

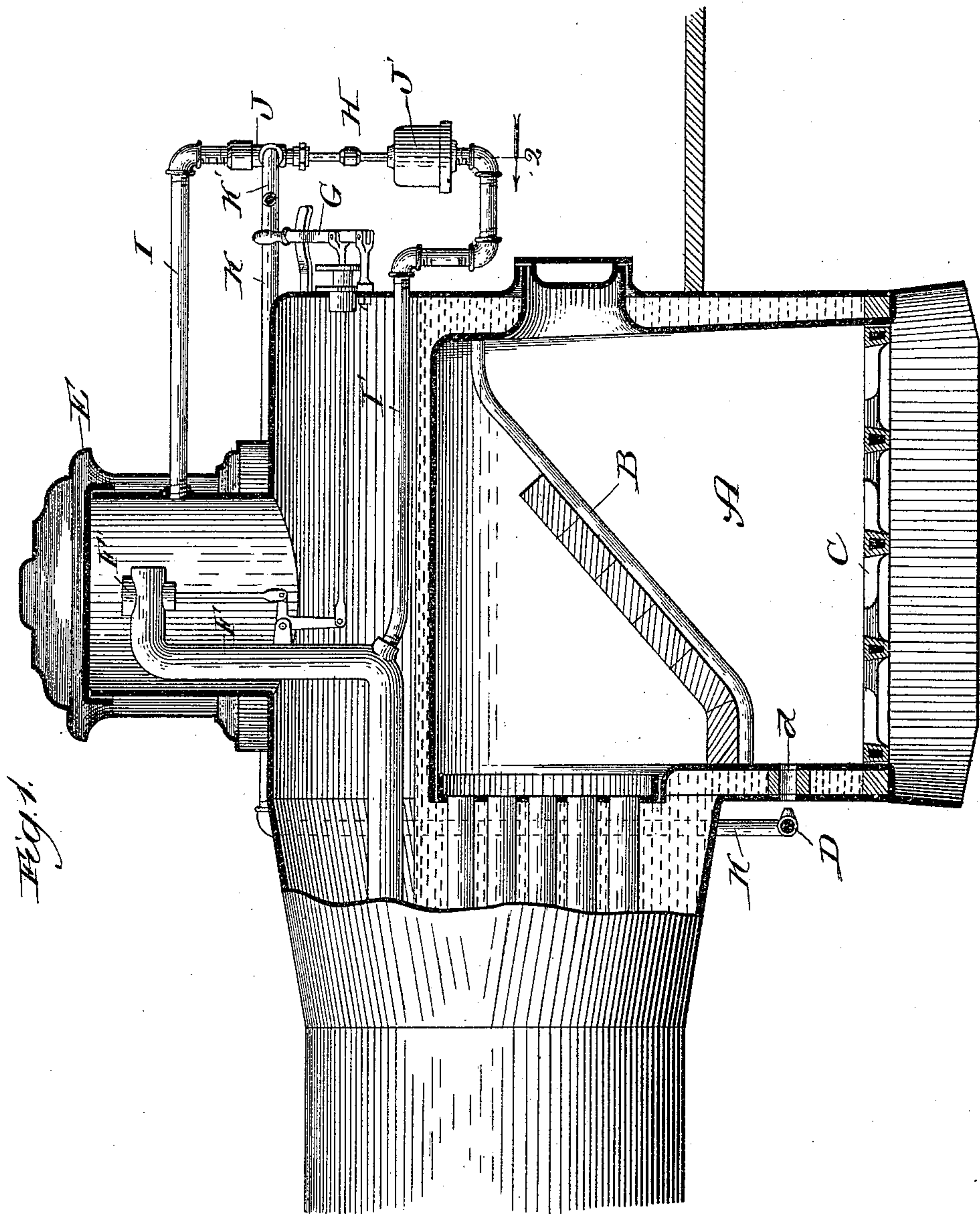
(No Model.)

2 Sheets—Sheet 1.

J. PLAYER.
SMOKE CONSUMER.

No. 449,827.

Patented Apr. 7, 1891.



Witnesses:
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Inventor:
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2 Sheets—Sheet 2.

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Fig. 2.

