2 Sheets—Sheet 1.

T. J. MARCH.

Grate for Furnaces and Stoves.

No. 211,336. Patented Jan. 14, 1879.

Fig. 1.

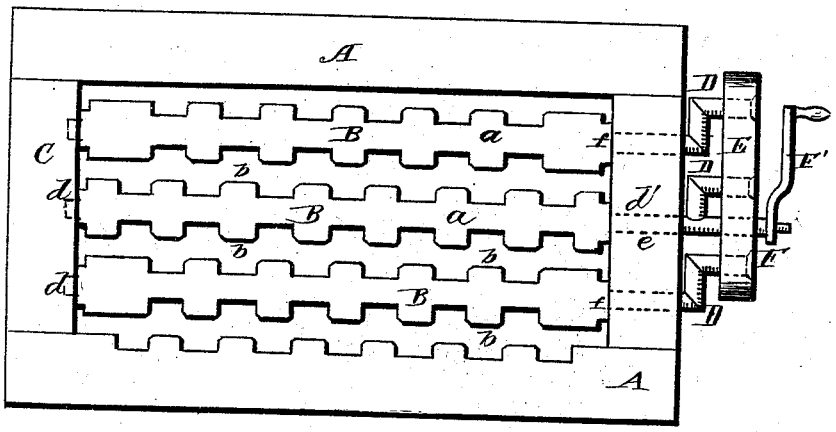


Fig. 2.

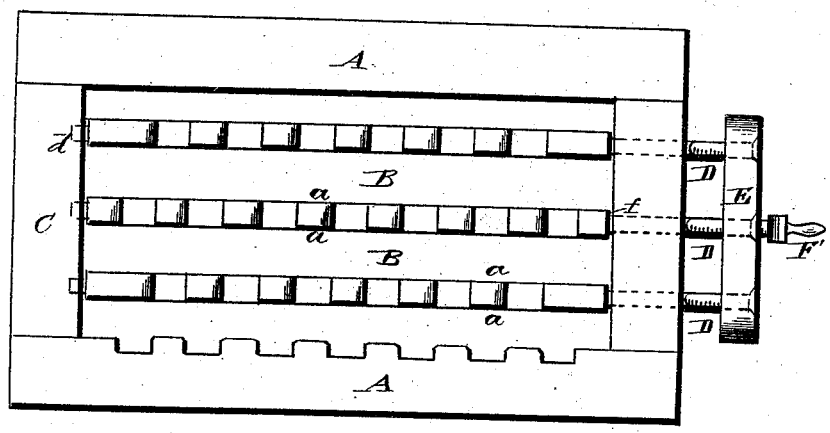
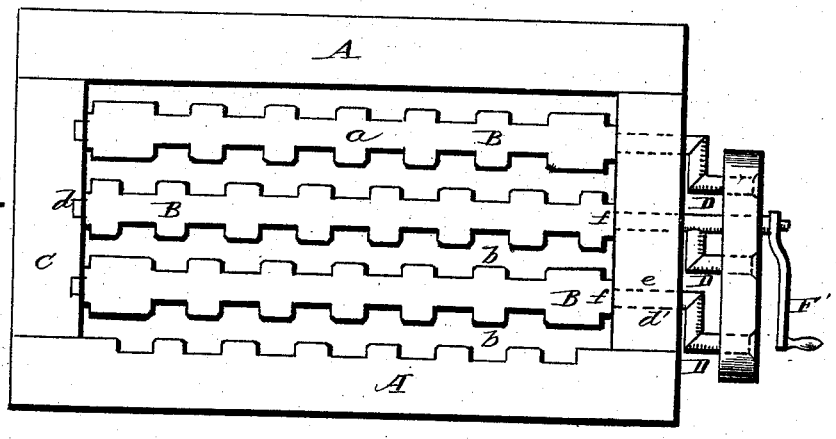


Fig. 3.



WITNESSES

E. D. Nottingham

Geo. F. Seymour

INVENTOR

Thos. J. March.

By F. A. Seymour.

ATTORNEY

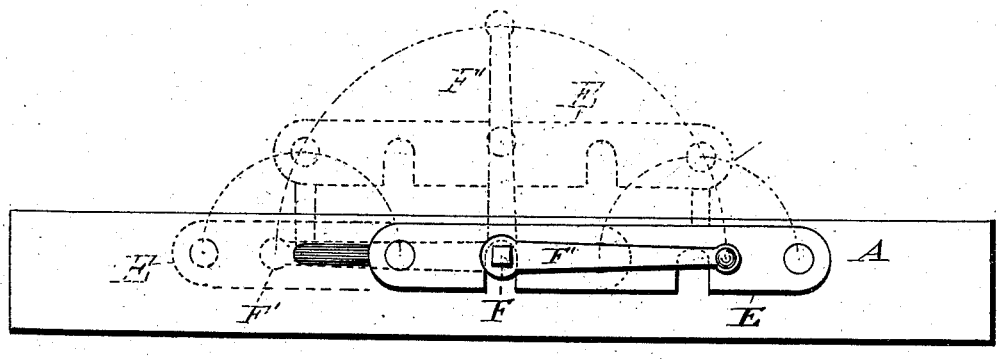
2 Sheets—Sheet 2.

