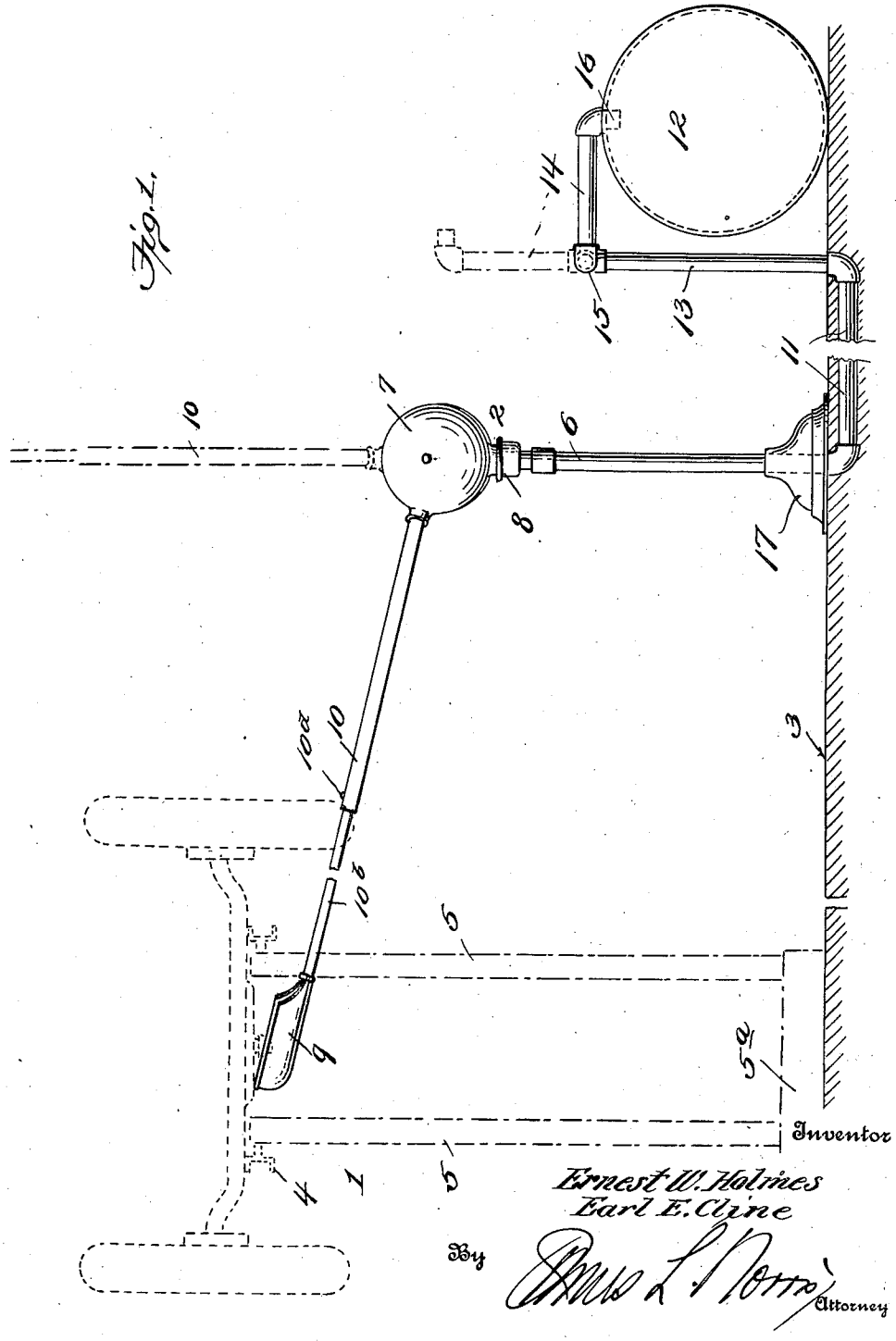
Aug. 16, 1932. E. W. HOLMES ET AL 1,871,522

OIL DRAINING STATION

Filed Sept. 1, 1928 4 Sheets-Sheet 1

Fig. 1.




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OIL DRAINING STATION

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Fig. 2.

