J. P. Rigal,

Feeding Boiler Furnaces.

No. 28,226, Patented May 8, 1860.

Fig. 2.

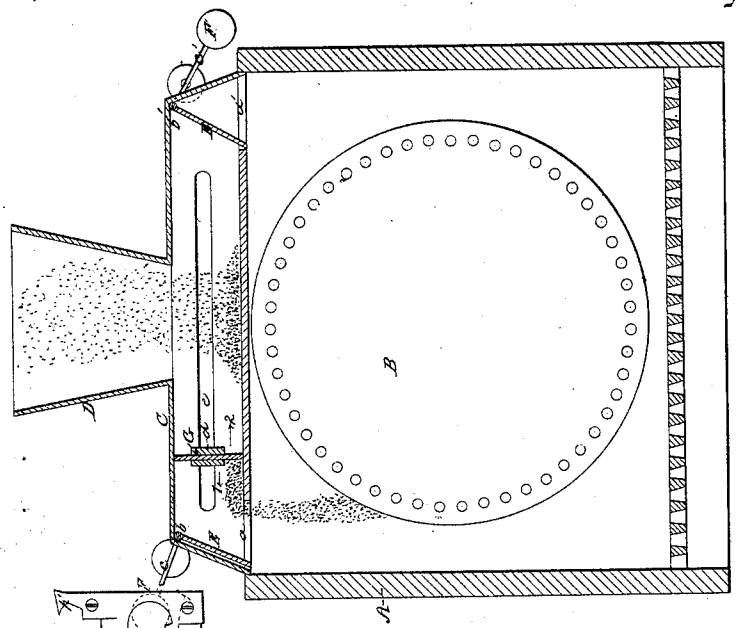
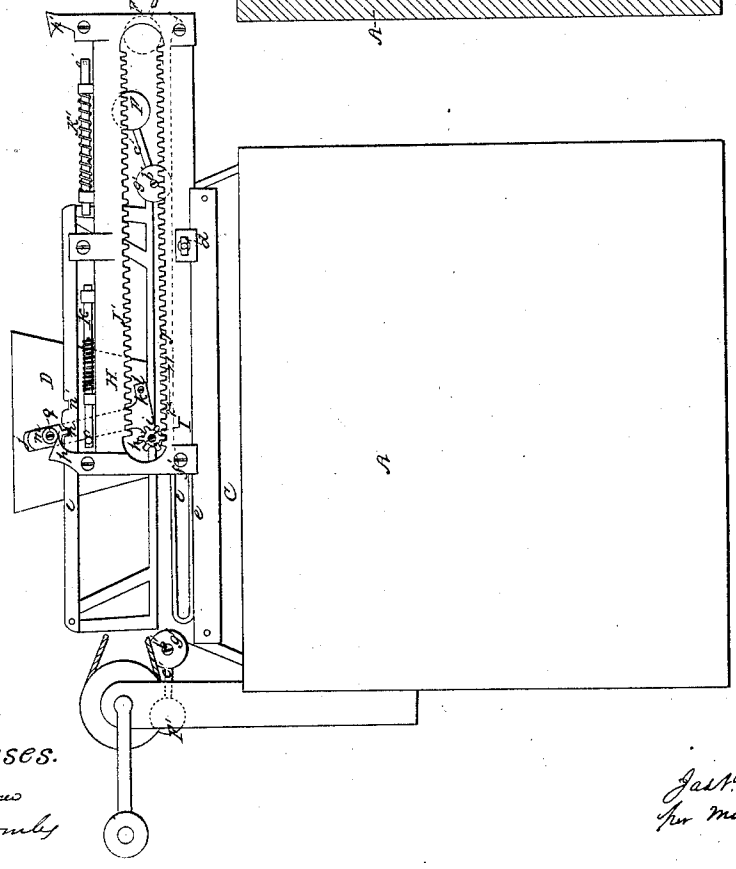


Fig. 1



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES P. WIGAL, OF HENDERSON, KENTUCKY.

APPARATUS FOR FEEDING SAWDUST TO FURNACES.

Specification of Letters Patent No. 28,226, dated May 8, 1860.

To all whom it may concern:

Be it known that I, JAMES P. WIGAL, of Henderson, in the county of Henderson and State of Kentucky, have invented a new and Improved Device for Feeding Sawdust, &c., to Furnaces; 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, forming a part of this specification, in which—

Figure 1, represents a rear elevation of my invention, and Fig. 2 a longitudinal vertical section of ditto.

Similar letters of reference in both views indicate corresponding parts.

