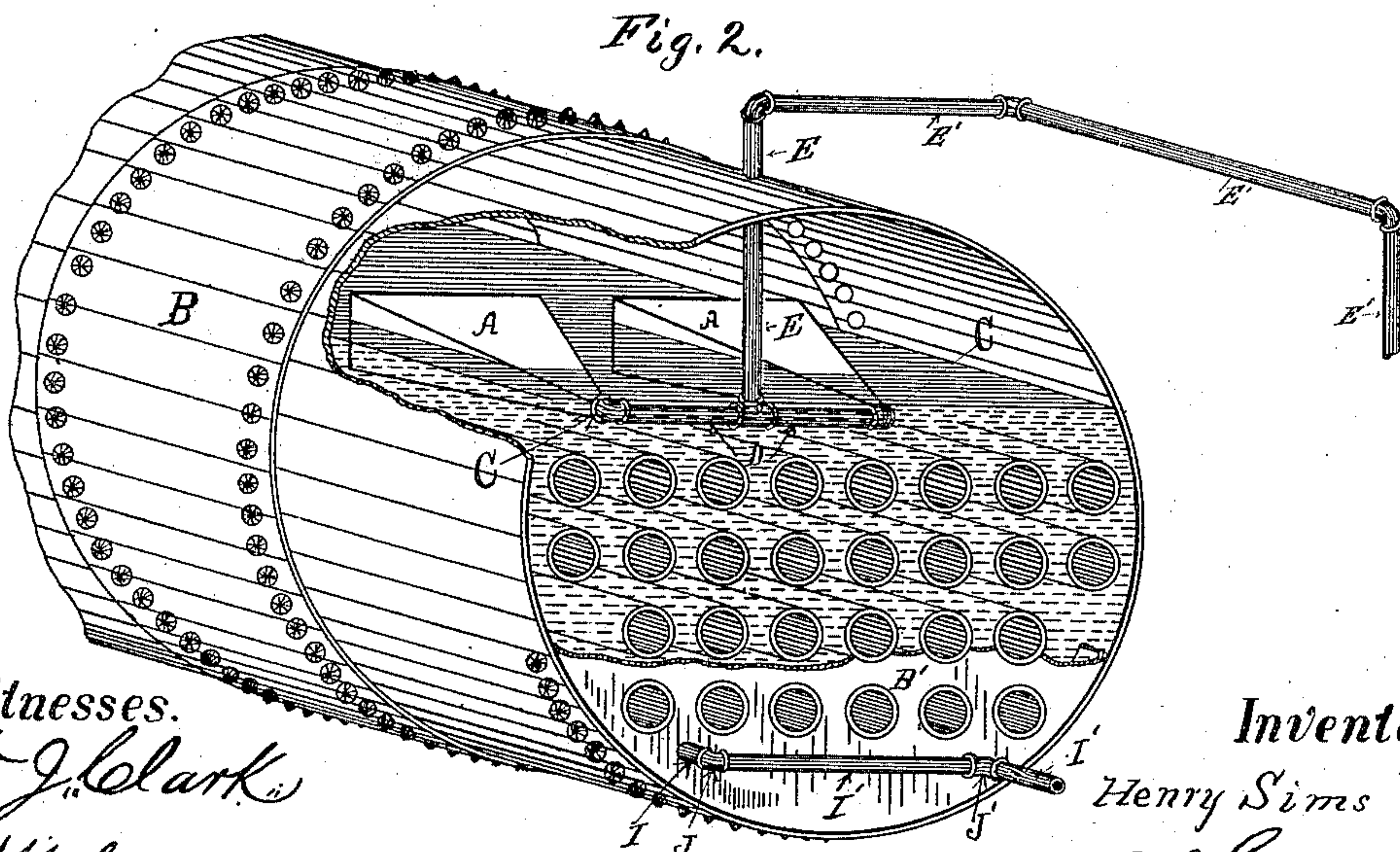
