

(No Model.)

2 Sheets—Sheet 1.

E. W. VAN DUZEN.

SKIMMER FOR BOILER CLEANERS.

No. 308,644.

Patented Dec. 2, 1884.

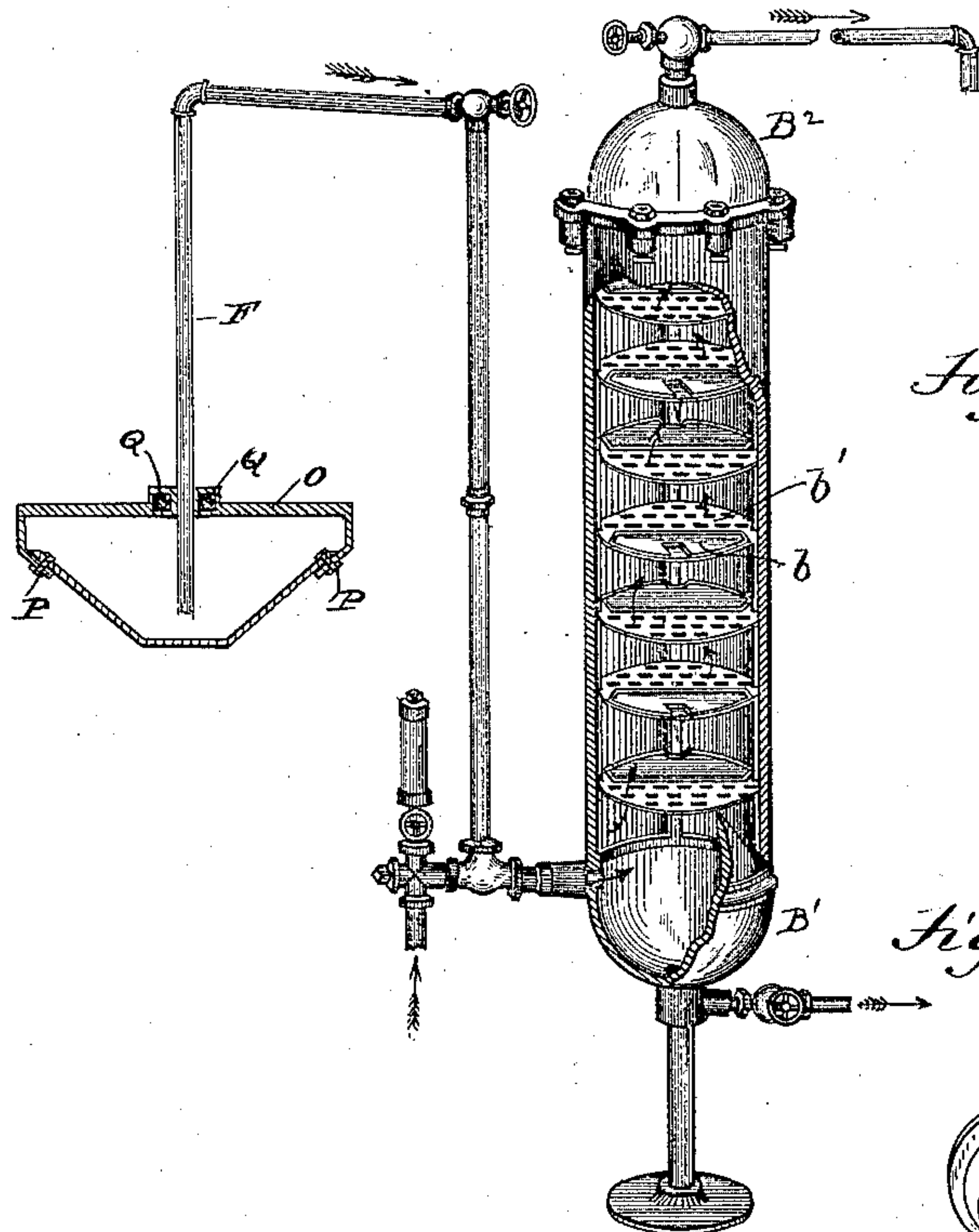


Fig. 1.

