H. PINDAR.

DEVICES FOR ARRESTING SPARKS AND REGULATING THE DRAFT IN FURNACES.

No. 178,189. Patented May 30, 1876.

Fig. 1.

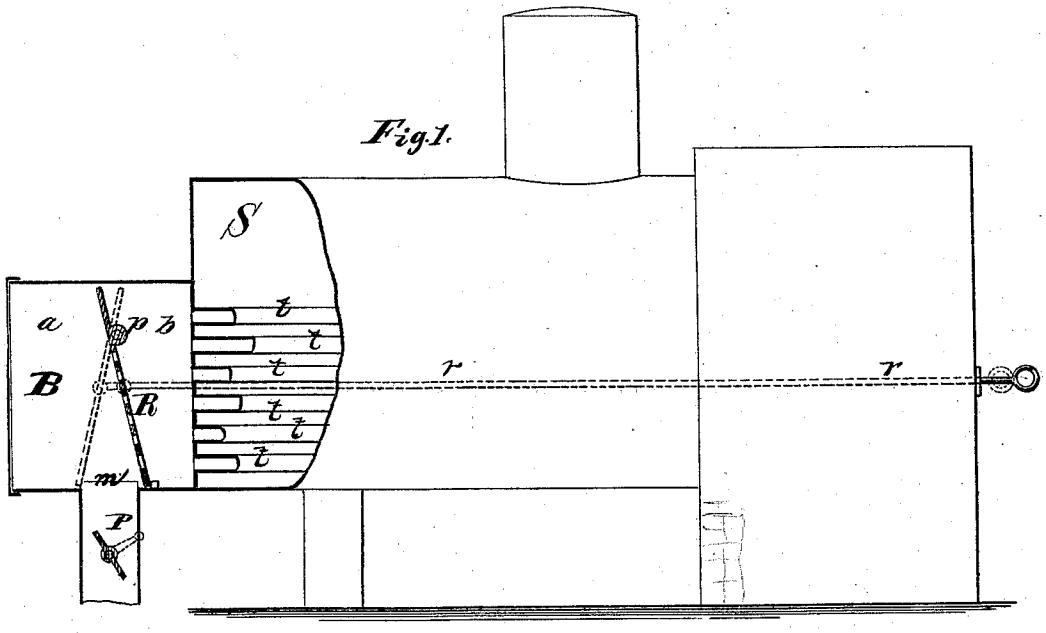
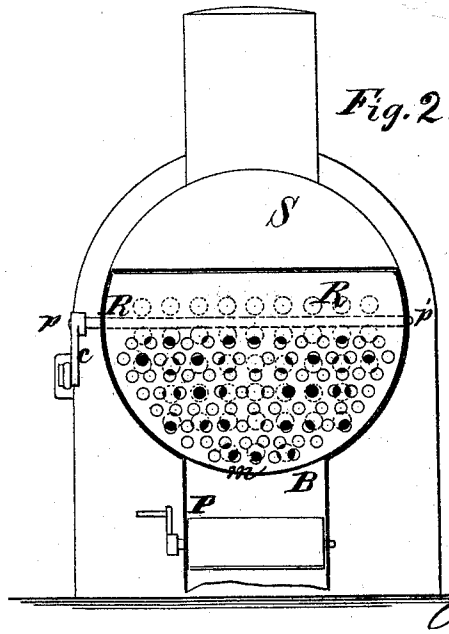


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY PINDAR, OF NEW YORK, N. Y.

IMPROVEMENT IN DEVICES FOR ARRESTING SPARKS AND REGULATING THE DRAFT IN FURNACES.

Specification forming part of Letters Patent No. **178,189**, dated May 30, 1876; application filed May 4, 1876.

To all whom it may concern:

Be it known that I, HENRY PINDAR, of the city, county, and State of New York, have invented an Improved Combustion-Regulator, for use in smoke-boxes of the furnaces of steam-boilers; 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 part of this specification.

My invention is specially applicable to the smoke-boxes of furnaces of boilers of the locomotive or tubular type, in which the incandescent products of combustion pass through tubes surrounded by water, from which steam is generated; but it is also applicable to the smoke-boxes of other kinds of steam-boilers. It consists in an adjustable perforated or reticulated diaphragm, placed and operated in the smoke-box in such manner that when the fire is first kindled the products of combustion pass directly from the smoke-box to the smoke-stack or chimney, and when the fire has attained a goodly vigor of combustion the gases are caused to pass through said perforated or reticulated diaphragm, which acts to break up the strong gaseous currents which enter from the tubes or flues into the smoke-box into smaller currents of much less force, to prevent the too rapid progress of the gases through said tubes or flues, and to give time for the more thorough combustion of said gases and of the sparks, which would otherwise be driven through the smoke-stack in an incandescent state. There results, therefore, from use of my invention, economy in the use of fuel, which would otherwise pass unconsumed out of the smoke-stack, and an increase in the generation of steam from the fuel actually consumed, which, combined, makes an important saving to users of steam. Moreover, the danger of fires caused by ignited sparks issuing from smoke-stacks is greatly lessened.

Figure 1 in the accompanying drawing represents a side view of my invention applied to a boiler of the locomotive type, a portion of the same being broken away to show the interior of the smoke-box. Fig. 2 is a face view of the combustion-regulator as placed and operated in a smoke-box of a similar boiler.

S indicates the steam-space in such a boiler, and *t* the tubes of the same, which deliver the gases into the smoke-box B, and which are surrounded by water when the boiler is in use.

R is the combustion-regulator, consisting of a perforated or reticulated diaphragm of the same shape as the cross-section of the smoke-box, extending from side to side and from the top to the bottom of said box, and the perforations or reticulations of which are smaller than the cross-sections of the tubes *t*.

P is the passage or flue through which the gases pass from the smoke-box to the uptake of the smoke-stack or chimney.

The combustion-regulator or perforated diaphragm R is pivoted at *p*, or otherwise attached to or suspended in the smoke-box B, in such manner that it divides the said smoke-box into two compartments, *a* and *b*, but may be made, through the aid of a rod, *r*, pivoted to an external crank, *c*, attached to the pivot of said regulator, or by any other suitable means, to change its position so as to include in either of the said two compartments into which the said smoke-box is divided the mouth *m* of the passage or flue P.

When the fire is first started in the furnace, and the combustion of the fuel requires urging, the regulator R is caused to assume the position shown in dotted outline in Fig. 1. In this position the mouth *m* of the passage P is included in the compartment *b* of the smoke-box B, and the products of combustion pass directly into said passage P; but when the fuel has attained a vigorous combustion, the position of the regulator is adjusted, as shown in section, Fig. 1, so as to include the mouth *m* of the passage P in the compartment *a* of said smoke-box. In this position the gases are forced to pass through the perforations or reticulations in the regulator before entering the passage P on their way to the chimney. The force of the currents is thereby checked, and the currents are broken up into smaller currents. Moreover, the perforations in the regulator are preferably placed so as not to

fall opposite the open ends of the tubes *t*, and the sparks, striking against the unperforated surface of the regulator, are deflected and thrown backward, and, thus retarded in their course, are more completely consumed.

I claim—

The adjustable perforated or reticulated diaphragm R, dividing the smoke-box B into compartments *a* and *b*, either of which may be made to include the mouth *m* of the flue P, according to the adjustment of said diaphragm, substantially as and for the purpose herein described.

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Witnesses:
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