July 26, 1949. J. D. GRAY 2,477,450

PORTABLE OIL CHANGER

Filed Dec. 15, 1948 3 Sheets-Sheet 1

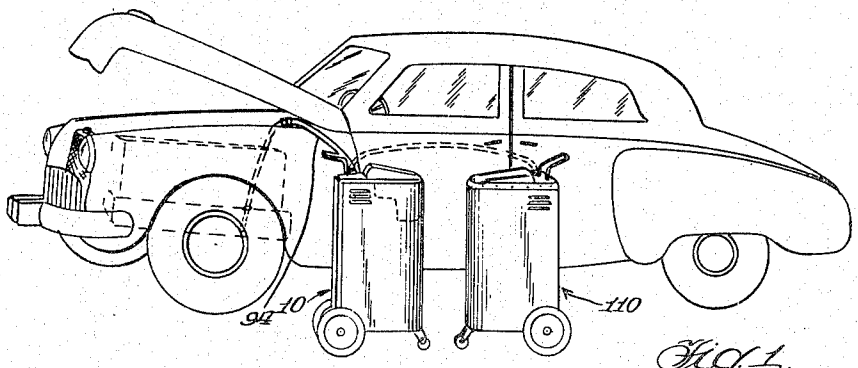


Fig. 1.

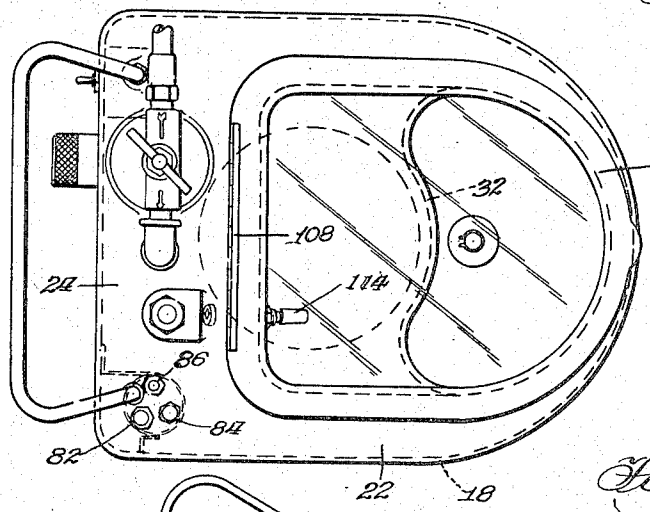


Fig. 4.

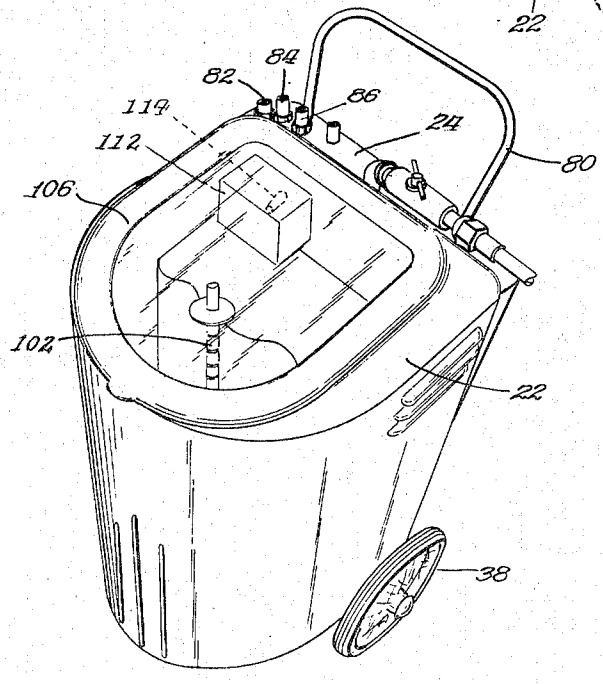


Fig. 5.

