

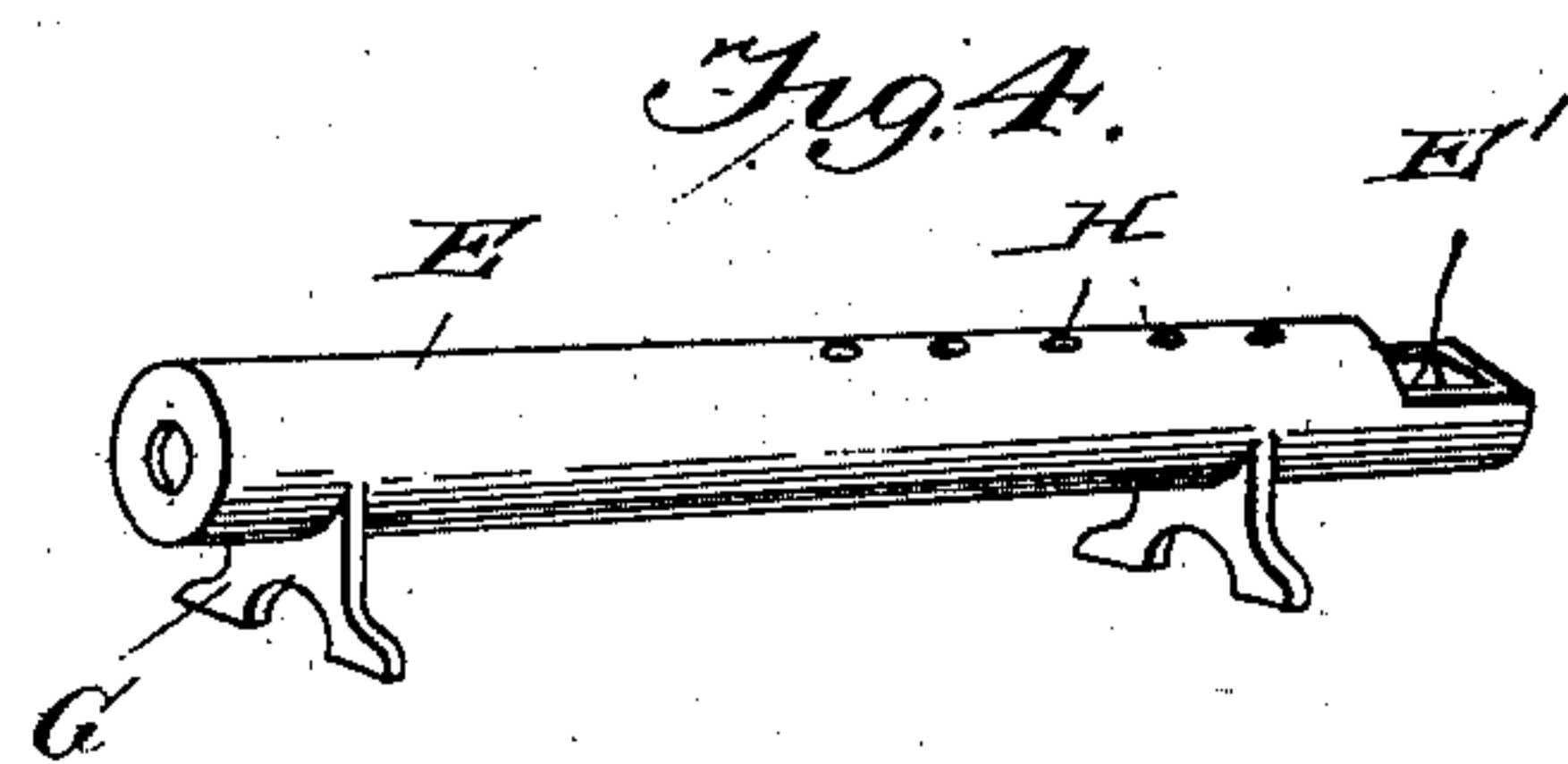
