 146 of tube 144. The flow of the oil or other liquid is thus visible in indicator 90 and the bubbles are brought to the top of the oil underneath cover 121 where they can be released by means of the valve 141 from time to time. The ball valve 83 prevents the oil from flowing back into the drum of container 10, and thus prevents the filling of the indicator and other parts of the discharge conduits by air. The presence of air might make the meter 89 give a false reading.

The upper tubular end 147 of the cover 121 is provided with threads for receiving the complementary tapped end 148 of the meter 89. The liquid flows into the meter at the point 145 and out through the outlet 149, which is connected by appropriate fittings, preferably detachable, to the hose 96.

The meter 89 may comprise any of a plurality of forms of liquid flow meters, but it is preferably provided with a dial 150 and a rotating pointer 151 for indicating the amount of liquid dispensed in terms of liquid measure. The meter is also preferably provided with a counter 152 for registering and indicating the total number of quarts or other units of liquid dispensed by the apparatus.

The hose 96 is preferably provided with a dispensing nozzle 153 of the type utilized for dispensing gasoline or oil, having a handle 154 with a valve 155 and a valve actuating member 156.

The operation of the apparatus described is as follows: The fitting 14 or 86 of the apparatus is secured in the drum or other container either by screw threads or some other fluid tight connection in such manner that the drum or other receptacle is closed except for the aperture 25, which is in registration with the jet issuing from nozzle 27. The inner end of the discharge conduit preferably extends to the lowermost part of the drum or receptacle. When the source of air under pressure is connected by hose 11 to the apparatus 12 the air passes in through the conduits 54, 44, 43, 42, 35 to the nozzle opening 33, and a very fine jet of air under high pressure is expelled from the nozzle 27. The jet discharges into the larger opening 25 and impinges upon the air in the opening 25 to drive the air into the drum 10. The discharge of air under high pressure through the jet carries additional atmospheric air with it and passes down through the opening 25 into the oil drum to create a limited pressure in the drum. It has been found that each cubic inch of air discharged through the air nozzle carries along with it approximately thirty-five cubic inches of free air, so that very little air is used in emptying the drum, and the present device is very economical in the consumption of compressed air.

The pressure in the drum will depend upon the proportions of the apertures 25 and 33 and the air pressure, and consequently the pressure in the drum can be predetermined for any particular air pressure. There is no danger in applying the high air pressure to the present apparatus for the reason that the drum is always in communication with the atmosphere through the opening 25 and the pressure generated in the drum never goes beyond a predetermined limit, which may be made relatively low. For example, with the relative proportions illustrated, a nozzle aperture of 0.025 inches and the larger orifice five thirty-seconds of an inch in diameter, the pressure produced in the oil drum is three and three fourths percent of the available air pressure applied to the apparatus through the air hose 11 so that with one hundred pounds of air pressure in the air line, for example, the pressure in the oil drum would be approximately three and three-quarters pounds. With one hundred and seventy-five pounds air pressure, which is the highest pressure recommended, the maximum air pressure in the drum would be about six and one-half pounds, or one-tenth of the ultimate bursting pressure of sixty-five pounds per square inch.

The discharge conduit is preferably made quite large in order to accomplish a relatively quick discharge of the oil from the drum with a low pressure in the drum due to increase in the air pressure which is caused by the jet, and the air carried with the jet is adapted to force the liquid out through the conduit 13 in a few minutes.

In the embodiment shown in Figs. 6 and 7, the operation of the device is substantially the same in principle, except that the liquid also passes through the indicator 90 and the meter 89 and at any time the flow of the liquid may be turned off by means of the valve 155.

The valve 155 is spring actuated and adapted to be closed when the handle 156 is released, and when the valve 155 is closed the dispensing apparatus is maintained full of oil or other liquid under pressure, and the pressure in the drum may be maintained by the nozzle 27 so that complete control may be had by means of the valve 155 for discharging any measured amount of liquid.

Ordinarily the valve 105 should be turned off also during the long intervals between successive dispensing operations, but when the device is being used successively to fill different containers or service cars one after another, the valve 105 may be kept in the open position, and the apparatus may be controlled by the valve 155.

It will thus be observed that I have invented an improved dispensing apparatus which may be utilized for emptying oil drums or other containers by means of compressed air or for dispensing liquid from drums or other containers in measured amounts. The present apparatus is economical in the consumption of compressed air and empties the container in a small fraction of the time usually required in the use of compressed air, according to the methods of the prior art. The pressure generated in the drum is kept well within the limits of safety, and the construction of the apparatus is such that it is sturdy, economical and capable of operation for a long period of time without repair or adjustment.

