

(No Model.)

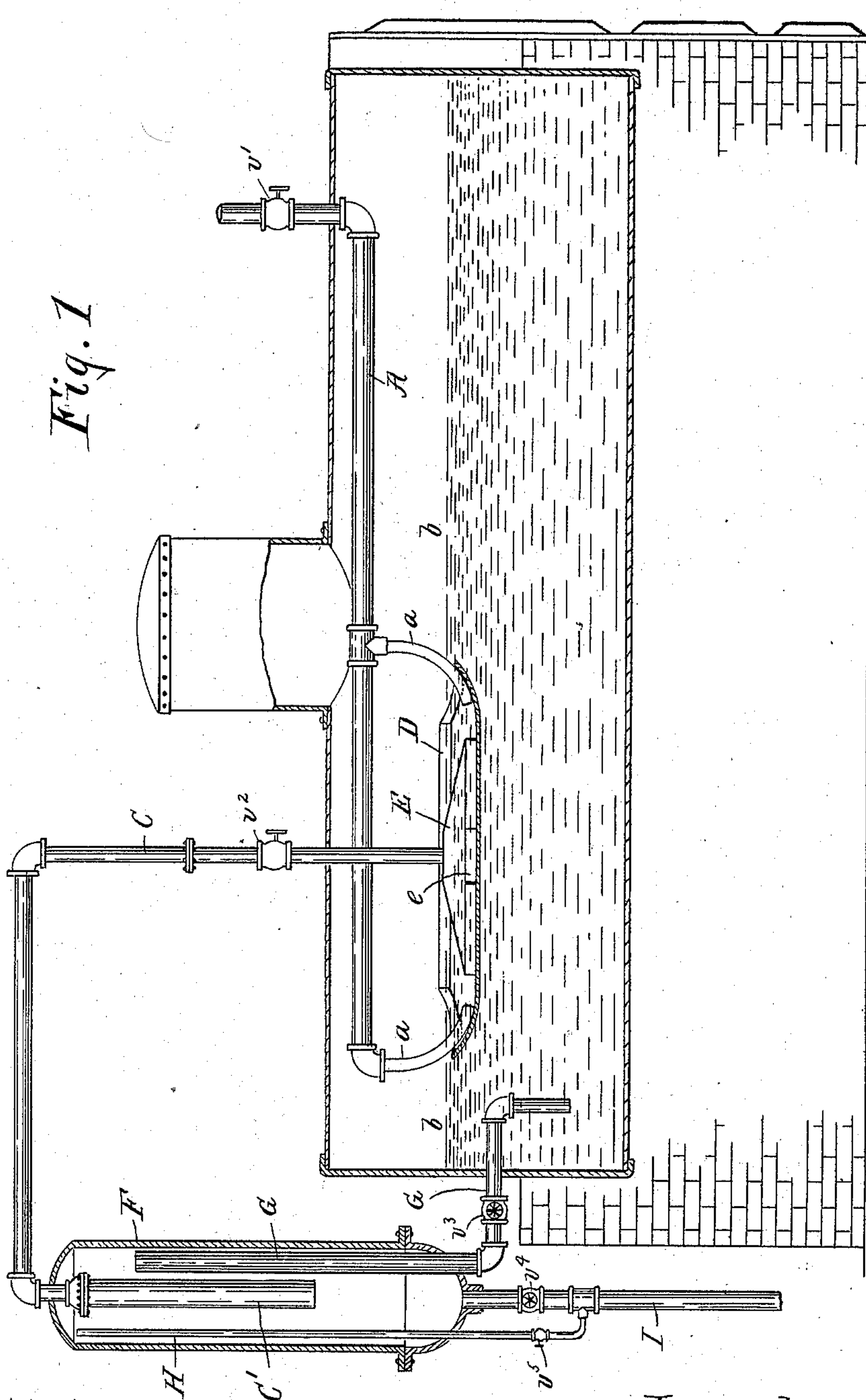
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F. C. FINCH.
BOILER CLEANER.

No. 565,676.

Patented Aug. 11, 1896.

Fig. 1



Witnesses.
Wm. Griswold
Charles N. Stage

Inventor.
Frederick C. Finch
by Francis J. Wright atty.

