

Crossman & Atkinson,

Furnace Grate.

No 20,937.

Patented July 20, 1858.

Fig. 2.

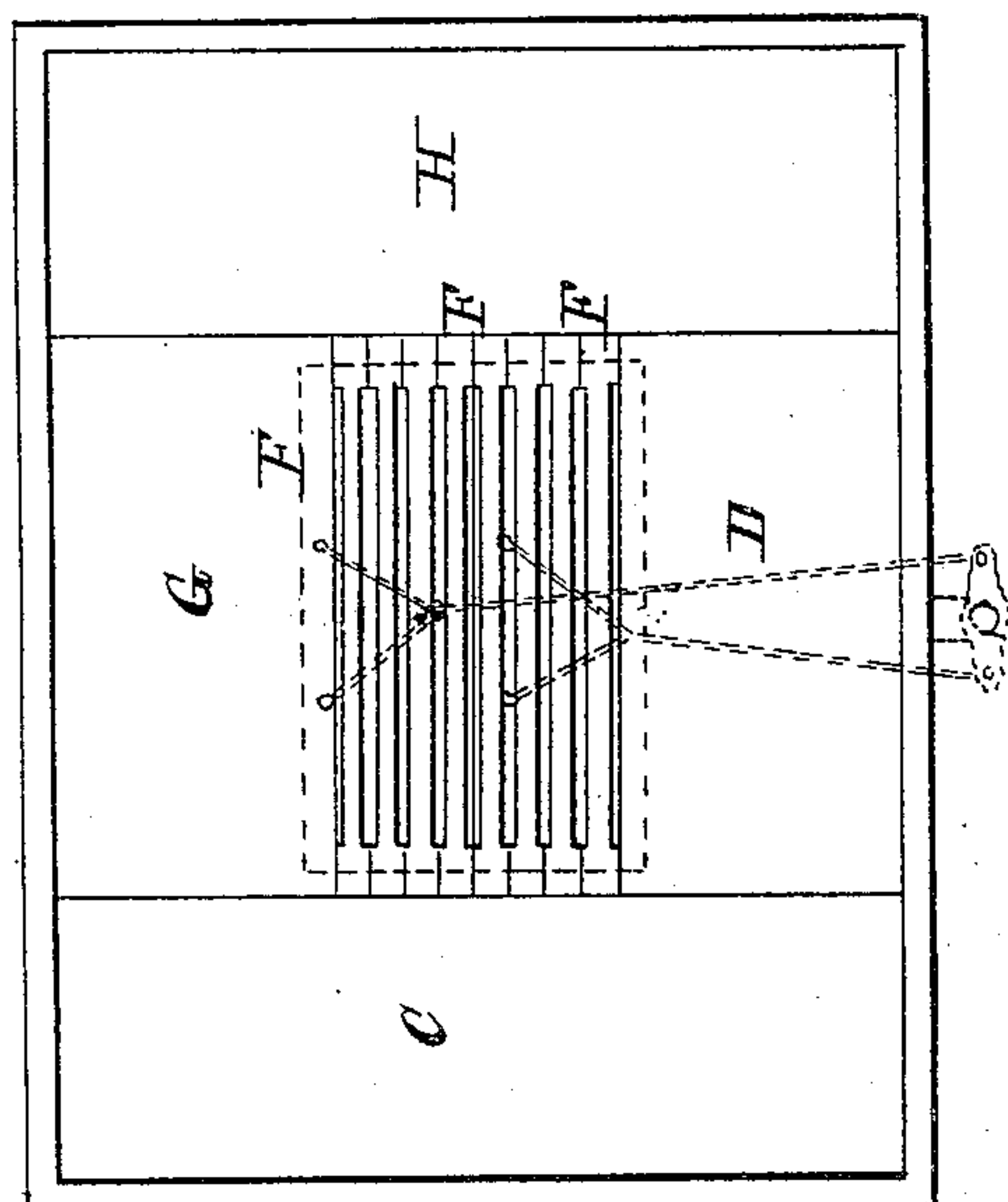


Fig. 4.

