F. B. ANDERSON.

FILTER.

APPLICATION FILED JUNE 29, 1908.

928,576. Patented July 20, 1909.

2 SHEETS—SHEET 1.

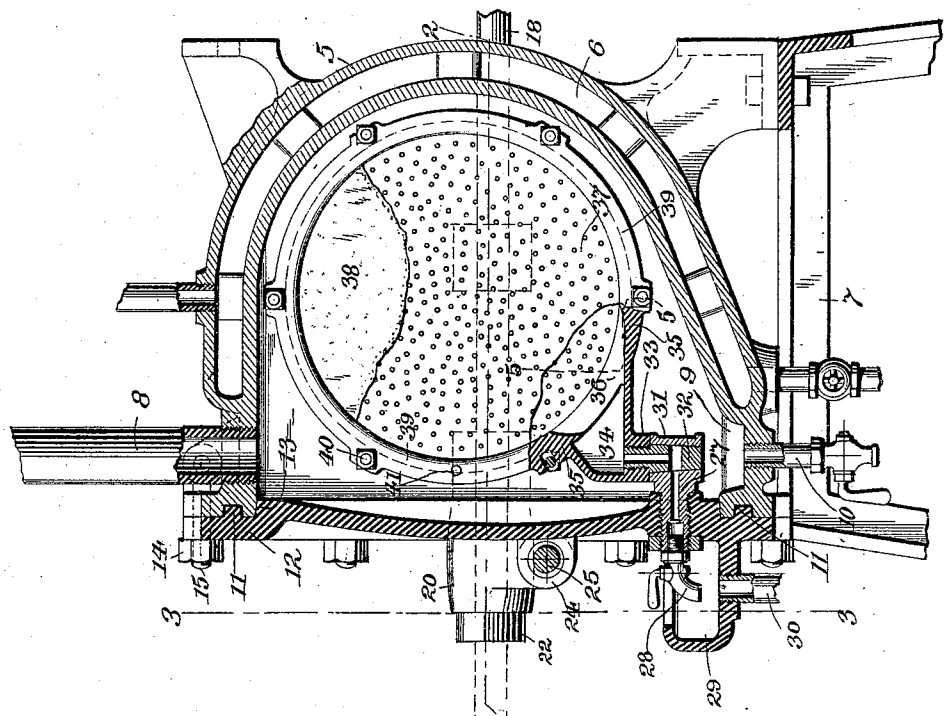
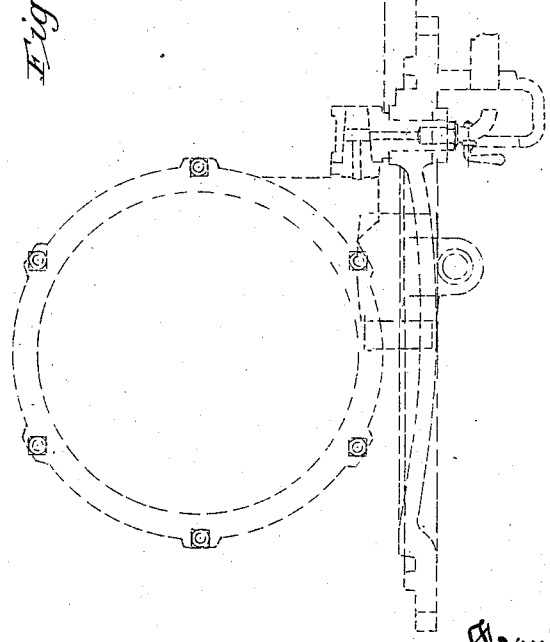


Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

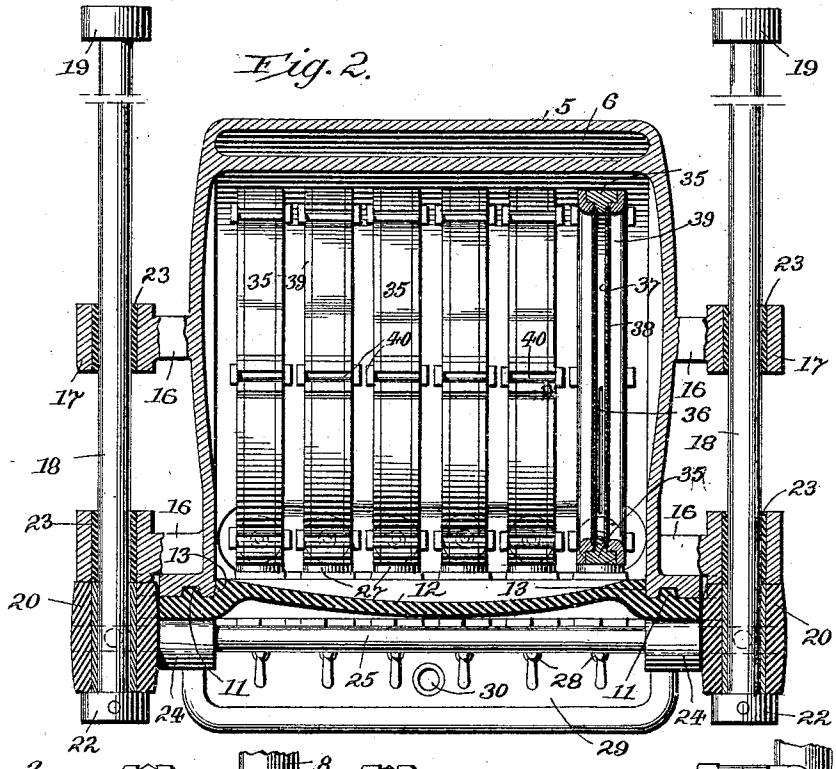


Fig. 3.

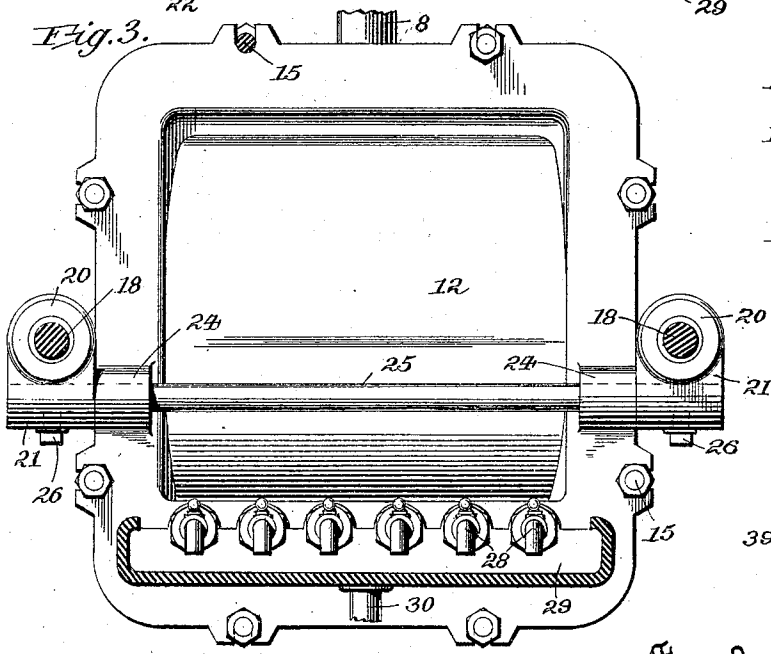


Fig. 4.

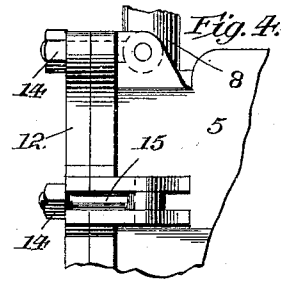
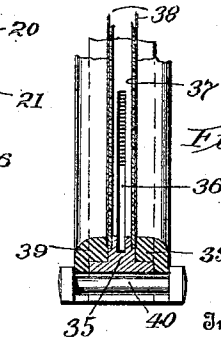


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK B. ANDERSON, OF CLEVELAND, OHIO.

FILTER.

No. 928,576. Specification of Letters Patent. Patented July 20, 1909.

Application filed June 29, 1908. Serial No. 440,872.

To all whom it may concern:

Be it known that I, FRANK B. ANDERSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Filters, of which the following is a specification.

My present invention pertains to improvements in filters, the construction being designed more particularly for use in the filtration of oil.

