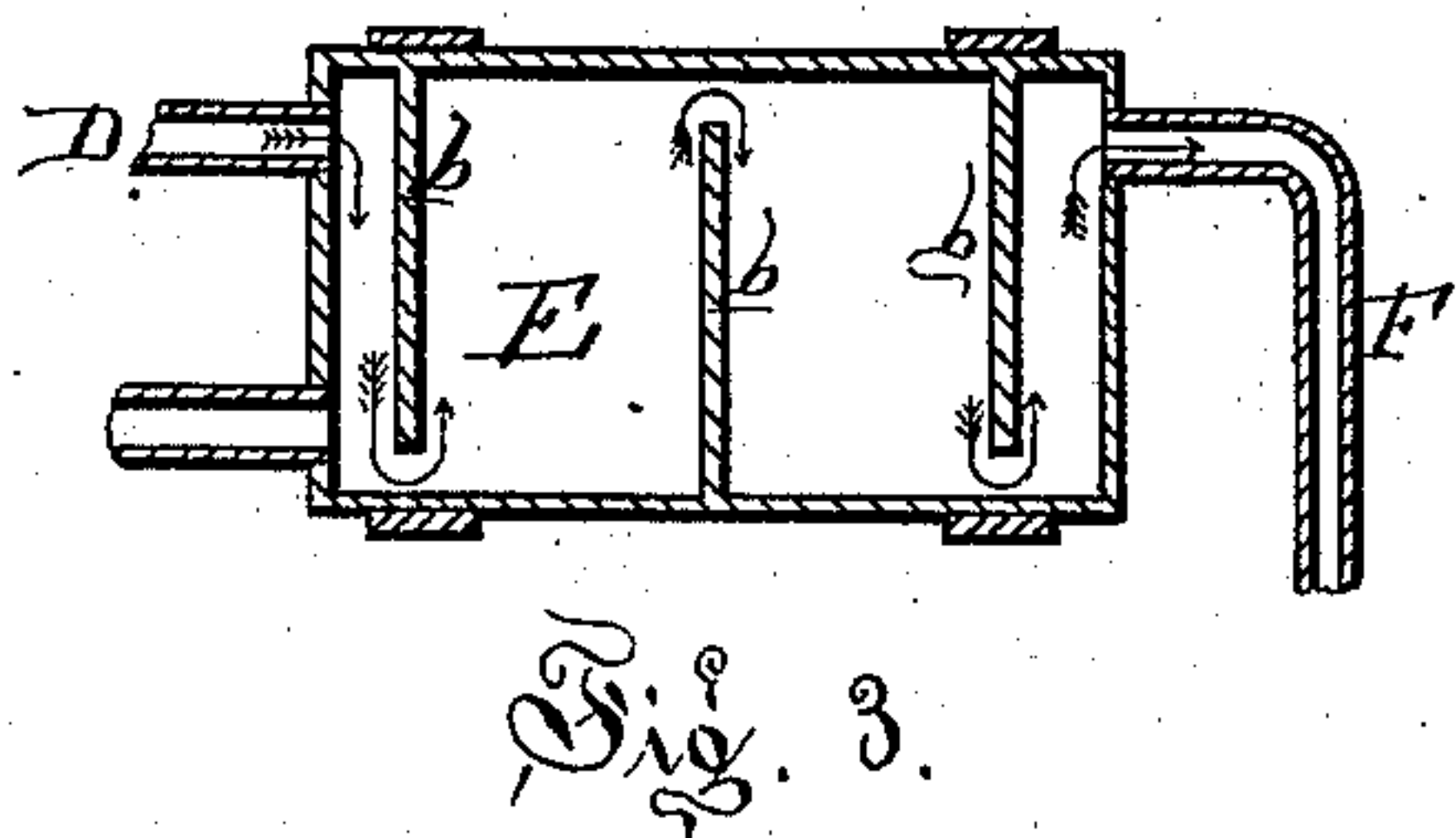