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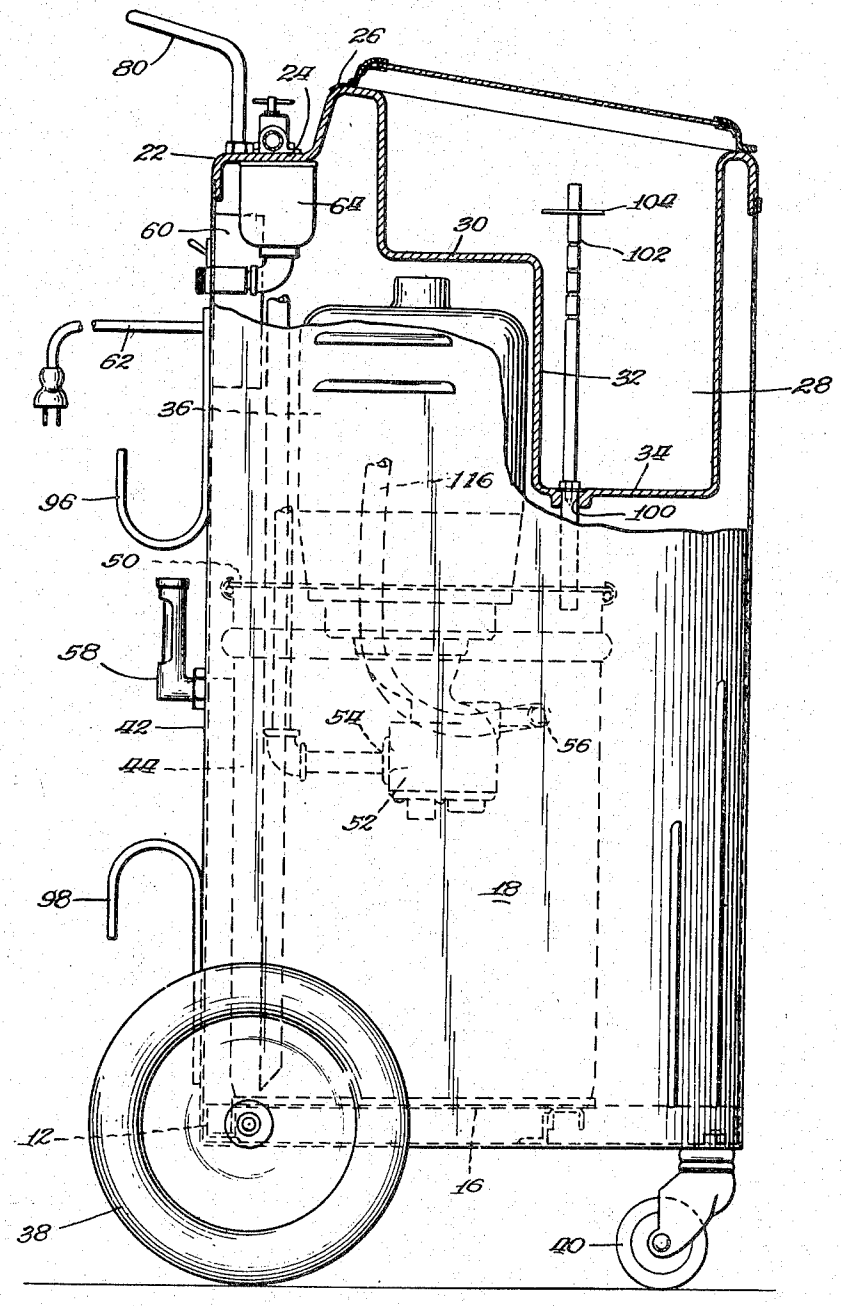


Fig. 2.

