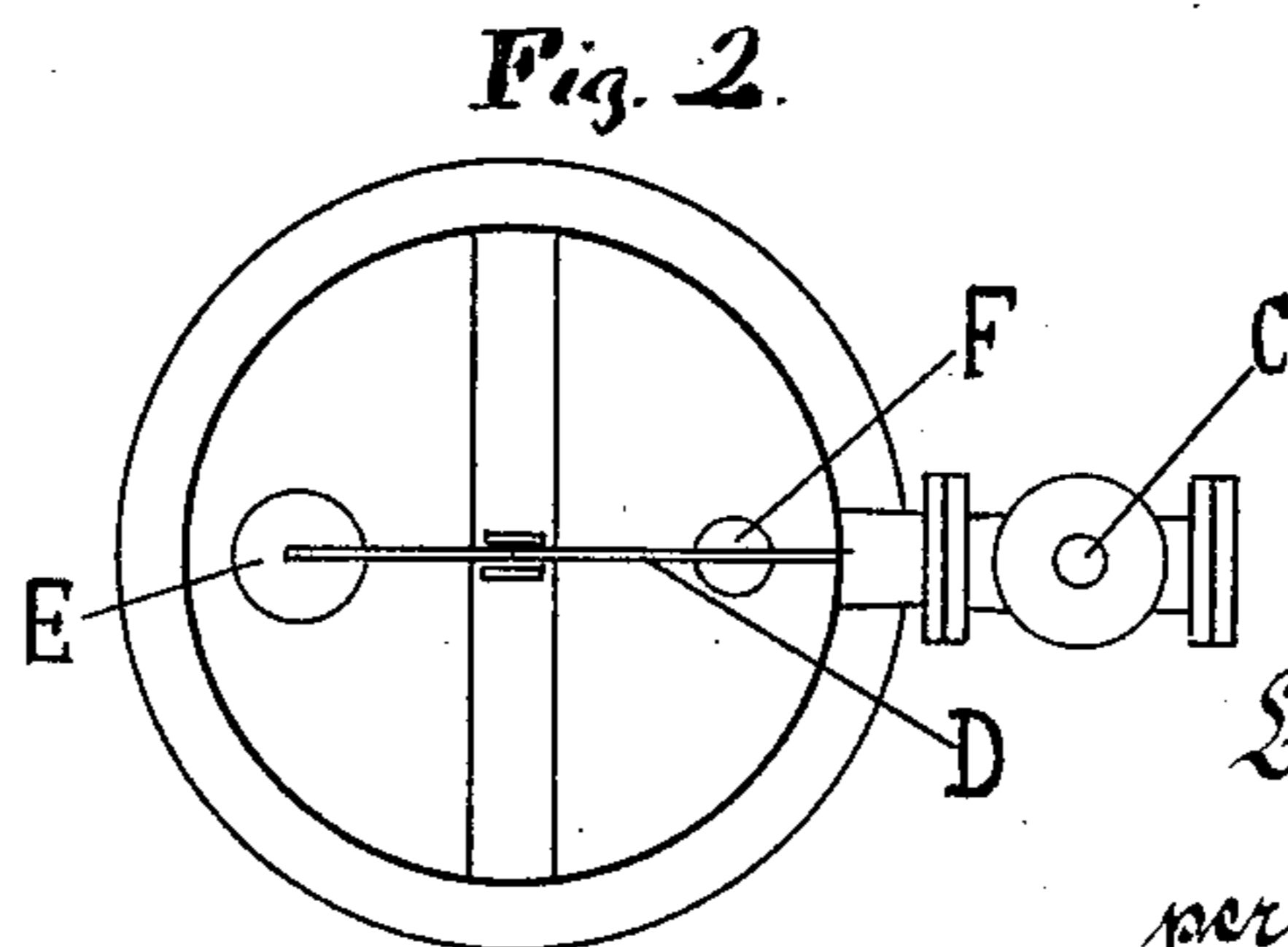