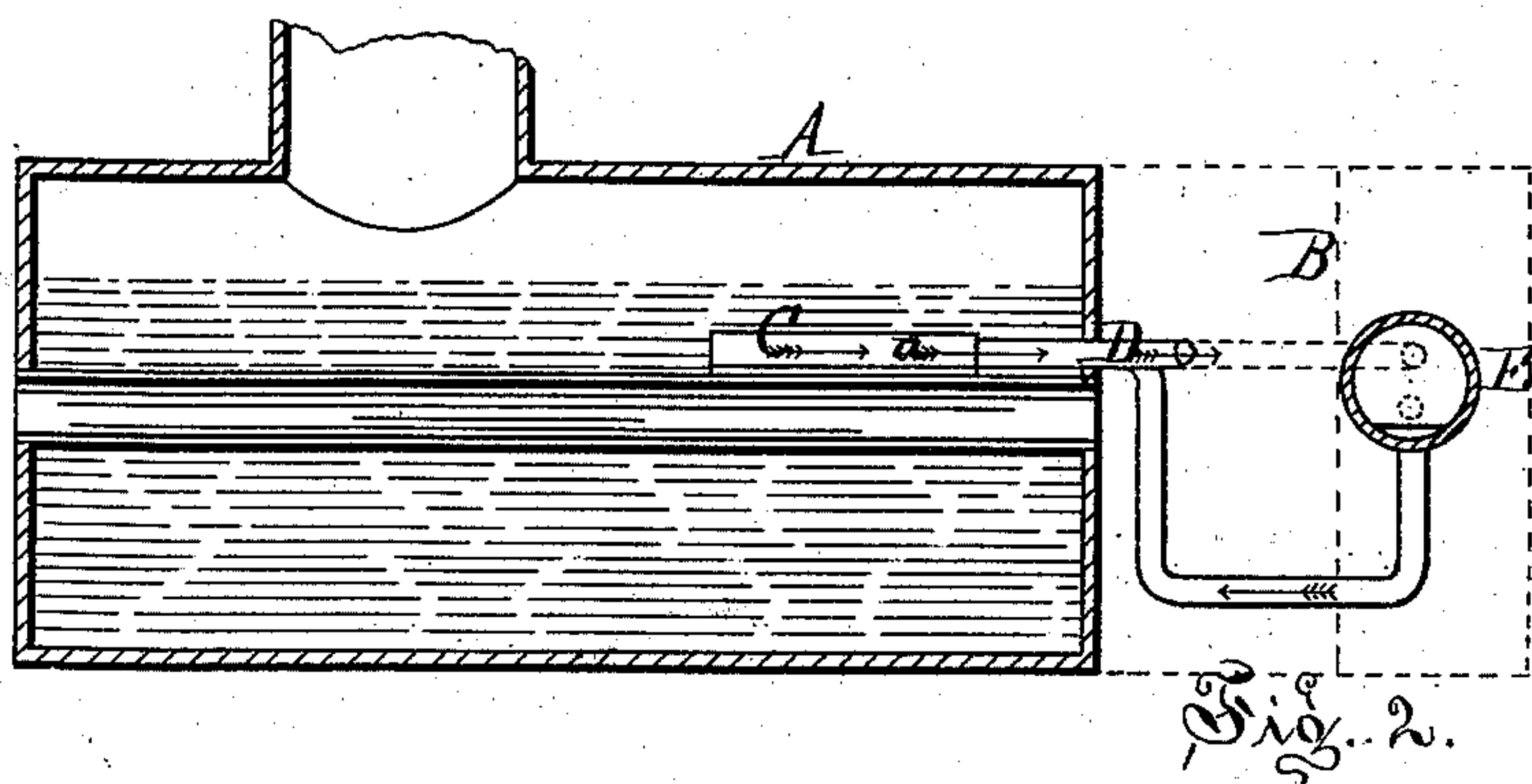