While I have illustrated and described a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim is new and desire to secure by Letters Patent of the United States, is:

1. In a dispensing apparatus the combination of a container with a discharge conduit having a fluid tight connection with the wall of the container and having its inner end immersed in the liquid in said container, said container having aperture, a removable air nozzle spaced from said aperture but in substantial registry therewith and adapted to impinge upon and entrain air through said aperture into said container to produce a limited pressure in said container and

force the liquid out through said conduit, and an apertured clamping screw to hold said nozzle in place.

2. In a dispensing apparatus the combination of a container with a discharge conduit having a fluid tight connection with the wall of the container and having its inner end immersed in the liquid in said container, said container having an aperture and an air nozzle spaced from said aperture but in substantial registry therewith and adapted to impinge upon and entrain air through said aperture into said container to produce a limited pressure in said container and force the liquid out through said conduit, said conduit having a flexible inner portion adapted to extend into the deepest part of said container and to bend to conform to the distance between said latter part and the wall of the container, to effect a full discharge of the liquid, and a spring wire spacer secured in the inner end of said conduit.

3. In a dispensing apparatus the combination of a container with a discharge conduit having a fluid tight connection with the wall of the container and having its inner end immersed in the liquid in said container, said container having an aperture, an air nozzle spaced from said aperture but in substantial registry therewith and adapted to impinge upon and entrain air through said aperture into said container to produce a limited pressure in said container and force the liquid out through said conduit, said conduit having a flexible inner portion adapted to extend into the deepest part of said container and to bend to conform to the distance between said latter part and the wall of the container, to effect a full discharge of the liquid, and spring wire means carried by the inner end of said conduit and projecting therefrom to prevent closure of the end of the conduit by engagement with the wall of the receptacle.

4. In a liquid discharging apparatus the combination of a closed container having a threaded bore with a conduit having a fitting with threads complementary to said threaded bore, said conduit passing through said fitting into said container, said fitting having an aperture, a nozzle for injecting a jet of gas under pressure into said aperture to force the liquid out through said conduit, a source of air under pressure connected to said nozzle, and a valve for controlling the supply of air to said nozzle.

5. In a liquid transfer apparatus, a supporting body provided with an aperture extending through the same, a conduit carried by said body and extending therethrough, and an air nozzle carried by said body in spaced relation to said aperture and adapted to project a jet of air under pressure into said aperture to increase the pressure in a receptacle and force liquid therefrom through said conduit.

6. In a liquid transfer apparatus, a supporting body provided with an aperture extending through the same, a conduit carried by said body and extending therethrough, and an air nozzle carried by said body in spaced relation to said aperture and adapted to project a jet of air under pressure into said aperture to increase the pressure in a receptacle and force liquid out of said conduit, said conduit being provided with means at its end for preventing sealing engagement between the conduit and the wall of receptacle.

7. In a dispensing apparatus, the combination of means for inducing a pressure in a container with a conduit extending from the interior of said container to the outside, said conduit comprising a portion of spiral flexible metallic conduit and a spacer spring comprising a wire member having a portion formed to space the end of said conduit from the container and having a circular loop adapted to be threaded into spiral grooves in said spiral conduit.

8. In an apparatus for dispensing liquid from drums or the like, the combination of a supporting fitting adapted to effect a fluid tight connection with the drum, said supporting fitting having an aperture through the same and an air nozzle adapted to project a jet of air into said nozzle to entrain air into said drum and produce a pressure therein, a conduit extending through said supporting fitting, and means for rotatably securing said conduit to said fitting.

9. In a dispensing device, the combination of a metal fitting having means for effecting a fluid tight connection with a container, a bore extending through said fitting, a supporting tube rotatably mounted in said bore, a conduit carried by the end of said tube and adapted to be immersed in liquid in said container, said fitting having an aperture providing communication between the interior and exterior of said container, a nozzle carried by said fitting and adapted to project a jet of air under pressure into said aperture to entrain air into said container and produce pressure in said drum, and an auxiliary conduit communicating with the upper end of said tube and adapted to be used for directing the flow of liquid to a predetermined point.

10. In a liquid transfer apparatus, the combination of a metal body having a conduit extending through the same, means carried by said body for effecting a fluid tight connection with a drum or other container, said body having a transverse aperture, and said body having a laterally projecting lug in spaced relation to said aperture, said lug having a bore and a counterbore in substantial registry with said aperture, a nozzle having its body in said bore and having a securing flange in said counterbore, said nozzle being adapted to project a jet of air under pressure into said aperture to entrain air into said container and produce pressure in said container to discharge liquid through said conduit, and threaded means engaging said attaching flange on said nozzle and securing said nozzle in said bore.

ERNEST W. DAVIS.