

(No Model.)

J. SETTLE.

ROCKING BARS FOR FURNACES AND MEANS FOR OPERATING THEM.

No. 372,176.

Patented Oct. 25, 1887.

Fig. 1.

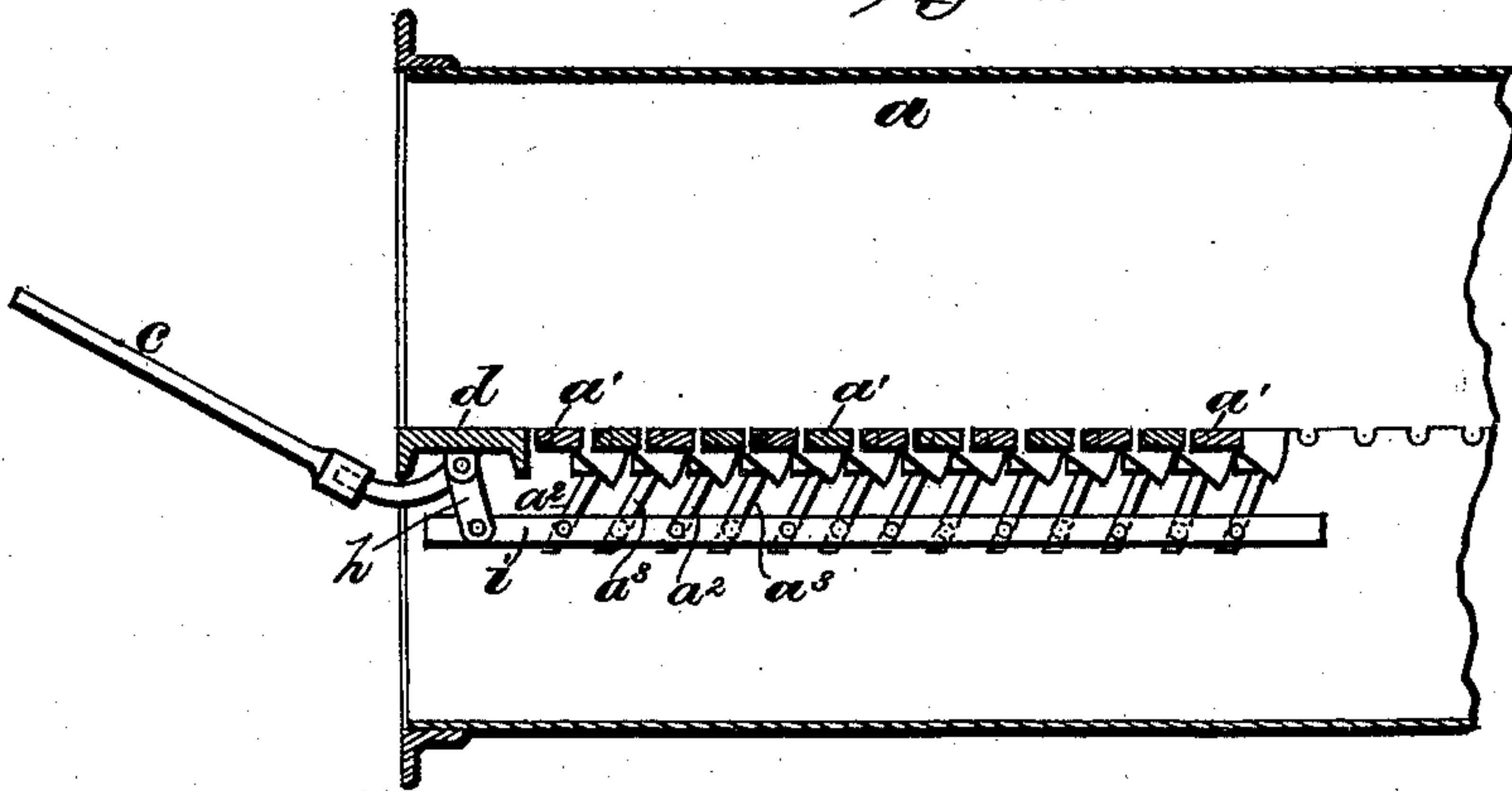


Fig. 2.

