

W. OEHLSTROM.  
AUTOMATIC COAL FEEDER AND STOKER.

No. 489,542.

Patented Jan. 10, 1893.

FIG. 1.

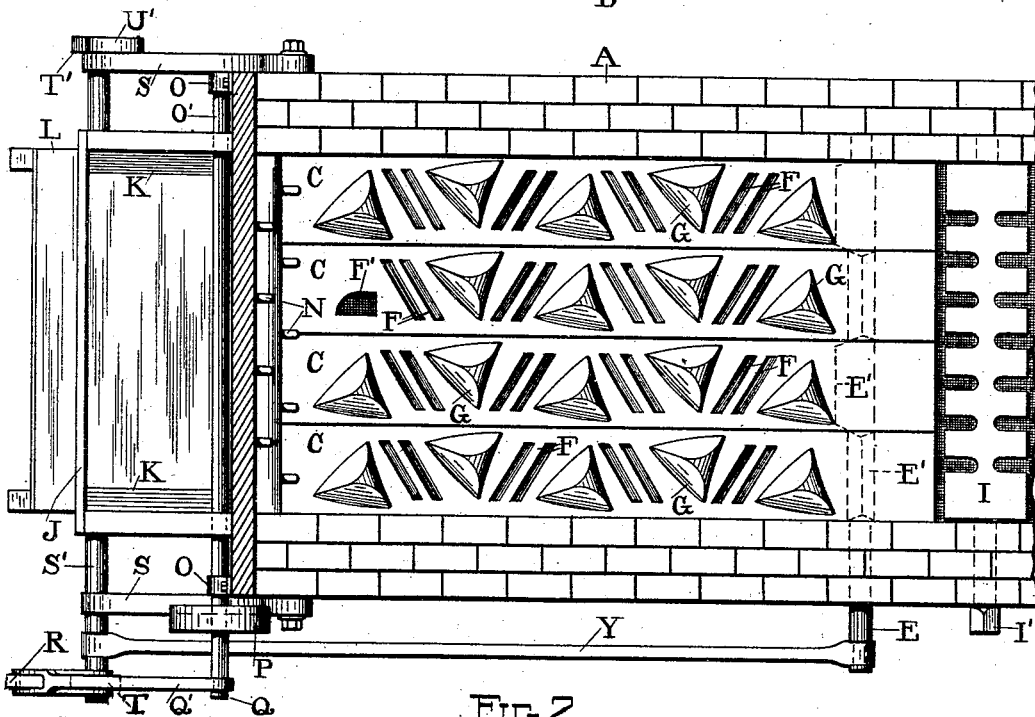
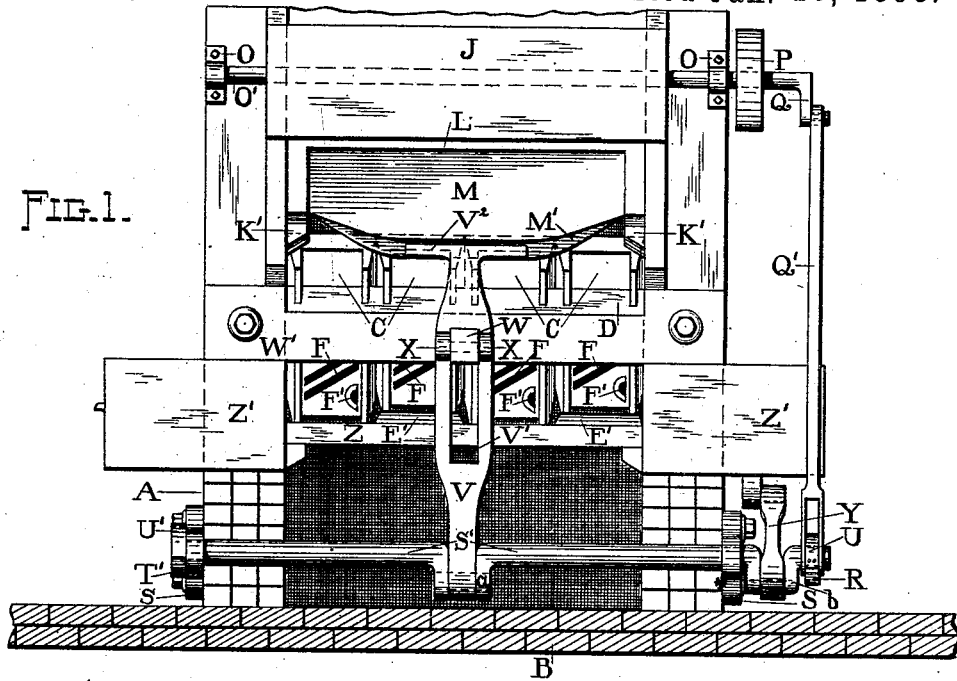