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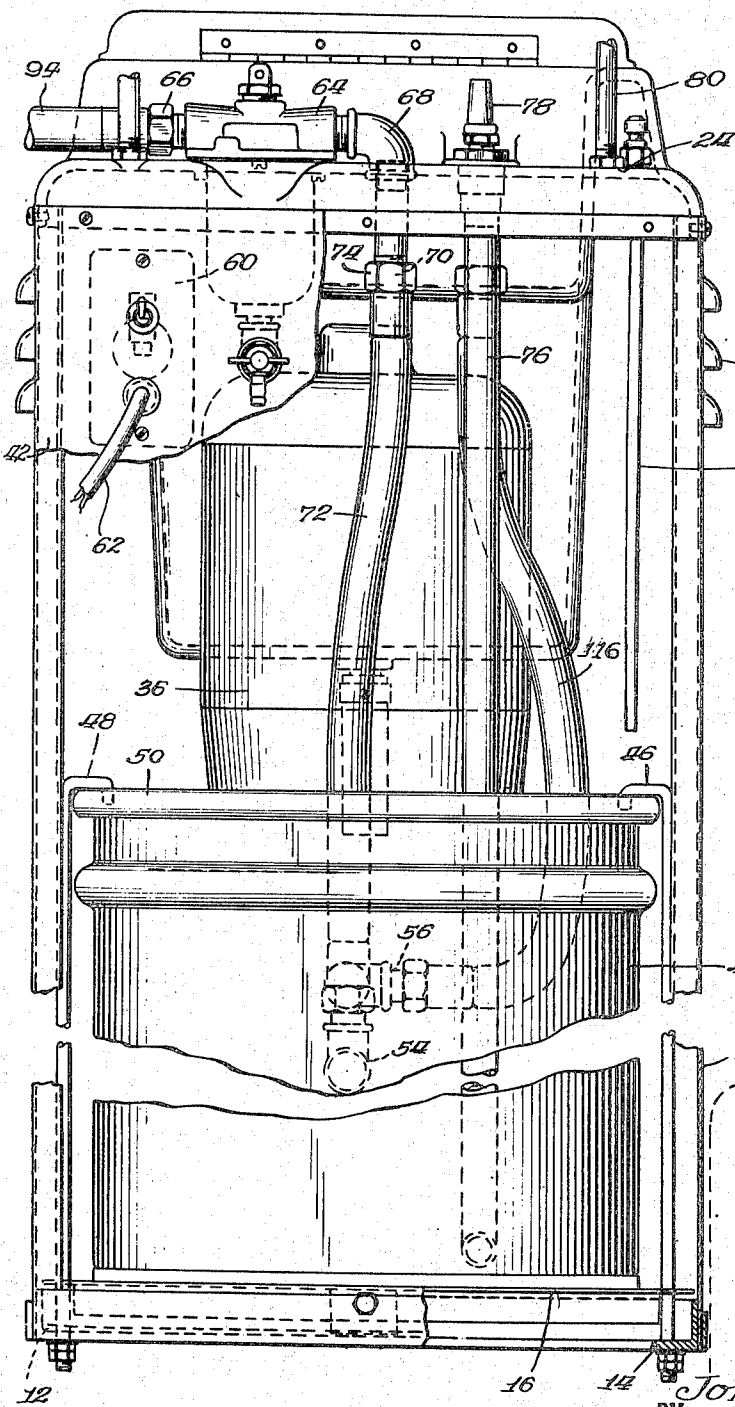
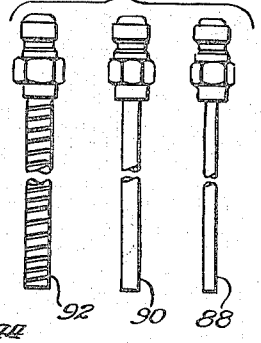


Fig. 3.

Fig. 6.



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PORTABLE OIL CHANGER

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8 Claims. (Cl. 184—1.5)

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This invention relates to a portable oil changer to withdraw oil from a crankcase of an automobile. It has several auxiliary uses.

The standard way of removing oil from an automobile crankcase is to drain it from the plug hole in the bottom of the crankcase. It has heretofore been proposed to withdraw the oil either through the oil intake or through the opening for the measuring stick so as to eliminate driving the car onto a lift or over an oil pit. Withdrawing oil through the oil intake is not practical because the passageway in almost all cars is somewhat tortuous and differs greatly with different engines so that even a flexible hose that may be positioned down the oil intake of one engine may not work very well when an attempt is made to force it down the oil intake of some other engine. Withdrawing the oil through the opening for the measuring stick is slow because this opening in many cars is only one-quarter of an inch in diameter and a tube insertable in this hole may have an inside diameter of only one-eighth of an inch.