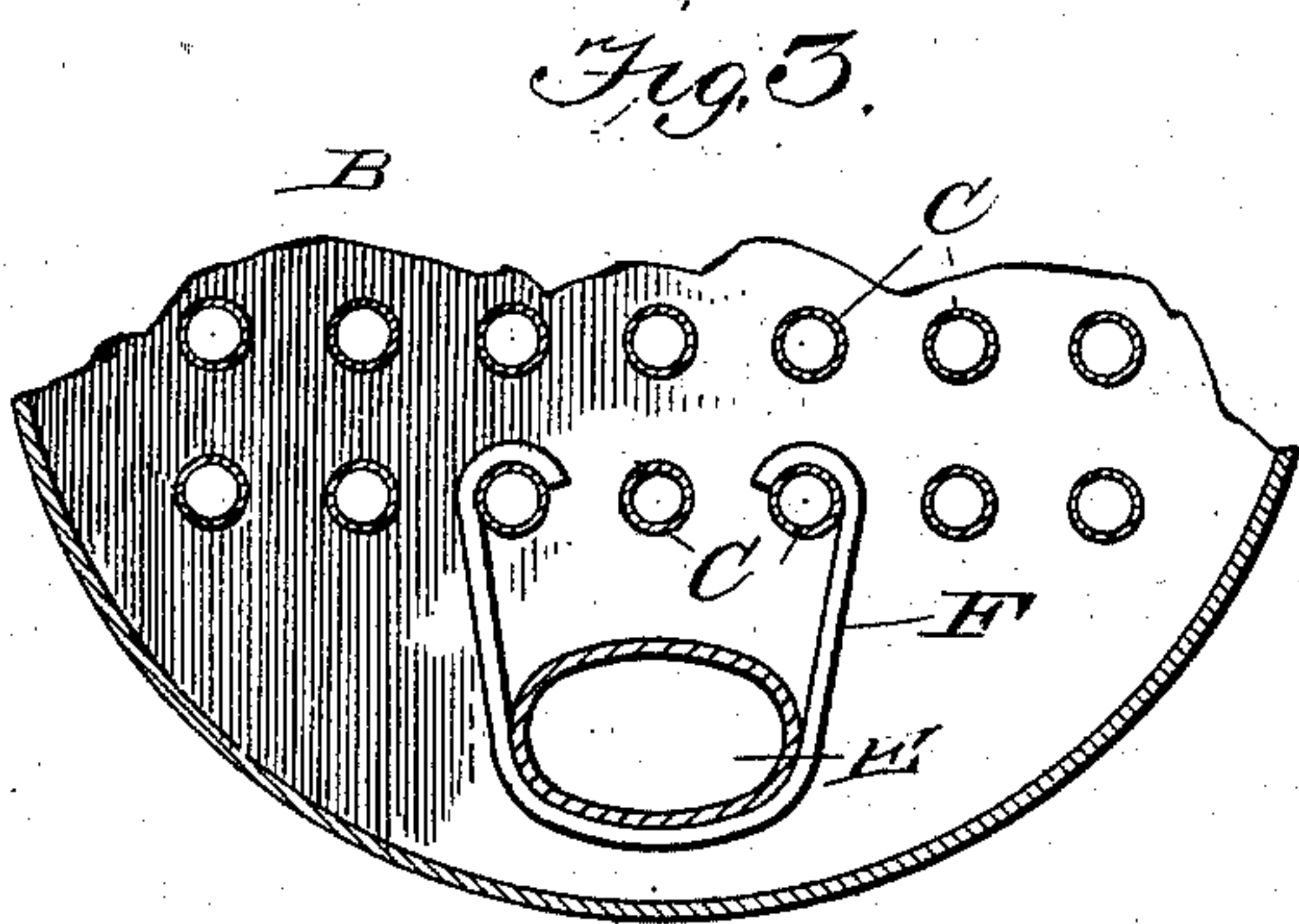