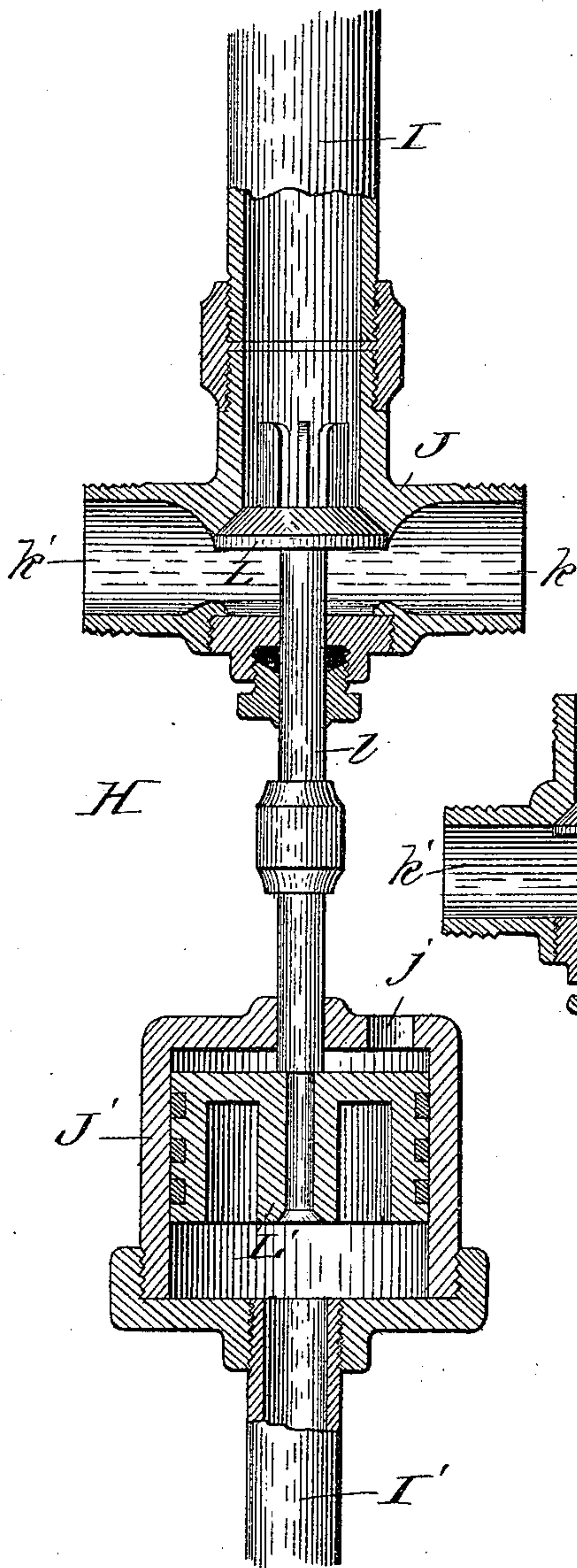
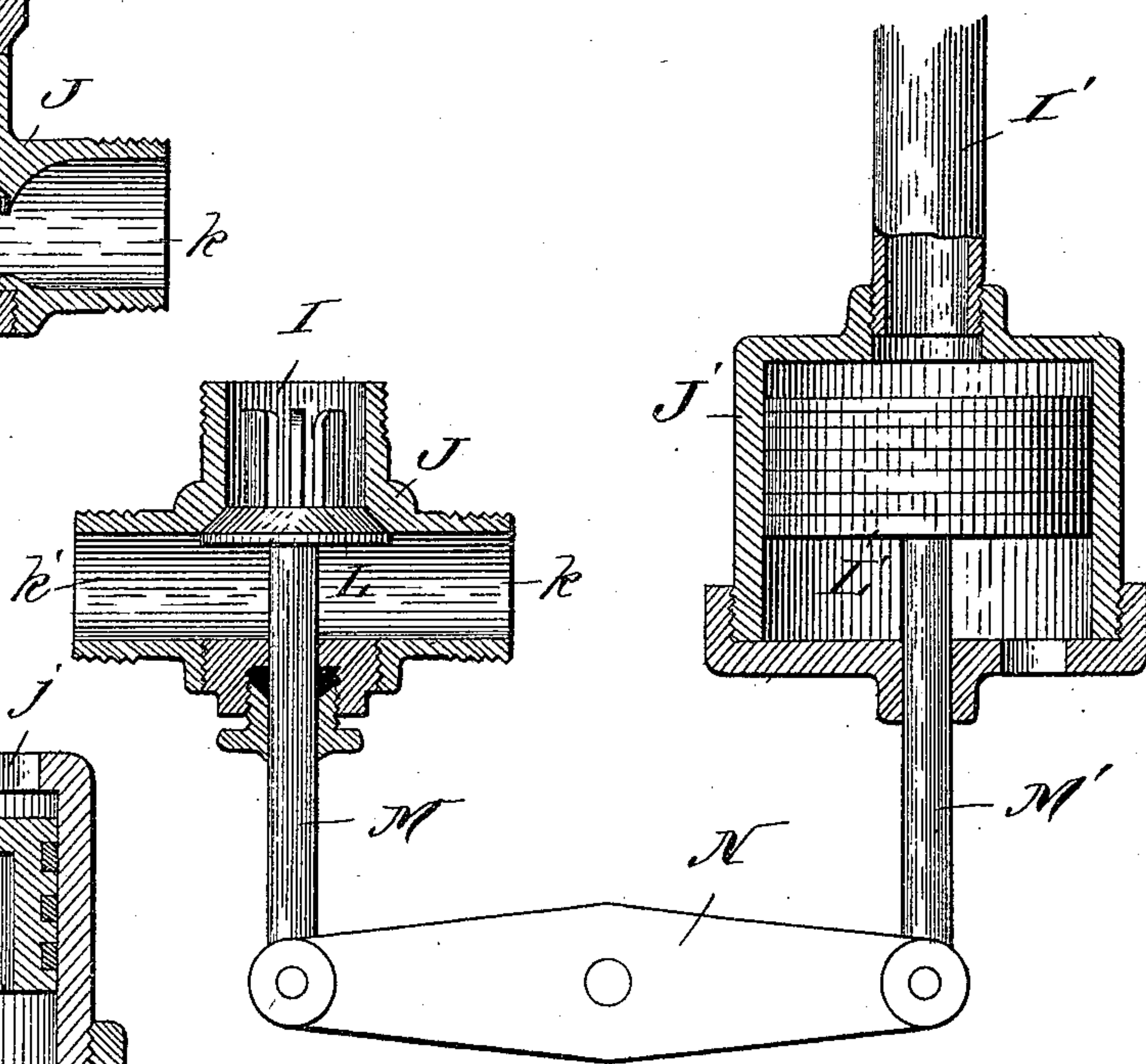