T. J. MARCH.

Grate for Furnaces and Stoves.

No. 211,336. **Patented Jan. 14, 1879.**

Fig. 4.



WITNESSES
E. F. Nottingham
Ann Bright.

INVENTOR
T. J. March.
By H. A. Simmons.
ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS J. MARCH, OF LIMERICK STATION, PENNSYLVANIA.

IMPROVEMENT IN GRATES FOR FURNACES AND STOVES.

Specification forming part of Letters Patent No. **211,336**, dated January 14, 1879; application filed November 18, 1878.

To all whom it may concern:

Be it known that I, THOMAS J. MARCH, of Limerick Station, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Grates for Furnaces and Stoves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in grates for furnaces and stoves.

The object of the invention is to provide a grate composed of revolving grate-bars, of such construction that any desired number of grate-bars may be given a half-revolution simultaneously, and remove the clinkers and ashes from the bed of fuel supported on the grate-surface; and another object of the invention is to provide simple and effective means for connecting the several grate-bars of a grate, so that the bars may be moved simultaneously, and when in desired position for use the several bars shall be securely locked against accidental displacement.

To these ends my invention consists in the combination, in a grate, of two or more reversible grate-bars provided with cranks on one or both ends, and a bar connecting the several cranks of the grate-bars, whereby motion being imparted to one of said grate-bars is imparted to the several bars of the grate, and all the bars are moved simultaneously to any desired angle of adjustment.

In the accompanying drawings, Figure 1 is a plan view of my improved grate, the bars being in proper position for supporting the bed of coal. Fig. 2 is a plan view, showing the bars in vertical position for dumping the contents of the fire-box. Fig. 3 is a plan view of the grate, showing the bars in a reverse position to that represented in Fig. 1. Fig. 4 is an end view of the grate.

A represents the grate-rest frame. B designates the reversible grate-bars, which may be of any desired form or shape, due regard being had to the principle of operation and requirements of the several bars.

As the bars B are to be used in reverse positions, it follows that their opposite faces *a* should be of substantially the same form and configuration. The edges *b* of each bar are notched or serrated, as shown, to form cutting or shearing edges, for the purpose of slicing the clinkers and ashes from the bed of the fuel, and also to form sufficient openings in the grate-surface for the admission of the required amount of air to support combustion.

The several grate-bars are provided with journals *d d'* on their opposite ends. Journals *d* may be supported in semicircular bearings formed in the bar or grate-rest A; and, if desired, the bar C may be arranged to rest upon the several journals at one end of the grate, and prevent said journals from being raised out of their several bearings, and the grate-bars thereby becoming displaced. The journals *d'* on the opposite ends of the several grate-bars are supported in suitable bearings *e*, the shoulders *f* on the journals serving to prevent undue longitudinal movement of the grate-bars. The outer ends of journals *d'* project beyond the grate-rest, and are formed into cranks D, the entire series of which are connected with each other by means of a connecting-bar, E. The central grate-bar of the series is provided with a squared shank, F, which is formed in line with the journal or center of the bar, and projects outwardly from the end thereof a distance equal to the crank-arms, and serves to to allow of the engagement of a detachable wrench, F', for turning and reversing the several grate-bars. The shank F also serves another important function, namely, to lock the grate-bars in proper position for use with either face of the grate-bars supporting the bed of fuel.

It will be observed that when the grate-bars are in position for use the connecting-bar rests upon and is retained in proper position by the shank F.

When it is desired to shake the bed of fuel and remove the ashes therefrom, the grate may be gently agitated by a slight oscillation of the wrench.

When it is desired to remove clinkers from the surface of the grate, the several bars may be given a half-turn, and thus deposit the clink-

ers in the ash-pit; or, by turning the bars through a quarter-revolution, the contents of the fire-box are deposited in the ash pit or pan.

When the bars become sagged at their central portions, as will be the case with all forms of bars, by simply turning the bars over the reverse sides or faces are then brought in contact with the fire.

The cranks may be attached to either the front or rear ends of the grate-bars, and the wrench may also connect with either end of the same. The bars may be employed in circular or in rectangular grates.

It is evident that many slight changes in the construction and arrangement of parts may be resorted to without departing from the spirit of my invention, and hence I do not limit myself to the exact construction shown and described.

I am aware that grates have been formed of revolving grate-bars having gear-wheels attached to the ends thereof, and means for imparting simultaneous movement to the entire series of grate-bars, and hence I make no claim to such construction of grate; but,

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

1. In a grate, the combination, with a series of reversible grate-bars having crank-arms connected therewith, of a connecting-bar attached to the several cranks of the series of bars, substantially as set forth.

2. A grate consisting, essentially, in the combination, with a series of reversible grate-bars provided with crank-arms, one of said grate-bars being furnished with a square shank, of a connecting-bar journaled upon the several cranks, and adapted, as set forth, to limit the movement of the grate-bars to a half-revolution, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

THOMAS J. MARCH.

Witnesses:
JAMES M. PENNYPACKER,
JAMES ROGERS.