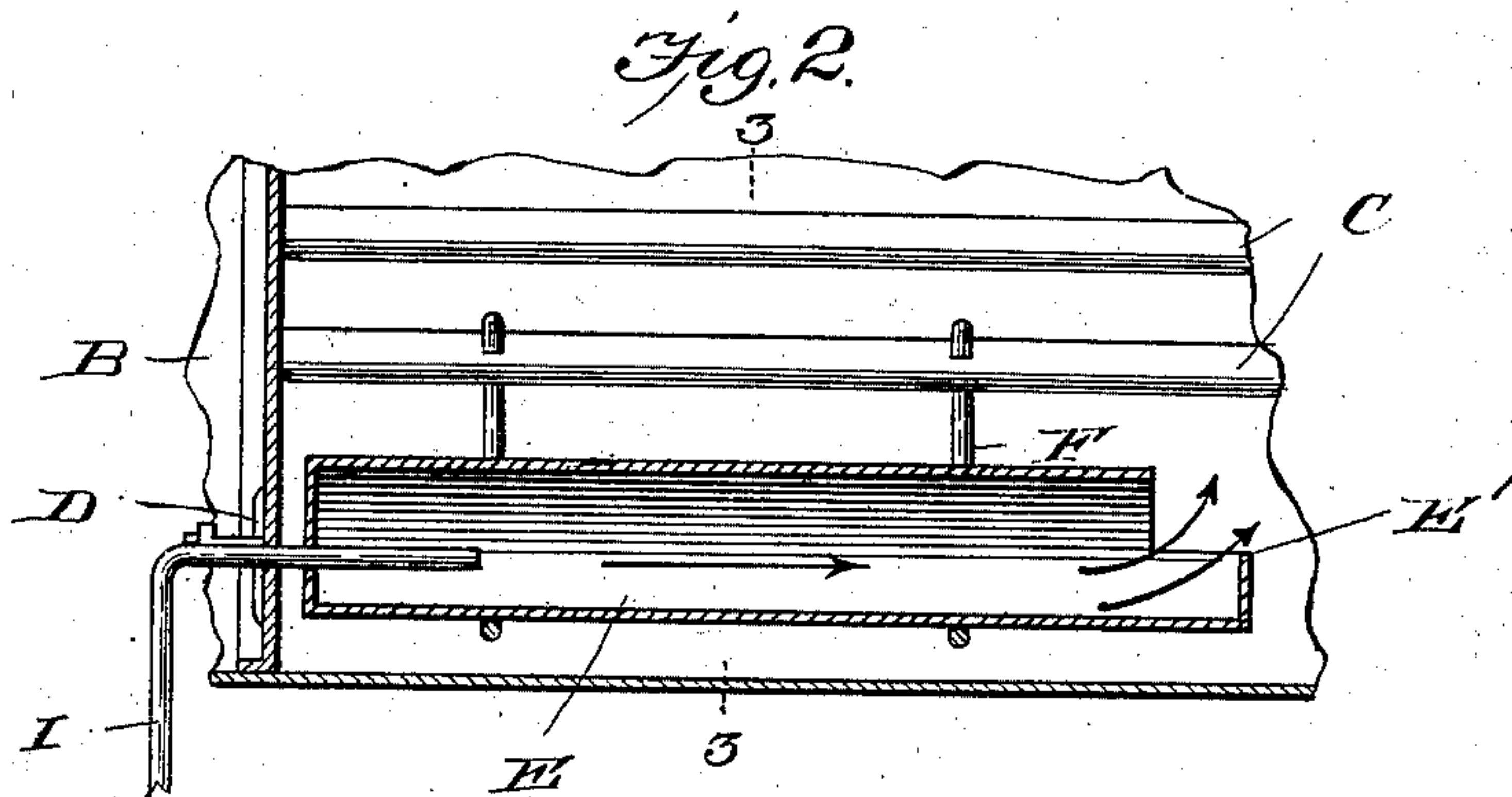
