

J. GOULDING.

Furnaces.

No. 148,361.

Patented March 10, 1874.

Fig. 1.

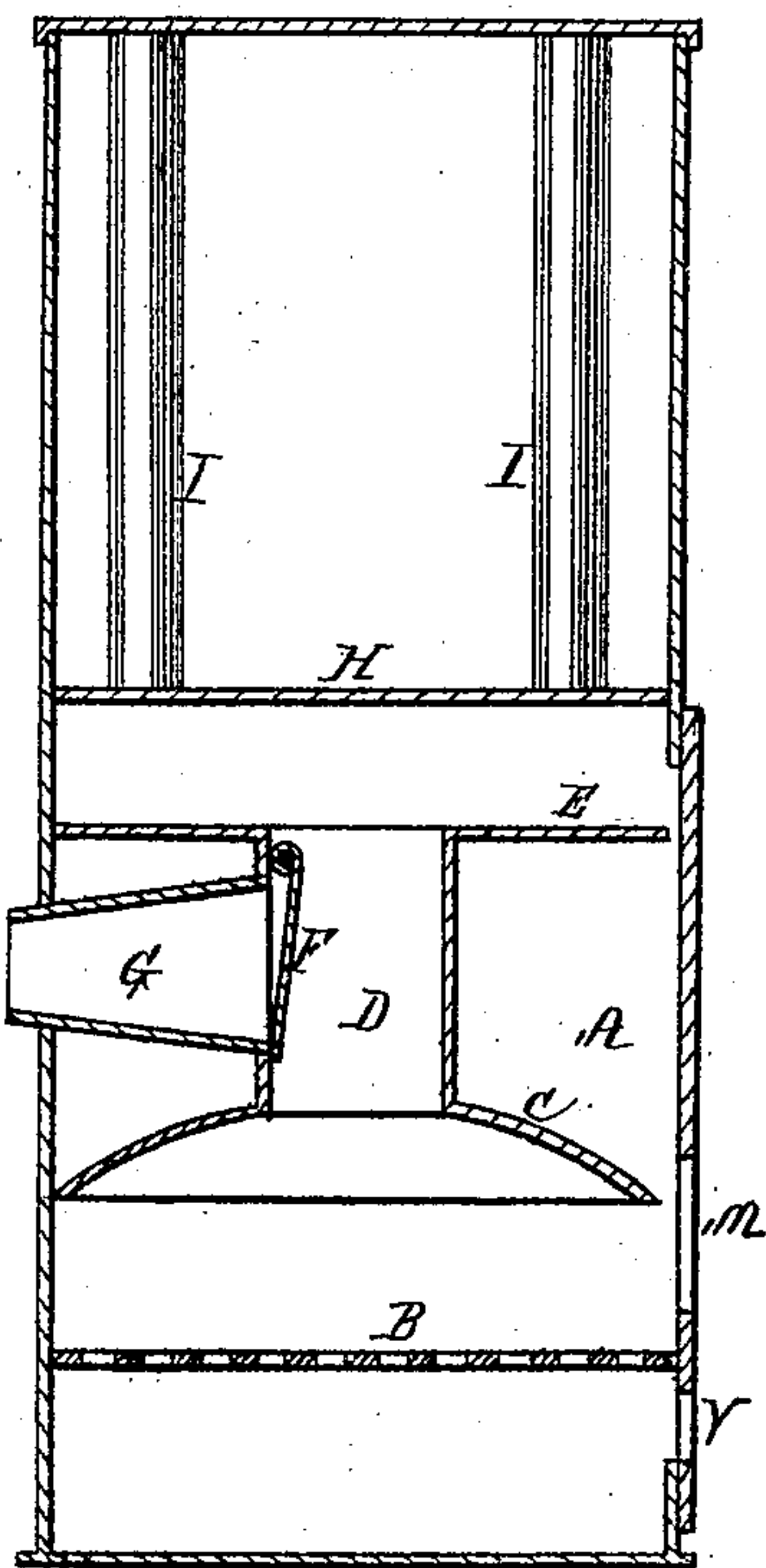


Fig. 2.

