

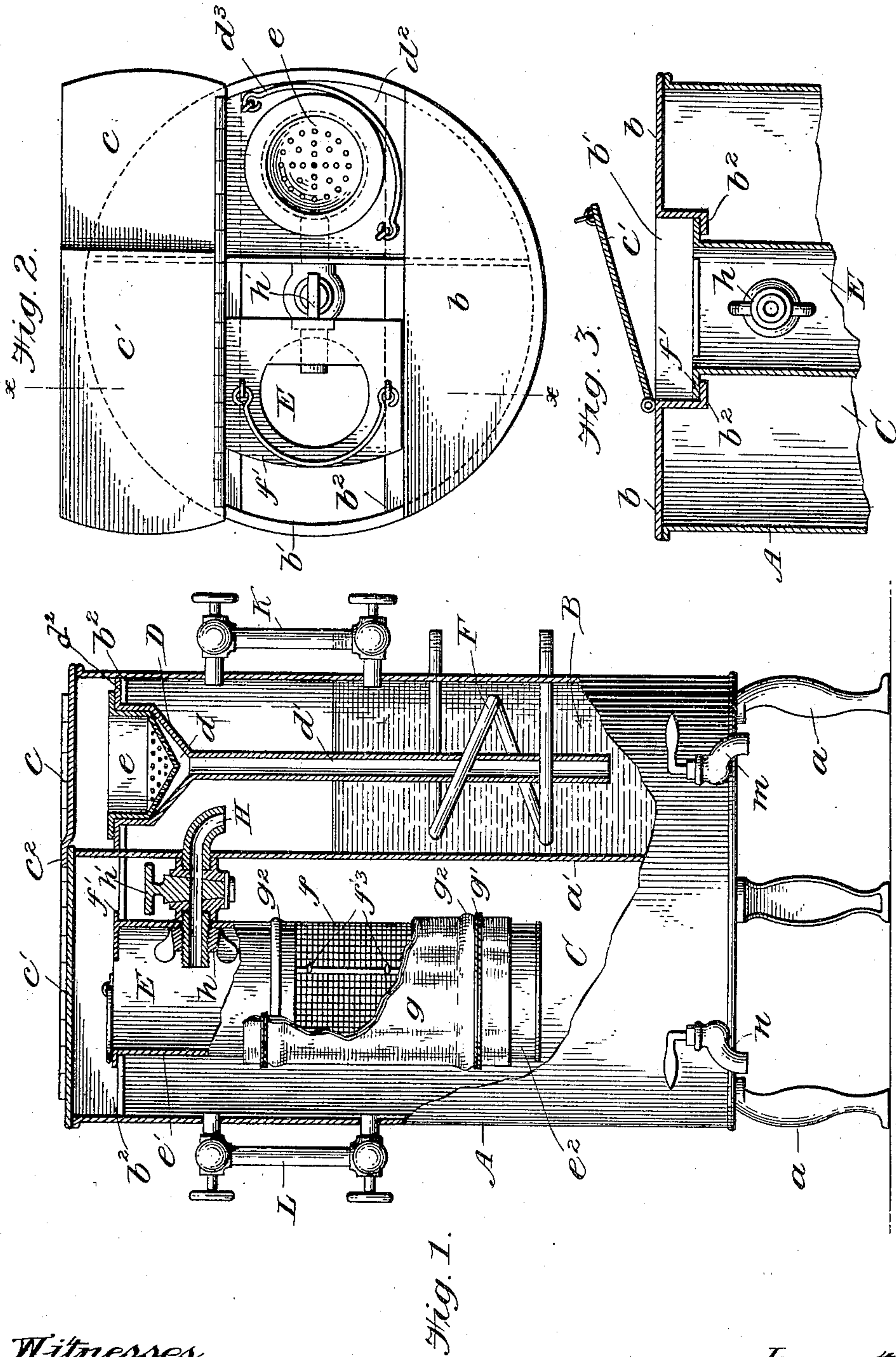
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Patented June 26, 1900.

C. E. LEFEBVRE.
OIL FILTER.

(Application filed Apr. 5, 1900.)

