(No Model.)

F. A. ELLIS.

OIL FILTER.

No. 453,629. Patented June 9, 1891.

Fig. 1.

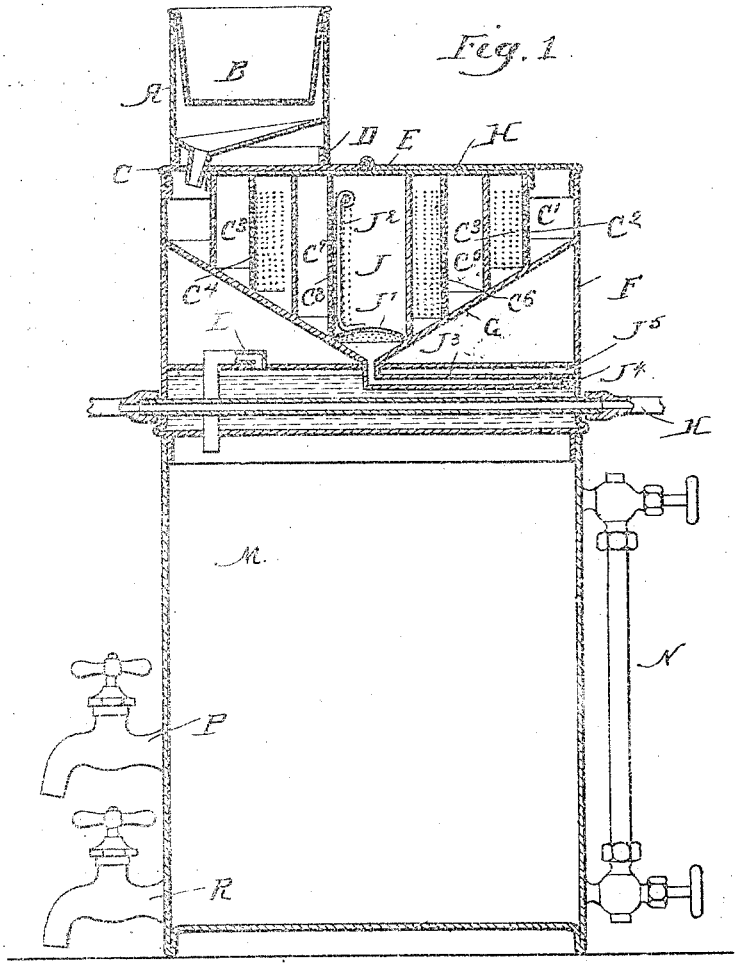
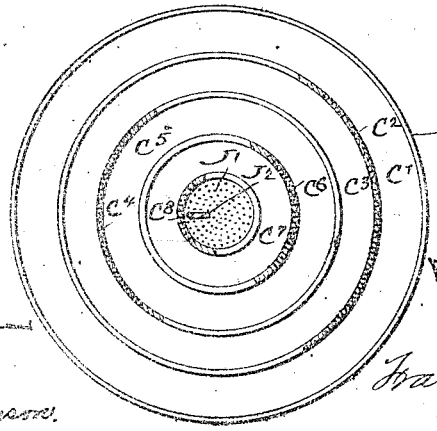


Fig. 2.



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FRANK A. ELLIS, OF CHICAGO, ILLINOIS.

OIL-FILTER.

SPECIFICATION forming part of Letters Patent No. 453,629, dated June 9, 1891.

Application filed June 28, 1890. Serial No. 357,022. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. ELLIS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Oil-Filters, of which the following is a full, clear, and exact specification.

My invention relates to oil-filters, and has for its object to provide a cheap, convenient, and simple filter. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical section. Fig. 2 is a horizontal section through the upper part.

Like parts are indicated by the same letter in both the figures.

A is a small cylinder containing the straining-cup B and the outlet C, and it is secured upon the thimble D on the cover E. The outlet C opens into the outer one of a series of circles C', C^3, C^4, and C^5, which said circles are formed by concentric cylinders and are connected successively by the perforated portions C^2, C^4, C^6, and C^8. These cylinders are secured within the upper portion of the part F of the filter and upon the funnel-shaped bottom G. All the inner circles are covered by the cap H, and the inmost cylindrical part J is provided with the strainer J′, having the handle J^2, and terminates below in the horizontal pipe J^3, which opens, preferably, by the perforated end J^4 into the water-chamber J^5 of the upper portion F of the filter. Through this part J^5 passes the heating-pipe K, and from its upper side and from a position opposite to that of the end of the pipe J^3 upwardly opens the pipe L, which then passes downward vertically through the chamber J^5 and opens into the oil-reservoir M. This reservoir is provided with the gage N at one side and an oil-valve P′ and a water-valve R at the other side. It is evident that these parts could be greatly changed as to number, size, and shape, and the relative disposition may be greatly altered without departing from the spirit of my invention.

