

(No Model.)

2 Sheets—Sheet 1.

A. M. GOW.  
FURNACE GRATE.

No. 549,913.

Patented Nov. 19, 1895.

Fig. 4.

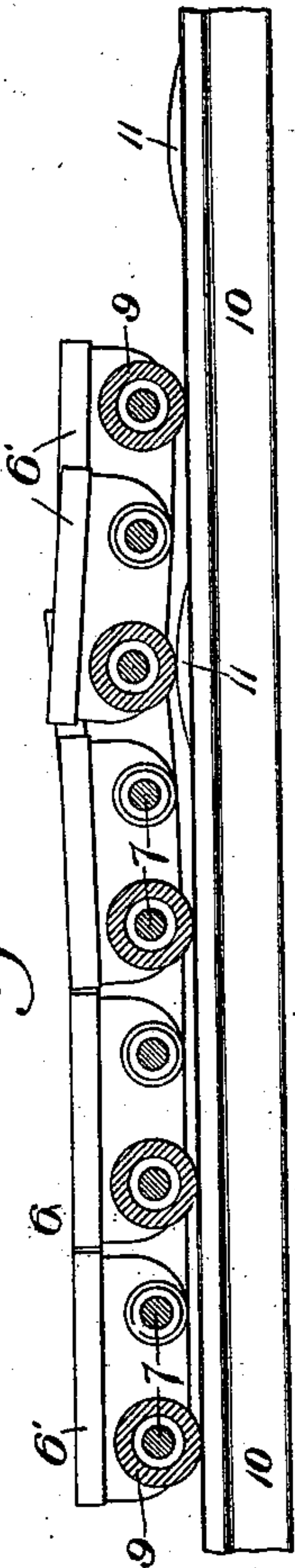
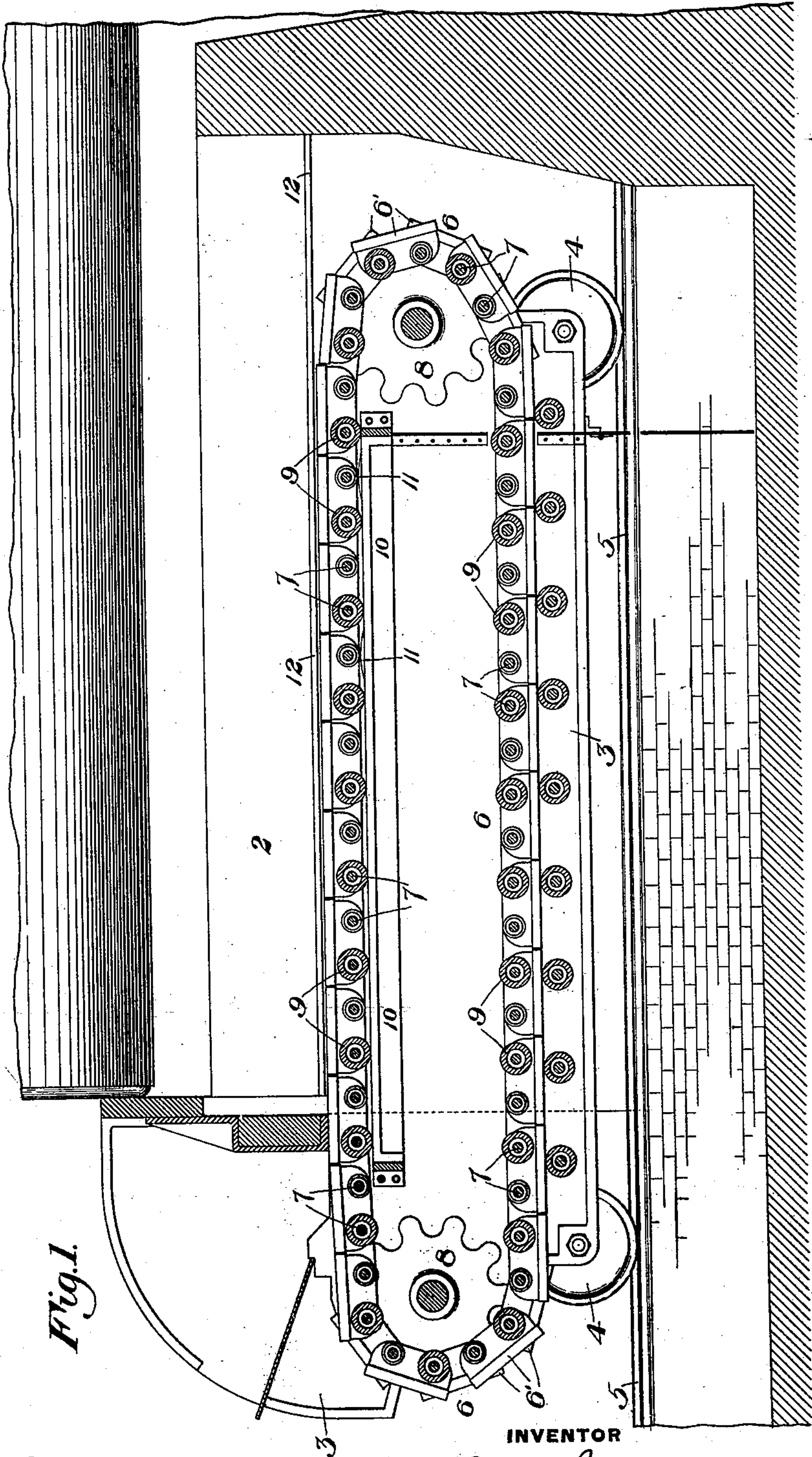