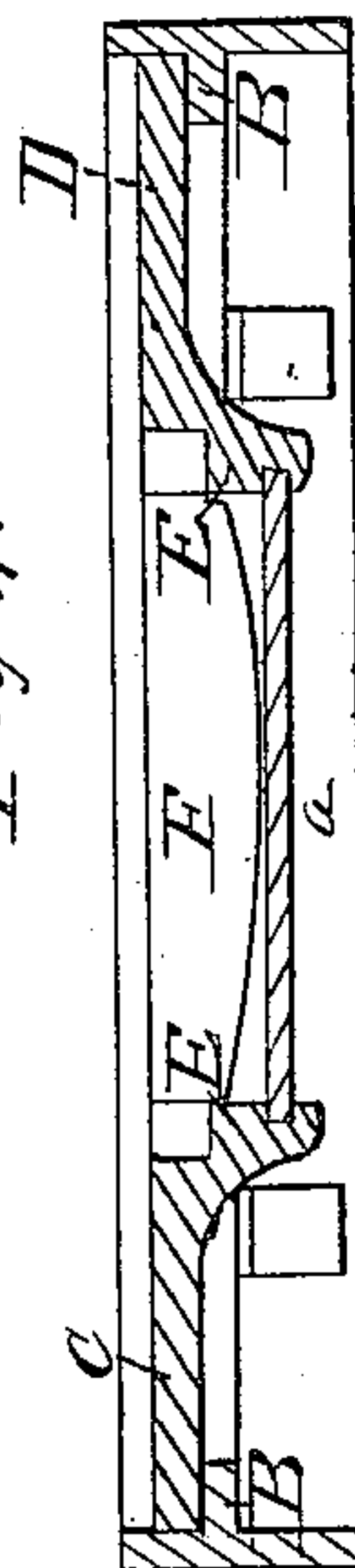


Fig. 1.