(No Model.)



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OIL-FILTER.

SPECIFICATION forming part of Letters Patent No. 652,543, dated June 26, 1900.

Application filed April 5, 1900. Serial No. 11,624. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. LEFEBVRE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Filters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain improvements in oil-filters, and particularly to that class designed for filtering waste oils caught from engines and other classes of machinery.

The principal object of my invention is to provide a filter which shall be simple in construction, and therefore inexpensive to manufacture, and more efficient in operation than the devices heretofore known and used.

A further object of my invention is to provide an oil-filter having a separate storage-chamber for the filtered oil, a purifying-chamber, and a filtering-cylinder, each compartment being independent of the other, thus making it unnecessary to draw off the pure oil when the purifying-chamber is to be cleaned or to disturb the contents of either chamber when it is desired to remove the filtering-cylinder for cleansing or repairing purposes.

A still further object of my invention is to construct the different filtering parts so that they may be readily and quickly removed from the outside casing without disturbing the oil therein when it is desired to cleanse the same or renew the filtering material.

Another object of my invention is to provide a steam-coil around the receiving-tube, so that heat may be applied directly at the beginning of the filtering process, thereby rendering the oil thin, and thus greatly aiding filtration, and also causing circulation of the water in the main purifying-chamber.

With these objects in view my invention consists in the construction, combination, and arrangement of the different parts, such as will be hereinafter fully described, and particularly pointed out in the claims made hereto.

In the accompanying drawings, Figure 1 is a sectional elevation of an oil-filter embodying my improvements, portions of the mechan-

ism being shown in side elevation and partly broken away for the purpose of more fully illustrating the construction and operation of my invention. Fig. 2 is a plan view of the same with the covers removed, and Fig. 3 is a detail sectional view taken about on the line *xx* of Fig. 2.

In carrying out my invention I provide an outer cylindrical casing A, provided with suitable supporting-feet *a*, the said cylinder being constructed of sheet-iron, copper, or any other suitable material. This cylinder A is divided by a vertical partition *a'* into two separate compartments B and C, the first-named, B, being the receiving and purifying chamber, and the latter, C, the storage-chamber for the reception of the purified or filtered oil.

The upper end of the cylinder A is provided with a top or cover *b*, which extends a short distance on each side of the said cylinder toward the center, leaving an opening *b'*, which is provided with two hinged lids *c c'*, one adapted to cover the receiving-chamber and the other the storage-chamber, as shown in Figs. 1 and 2 of the drawings. The lid *c* is provided with a flange *c²*, which overlaps the lid *c'*, so that when the lid *c'* is opened the lid *c* will also be opened with it. The inner edges of the top portions *b* are provided with the angular flanges *b²*, extending across both chambers of the cylinder A and serving as supporting-ledges for the receiving-funnel in the chamber B and the filtering-cylinder in the chamber C. The receiving-funnel D comprises the funnel-shaped top *d*, terminating in the vertical pipe *d'*, which extends down within a short distance of the bottom of the chamber B. The funnel *d* is provided with a flange *d²*, which fits exactly into the opening provided in the top of the chamber B and rests upon the flanges *b²*. Into the funnel *d* is fitted a sieve or strainer *e*, having a bottom corresponding in shape to the funnel-bottom, but inclined on a slightly-different pitch and provided with perforations, as illustrated in Figs. 1 and 2 of the drawings. The funnel D is provided with a bail *d³*, so that it may be easily removed from its position in the chamber B for cleaning and repairing purposes. Around the lower end of the pipe *d'* I provide a coil of steam-pipe F, having its ends

projecting through the outer casing A, which are connected with the source of steam-supply and with an exhaust-pipe.

The filtering-cylinder E comprises the upper neck portion e' , made of solid sheet metal, the lower portion e^2 having a solid bottom and the intermediate portion f constructed of galvanized wire mesh. The upper end of the cylinder E is provided with the flanges f' , which rest upon the ledges b^2 , formed on the top sections b , and serve to support the said cylinder in the storage-chamber C. The intermediate section f is provided at its seam with a series of hooks or prongs f^3 , adapted to engage and secure the edge of the filtering-cloth g , which is wrapped around the said intermediate portion three or four layers thick. The upper and lower edges of the filtering-cloth extend around the upper and lower sections e' and e^2 of the filtering-cylinder and are secured in position by the cords g' , which are wound around the same just above and below the beads g^2 , which are provided in the cylinder for the purpose of preventing the cords from slipping out of place.