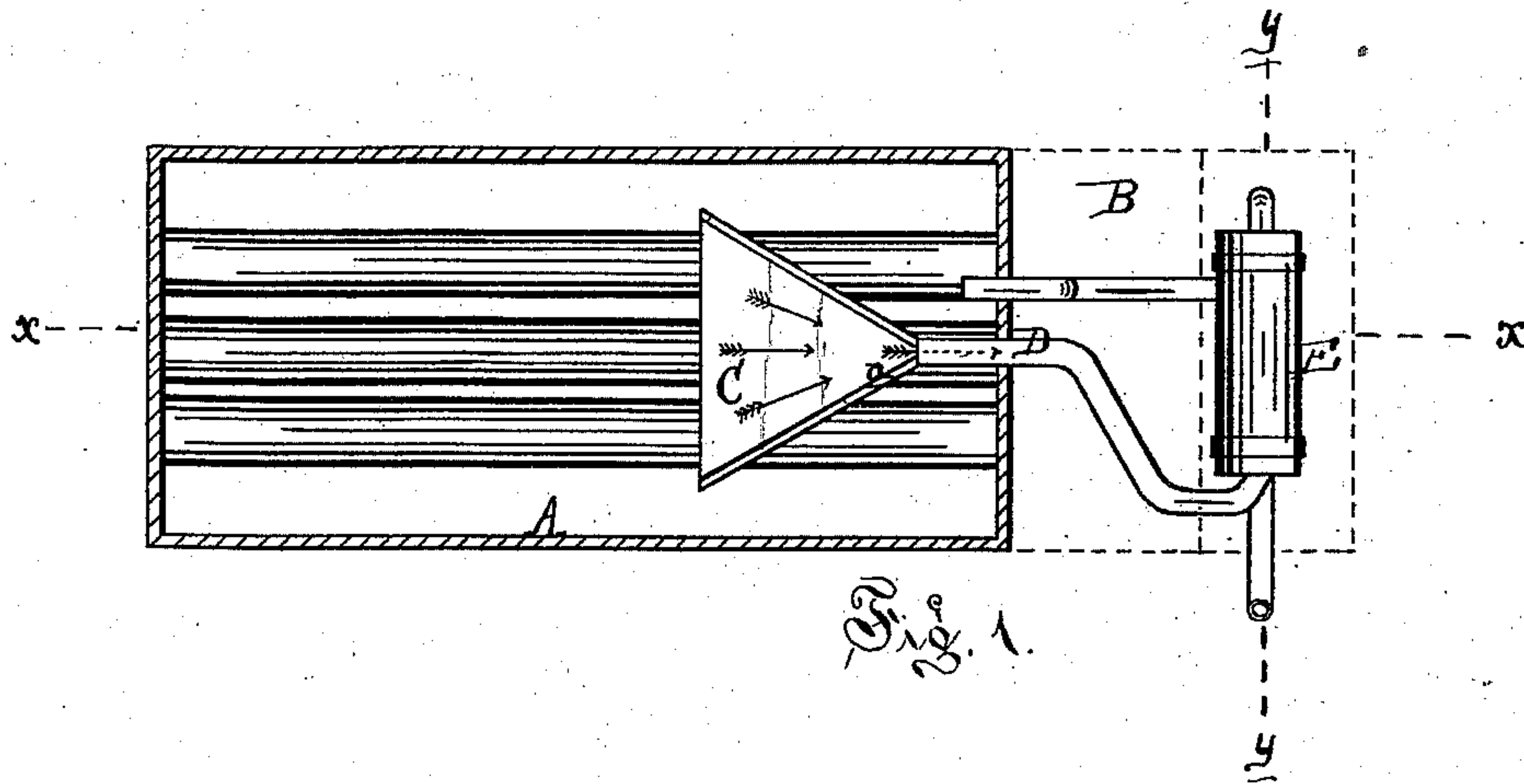