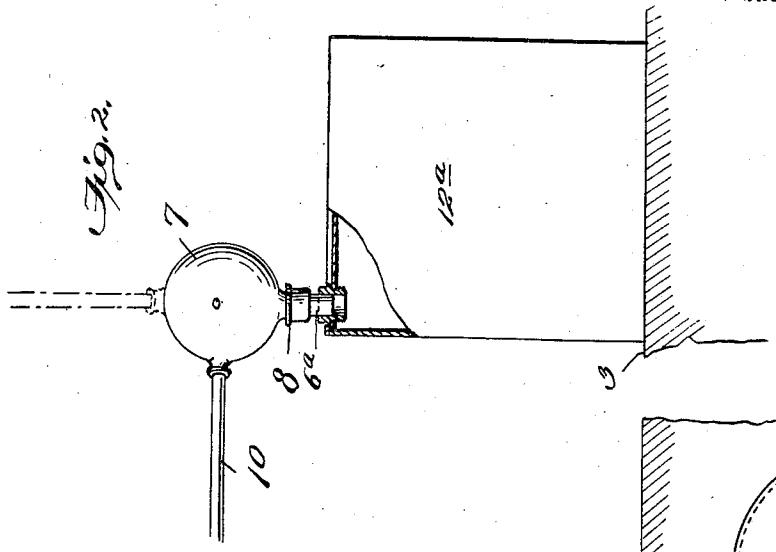
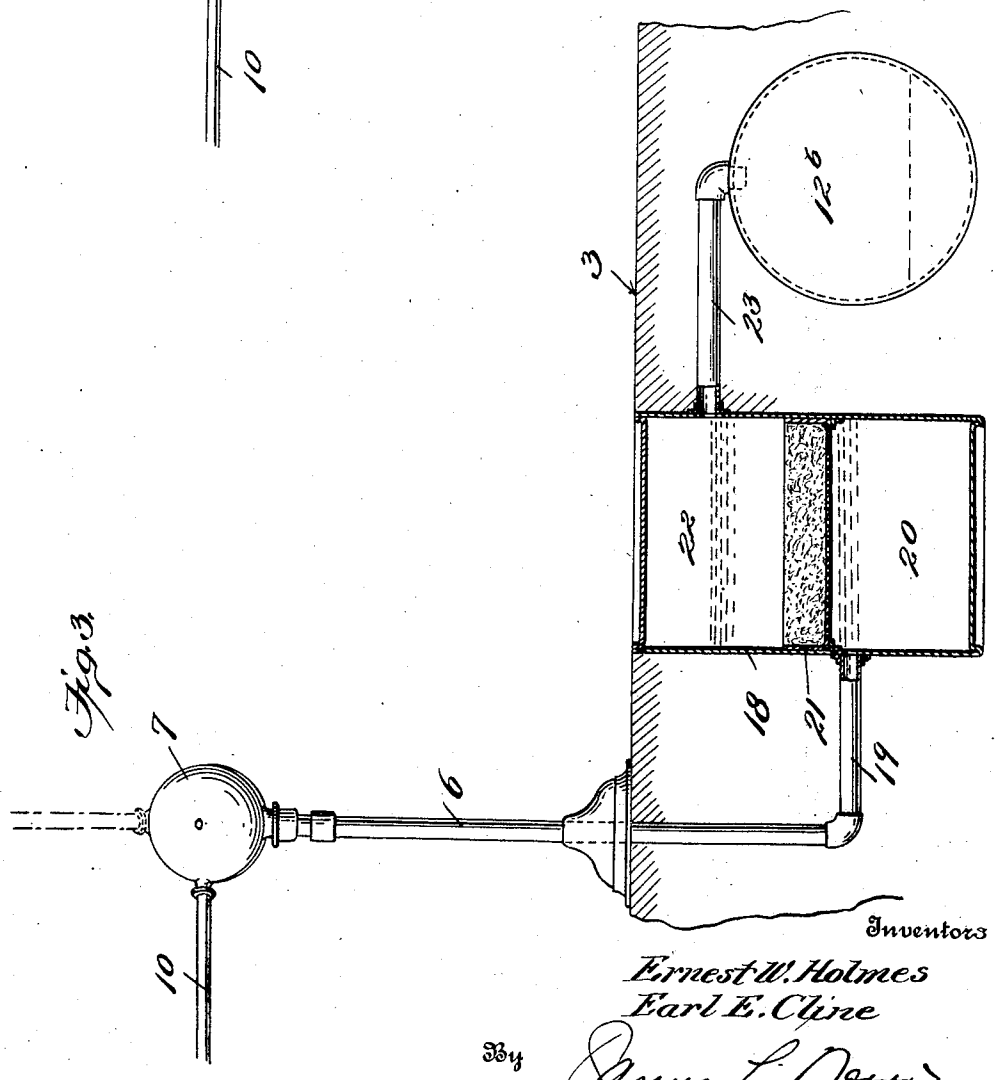



Fig. 3.




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OIL DRAINING STATION

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Fig. 4.

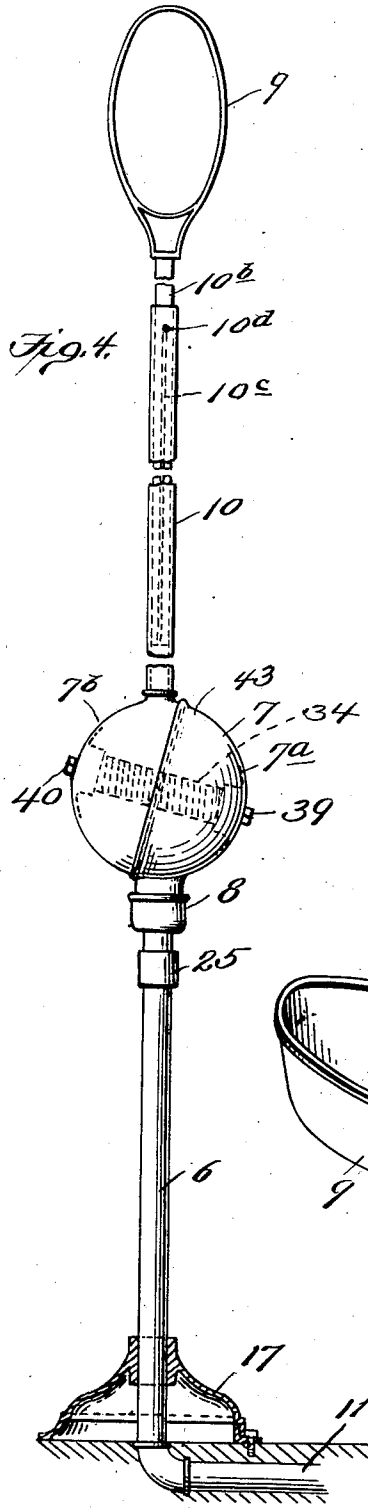



Fig. 5.