A pipe H is provided in the upper portion of the filter, which communicates the receiving-chamber with the filtering-cylinder. One end of this pipe passes through an opening provided in the section e' of the filtering-cylinder and is threaded for the reception of the thumb-nut h , by means of which the said filtering-cylinder may be securely held in place. The pipe H is provided with a cut-off valve h' , by means of which the passage between the two compartments may be opened or closed.

Each of the compartments B and C is provided with faucets, as m and n , located in the outer casing at a point near the bottom of said chambers for drawing off the contents thereof. A sight-gage, as L, is provided for the storage-chamber and a similar gage K for the receiving-chamber.

The operation of my improved filter may be described as follows: The lid c is raised and the impure and waste oils are poured into the sieve e , provided in the upper portion of the funnel D, the lid c' remaining closed, so as to prevent the splashing of the dirty oil into the storage-chamber when carelessly handled. The oil then descends through the pipe d' and passes out through the bottom of said pipe into the water provided in the lower portion of the chamber B, which being heated by the steam-coil F diffuses the oil and causes it to separate into globules and rise to the surface of the water, while all the heavier particles of grit and dirt sink to the bottom of the chamber, where they can be drawn off through the valve m when desired. The oil in rising through the water in the manner just described becomes partially purified and accumulates on the top of the water and, when it reaches the level of the inlet-pipe H, will pass through the same into the filtering-cylinder E. From thence it passes through the wire

mesh f and percolates through the filtering-cloth g , which action removes all foreign matter retained in the oil, so that when it reaches the storage-chamber C it is absolutely purified and ready for use. When the filtering-cloth becomes clogged from constant usage and it is desired to remove the cylinder E for the purpose of cleaning same and renewing the cloth, the valve h' is shut off and the thumb-nut h removed from the pipe H. The cylinder can then be slid on the ledges b^2 until it is entirely clear of the pipe H, when it can then be lifted out and the contents thereof poured into the sieve e . The flange f' around the top of the cylinder E is of a size and shape corresponding to the opening b' in the top of the chamber B, so that when the cylinder E is removed it may be turned upside down and fitted into the opening b' over the sieve e , and thus allow the oil to drip out while the filtering-cloth is being removed and new cloth substituted.

From the above-described construction and operation it will be readily seen that I have produced a filter which is simple in its construction and very rapid and efficient in its operation and one which absolutely purifies the oil passing through it no matter how bad its condition might have been. Also by reason of the construction and arrangement of the different parts I am enabled to remove the different parts for cleansing purposes without disturbing either the filtered oil in the storage-chambers or the partially-purified oil and other contents of the receiving-chamber.

The sieve e and the funnel D can both be easily lifted from their seats and cleaned without disturbing the contents of either chamber.

I do not wish to be limited to the exact details of construction illustrated in the drawings, as various slight changes might be effected without departing from the spirit and scope of my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an oil-filter, the combination with the outer casing, of a receiving-chamber adapted to be partially filled with water, a receiving-funnel located in said chamber extending near the bottom thereof, means for heating the water in said chamber, a storage-chamber separate from the receiving-chamber, a filtering-cylinder suspended in said storage-chamber, a communication between the upper end of the receiving-chamber and the upper end of the filtering-chamber, and means for closing the said communication, substantially as described.

2. In an oil-filter, the combination of an outer casing having a separate receiving-chamber and a storage-chamber, a removable funnel located in the receiving-chamber having a pipe extending to a point near the bottom thereof, a removable sieve adapted to the upper end of said funnel, a filtering-cyl-

inder suspended in the upper portion of the storage-chamber, a pipe communicating the upper portion of the receiving-chamber with the filtering-cylinder, an open mesh provided in the lower portion of the filtering-cylinder, and a filter-cloth secured around said open mesh, substantially as described.

