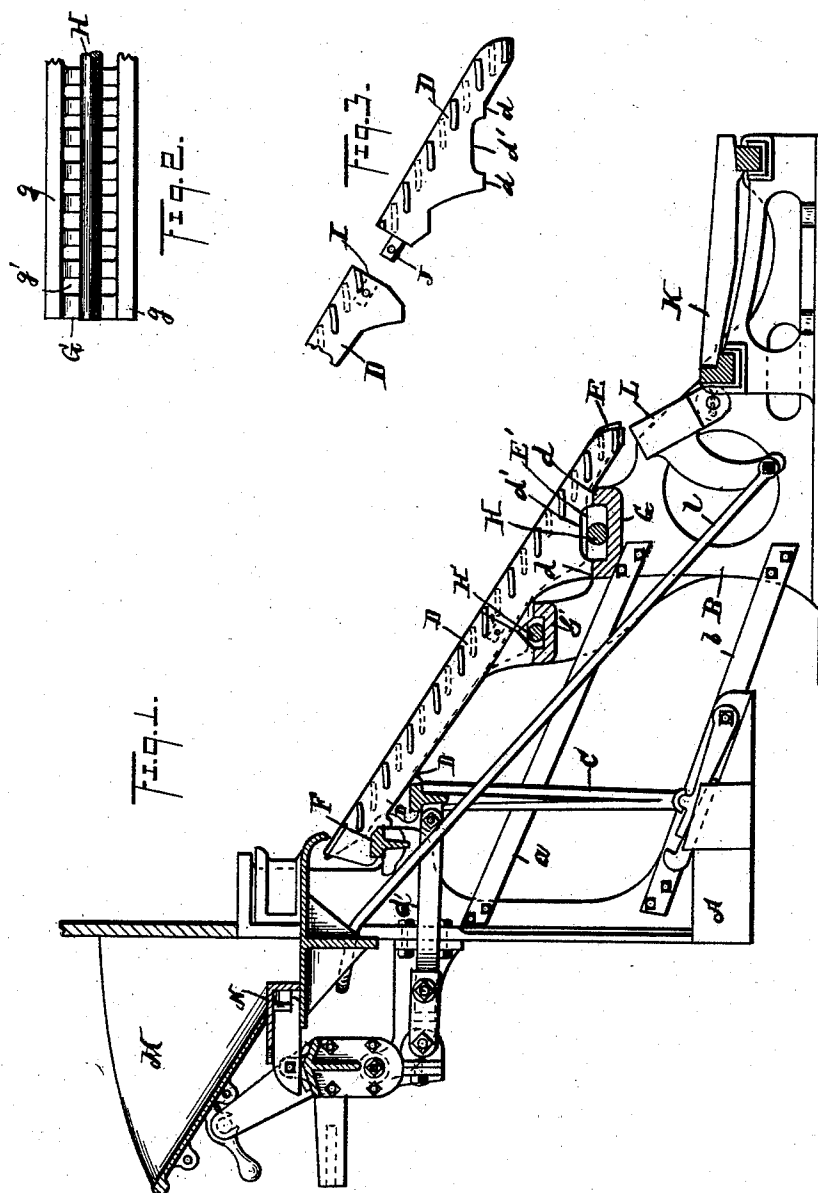


(No Model.)

H. H. CAMPBELL.
INCLINED GRATE, &c.

No. 505,748.

Patented Sept. 26, 1893.



WITNESSES

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INCLINED GRATE, &c.

SPECIFICATION forming part of Letters Patent No. 505,748, dated September 26, 1893.

Application filed August 1, 1892. Serial No. 441,900. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. CAMPBELL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Inclined Grates and Co-Operating Mechanism; 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 the same.

My invention relates to improvements in inclined grates for automatic stoking furnaces, and it consists in certain features of construction and in combination of parts hereinafter described and pointed out in the claims.

My improvements pertain to a class of grates known as the Brightman grate (see United States Patent No. 318,862, of May 26, 1885) in which a series of inclined stationary grates, having laterally projecting shelves, alternate with the grates of a corresponding series of movable grates, the latter having reciprocating movement endwise.