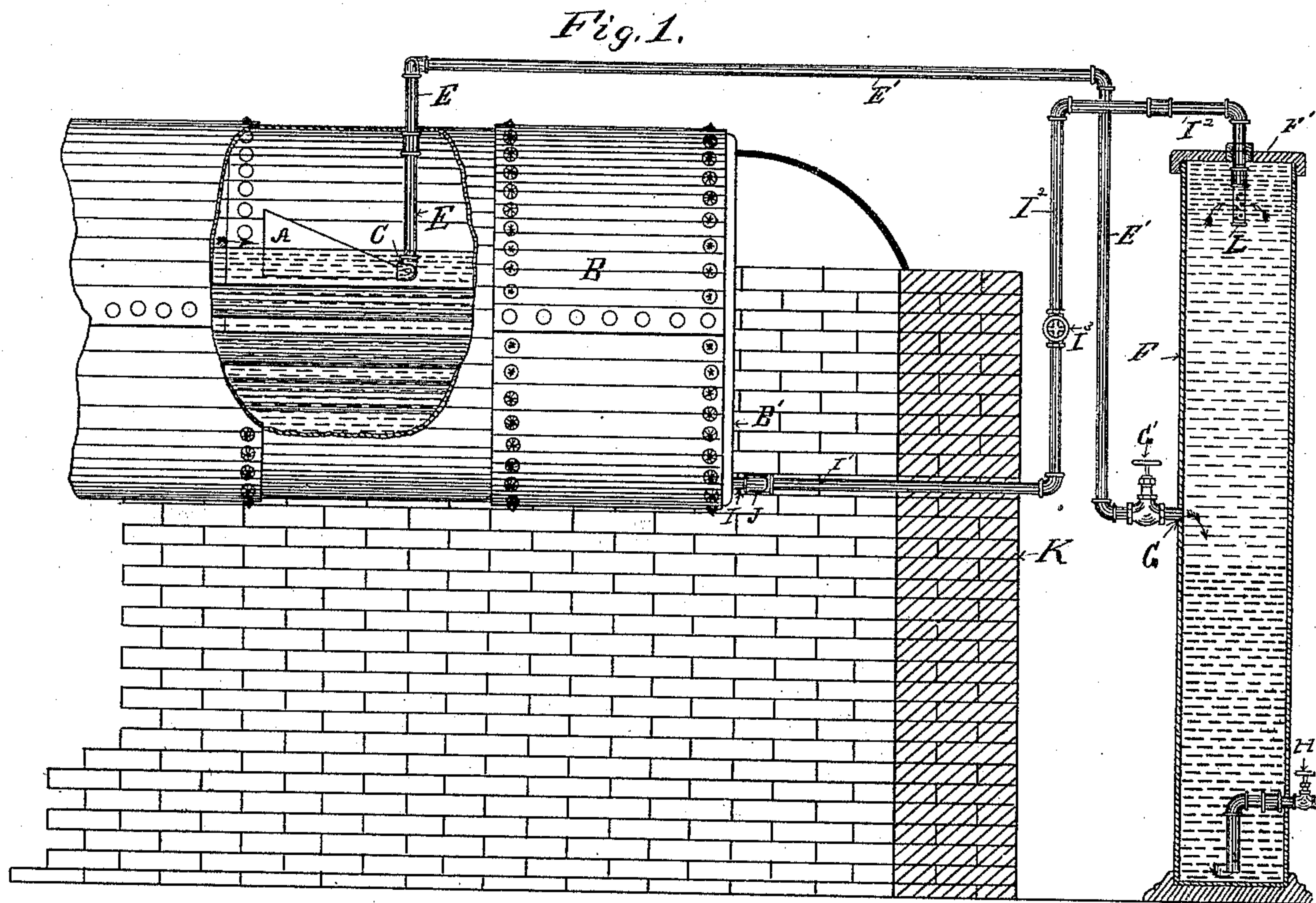