The first object of this invention is to provide an oil changer that is equipped with a pump developing sufficient suction to withdraw oil through an opening slightly more than one-eighth of an inch in diameter at a high velocity so that the oil may be taken from a crankcase in a period of two or three minutes. The time element is of great importance because the time required to fill a gas tank is two or three minutes and if the oil changer suction stick is positioned in the measuring stick hole of the crankcase before the gasoline is pumped, when the gasoline pumping step is completed, the oil will be out of the crankcase. To repeat, the commercial success of this type of apparatus will largely depend upon its ability to remove the oil while a station attendant is performing the usual operations of filling the gas tank, checking the water, and cleaning the windshield. If the removal of oil can be performed concurrently with these operations, then a customer is more likely to order the oil change because he need only spend the additional few moments required to add fresh oil to the crankcase.

A specific object of this oil changer is to provide the customer with a visual check on the condition and the amount of the oil withdrawn from his engine crankcase. Automobile owners are so accustomed to the practice of draining oil from their engines through the plug hole in the bottom of the crankcase that the vast majority are skeptical of the ability of any device to suck

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it out of the crankcase. A customer wants to know that the oil is out and he wants to decide this for himself. He does not want to take the word of a station attendant or a machine.

A major feature of applicant's invention is the provision in the oil changer of a sump which will hold six or seven quarts of oil and which sump carries a measuring stick. When the customer draws along the gasoline pump island, the station attendant will first check the oil. If the oil is in bad condition, or if the oil is so low that two or three quarts should be added so that the customer might as well have a complete oil change, the customer will know by being shown the oil stick from his crankcase approximately how much oil is in the crankcase. He may inspect the sump of the oil changer to satisfy himself that this sump is empty. He may then watch the oil enter the sump in the oil changer from his engine crankcase. By examining the measuring stick in the sump of the oil changer, he can satisfy himself that the oil changer did actually remove the oil from his crankcase.

The second specific object of this invention is to locate this sump in the oil changer so that the customer can do all of his inspecting from the driver's seat. One of the features of this invention is the location of the sump in the top of the oil changer with a transparent cover over it. The portable oil changer is rolled next to the driver's seat. After the suction tube of the oil changer has been inserted in the measuring stick hole in the crankcase, the pump of the oil changer is started, and the driver sitting in the driver's seat can watch the oil pour into the sump. During this time, the attendant may be filling the gas tank, adding water, and the like, and will then raise the transparent top and show the customer just how much oil was taken out of his crankcase. The visible sump in the oil changer keeps the driver in his car and this in turn causes him to leave the station when the servicing is completed. The tendency of the driver to stay in the driver's seat while the car servicing is proceeding provides an important sales feature of applicant's oil changer. In the early days of automobiles before the development of either pits or lifts, when a station attendant crawled under the car to remove the crankcase plug, it became practice to perform this operation away from the gasoline island because the standing car tied up the island. Station attendants do not like automobile drivers to leave the driver's seat when the car is pulled up next to a gasoline pump island and inasmuch

as the sump of applicant's oil changer can best be viewed from the driver's seat, the driver will be likely to remain in his seat and be ready to pull out of the station when the servicing is completed.

An important object of this invention is so to relate the major parts of the oil changer, namely, the container for waste oil, the pump, and the sump, to each other so that the oil changer is very compact from a plan view. By way of explanation, most gasoline pump islands consist of an elongated concrete platform whose height is from six to eight inches above the concrete aprons over which the automobiles move. The pumps are mounted on this platform. It is, therefore, not practical to pull a portable oil changer onto this platform between servicing operations. Through long practice, drivers pull up beside the pump island so as to space the near edge of the car from the pump island by two or three feet and the hoses on the pump are of such a length that the station attendant can reach the gasoline inlet irrespective of which side of the car the inlet is on. The portable oil changer, therefore, must be between the island and the car when the driver's seat is adjacent to the island and must be on the far side of the car when the driver's seat is away from the island, the position of the driver's seat depending upon the direction of the car as it pulls along side the island. It will frequently be desirable to turn the oil changer around between the car and the island. If the oil changer has one horizontal dimension exceeding two feet, turning it around will in many cases be impossible. It will be necessary to push the oil changer beyond the island and turn it around and bring it back. Applicant's oil changer has an over-all length of twenty inches and a width of approximately seventeen inches. It is supported on two wheels and a caster. Additionally, the top of the sump must be quite low in order for a person sitting in the driver's seat of a car, particularly of the new low cars, to be able to see into it. The over-all height of applicant's oil changer is thirty-eight inches and the highest point on the sump cover is thirty-six inches above the bottom of the wheels. These dimensions are possible primarily because of applicant's positioning the sump, the motor and pump, and the waste oil container in a vertical line with these various parts overlapping each other so as to provide compactness.