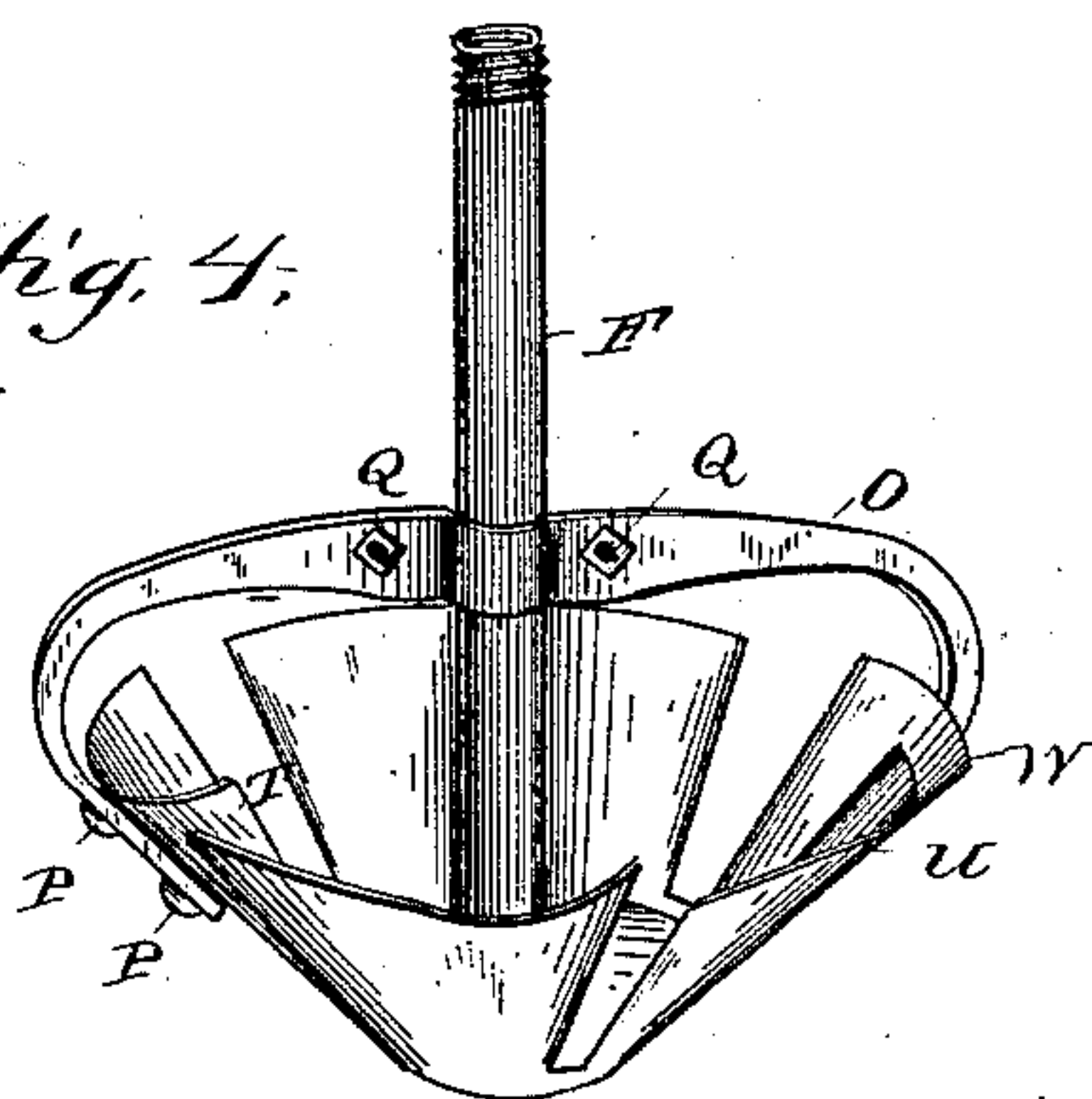


Fig. 4.

