2 Sheets--Sheet 1.

E. F. WILDER.

Pumping and Measuring Liquids.

No. 126,604. Patented May 7, 1872.

Fig. 1.

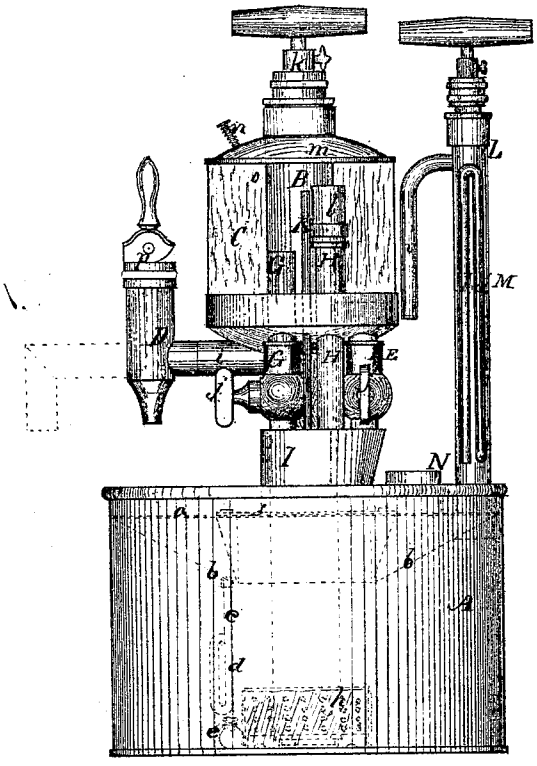
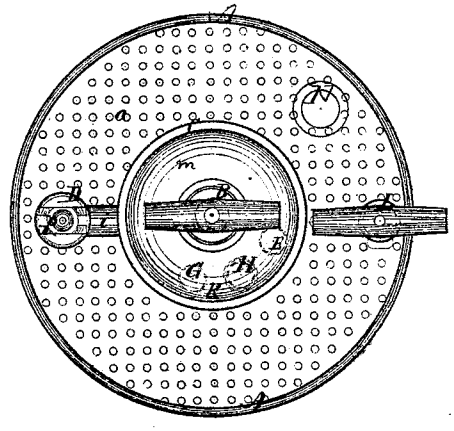


Fig. 2.



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per his atty.,
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Fig. 3.

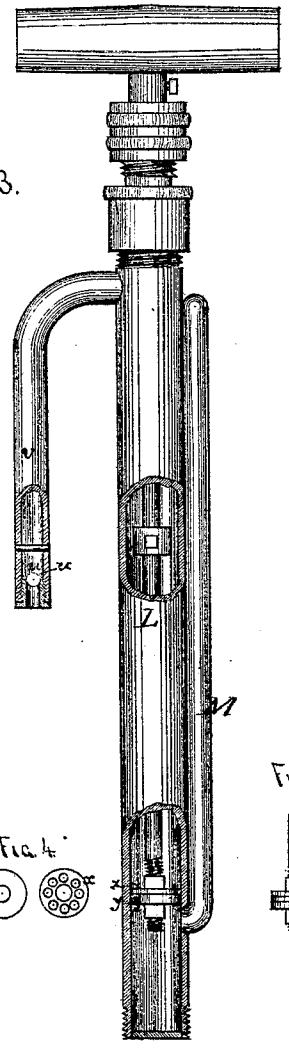
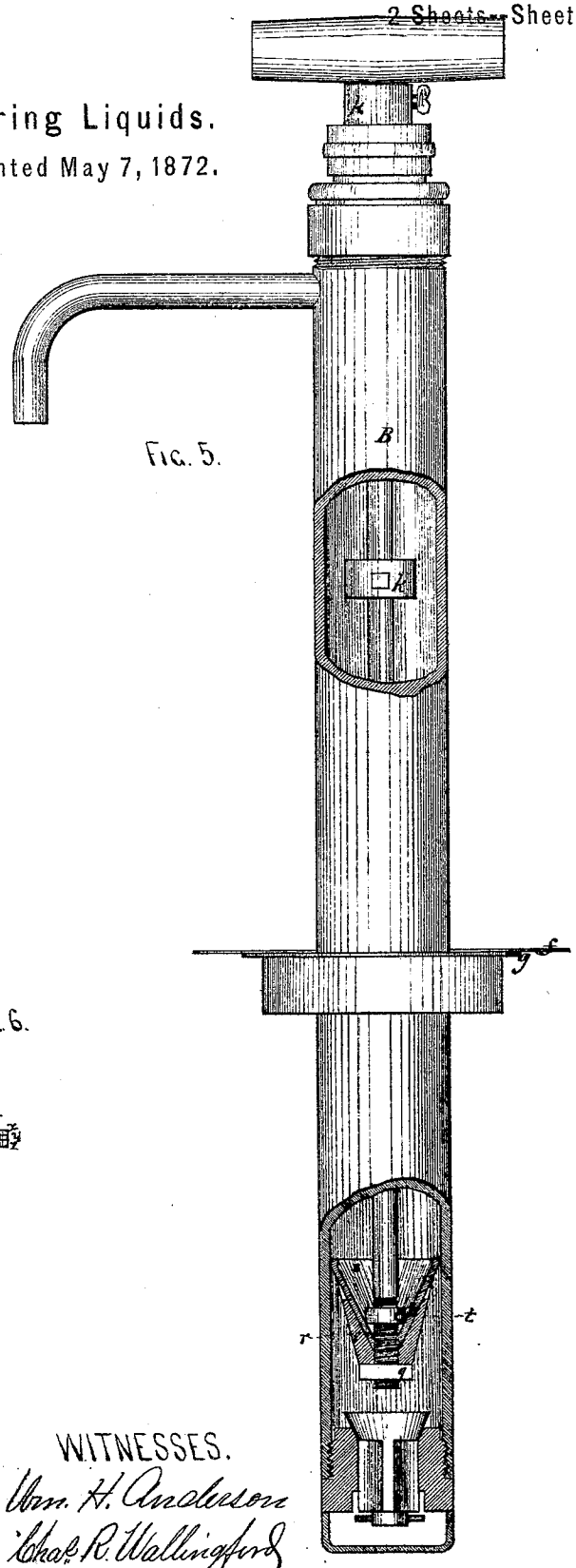