(No Model.)

H. SIMS.
AUTOMATIC BOILER CLEANER.

No. 344,925.

Patented July 6, 1886.



Witnesses.
Chas. J. Clark
H. W. Sturgeon

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UNITED STATES PATENT OFFICE.

HENRY SIMS, OF ERIE, PENNSYLVANIA.

AUTOMATIC BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 344,925, dated July 6, 1886.

Application filed February 25, 1886. Serial No. 193,248. (No model.)

To all whom it may concern:

Be it known that I, HENRY SIMS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Boiler-Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains, to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to boiler-cleaners; and it consists in the improvements hereinafter set forth and explained.

My invention is illustrated in the accompanying drawings, in which Figure 1 is a view, partly in elevation and partly in section, of my invention, showing the same attached to a boiler. Fig. 2 is a perspective view of a portion of my invention and of a section of the boiler to which it is attached, portions of the boiler being broken away, showing the open-mouthed pans and their arrangement in the boiler, and also the arrangement of the discharge-pipe supporting the same.

Like letters refer to like parts in all the figures.

In constructing my improved boiler-cleaner, I make one or more triangular open-mouthed covered pans, A, according to the size of the boiler B, in which they are to be placed. The mouths of the pans A are made wide enough to occupy as much of the width of the boiler B at the normal level of the water therein as possible, and the mouths of these pans are made of sufficient height, so that they will embrace the highest and lowest normal level of the water in the boiler. The bottoms of the pans A are placed nearly or quite level. The tops, however, slope from the open mouths thereof downward, and the perpendicular sides toward each other to the points CC, where they are coupled to a T, D, on the discharge-pipe E, which projects through the top of the boiler B. These pans A may be made in sections, of any suitable and convenient size, which can be readily inserted through the man-hole of a boiler, and bolted together after they are inside of the boiler. The pans A are located preferably as near as possible to the back end of the boiler

B, with their open mouths toward the front end of the boiler and toward the point where the feed-water pipe discharges, which I preferably locate near the surface of the water in the boiler, directly in front of the open mouths of the pans A.

At the rear of the boiler-arch, or at any convenient point, I place an upright settling-tank, F, which is of any convenient height; but I preferably make it so as to extend from the floor to a height equal to that of the top of the boiler B, substantially as illustrated in Fig. 1. I connect the discharge-pipe E by means of suitable connections, E', to this settling-tank F at a point, G, preferably about one-half of the distance vertically between the top and bottom of the tank F, so that the mud and other material discharged from the boiler will settle downward to the bottom of the tank F, where it can be blown off through a blow-off cock, H, placed therein for that purpose, leaving substantially clear water above the point G. The connection E' of the discharge-pipe E is also provided with a cock, G', near the tank F, by means whereof the connecting-pipe E' may be shut off when desired.

At or near one side of the rear head, B', of the boiler B, I insert a delivery-pipe, I, which extends outwardly from the head B' a short distance, where an elbow, J, is coupled thereto, into which a section thereof, I', extends horizontally across the head B' a short distance therefrom to a point on the opposite side thereof, where by means of an elbow, J', the connection I' is turned back through the rear of the brick arch-work K, from which point, by means of suitable connections, I'', the delivery-pipe I is connected with the upper end, preferably the top F' of the settling-tank F. This connecting-pipe I'' is also provided with a valve, I'', so that it can be shut off when desired. The end of the pipe I'', where it extends into the settling-tank F, is preferably provided with a screen, L, to prevent light particles of matter which have been once discharged into the settling-tank F from being drawn back into the boiler.