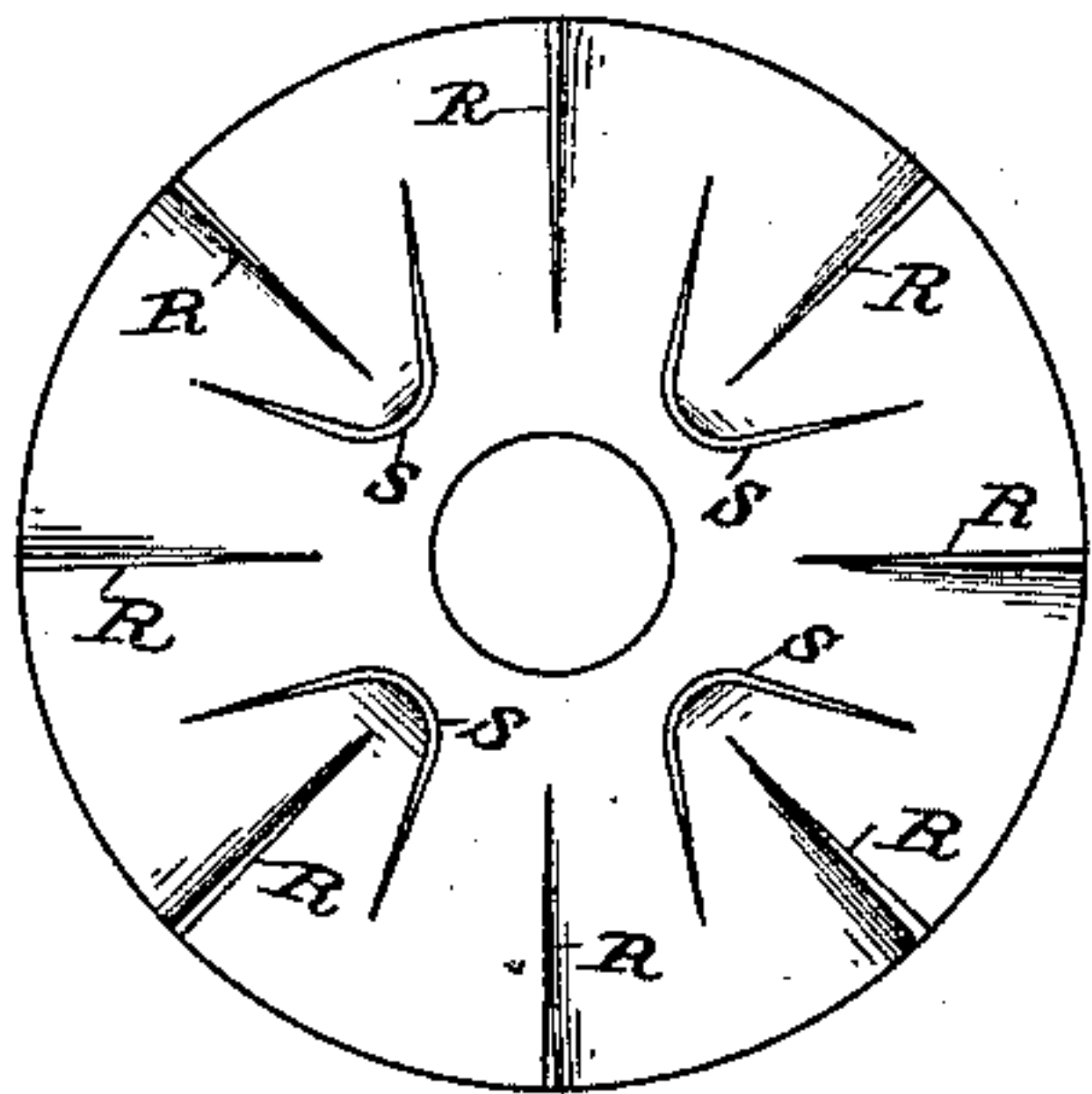


Fig 3.