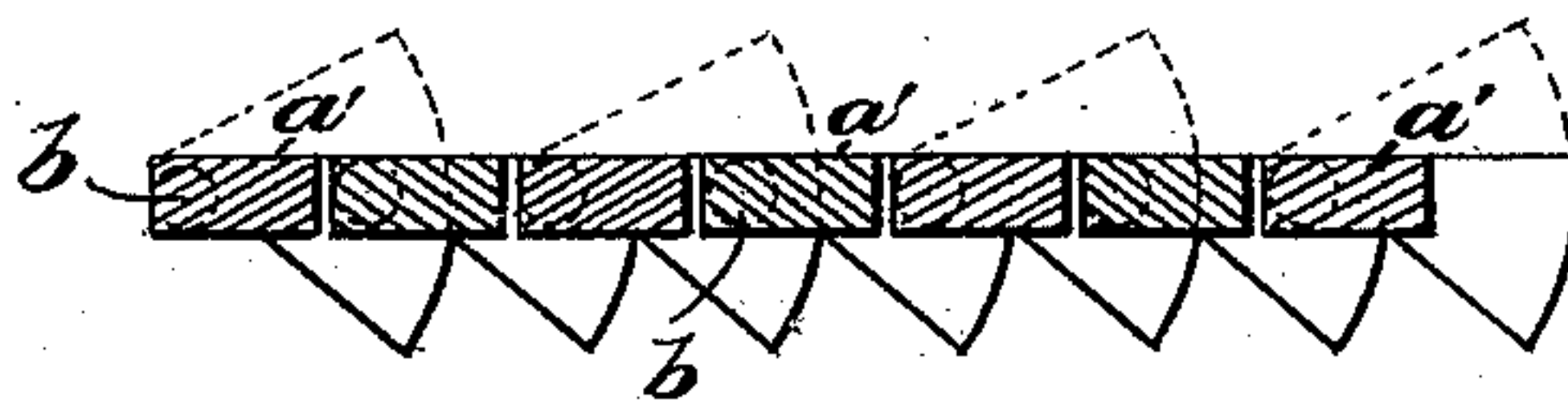


Fig. 3.