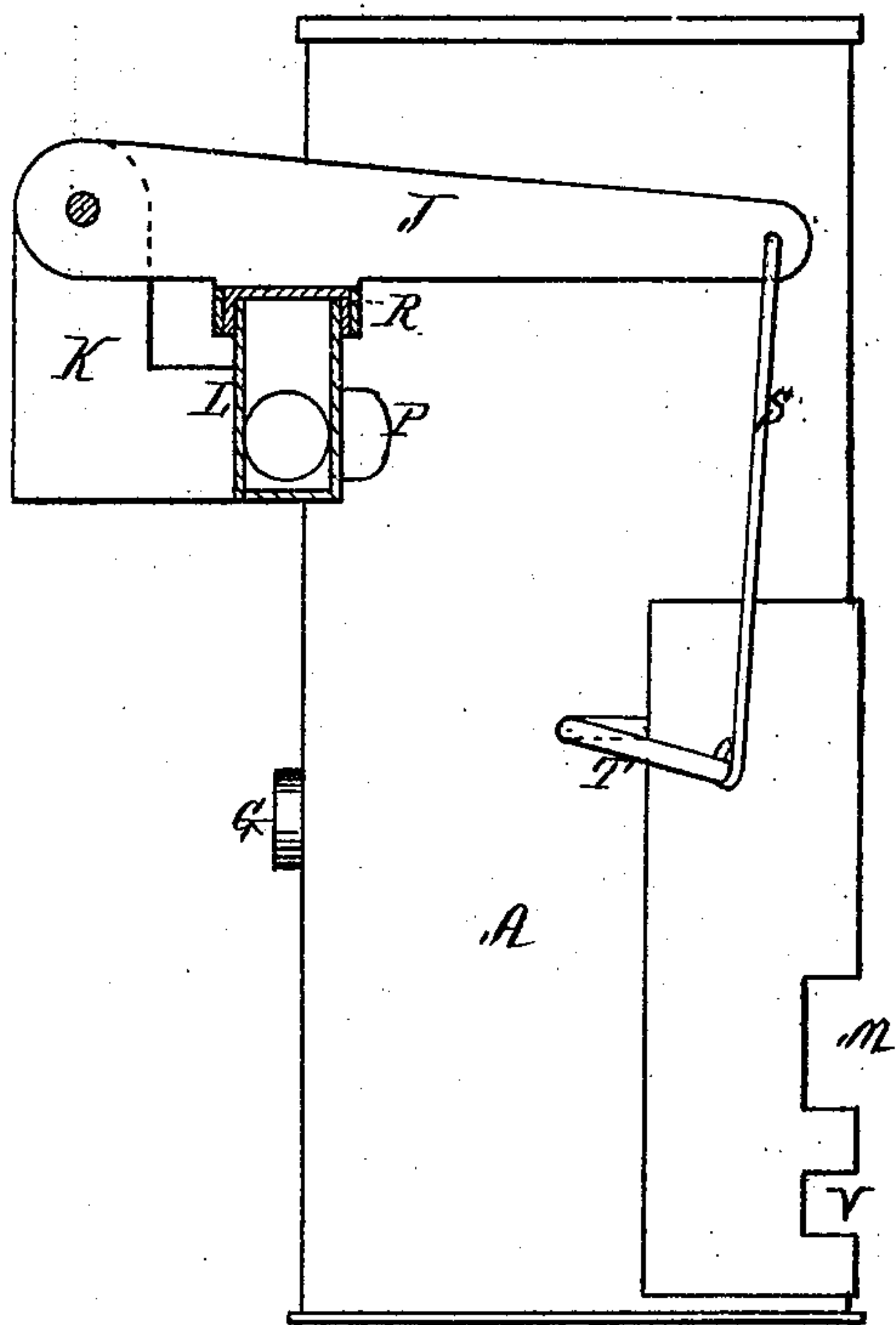
