

J. HOWES.

Improvement in Steam-Boiler Furnaces.

No. 132,466.

Patented Oct. 22, 1872.

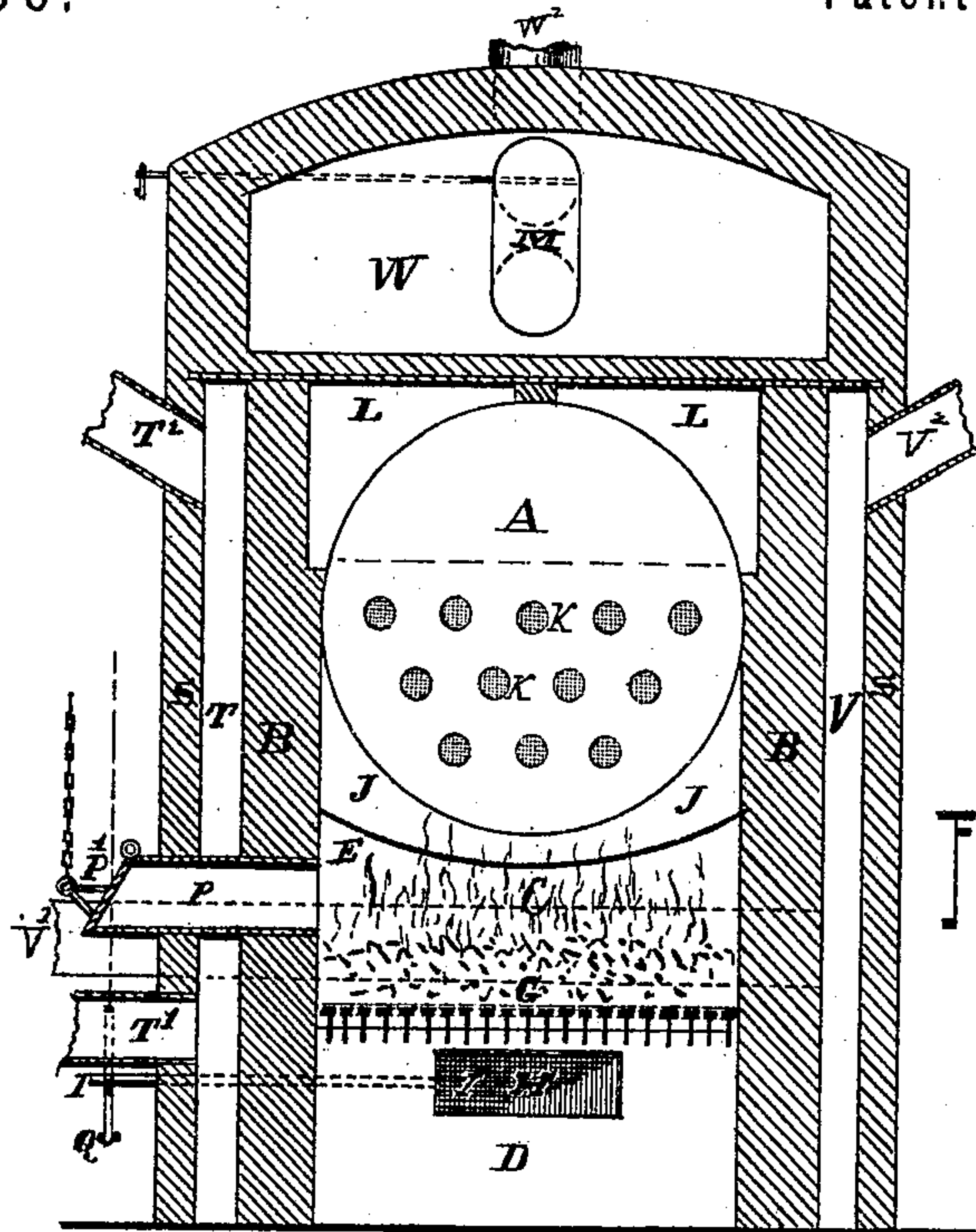


FIG. 1

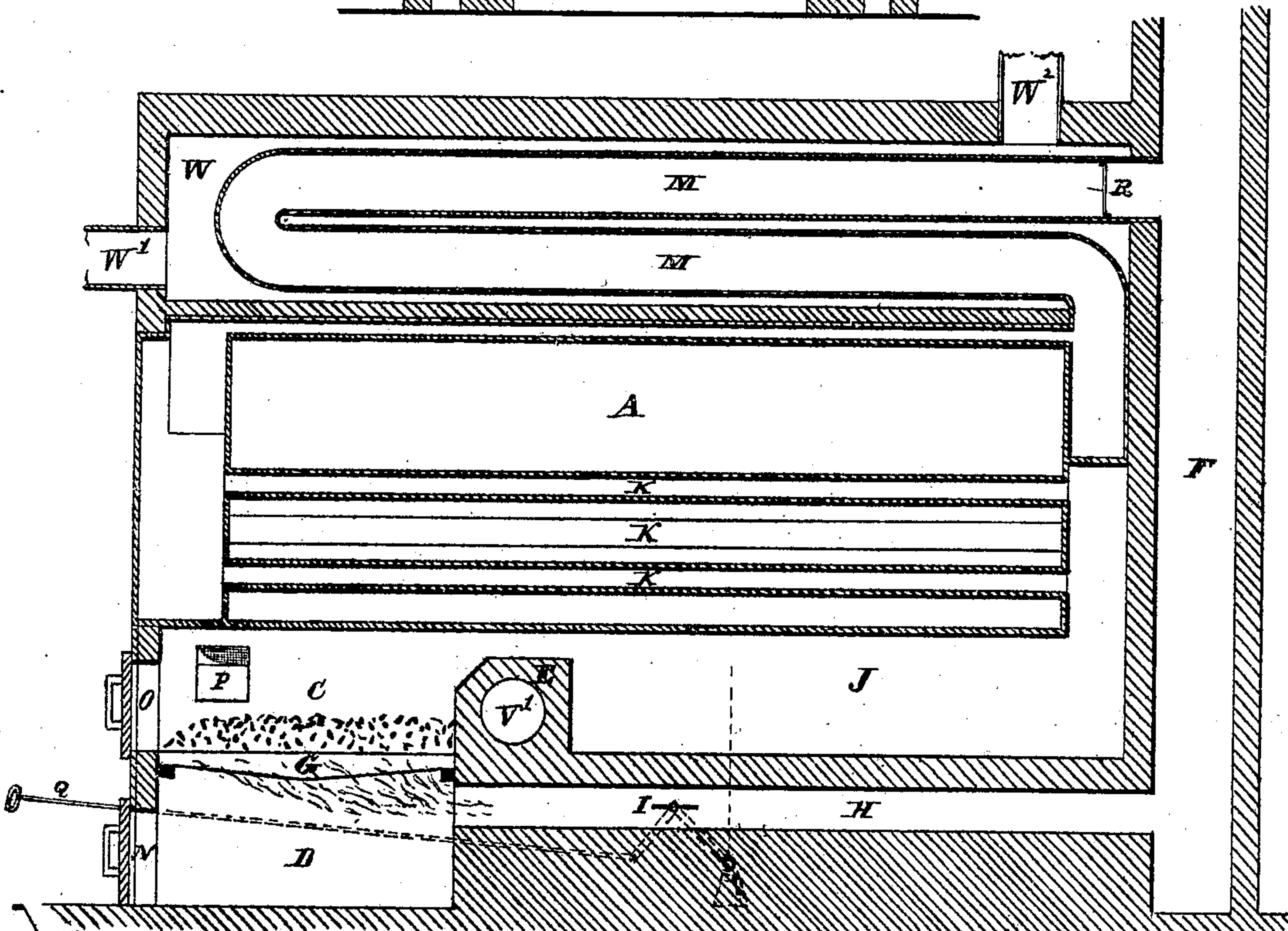


FIG. 2

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IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. **132,466**, dated October 22, 1872.

