(No Model.) 2 Sheets—Sheet 1.

G. H. PERKINS.

OIL VALVE.

No. 519,306. Patented May 1, 1894.

FIG. 1.

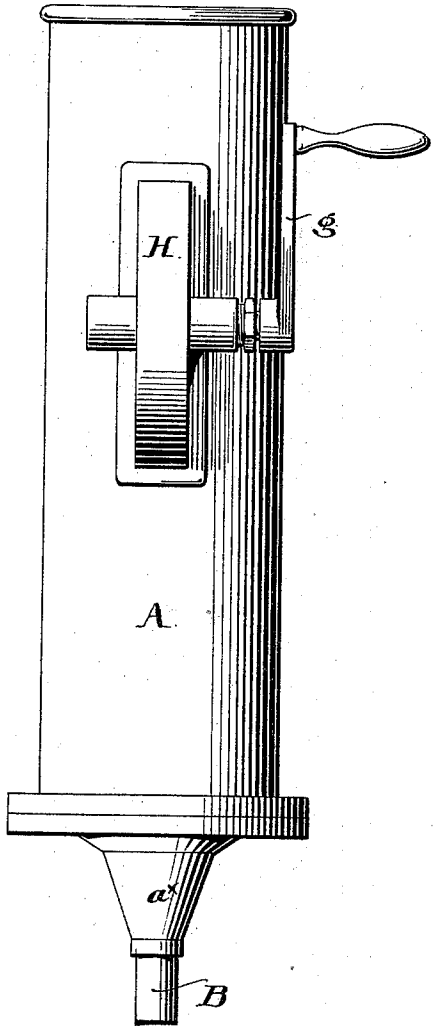
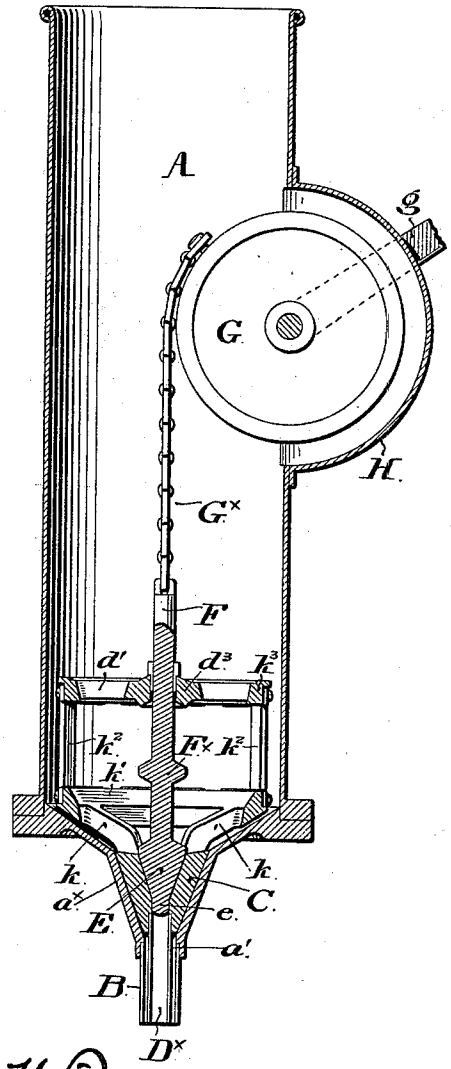


FIG. 2.



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(No Model.) 2 Sheets—Sheet 2.

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No. 519,306. Patented May 1, 1894.

FIG. 3.