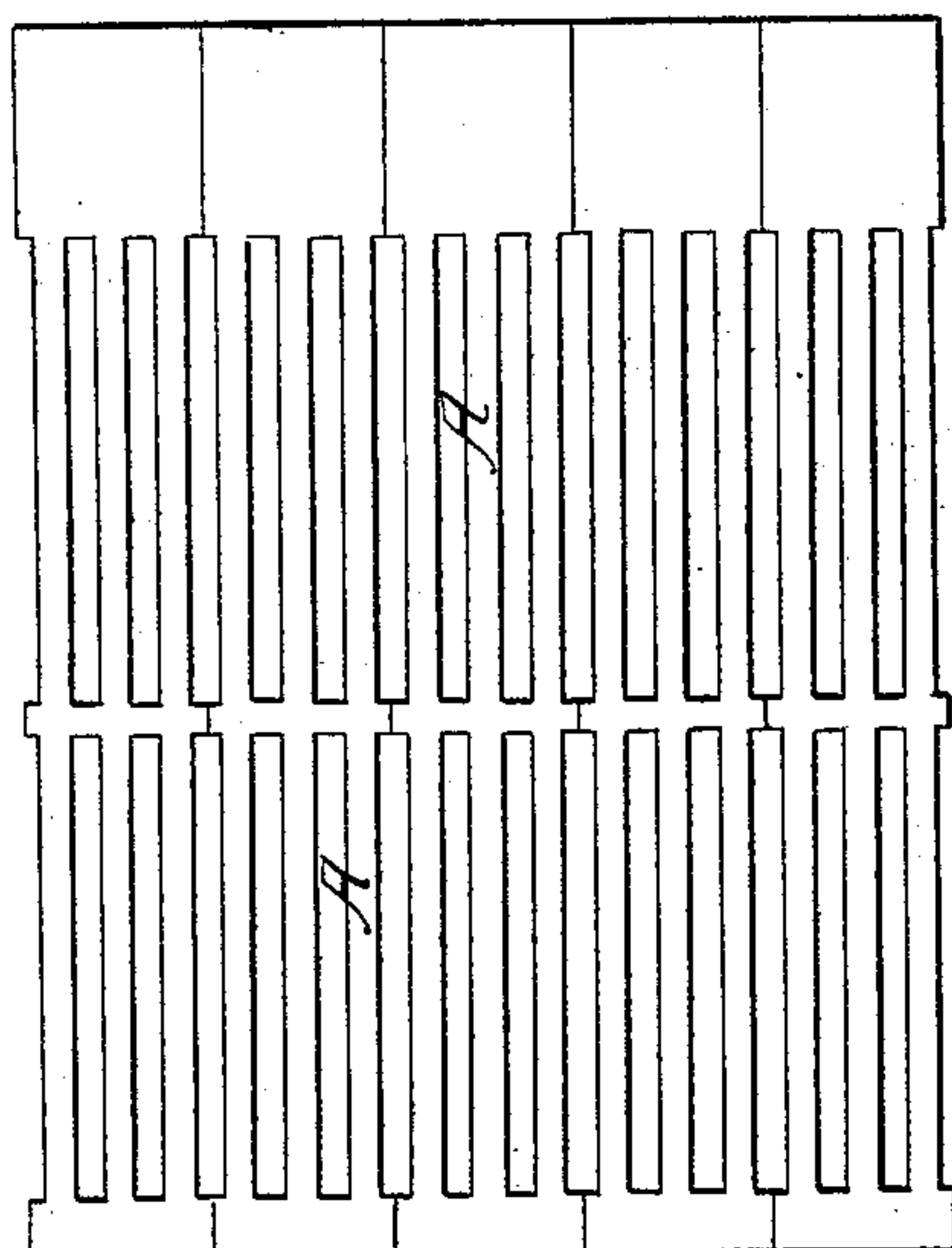
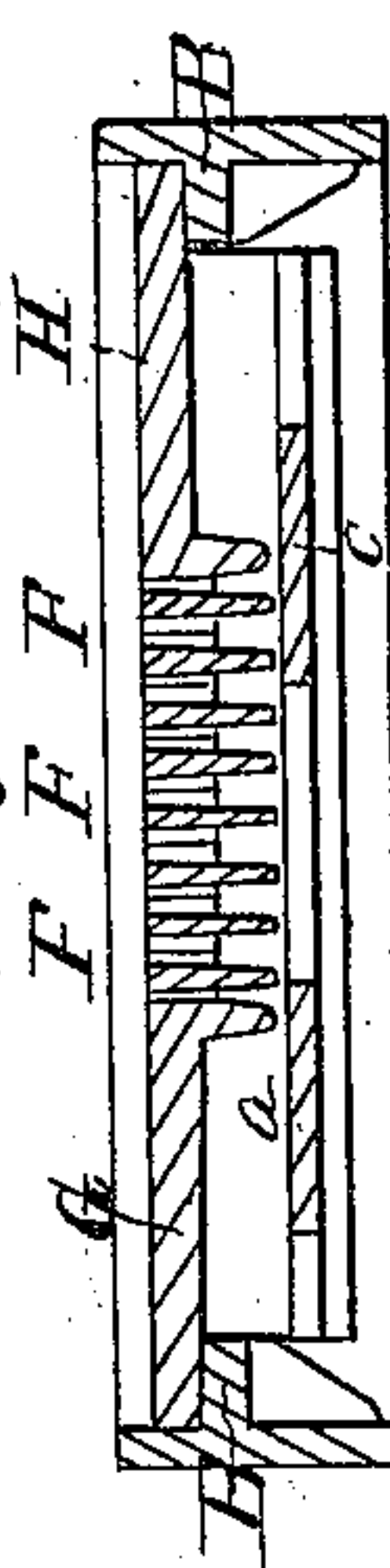


Fig. 3.