3. In an oil-filter, the combination of a receiving-chamber adapted to contain water, having ledges formed in its upper portion, a funnel having flanges adapted to rest on said ledges, a pipe extending from said funnel to a point near the bottom of the receiving-chamber, means for heating the said water, a storage-chamber separate from the receiving-chamber, a filtering-cylinder suspended in said storage-chamber, and a pipe communicating the upper portion of the receiving-chamber with the filtering-cylinder.

4. In an oil-filter, the combination of a receiving-chamber adapted to contain water, ledges formed near the top of said chamber, a funnel having flanges adapted to rest on the top of said ledges, a sieve located in said funnel, a pipe extending from the funnel to a point near the bottom of the receiving-chamber, a storage-chamber adjacent to the receiving-chamber, ledges formed near the top of said storage-chamber, a filtering-cylinder having flanges formed on its upper edges adapted to rest on the ledges of the storage-chamber and a pipe connecting the upper end of the receiving-chamber with the filtering-cylinder, substantially as described.

5. The combination of a receiving-chamber adapted to contain water, a funnel located therein for delivering the oil at a point near the bottom of said chamber, a separate storage-chamber having a filtering-cylinder suspended therein, a pipe communicating the upper end of the receiving-chamber with the filtering-cylinder, a solid bottom formed in said filtering-cylinder, an open wire mesh formed in said cylinder above its bottom, a filtering-cloth secured around said wire mesh, and means for securing said cloth to the cylinder, substantially as described.

6. The combination of an outer cylinder, having an oil-receiving chamber, adapted to receive the waste oil, a storage-chamber provided with a filtering-cylinder communicating with the receiving-chamber, a hinged lid for closing the upper end of the storage-chamber, and a separate hinged lid adapted to cover the upper end of the receiving-chamber having a flange overlapping the lid of the storage-chamber, substantially as described.

7. In an oil-filter, an outer cylindrical casing having a vertical partition dividing the

same into two separate compartments, a top partially covering both sides of the outer cylinder, hinged lids adapted to cover the openings of each compartment, ledges pending from each side of the stationary cover in each compartment, a filtering-cylinder suspended on the ledges of one compartment, a receiving-funnel suspended on the ledges of the other compartment, and a pipe communicating the filtering-cylinder with the receiving-compartment.

8. In an oil-filter, the combination with the receiving-chamber, of a storage-chamber adjacent thereto, a filtering-cylinder located in the upper portion of the storage-chamber, flanges formed on the upper edges of said filtering-cylinder, ledges formed in the top of the storage-chamber on which the flanges of the filtering-cylinder rest, a pipe entering the receiving-chamber and having its other end entering the filtering-cylinder, and a lock-nut secured on the projecting end of the pipe inside of filtering-cylinder, whereby the said cylinder is held in position, substantially as described.

9. A filtering-cylinder for oil-filters comprising a cylinder closed at its lower end, an open wire mesh provided in said cylinder a short distance above its bottom, a bead formed above the mesh, and directly below the same, a series of prongs provided in the said wire mesh, a filtering-cloth hooked to said prongs and wound around the wire mesh, and means for securing the said cloth in its wrapped position.

10. In an oil-filter, the combination of an outer casing A, a receiving-chamber B, provided therein, adapted to contain water, a funnel D, suspended in the upper portion of said receiving-chamber, a tube connecting said funnel and extending to a point near the bottom of the chamber, a steam-coil surrounding the tube for heating the water and oil, a sieve *e*, located in the funnel D, a storage-chamber C, a filtering-cylinder E, suspended in the upper portion of the said storage-chamber, a wire mesh *f*, formed in said filtering-cylinder, a filtering-cloth provided around the wire mesh, a pipe H, entering the upper part of the receiving-chamber, and the upper part of the filtering-cylinder, and a valve *h'*, provided in said pipe, substantially as described and for the purpose stated.

In witness whereof I have hereunto set my hand this 2d day of April, A. D. 1900.

CHARLES E. LEFEBVRE.

In presence of—

JNO. T. CROSS,

CHAS. K. BENNETT.