





No. 734,671.

PATENTED JULY 28, 1903.

A. S. COFFIN.  
FURNACE GRATE.

APPLICATION FILED JAN. 20, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

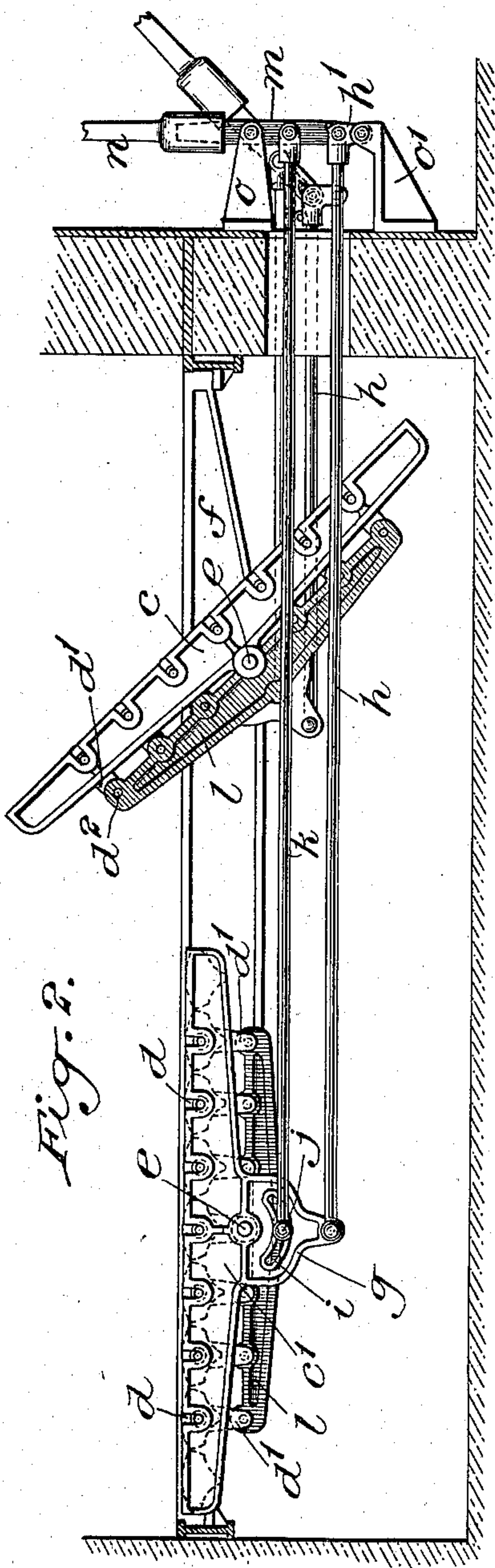


Fig. 2.