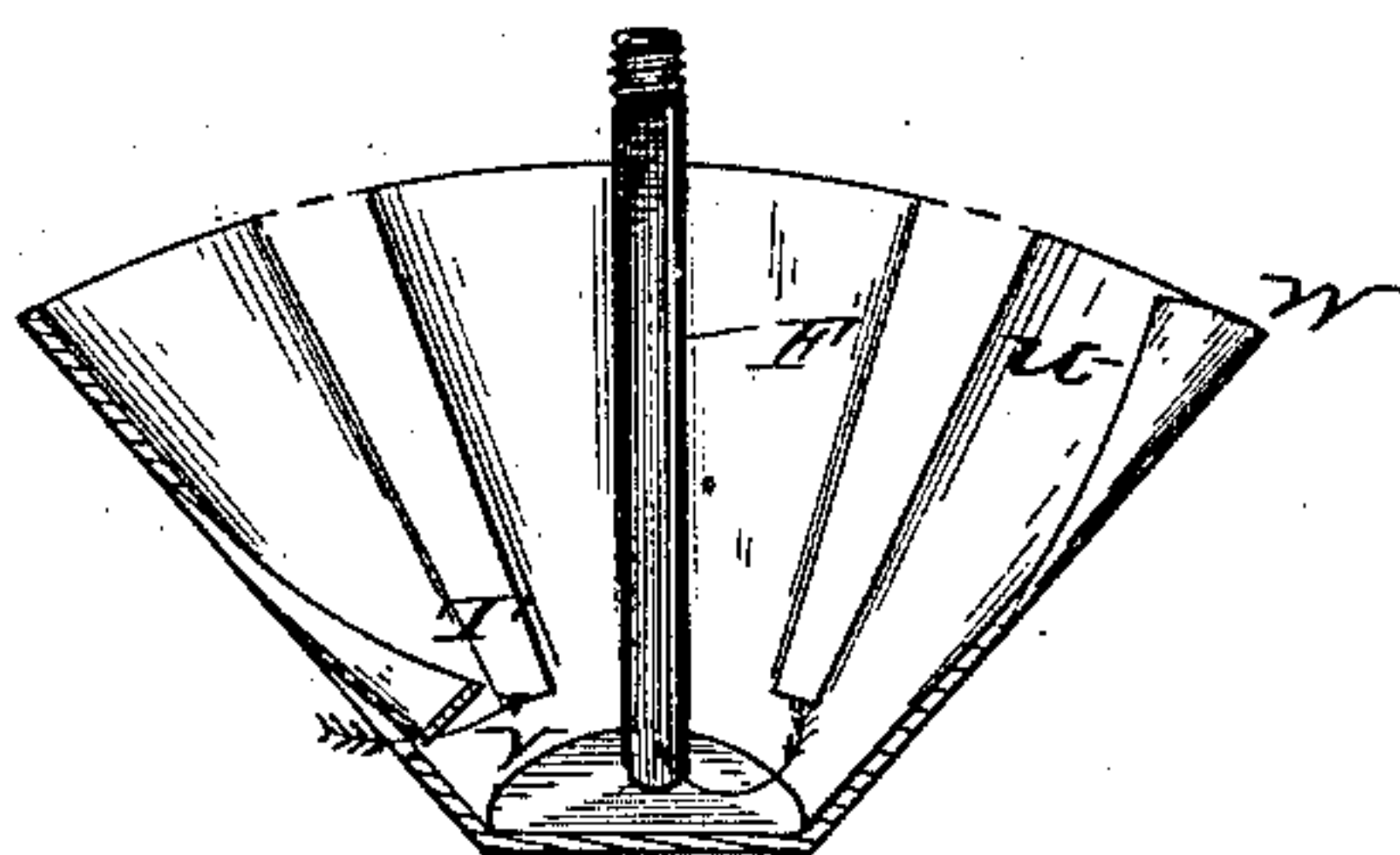


Fig. 2.

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WITNESSES

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2 Sheets—Sheet 2.

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Fig. 6.

