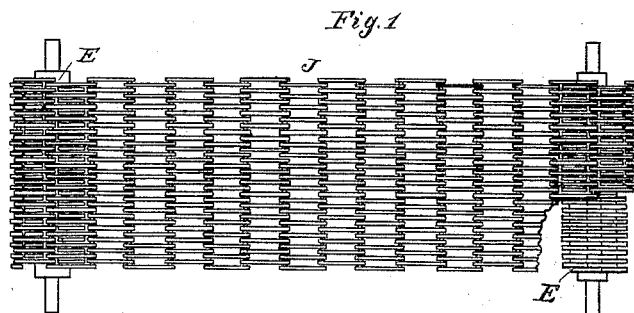
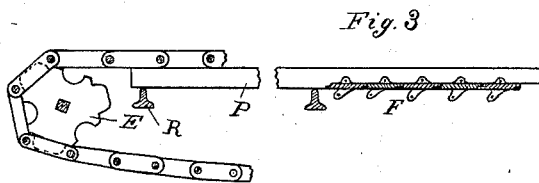
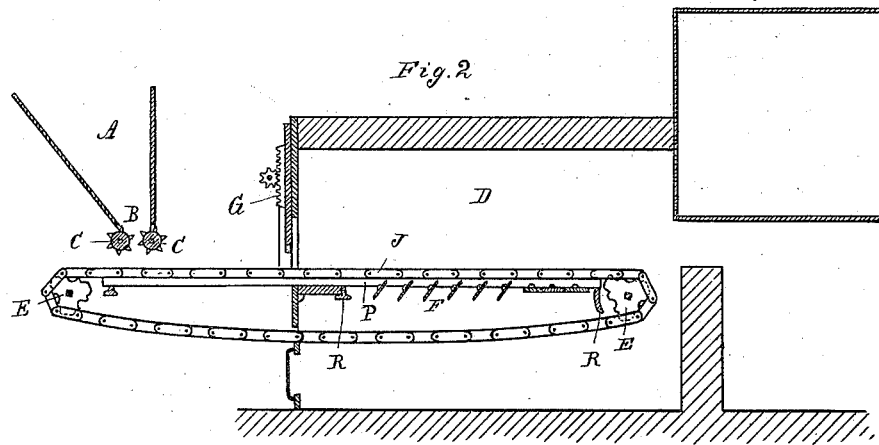


(No Model.)

T. CRANEY.  
FURNACE STOKER.

No. 344,631.

Patented June 29, 1886.



Attest:  
John Schuman.  
*[Signature]*

Inventor:  
Thomas Craney.  
By his Atty  
*[Signature]*

# UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

## FURNACE-STOKER.

SPECIFICATION forming part of Letters Patent No. 344,631, dated June 29, 1886.

Application filed October 29, 1885. Serial No. 181,253. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS CRANEY, of Bay City, in the county of Bay and State of Michigan, have invented new and useful Improvements in Furnace-Stokers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to a new and useful improvement in fuel-feeders for steam-boiler furnaces; and the invention consists in the construction, arrangement, and combination of a boiler-furnace and grate so arranged that  
15 the quantity of fuel, together with the necessary quantity of air for burning it, may be regulated.

In the drawings which accompany this specification, Figure 1 is a plan of the grate. Fig.  
20 2 is a vertical central longitudinal section. Fig. 3 is an enlarged section of the grate.

A represents a feed-hopper provided at the lower end with a discharge-spout, B, which is controlled by the feed-rolls C. The feed-rolls  
25 are revolved by suitable motive power to discharge the proper amount of coal required by the furnace. They are preferably of the kind known as "crusher-rolls," so as to reduce at the same time the larger lumps of coal.

30 D is the boiler-furnace, and J is a so-called endless chain-grate. This chain-grate is of suitable length to reach the whole length of the furnace and project some distance outside and below the feed-hopper. It is operated  
35 by suitable motive power and passes over sprocket-wheels E E, one of which is in front of the furnace, while the other one is secured near the bridge-wall.