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN PLAYER, OF TOPEKA, KANSAS.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 449,827, dated April 7, 1891.

Application filed December 30, 1890. Serial No. 376,251. (No model.)

To all whom it may concern:

Be it known that I, JOHN PLAYER, a citizen of the United States, residing at Topeka, Shawnee county, Kansas, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

What is known as "Clarke's jet" has heretofore been used in connection with locomotive-engines for promoting more perfect combustion, thereby preventing the formation of smoke and increasing the efficiency of the locomotive. This jet consists, speaking generally, of a pipe running along close to the fire-box of the locomotive, provided with orifices along the side next to the fire-box. Holes are made in the fire-box opposite these orifices or jets, and when steam is admitted to the pipe it is forced through these holes into the fire at a short distance above the grate-bars. When the engine is running, the draft is ordinarily sufficient to prevent the formation of smoke, and consequently it is only necessary to admit steam to the jets and the blast when the engine is standing still or when running into a station with the steam shut off. This renders it necessary for the engineer or fireman to open the valve in the pipe leading from the steam-dome to the jet and blower. Now it is found that in practice the employes will neglect to do this, and consequently a large amount of smoke will be formed as the result of their negligence.

The object of the present invention is to provide a valve in the pipe leading to the jet and blower which shall be automatically opened or closed when the engineer shuts or opens the throttle-valve; and the invention consists in the features and details of construction hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of the rear end of a locomotive-boiler, the casing being broken away to show the interior of the fire-box and steam-dome; Fig. 2, a vertical central section in line 2 of Fig. 1, looking in the direction of the arrow, and Fig. 3 a similar section illustrating a modification of the valve.

The fire-box A, smoke-arch B, grate C, jet-pipe D, holes *d* through the front of the fire-box opposite the jets in the pipe D, steam-dome E, dry pipe F, throttle-valve F', and

throttle-lever G, connected, as shown, with the throttle-valve F', are made in the usual manner; and inasmuch as their construction is well known or will be from an inspection of the drawings they require and will receive no further description.

The valve apparatus H is connected with the steam-dome by a pipe I and with the dry pipe at a point forward of the throttle-valve by a pipe I', the pipe I entering the upper end of the valve apparatus and the pipe I' the lower end.