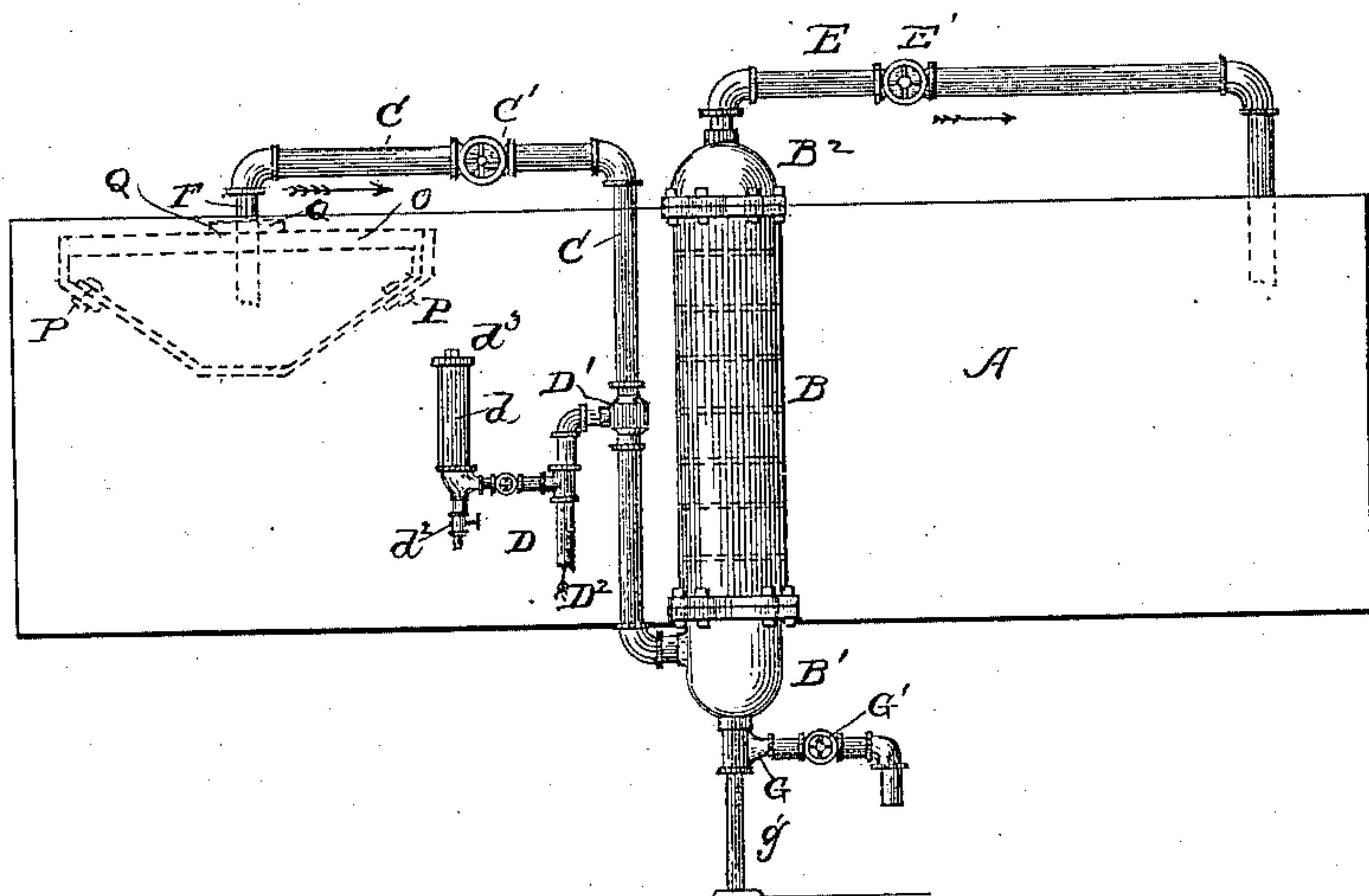
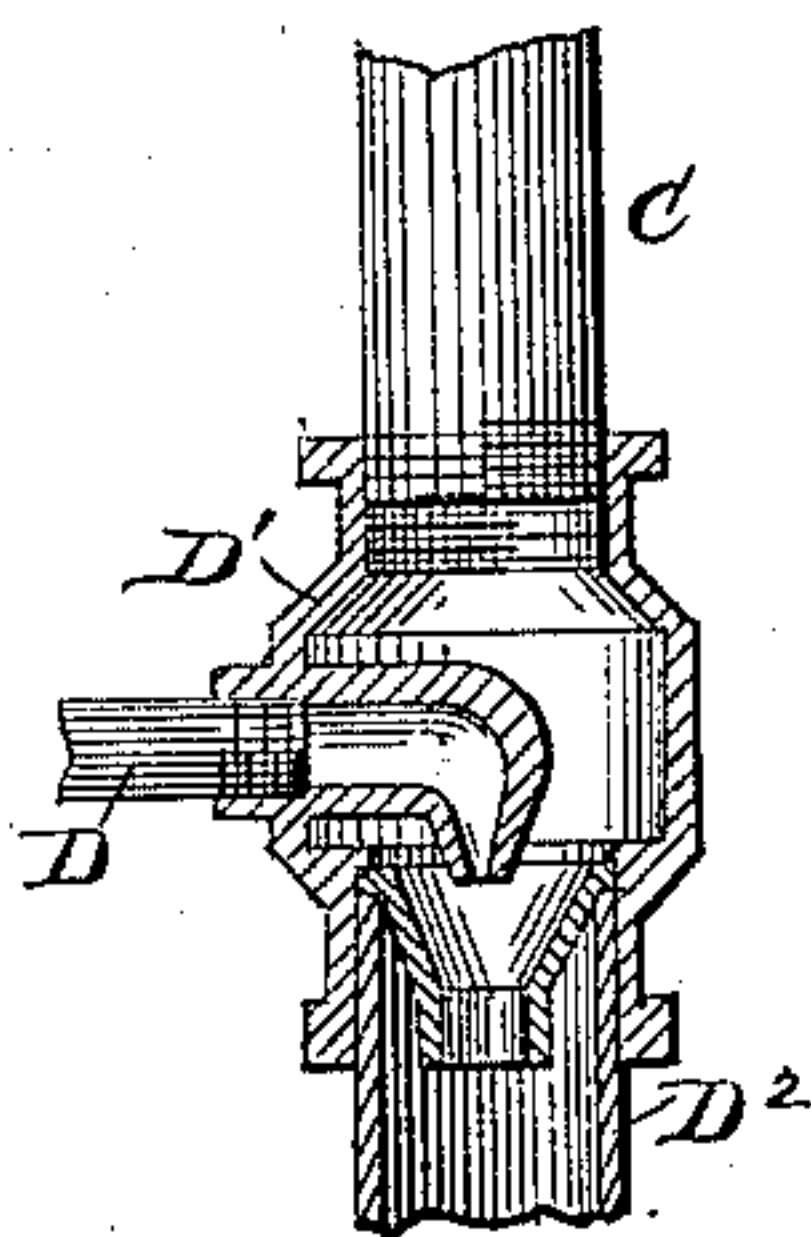