This invention consists in a box that extends over the whole width of the furnace, communicating with the same on either end by two flap doors in combination with a sliding piston and counter weights in such a manner that saw-dust fed to the box is alternately discharged through one and through the other of the openings at the ends of the box, said flap doors being opened as the piston advances toward the same, and closed when the piston recedes.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A represents the furnace erected around a steamboiler B, which is heated by a fire in a suitable grate or fireplace in the usual manner. On the top of this furnace and extending over its whole width or nearly so, is the box C, made of cast iron or of any other suitable material and provided with a hopper D, in its center, to receive the sawdust or other fuel of a similar nature. The cross section of this box is square or oblong and its ends are inclined as clearly shown in Fig. 2. The bottom of this box is perforated with apertures *a*, *a'*, which communicate with the interior of the furnace. Flap doors E, E', which are suspended from cross bars *b*, *b'*, serve to open or close said apertures, and the cross-bars *b*, *b'*, turn on pivots in the upper corners of the box C. The bearings of said pivots are beyond the edges of the apertures *a*, *a'*, so that the trap doors when left free to follow the action of their gravity, assume such a position that the apertures *a*, *a'*, are left open. In order to keep them closed, counterweights F, F', are arranged on arms *c*, *c'*, which are secured to the pivots from which the flap doors are suspended, outside of the box and in such a position that by the action of said weights the flap doors are kept close up to the inner edges of the apertures *a*, *a'*, shutting off the communication between the interior of the box C, and the furnace A. A piston G is fitted nicely into the box C, and an arm *d*, which extends through a slot *e*, in the rear wall of the box, serves to impart motion to the piston. The arm *d*, is secured to a sliding frame H, which moves between suitable guides *e*, attached to the rear wall *f*, of the box C, and as the frame moves toward one side or toward the other, cams *f*, *f'*, attached to its ends by coming in contact with friction rollers *g*, *g'*, on the weighted arms *c*, *c'*, serve to open the flap doors E, E'.

A reciprocating motion is imparted to the frame H by means of a pinion I, mounted on one end of a rotary shaft *h*. The end of this shaft nearest the pinion I, turns in one of the arms *i*, of a three-armed lever *i*, *j*, *k*, which swings on a pivot *l*, passing through the arm *k*, and secured in the rear wall of the box C. The middle arm *j*, of this lever extends upward behind the frame H, and guides *e*, and it is provided with a spring catch *m*, that serves to retain said arm in an inclined position by catching into notches *n*, *n'*, on the top edge of the upper guide *e*. These notches are so arranged that when the catch *m*, is in the notch *n*, the pinion I, is thrown in gear with the lower one of two toothed racks J, J', which are formed on the inside of the frame H, as clearly shown in Fig. 1, and if the spring catch *m*, catches into the notch *n'* the pinion I, is thrown in gear with the upper rack J', whereby the rotary motion of the pinion is converted into a reciprocating motion of the frame.

The motion of the lever *i*, *j*, *k*, with the pinion I, is rendered automatical by means of spring bars K, K', secured to the upper edge of the sliding frame H, and pins *o*, *o'*, projecting from the opposite ends of said bars by catching over the edge of the arm *j*, of the lever *i*, *j*, *k*, serve to gather up the springs of the spring bars so as to throw said arm suddenly in one direction or in the other as soon as the catch *m*, is disengaged from the notches *n*, *n'*. The operation of disengaging the catch *m*, is effected by dogs *p*, *p'*, secured to the ends of the sliding frame H. The upper edges of said dogs are inclined, so that they catch under a roller *q*, that pro-

jects from the spring catch *m*, and as the motion of the frame progresses, the catch is released from the notch which previously retained it and the arm *j*, is now thrown to one side or to the other, by the action of one of the spring bars K, K′, so as to bring the pinion I, to gear with the rack opposite to the one from which it passes off and as the pinion turns in the direction of the arrow marked on the same the motion of the frame H, takes place in the direction of arrow 1, if the pinion gears into the lower rack J, and in the direction of arrow 2 if the pinion is in gear with the upper rack J′. By these means the saw-dust which is introduced into the box C, through the hopper D, is carried toward the aperture *a′* if the piston G, moves in the direction of arrow 2, and toward the aperture *a′*, if the piston moves in the direction of arrow 1, and the flap doors E, E′, are thrown open by the pressure of the saw-dust against them, and also by the agency of the cams *f*, *f′*, as the piston advances toward one of them, and as soon as the piston recedes, the flap doors close through the agency of the weights F F′, thus cutting off the communication between the hopper and the interior of the furnace, and precluding the danger of setting fire to the saw-dust before it has reached its place of destination.

It is obvious that any other fuel of similar nature to saw-dust may be introduced into this device, and fed to the furnace with equal facility.

What I claim as new, and desire to secure by Letters Patent, is,

The arrangement of the automatically closing flap doors E, E′, in combination with the reciprocating piston G, and box C, constructed and operating substantially as and for the purpose described.

JAMES P. WIGAL.

Witnesses:

N. C. HOWARD,

A. T. GOODE.