The invention is shown in the accompanying drawings, wherein:

Figure 1 is a vertical longitudinal sectional view of the filter, the removable front or closure being shown in dotted lines as open and turned upon its pivot; Fig. 2 a horizontal sectional view, taken on the line 2—2 of Fig. 1; Fig. 3 a vertical sectional view, taken on the line 3—3 of Fig. 1; Fig. 4 an elevation showing a portion of the front plate or closure and the body of the press; and Fig. 5 a detail sectional view of a portion of one of the filtering elements, the section being taken on the line 5—5 of Fig. 1.

The object of the present invention is to produce a simple and efficient apparatus for filtering oil, and particularly oil which has been used in machinery, for the purpose of removing all impurities from the oil so that it may be reused.

The press is comparatively small and may be installed and used wherever sufficient fluid pressure is to be had to force the oil through the filtering medium.

In the drawings, 5 denotes the horizontal shell or casing forming the main body of the filter, which, as will be seen upon reference to Fig. 1, is substantially U-shaped in vertical section, the wall of the body being made hollow so as to produce a chamber 6, through which the heating medium may be passed. The lower end of said chamber extends downwardly toward the stand or table 7 upon which the press is preferably mounted.

A supply pipe 8 enters the shell, and the lower portion of the shell is provided with a trough or depression 9 from which extends a valved pipe 10, the purpose of which will presently appear. The forward face of the shell is provided with a groove or depression into which projects a rib 11 formed upon the cover plate or head 12, said head being likewise provided with an inwardly-projecting shoulder 13 which makes a close fit with the interior face of the shell or casing and thereby assists in maintaining a tight joint between the parts when the head 12 is held in place by nuts 14 which are secured upon swing bolts 15, the latter being pivotally attached to eyes or ears formed upon the shell or casing.

Extending outwardly from each side of the shell or casing is a pair of arms 16, each of which arms is provided at its outer end with a hollow lug or eye 17, through which lugs pass rods 18. The rear end of each rod is formed with a head 19 and the forward end of each rod passes through a hollow lug or boss 20 formed upon the upper portion of a bracket 21. The forward end of each of the rods 18 is also provided with a stop-collar 22.

In order to insure true alinement of the parts and to cause the head or closure 12 to come to its proper position when the filter is closed, bearings 23 will preferably be formed in the lugs or eyes 17 and the lugs 20.

The head or closure 12 is provided, adjacent to its lower end, with a pair of lugs or bosses 24, through which is passed a rod 25, said rod at its opposite ends projecting into and passing through the lower portions of the brackets 21 to which it is secured by tap screws 26. It will be seen that the head or closure 12 is hinged upon the rod 25 and when the parts are separated and brought outwardly to the position shown in dotted lines the head, together with the filter elements which are carried thereby, as will be hereinafter pointed out in detail, may be turned so that the filter elements may come to a position where they may be readily handled.

A series of nipples or pipes 27 are screwed through openings formed in the lower portion of the head, and a faucet or cock 28 is mounted in the outer end of each of said pipes. The faucets discharge into a trough 29, preferably formed as an integral portion of the head, and a drain pipe 30 extends from said trough to any desired point.

The inner end of each of the pipes or nipples is provided with a socketed head 31, adapted to receive a plug 32, the upper projecting end of which is threaded and screwed into a boss 33 which extends downwardly from a hollow chamber 34 formed as a projection upon a ring-shaped supporting body 35. A slot or opening 36 (Figs. 1, 2 and 5) extends through the ring-shaped member so as to connect the chamber 34 with the space bounded by the inner circumference of said

ring-shaped member. The supporting body 35 is of the cross-section best shown in Fig. 5, having an inwardly-projecting narrow portion provided with recesses adapted to receive oppositely-disposed, foraminous, disk-shaped members 37 which form the support for the overlying filter papers 38, said disks and papers being held in place by rings 39, which rings in turn are clamped in position by bolts 40 located at intervals around the periphery of the ring-shaped member 35 and the clamping rings 39. In order to bring the recesses formed in the clamping rings and the supporting body 35 into alinement so that the bolts 40 may be readily positioned, I secure in the supporting member 35 a dowel pin 41, the ends of which project from opposite sides of said supporting member and pass into openings formed in the clamping rings 39 when the latter are initially positioned.