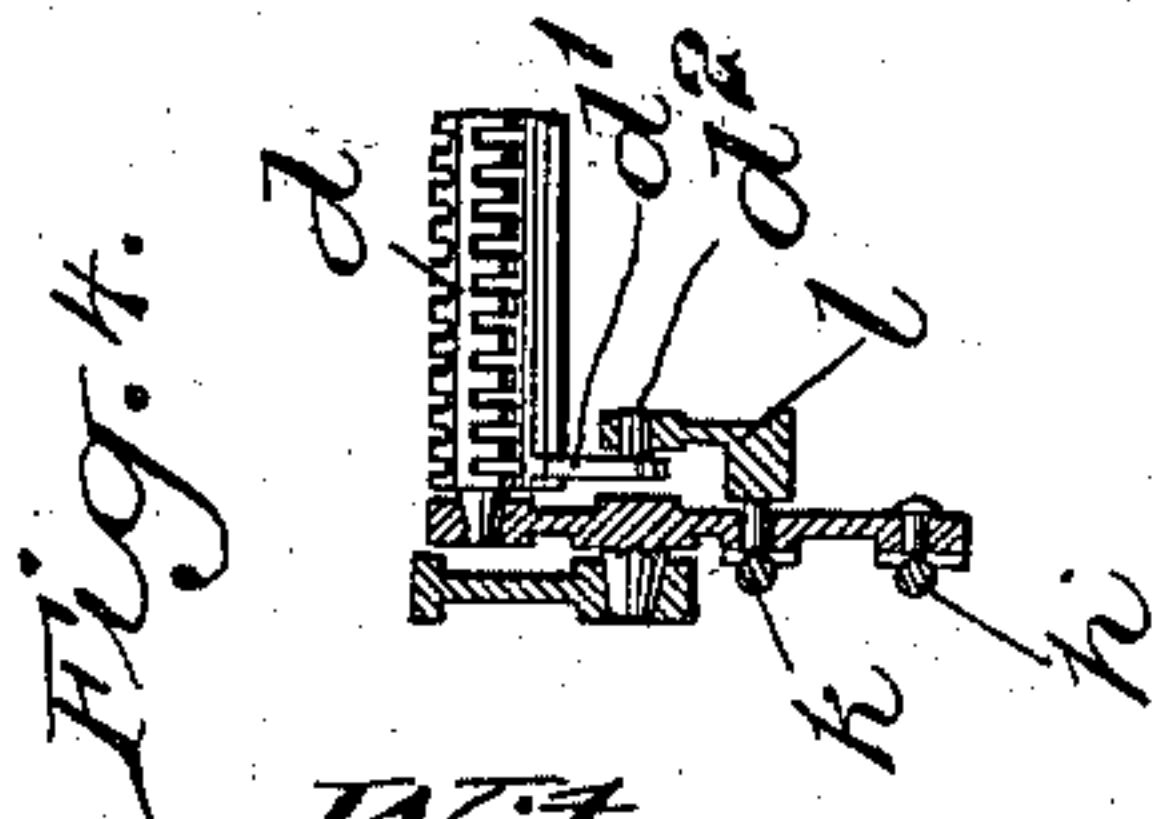
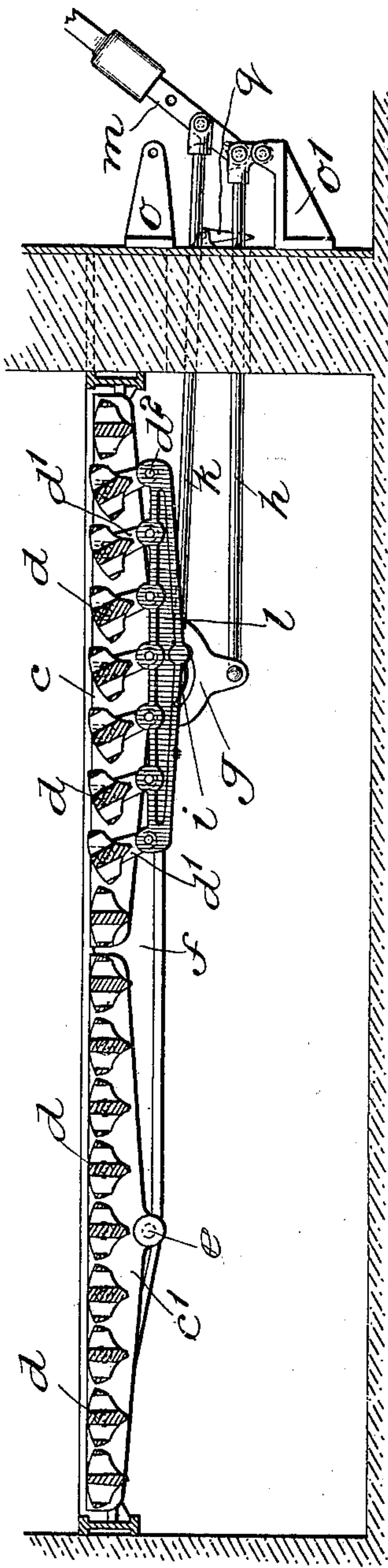


Fig. 4.

Witnesses: { George Baruff Jr.  
Henry Thine.

Fig. 3.



Inventor:  
Albert S. Coffin  
By Brown & Howard  
his Attorneys



# UNITED STATES PATENT OFFICE.

ALBERT S. COFFIN, OF NEW YORK, N. Y., ASSIGNOR TO M. H. TREADWELL & COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 734,671, dated July 28, 1903.

Application filed January 20, 1902. Serial No. 90,546. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT S. COFFIN, a citizen of the United States, and a resident of the borough of Bronx, in the city and State of New York, have invented a new and useful Furnace-Grate, of which the following is a specification.

My invention relates to furnace-grates, with the object in view of providing a grate composed of a plurality of sections capable of being dumped at pleasure in addition to the rocking of the several bars which compose the sections, the dumping being in a direction to facilitate the removal of the ashes from the ash-pit.

My invention has particular reference to grates for use in connection with furnaces requiring an extended fire-chamber where a single grate frame or section would not be feasible and where the grates are intended to be freed from cinders and ashes at intervals of time as great as consistent with maintaining an effective fire.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view in perspective of a fire-chamber of a furnace, showing the grate-sections therein, one in the position which they assume when in use and one in its dumped position, one wall of the fire-chamber being removed to more clearly show the parts therein. Fig. 2 is a view of the grate-sections in end elevation, showing them in reversed positions—i. e., the one shown in dumped position in Fig. 1 is here shown in its position for use and the other in its dumped position. Fig. 3 is a longitudinal section showing the grate-sections in position for use with the grate-bars in one section rocked; and Fig. 4 is a view in detail, showing the manner of connecting the grate-bars with their section-frames and the grate-section frame with the general supporting-frame.

The fire-chamber of a furnace is represented as fitted with two grate-sections, a front and a rear section, it being understood that the addition of another section or sections to the rear or of additional sections at the side of those here shown would simply require a further duplication of the grate-operating

means in order to bring each of the sections under the control of the fireman at the front of the furnace.

The front of the furnace is denoted by *a* and is provided with the ash-pit door *b* for gaining access to the ash-pit beneath the grate-sections, as is common.