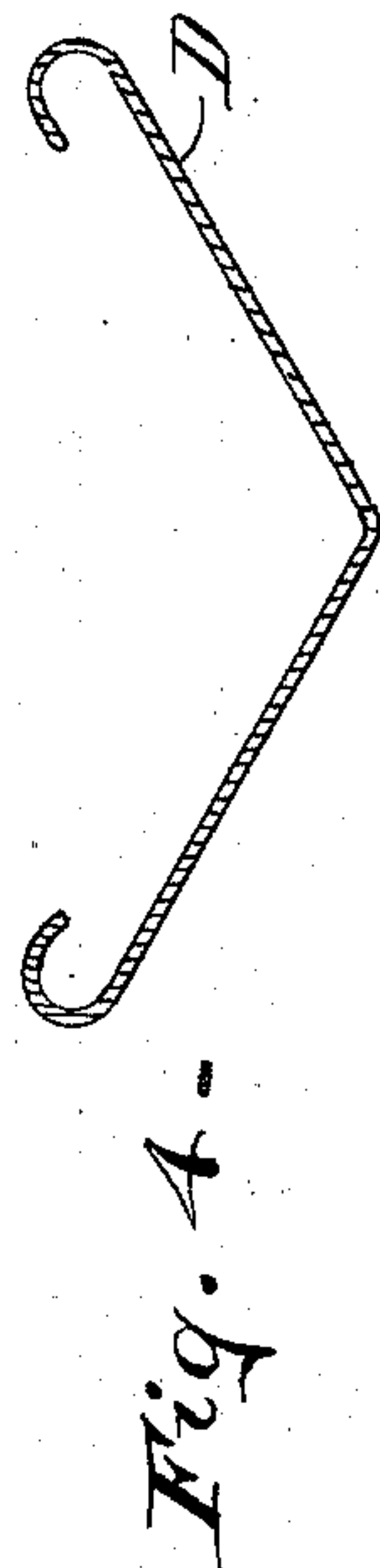
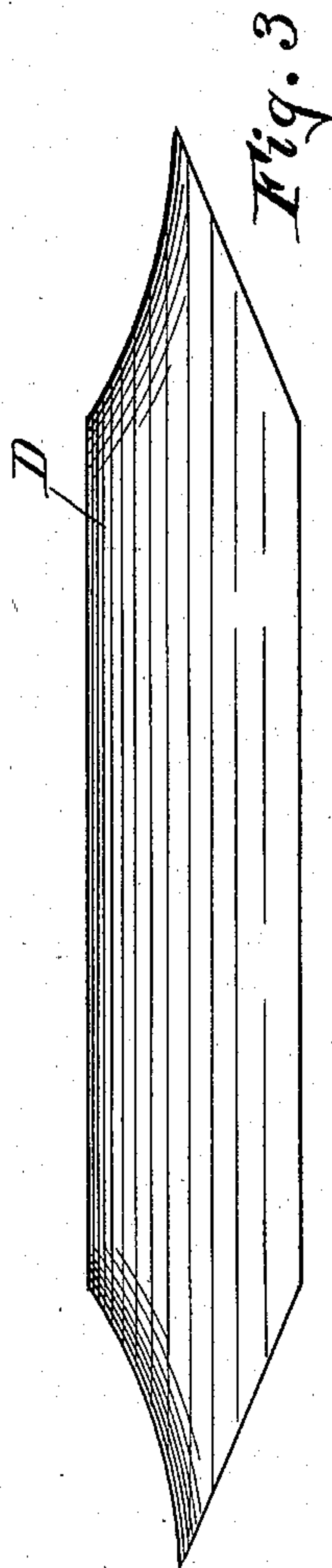
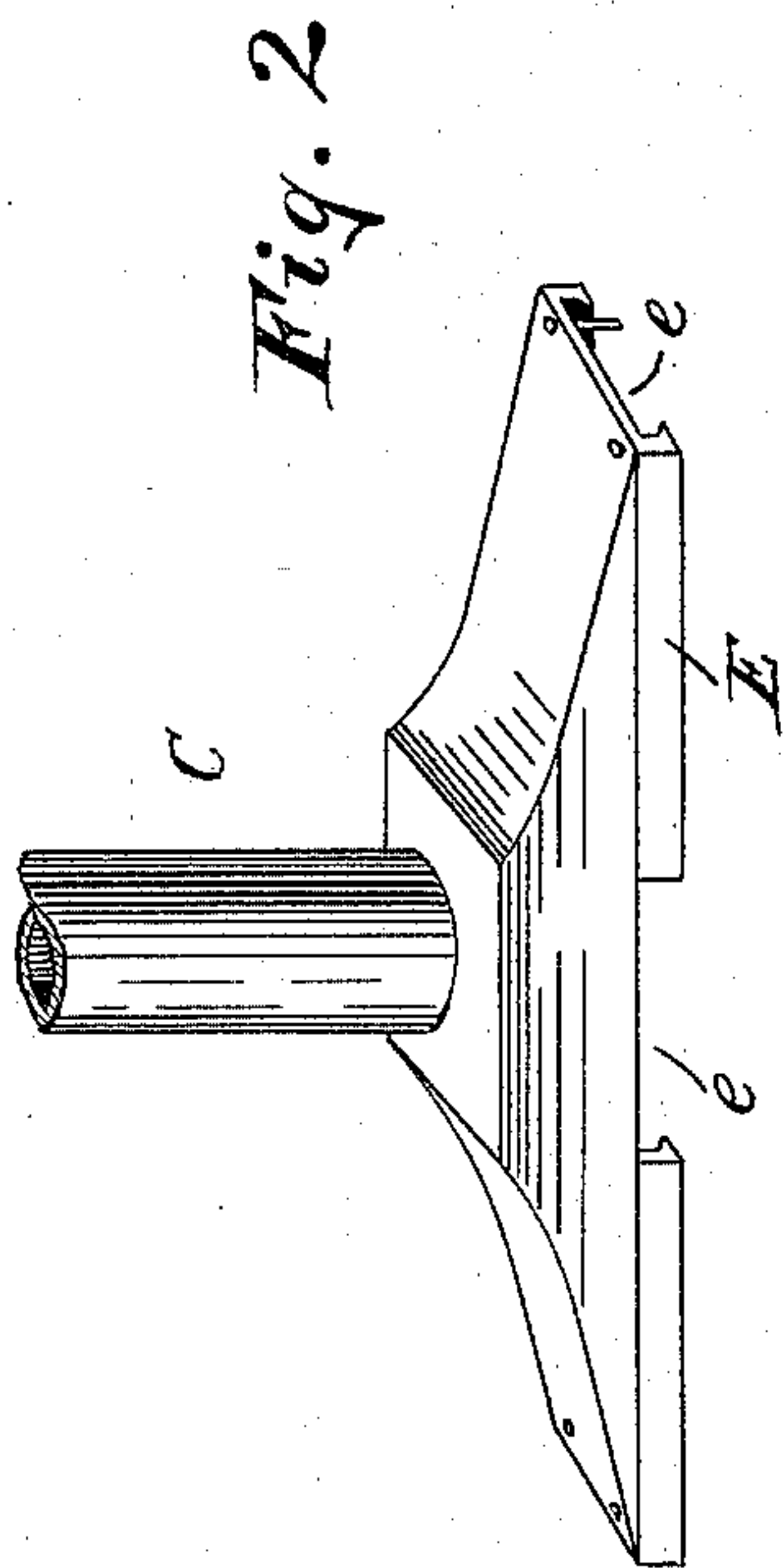
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Frederick C. Finch by
Marion J. Tracy his atty