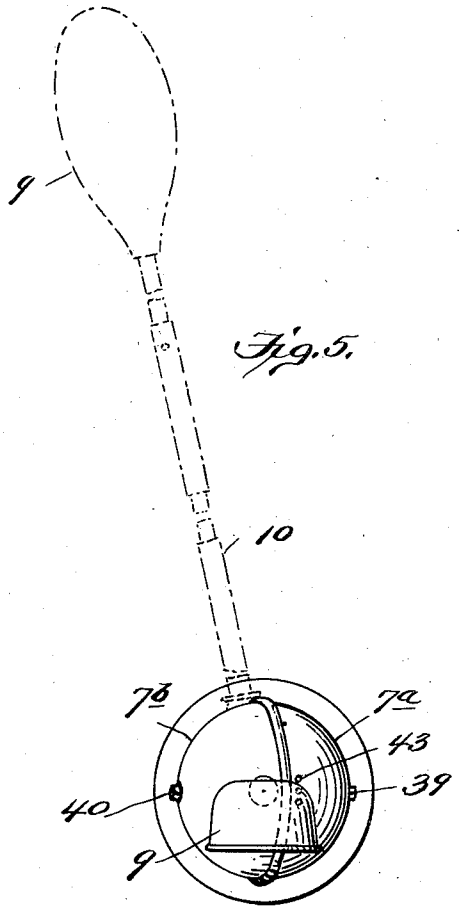
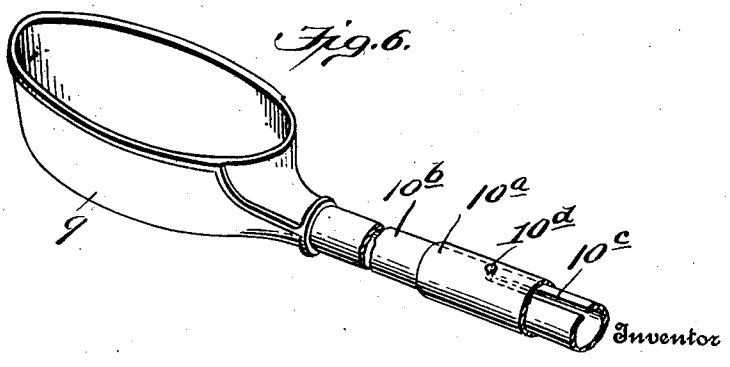



Fig. 6.




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OIL DRAINING STATION

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Fig. 7.

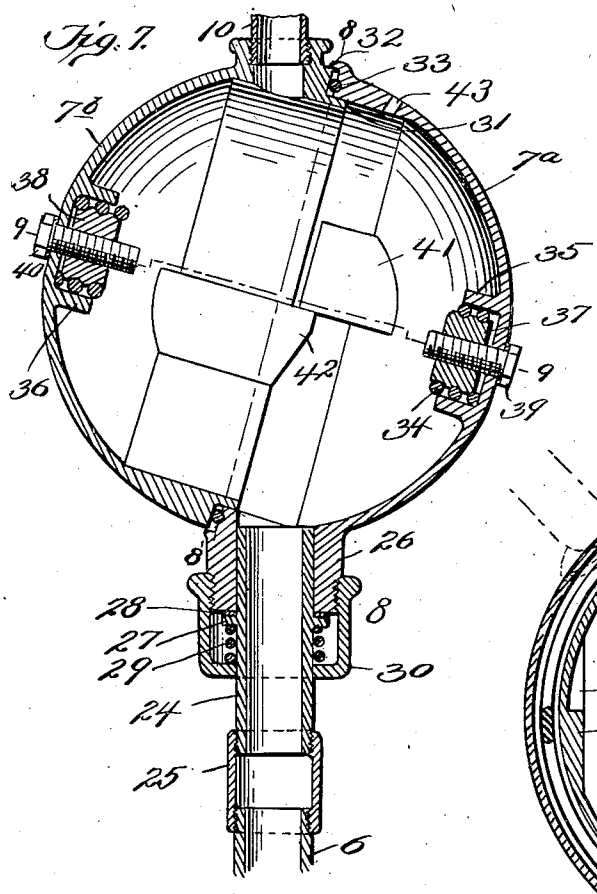
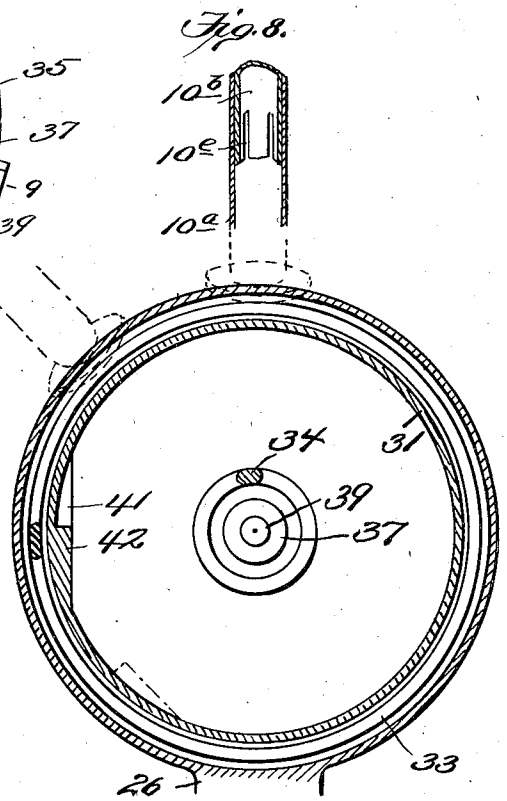