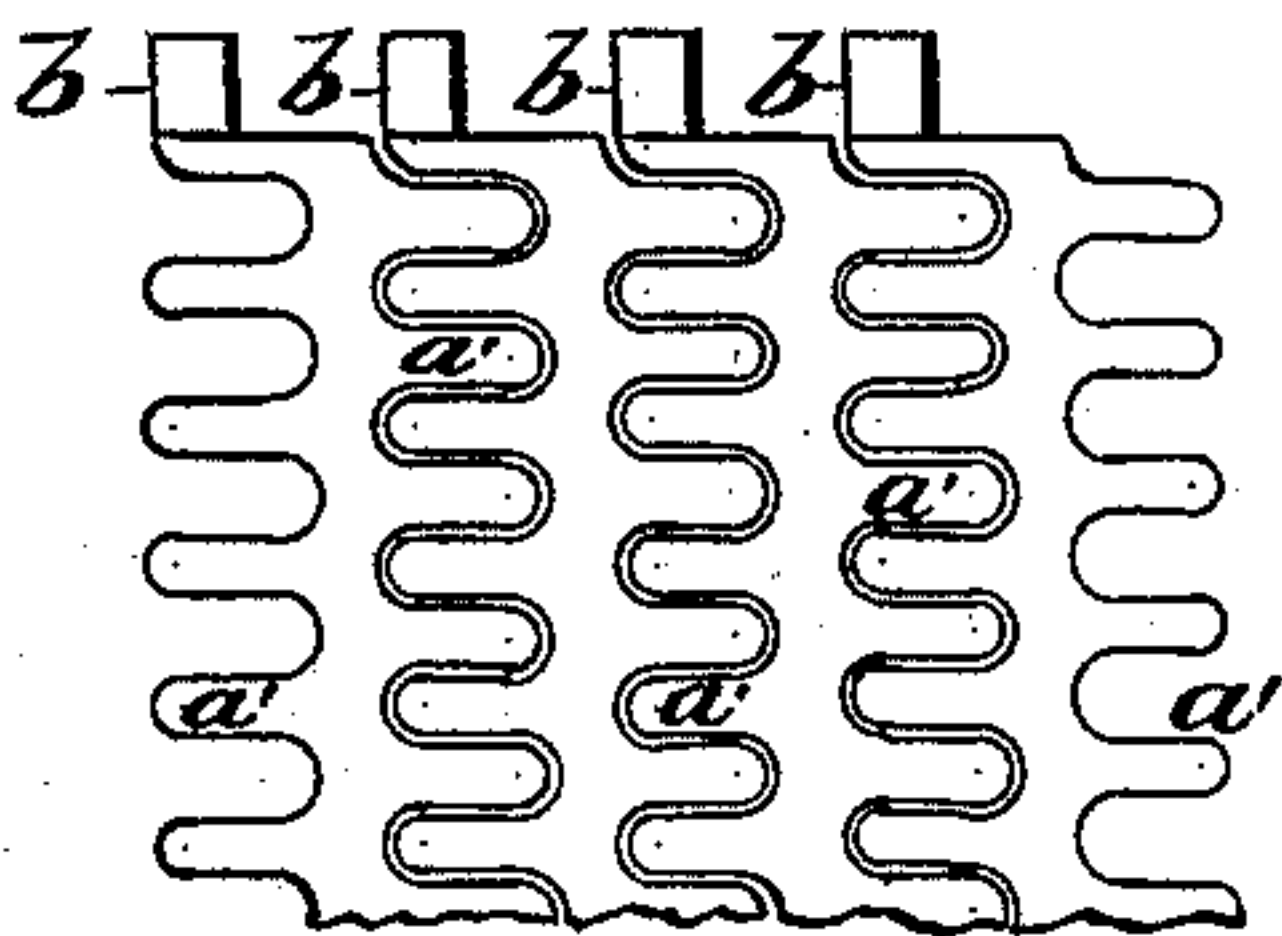


Fig. 4.