Fig. 1.



WITNESSES

*H. M. Corwin*  
*Warren H. Swartz*

INVENTOR

*A. M. Gow*  
*by Caxwell & Caxwell*  
*his Attorneys.*



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Fig. 3.

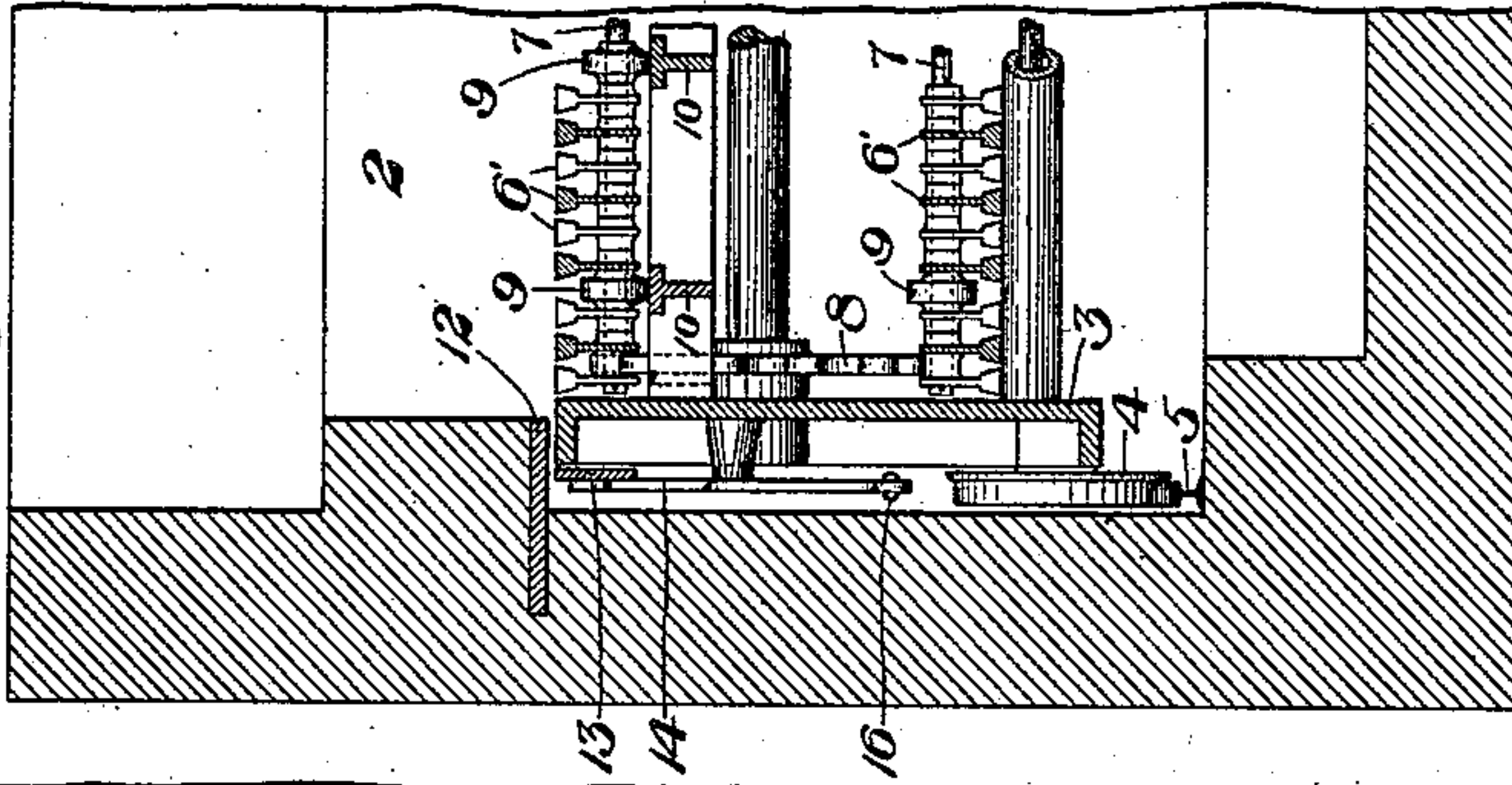
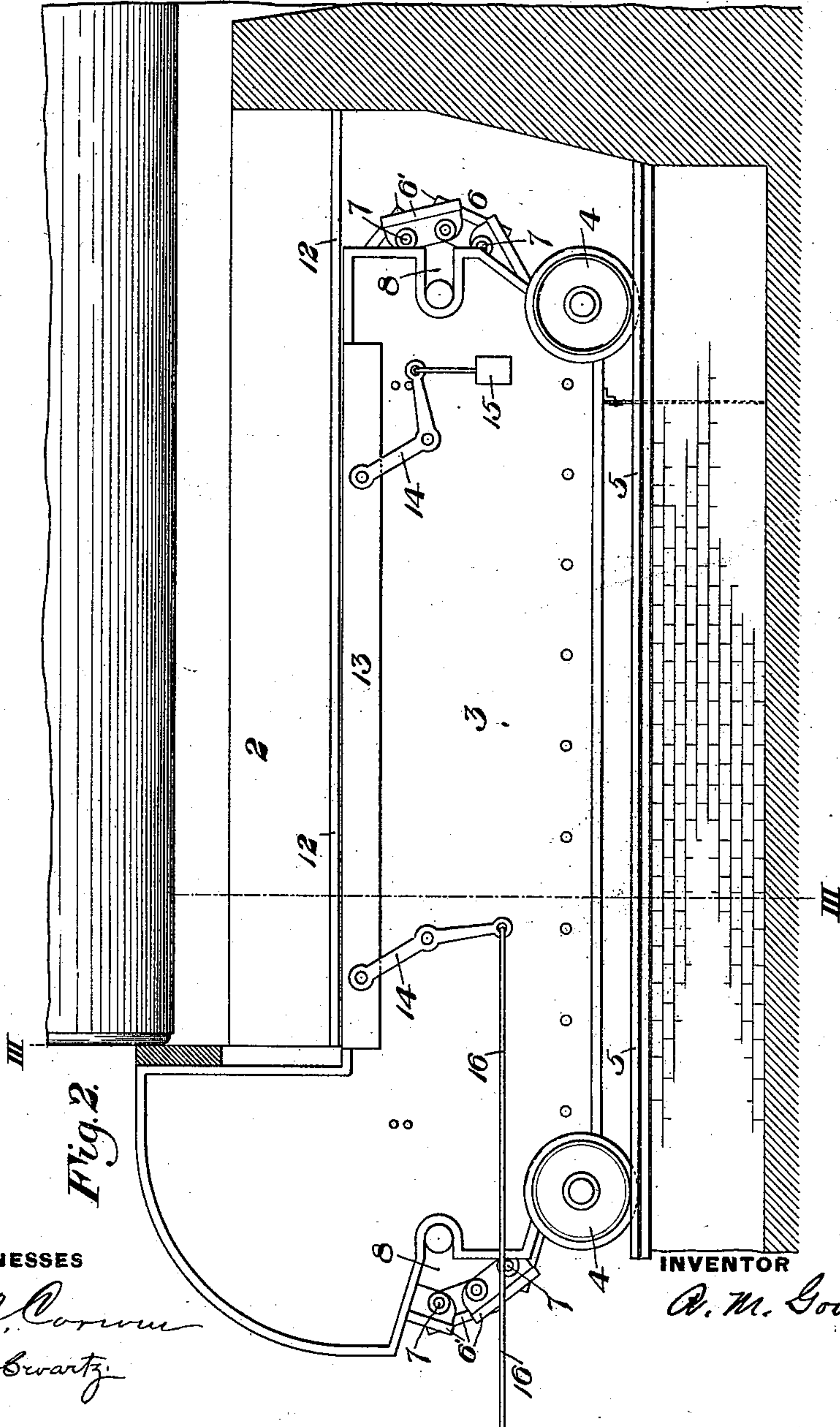


Fig. 2.



WITNESSES

*H. M. Corwin*  
*Marvin H. Swartz*

INVENTOR

*A. M. Gow.*



# UNITED STATES PATENT OFFICE.

ALEXANDER M. GOW, OF PITTSBURG, PENNSYLVANIA.

## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 549,913, dated November 19, 1895.

Application filed May 2, 1895. Serial No. 547,881. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER M. GOW, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Furnace-Grates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved apparatus. Fig. 2 is a side elevation of the grate and grate-frame. Fig. 3 is a vertical cross-section on the line III III of Fig. 2, and Fig. 4 is a detail view in side elevation.