The valve apparatus consists of two chambers or cylinders J J'. The chamber J connects with the pipe I, and also, as shown, with the jet-pipe D by means of a pipe K, and with the blower by means of a pipe K', these pipes connecting, respectively, with the ports *k k'* in the chamber J. The pipe K' is broken off, its connection with the blower not being shown; but since the construction of this blower is obvious and forms no part of the present invention, I do not consider that it needs to be illustrated, it being understood that the pipe *k'* is extended along the boiler to the smoke-box, which it enters and wherein it connects with the blower.

In the chamber J is a winged valve L seating upward, as shown, and closing or opening the connection between the pipes I, K, and K'. In the chamber J', which is provided with an opening *j'* to the air in its upper side, is a piston L', the valve L and the piston L' being connected, as shown, by means of a rod or stem *l* so as to move together.

The parts, being constructed and put together as shown, will operate as follows, supposing them to be in the position shown in Fig. 1. In this position the throttle-valve is closed, and there is consequently no pressure in the dry pipe or pipe I' connecting with the lower end of the chamber J'. The pressure of the steam in the dome will, therefore, act upon the upper surface of the valve L, forcing it downward, together with the piston L', admitting steam from the dome to the jet-pipe D and the blower, or to the former alone if the blower is not connected with the valve. If, now, the engine be started, at which time the jet and blower are not required to work, the throttle-valve will be opened, admitting steam from the dome to the dry pipe F, from

whence it will pass to the pipe I' into the cylinder J, pressing against the lower side of the piston L'. The area of this piston being greater than the area of the valve L, the pressure upon it will overbalance the pressure from the steam-dome upon the valve and will close the same, shutting off the connection with the jet-pipe and blower. When the throttle-valve is closed, the pressure upon the piston will be cut off, and the pressure upon the valve remaining constantly the same will open it, as above described, and in the same manner whenever the throttle-valve is closed the valve L will be opened, and vice versa.

The form shown in Fig. 3 is practically the same as that already described, the difference being that the chamber J and cylinder J' are placed side by side so that instead of a single stem l connecting the valve and piston they are connected by means of rods M M', the former being connected with the valve L and to one end of a walking-beam or lever N, and the rods M' being connected with the piston L' and the other end of the lever N.

This change in the relative position of the parts renders it necessary for the pipe I' to connect with the upper end of the cylinder J' instead of with the lower, as in Figs. 1 and 2. The modified form, however, operates in precisely the same manner as the form first described. When the throttle-valve is opened the pressure against the upper surface of the piston L' counterbalances the pressure on the valve L and closes it, and when the throttle-valve is closed, shutting off the steam from the pipe I' and releasing the pressure upon the piston, the constant pressure upon the valve L will force it down, admitting steam to the jets and blast. In using this construction it will be obvious that the engineer has no extra duties thrown upon him, since of course it is absolutely necessary for him to move the throttle-lever back and forth to start or stop his engine, and the motion of this lever serves to open or close the valve in the manner already set forth.

I claim—

1. In a smoke-consumer for locomotives, the combination of a jet-pipe, a valve-chamber connected with such pipe and with the steam-dome, a cylinder connected with the dry pipe and containing a piston connected with the valve in the valve-chamber, the area of the piston exceeding that of the valve, whereby when the throttle-valve is closed the pressure of the steam upon the valve L opens it to admit steam to the jet-pipe, and when the throttle-valve is opened the pressure upon the piston closes the valve L, substantially as described.

2. The combination of a valve-chamber connected with the steam-dome and with the jet-pipe and containing a valve L, a cylinder connected with the dry pipe forward of the throttle-valve and containing a piston the area of which exceeds the area of the valve and which is connected with such valve, whereby when the throttle-valve is closed the steam-pressure opens the valve L, and when the throttle-valve is open the pressure upon the piston overbalances the pressure on the valve and closes the same, substantially as described.

3. The combination of a jet-pipe, a valve-chamber connected with the steam-dome, jet-pipe and blower, a valve L in such chamber, a cylinder connected with the dry pipe forward of the throttle, and a piston in such cylinder of an area greater than that of the valve L, the piston and valve being suitably connected, whereby when the throttle-valve is closed the steam-pressure opens the valve to admit the steam to the jet-pipe and blower, and when the throttle-valve is opened the pressure upon the piston overcomes the pressure upon the valve L and closes such valve, shutting off the steam from the jet-pipe, substantially as described.

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