The grate-sections are denoted as a whole by *c c'*, each being provided with a series of rocking bars, in the present instance seven, (denoted by *d*), and mounted in the end frames of the sections *c c'*, as is usual. The sections *c c'* are provided with trunnions *e*, by means of which they are mounted in rocking adjustment in the side bars *f*, which may conveniently be iron channel-bars extending along the interior wall of the fire-chamber and provided with suitable bearings for the reception of the trunnions *e*.

One end of each grate-section *c c'* is provided with a depending extension *g* below its pivotal connection with the frame *f*, to which extension an operating-rod *h* is attached for purposes of dumping the section. The extension *g* is also provided with an arch-shaped slot *i*, through which there extends a pin *j*, connected with the rod *k* for rocking the grate-bars without disturbing the position of the section as a whole. This pin *j*, which extends through the slot *i*, connects with a bar *l*, to which the depending tail-pieces *d'* of the grate-bars are pivoted, as at *d<sup>2</sup>*, (see Fig. 4,) the bar *l* being suspended along the pivots *d<sup>2</sup>*, so that when moved longitudinally it will cause the several grate-bars *d* of a section to be simultaneously rocked in the same direction, and a gradual lifting of the bar *l* on opposite sides of its normal position during its longitudinal movement is provided by the curved slot *i* in the extension *g*.

The rods *k* and *h* extend through the front of the furnace and are pivotally connected with an operating-bar *m*, adapted to receive a socket-lever *n* for gaining additional purchase in operating the rods.

The rod *h* is connected with the operating-bar *m* at or near its lower end, and the rod *k* is connected with the bar *m* at a point above the point where the rod *h* is connected, a structure which will produce results to which attention will be particularly called later on.



The bar *m* may be fulcrumed on a bracket *o*, secured to the front of the furnace or to a bracket *o'*, secured to the front of the furnace below the bracket *o*, to operate either the section as a whole without disturbing the bars individually or to operate the bars individually without disturbing the section as a whole, as may be desired. To accomplish this, the fulcrum-pin *p* is made removable from the bracket *o* and adapted to enter the perforation in the bracket *o'* and also a perforation in a lug *h'* on the end of the bar *h*.

As represented in Fig. 1, the operating-bar *m* is fulcrumed on the bracket *o*, and the lever-handle *n*, applied to the bar, is pulled outwardly, thereby forcing the lower end of the bar *m*, and hence the rod *h*, inwardly, rocking the grate-section *c'* into a tilted position with its lower edge toward the front of the furnace, so that the ashes and cinders therefrom will be discharged toward the ash-pit door *b* instead of away from it or off to one side of it, and hence into a position where they can be more readily removed from the pit.

In Fig. 2 the bar *m* is shown in its upright position, the throw from the position shown in Fig. 1 to that shown in Fig. 2 being such as to rock the grate-section *c'* back into its level position, and, the rod *h* having its outer end secured to the bracket *o'* by means of inserting the pin *p* through the bracket and the lug *h'* and the bar *m* being free from the bracket *o*, the said bar *m* will now fulcrum on its pivotal connection with the rod *h* and as it is moved toward and away from the front of the furnace will operate the rod *h*, thereby rocking the individual grate-bars of the section *c'* without disturbing the position of the grate-bar section as a whole.

The means for operating the grate-bar section *c* are located in the present instance on the opposite side of the furnace from where the means for operating the grate-bar sections *c'* are located, and as they are quite similar to the parts hereinabove described a particular description of them is omitted. They are shown in Fig. 2 in the position which they assume to dump the section *c* of the grate, this dumping action being also to-

ward the front of the furnace, and in Fig. 3 these parts are shown in the position which they assume when they are utilized to rock the individual grate-bars of the section *c* without disturbing the section itself.

To provide for rocking the grate-bars when the section is in its dumping position, the lug *h'* may be fastened at the limit of its inward throw by a hook *q*, for example, and the pin *p* removed.

If additional grate-sections were employed, the means for dumping and rocking their bars would be duplicated—a set of operating-rods and bar for each of the grate-sections—so that the entire grate-surface of the fire-pot may be dumped a section at a time by operating the controlling-rods from the front of the furnace, the same bars and lever being utilized for rocking the grate-bars during the continuance of the fire on the grate as are utilized to dump the grate-bar sections when it is required to clean out the furnace.

It is obvious that changes might be resorted to in the form, construction, and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein shown and described; but

What I claim is—

A furnace-grate comprising a plurality of grate-sections, each provided with movable bars, grate-operating rods leading from the grate-sections to the exterior of the furnace, one of the said rods being connected with the grate-bars and the other with the grate-sections as a whole, an operating-bar connected with the said rods exterior to the furnace and means for changing the fulcrum of said operating-bar to operate one or the other of said rods at pleasure.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 19th day of December, 1901.

ALBERT S. COFFIN.

Witnesses:

FREDK. HAYNES,  
HENRY THIEME.