The subject of my invention is an improvement in that form of furnace-grates known as "chain-grates," in which the grate-surface is composed of bars or blocks linked together so as to form parallel endless chains, the adjacent links being connected by cross-bars or pins, and the chains passing over end sprocket-wheels in a frame which is removable bodily from the combustion-chamber. One of the sprocket-wheels being rotated by suitable mechanism, the endless chains travel longitudinally from the front to the rear of the furnace, carrying on their surface a supply of fresh fuel into the combustion-chamber, while the ashes fall off into the ash-pit at the rear turning-point of the chains. The grate thus provides both for the automatic feed of fuel and the automatic discharge of ashes.

I have invented as part of my improved grate means for breaking the clinkers which may form on the surface of the chains when hot fires are made with fuel containing a large percentage of incombustible material, and which by excluding air from the fire interfere with the operation of the furnace. This I effect by providing on the rails or tracks on which the chains are supported raised portions or waves, which cause the chains to flex or bow upwardly as they pass over them, and thus crack and break the clinkers. The number of such waves proper to be used will vary with the nature of the fuel, being greater with fuels which produce clinkers readily.

As above noted, chain-grates are preferably built with frames which are removable from the furnace, and are therefore inde-

pendent of the furnace-walls, the frame being for this purpose provided with wheels running upon tracks in the ash-pit. To provide for closing the spaces between the side frames of the grate and the brickwork, so as to prevent the access of cold air therethrough to the top of the fire and the consequent checking of the draft through the spaces between the chains, I build into the side walls of the furnace wall-plates, which project over the side frames of the grate, and I close the vertical space between the top of the side frames and the wall-plates by vertically-movable guard-plates hung on the side frames and adapted to be moved vertically into contact with the wall-plates above. I prefer that these guard-plates should be mounted on links and bell-crank levers, which can be raised after the grate-frame has been run into the furnace, but other mechanism can be used to raise the plates. It has been proposed to close the space above mentioned by building the side walls of the combustion-chamber so that they shall converge or slant, and so that the grate-frame when inserted shall wedge between them; but such plan is objectionable, because the expansion of the parts when heated is apt to burst the walls and to displace the wall-plates. Such expansion is provided for in my apparatus by weighting the bell-crank levers, so that the guard-plates, under all conditions, shall be pressed slightly against the under side of the wall-plates.

In the drawings, 2 represents the combustion-chamber of the furnace.

3 is the grate-frame. 4 4 are its supporting-wheels, which run upon a track 5 within the ash-pit.

6 6 are the endless chains, composed of links 6'.

7 7 are the cross bars or pins connecting the adjacent links.

8 8 are the end sprocket-wheels journaled in the frame.

9 9 are the wheels or rollers of the links journaled on the cross bars or pins 7 7.

10 10 are the horizontal and longitudinal rails fixed to the frame upon which the wheels or rollers 9 9 travel, and 11 11 are waves or elevations on said rails, which cause the links to bow upwardly and to break the clinkers as the chain-wheels pass thereover.



12 12 are the wall-plates set horizontally in the side walls of the combustion-chamber.

13 13 are the guard-plates pivotally supported by bell-crank levers 14 to the sides of the grate-frame, and having weights 15 which tend to elevate them, and 16 is a hand-rod by which said bell-crank levers may be turned in either direction.

The operation of the parts above mentioned will be understood from the foregoing general description.

The advantages of the invention will be appreciated by those skilled in the art.

Within the scope of the invention, as defined in the claims, many modifications in the form and construction of the apparatus may be made by the skilled mechanic, since

What I claim is—

1. A chain-grate comprising endless chains, and longitudinal supporting rails upon which they run, said rails having elevations or waves over which the chains pass and by which they are caused to bow or flex upwardly and to break the clinker; substantially as described.

2. In a chain grate, the combination of a removable frame by which the chains are car-

ried, and vertically movable guard-plates carried at the sides of the frame and adapted to close the space between the frame and the furnace wall plates; substantially as described.

3. In a chain grate, the combination of a removable frame by which the chains are carried, vertically movable guard-plates carried at the side of the frame and adapted to close the space between the frame and the furnace wall plates, and weights by which the guard-plates are forced upwardly; substantially as described.

4. In a chain grate, the combination of a removable frame by which the chains are carried, vertically movable guard-plates carried at the sides of the frame and adapted to close the space between the frame and the furnace wall plates, and levers or links on which the guard-plates are pivoted; substantially as described.

In testimony whereof I have hereunto set my hand.

ALEXANDER M. GOW.

Witnesses:

W. B. CORWIN,

H. M. CORWIN.