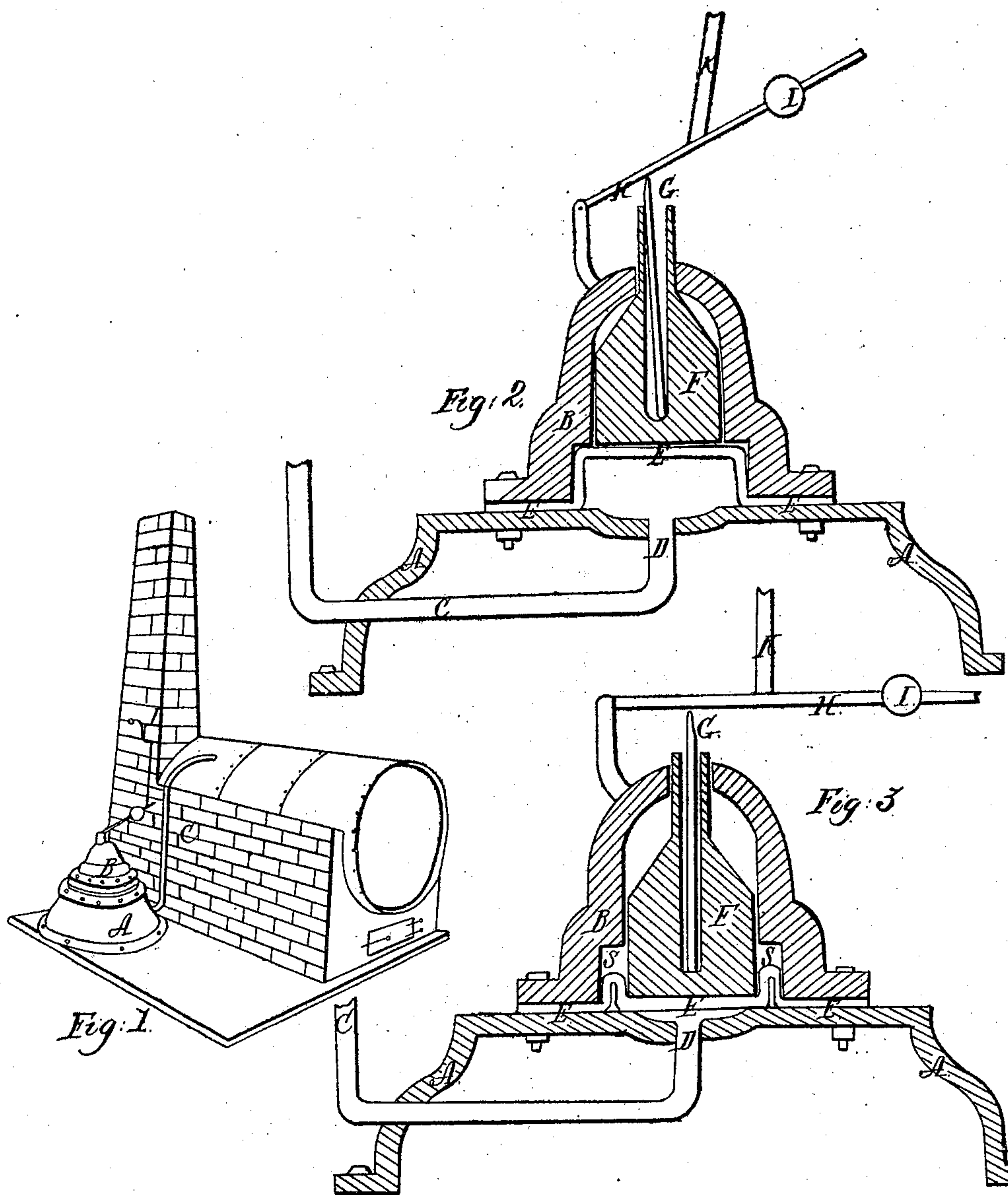


P. CLARK.
STATIC REGULATOR FOR STEAM BOILER FIRES.
No. 10,387. Patented Jan. 3, 1854.



UNITED STATES PATENT OFFICE.

PATRICK CLARK, OF RAHWAY, NEW JERSEY.