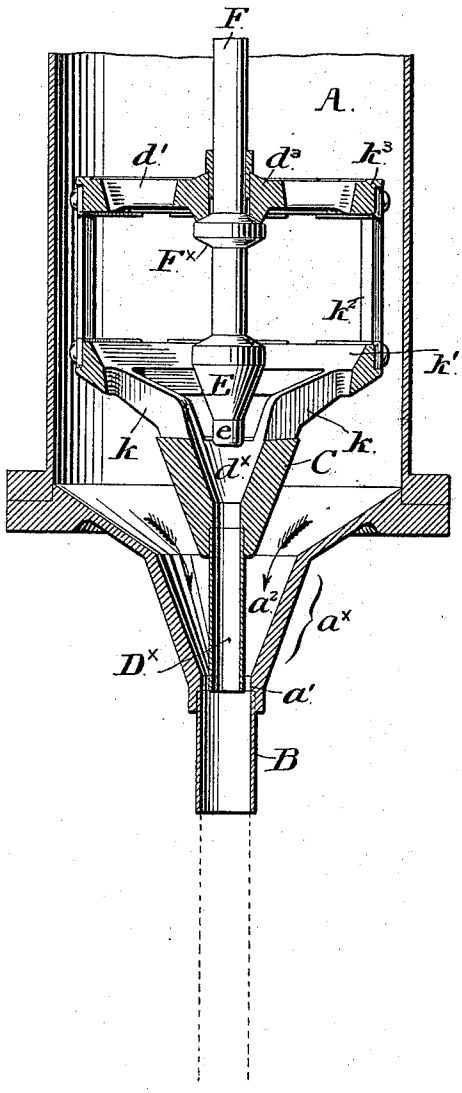
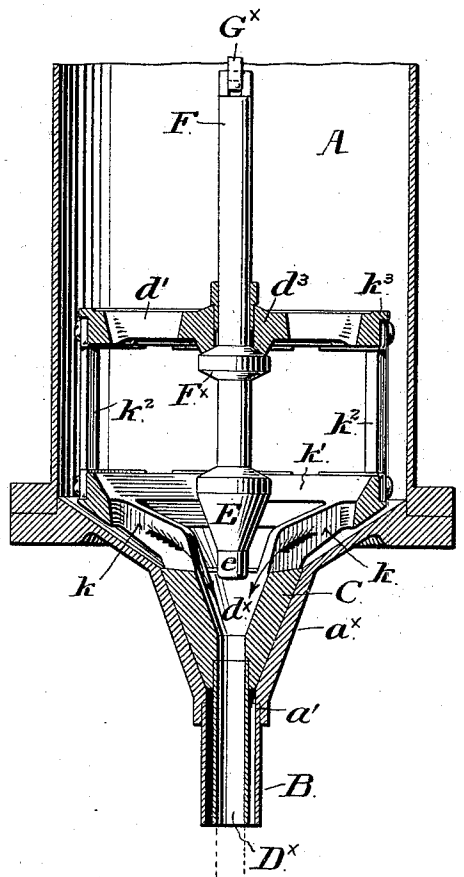


FIG. 4.



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UNITED STATES PATENT OFFICE

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO THE ATLANTIC REFINING COMPANY, OF SAME PLACE.

OIL-VALVE.

SPECIFICATION forming part of Letters Patent No. 519,306, dated May 1, 1894.

Application filed December 9, 1893. Serial No. 493,228. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. PERKINS, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Valves, of which the following is a specification.

In filling cans with petroleum it is desirable that the inflowing stream of oil should be of large size so that the filling may be expeditiously accomplished, and it is customary to provide the can with an inlet opening of diameter greater than that of the stream so as to afford an outlet for the air displaced by the oil. In practice, however, it is found that the foaming occasioned within the can by the volume and impetus of a large entering stream results in the splashing or overflow of a portion of the liquid through the said air outlet when the level of the oil approaches the top of the can, and renders it difficult to fill the can exactly full. It has been attempted to remedy the difficulty by charging a stream of a given size into a can until the latter is nearly full, and by then, by means of a valve, partially closing the pipe or conduit through which the stream flows, so that thereafter, the size of the stream of oil flowing into the can being diminished, the amount of foaming within the can will be correspondingly decreased. Such smaller stream of oil, however, in descending through and issuing from the relatively large vertical pipe through which it flows, does not follow a directly vertical course, but flows over different portions of the inner face of the pipe, and, crawling outwardly across its lower edge, tends to discharge eccentrically and irregularly in different directions, with the result, the pipe not entering the can but terminating a short distance above it, that a quantity of the oil lodges upon the exterior of the can.

It is the object of my invention to provide an apparatus by which a large volume of oil may be rapidly charged to a can or kindred receptacle until the latter is nearly full, and by which a small stream of oil may thereupon be steadily and accurately and in such manner as not to occasion foaming, charged to the can until the latter is precisely full.

