

(No Model.)

2 Sheets—Sheet 2.

C. P. BLISS.
FURNACE GRATE.

No. 504,195.

Patented Aug. 29, 1893.

FIG. 3.

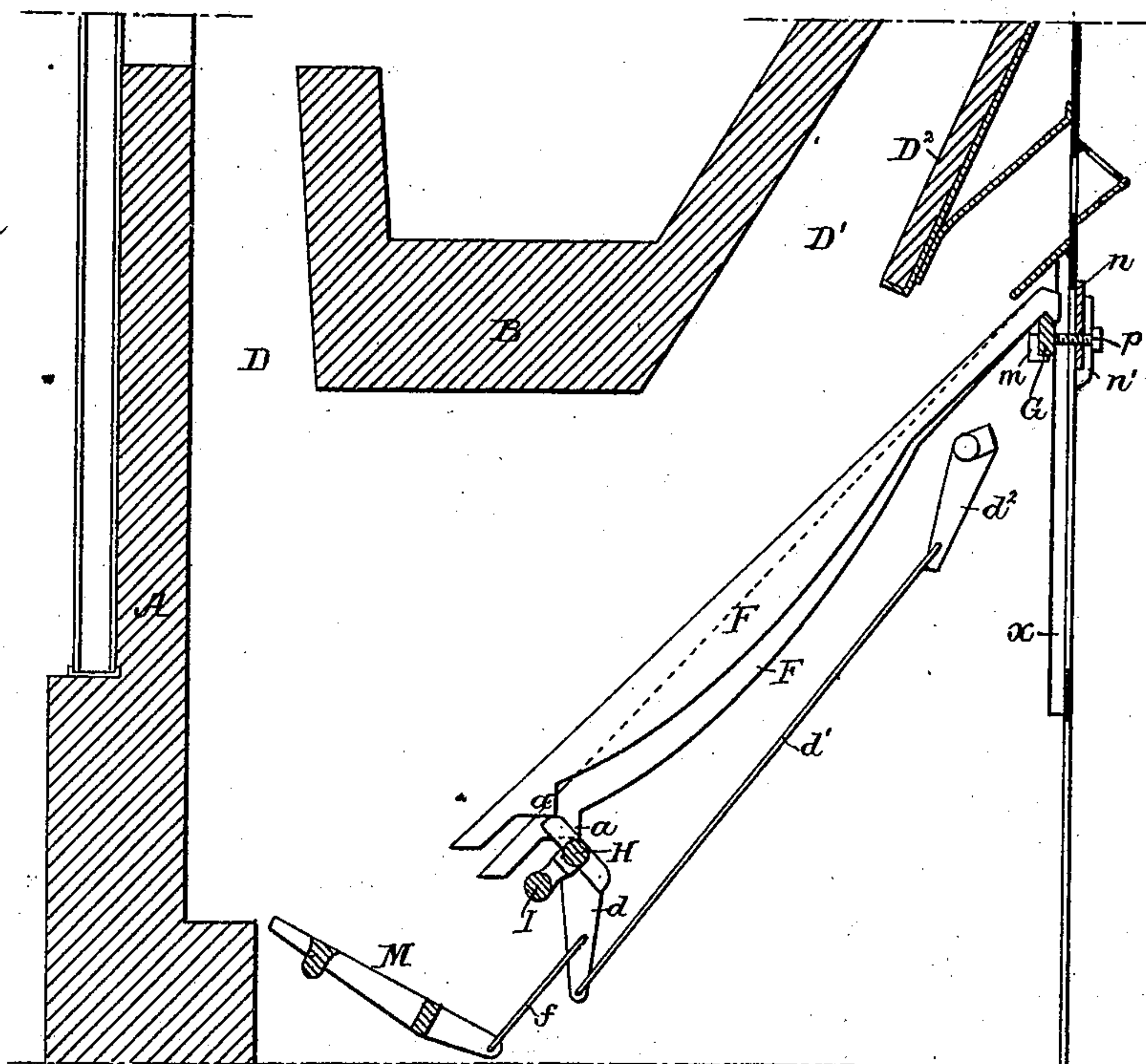
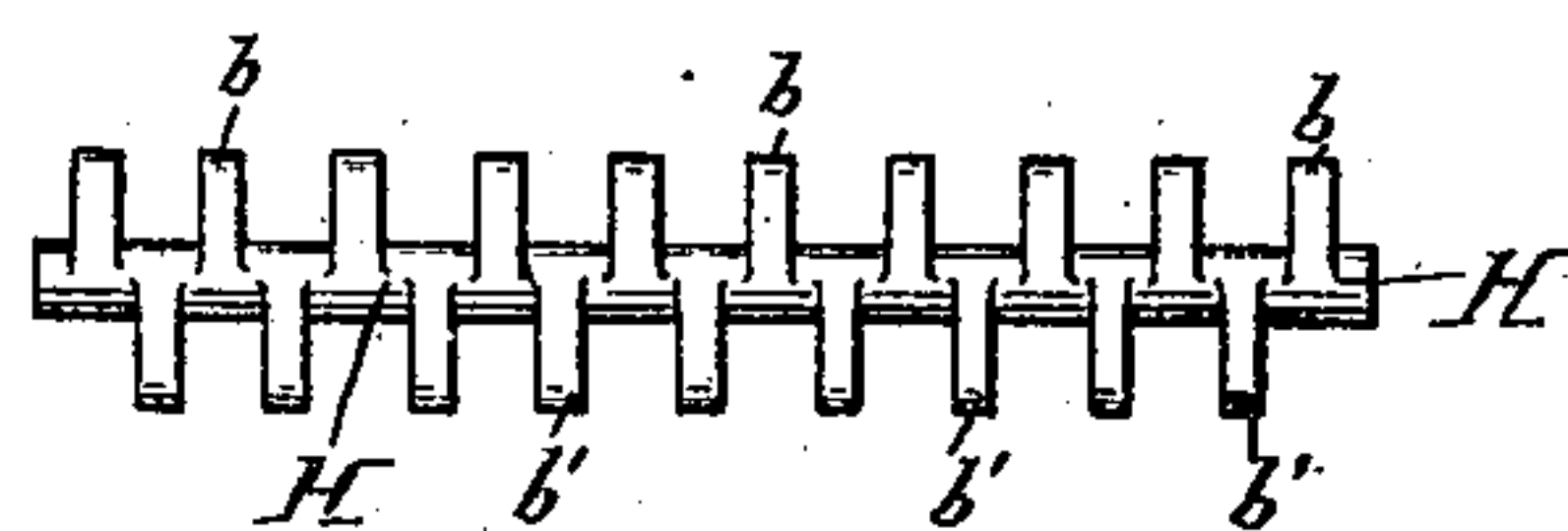