J. A. FORDON & J. E. THOMAS.  
BOILER-CLEANERS.

No. 194,036.

Patented Aug. 14, 1877.



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# UNITED STATES PATENT OFFICE.

JOHN A. FORDON, OF BAY CITY, AND JAMES E. THOMAS, OF WENONA,  
MICHIGAN.

## IMPROVEMENT IN BOILER-CLEANERS.

Specification forming part of Letters Patent No. **194,036**, dated August 14, 1877; application filed May 28, 1877.

*To all whom it may concern:*

Be it known that we, JOHN A. FORDON, of Bay City, and JAMES E. THOMAS, of Wenona, in the county of Bay and State of Michigan, have invented a new and useful Improvement in Boiler-Cleaners, of which the following is a specification:

The water used in steam-boilers is always more or less impregnated with foreign matter, and the greatest difficulty, and the one that causes the most trouble and expense to steam users, is the deposit of sediment, and the formation of scale on the inside of the boiler. This is caused by the water holding in solution, when fed into the boiler, solid matter, and, in suspension, vegetable matter and dirt, and these, being precipitated by high temperatures, remain behind by evaporation of the water. This deposition, if not immediately taken out, will harden and form incrustation or scale.

The object of our invention is to furnish a device by means of which the impurities and foreign matter in the water in a steam-boiler may be collected and blown off or be taken out, at the will of the operator; and it consists, mainly, in a peculiar skimming-pan, placed in the boiler just below the water-line, with a pipe passing through the shell of the boiler to an external receiver or settling-chamber, from which a return-pipe conducts the water back into the boiler, first, however, passing through the smoke-box, or some other place where it will be subjected to heat, in order to force the circulation of the water through said pipes and chamber, as more fully hereinafter set forth.

Figure 1 is a sectional plan of our apparatus as applied to a return-flue boiler. Fig. 2 is a longitudinal vertical section at *x x*. Fig. 3 is a similar section through the chamber at *y y*.

In the drawing, A represents a partially-incased return-flue boiler, and B its smoke-box. C is a skimming-pan resting on the flues. This pan is a triangular plate, with its apex to the rear, and near the back end of the boiler. Its front edge extends nearly across

the shell of the boiler, while its two other sides are turned up to form deflectors. Near the apex, however, the side flanges are replaced by a wire-cloth screen, *a*, which, while not entirely arresting the natural flow of the surface-water to the rear, will deflect the current and the floating scum and impurities held in suspension toward and into the mouth of a pipe, D, which passes through the head of the boiler and into one end of a receiving-chamber, E, provided with one or more vertical diaphragms or partitions, *b*, which are so arranged as to compel the water to pass from top to bottom, and vice versa, in going through, thereby retarding the current, in order to facilitate the deposition of the sediment in the chamber, from which it can be blown out through one or more blow-off cocks; or it can be removed through the hand-holes provided for that purpose.

F is the return-pipe, issuing from the other end of the chamber E, at the top, which pipe, before it passes into the boiler below the water-line, is led through the smoke-box, or some other point where it will be subjected to the action of the heated gases, which, in raising the temperature of the water contained therein, expands it and causes it to seek an outlet. The easiest and most direct outlet in this case is into the boiler, and, in consequence, the circulation of the water through the receiver is established and maintained. The foreign matter in the water, being liberated by the heat, rises to the surface in the form of scum, and, as there is a current in the boiler from front to rear on the surface of the water, and from rear to front at the bottom, due to the greater heat of the fire under the front part of the boiler, this scum is carried along onto the pan, and deflected into the mouth of the pipe D, while the water passes through the screen. The current through the said pipe carries the water so charged with impurities into the receiver, where the latter are therein precipitated, as described.

We are aware that it is not original with us to combine in a boiler-cleaner a flow-pipe for conducting off the surface-water, a sedi-



ment-collecting chamber, and a pipe to return the water to the boiler, and we hereby disclaim the same; but

What we claim as our invention is—

The combination, with a steam-boiler, of the triangular skimming-pan C, placed in the rear part of the boiler, so as to receive at its large open end the surface-current, the flow-pipe D, for conducting off the material caught

up by the said pan, the settling-chamber E, and return-pipe F, substantially as described and shown.

JOHN ALLAN FORDON.  
JAMES ELI THOMAS.

Witnesses:

J. R. LAHEY,  
J. B. HART.