To all whom it may concern:

Be it known that I, JOHN HOWES, of the city and county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Steam-Boiler Safety-Regulator and Heat-Economizer; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing which forms a part of this specification, in which—

Figure 1 represents a transverse vertical section through the front end of the boiler and furnace; and Fig. 2 represents a longitudinal vertical section through the center of boiler, furnace, and smoke-flues.

The nature of my invention consists in the combination, with a steam-boiler and its furnace, of a safety-regulator or under-draft flue for regulating the heat upon the surface of the boiler, as hereinafter described.

In the drawing, the part marked A represents the boiler, which, in the present instance, is an ordinary horizontal, cylindrical, tubular boiler; but my improvements may be used with boilers of any other class. B B indicate the brick walls of the furnace, and upon which the boiler A is supported. C indicates the furnace, and D the ash-pit. E indicates the bridge-wall; F, the chimney-flue; and G, the grate and fire. The furnace is made substantially of the usual form, and from the ash-pit D, or from the space below the grate G, I construct a flue or passage, H, direct to the chimney-flue F. This flue H is fitted with a damper, I, by means of which the passage can be opened and closed at pleasure by the person attending the fire. The usual course of the smoke and gases from the fire is along the under side of the boiler, the passage J, through the tubes K to the front end of the boiler, back over the top surface of the boiler in the passages L, and from thence through the funnel M to the chimney-flue F. The products of combustion follow this course when the damper I in the flue H is closed, the flame from the fire rising and impinging upon the plates of the boiler, as indicated in Fig. 1; but when the damper I is opened and the damper in the smoke-flue M closed, the draft to the chimney-flue F is then sent direct through

the flue H, and the products of combustion are drawn downward through the grate, the flame being carried away from the boiler A and down into the ash-pit D, as indicated in Fig. 2. It will not in all cases be necessary to close the damper R to produce the desired effect, unless the upper flues are quite direct, or the under flue H is of considerable length, and in many cases it may be desirable to leave the damper R open to permit a current of air to carry away the heat radiated from the walls.

When the fire is running in the ordinary manner, the door N of the ash-pit is left open for the entrance of air; but when the damper I, in flue H, is opened, the door N is to be closed, and the furnace-door O is opened to let the air in upon the top of the fire; or, a side air-passage, P, may be provided instead of using the door. This side passage would not be required, however, unless the mechanism was arranged to operate automatically, as hereafter described. The damper I may be arranged either as a sliding or rotating damper, and it may be operated by means of a hand-bar, g, or be weighted and connected to some suitable automatic indicator worked by the variation of the water-level or steam-pressure in the boiler, as preferred. In the latter case the cover P' of the air-passage P should be arranged to operate in concert therewith, as may also the damper R in the smoke-funnel M.

Among the advantages gained by the use of the under flue H and damper I may be mentioned the following: It enables the attendant to instantly divert the heat away from the boiler, in case the water should become too low from derangement of the pumps or from other cause, or in case of an excess of steam, thus guarding against an explosion, or preventing any straining of the boiler-plates and rivets. It thus establishes a feeling of safety in the minds of the attendant and others in the vicinity. In case the fire becomes dead at the under side, by changing the direction of the draft to the flue H for a short time, the dead coals become rekindled. It prevents dust or gas from escaping into the room while removing ashes or stoking the fire. In case of banked fires, the draft from above

and below can be so regulated, by properly adjusting the damper I, as to preserve the fire with but slight heat upon the boiler, and when blowing off, by opening the damper I, all liability of burning the boiler is obviated.

Having described my improved steam-boiler, safety-regulator, and heat-economizer, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

The combination, with a steam-boiler and its furnace, of an under flue or safety-draft passage H, substantially as and for the purposes set forth.

JOHN HOWES.

Witnesses:

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E. E. MOORE.