FIG. 2.

WITNESSES:

*Henry Ford*  
*W. A. Biddle*

INVENTOR:

*W. Ohlstrom*  
*By W. H. Bunnings*  
*att'y*

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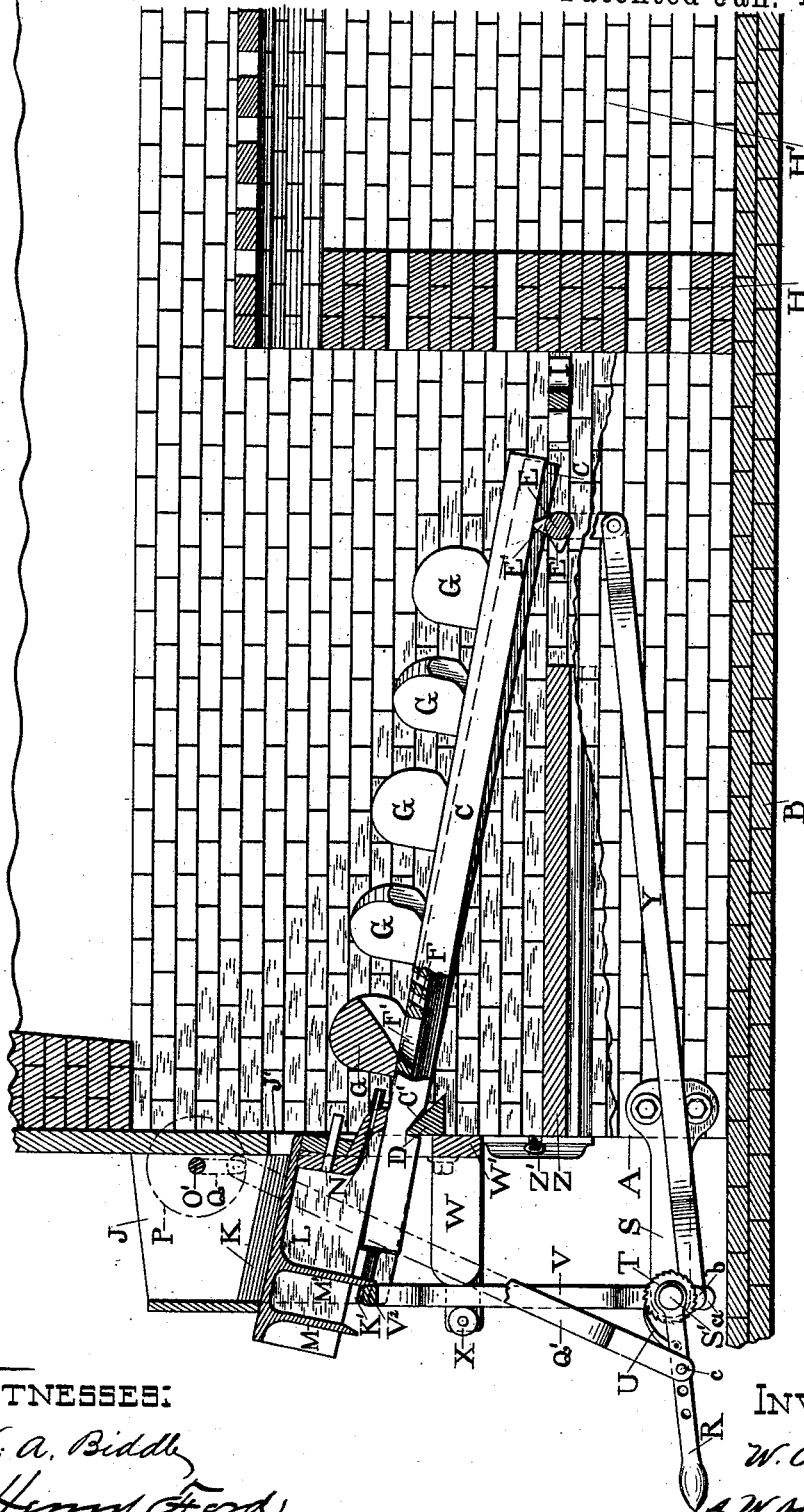