In my improved grate I provide a stationary cross bar, on which the stationary grates rest, and this cross bar is located so near the rear ends of the grates, that there is no danger of the overhanging ends of the grates bending downward. Then I provide a roller adapted to rest and travel, a limited distance, forward and backward, on this cross bar, and the reciprocating grates are adapted to bear and travel on this roller. Hence the two series of grates are respectively supported so near the rear ends thereof that the tendency to sag or bend downward is entirely obviated. As the rear ends of the grates, by reason of their exposed positions are sooner burned out, I provide, more especially in the case of long grates, a joint or splice in each grate, so that the rear sections may be renewed from time to time, as may be necessary. I have also improved the supporting frame of the grates, so that the same patterns for the frame, may be used in constructing a furnace for long or short grates.

In the accompanying drawings Figure 1 is a side elevation partly in section of grates and co-operating mechanism embodying my invention. Fig. 2 is an enlarged plan of a

portion of cross bar G. Fig. 3 is a side elevation in detail of a splice or joint in a grate.

A and B represent side frames, usually of cast metal, there being two of each, and these are arranged in pairs, and on either side of the furnaces, the members of each pair being connected by one or more suitable cross, or tie bars, such tie bars being longer or shorter according to the desired width of the furnace. The two pairs of side frames are connected by side bars as at *a* and *b* usually of wrought metal, and these side bars are made longer or shorter, according as the furnace is intended to accommodate longer or shorter grates. The inclination of the grates is regulated by the relative height of the bases, or foundations on which the respective pairs of side frames are set. These side frames and their connecting members constitute a rigid supporting frame for the grates and such frame being located inside the setting or brick work so that the grates or frame work may be removed and renewed at any time without disturbing the setting. To and between frames A is pivoted the oscillating frame C that supports the forward ends of the movable grates D, these grates having shoulders D' that embrace frame C. Member C is actuated by pitmen C' only one of which is shown, these pitmen receiving their movement from the feed mechanism, the latter being substantially the same as shown in Patent No. 318,862 aforesaid. The front ends of the stationary grates rest on cross bar F of side frames A.

Near the rear ends of the grates, is located a stationary cross bar G the same connecting with side frames B. Bar G has upwardly projecting side flanges *g g*, and between the flanges the bar has a series of vertical air spaces *g'*.

H is a roller extending lengthwise of, and resting on bar G, member H being adapted to roll forward and backward between flanges *g g*.

The stationary grates have shoulders *d d* adapted to rest on flanges *g g* of bar G, while between these shoulders the grates D are cut away at *d* so as to clear roller H.

Grates E have each an approximate horizontal section E' adapted to rest and travel on roller H. Hence the lower ends of grate E

have an easy and almost frictionless movement, and at the same time are supported so near the rear ends thereof that there is no liability of the rear ends bending downward when these grates become heated. Where it is desired, I make a splice in each grate, so that the shorter rear section can be renewed. The manner of constructing such side splice will be readily understood by referring to Fig. 3. The rear end of the longer section of a grate is chambered as at I and the shorter section is provided with a tongue or tenon J adapted to fit in such chamber, and the engaging parts are bolted through and through. Of course the joint or splice is not as strong as the other portions of the grate, and so in case splice bars are used, I provide a cross bar G' and roller H' constructed as before described, and these are located at or near the splice, the grate having been constructed to engage two such supports.

The other parts that are substantially as heretofore constructed may be briefly described as follows: A series of short grates K receive the fuel discharge from the inclined grates. L is a dumping grate operated by means of rod L. When this grate is tilted forward and downward, access is had for cleaning the clinkers from grate K. When grate L is in its normal, inclined position shown in Fig. 1, it practically closes the space between the other grates so that no fuel is wasted.

M is the feed hopper, and N is a reciprocating feed block that forces the coal out

from the bottom of the hopper onto the inclined grate where it is coked, and down which it is fed by means of the end movement of grates E aforesaid.

What I claim is—

1. In a grate, the combination with the front and rear supporting frames, of the rear and intermediate cross bars, each carrying a roller, of the stationary inclined grates, and the movable inclined grates, the side bars of said grates being spliced at points opposite the intermediate cross bar, and provided with projections adapted to bear upon said intermediate cross bar, substantially as shown and described.

2. In a grate, the combination with the front and rear supporting frames, the cross bars connecting the opposite frames, the side bars connecting the front and rear frames, the stationary inclined grates, the oscillating frame, the inclined grates attached to the said oscillating frame, the roller located in the cross bar, and on which the rear ends of the movable grates rest, the horizontal grate, the dumping grate and rod for operating the same, all arranged substantially as shown and described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 25th day of July, 1892.

HENRY H. CAMPBELL.

Witnesses:

J. T. MCANINCH,

E. E. STILES.