The operation of the apparatus is as follows: Assuming that the rods 18 are drawn forwardly, carrying the head 12 with the filtering elements in position thereon, the head and filtering elements will be brought into the position shown in dotted lines in Fig. 1, where any one of the filtering elements may be withdrawn and a new paper placed upon one or both sides thereof, as occasion may require, and then replaced, the plug 32 being seated in the socket 31. After all the filtering elements have been replenished, the head is turned upon the hinge rod 25 and pushed home against the forward face of the shell or casing, where it is secured in position by tightening up the nuts 14 upon the swing bolts 15. The oil to be filtered is then forced inwardly through the pipe 8 and passes through the filter paper carried upon the various filtering elements, through the slots 36 in said elements to the chamber 34, thence through pipes 27 and faucets 28 to the trough 29. By observing the oil which passes out of the various faucets, the operator can shut off any one faucet should the filter paper become ruptured or otherwise injured. When it becomes necessary to renew the filter papers the flow of oil is shut off from the pipe 8 and the stop-cock 10 opened, which will drain out the oil from the shell or casing, it passing down into the trough or depression 9 from the interior wall of the shell or casing and finally out through the pipe 10. It will thus be seen that it is not necessary to wait for all of the oil to drain out from the shell or casing before the head is loosened and moved outward so as to permit the filtering elements to be examined and renewed if required.

By the employment of the plug 32, passing into the socket 31, the use of bolts, retaining screws and the like is not necessary, the parts being merely placed in position and properly spaced with reference to each other and the shell or casing by such connection.

So long as the outermost pair of filtering members is clear of the outer walls of the shell or casing as the head is moved into position, it is immaterial whether or not the intermediate filtering members be equally spaced.

The construction is such that the heads of the bolts 40 will come into contact with each other and hold the working faces of the filtering papers away from each other, so that the oil will have free access to the entire surface of all of the various filter papers supported by the members 35.

Having thus described my invention, what I claim is:

1. In an oil filter, the combination of a shell or casing; a head adapted to be secured thereto and to close the shell or casing; a series of filtering media supported by said head; means for draining the filtered material from said media; and a pair of rods supported by the casing and pivotally connected to the head, whereby when the head is freed from the shell or casing it may be turned upon its pivot to bring the filtering media carried thereby into position where they may be readily handled.

2. In an oil filter, the combination of a shell or casing provided with an opening at one side; a head for closing said opening; a plurality of filtering media supported by said head; means for conveying the filtered oil from said media to a point outside of the shell or casing; and pivotal means for supporting said head with the filtering media when the head is released from its connection with the shell or casing and moved therefrom to expose the filtering media, whereby the head may be turned upon its pivot to bring the filtering media into position where they may be readily handled.

3. In an oil filter, the combination of a shell or casing provided with an opening at one side; a head adapted to close said opening; a series of filtering media carried by the head; means for draining the oil from said filtering media and conveying it to a point outside of the filter; a pair of horizontally-disposed rods slidably supported upon said shell or casing; and a hinged connection between said rods and the head.

4. In an oil filter, the combination of a shell or casing; a pair of arms extending outwardly from each side of the casing; a rod slidably mounted in each pair of said arms; a head adapted to be secured to the casing and to close an opening formed in one side thereof; a pair of brackets mounted upon said rods; a hinge rod connecting said brackets and upon which the head is rotatably mounted; and a series of filtering media carried by the head and adapted to be withdrawn from the shell or casing when the head is moved outwardly with the rods.

5. In an oil filter, the combination of a

shell or casing provided with an opening at one side thereof; a head adapted to close said opening; a threaded pipe extending through said head, provided at its inner end with a tapered seat or socket; a supporting member for the filtering media, said member being formed with a drainage chamber at the lower portion thereof; and a plug secured to the filtering media and in communication with said chamber, the plug being seated within the socket, said socket and plug forming a support for the filtering media.

6. In an oil filter, the combination of a shell or casing provided with an opening in one side thereof; a head adapted to close said opening; a pipe extending through said head, the pipe being provided at its inner end with a socket; a support for the filtering media, said support comprising a ring-shaped member having a drainage chamber formed in the lower portion thereof; a plug secured to said drainage chamber and communicating therewith and adapted to seat in the socket; perforated plates secured upon opposite sides of said member for supporting the filtering media; filter papers overlying the outer faces of said plates; and means for securing said papers and plates in position, said means likewise acting to space the filtering media.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK B. ANDERSON.

Witnesses:
RALPH BLUE,
CHAS. M. MIX.