FIG. 3.

WITNESSES:

W. A. Biddle

Henry Ford

INVENTOR:

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# UNITED STATES PATENT OFFICE.

WILLIAM OEHLSTROM, OF CLEVELAND, OHIO.

## AUTOMATIC COAL FEEDER AND STOKER.

SPECIFICATION forming part of Letters Patent No. 489,542, dated January 10, 1893.

Application filed September 9, 1892. Serial No. 445,470. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM OEHLSTROM, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Automatic Coal Feeder and Stoker, of which the following is a full, clear, and exact description.

My improved coal feeder or stoker for furnaces, in which the grate relates to detachable, perforated bars with hoods, operating conjointly and automatically with a hopper arranged at the front of the furnace; said hopper having a series of tubes connected thereto for the induction of air from the exterior.

The object of my improvement is to provide means by which the fuel in a furnace may be quickly kindled, automatically replenished, easily freed from non-combustible elements and which, when ignited, shall consume its own smoke.

That my invention may be seen and fully understood by others, reference will be had to the following specification and annexed drawings forming a part thereof, in which—

Figure 1 is a front view of my device; Fig. 2, a top view and Fig. 3, a longitudinal, vertical section of the same.

Similar letters of reference designate like parts in the drawings and specifications.

The furnace A, rests on the floor or foundation B, Figs. 1 and 3 and is provided with the detachable grate bars C. The bars C, are supported at their forward ends by the triangular shaped rod D, Figs. 1 and 3, the upper angle of which is received into a notch C', Fig. 3, in the sides of each bar. Below the rod D, and supporting the rear ends of the bars C, is the cam-shaft E, of essentially the form shown in Fig. 3. In the bars C, are the slits F and the openings F', a sectional view through both the slits and openings being shown in Fig. 3. Over each of the openings F' is a hood G, one of which is removed in Fig. 2, thereby bringing the opening below into view. The sides of the slits F and the curved sides of the openings F' are inclined forward the better to facilitate the entrance of air into the fire-place. The inclined sides of the slits F also prevent the fuel from falling through said slits. The hoods G, not only serve to cover the openings F', thereby preventing

small pieces of coal from falling through or clogging said openings, but they prevent the fuel from passing at once to the lower ends of the grate-bars C. Between the lower ends of the bars C and the bridge wall H, is the ash grate I, Figs. 2 and 3, which receives the non-combustible properties of the fuel consumed on the bars C. The ash grate I is turned over to discharge its contents, by means of a suitable lever or shaker applied to the end of the bearing rod I', Fig. 2.

Attached to the front of the furnace A, is the bin J, having secured thereto the guides or ways K and K'. Supported and guided by the ways K and K', is the hopper L, its rear end resting upon the bars C. The hopper L is provided on its under side with the two brackets M and M', Figs. 1 and 3 and with a series of tubes N, Figs. 2 and 3, piercing the rear support of said hopper. The tubes N admit air directly from the exterior to the interior of the furnace. The hopper L is placed on the same angle with the bars C and its roof or upper part, when said hopper is in position, becomes the floor of the bin J.

