

(No Model.)

A. H. FRANKE.
OIL FILTER.

No. 582,467.

Patented May 11, 1897.

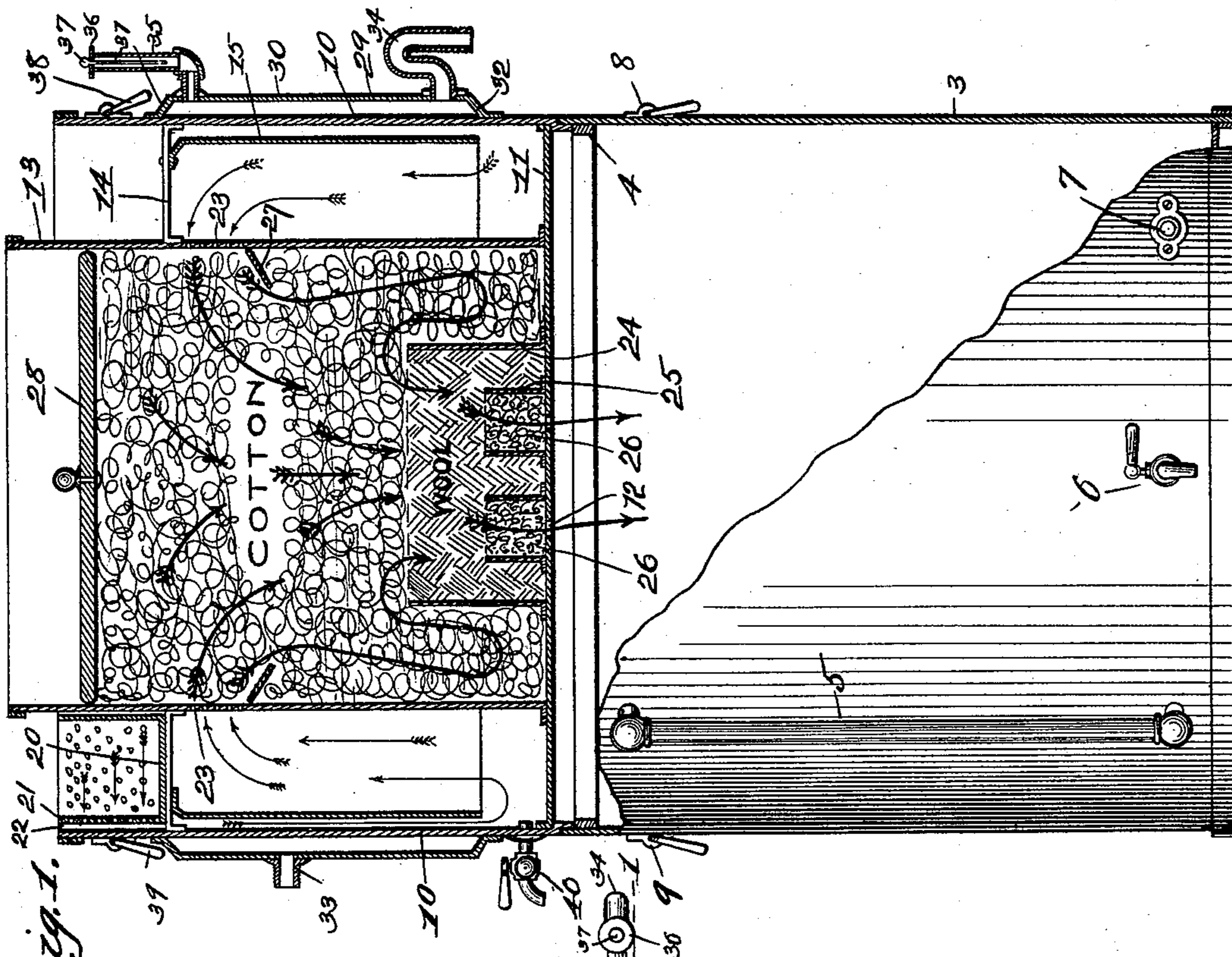
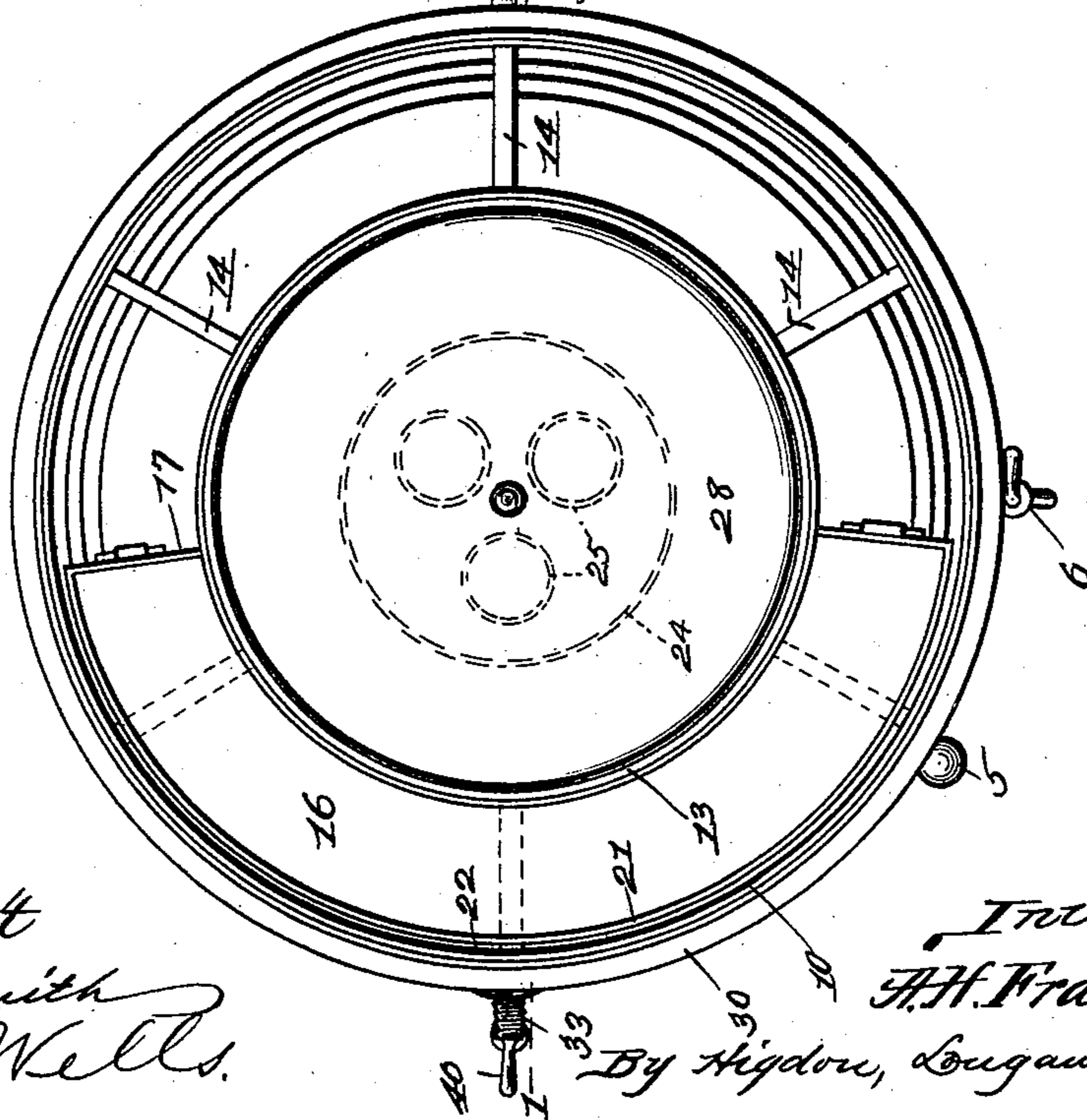