In the accompanying drawings I show and herein I describe a good form of a convenient embodiment of my invention, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the accompanying drawings, Figure 1 is a view in side elevation, and Fig. 2 a central, vertical, partly sectional, elevation, of an oil reservoir equipped with a good form of my invention. Figs. 3 and 4 are vertical, partly sectional, elevational views of my improved oil valve as mounted within the reservoir, illustrating respectively different positions of the parts.

Similar letters of reference indicate corresponding parts.

In the drawings, A is what I hereinafter term a reservoir, the same being a receptacle of any desired general character, shown however as an upright vessel of cylindric contour, the upper end of which is open, and the lower end or head $a^{\times}$ of which consists of a depending funnel-shaped bottom, the interior of which tapers from the vertical wall of the reservoir, to a diameter, at its mouth a', corresponding to that of a conduit B, the upper extremity of which is permanently fitted within said mouth. The lower portion or throat of the tapering interior of the funnel bottom $a^{\times}$, I term the reducer seat a^2.

The conduit B is of any appropriate length, and beneath it the cans to be filled are successively placed with their receiving apertures in alignment with its bore.

C is what I term an annular reducer, the same being externally conical, so that it accurately corresponds to the conical form of the interior of the reducer seat a^2 in which it is adapted to rest. The bore of the reducer is, as shown, as to its lower portion, straight-walled or cylindric, and within its mouth, which is conveniently slightly enlarged for the purpose, is entered and secured a pipe $D^{\times}$ of inferior diameter to the conduit B and disposed concentrically with respect to it. The upper portion of the bore of the reducer is conical to form a valve seat $d^{\times}$.

In the embodiment of my invention illustrated, the reducer is shown as provided with a skeleton frame, composite, in the form shown, of arms k which extend radially away from the reducer and have an inclination cor-

responding to that of the upper portion of the funnel bottom upon which they are adapted to rest when the reducer is in its seat,—of a lower annular rim k' mounted upon the upper extremities of said arms k, and of a diameter somewhat less than that of the interior of the reservoir,—of vertical posts k^2 the lower extremities of which are attached to the lower rim k',—of an upper annular rim k^3 mounted upon and secured to the upper extremities of the posts k^2,—and of a spider d' mounted upon and secured to the rim k^3 to support in axial alignment over the mouth of the funnel bottom, an annular head plate d^3.

E is a valve head of such form as to accurately fit within the seat $d^\times$, and having by preference an extension e adapted to project into and fit within the straight portion of the bore of the reducer.

F is a valve stem extending upward from the valve head and passing through the bore of the head plate d^3.

$F^\times$ is a boss formed upon the valve stem a short distance above the valve head.

The operation of the device is as follows: The reducer being in the position illustrated in Fig. 2, and it being assumed that the reservoir is full of oil and that a can to be filled and adapted to contain a quantity of oil equal to the quantity contained in the reservoir, has been placed in position beneath the reservoir, it will be understood that the elevation of the valve stem F will withdraw the valve head from its seat, and, by the encounter of its boss $F^\times$ with the head plate d^3 will also lift the reducer from its seat, so that the parts occupy the position shown in Fig. 3, whereupon a full head of the liquid contents of the reservoir will be discharged through the conduit B, the liquid passing into said conduit both through the space exterior to the pipe $D^\times$ and through the bore of said pipe $D^\times$. The full discharge is permitted to continue until the liquid in the receiving can has reached a predetermined level,—whereupon, to avoid splashing and overflowing of the liquid in the filling of the remaining or unfilled portion of the can,—the valve stem F is lowered sufficiently to effect the seating of the reducer as shown in Fig. 4, the result of which is to reduce the diameter of the liquid outlet to the diameter of the bore of the reducer and of the pipe $D^\times$, and, thereupon, the remaining oil contained in the reservoir is discharged through said reducer bore and the pipe $D^\times$, in a stream which, though small, is of the full size of the pipe $D^\times$ and will therefore be discharged directly and accurately through the center of the can opening.

The valve stem may be operated in any desired manner. The arrangement illustrated in Figs. 1 and 2 of the drawings is, however, adapted to the purpose and one which I employ.

G is a windlass wheel having a crank handle g, and mounted in such position within the reservoir that its periphery is in line above the valve stem, and $G^\times$ is a flexible connection between said stem and windlass. By the throw of the handle g in one or the other direction, the elevation or depression of the valve stem will be occasioned.