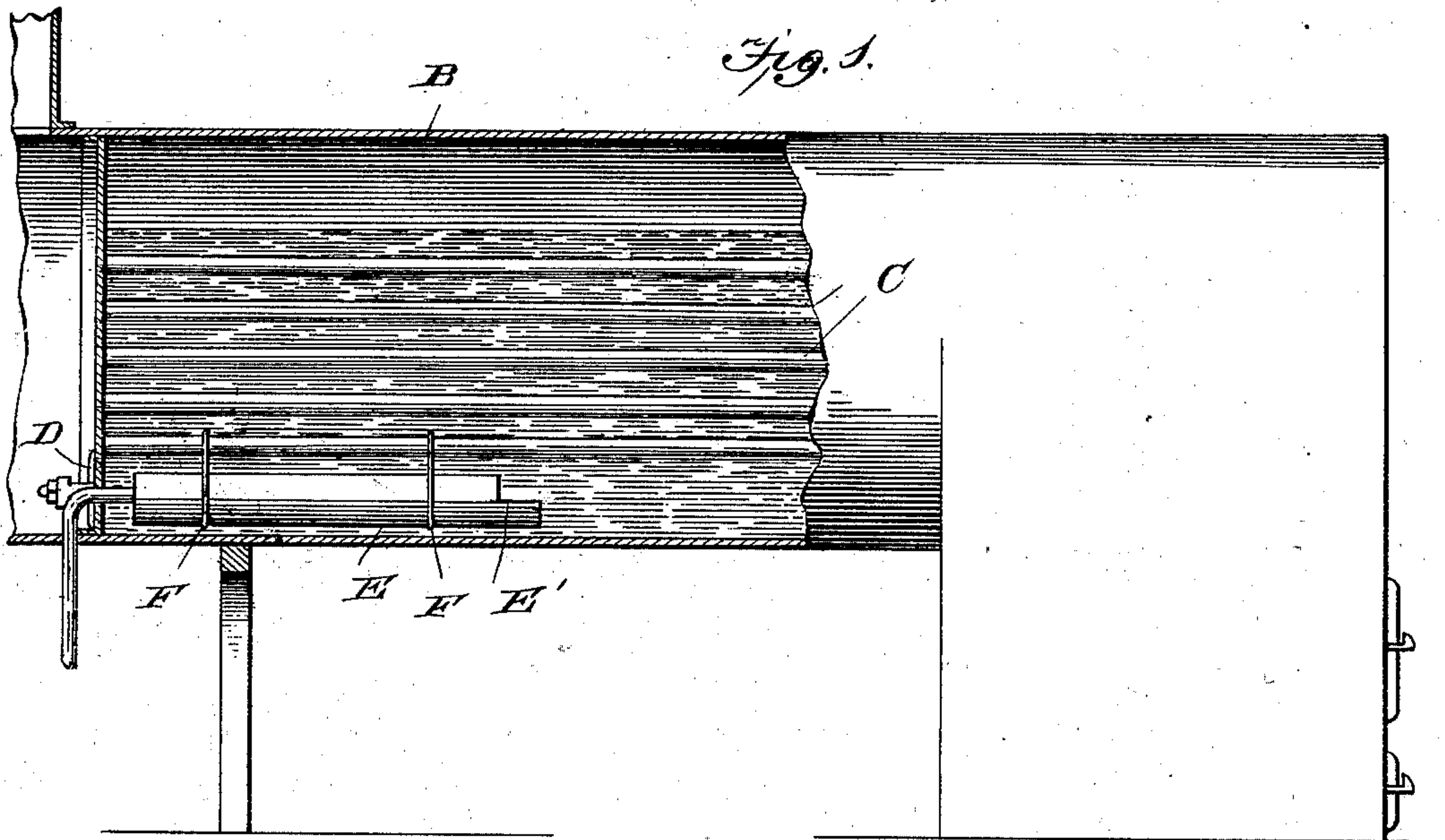
No. 698,366.