The operation of my improved boiler-cleaner is automatic, it being operated by means of the action of the fire upon the section I', crossing the rear boiler-head, B', which superheats the water therein, thereby producing a cur-

rent from the top of the settling-tank F into the bottom of the boiler, which operates to draw the water and impurities raised to the surface thereof by the operation of boiling
 5 into the pans A, from whence it is conveyed through the discharge-pipe E and its connections E' into the settling-tank at G, this action being constant while the boiler is being oper-
 10 ated. The water in the tank being cooler than that in the boiler, the impurities held in suspension are speedily precipitated to the bottom of the settling-tank F by the cooling of the water, leaving the water in the upper part of the tank F, where it is being conveyed back
 15 to the boiler by the pipes I' and I, comparatively free from impurities, so that I am enabled to practically remove the greater part if not all of the impurities from the water, without the intervention of a separate heater
 20 or other device than that hereinbefore described.

I am aware that devices having some of the characteristics of my invention have been heretofore constructed—for example, the de-
 25 vice of Kemp, shown in his Patent No. 166,782, dated August 17, 1875. This device, however, differs materially from my invention, both in its construction and operation, viz: In Kemp's device the settling-tank is a comparatively
 30 shallow tank, located above or on the top of the boiler, having its inlet and outlet pipes entering it on the same level, no means being provided for superheating any portion of the outlet pipe on its return to the boiler.
 35 Again, the funnel ends of Kemp's outlet-pipes have comparatively little skimming capacity, and that capacity is constantly varying with the height of the water in the boiler, while in my device the settling-tank
 40 is located at one end or beside the boiler, and is of very considerable depth vertically, and has its inlet-pipe near its center vertically, and an outlet-pipe at its top, which outlet-pipe passes through the fire-chamber, en-
 45 tering the boiler near the bottom, at its rear end, whereby it is superheated. The pans in my device also differ substantially from Kemp's in both shape and operation. Their sides being
 50 vertical, much wider pans may be used, and their skimming capacity is always the same without regard to the height of the water in the boiler.

In the construction shown I show a convenient construction and arrangement of the
 55 the parts of my device, and suitable means for connecting the parts together; but these may all be varied to suit the shape or location of the boiler to which they are to be applied with-

out departing from the spirit of my invention.

Having thus fully described my invention, 6c
 so as to enable others skilled in the art to which it appertains to construct and use the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in an automatic boiler- 65
 cleaner, of one or more covered pans opening at one end, and located in the boiler about the water-level, substantially as shown, with an upright settling-tank provided with a blow-off
 70 cock near the bottom thereof, and a pipe connecting the ends of said pans in the boiler with the said tank at or near the center vertically of the tank, and also a pipe extending from the
 75 upper end of said settling-tank across the fire-chamber and into the rear end of the boiler near the bottom thereof, substantially as and for the purpose set forth.

2. The combination, in an automatic boiler-
 cleaner, of one or more triangular covered 80
 pans open at the large ends thereof, and located in the boiler about the water-level, substantially as shown, with an upright settling-
 tank provided with a blow-off cock near the 85
 bottom thereof, and a pipe connecting the small ends of said triangular covered pans in
 the boiler with said tank at or near the center 90
 vertically of the tank, and also a pipe in the upper end of said tank provided with a screen and extending therefrom into the fire-chamber
 and across the rear end of the boiler, and en- 95
 tering the same at or near the bottom thereof, substantially as and for the purpose set forth.

3. In an automatic boiler-cleaner, the trian-
 gular flat-bottomed and perpendicular-sided 95
 covered pans A, the T D, connected to the small ends of the pans A, and the discharge-
 pipe E, in combination with the boiler B, sub-
 stantially as and for the purpose set forth.

4. In an automatic boiler-cleaner, the up-
 right settling-tank F, having a blow-off cock, 100
 H, near the bottom thereof, and an ingress-pipe entering the same at G, and an egress-pipe
 near the top of said tank F, all substantially
 as and for the purpose set forth.

5. In an automatic boiler-cleaner, the com- 105
 bination, with the upright settling-tank F, of an egress-pipe near the top thereof provided with the screen L, substantially as and for the
 purpose set forth.

In testimony whereof I affix my signature 110
 in presence of two witnesses.

HENRY SIMS.

Witnesses:

H. M. STURGEON,
 ANNA R. ROSS.