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

EZRA W. VANDUZEN, OF NEWPORT, KENTUCKY.

SKIMMER FOR BOILER-CLEANERS.

SPECIFICATION forming part of Letters Patent No. 303,644, dated December 2, 1884.

Application filed April 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, EZRA W. VANDUZEN, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented a new and useful Skimmer for Boiler-Cleaners, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to skimmers for boiler-cleaners; and it consists in the construction and novel arrangement of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

Figure 1 is a view in perspective (a portion of the shell being broken away) of my water-purifier and mechanical and automatic boiler-cleaner, Patent No. 292,076, granted to me on the 15th day of January, 1884, with my improved skimmer attached. Fig. 2 is a vertical sectional view of the skimmer detached. Fig. 3 is a plan view of the skimmer detached, and Fig. 4 is a perspective view of my skimmer with bail attached. Fig. 5 is a detail view of the ejector or apparatus for mingling the water from the heater with that from the boiler. Fig. 6 is a side elevation of the device attached to the boiler.

Referring by letter to the accompanying drawings, similar letters of reference indicate the same parts in the several figures.

The improved skimmer is made of sheet-iron in the shape of a funnel, with the bottom cut off and closed. In size the skimmer is about sixteen inches in diameter at the top and about four inches in diameter at the bottom, the sides sloping outward and upward at an angle of about forty-five degrees from the bottom.

R designates slots cut in the sides of the skimmer, running down from the top edge, and having the metal at one side bent inward, as shown at *u*, so as to permit the water and impurities floating on it to pass into the skimmer at an angle to the center of the skimmer, as shown at *W*. The object is to give all of the currents of water entering the skimmer near the top and at the top and above a circular motion, all in the same direction, so the impurities floating on and in the water may be kept from settling on the inner side of the skimmer, which will be thrown by the whirling motion

of the water toward the suction-pipe F, thus forming a vortex around this pipe. The slots S, which are preferably crescent shape, are located below the slots R, and are intended to admit the water and impurities into the skimmer when the water is at a low level in the boiler. The metal forming the tongue part of these slots S is bent inward and upward, as shown at T, so as to permit the water to enter as shown by arrow at V. The tongue T is to prevent the impurities once inside of the skimmer from falling out into the boiler when the water is at a higher level.

The shape of the skimmer may be varied—*i. e.*, it may be oblong, four, six, or eight sided, or crescent shape—without departing from the character of the invention.

The skimmer is attached to the pipe F by an iron strap or bail, O, and bolts or rivets P, and clamp and bolts Q, so that it can be adjusted to any height in the boiler desired.

The shape of the slots and openings in the sides of the skimmer may be varied and still accomplish the work or purpose desired.