UNITED STATES PATENT OFFICE.

FREDRICK C. FINCH, OF CLEVELAND, OHIO, ASSIGNOR TO THE FINCH MANUFACTURING COMPANY, OF SAME PLACE.

BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 565,676, dated August 11, 1896.

Application filed June 8, 1895. Serial No. 594,698. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK C. FINCH, 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 Boiler-Cleaners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to boiler-cleaners by which there is removed from the water used in the boiler mud, sand, and other extraneous substances, so that these substances may be collected in a trap or settling-tank provided for that purpose on the outside of the boiler, and at convenience may be removed from such trap. There are almost numberless extraneous substances found in water used for steam purposes, and many of such substances are of such a character and so closely united or mingled with the water that nothing but a high degree of heat will cause them to be precipitated. Many devices have been constructed and used for the purpose of cleansing and purifying water under these conditions, and the general principle of conducting water from the boiler to an outside trap or settling-tank, sometimes called a "purifier," and thence to the boiler again, and by this means partially removing the impurities, has been frequently employed and is well known. I claim, however, that by the addition of certain devices which have never been known or used before to the well-known method I accomplish a more nearly perfect cleansing of the water than has as yet been obtained, and also prevent a large proportion of impurities in the water introduced into the boiler from mingling at all with the water already contained in the boiler.