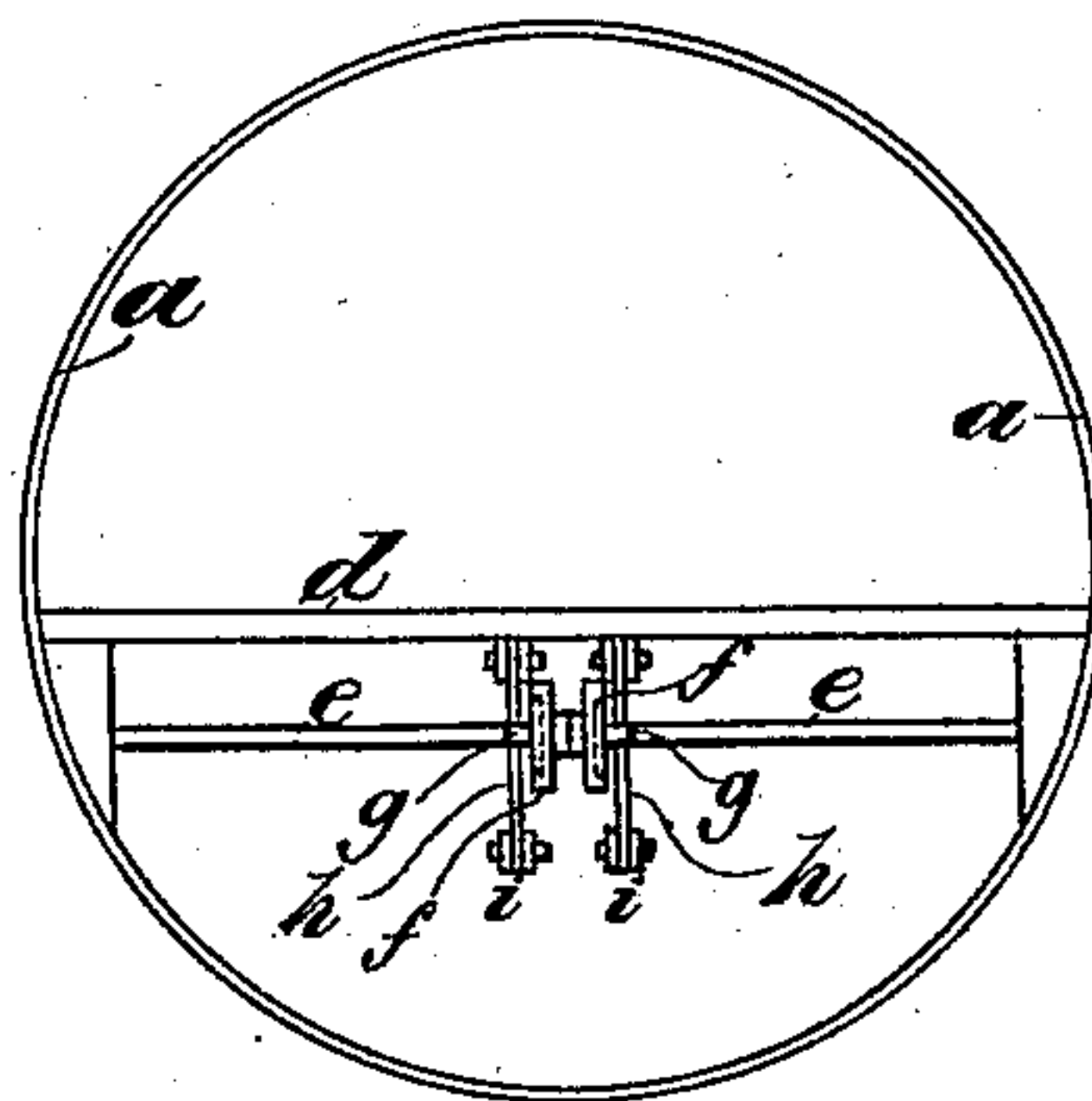


Fig. 5.

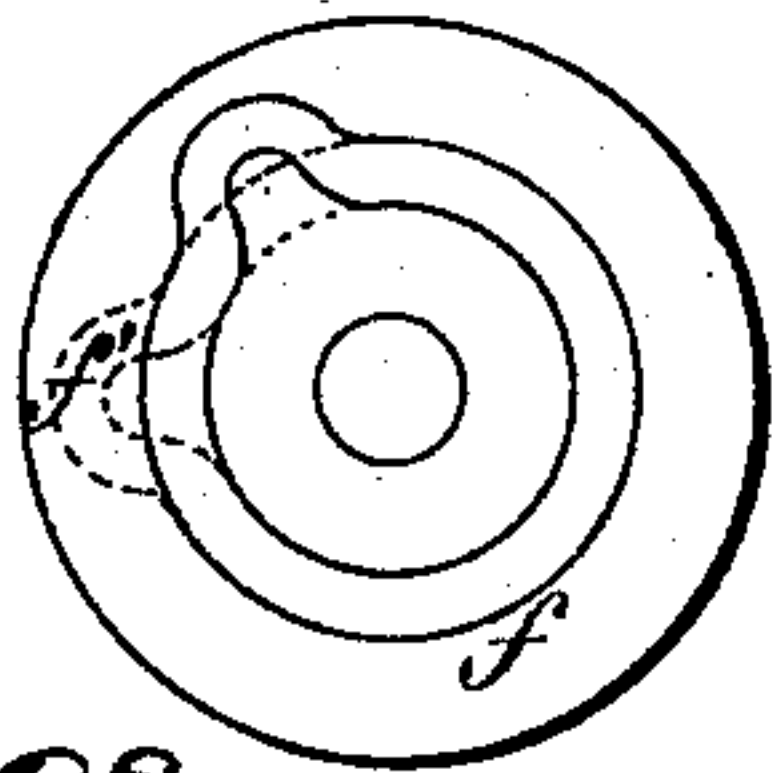


Fig. 6.