Fig. 8.



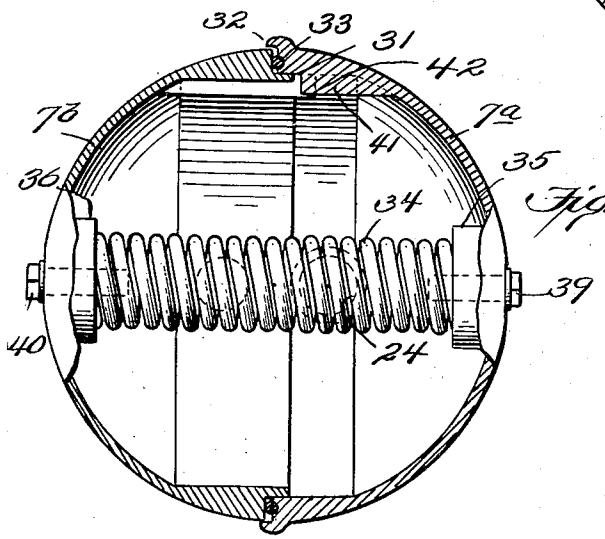




Fig. 9.

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# UNITED STATES PATENT OFFICE

ERNEST W. HOLMES AND EARL E. CLINE, OF CHATTANOOGA, TENNESSEE, ASSIGNORS TO ERNEST HOLMES COMPANY, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE

## OIL DRAINING STATION

Application filed September 1, 1928. Serial No. 303,432.

The present invention relates to improvements in oil draining means and more especially to means for draining waste oil from automobiles as, for example, from the crankcases thereof.

The primary object of the invention is to provide a novel and improved oil draining station which comprises an automobile lift operative to lift an automobile bodily to a suitable height above the ground or a floor and an oil receiver mounted at a side of the lift so that it does not interfere with the operation of lifting and lowering automobiles on the lift but is provided with a funnel which is capable of being brought into a position beneath the drain hole of the crankcase of an automobile elevated on the lift and to receive the oil drained from the crankcase thereof, the oil receiver being preferably mounted at the surface of the ground or floor where it can be manipulated with facility by the attendant and the waste oil received by it can be discharged into a drum, tank or other receptacle which may be mounted on the surface of the ground or floor where it may be easily placed in position and removed, or such collecting receptacle may be placed below the ground or floor level to receive the waste oil, if desired.

Another object of the invention is to provide a novel and improved oil receiver which comprises a funnel or oil-receiving member so mounted that it normally occupies an upright position where it will not obstruct the movements of the attendant around it but is capable of being swung downwardly and laterally into a position where it will receive oil drained from the crankcase or other unit of an automobile.

Another object is to provide an oil receiver of this character wherein means is provided for automatically returning the funnel or oil-receiving member thereof to upright position when released by the attendant and for normally and yieldingly holding it in such position.

A further object of the invention is to provide an oil receiver of this character wherein an oil reservoir is provided between the funnel or oil-receiving member and the discharge pipe or outlet of the receiver, such reservoir being of a capacity to receive directly or immediately the charge of oil from the crankcase, thus avoiding overflowing of the funnel by back pressure due to sluggish flow of the oil from the receiver, the oil being afforded ample opportunity to drain by gravity from the reservoir into the discharge pipe or outlet of the oil receiver and thence into an appropriate collecting receptacle.

To these and other ends, the invention consists in certain improvments and combinations and arrangements of parts, all as will be hereinafter more fully described, the features of novelty being pointed out particularly in the claims at the end of the specification.