I am aware of Patents No. 201,446, of March 19, 1878, and No. 204,250, of April 11, 1878, wherein a funnel with openings in the side and an outlet through the bottom downward are shown; but my device has a closed bottom, so the water and impurities will not flow out, but must be lifted out of the skimmer by suction through the pipe F.

A designates the steam-boiler. B is the purifying-chamber; B' the lower, and B² the upper, head of the same. *b* are the settling diaphragms or pans inside of said chamber. *b'* is the perforated portion of the same. C is the pipe which conveys the water from the boiler to the purifier; C', valve in same; D, water-pipe supplying the chamber; D', the ejector or device for mixing the feed-water with that from the boiler; D², the pipe conveying said water to the purifier; *d*, a vessel for containing soda or other suitable purifying material; *d'*, cut-off valve, and *d*² drain-cock; *d*³, screw-cap screwing onto the top of vessel *d*; E, boiler feed-pipe leading from the purifying-vessel to the boiler; E', valve in the same; *f*, ledges on the settling-diaphragms *b*; G, the blow-off pipe; G', valve in same; *g*, leg or standard tapped into bottom

of pipe G, and resting on the floor to support the apparatus; *l*, legs supporting the diaphragms *b*.

The operation of my device is as follows:

- 5 Valves *C'* and *E'* are opened, water is forced through pipe D and downward through ejector *D'* by a pump or inspirator, which causes a flow of water from boiler A through pipe C to ejector *D'*, where it mingles with the water
- 10 from the pump, coming through pipe D, and thence through pipe *D'*, to the purifier. The valve *d'* is left open, so that water from the pump or inspirator can enter vessel *d* and dissolve the soda contained therein, when the
- 15 pulsation of the pump or inspirator exhausts a portion of the solution and mingles it with the feed-water, and it passes with it into the purifying-chamber, and assists in separating the lime or other impurities from the water and
- 20 depositing the same in the purifying-chamber. After the water enters the purifier it follows the course indicated by the arrows in Fig. 1, passing upward, and depositing the mud or other sediment it contains upon the plates *b*.
- 25 Ledge *f* serves to retain the deposited sediment upon said plates or diaphragms. The water passes thus slowly through vessel B, depositing its sediment on diaphragm *b*, and goes out through pipe E to the boiler at the end thereof
- 30 opposite that from which water is taken. This is a very desirable feature, as by this means a circulation of water from end to end of the boiler is obtained, thus preventing the depositing of sediment inside of the boiler.
- 35 When it is desired to blow out the sediment contained in vessel B, valves *C'* and *E'* are first closed, (the pump being stopped.) Valve G is then opened, and the water in vessel B is allowed to run out. Valve *E'* is then opened,
- 40 and water is forced by pressure in the boiler A through pipe E, and dashes down upon diaphragms *b*, washing off all sediment lying thereon and carrying it down through mud-chamber B' and blow-off pipe G. In blowing
- 45 out vessel B the water takes a course just the opposite of that indicated by the arrows in Fig. 1.

It will be seen that the perforated or open portions of the diaphragms are located alternately on opposite sides of vessel B, and each 50 over the solid portion of the next in series below. By this arrangement the water strikes fairly upon the top of said solid portions and readily washes off all sediment thereon.

The skimmer shown in Fig. 4 is similar to 55 the one hereinbefore described in all respects, except in the omission of the slots S.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is— 60

1. A skimmer for boiler-cleaners of the class shown, consisting of a closed bottom shell provided with the slots R and S in its sides, provided, respectively, with the flanges *u* and T, in combination with the suction-pipe F, substantially as specified. 65

2. A skimmer for boiler-cleaners of the class shown, consisting of the funnel-shaped shell having a closed bottom, and having its sides provided with the slots R, running from the top edge downwardly, and provided with the side flanges, *u*, and the slots S, having tongues T below the slots R, and the bail O, adjustably secured to the suction-pipe F, substantially as specified. 70

3. A funnel-shaped skimmer having a closed bottom and flanged slots S T near the bottom, in combination with the suction-pipe F in the steam-boiler, substantially as specified. 75

4. A funnel-shaped skimmer having a closed 80 bottom and flanged slots T U, running from the top edge downward, in combination with the suction-pipe and bail, substantially as specified.

In testimony that I claim the foregoing as 85 my own I have hereto affixed my signature in presence of two witnesses.

EZRA W. VANDUZEN.

Witnesses:

ALFRED R. MULLINS,
JAMES E. CULVER.