FIG. 4.



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UNITED STATES PATENT OFFICE.

COLLINS P. BLISS, OF NEW YORK, N. Y.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 504,195, dated August 29, 1893.

Application filed May 12, 1893. Serial No. 473,920. (No model.)

To all whom it may concern:

Be it known that I, COLLINS P. BLISS, a citizen of the United States, and a resident of New York city, New York, have invented certain Improvements in Furnace-Grates, of which the following is a specification.

My invention consists of a grate especially intended for furnaces of that class in which the fuel is maintained in a confined mass in the combustion chamber and is continuously fed in through a hopper as the ashes and cinders are removed from the bottom of the combustion chamber, the object of my invention being to so construct such a grate as to provide for the agitation of the mass of fuel, to insure the downward feed of the same as the ashes and clinkers are discharged, to break up any clinkers formed on the face of the bars, and to provide for the ready drawing of the fire in case of exigency. This object I attain in the manner hereinafter set forth reference being had to the accompanying drawings, in which—

Figure 1, is a longitudinal section of a furnace constructed in accordance with my invention. Figs. 2 and 3, are similar views showing the grate in different positions; and Fig. 4, is a view of a rocking bar forming part of the structure.

A represents the rear wall of the furnace, and B a hollow transverse slab constituting the top of the fire place, an outlet flue D being formed between the slab and the rear wall and an inclined feed hopper or chute D' being formed in front of said slab by means of an inclined slab or plate D². The inclined grate bars F are hung at the upper ends upon a bar G mounted in the frame of the furnace, as hereinafter described, and the lower ends of the grate bars are supported upon a rocking bar H extending transversely across the furnace, each bar of the grate having on the under side a lug *a* resting upon the rocking bar H and upon a lug *b* and *b'* projecting therefrom, every other bar resting upon the lugs *b* which project from the bar H in one direction, while the alternate bars rest upon the lugs *b'* which alternate with the lugs *b* and project from the rocking bar H in the opposite direction. The rocking bar H is mounted upon a transverse shaft I below the same, said shaft being adapted to suitable

bearings on the side frames or walls of the furnace, and said bar H has one or more arms *d* each connected by a rod *d'* to a suitable lever, such as *d*² either within or just outside of the furnace, a detachable handle or other suitable means being employed for operating the lever so as to effect the swinging of the bar H. When said bar is swung in one direction, therefore, one-half of the grate bars will be lifted at their lower ends, and the other half will be lowered, and on swinging the bar H in the opposite direction the bars which were formerly lowered will be raised, and those which were lifted will be lowered. Besides this independent or oscillating movement of the alternate bars of the grate there is, on each swinging of the bar H, also a slight lowering of the entire grate structure, owing to the fact that the bar H is at its highest when in the mid or inactive position, and swings downward from such mid-position so that besides the agitation of the fuel due to the reciprocation of the grate bars there is a loosening up of the mass of fuel due to the slight drop of the grate which increases the distance between the same and the transverse slab B at the top of the fire box so that the mass of fuel will slide downward upon the grate and the choking or arching of the fuel in the contracted fire box will be prevented.

At the bottom of the inclined grate F is a supporting grate M pivoted adjacent to the rear wall of the furnace and connected at the front end, by means of a rod *f*, to the arm *d* of the rocker bar H. As the latter is rocked in one direction, therefore, the front end of the grate M will be lifted and the outlet for ashes and clinkers will be contracted as compared with the size of the outlet when the grates F and M are in their normal positions, but on rocking the bar H in the opposite direction the front end of the grate M will be lowered and the outlet for ashes and clinkers will be enlarged so as to insure the discharge of the same into the ash pit. The bar G which supports the upper end of the grate rests in L-shaped sockets *m* on the side frames or walls of the furnace and is held in place thereon by any suitable form of detachable retainer, that shown in the present instance being a cross bar *n* mounted in lugs *n'* on the front plate of the furnace and carrying one

or more binding screws *p* bearing against the bar *G*. The opposite ends of the bar *G* are intended to fit into vertical grooves *x* in the side frames or walls of the furnace so that on
 5 removing the retainer plate *n* the bar *G* can be drawn forward until it is clear of the sockets *m* and can then be lowered to a given distance so as to drop the front end of the grate as shown for instance by dotted lines in Fig.
 10 1, this operation being resorted to when it is desired to draw the fire or effect a quick clearing out of the contents of the fire box. The tops of the lugs *b b'* of the rocker bar *H* are preferably grooved for the reception of
 15 the lower edges of the grate bars *F* so as to retain the same in proper lateral position, or if desired, the grate bars may be grooved for the reception of ribs on the lugs.

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

1. The combination of the fire box and feeder, with the inclined grate composed of a series of bars supported at their lower ends upon a swinging bar mounted upon a rock
 25 shaft below the same, and having alternating projecting lugs upon opposite sides, the faces of these lugs being eccentric in respect to the axis of the rock shaft, and those upon one side of the bar supporting every other bar of
 30 the grate, and those upon the opposite side

supporting the alternate bars, substantially as specified.

2. The combination of the fire box and feeder, with the inclined grate composed of a series of bars, a pivoted fuel supporting grate
 35 at the base of said inclined grate, a rocking bar upon which the lower ends of the inclined grate bars are supported, and a connection between said rocking bar and the pivoted fuel supporting grate whereby the latter
 40 is caused to swing as the bars of the inclined grate are vibrated, substantially as specified.

3. The combination of the fire box and feeder, the inclined grate, a rocking support for the lower ends of the grate bars, a sup-
 45 porting bar for the upper end of the grate, side frames or walls having sockets for said supporting bar and grooves in which the ends of the bar are guided and in which they can be lowered on the removal of the bar from
 50 the sockets, and detachable retaining devices for confining the bar in the sockets, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of
 55 two subscribing witnesses.

COLLINS P. BLISS.

Witnesses:

THERON G. STRONG,
 JOHN DAVIS.