Fig. 2.



Attest
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UNITED STATES PATENT OFFICE.

AUGUST H. FRANKE, OF ST. LOUIS, MISSOURI.

OIL-FILTER.

SPECIFICATION forming part of Letters Patent No. 582,467, dated May 11, 1897.

Application filed December 23, 1896. Serial No. 616,806. (No model.)

To all whom it may concern:

Be it known that I, AUGUST H. FRANKE, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Oil-Filters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to oil-filters; and it consists in the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a vertical sectional view of my improved oil-filter, taken approximately on the line 1 1 of Fig. 2. Fig. 2 is a top plan view of the filter.

In the construction of an oil-filter in accordance with the principles of my invention I employ the lower tank 3, which tank is normally open at the top and has the ring 4 attached to its inner surface and near the upper edge in a horizontal position. The tank 3 is designed to receive the oil after it has been filtered, and the sight-gage 5 is mounted upon its outer face to indicate the amount of oil contained in the tank. The faucet 6 communicates with the interior of the tank and near the bottom, and a nipple 7 is attached to the outer face of the wall of the tank and near the bottom, and a pump or automatic oiling system may be attached to said nipple. Handles 8 and 9 are attached to the tank 3 near its upper edge.

The filter proper, when in operation, rests upon the tank 3, and consists of the outer wall 10, the lower edge of which rests upon the ring 4 when the filter is in position for use. The bottom 11 is fixed in position slightly above the lower edge of the wall 10, and openings 12 are formed through said bottom near its center. An annular wall 13 is placed within the wall 10 and attached to the bottom 11 in a position concentric with the wall 10, and said wall 13 extends or may be extended some distance above the upper edge of the wall 10. Braces 14 are inserted horizontally between the walls 10 and 13 and about three-fourths of the way from the bottom 11 to the upper edge of the wall 10. Said braces 14 are distributed equal dis-

tances apart around the wall 13, as shown in Fig. 2.

The deflector 15 is an annular wall mounted between the walls 10 and 13 with its upper edge attached to the braces 14 and its lower edge a short distance above the bottom 11. The deflector 15 is arranged concentrically relative to the walls 10 and 13 and near to the wall 10.

The removable strainer 16 is placed in the space between the walls 10 and 13 and above the braces 14 and rests upon said braces 14. The strainer 16 is a segment of a circle in plan and is square or rectangular in cross-section. The end walls 17 and 18, the inner vertical wall 19, and the bottom 20 of the strainer are imperforate, while the outer vertical wall 21 is foraminous.

When the strainer 16 is placed in position, the inner wall 19 engages against the outer surface of the wall 13, and said strainer is of such a size that the foraminous wall 21 will not engage closely against the inner face of the wall 10; thus leaving the space 22 between said walls 21 and 10.

Immediately below the braces 14 is a series of perforations 23, formed through the wall 13 and extending entirely around said wall. The annular wall 24 is mounted within the wall 13 and fixed to the bottom 11, and extends upwardly from said bottom about one-quarter or one-third of the distance to the upper edge of said wall 13. The space between the wall 24 and the wall 13 is equal to the space between said wall 13 and the wall 10, and each of said spaces is equal to about one-fourth of the diameter of the filter. The annular walls 25 are mounted within the wall 24 and fixed to the bottom 11 and are about one-half the height of said wall 24. There may be three or more of the walls 25, and each of said walls surrounds an opening 12 through the bottom 11. The spaces within the walls 25 are filled with sponges 26, the space within the wall 24 and outside of the walls 25 is filled with scoured wool, and the space within the wall 13 and outside of the wall 24 is filled with cotton.

The deflector 27 is placed within the wall 13 and below the perforations 23 and is sup-

ported by the cotton. The deflector 27 is an annular ring inclined in cross-section and having its outer edge fitting closely within the wall 13 and its inner edge somewhat below said outer edge.

The plate or follower 28 fits loosely within the wall 13 and rests upon the cotton. The steam-jacket 29 is placed outside of the wall 10, and consists of the annular concentric wall 30, having its upper edge 31 and its lower edge 32 turned inwardly and attached securely to said wall 10. The steam-jacket 29 may reach from the lower edge of the wall 10 to the upper edge, or any desired part of that distance, but I prefer to attach it some distance above the lower edge of said wall 10 and approximately on a line with the lower edge of the deflector 15 and extend it upwardly to a level with the braces 14. A nipple 33 is attached to the steam-jacket in a convenient position and is designed to have a steam-supply pipe attached to it. The discharge or drain pipe 34 is attached near the lower edge of the wall 30 and is bent upwardly and then downwardly to form a trap, which trap will offer some resistance to the passage of the air and steam outwardly through the jacket, as required to cause the jacket to fill with steam before any steam passes out through the pipe 34.

The pressure-regulator 35 is attached to the wall 30 near its upper edge and is designed to allow the steam to escape from the jacket after said jacket has been filled. The pressure-regulator 35 consists of the elbow-shaped pipe with its free end extending upwardly, and the disk 36 normally closes the upper end of said pipe. A rod 37 extends through said disk and downwardly into said pipe. Pressure from the steam-jacket outwardly and upwardly through the pipe will raise the disk 36 and allow the air and steam to escape. Handles 38 and 39 are attached to the wall 10 near its upper edge for operating the filter. The faucet 40 is attached to the wall 10 near its lower edge and communicates with the space immediately above the bottom 11.

When the dirty oil is poured into the strainer 16, it will pass through the foraminous wall 21 and downwardly outside of the deflector 15 to the lower edge of said deflector and then upwardly inside of said deflector. Coarser particles of dirt and foreign substance will be caught by the foraminous wall 21 and retained within the strainer. As the oil passes downwardly outside of the deflector 15 it comes in contact with the wall 10, which is heated by the steam-jacket, and by the heat of said wall the oil is rendered very thin. In passing downwardly and around the edge of the deflector 15 the heavier particles of impurities, such as sand, will be deposited upon the bottom 11. The oil passes upwardly inside of the deflector 15, then through the series of perforations 23 in the wall 13, and into the cotton within said wall

13. In passing downwardly inside of the wall 13 the oil will strike the deflector 27 and will be thrown inwardly from said wall 13 into the cotton. The oil will then pass downwardly through the cotton, then upwardly over the upper edge of the wall 24, thence through the wool within the wall 24, and, finally, through the sponges within the walls 25 and through the openings 12 and be deposited in the tank 3.

