

(No Model.)

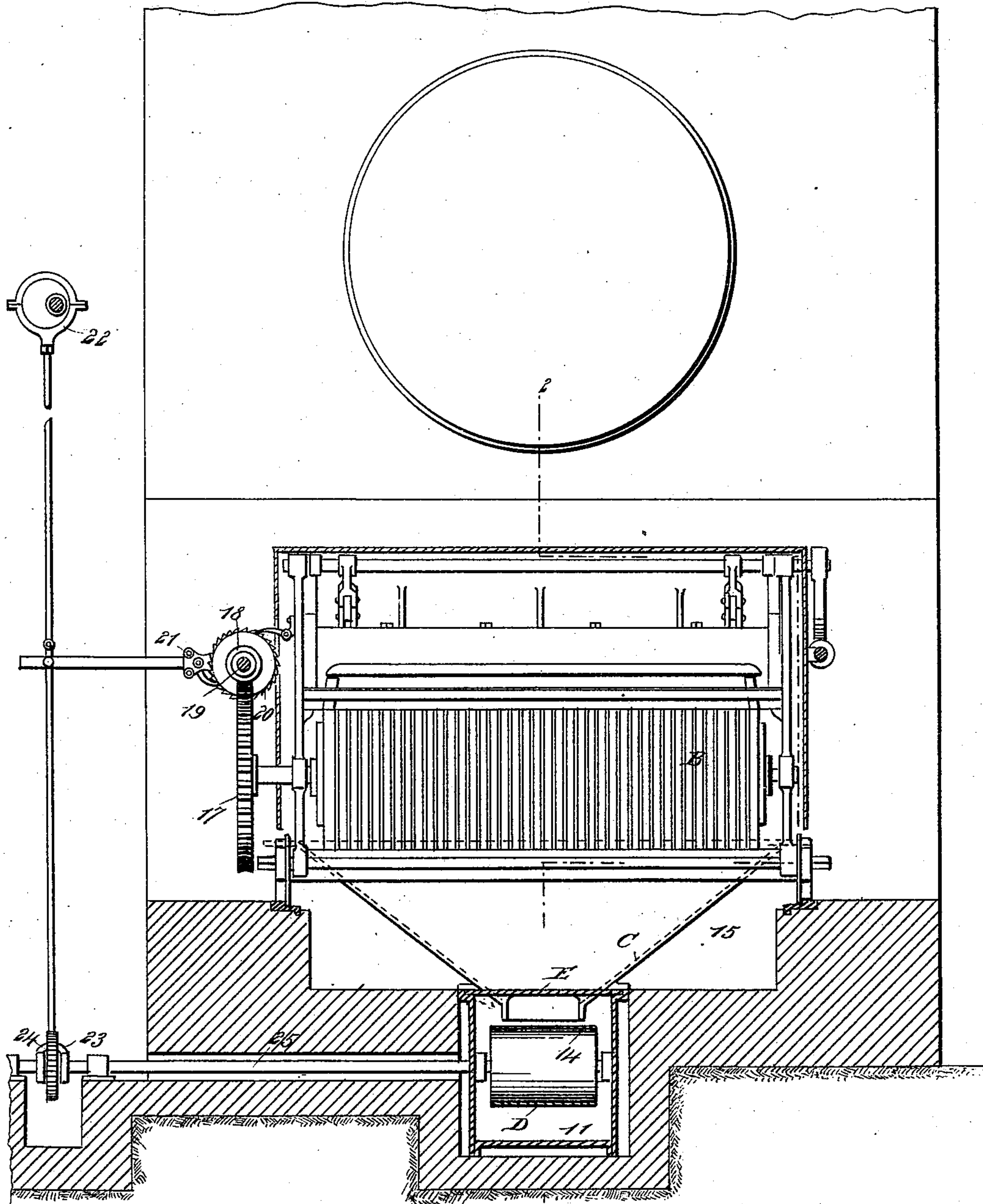
2 Sheets—Sheet 1.