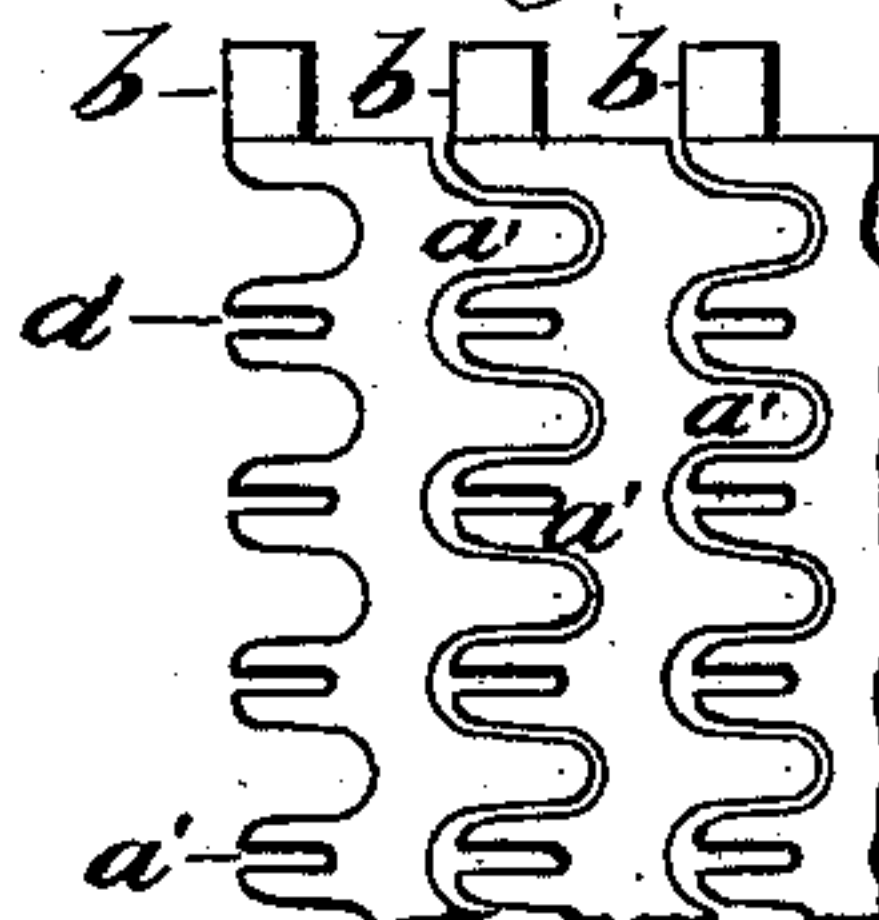
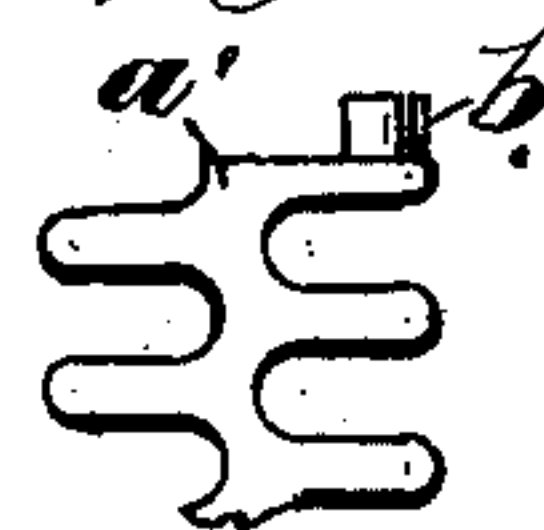


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN SETTLE, OF BOLTON, COUNTY OF LANCASTER, ENGLAND.

ROCKING BARS FOR FURNACES AND MEANS FOR OPERATING THEM.

SPECIFICATION forming part of Letters Patent No. 372,176, dated October 25, 1887.

Application filed June 30, 1887. Serial No. 242,969. (No model.) Patented in England December 17, 1885, No. 15,482.

To all whom it may concern:

Be it known that I, JOHN SETTLE, of No. 305 Vernon Street, Bolton, in the county of Lancaster, England, engineer, have invented
5 new and useful Improvements in Rocking Bars for Furnaces and in the Means for Operating them, (for which I have obtained a patent in Great Britain, No. 15,482, dated December 17, 1885,) of which the following is a specification.

10 This invention relates to the construction and operation of the movable or rocking fire-bars of furnaces for steam-boilers and other purposes, and also to the construction of the apparatus employed for operating the same.