Fig. 4.

Fig. 6.



Fig. 5.



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126,604

UNITED STATES PATENT OFFICE.

ELI F. WILDER, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR PUMPING AND MEASURING LIQUIDS.

Specification forming part of Letters Patent No. 126,604, dated May 7, 1872.

To all whom it may concern:

Be it known that I, ELI F. WILDER, of Lowell, in the county of Middlesex and State of Massachusetts, have invented an Improved Apparatus for Pumping and Measuring Oils and other Liquids; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a side elevation of the apparatus; Fig. 2, a top view of the same; Figs. 3, 4, and 5, views of parts detached.

Like letters designate corresponding parts in all the figures.

The object of this invention is to provide an improved apparatus for pumping oils and other liquids from tanks, cans, or other vessels in such a manner as to accurately measure the quantities drawn in the act of drawing, and to provide for filtering the liquids at the same time, as well as to catch the drip and return it to the can or vessel, strained, through the apparatus, which is also arranged to transfer the liquid from another vessel to the tank or can provided therewith, or vice versa, at pleasure, all substantially as hereinafter specified.

Let A represent a tank or can, to which the apparatus is applied. The pump B is connected with the tank or can by means of a horizontal perforated strainer-plate, *a*, which covers the top or opening of the said tank or can and of a tight funnel-formed basin, *b*, Fig. 1, beneath the strainer. The strainer receives any drip or waste of oil or other liquid incident to the drawing and measuring, and the funnel-formed basin catches it and conducts it to a tube, *c*, which extends from its bottom down into the tank or can. This tube has a bend or coil, *d*, Fig. 1, and a filtering-bag, *e*, secured around its lower end. Thus all the drip or spilled liquid is returned automatically to the tank or can, and is filtered by the bag *e*, while the bend or coil *d* serves as a trap to prevent the ingress of air into or the evaporation of the liquid from the tank or can through the tube. This strainer and basin may be permanently attached to the tank or can, or may be removably secured thereto, by suitable packing so as to fit air-tight therein. The pump B is secured in the center of the strainer-plate by means of a flanch-plate, *f*, and a packing-gasket, *g*, Fig. 5, of India rubber or other suitable material. Between the strainer-plate and the basin-bottom the pump-body may be inclosed in a tight case, as indicated by dotted lines in Fig. 1. The lower end of the pump-barrel is inserted into a filter-cup, *h*, which serves both to filter the liquid as it is drawn out and to keep the pump firmly in position. Above the tank or can the pump is surrounded with a measuring-reservoir, C, which receives the liquid as it is drawn up by the pump and holds it till it is drawn off through a faucet, D, communicating with the bottom of the reservoir through a tube, *i*.

The measuring is effected by two means, either of which may be relied on; or, if undoubted accuracy is desired, both can be used, so as to obviate any probability, if not possibility, of mistake. First, the pump itself measures by its strokes. I have an improved arrangement for applying this mode of measurement by the use of adjustable collars *k k* on its piston-rod, one being above the pump-barrel and the other inside thereof, and thus furnishing stops to limit both the upward and downward strokes of the piston. These collars are secured in position by set-screws or their equivalent, and they may be placed on the piston-rod in different relative positions, so as to produce different measurements by the single stroke, each measurement being accurately adjustable; second, by means of the reservoir C and a series of gauge-tubes, E G H, which reach upward into the same at regularly different heights from the tank or can, so as to accurately measure the liquid in the reservoir, by any desired unit of measure and multiples thereof, at the tops of the tubes, respectively, while all excess of the liquid drawn into the reservoir flows over into the open tops of the tubes, and is conducted back thereby into the tank or can. All of these gauge-tubes may connect with a single tube, I, below the reservoir, to reach down into the tank or can. They are, respectively, provided with stop-cocks *j j* below the reservoir, except the highest tube H, in order that all shorter than the one used for measuring, at any time, may be closed to prevent the liquid escaping thereby. Each tube has, or may, preferably, have, an adjusting-collar to screw or otherwise adjust upon its upper end, as shown at *l* on the tube H, Fig. 1, for the purpose of accurately graduating the height of the tube and