Another object of this invention is to provide a portable oil changer which may be used in connection with a crankcase flushing operation. The ratio of the number of the crankcase flushing operations to the number of crankcase oil changes is very wide—it may be one to fifty or one to five hundred. The flushing operation requires the addition of some light oil to the crankcase, after which the engine is ordinarily run for a few minutes and then the flushing oil is withdrawn. Applicant considered mounting the container for flushing oil in his portable oil changer but discarded this plan because it necessitated enlarging the oil changer unit and this impaired the mobility of the unit. Additionally, the flushing oil tank with contents would add considerable weight. One of the features of applicant's invention is the provision of quick-change couplings which make it possible to utilize the oil changer as a means for withdrawing oil from a flushing oil container and pumping it down the measuring stick opening of the crankcase.

Thereafter, by quickly changing hoses, the flushing oil could be withdrawn from the crankcase and returned to the flushing oil container. These quick-change couplings also make it possible for applicant to quickly remove the oil from the waste oil container of his oil changer. Applicant's container has a capacity of something over twenty quarts and it is, therefore, necessary to empty it frequently. By means of an auxiliary hose, applicant uses the pump to remove the oil from this container.

There are several other features in applicant's oil changer which will appear in the description that follows. In the accompanying drawings comprising three sheets:

Fig. 1 illustrates the position of applicant's portable oil changer adjacent the driver's seat of a car and also shows a portable cart carrying a flushing oil;

Fig. 2 is a side elevation, partly cut away, of applicant's oil changer;

Fig. 3 is a front view of applicant's oil changer with the front side wall partly cut away;

Fig. 4 is a plan view of applicant's oil changer.

Fig. 5 is a perspective view from above looking down on the oil changer at approximately the angle that a driver would see it when sitting in a driver's seat of an automobile; and,

Fig. 6 illustrates the three types of suction sticks having different diameters, one being flexible, with which applicant's oil changer is equipped.

Continuing to refer to the drawings, particularly Fig. 1, the numeral **10** generally identifies applicant's portable oil changer. The front bottom of the oil changer comprises a straight angle iron **12**, see Figs. 2 and 3, to either end of which is fastened an angle iron **14**, the angle iron **14** being bent around in a curve to form a plan similar to that illustrated in Fig. 4. A floor **16** is suitably supported on the frame members **12** and **14**. A side wall **18** extends around the frame member **14** and is fastened thereto. This side wall carries louvers **20** which assist in circulating air to cool the motor. The rigidity to the top of the unit is provided by a sump casting **22**. Referring to Figs. 2, 3 and 4, the periphery of this casting has the same general shape as the bottom frame members and the side walls are fastened to this periphery by any suitable means. The casting has a front flat portion or shelf **24**, see Fig. 2, a raised shoulder **26**, and a sump **28**. The sump has a shelf **30** therein and the wall **32** connecting the shelf to the bottom **34** of the sump is arcuate, see Fig. 4, so that an electric motor **36** may be positioned beneath the shelf **30** and close to the wall **32** for purposes of compactness. A pair of large wheels such as **38** are mounted on the front side of the oil changer and a single caster **40** supports the front end of the oil changer. A removable front panel **42**, partly shown in Fig. 3, may be fastened over the front of the oil changer by any suitable means such as screws.

The entire pump assembly and waste container is a separate unit which may be quickly installed or removed from the oil changer. It consists of a waste oil container **44**, see Fig. 3, which rests on the floor **16** and which is held to the floor by tie rods **46** and **48** which in turn are removably fastened to the bottom frame member **14** so that the hooks may be turned ninety degrees to permit ready removal of the container **44**. The top of the container supports a lid **50**, and mounted on this lid is the motor **36** which is drivingly connected to a pump **52**, see Fig. 2, supported on the

under side of the lid. The pump has an inlet 54 and an outlet 56. An oil gauge 58 for showing that the oil in the container 44 has reached a place where it should be removed is mounted on the front of the container and an opening is provided in the front panel 42 so that the oil gauge may project therethrough.