E. P. EASTWICK, Jr.  
FURNACE GRATE.

No. 549,850.

Patented Nov. 12, 1895.

*Fig. 1*



WITNESSES:

*H. Walker*  
*J. A. Ken*

INVENTOR

*E. P. Eastwick Jr*

BY

*Munn & Co*

ATTORNEYS.

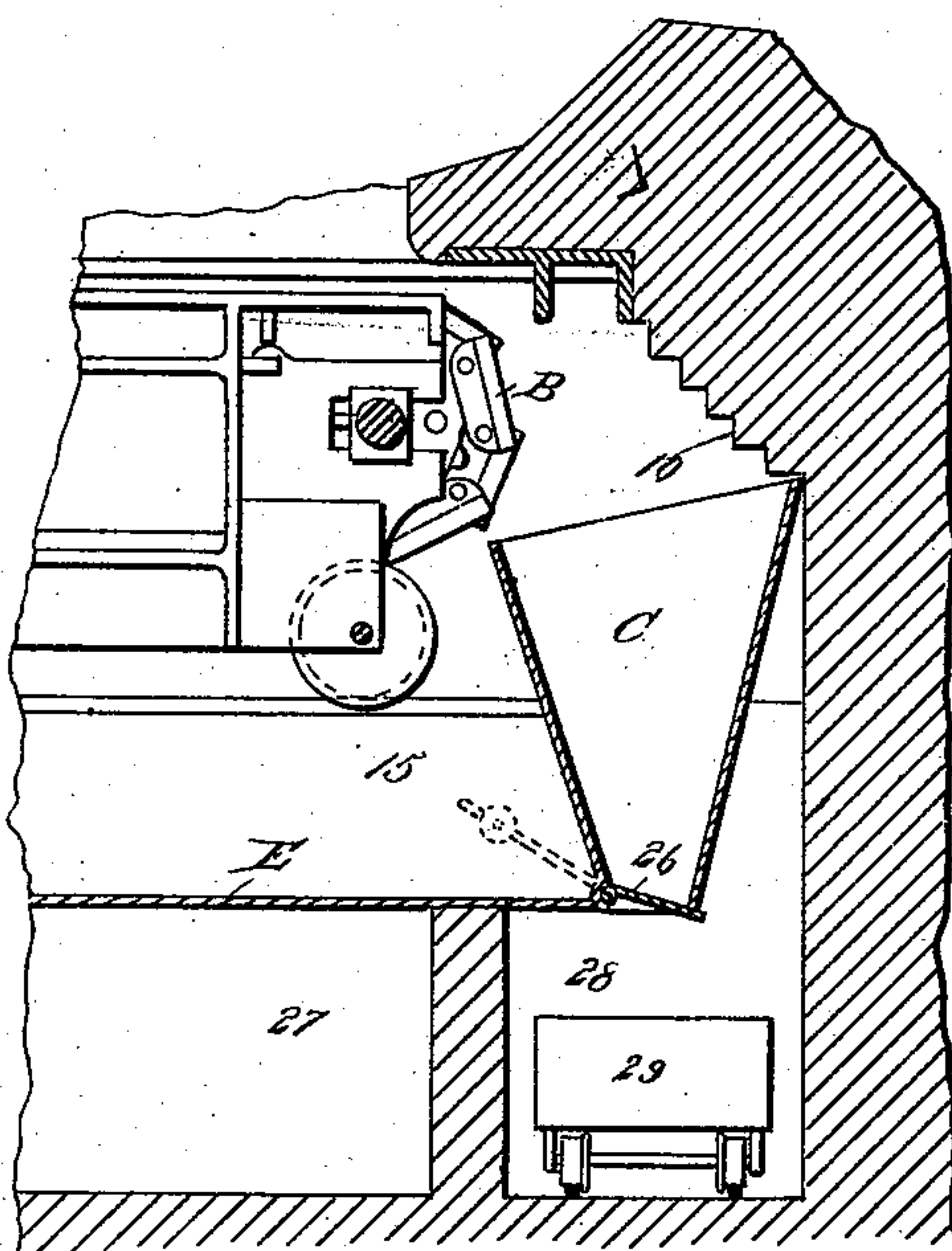
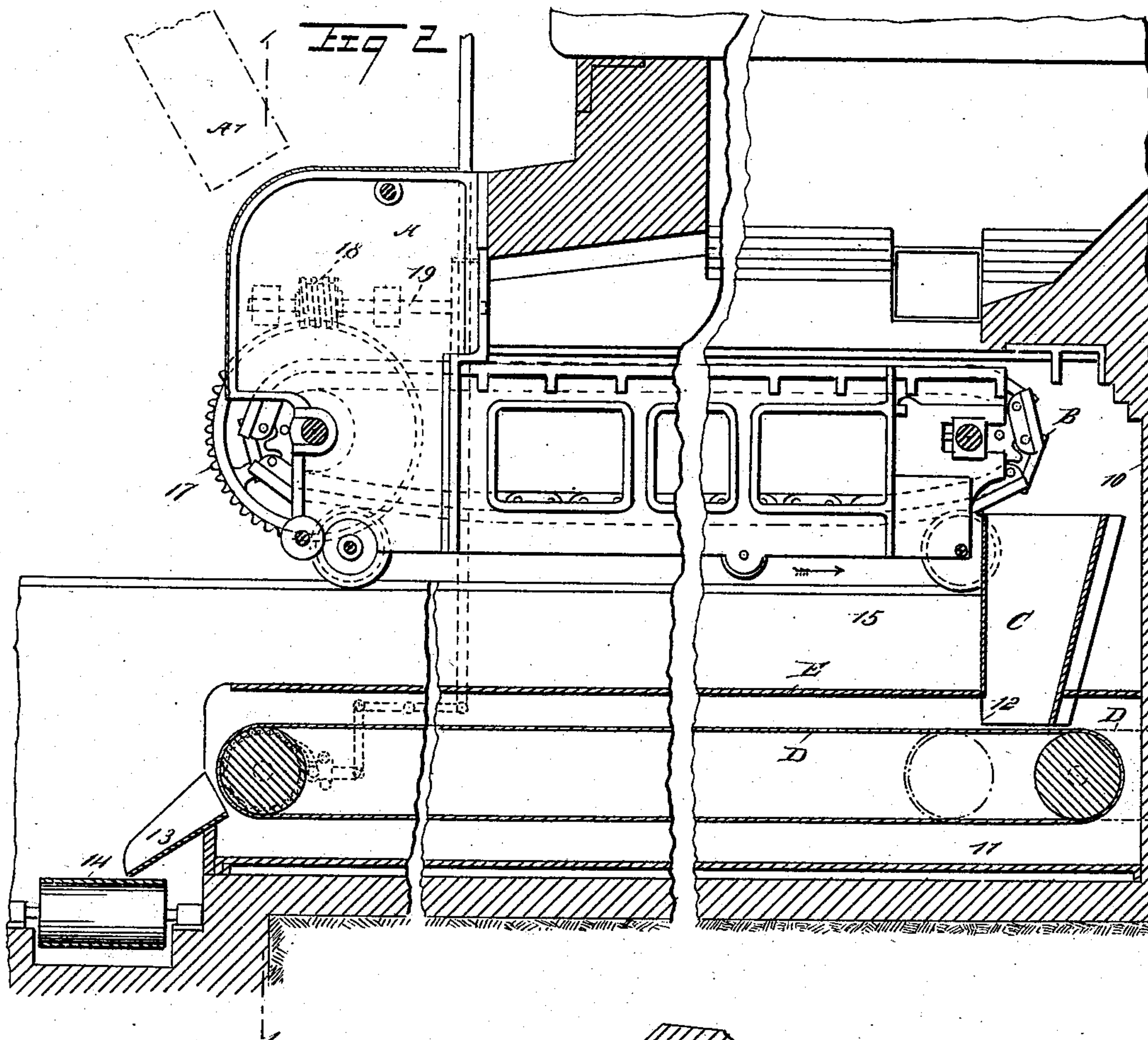
(No Model.)