the quantity of liquid in the reservoir indicated thereby. Another small tube, K, extends upward by the side of the measuring-tubes, reaching as high as or a little higher than the highest measuring-tube H, for the purpose of furnishing a vent for the air displaced in the tank or can below or the other way. In connection with these measuring-tubes, inside of the reservoir C, the sides or periphery of the said reservoir are made transparent for the purpose of observing the height of the liquid therein and of seeing that the measurement is complete and accurate. The top *m* of the reservoir is of metal, fitting down upon or over the transparent periphery, and the upper part of the pump B is secured therein and keeps it firm in position. The pump extends upward through the center of the reservoir and of its cap or top *m*, and sustains the same. A spring-valve, *n*, opening inward, is secured in the top or cap *m* of the reservoir to allow the introduction of air therein, and into the tank or can below, as the liquid is pumped or drawn therefrom, to prevent a continual circulation of air therein, and any evaporation and dissipation of the liquid therefrom. In the side of the pump-barrel, above the top of the highest measuring-tube H, is the discharging-aperture *o*, Fig. 1, through which the liquid flows from the pump into the reservoir. By removing the top *m* of the reservoir a discharge-pipe or nozzle may be inserted in this aperture for drawing off the liquid as it is drawn up by the pump, without measuring directly into oil-cans and other receivers; and the pump may be removed from the tank or can A, and, by removing the faucet D from the connecting-tube *i*, an elbow or nozzle may be screwed on in its place, as indicated by dotted lines in Fig. 1, so that the pump may be employed for filling tanks or cans from barrels, &c., and for any other similar purpose. The faucet D has a tapering or funnel-shaped discharge-orifice, with a conical valve, forced down by a spring, to close the same. The valve is raised by a lever-cam, *p*, Fig. 1. The piston of the pump B, as shown in Fig. 5, is composed of a hollow inverted cone, *r*, through the truncated apex of which the lower end of the piston-rod extends, and is held by a nut, *q*, at the bottom; and a conical flexible valve, *s*, fits in the inside of the cone, and is retained in place by a nut, *t*, screwed down on the piston-rod inside of the valve. This valve fits the bore of the pump-barrel; but the piston does not quite fill its diameter, and has holes *u u* near the upper edge to give free passage to the liquid. In addition to the pump B I employ, when desired, another pump, L, which may be smaller, for the principal purpose of drawing or draining liquids from small cans or other vessels into the tank or can A. This pump is of peculiar construction for the purpose, so that its action is the reverse of ordinary pumps. To effect this its discharging-pipe *v* extends downward somewhat further than usual, and forms at the same time an induction or suction pipe. It has a ball-valve, *w*, in its lower end, so that, with a proper construction of piston, it will retain the liquid drawn into the the pump. The piston is composed of a perforated disk, *x*, and a leather disk-valve, *y*, below it, so that when the piston is forced down the valve closes and causes the liquid to be drawn into the pump through the pipe *v*, and when the piston is raised again the valve opens and transmits the liquid downward. The liquid is discharged through a pipe, M, from the lower end of the pump upon the strainer-plate *a* of the tank or can A, and so on, removing the valve *w* from the pipe *v* by unscrewing its seat from the end of the pipe, and adding a solid disk, *z*, Figs. 4 and 6, to the piston below the valve *y*, so as to make a solid or close piston, liquid can be drawn from a can or vessel at the down-stroke of the piston into the pump-barrel, and then discharged through the same pipe *v*, at the up-stroke of the piston, into another can or vessel, or deliver it anywhere else desired. In order that the discharge-pipe M may not interfere with the use of this latter arrangement, and still be ready to serve for the former arrangement of the pump, it extends first upward as high as the pipe *v*, and then bends and reaches downward to near the lower end of the pump. Upon the strainer-plate *a* is secured a short pipe or collar, N, of suitable size, to receive and hold the necks of inverted cans and bottles for draining them into the tank or can A.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an apparatus for holding, drawing, and measuring oils and other liquids, a pump-piston provided with means or devices, as described, the adjustable collars *k l* on the piston-rod, or their equivalent, in connection with the means of giving the piston-rod a reciprocating motion, whereby the fluid contained within the tank may not only be drawn and accurately measured, but be automatically discharged into a can or receptacle, as herein specified.

2. I also claim the separate gauge-tubes E G H, of different lengths, constructed, arranged, and operating as described, in combination with the reservoir C, substantially as and for the purpose herein set forth.

3. I also claim the adjustable collars *l l*, in combination with the gauge-tubes E G H, for the purpose specified.

4. I also claim the valve *n* and vent-tube K, in combination with the close reservoir C and close tank or can A, substantially as and for the purpose herein set forth.

5. I also claim the drain-pipe *c*, constructed with the bend or coil *d* and filter *e*, in combination with the drip-strainer *a* and basin or receiver *b*, substantially as set forth.

Witnesses: ELI F. WILDER.

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