To the upper face of the furnace A are secured the bearings O, which support the crank-shaft O', said shaft being revolved by the pulley P. The crank Q, at the end of the shaft O', is connected, by means of the rod Q', to the lever R. The lugs S, attached to the lower part of the furnace, support the crank-shaft S' and on opposite ends of said shaft are the ratchet wheels T and T'. The bifurcated end of the lever R, is attached to the shaft S' and embraces the ratchet T. To the lever is pivoted the pawl U, engaging the ratchet T, best shown in Fig. 3. The ratchet T', Figs. 1 and 2 is controlled by the pawl U' and is for the purpose of preventing back-lashing by the shaft S'. By means of the above described mechanism, it will be readily seen that, by revolving the shaft O', the shaft S' is rotated, for the purpose hereinafter described.

Attached to the crank a, on the shaft S', midway between the walls of the furnace A, is the rocker-arm V, Figs. 1 and 3, having the elongated slot V' and the cross-piece V<sup>2</sup>, at the top. The guide bar W, Figs. 1 and 3, projects from the plate W', (said plate being bolted to the face of the furnace,) and is received into the slot V'. In front of the rock-

er-arm V and attached to each side of the guide bar W, are the anti-friction rolls X, Figs. 1 and 3. As the arm V is rocked back and forth on the bar W, by the rotation of the shaft S', the cross-piece V<sup>2</sup> alternately comes in contact with the brackets M and M' and thereby forces the back of the hopper L, in and out of the fire-place. The motion imparted to the hopper L, by the rocker-arm V, causes the fuel in the bin J to slowly slide through the opening J', Fig. 3, onto the grate-bars C and in this manner the fire thereon is fed automatically. The rod Y connects the crank b, on the shaft S' between the lug S' and the lever R, with a crank on the end of the cam-shaft E. When the shaft S' is rotated, a rocking motion is imparted to the cam-shaft E, since the crank on said cam-shaft is longer than the crank on the shaft S', and the cams E' raise and lower each alternate bar C.

Below the grate-bars C, is the floor Z, Figs. 1 and 3, resting on suitable supports and forming an air chamber which is closed at the front after the fire is started, by the doors Z'. When the doors Z' are open, air enters the space above the floor Z and passes through the slits F, openings F', and is projected onto the fire by the hoods G. In this manner a strong draft is obtained, which quickly kindles the fire. The air introduced into the fire-place, by the tubes N, drives the carbonaceous properties of the smoke back into the fire, whence they came, to be consumed and carries the gases into the heating chamber II', Fig. 3, where combustion takes place and all the elements capable of generating heat are utilized. The space between the foundation B and the floor Z, is open and communicates with the chamber H', through holes in the wall H.

The connection of the rod Q' with the lever R may be adjusted by means of the pin c, Fig. 3, and the holes in said lever. The rod Q' may be detached from the lever R and said lever may be operated by hand. By removing the hopper L, one or more of the

grate-bars C, may be taken out without disturbing the remaining bars.

Other means than that shown may be employed to impart motion to the hopper L.

What I claim as my invention and desire to secure by Letters Patent, is—

1. In an automatic coal feeder and stoker, a series of detachable, perforated grate-bars, having hoods secured thereto, over the larger openings, in combination with a bin or receptacle having a movable floor or hopper and the means for reciprocating the same, said hopper being provided with a series of air tubes piercing the rear support of the hopper, in the manner substantially as and for the purpose set forth.

2. In an automatic coal feeder and stoker, a series of detachable, perforated and hooded grate-bars, resting at one end on a suitable rod or bar received into a notch or opening in the sides of said grate-bars, in combination with a cam-shaft having cams for agitating the grate-bars and the means for rocking said cam-shaft, in the manner substantially as and for the purpose set forth.

3. In an automatic coal feeder and stoker, a series of detachable, perforated and hooded grate-bars supported by a rod or bar forward and a cam-shaft for agitating said grate-bars, in the rear, in combination with the ash grate I, in the manner substantially as and for the purpose set forth.

4. An automatic coal feeder and stoker consisting of a series of detachable, perforated and hooded grate-bars, resting on a bar forward and a cam-shaft in the rear, an ash grate, the bin and hopper, said hopper having a series of tubes piercing the rear support thereof, the floor Z and doors Z', with the mechanism for operating the hopper and cam-shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM OEHLSTROM.

Witnesses:

W. H. BURRIDGE,  
F. A. CUTTER.