UNITED STATES PATENT OFFICE.

L. CROSSMAN AND S. ATKINSON, OF ELIZABETH, NEW JERSEY.

FIRE-BOX FOR LOCOMOTIVE-ENGINES.

Specification of Letters Patent No. 20,937, dated July 20, 1858.

To all whom it may concern:

Be it known that we, LEONARD CROSSMAN and SAMUEL ATKINSON, of Elizabeth city, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in the Construction of the Fire-Boxes of Wood-Burning Locomotives; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, represents a fire box, with the grate bars, as at present used. Fig. 2, represents our plan of arranging the grate bars, with dead plates surrounding them; but which do not diminish the area of the fire box. Fig. 3, represents a transverse section through the grate bars and dead plates, and Fig. 4 a similar section taken longitudinally.

Our invention relates to locomotive fire boxes, wherein wood is used as a fuel mainly, and our invention may be applied as well to fire-boxes already constructed, as to those which are in course of construction, and at a very slight expense when compared with its economy in the consumption of fuel, which we have ascertained by actual experiment.

We are fully aware that, in coal burning furnaces, a kind of dead plate has been used above the top of the fire pot, but which dead plate (if it may be so called) inclined toward the fire pot, its apparent object being simply to direct the fuel to the fire pot. To such an arrangement we of course lay no claim.

Our invention consists in arranging around the grate bars, and on the same plane with the tops of said bars, dead plates, upon which the wood may rest and burn as well as upon the grate bars, though the draft is only through between the grate bars which occupy a central position in the bottom of the fire box.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same with reference to the drawings.

To convert one of the present wood burning fire boxes as shown at Fig. 1, into one of our improved form, we proceed as follows: We first remove the grate bars A, en-

tirely, and leave the flanges B, upon which they were supported in their original position. At the front and rear of the fire box, we insert two dead plates C, D, which extend clear across the fire box, their ends resting upon the flanges B. Underneath these dead plates C, D, are secured ribs or stays E, which project far enough beyond the edges of the plates, toward the grate bars, to form ledges for the grate bars F, which we substitute for the others taken out, and also for the side dead plates G, H, to rest upon. And these ribs may also have a groove or its equivalent in them, in which two damper-plates *a, c*, may be slid by means of a rod lever, or handle extending up to some convenient position for the engineer or fireman to operate, so that the damper plates, if at any time it should be required, may be slid to and fro, to close or open the space under the grates.

In the construction of new fire boxes any other equivalent arrangement of supports may be used instead of those above mentioned.

It will be perceived that, we do not diminish the area or capacity of the fire, but we do dispense with three-fourths of the grate bar surface, while we have all the draft that is required for economical combustion. The tops of the dead plates, are flush with the tops of the grate bars, and are at both the ends and sides of the grate bars, which leaves the latter in a central position in the bottom of the fire box.

When we say that, the tops of the grate bars and the tops of the dead plates, are flush with each other, we do not mean to confine ourselves to that exact position, for either may be slightly raised or lowered, without effecting the result injuriously, and to this extent we would so claim them.

As the grate bars and dead plates are subject to be burned out, and must be renewed, it is necessary that they should be so placed in the fire box, as to be readily removed when occasion shall require. This need not be the case where furnaces are permanently constructed of brick or stone, but where, as in locomotives, iron alone is used for furnace bottoms and walls they must be made with a view to repairs.

Having thus fully described the nature

and object of our invention, what we claim therein as new, and desire to secure by Letters Patent is—

5 The arranging of the grate bars centrally in the bottom of the fire box of wood burning locomotives, and surrounding said grates with dead plates, when said grate bars and dead plates are susceptible of being removed

or replaced substantially in the manner, and for the purpose herein set forth.

LEONARD CROSSMAN.
SAMUEL ATKINSON.

Witnesses:

JOSIAH O. STRAUSS,
JAMES MACKIE.