2 Sheets—Sheet 2.

E. P. EASTWICK, Jr.  
FURNACE GRATE.

No. 549,850.

Patented Nov. 12, 1895.



WITNESSES:

W. Walker  
J. H. Archer

INVENTOR

E. P. Eastwick, Jr.

BY

Munn & Co.  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

EDWARD P. EASTWICK, JR., OF NEW ORLEANS, LOUISIANA.

## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 549,850, dated November 12, 1895.

Application filed June 29, 1895. Serial No. 554,431. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD P. EASTWICK, Jr., of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Furnace-Grate, of which the following is a full, clear, and exact description.

My invention relates to grates which receive fuel upon their surfaces to undergo combustion and discharge the ashes or unconsumed fuel at their ends or sides, and especially applies to what are known as "traveling" grates or stokers, which continuously and automatically receive their fuel and discharge their refuse. In the practical use of grates of the above description the experience is that the fuel falling on or passing over or while being carried on the grates sifts through them unconsumed and by mixing with the ashes discharged is wasted; also, that an excessive amount of air is admitted to the furnace without passing through the grate.

My invention has for its object a remedy for these defects; and it consists in placing at the discharge side or end of the grate a hopper to receive and retain the ashes or refuse, having at its bottom an opening and under the same a valve or traveling conveyer adapted to release or carry away its contents in quantity as required, and at the same time keep the opening at the bottom of the hopper sufficiently closed to prevent a too free admission of air, which is undesirable, at the rear end of the furnace.

The invention further provides means for separating the unburned fuel from the ashes falling from the grate.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a transverse section through a portion of a boiler-furnace, the section being taken practically on the line 1 1 of Fig. 2. Fig. 2 is a longitudinal section through a portion of a boiler-furnace to which is applied the improved discharging apparatus; and Fig. 3 is a longitudinal sectional view of the rear

portion of the grate and fire-box of a boiler-furnace, illustrating a slight modification in the manner of discharging the ashes from the receiving-receptacle.

In the illustrations given in Figs. 1 and 2 the fuel is fed from a hopper A on the upper stretch of the traveling grate B, which is of the variety known as the "chain-grate," the grate being propelled in the direction of the arrows into and through the furnace. The fuel is carried along to be consumed in its passage toward the back part of the furnace, and when it reaches a point in the rear of the furnace removed a predetermined distance from the end wall 10 the unconsumed fuel leaves the grate and falls into a receptacle or hopper C, which is placed transversely in the rear portion of the furnace and immediately below the rear or delivery end of the grate.

A conveyer D, usually consisting of an endless belt, is made to travel ordinarily the length of a chamber or ash-pit 11 at the bottom of the furnace, as shown in Fig. 2, and closely approaches the bottom of the hopper, which is opened at that point to discharge its contents on the said conveyer, and the opening 12 in the bottom of the hopper is carried a short distance up the front of the same. The hopper is placed between the rear end of the grate and the rear wall of the furnace, and the conveyer is constantly beneath the lower opening in the said hopper.

I desire it to be distinctly understood that the conveyer D may be carried longitudinally through the ash pit or chamber 11 from the hopper in direction of the front of the furnace, as shown in positive lines in Fig. 2, or carried in a reverse direction, as shown in dotted lines in the same figure, or the conveyer may be made to travel transversely of and through the said chamber beneath the hopper, as may be desired. The conveyer may also, as shown in Fig. 2, be made to deliver the material to a chute 13, and the said chute may transfer the material to a second conveyer 14 at an angle to the main conveyer D.