Attached to the inside of the front panel 42 is a switch box 60 through which passes an electric line lead 62 which is connected to the motor 36. Mounted on the shelf 24 of the casting 22 is a filter 64, see Fig. 3, whose inlet carries a quick-change coupling 66 and whose outlet is directed through an elbow 68 to a quick-change coupling 70. A flexible conduit 72 connects the pump inlet 54 to the quick-change coupling 70, the complementary quick-change coupling 74 being on the flexible conduit 72. An oil drain pipe 76 having a quick-change coupling 78 is rigidly mounted on the shelf 24 and the bottom of this pipe is close to the bottom of the container 44. A handle 80 is also mounted on the shelf 24. There are three holes 82, 84 and 86 in the casting for supporting the suction tubes or sticks 88, 90 and 92.

Because the crankcase measuring stick openings are of a different size, applicant equips his oil changer with three different types of suction tubes or sticks. These sticks 88, 90 and 92 are illustrated in Fig. 2. Each has a quick-change coupling at its upper end. Suction stick 88 has an outside diameter of slightly less than one-fourth inch, 90 has an outside diameter of slightly less than three-eighths inch, and 92 is flexible. Each stick is equipped with a quick change coupling. Two lengths of flexible hose such as 94 are supplied and when not in use they may be wound around the arms 96 and 98.

The sump has a drain opening 100 in which seats a conical end of a measuring stick 102 having a disc 104 near its top for protecting the hand from a rag used to clean the stick after showing the reading to a customer.

Applicant provides a transparent plastic lid 106 fastened by a hinge 108 to the top of the sump casting 22.

The oil changer is used as follows. When a customer pulls up next to an island, the oil changer is positioned adjacent the windshield with the lower side of the sump adjacent to the driver's seat. Under normal circumstances, the hose 94, see Fig. 1, is attached at the quick-change coupling 66, see Fig. 3, and the attendant selects that one of the suction sticks 88, 90 or 92, see Fig. 6, which is the largest that may be inserted in the measuring stick opening of the crankcase of the particular type of motor. He positions the suction stick in the opening and then snaps the free end of the hose 94 onto the suction stick. He throws the switch of the switch box 60, see Fig. 3, and proceeds with the steps of putting gasoline into the tank, checking the water and cleaning the windshield. The driver sees the oil changer in approximately the position shown in Fig. 5. As presently constructed, the baffle 112 is opaque so that he cannot see the flow of the oil through the port 114 (the baffle is omitted from Fig. 4), but he does see it flow over the step 30. The oil rises on the measuring stick 102. When the attendant has completed his other servicing operations, he raises the lid 106 and lifts out the measuring stick 102. The measuring stick also constitutes the plug for drain 100 so that the oil flows into the waste oil tank 18. He shows the measuring stick 102 to the customer, wipes it off, and replaces it in the drain 100 as soon as the oil is out. He then removes the suction stick and hose 94 and replaces the automobile's measuring stick in the crankcase measuring stick hole. Oil is then added to the motor in the standard manner.

When it is necessary to empty the oil from the container 18, the oil changer is rolled over to a waste oil drum and the hose 94 is connected to the quick-change coupling 78. A second hose having a quick-change coupling is connected to the port 114, see Fig. 4, and the other end of that hose is placed in the waste drum. The apparatus quickly empties the container 18.

The machine is easily serviced. The filter 64 is a commercial product on the market which can be cleaned by turning the handle on the top thereof and dirt accumulations pass out through the bottom port. If the pump or motor require servicing, the front panel 42 is removed and the tie rods 46 and 48 loosened. By disconnecting an electrical connection, not shown, between the switch box 60 and the motor 36, and by disconnecting the liquid line connections between the pump and the couplings on the shelf 24, the container 18 and motor pump assembly may be quickly lifted out of the cart.