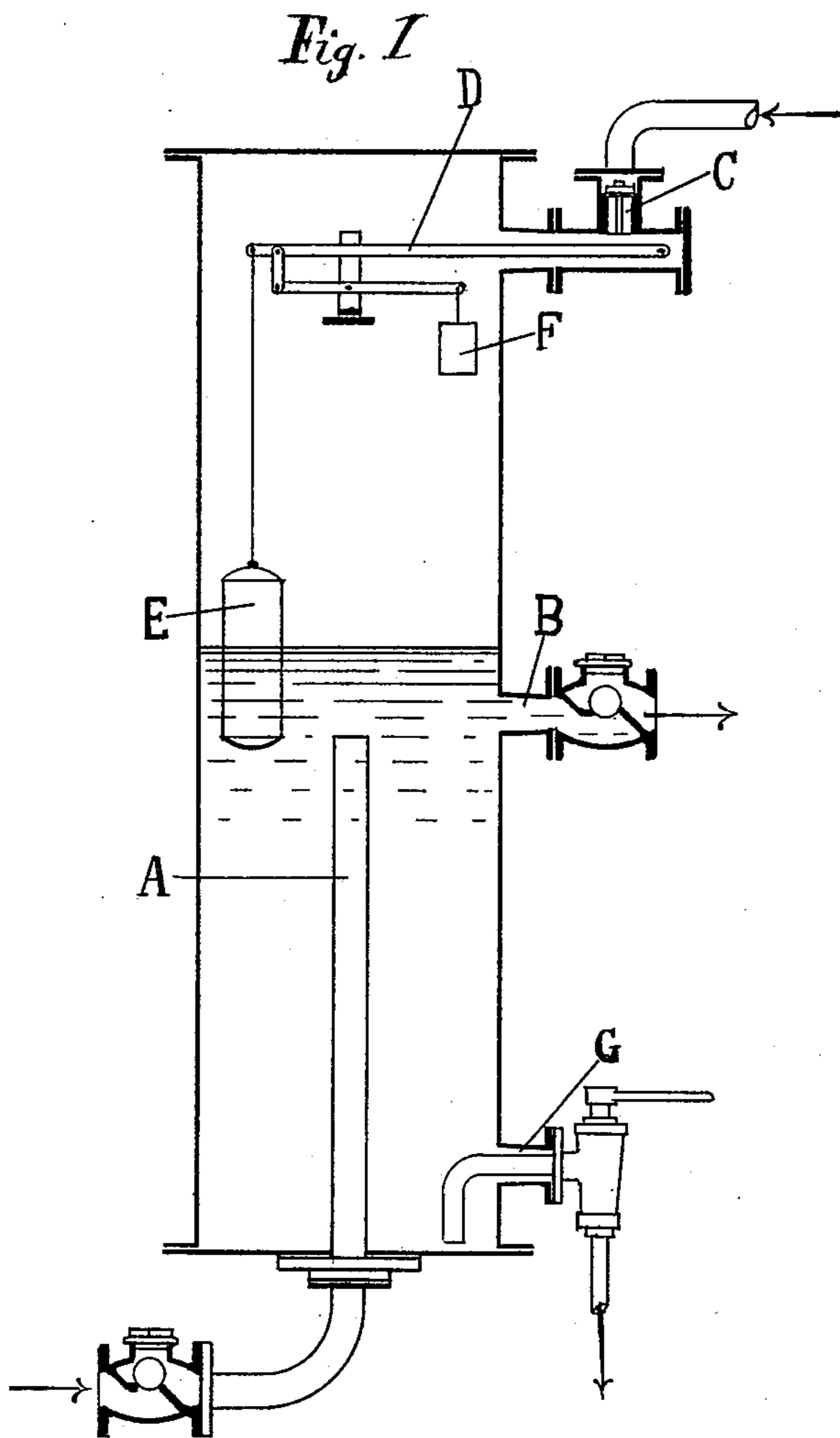