The use and operation of my invention are as follows: The oil to be filtered is first poured into the cup B, whence it passes through the strainer and through the outlet C into the outer circle C' of the upper portion of the filter. It then passes through the perforated part C^2 into the circle C^3. Then it passes around through the perforated part C^4 into the circle C^5, then around to the perforated part C^6, and thence into the circle C^7, then to the perforated part C^8, and then to the cylindrical part J. It then passes downwardly through the strainer J′ into the pipe J^3, which pipe, being preferably below the water-level, will be full of water, and through this pipe it passes horizontally, issuing in a comparatively finely-divided state through the aperture J^4 into the water-compartment J^5. This compartment may be completely full of water, if desired, at starting. The oil now passes under the pressure of the superior column backward horizontally through the water-chamber J^5, and upon the surface of such water and upward into the pipe L, and thence downward into the reservoir M. This reservoir will preferably have a quantity of water in the lower portion. It is clear that as the oil passes through these several perforations and strainers it is being strained and cleansed. In passing through the several circles in the upper part of the filter it passes successively inwardly along the inclined bottom G and through the perforations formed on the opposite sides of their respective cylinders, thus having a long path to travel over. As the oil passes through the pipe J^3 and backward through the chamber J^5 it is passing horizontally through a chamber of water and on the water-surface, and hence it is well filtered, for the particles which it contains will be precipitated, as it issues from the pipe J^3 into the chamber J^5 in a finely-divided state, the globules being broken up into small drops, molecules, or particles, and as it passes in this condition horizontally through the water-chamber J^5 and on the surface of the water it is in a peculiarly good condition for the discharge of the particles which it contains. The heating-pipe K, passing through the chamber J^5, permits the heating of the same, if desirable, for cleansing oil when in certain conditions. The gage N indicates the relative amount of oil and water. This passage of the oil through the water-chamber causes a continuous current of such oil, and the continuous motion of such oil results in a precipitation of the impurities which such oil contains into the water of the chamber through which it is passing. The water-chamber J^5 is normally sub-

stantially full of water, and in operation would always be full of water and oil. Since the oil-supply is at one side of this horizontally-disposed chamber and the oil-discharge pipe at the other side, the oil must necessarily pass through such chamber horizontally, and this whether the oil be supposed to pass horizontally through the body of water or through the water-chamber. The oil passes into the water in small quantities, but under a certain pressure, which will result in spreading such oil as it moves in a thin sheet upon the surface of the water. I have, however, contemplated floating the oil in a thin surface layer or stream over the surface of water in an open or partially filled vessel. The storage chamber or tank is entirely distinct from the filtering apparatus, and the oil does not pass into the same until thoroughly filtered. The oil, before being admitted to the water-chamber, should be finely divided and not in large globules.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In an oil-filter, the combination of a water-chamber normally nearly full of water with an oil-supply tank above and an oil-storage tank below, said tanks connecting with such chamber at the opposite sides thereof, so that the oil in its passage to the storage-tank is passed in a thin film or current over the water.

2. In an oil-filter, the combination of a water-chamber normally nearly full of water with an oil-supply tank above and an oil-storage tank below, said tanks connecting with such chamber on opposite sides thereof, so that the oil in its passage to the storage-tank is passed in a thin film or current over the water, the said receiving-tank opening into the water-chamber and a filtering or straining apparatus placed in the channel of the oil, so as to strain the same or partially filter it before it is passed from the receiving-tank into the water-chamber.

3. In an oil-filter, the combination of a water-chamber, an oil inlet and discharge pipe opening into such water-chamber and on the opposite sides thereof and so arranged that the oil passes horizontally through the water-chamber, and said inlet-pipe arranged so as to deliver the oil in a finely-divided state.

4. In an oil-filter, the combination of a water-chamber, an oil-reservoir below the same, a pipe leading from the top of the water-chamber down to the reservoir, and an oil-supply pipe entering the water-chamber near the top thereof.

5. In an oil-filter, the combination of a water-chamber, an oil-reservoir below the same, a pipe leading from the top of the water-chamber down to the reservoir, and an oil-supply pipe entering the water-chamber near the top thereof and discharging at the opposite extremity of the water-chamber.

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