R. S. DUNHAM.

Draft-Regulating Dampers.

No. 152,089. Patented June 16, 1874.

Fig. 1.

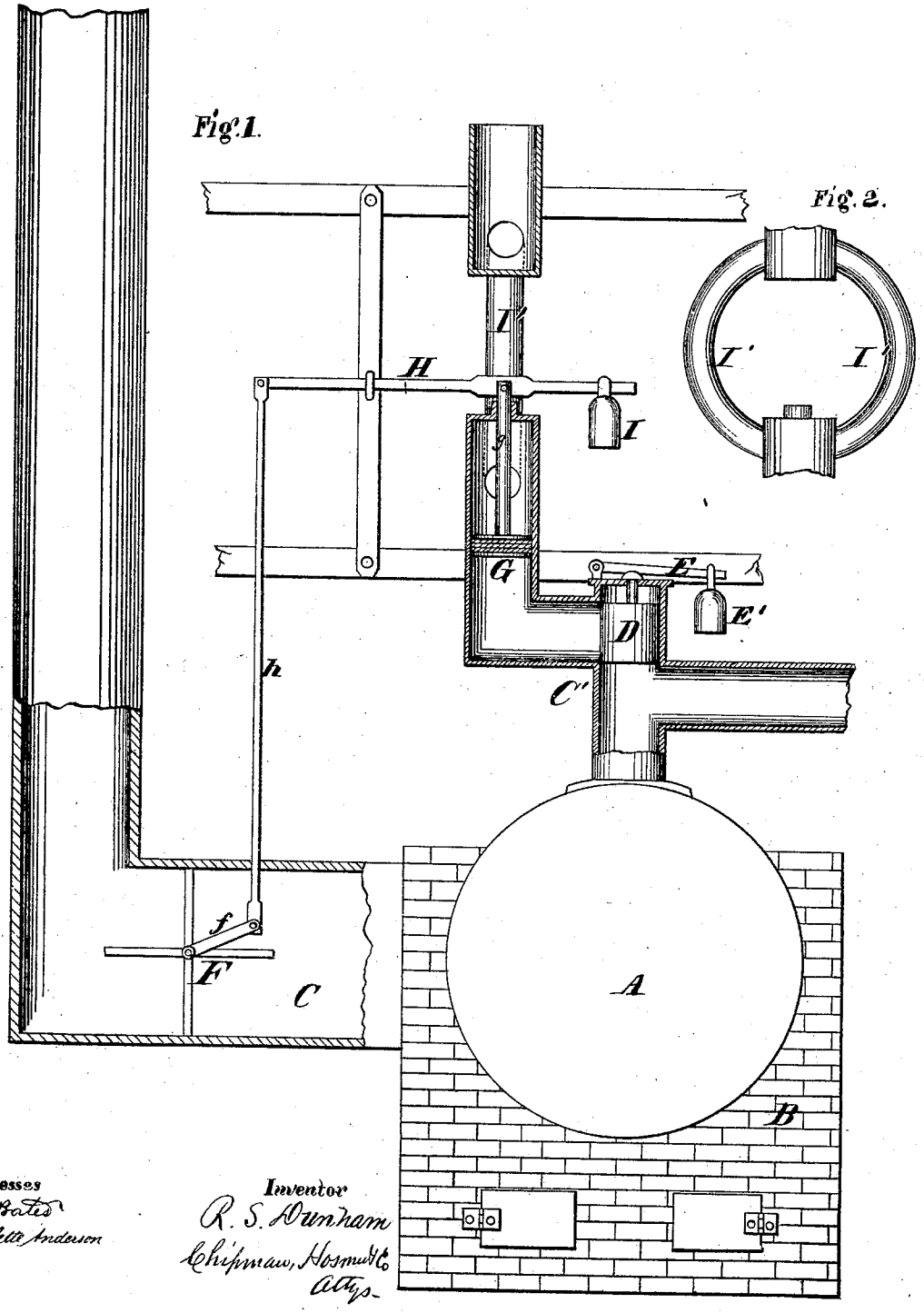

Fig. 2.

Witnesses
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A.M. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

ROYAL STYLES DUNHAM, OF COLDWATER, MICHIGAN.

IMPROVEMENT IN DRAFT-REGULATING DAMPERS.

Specification forming part of Letters Patent No. **152,089**, dated June 16, 1874; application filed September 14, 1871.

To all whom it may concern:

Be it known that I, ROYAL STYLES DUNHAM, of the city of Coldwater, in the county of Branch and State of Michigan, have invented a new and valuable Improvement in Draft-Regulating Damper for controlling the draft of the fire under or for steam-boilers; 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical section of my invention. Fig. 2 is a detail.

This invention has relation to dampers for the flues of steam-boiler furnaces; and the novelty consists in the herein-described method of establishing a connection between the safety-valve pipe and the damper, whereby the latter may be operated automatically by the force of the steam escaping through the safety-valve. The object of this invention is the adapting of the heat to the condition of the steam, so as to keep up an equal pressure and prevent the waste of fuel.

Referring to the accompanying drawings illustrating this invention, A represents a steam-boiler; B, the furnace; C, the draft-flue leading from the interior of the latter; C′, the safety-valve tube, within the first section of which is located the safety-valve D, of which E is the lever and E′ the weight. F represents the damper pivoted within the flue C, and provided with a crank-arm, *f*. G indicates a valve or piston within the safety-valve pipe, above the position of the safety-valve, but in such relation to it that the escaping steam may act on said piston and drive it upward. H represents a lever-arm, which is pivoted at one end to the rod *g* of the piston G, and at the other end to an arm, *h*, which is coupled to the crank-arm *f* on the damper-shaft. I represents a weight hung on the lever H, and capable of adjustment, so as to adapt the piston to work at different pressures of steam. The steam-escape pipe is continued above the lever H by means of the curved sections I′, between which the lever extends. The lever H is pivoted to any convenient part of the engine-frame or surroundings.

When the fire is being kindled and just started, the damper is supposed to be fully opened to allow free draft; at the same time the safety-valve is closed, and the piston down. When the steam generates and attains the proper pressure to which the weights E′ and I are adapted, the valve D opens, and, allowing the escape-steam to act on the piston, raises the latter, and through the medium of the levers H *h* and crank-arm *f* closes the damper and shuts off the draft, thus establishing an intimate combination between the damper and the safety-valve. A simple, but perhaps less effectual, method of producing the described effect may be provided by simply extending the lever of the safety-valve and connecting it by means of an arm and crank to the damper.

I claim as my invention—

The combination, with the damper F, having crank-arm *f*, of the double elbow-pipe C′, provided with the lateral escapes I I′, safety-valve D, packed piston G, weighted sliding lever H, and connecting-rod *h*, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ROYAL S. DUNHAM.

Witnesses:

DAVID N. GREEN,

J. E. PERRY.