Where it is desired to perform a flushing out operation, an auxiliary cart 110 carrying a container of flushing oil, see Fig. 1, is drawn up beside the oil changer 10. The free end of the hose 94, either with or without a suction stick on it, is positioned in the flushing oil on the cart 110, and a second hose is attached to the port 114 in the sump. The largest suction stick that can be used for the particular engine is attached to this hose and the oil is pumped from the cart 110 into the crankcase of the engine. The engine may be run for a few moments, after which the hoses are reversed so that the hose 94 sucks the oil out of the engine and the other hose attached to the port 114 directs the oil back to the flushing oil cart 110. It will be noted that the flushing oil on its return to the cart 110 passes through the filter 64. This filter performs the double function of protecting the pump, which is a gear pump, and cleaning the flushing oil so that it may be used repeatedly.

There is one thing that is not shown clearly in the drawings and that is the connection of the pump's outlet line 116 to the port or quick-change coupling 114. This is a direct connection which cannot be seen in Fig. 3 because it is directly behind a quick-change coupling 78 and between the two walls that form the shoulder of the sump 26, see Fig. 2.

Having thus described applicant's invention, what he claims is:

1. A portable oil changer comprising a cart supported on wheels, a pump mounted on the cart, a liquid conduit having one end attached to the inlet of the pump, a visible sump mounted on the cart, a conduit connecting the outlet of the pump to the sump, a waste oil container positioned beneath the sump, a drain in the sump over the waste oil container, and a measuring stick having a plug on the bottom for seating in said drain.

2. A portable oil changer comprising a cart supported on wheels, a pump mounted thereon, a liquid conduit connected to the inlet of the pump, an upwardly open liquid sump mounted on the top of the cart, the top periphery of the sump lying in an inclined plane, a transparent lid over said sump, and a liquid conduit connecting the pump outlet to the sump.

3. A portable oil changer comprising a cart supported on wheels, a pump mounted thereon, a liquid conduit connected to the inlet of the pump, an upwardly open liquid sump mounted on the top of the cart, the top periphery of the sump lying in an inclined plane, a transparent lid over said sump, a liquid conduit connecting the outlet of the pump to the sump, a waste oil container positioned beneath the sump, a drain in the sump over the waste oil container, and a liquid measuring gauge having a plug on the bottom for seating in said drain.

4. A portable oil changer comprising a cart, a waste oil container in the bottom of the cart, a pump positioned within said container, an electrical motor drivingly connected to the pump positioned vertically above the pump and above the container, an upwardly open visible sump positioned above the motor, said sump having a depending portion extending below the top of the motor and to one side thereof, a liquid conduit connecting the outlet of the pump to the sump, a liquid conduit leading to the inlet of the pump, and a drain from the depending portion of the sump into the waste container.

5. A portable oil changer comprising a cart supported on wheels, a side casing for said cart, a single casting constituting the top of the cart and mounted on the top edges of the side casing, an upwardly open sump having a top periphery lying in an inclined plane in said casting, a horizontal shelf on said casting adjacent the sump, a pump in said cart, a liquid conduit connecting the pump to the sump, a filter mounted on the shelf, a liquid conduit connecting the filter to the pump inlet, a flexible liquid conduit connected to the inlet of the filter, a waste oil container positioned beneath the sump, a drain in the sump over the waste oil container, and a measuring stick having a plug on the bottom for seating in said drain.

6. A portable oil changer comprising a cart supported on wheels, a side casing for said cart, a single casting constituting the top of the cart and mounted on the top edges of the side casing, an upwardly open sump having a top periphery lying in an inclined plane in said casting, a horizontal shelf on said casting adjacent the sump, a waste oil container beneath the sump and the shelf, a drain from the sump into the waste oil container, a suction tube mounted on the shelf and depending into the waste oil container, a filter mounted on the shelf, liquid conduits connecting the outlet of the filter to the pump inlet and the pump outlet to the sump, and quick-change couplings mounted on the filter inlet and on the suction tube outlet, both quick-change couplings being on top of the shelf.

7. A portable oil changer comprising a cart supported on wheels, a pump mounted thereon, a liquid conduit connected to the inlet of the pump, an upwardly open liquid sump mounted on the top of the cart, the top periphery of said sump lying in an inclined plane, a liquid duct opening into the sump in that wall whose upper edge is highest, and a liquid conduit connecting the outlet of the pump to said duct.

8. The portable oil changer of claim 7 wherein there is a transparent lid over said sump pivoted to the highest edge of the sump's periphery.

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