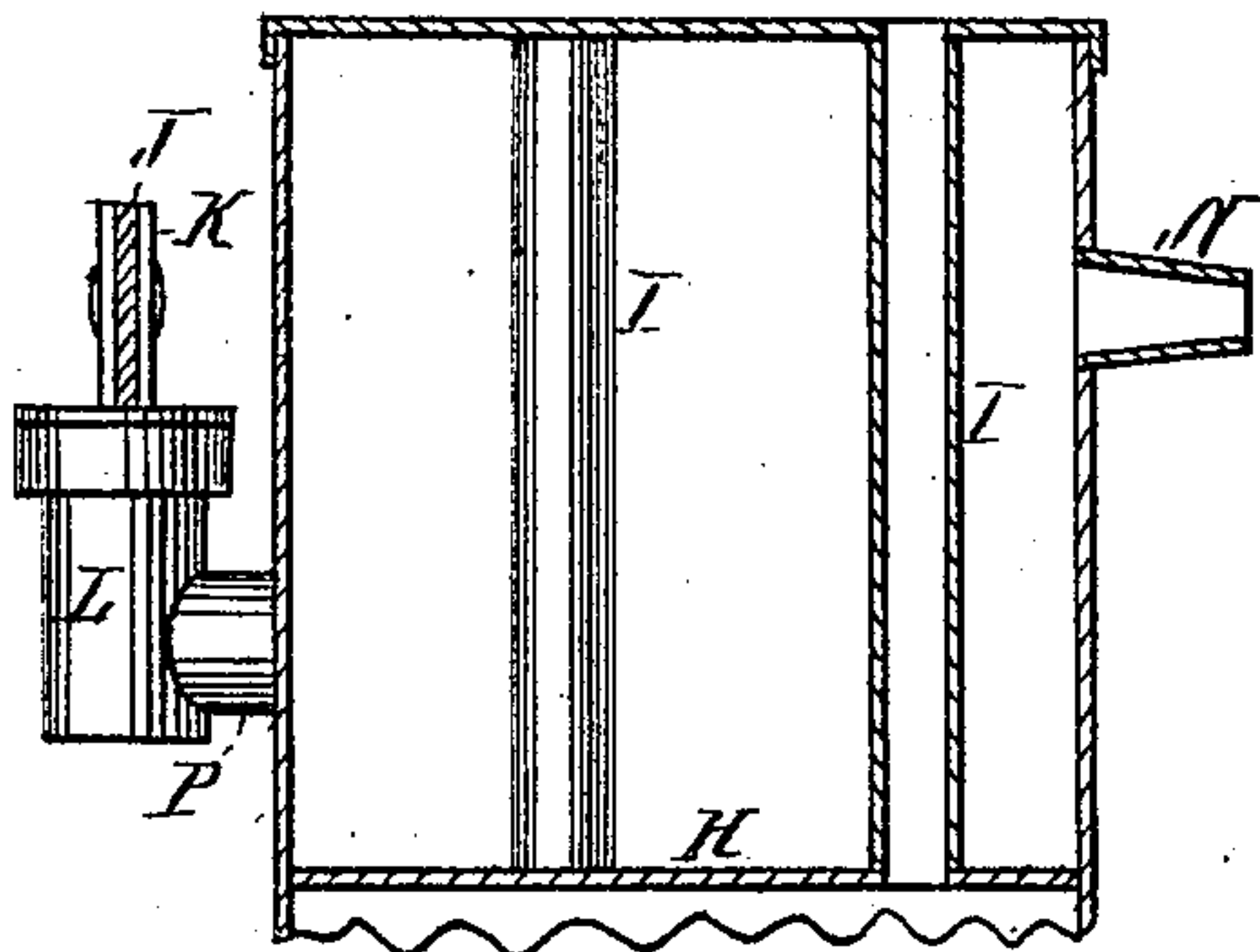