In the accompanying drawings:—

Figure 1 is a view in elevation of an oil-draining station embodying the present invention, an automobile lift being shown supporting an automobile in elevated position and an oil receiver being shown at one side of the lift and in position to receive waste oil from the crankcase of the elevated automobile;

Figure 2 is a view in elevation of a modification of the oil receiver whereby it may discharge waste oil which it receives directly into a drum, barrel or other suitable receptacle;

Figure 3 is a view, partly in elevation and partly in vertical section, of a further modification of the oil receiver, it being shown in connection with a filter for removing solid particles, sediment and the like from the waste oil and for discharging the filtered oil into a tank or receptacle which is shown arranged below the level of the ground or floor;

Figure 4 shows the oil receiver on an enlarged scale and in vertical elevation, the oil-receiving funnel being shown in its normal upright position;

Figure 5 is a top plan view of the oil receiver as shown in Figure 4, the oil-receiving funnel being shown in upright position by the full lines and in its lowered oil-receiving position by the dotted lines;

Figure 6 is a detail perspective view, on

an enlarged scale, of the oil-receiving funnel;

Figure 7 represents a detail section on an enlarged scale through the oil reservoir, the section being taken on a diameter of the oil reservoir;

Figure 8 represents a section taken on the line 8—8 of Figure 7; and

Figure 9 represents a section taken on the line 9—9 of Figure 7.

Similar parts are designed by the same reference characters in the several figures.

The present invention provides a waste oil receiver which is capable of being used in combination with automobile lifts of different constructions but which are of the type which lift an automobile bodily above the ground or a floor, the oil receiver being adapted for mounting at either side of the lift and preferably at the level or surface of the ground or floor where it may be manipulated quickly and with facility by the attendant, an oil draining station being thus provided whereby the waste oil may be drained from the crankcase or other part of an elevated or lifted automobile and received by the oil receiver and which may flow by gravity from the oil receiver into a drum, barrel or other collecting receptacle, the awkwardness and inconvenience of draining the oil into a receptacle arranged in a pit beneath the automobile and of carrying or removing the oil from the pit being avoided.

The preferred embodiments of the invention are shown in the accompanying drawings and will be hereinafter described in detail, but it is to be understood that the invention is not restricted to the precise constructions shown as equivalent constructions may be used, and such will be included within the scope of the claims.

The oil draining station provided by the present invention comprises generally an automobile lift 1 and an oil receiver 2. Automobile lifts of different kinds may be used to elevate the automobile to a suitable height above the ground or floor, the surface of which is designated 3, the automobile lift shown as an example in the present instance being of the kind shown and described in the co-pending application of Ernest W. Holmes, Serial No. 224,657, filed October 7, 1927, to which reference is made for a full understanding of an automobile lift of that type. For the present purposes, it is deemed sufficient to explain that the automobile lift shown in a general way in the present instance embodies a horizontal frame or cradle 4 which is of a length and width to engage beneath the front and rear axles of an automobile, and lifting mechanism comprising columns 5 arranged beneath and connected to opposite ends of the frame or cradle 4, the lifting columns being composed of links which rise from a base $5^a$ and are forced upwardly by mechanism contained in the base, the base resting on the surface of the ground or floor. Figure 1 illustrates diagrammatically the manner in which an automobile is lifted by such an automobile lift to a suitable height above the ground or floor to permit draining of oil therefrom.

The oil receiver 2 comprises a tubular upright support or standard 6 which preferably constitutes the outlet through which the waste oil flows from the oil receiver to a suitable collecting receptacle, a reservoir 7 mounted or supported on the standard 6 by a swivel 8 which allows the reservoir to rotate about a vertical axis, and a funnel 9 which is carried by a hollow or tubular stem or arm 10 which provides communication between the funnel and the reservoir 7. The reservoir 7 is composed of pivotally connected members or sections $7^a$ and $7^b$, the section $7^a$ being mounted on the standard 6 so that it may swivel thereon about a vertical axis, and the section $7^b$ having the funnel extension or arm 10 fixed thereto, the section $7^b$ being rotatable relatively to the section $7^a$ about an approximately horizontal axis so that the funnel 9 may swing in an approximately vertical plane. Normally, the funnel and its stem 10 occupy a substantially upright position, as indicated by the dotted lines in Figure 1, the funnel and its stem then avoiding obstruction to the movements of an attendant around the oil receiver or the automobile lift, but after an automobile has been lifted for the draining of oil therefrom, the funnel 9 is swung downwardly out of its normal upright position, this movement being permitted by rotation of the reservoir section $7^b$ in relation to the reservoir section $7^a$, and the funnel may be swung laterally or in an approximately horizontal plane about the vertical axis of the swivel 8 as a center in order to bring the funnel 9 beneath the drain hole in the crankcase or other part of an automobile, as shown by the full lines in Fig. 1. With the funnel so placed, the usual drain plug may be removed and the oil will then drain from the crankcase into the funnel and will pass along the stem 10 into the reservoir 7, and from the latter the oil flows through the standard 6 to a suitable collecting receptacle. After the oil has drained completely from the crankcase, the funnel 9 may be lowered and swung laterally to remove it from beneath the elevated automobile, and the funnel may then be elevated or returned to its normal upright position.