In the drawings, Figure 1 is a longitudinal sectional elevation of a boiler provided with my improved boiler-cleaning apparatus. Fig. 2 is a perspective view of a reverse-pan which acts as a receiver for the water going out of the boiler. Fig. 3 is a longitudinal elevation of the collection-pan D. Fig. 4 is a cross-section of the pan D.

A description of the operation of my im-

proved device is as follows: The water is introduced into the boiler E through pipe A, which is arranged to pass through the steam-space above the water in the boiler. The water conducted through this pipe becomes thoroughly heated before it is discharged from the pipe. This pipe A is provided with discharge-pipes *a a*, bent toward each other and arranged to discharge the water toward each other at opposite ends and near the bottom of the pan D. So soon as the water is thus discharged into the pan D precipitation of the impurities begins, and this is occasioned by reason of the fact that the water has been heated in its passage through the steam-chamber to a sufficiently high degree to render suspension of a portion of the impurities no longer possible. The edges of the pan D are turned inward toward the center of the pan, as shown in Fig. 4. This construction of the pan serves to keep the heavier impurities from being carried out with the water overflowing into the boiler. The pan D, which is longer than it is wide, is constructed with the walls at its ends of less height than those at its sides, as shown in Fig. 3, and it is adjusted with respect to the water in the boiler so that the surface of the water in the boiler will be at about the dotted line *b b b*, at a point which is not so high as the walls of the sides of the pan, but higher than the walls of its ends. The water which is brought in through the pipe A and discharged into the pan D after the water in the boiler has arisen to the dotted line *b b b* will tend to overflow the sides of the pan only at the ends. The construction and position of the discharge-pipes *a a* will tend to throw the water toward the center of the pan D, and the suction occasioned by the drawing in of the water through ports or openings *e e* will tend to prevent outflow at the ends of the pan. By these combined means a vortical motion will be imparted to the water within the pan D, which will be of great assistance in depositing impurities which will be drawn out through the pipe C. The receiver E referred to is attached to the end of the outflow-pipe C and is a reverse-pan fastened to the bottom of the pan D by bolts or other convenient means, and having in its sides and ends openings or ports *e e*, through

which the water drawn off through pipe C enters from the boiler. The water thus received through these ports *e e*, together with any accumulation of deposit in the pan D, flows out of the boiler through the pipe C into the trap or settling-tank F by a principle which has been hereinbefore referred to as being well known. The pipe C, at its entrance into the trap or settling-tank F, is connected with or enlarged into a pipe C', of larger diameter, which extends into the trap or settling-tank to a point below its middle and about two-thirds of the distance from the top to the bottom of the trap. The pipe G, which is preferably of less diameter than the pipe C', but of greater diameter than pipe C, is fixed in the trap F with its upper and open end above the middle of the trap and at a point distant from the bottom about two-thirds of the height of the trap. This pipe G is continued through the walls of the trap and into the boiler, where it discharges below the water-line and below the point of entrance of the water into the receiver E.

A small pipe H is fixed in the trap F, with its open end at about the top of the trap, and extends downward through the bottom of the trap and connects with the discharge-pipe I.

The pipe H serves as a means through which the scum of lighter impurities which have arisen to the surface of the water in the trap may be blown off into the outer air through the lower part of the pipe F.

The pipe A is provided with necessary valves *v'* outside of the boiler.

The pipe C is provided with a valve *v*² be-

tween its point of exit from the boiler and its point of entrance to the trap.

The pipe G is provided with a valve *v*³ between the trap and the boiler.

The pipe I is provided with a valve *v*⁴ between the trap and the point of connection of pipe E with pipe I, and pipe H is provided with a valve *v*⁵ between the trap and the point of connection of pipe H with pipe I.

Having thus described my invention, what I claim is—

1. In combination with a boiler and outside trap or settling-tank, which are connected by pipes, of a pan D, provided with a reverse-pan E, having two or more ports or openings, *e e*, substantially as shown and described.

2. In combination with the boiler the supply-pipe A provided with discharge-pipes *a a*, the pan D, provided with reverse-pan E, having two or more openings or ports *e e*, the pipe C enlarged pipe C', trap F and pipe G, substantially as shown and described.

3. In a boiler-cleaning apparatus the combination of pipe A placed in the steam-chamber of the boiler and having discharge-pipes *a a* with the pan D, having its edges turned inward toward the center and provided with and fastened to the reverse-pan E, having ports or openings *e e*.

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

FREDRICK C. FINCH.

Witnesses:

CHARLES W. STAGE,
W. D. KERMITH.