Fig. 3.



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IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. **148,361**, dated March 10, 1874; application filed January 10, 1874.

To all whom it may concern:

Be it known that I, JOHN GOULDING, of Worcester, in the county of Worcester, State of Massachusetts, have invented a certain new and useful Improvement in Furnaces, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a vertical section of my improved generator. Fig. 2 is a side elevation of the same with a sectional view of the diaphragm. Fig. 3 is a sectional view of the boiler.

Like letters refer to like parts in the different figures of the drawing.

My invention relates more particularly to that class of generators in which gas, generated from a hydrocarbon-oil, or other volatile liquid, is used as the motive power; and consists in a mechanism for automatically controlling and regulating the heat used in generating such gas, as hereinafter more fully set forth, the object being to render generators of this description less liable to explosion, and, consequently, safer than they have heretofore been.

In Fig. 1, A is the furnace, provided with the usual door M, register or draft V, grate B, and with the safety-funnel G. Within the furnace A there is a conical diaphragm or "petticoat," C, and a diaphragm, E, extending laterally entirely across the interior or cavity of said furnace. These diaphragms are each provided with a central opening, and are connected by the vertical funnel or flue D, from which the horizontal safety-funnel G opens outwardly, as shown. H is the tank or boiler for containing the oil or other liquid, and is provided with the flues I I. Within the vertical funnel or flue D, there is a deflector or damper, F, disposed on the crank-shaft T, Fig. 2. This shaft is connected by the link S with the long arm of the damper-lever J, which lever is pivoted to the stud K projecting from the boiler A. There is a chamber or tube, L, connected by the pipe P with the boiler or tank H. Across the top of this chamber a rubber diaphragm or valve is se-

cured, on which the lever J rests, as shown in Fig. 2, said lever J, diaphragm R, chamber L, and pipe P, constituting what I denominate a valve mechanism.

From the foregoing description the nature and operation of my invention will be readily understood by all conversant with such matters.

The boiler H being properly supplied through the inlet-pipe N with the liquid to be used, and a fire started on the grate B in the furnace A, the products of combustion will pass upwardly through the funnel D and flues I I, imparting their heat to the contents of the boiler H, and thence out of the apparatus into any convenient chimney or funnel to be provided for that purpose. By this means gas or steam, as the case may be, will be generated in the boiler, and will pass through the pipe P and fill the chamber L, exerting the same pressure on the rubber diaphragm R, which is exerted within the boiler H. The diaphragm will thus be extended or expanded, and, acting upwardly against the lever J, will, through the link S and crank-shaft T, operate the damper or deflector F, and thus close, or partially close, the funnel D.

It will be seen that, as the valve F is thus operated, the heat will be wholly or partially shut off from passing through the funnel D and flues I I, and will pass out of the safety-funnel G instead. For instance, in case the pressure in the boiler H is great enough to raise the lever J sufficiently to entirely close the damper F, all of the heat will then pass out of the furnace through the funnel G. Heat being thus deflected or withdrawn from the boiler H, and, at the same time, gas or steam being taken from the engine for use in the ordinary manner, the pressure within the boiler will be gradually reduced, allowing the lever J to fall and partially open the damper F, which will again permit the heat to ascend through the flues I I and generate a further supply of steam or gas, thus operating automatically to supply the boiler with a uniform degree or quantity of heat. I sometimes connect the lever J with the door M and register V, in such a manner as to open said door, and at the same time close the register, thus lessening the draft through the fuel when necessary, and prevent-

ing a waste of the same. A piston properly packed may also be used in the chamber L, to act against the lever J in place of the rubber diaphragm R, if preferred.

It should be understood that the lever J must be properly weighted in accordance with the pressure desired in the boiler, and that the damper F should be so arranged that when there is no fire in the furnace it will always be in a position to close the funnel G, as shown in Fig. 1.

My invention is more especially applicable to gas-generators, but is equally valuable in certain kinds of steam-engines, and I do not therefore confine myself to its use in either connection.

I am aware that engines have been used in which the steam or gas in the boiler has been applied to regulate the draft of the furnace by opening and closing the draft-registers to an extent varying in accordance with the pressure of such steam or gas, but the objection to such an arrangement is, that, after the draft-register is entirely closed, considerable time will elapse before the heat supplied to the

boiler will be materially reduced, whereas, in my improved generator, by turning aside or deflecting the volume of heat, as described, the generation of gas or steam in the boiler is at once lessened, and all danger of explosion obviated. I, therefore, do not herein claim a mechanism for operating the draft-register of a generator, as described, when in and of itself considered; but

What I do claim is—

1. In combination with the furnace of a generator, such as described, a mechanism operating automatically to deflect or turn away the heat and products of combustion from the boiler, substantially in the manner and for the purpose specified.

2. The furnace A, diaphragm E, damper F, flue D, diaphragm C, and safety-funnel G, in combination with a valve mechanism connected with the boiler for operating said damper, substantially as and for the purpose specified.

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Witnesses:

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