The chain-grate is composed of small grate-bars lapping each other at the ends, so as to  
40 form air-spaces between them. They are pivotally secured together by pivot-rods to form a flexible apron or belt; but instead of making the grate in one breadth I preferably use two  
45 or more smaller breadths and place them side by side, so as to form the required width of grate. This construction greatly reduces the friction, and is also preferable in a constructive sense, as the pivot-rods are much shorter  
50 and less liable to become distorted and make

the work of repairing and fitting together difficult.

Each sprocket-wheel is composed of a series of disks secured upon a common shaft. The  
55 cogs or spurs of each disk engage into the air-spaces of the grate in their line of travel, and as there are as many disks on each shaft as there are rows of air-spaces the spurs of the sprocket-wheels will free all the air-spaces  
60 from clinkers or ashes which may lodge therein, the spurs having about the dimensions of the air-spaces. The upper stretch of the grate-bars is supported upon longitudinal bars P, which in turn are supported by transverse  
55 bars R.

F are a series of slats pivotally secured below the grate within the furnace-chamber in the manner of dumping slats. They can be  
70 closed or opened at will or adjusted to any degree of opening, so as to cut off or regulate the amount of air which is admitted for combustion through the air-spaces of the grate. It is not necessary that these slats or cut-offs  
75 extend the whole depth of the furnace, as they may be omitted near the front end.

I do not want to confine myself to any peculiar method of operating these slats or cut-offs, as the nature of the fuel and of the draft and the absence or presence of other air-feeding devices has a bearing thereon—that is, 80  
they may be connected so as to be capable of joint operation in whole or in sections, or be independently adjustable.

The proper distribution of air for a perfect and well-regulated combustion of the fuel, by  
85 means of devices which are susceptible of the same degree of adjustment as all the other parts of a mechanical stoker, has a most important bearing on the economy of fuel with this class of devices, as otherwise the fuel may  
90 be either dumped off the grate at the rear end only partly consumed or the combustion may be wastefully carried on only in the fore part of the furnace by not giving the fuel the necessary time to coke and gradually give off its  
95 gases.

The amount of fuel dropped onto the grate can be regulated by adjusting the speed of the feed-rolls; but in order to obtain a greater regularity and a more even distribution of the  
100

coal upon the grate, I provide the furnace-chamber with a vertically-adjustable door, G, which admits no more coal than its adjusted height will permit, at the same time it levels the coal and excludes the air.

As the arrangement of suitable mechanical devices for giving motion to the different parts of my feeder does not involve any invention and can be suitably devised by any skilled mechanic, I omit all reference thereto, except to state that I prefer to give the grate a slow, progressive, and continuous motion.

What I claim as my invention is—

1. In a fuel-feeder, the combination of the following elements: an endless traveling grate projecting out in front of the furnace, a hopper with feed-rolls arranged to discharge thereon, a vertically-adjustable door in the front wall of the furnace above the grate, and a series of adjustable air-regulating cut-offs below the grate in the furnace, all arranged substantially as described.

2. The combination, with the endless trav-

eling grate J, consisting of a plurality of sections arranged side by side and pivotally secured together, leaving air-spaces between the bars of each section, of the sprocket-wheels E E, having cogs corresponding in number with the air-spaces in one section of the grate and of substantially the same size, substantially as and for the purposes specified.

3. In a fuel-feeder, an endless traveling grate, in combination with adjustable cut-offs arranged underneath thereof for regulating the supply of air to the fuel, substantially as described.

4. In a fuel-feeder, an endless traveling belt provided with air-spaces, as described, combined with the adjustable pivoted slats F, arranged beneath said belt for regulating the supply of air to the fuel therethrough, substantially as described.

THOS. CRANEY.

Witnesses:

H. S. SPRAGUE,  
CHARLES J. HUNT.