By maintaining a temperature of from 180° to 212° in the space between the deflector 15 and the wall 10 by the use of the steam-jacket eighty per cent. of the impurities will be deposited upon the bottom 11 and between the walls 10 and 13, and all of the lighter or volatile parts of the oil which have no lubricating properties will be carried off by evaporation, thus refining and purifying the oil at the same time it is filtered. When the oil is heated greatly above 212°, a large part of the lubricating properties of the oil will be evaporated or burned up and destroyed.

By the use of the steam-pressure regulator 35 the temperature of the filter cannot be raised above 212°, because there will not be sufficient pressure within the jacket.

The impurities may be drawn from the filter through the faucet 40, and only the refined oil will pass upwardly through the perforations 23 into the cotton.

I claim—

1. In an oil-filter, an outer wall, a bottom attached to said outer wall, an inner wall attached to said bottom, braces connecting said outer and said inner wall, a strainer resting upon said braces in the space between said outer and said inner walls, said strainer consisting of imperforate end walls, an imperforate bottom, an imperforate inner wall and a foraminous outer wall, substantially as specified.

2. In an oil-filter, an outer wall, a bottom attached to said outer wall, an inner wall attached to said bottom, braces connecting said inner and said outer walls, a deflector positioned between said inner and said outer walls and attached to said braces, and a strainer mounted upon said braces, substantially as specified.

3. In an oil-filter, an upper tank, an annular wall attached to the bottom of said tank and extending upwardly within said tank, braces between said annular wall and the wall of said tank, a strainer above said braces, having the foraminous side wall, a deflector attached to said braces and depending downwardly outside of said annular wall and to a point near the bottom of said tank, a series of perforations through said annular wall below said braces, and filtering material within said annular wall, substantially as specified.

4. In an oil-filter, an outer wall, an inner wall having a series of perforations some distance above its lower edge, a deflector between said inner and said outer walls and ex-

tending to a point near the lower edges of said walls, a filling of cotton within said inner wall, a deflector slidingly operating within said inner wall and below said perforations, 5 a third wall within said inner wall, the upper edge of said third wall being below said sliding deflector, wool within said third wall, a series of walls within said third wall, and sponges within each of said series of walls, 10 substantially as specified.

5. In an oil-filter, an outer wall, a bottom attached to said outer wall, an inner wall attached to said bottom, braces connecting said outer and said inner walls, a strainer resting 15 upon said braces in the space between said outer and said inner walls, said strainer consisting of imperforate end walls, an imperforate bottom, an imperforate inner wall, a foraminous outer wall, a casing surrounding 20 and attached to said outer wall and forming a steam-chamber, and a pressure-regulator attached to said casing, substantially as specified.

6. In an oil-filter, an outer wall, a bottom 25 attached to said outer wall, an inner wall attached to said bottom, braces connecting said inner and said outer walls, a deflector positioned between said inner and said outer walls and attached to said braces, a strainer 30 mounted upon said braces, and a casing surrounding and attached to said outer wall and forming a steam-chamber, substantially as specified.

7. In an oil-filter, an upper tank, an annu- 35 lar wall attached to the bottom of said tank

and extending upwardly within said tank, braces between said annular wall and the wall of said tank, a strainer above said braces, having the foraminous side wall, a deflector attached to said braces and depending down- 40 wardly outside of said annular wall and to a point near the bottom of said tank, a series of perforations through said annular wall below said braces, filtering material within said annular wall, and a casing surrounding and 45 attached to said upper tank and forming a steam-chamber, substantially as specified.

8. In an oil-filter, an outer wall, an inner wall having a series of perforations some distance above its lower edge, a deflector be- 50 tween said inner and said outer walls and extending to a point near the lower edges of said walls, a filling of cotton within said inner wall, a deflector slidingly operating within said inner wall and below said perforations, 55 a third wall within said inner wall, the upper edge of said third wall being below said sliding deflector, wool within said third wall, a series of walls within said third wall, sponges within each of said series of walls, and a cas- 60 ing surrounding and attached to said outer wall and forming a steam-chamber, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUST H. FRANKE.

Witnesses:

S. G. WELLS,
MAUD GRIFFIN.