The reservoir 7 of the oil receiver is located at such a height in relation to the elevated position of the automobile on the lift that it will be below the level of the funnel 9 when the latter is in position to receive oil drained from the automobile, the tubular stem 10 connecting the funnel with the reservoir 9, in

consequence, sloping to a degree which will insure gravity flow of the oil from the funnel to the reservoir. The reservoir 7 which receives the drained oil directly from the funnel is of a capacity sufficiently large to receive preferably the full charge of oil from the crankcase, the conducting of the drained oil directly or immediately into such a reservoir avoiding overflow of the funnel due to sluggishness in the discharge of the oil from the oil receiver, a condition which is likely to exist in cold weather when the viscosity of the oil is high or in a station in which the oil passes from the oil receiver through a filter or strainer which imposes more or less back pressure upon the discharging oil. By providing the enlarged reservoir 7 to immediately receive all of the oil from the funnel, overflow of the funnel is prevented, and the oil accumulated in the reservoir will be afforded ample time to flow therefrom by gravity into the collecting receptacle.

The upright standard 6 which supports the oil receiver and constitutes the oil outlet from the reservoir 7 may rise directly from the surface 3 of the ground or floor and may be connected to a pipe 11 which may be embedded in the ground or floor and may lead off to a point where a drum, barrel or other collecting receptacle 12 may be placed on the surface of the ground or floor, the oil being conducted from the pipe 11 into the receptacle 12 by an upright pipe 13 which may lead upwardly from the pipe 11 and may be connected to a pipe 14 connected by an elbow or swivel 15 to the upper end of the pipe 13 so that the pipe 14 may be swung about a horizontal axis into either the raised position indicated by the dotted lines in Figure 1, which permits the receptacle to be conveniently placed for filling, or into the full line position where a nozzle 16 on the pipe 14 may enter an opening in the drum, barrel or receptacle. This arrangement enables a receptacle which has been filled with oil to be easily removed and an empty receptacle placed for filling, as the drum or other receptacle rests on the surface of the ground or floor, it being unnecessary to lift the filled receptacle from a pit or other depression. A base 17 is preferably provided for supporting the oil receiver rigidly in upright position, this base having a flange which may be bolted or otherwise secured rigidly to the surface of the ground or floor and the base fits closely around the upright 6 and supports it firmly in upright position.

Instead of mounting the oil receiver on the ground or floor, as shown in Fig. 1, the oil receiver may be mounted directly on the drum or receptacle in which the waste oil is to be collected. Such an arrangment is shown in Fig. 2 wherein the oil receiver is supported by a relatively short standard $6^a$, the lower end of which is adapted to be threaded into or otherwise attached to a drum, barrel or collecting receptacle $12^a$ resting on the surface of the ground or floor so that the oil receiver will discharge oil therefrom directly into such receptacle.

Figure 3 shows the oil receiver connected to discharge the waste oil into a filter 18 which may be embedded in the ground or floor below the surface thereof, the standard 6 of the oil receiver, in this instance, being extended downwardly below the surface of the ground or floor and connecting at its lower end with a pipe 19 which serves to conduct the waste oil into the lower compartment 20 of the filter, the latter having a tray 21 supported removably therein above the pipe 19, the tray containing a suitable filtering or straining material which will separate the solid material from the oil, the compartment 22 of the filter above the tray discharging the oil through a pipe 23 into a suitable tank or receptacle $12^b$ which may be embedded in the ground or floor below the surface thereof. In this embodiment of the invention, the reservoir 7 of the oil receiver is sufficiently high above the filter and collecting receptacle to insure the gravity flow of the waste oil from the reservoir through the filter and into the collecting receptacle.

The stem or arm 10 which carries the funnel is preferably extensible so that it can be lengthened or shortened to bring the funnel immediately beneath the drain hole in the automobile. For this purpose, the stem is composed of telescopic tubes $10^a$ and $10^b$, the tube $10^a$ being fixed to the reservoir section $7^b$ and the tube $10^b$ being fixed to the funnel. In order to prevent undue extension of the funnel which would cause separation of the tube $10^b$ from the tube $10^a$, the tube $10^b$ is provided with a longitudinal slot $10^c$ of suitable length and the tube $10^a$ has a pin $10^d$ fixed in it and projecting into said slot, the range of extensible movement of the tube $10^b$ within the tube $10^a$ being thus limited by the length of the slot. Also, in order to prevent dropping of the funnel and its tube $10^b$ downwardly in the tube $10^a$ when the funnel is brought into its normal upright position, the lower end of the inner tube $10^b$ is preferably slotted, as at $10^e$, and the tongues thus formed may be expanded slightly so that they will engage the inside of the tube $10^a$ with sufficient friction to hold the tube $10^b$ and the funnel in different adjusted positions and will prevent sliding of the tube $10^b$ downwardly within the tube $10^a$ when the funnel is brought into upright position.

The swivel 8 which connects the reservoir 7 with the standard 6 comprises preferably a nipple 24 which may constitute the short standard shown in Fig. 2, the lower end of this nipple being threaded into a pipe union 25 attached to the upper end of the standard 6, the upper end of the nipple being fitted

to rotate in a boss 26 formed on the lower side of the reservoir section $7^a$, the nipple having a circumferential flange 27 thereon, and a washer 28 may be interposed between this flange and the boss 26 to provide an oil-tight joint to prevent leakage. A coiled compression spring 29 preferably encircles the nipple below the flange 27 thereon, and a cap 30 is threaded on the boss 26 and acts on the spring 29 to compress it, the spring acting, in turn, upon the flange 27 and forcing the washer 28 against the boss 26. The swivel thus provided will permit the reservoir 7 and the funnel attached to it to rotate freely about the vertical axis of the swivel as a center but leakage of oil will be prevented by the flange and washer described.