(No Model.)

L. SCHRÖTER.
BOILER CLEANER.

No. 366,796.

Patented July 19, 1887.



Witnesses:
H. Zossen.
H. Jander

Inventor:
Louis Schröter
per Oscar Brünler
Attorney.

UNITED STATES PATENT OFFICE.

LOUIS SCHRÖTER, OF GUBEN, PRUSSIA, GERMANY.

BOILER-CLEANER.

SPECIFICATION forming part of Letters Patent No. 366,796, dated July 19, 1887.

Application filed September 17, 1886. Serial No. 213,809. (No model.) Patented in Belgium January 31, 1885, No. 67,710, and May 8, 1885, No. 68,813; in England May 4, 1885, No. 5,472, and in Germany September 30, 1885, No. 36,175.

To all whom it may concern:

Be it known that I, LOUIS SCHRÖTER, a subject of the King of Prussia, German Emperor, residing at the city of Guben, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Boiler-Cleaners, (for which I have received Letters Patent in Germany, No. 36,175, dated September 30, 1885; in England, dated May 4, 1885, No. 5,472, and in Belgium, No. 67,710, dated January 31, 1885, and No. 68,813, dated May 8, 1885;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Hitherto it has been customary to purify the feed-water of steam-boilers by passing the same into large clearing or filtering vessels, in which, partly with the aid of chemicals or by the application of heat, the solid parts are caused to subside; or chemicals are placed in the boiler, and by frequent blowing off, or by provision of intercepting chambers, it is attempted to keep the impurities away from the parts of the boiler which are exposed to the fire. Both of these methods are faulty. The first is obviously very costly, at the same time that a portion of the impurities is not infrequently carried over into the boiler, and the second method gives unfavorable results, as the sediment cannot well be prevented from burning onto the interior surface of the boiler.

Now the object of my invention consists in continuously conducting the water—which has been pumped into the boiler in an impure state, the lime components and impurities of which concentrate near the bottom by reason of the boiling and evaporation—from the point where such concentration takes place, to a clarifying-vessel, allowing it to stand for settlement, and then conducting it back again to the boiler, the sediment remaining behind in the clarifying-vessel being discharged therefrom at suitable intervals.

The apparatus of this invention is shown in the accompanying drawings, Figure 1 being a sectional elevation, and Fig. 2 a plan, of the same.

A is a central pipe, in which water drawn from the boiler—generally from the lowest point in

the same—is caused to ascend in the impure state. It becomes distributed within the apparatus, and all heavy impurities fall to the bottom. After the water has been purified in this way, it flows back into the boiler through the orifice B. Check-valves are mounted on the pipes, which connect with A and B, for the purpose of preventing water entering at B and passing out at A.

D is a lever connected to a float, E, which is in part counterbalanced by a weight, F. The whole apparatus is in communication by means of a steam-pipe connected thereto at C with the steam-space of the boiler, and is constantly subject to boiler-pressure. When the steam-valve is shut, condensation takes place within the apparatus, causing a partial vacuum, by which the water is caused to rise in the apparatus until the float E is so far acted upon that the counter-weight F, through its connecting-levers, raises the end of the lever D, and thus operates the opening of the valve C, through which steam from the boiler at once passes into the apparatus and drives the already-clarified boiler-water present in apparatus out of the same in such quantity as to leave the float E nearly free of boiler-water, so that its weight will overcome that of the counter-weight F, pull down the end of the lever D, and allow the valve C to shut.

G is an orifice to which is fixed a cock for discharging the mud or sediment, and also for emptying the apparatus.

The inlet and outlet of the water into and from the apparatus may also take place through a single pipe, in which case either the central pipe, A, or the outlet B would be dispensed with, and instead of the two check-valves a duplex check-valve would be provided. The apparatus is worked by the surface condensation of the steam and by the pressure of the same, the heavy impurities being precipitated to the bottom, the clarified water supplied back to the boiler, and more impure water received for clarification. In this way the whole of the contents of a steam-boiler may in the course of a day be passed several times through the apparatus and purified.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the clarifying-vessel

with the steam-valve C, float E, lever D, and counter-weight F, for the purpose specified.

2. The combination of the clarifying-vessel, steam-valve C, lever D, float E, and counter-weight F with the pipe-connections A B and the check-valves, for the purpose specified.

5 In testimony whereof I have signed this

specification in the presence of two subscribing witnesses.

LOUIS SCHRÖTER.

Witnesses:

B. ROI,

EMIL CAPITAIN.