In the drawings I have shown the reservoir as provided with an enlargement H to receive the wheel G.

From an examination of the construction described and illustrated it will be understood that the reducer may be regarded as an auxiliary funnel adapted to be seated within the funnel bottom of the reservoir, and adapted to reduce the size of the outlet of the funnel bottom without altering its character or operation.

The skeleton frame serves both as a device to be engaged by the valve stem for the elevation of the reducer,—and as a device to guide the reducer, in its descent, accurately to its seat.

Having thus described my invention, I claim—

1. In combination with a reservoir embodying an outlet, a reducer having a vertical bore and externally adapted to said outlet, and means for elevating the reducer to a position within the reservoir and clear of the outlet, substantially as set forth.

2. In combination with a reservoir embodying an outlet, a reducer having a vertical bore and externally adapted to said outlet, and a valve head adapted to the bore of the reducer, substantially as set forth.

3. In combination with a reservoir embodying an outlet, a reducer having a vertical bore and externally adapted to said outlet, a valve head adapted to the bore of the reducer, and means for withdrawing the valve head from the bore of the reducer and withdrawing the reducer from the reservoir outlet, substantially as set forth.

4. In combination with a reservoir embodying an outlet, a reducer having a vertical bore and externally adapted to said outlet, a valve head adapted to the bore of the reducer, and having an upwardly extending valve stem, means for occasioning the vertical movement of said valve stem, and a connection between said valve stem and the reducer, substantially as set forth.

5. A liquid reservoir the bottom of which is provided with a tubular outlet of a given diameter, in combination with an annular reducer fitted to a seat in said bottom, axially apertured and provided with a discharge tube of less diameter than the first mentioned outlet, said reducer being adapted to occupy a position within the first mentioned outlet, a valve adapted to close the aperture of said reducer, and means for controlling said reducer and operating the valve, substantially as set forth.

6. In combination with a reservoir having an outlet embodying a reducer seat, an annular reducer fitted to said seat, a valve head

fitted to the bore of the reducer, and provided with a valve stem, a connection between said valve stem and said reducer, a windlass mounted in the upper portion of the reservoir, and a flexible connection between said windlass and the valve stem, substantially as set forth.

7. In combination with a reservoir having an outlet embodying a reducer seat, a conduit leading from said seat, an annular reducer, a pipe leading from said reducer, a valve head, a valve stem, and a connection between the reducer and the valve stem, substantially as set forth.

8. In combination with a reservoir having a funnel bottom embodying a reducer seat, a conduit fitted to said bottom, a reducer adapted to fit within said seat, a pipe fitted to said reducer, a skeleton frame connected with said reducer and embodying a head plate, a valve head adapted to fit within the reducer, a valve stem extending through the head plate of the skeleton frame and provided with a projection adapted to encounter said head plate, substantially as set forth.

9. In combination with a reservoir having a funnel bottom embodying a reducer seat, a conduit fitted to said bottom, a reducer adapted to fit within said seat, a pipe fitted to said reducer, a skeleton frame connected with said reducer and embodying a head plate, a valve head adapted to fit within the reducer, a valve stem extending through the head plate of the skeleton frame, and provided with a projection which when the valve head is seated in the reducer is somewhat below the head plate, but which, in the elevation of the valve head and stem, after the valve head leaves the reducer, encounters the head plate and occasions the elevation of the reducer and skeleton frame, substantially as set forth.

10. In combination with a reservoir having a funnel bottom embodying a reducer seat, a conduit fitted to said bottom, a reducer adapted to fit within said seat, a pipe fitted to said reducer, a skeleton frame connected with said reducer and embodying a head plate, a valve head adapted to fit within the reducer, a valve stem extending through the head plate of the skeleton frame, and provided with a projection which when the valve head is seated in the reducer is somewhat below the head plate, but which, in the elevation of the valve head and stem, after the valve head leaves the reducer, encounters the head plate and occasions the elevation of the skeleton frame and reducer, and means for occasioning the elevation of said valve stem and head, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 25th day of August, A. D. 1893.

GEORGE H. PERKINS.

In presence of—

F. NORMAN DIXON,

J. BONSALL TAYLOR.