The plate or plates E serve to prevent the unconsumed fuel which falls through the grate from mixing with the ashes on the conveyer, since the fuel thus dropped will remain



in the chamber 15, and may be readily removed therefrom.

The coal is delivered to the hopper A ordinarily through the medium of the feed-chute 5 A', and any approved driving mechanism may be employed for propelling the grate, since such mechanism constitutes no portion of the invention. In the drawings the trunnion of one of the drum-supports for the grate is provided with a worm-wheel 17, which meshes 10 with a worm 18 on a shaft 19, the said shaft being provided with a fixed ratchet-wheel 20, driven through the medium of a dog 21 operated from an eccentric 22, the said eccentric 15 likewise serving to operate a second dog 23, in engagement with a ratchet-wheel 24, secured on a shaft 25, connected with one of the supporting-drums of the main conveyer D.

In Fig. 3 the discharge arrangement for the 20 ashes consists in having the bottom of the hopper closed and regulated by a valve 26, the valve being substituted for the conveyer D, and the lower chamber or ash-pit 11 is in this case preferably divided into two compartments 27 and 28, one of them receiving the 25 lower end of the hopper C. The refuse or ashes falling from the grate into the hopper may be allowed to accumulate, and the accumulation is continued by regulation of the 30 conveyer in order to intercept in a measure the current of air passing therethrough.

Under the arrangement shown in Fig. 3 a car 29 may be entered into the compartment 28 of the furnace below the hopper to receive 35 the contents of the hopper. In any of the arrangements described an inclined plane may be substituted for the conveyer to discharge the ashes by gravity.

Having thus described my invention, I 40 claim as new and desire to secure by Letters Patent—

1. The combination with the endless grate and a longitudinal chamber below the lower run thereof, of a vertically disposed hopper 45 closing the rear end of said chamber, and receiving at its upper open end the ashes from the inner end of the said grate, the lower open end of the grate discharging exterior to said open chamber, and means for regulating the 50 exit of ashes from the said lower open end of the hopper and thereby preventing an up draft

of air therethrough into the rear end of the furnace, substantially as described.

2. The combination with the endless grate, of a vertically disposed hopper closed except 55 at its ends and located at the discharge end of the grate to receive the ashes therefrom in its upper end, a traveling conveyer crossing the lower open end of the hopper, a portion of the lower edge of the hopper adjacent to 60 the discharge end of the conveyer being removed as at 12, whereby the conveyer will cause the hopper to retain sufficient ashes to prevent ingress of air through the lower end of the hopper, substantially as described. 65

3. The combination of the furnace having an endless grate, an ash pit therebelow and a horizontal partition between the lower run of the grate and the ash pit, thereby forming a chamber under the grate open at its front 70 end, with a vertically disposed hopper closing the rear end of said chamber, receiving ashes at its upper open end from the inner end of the grate and discharging at its lower open end through said partition into the ash pit 75 and means at said lower open end for regulating the discharge of ashes and preventing ingress of air through the hopper into the furnace, substantially as described.

4. The combination of the furnace having 80 an endless grate, an ash pit thereunder open at one end and a horizontal partition between the lower run of the grate and the ash pit thereby forming a chamber open at the furnace front, with the vertically disposed hopper closing 85 the rear end of said chamber, receiving the ashes at its upper open end from the inner end of the grate, and extending at its lower open end through said partition into the ash pit, the lower edge of the hopper facing the 90 open end of the ash pit being cut away as at 12, and an endless conveyer extending longitudinally through the ash pit with its upper run crossing the lower open end of the said hopper for regulating the discharge of ashes 95 and preventing ingress of air, substantially as described.

EDW. P. EASTWICK, JR.

Witnesses:

HELEN ANNA KLEMM,  
ARTHUR S. KLEMM.