The reservoir 7 which receives the charge of waste oil immediately from the crankcase and allows it to flow therefrom to the outlet of the oil receiver is preferably spherical in form, the sections or members $7^a$ and $7^b$ composing it being each formed of an approximate hemisphere. These hemispherical sections of the reservoir are formed with a rotatable joint which lies substantially in the plane of the section line 8—8 of Figure 7, this plane extending angularly across the axes of the standard 6 and funnel stem 10 so that the section $7^b$ to which the funnel is attached may rotate on an approximately horizontal axis but the joint between the reservoir sections will not interfere with the connections of the standard and funnel with the respective sections of the reservoir. The joint between the reservoir sections is formed preferably by providing the section $7^b$ with an interior annular flange 31 to fit rotatably within the adjacent rim of the section $7^a$ and providing the section $7^a$ with an exterior flange 32 which encircles peripherally the circumference of the section $7^b$, a packing ring 33 of suitable material being interposed between the directly opposed surfaces of the reservoir sections. The circular joint thus provided enables the reservoir section $7^b$ to rotate relatively to the reservoir section $7^a$ in the plane of the joint.

Means is provided for drawing the reservoir sections against one another to maintain them in proper working relationship and to exert sufficient compression on the packing ring 33 to prevent leakage of oil at the joint, and means is also provided for automatically swinging the funnel to its upright position when released by the attendant and for normally and yieldingly holding the funnel in upright position. In the present instance, a spring is provided which performs these two functions, it consisting of a coiled torsion and tension spring 34, the axis of which is coincident with the axis about which the relative pivotal movements of the reservoir sections take place, the ends of this spring being received in bosses 35 and 36 formed within the reservoir sections $7^a$ and $7^b$, and means is provided for drawing the ends of the spring into these bosses so as to impose sufficient tension on the spring to cause it to draw the reservoir sections toward one another with sufficient force to produce the requisite compression on the packing ring 33 and to hold each end of the spring against rotation with respect to the reservoir section to which it is attached so that when the section $7^b$ is rotated incident to the downward swing of the funnel, the spring will be wound torsionally and the torsion of the spring will act to rotate the reservoir section $7^b$ in an opposite direction to swing the funnel toward upright position. As shown, nuts 37 and 38 are fitted into the respective ends of the spring for this purpose, each nut being formed with a helical circumferential groove of a pitch corresponding with that of the convolutions of the spring so that the convolutions at the respective ends of the spring will engage in the respective nuts, and adjusting screws 39 and 40 are fitted loosely through holes in the reservoir sections $7^a$ and $7^b$ centrally of the bosses 35 and 36, and these screws are threaded into the nuts 37 and 38. By rotating the screws 39 and 40 in the appropriate directions, the nuts 37 and 38 which have been previously fitted into the respective ends of the coil spring so that their outer faces are inside the ends of the spring, will be drawn apart and the ends of the spring will be drawn into the bosses 35 and 36 to an extent sufficient to tension the spring to the desired degree and to jam the ends of the spring against the bottoms of the respective bosses, and as the action of the screws on the nuts tends to draw them out of the ends of the spring, the sloping sides of the grooves in the peripheries of the nuts acts to expand the ends of the spring within the surrounding bosses thereby non-rotatably fixing the ends of the spring relatively to the respective reservoir sections $7^a$ and $7^b$. Preferably means is provided for arresting the swing of the funnel when it reaches upright position, such means comprising a stop lug 41 formed interiorly on the reservoir section $7^a$ and a stop lug 42 formed interiorly on the reservoir section $7^b$, these stop lugs having surfaces which will abut when the reservoir section $7^b$ reaches a position in its rotation where the funnel occupies an upright or a vertical position. This stop arrangement will allow the funnel to be swung from its normal upright position only in a direction which will insure that the opening in the funnel is uppermost, swinging motion of the funnel in an opposite direction which would cause the funnel to occupy an inverted position when lowered being prevented by the stop lugs. The spring 34 is coiled in a direction which will cause winding thereof when the funnel is swung downwardly and, hence, the funnel, when lowered, will always tend

to rise or return to its normal upright position. This tendency of the funnel to rise not only serves to automatically swing the funnel into an upright position where it will not obstruct the movements of the attendants around the oil draining device when the latter is not in use but it will facilitate the oil draining operation as it will serve to support the funnel against the bottom of the crankcase or other part of the automobile while the oil is being drained therefrom, thus rendering it unnecessary for the attendant to manually or otherwise support the funnel during this operation.