15 Such being the nature and object of my said invention, I will now proceed to describe the manner in which the same is to be or may be performed or carried into practical effect; and in order that the same may be clearly under-
20 stood I have annexed hereunto a sheet of drawings illustrative thereof, and have marked the same with figures and letters of reference corresponding with those in the following explanation thereof.

25 Figure 1 on the drawings is a longitudinal section of part of a boiler-furnace constructed according to my invention. Fig. 2 is an enlarged section of a portion of the bars. Fig. 3 is a plan view of the same. Fig. 4 is an elevation showing the cam-shaft and apparatus for
30 automatically tilting the bars. Fig. 5 is a face view of the cams. Fig. 6 is a plan view of bars, showing increased air-space; and Fig. 7 is a broken detail view of one grate-bar, showing the arrangement of the eccentric pivot-pin
35 where the fuel is to be moved rearward from the furnace-door.

a a is the boiler-flue. I employ fire-bars a' a' of the alternate toothed form interlocking
40 with each other, as seen clearly at Fig. 3; but instead of having the pivots b b placed or cast opposite to the central line of the bars, as usual, I have them at or near one edge thereof, so that the bars a' a' , instead of rocking in the
45 usual manner, will only tilt upward in one direction, as shown by the dotted lines in Fig. 2. By these means each bar a' a' , when tilted, will throw its fuel onto the next bar in succession, and as each works alternately, (that is to say,
50 all the odd ones together first and then all the

even ones,) while the intermediate bars remain stationary, the bars will act as carrying-bars as well as rocking bars, and carry the clinkers and fuel toward the furnace-doors. This is effected by placing the pivots b to the front edge
55 of the bars a' , as shown in Figs. 1, 2, 3, and 6, said bars being operated, as in Fig. 1, by the hand-levers c . Obviously, if the clinkers and fuel are to be carried rearward, or away from the furnace-doors toward the bridge-wall of a
60 furnace, the pivots b may be placed at the rear edge of the bars a' , as in Fig. 7.

The alternate tilting of the bars a' a' (if desired to be worked automatically) may be effected by means similar to those ordinarily
65 employed for working the rocking bars, but with a slight modification, such as will cause them to tilt (alternately odd and even) as above described. I, however, operate the tilting of the bars (if required to be automatic)
70 in the following manner, as illustrated at Figs. 4 and 5. Across the flue a a , beneath the dead-plate d d , I mount a shaft, e e , to which I impart an intermittent revolving motion by means
75 of a star-wheel actuated in any convenient manner. Upon this shaft e e , I fix two grooved cams or face-plates, f and f' , in the grooves of which work bowls g g , attached to two levers,
80 h h , hung from the lower side of the dead-plate d d , the grooves being so formed and the cams so arranged with regard to each other (see Fig. 5) that once in each revolution they give
85 a sudden alternate motion to the levers h h , one after the other, while they remain stationary during the rest of the revolution. One of these hanging levers h h is connected by a rod,
90 i , to all the arms a^2 of the odd bars, and the other lever is similarly connected to the arms a^3 of all the even bars, and the consequence is that during one portion of the revolution all
95 the odd bars tilt their fuel onto the even bars next in advance, and during the succeeding portion of the revolution all the odd bars will remain stationary, while the even bars immediately after tilt the said fuel forward onto the
odd bars next in succession, and so on alternately, all the bars remaining stationary during the greater part of the revolution.

I sometimes dispense with the hanging levers h h and attach the bowl g g direct to the rods i i . 100

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The series of fire-bars *a'*, each having its end pivots, *b*, arranged at one side of a line
5 centrally through the length of the bar, in combination with the reciprocating rods *i i*, connected, respectively, with each alternating bar, to separately tilt the alternating bars, substantially as described.
- 10 2. The combination of a series of fire-bars *a'*, the bars *i i*, connected, respectively, with

each alternating bar, the shaft *e*, and the rotating cams *f f'*, engaging and alternately reciprocating the bars, substantially as and for the purposes described.

The foregoing specification of my invention
signed by me this 13th day of June, 1887.

JOHN SETTLE.

Witnesses:

E. CHADWICK,
E. A. CHADWICK.