Patented Apr. 22, 1902.

I. BROOKE.
FEED WATER HEATER AND PURIFIER.

(Application filed May 10, 1899.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

ISAAC BROOKE, OF POTTSTOWN, PENNSYLVANIA.

FEED-WATER HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 698,366, dated April 22, 1902.

Application filed May 10, 1899. Serial No. 716,316. (No model.)

To all whom it may concern:

Be it known that I, ISAAC BROOKE, a citizen of the United States, residing at Pottstown, in the county of Montgomery and State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Heaters and Purifiers, of which the following is a specification.

My invention relates to devices for heating and purifying the feed-water prior to discharging it into the boiler, so as to cause it to deposit the greater part of the sediment, which would form boiler-scale if deposited in the boiler itself.

The object of my invention is to provide a simple, economical, and reliable device of this class; and with this object in view my invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described and afterward specifically pointed out in the appended claim.

In order to enable others skilled in the art to which my invention most nearly appertains to use and make the same, I will now proceed to describe its construction and operation, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a view, partly in elevation and partly in section, illustrating a stationary boiler equipped with a feed-water heater and purifier constructed in accordance with my invention, the heater and purifier being shown in elevation suspended from the boiler-tubes.

Fig. 2 is a fragmentary detail sectional view on a plane cutting vertically and longitudinally through the boiler and the heater and purifier suspended therein. Fig. 3 is a transverse vertical sectional view on the plane indicated by the dotted lines 3 3 of Fig. 2. Fig. 4 is a detail perspective view illustrating the heater and purifier removed from the boiler and provided with modified supporting means.

Like letters of reference mark the same parts wherever they occur in the various figures of the drawings.

Referring to the drawings by letters, A indicates the shell, B the tubes, C the rear end, and D an ordinary manhole, of any ordinary form of boiler, all of which parts may be of

any old and well-known type or construction, forming no part of my invention.

E indicates my improved water heater and purifier, which is illustrated as a chamber arranged horizontally in the boiler and supported therein above the bottom thereof by means of hangers F, suspending it from the tubes B, as in Figs. 2 and 3, or is provided with feet G, as in Fig. 3, arranged to rest upon the bottom of the boiler. This cylinder is opened at the top at its inner end, as at E, or may be provided with a series of openings H, or may be made trough-shaped with open top the whole length, if desired.

It is not necessary that the heater be of any particular shape in cross-section, as it would answer its purpose equally well if made of cylindrical, elliptical, angular, or other shape, and it should be as large as can be gotten through the manhole usually found in boiler-heads.

II indicates the feed-water pipe, which passes through the head C of the boiler and into the outer end of the heater E, preferably entering the heater above the bottom thereof.

It is a matter of common knowledge that mineral substances held in solution in water fed to steam-boilers are precipitated when the water is heated, and if precipitated in the boiler form smudge and boiler-scale, which causes the boiler to burn out and to require more heat to produce steam, thus wasting the coal or other fuel, shortening the life of the boiler.

When the feed-water flows through pipe I into the chamber E, it is cooler than the water already in the boiler and will remain in the chamber until it becomes hot. It is soon heated by the water around it, and the greater portion of all mineral substances in solution are precipitated in the chamber, and thus prevented from entering the boiler proper to form smudge or scale therein.

I have shown the device located in the rear end of the boiler, but where there is a manhole in the front head of the boiler I prefer to locate the heater directly over the fire.

This device is extremely cheap, simple, and reliable, and in an actual test made received during the period of trial four times as much

precipitated sediment as entered the boiler proper, thus proving its extreme usefulness. It can be readily put in or taken out through a manhole, as at D, whereby it can be easily
5 cleaned, repaired, or replaced when necessary.

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

As an improved article of manufacture, a
10 water heater and purifier consisting of a cylinder F, open at one end as at E' and having

a series of perforations H, the hangers F, said hangers being essentially U-shaped and having their upper ends hooked or bent to engage the boiler-tubes, and a pipe I leading
15 into the closed end of the cylinder above the bottom, substantially as shown and described.

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Witnesses:

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