In using an oil draining station constructed substantially as hereinbefore described, the funnel will be normally but yieldingly held in upright position above the reservoir 7 and the automobile from which oil is to be drained is placed on and elevated by the automobile lift, in the usual way. After the automobile has been elevated to an appropriate height by the lift, it is merely necessary for the attendant to swing the funnel downwardly from its normal upright position and to then swing it horizontally to bring it beneath the crankcase or other part of the automobile, and, if necessary, the funnel may be shifted longitudinally by lengthening or shortening its stem 10 to bring the funnel directly beneath the oil drain hole, and when the grip of the attendant on the funnel is released, the tendency of the funnel to move upwardly will carry it automatically into position against the bottom of the crankcase or other part of the automobile, and the funnel will be thus supported during the oil draining operation which takes place when the usual plug is removed from the oil drain hole. The oil received from the drain hole by the funnel flows by gravity through the tubular stem 10 which slopes downwardly from the funnel to the reservoir 7 and the latter receives the charge of oil immediately and without imposing appreciable back pressure upon the oil flowing thereto from the funnel. In order to prevent trapping of air in the upper portion of the reservoir, which might take place if the oil drained from the automobile is sufficient to fill or nearly fill the reservoir, air vent holes 43 are provided in the reservoir section $7^a$ near the top thereof through which air contained in the reservoir may vent freely therefrom. After the oil receiver has received the complete charge of waste oil, the funnel 9 may be swung laterally from beneath the elevated automobile and then released, whereupon it will automatically swing upwardly to its normal elevated position, and the oil received by the reservoir will flow therefrom through the standard 6 to the collecting receptacle, there being no back pressure imposed upon the oil flowing from the funnel and which might cause it to overflow, as the reservoir 7 is of sufficient capacity to receive the full charge of waste oil directly and immediately from the funnel and to store this oil until it can pass off through the outlet of the oil receiver if back pressure or high viscosity of the oil retards its discharge.

We claim as our invention:—

1. An oil receiver comprising a relatively fixed standard, a rigid arm pivoted at one end on said standard to swing substantially vertically and carrying a funnel on its other end, and means acting on the pivoted end of said arm to yieldingly hold said arm and funnel normally in a substantially upright position.

2. An oil receiver comprising a hollow supporting standard which forms an oil outlet, a reservoir mounted on said standard and having means for venting air therefrom, said reservoir embodying sections relatively rotatable on a substantially horizontal axis, one of said sections being connected to the standard, and an oil-receiving funnel connected to the other section of the reservoir.

3. An oil receiver comprising a reservoir embodying sections relatively rotatable on a substantially horizontal axis, an oil outlet connected to one of said sections, an oil-receiving funnel connected to the other section and adapted to swing substantially vertically during rotation thereof, and a spring acting to relatively rotate the sections of the reservoir in a direction to swing the funnel upwardly.

4. An oil receiver comprising a reservoir embodying sections which abut to form a joint between them whereby said sections may relatively rotate about a substantially horizontal axis, an oil outlet connected to one of said sections, an oil-receiving funnel connected to the other section and adapted to swing substantially vertically, said reservoir having means for venting air therefrom, and means for relatively pressing said sections toward one another to maintain a pressure on said joint.

5. An oil receiver comprising a reservoir embodying opposed sections which cooperate to form a circular joint betwen them, an oil outlet connected to one of said sections, an oil-receiving funnel connected to the other section, and a spring connecting said sections and acting to draw them together and to relatively rotate them.

6. An oil receiver comprising a reservoir embodying cooperative relatively rotatable sections which abut to form a joint between them, an oil outlet connected to one of said sections, an oil-receiving funnel connected to the other section, and a spring connecting said sections and acting to relatively rotate them in one direction.

7. An oil receiver comprising an oil-receiving funnel, and a member supporting the funnel to swing in a substantially vertical

direction embodying cooperative relatively rotatable sections to one of which said funnel is connected, means acting to relatively rotate said sections in a direction to raise the funnel, and stop means between said sections for arresting the upward swing of the funnel.

8. An oil receiver comprising an oil-receiving funnel, and a member supporting the funnel to swing to and from a substantially upright position, said member embodying relatively rotatable opposed sections, to one of which the funnel is connected, a torsional tension spring located substantially in the axis of rotation of said sections, and means connecting the ends of said spring to the respective sections, the tension of said spring acting on said sections to hold them in cooperative relation and the torsion of said spring acting to raise the funnel toward upright position.

9. An oil receiver comprising a hollow relatively fixed standard forming an oil outlet, an oil-receiving funnel, and a reservoir between said funnel and outlet embodying cooperative relatively rotatable sections, one of said sections being swivelled on said standard and the other section having the funnel fixed thereto and being rotatable to swing the funnel vertically relatively to the standard, and means acting to rotate said funnel carrying section to swing the funnel upwardly.

10. An oil receiver comprising a hollow supporting standard forming an oil outlet, an oil-receiving funnel having a tubular stem, and an intermediate reservoir composed of sections one of which is connected to the standard and the other of which is connected to the stem of the funnel, said sections being relatively rotatable about a substantially horizontal axis and having a joint between them which lies in a plane which extends angularly across the axes of the standard and the stem of the funnel, the upper portion of said section connected to the standard having an air vent.

11. An oil receiver comprising a supporting standard, an oil-receiving funnel having a stem composed of telescopic sections, means swivelled on the standard and supporting the funnel to swing laterally about the standard and also vertically, and means yieldingly holding the telescopic sections of the stem of the funnel in different adjusted relations.

In testimony whereof we have hereunto set our hands.

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EARL E. CLINE.