REGULATING THE DAMPER OF STEAM-BOILERS BY THE PRESSURE OF THE STEAM.

Specification of Letters Patent No. 10,387, dated January 3, 1854.

To all whom it may concern:

Be it known that I, PATRICK CLARK, of Rahway, in the county of Essex and State of New Jersey, have invented a new and useful
5 Machine for Controlling and Regulating the Combustion of Fuel Under Steam-Boilers.

The nature of my invention consists in causing the damper in the chimney (or if
10 a blower is used, the damper for shutting off the blast) to be acted on by the pressure of the steam, so that when the head of steam in the boiler has attained the pressure required the damper will be closed, but when
15 the pressure is less than that, say by 1 pound per square inch, the damper will be opened. And I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification in
20 which—

Figure 1 is a perspective view of the machine as connected with the boiler by
25 means of the pipe C and with the damper in the chimney by means of the lever H and rod K. Figs. 2 and 3 are vertical sections through the center in which Fig. 2, shows the piston up and Fig. 3 shows the piston
30 down.

The same letters represent the same parts in all the figures.

A is a base or platform of cast iron on which is fastened by means of screw bolts,
35 the cylinder B which is also of cast iron, this cylinder has a cone shaped top which facilitates the casting and finishing of it. C is the pipe leading from the boiler and connecting with this cylinder at D by being
40 screwed into the platform A to which the cylinder B is bolted. The pipe C is bent like a siphon to prevent the steam from coming in contact with the diaphragm EEE. This diaphragm may be made of vulcanized india-
45 rubber, or any flexible substance having considerable strength and being impervious to water. It is shown in Figs. 2 and 3, intervening between the piston F and the water D. It is made cylindrical in form of a
50 length sufficient to allow of the piston moving through any distance required, about one inch is sufficient, but it may be one or ten feet should the nature of the case require it. One end (the upper end) is
55 closed—i. e., it has a bottom in it. The lower

end is open and is surrounded by a flanch about one inch wide, which answers the double purpose of holding it (the diaphragm) to its place, and making a tight joint between the flanch of the cylinder and
60 the top of the platform upon which the cylinder rests.

Take notice: A flat disk of vulcanized rubber will answer in place of the above described diaphragm where the distance
65 moved through by the piston is not greater than one inch, provided the cylinder is made as shown in Figs. 2 and 3—viz., as far as the diaphragm extends into the cylinder, the bore of the cylinder must be as much greater
70 than the piston as will allow of the diaphragms assuming the position shown at S and S Fig. 3, above where the diaphragm extends the cylinder is no longer than is sufficient to allow of the free motion of the
75 piston which is simply a plain cylindrical piece of cast iron fitting the upper part of the cylinder loosely and having a hole bored nearly through its axis from the top to receive the bar G, the bar is smaller than the
80 hole in which it stands to allow of its accommodating itself to the varying position of the lever H which rests on its top.

(I) is a ball or weight made to slide back and forward on the lever. It is used to
85 counterbalance the static pressure on the bottom of the piston.

K is a rod connecting the lever H with the crank of the damper L Fig. 1.

The machine as described by the foregoing, being put in connection with the boiler and damper as shown in Fig. 1 the piston will be acted upon by the pressure of the steam and when the weight of the ball on the lever H is a little more than counterbalanced the lever will be lifted, thereby
90 closing the damper, of course if the pressure now diminishes a little, the weight and lever will descend and open the damper, to be closed again if the pressure of the steam
95 should rise above the given point.

I do not claim operating the damper of a steam boiler fire by means of the pressure of the steam in a boiler nor do I claim to have invented the diaphragm, nor its use to
100 avoid friction where fluid pressure is used to produce motion.

What I do claim is—

The combination of a cylindrical diaphragm with a cylinder and piston as de-
110

scribed in the foregoing specification and illustrated by the accompanying drawings in Figs. 2 and 3 for the purpose of operating the damper of a boiler fire by means of the
5 pressure of the steam.

In testimony whereof I the said PATRICK CLARK hereunto subscribe my name in the

presence of the witnesses whose names are hereunto subscribed on the 15th day of July 1853.

PATRICK CLARK.

Signed in our presence:

JOSEPH WOODRUFF,

CHARLES TIGHE.