

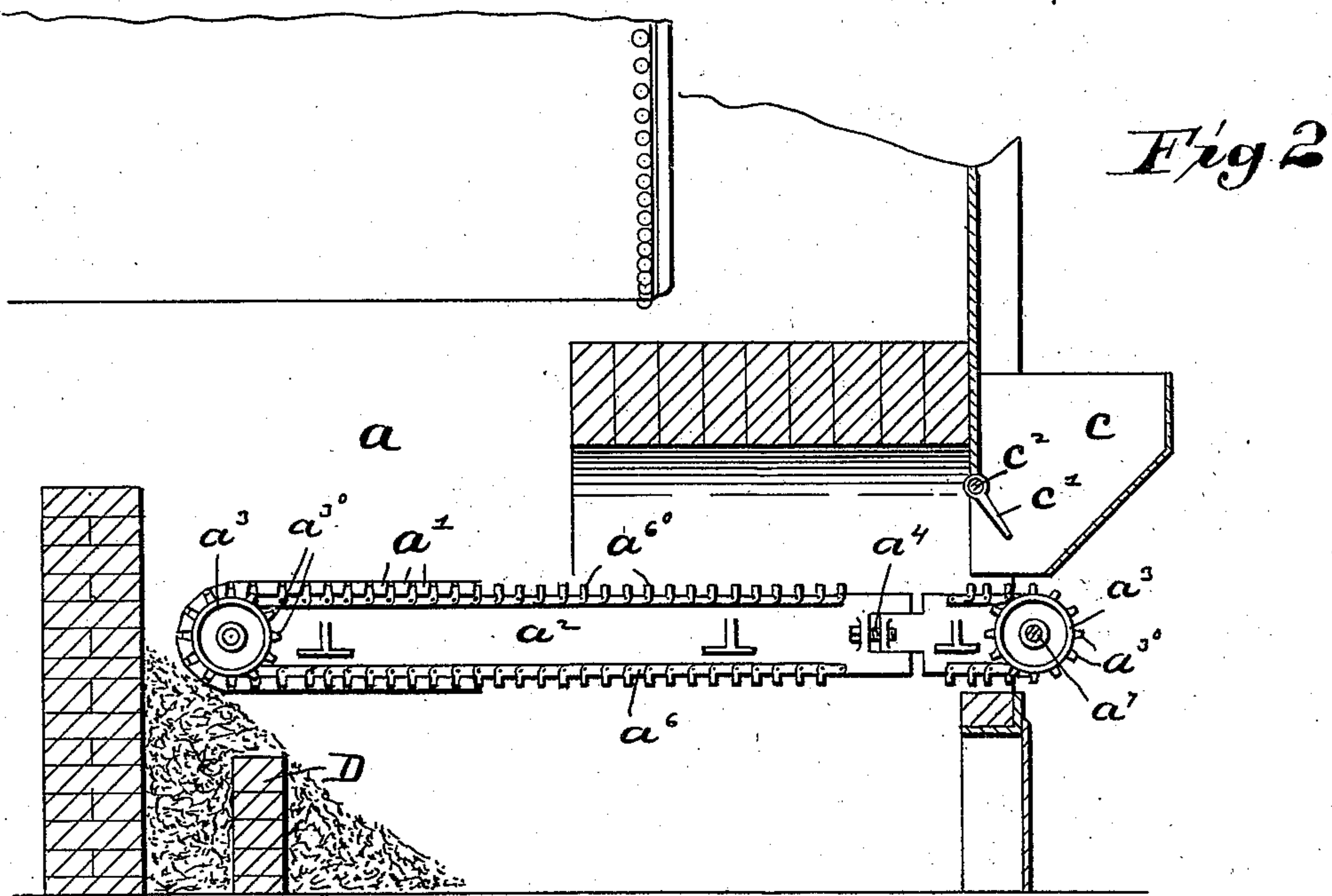
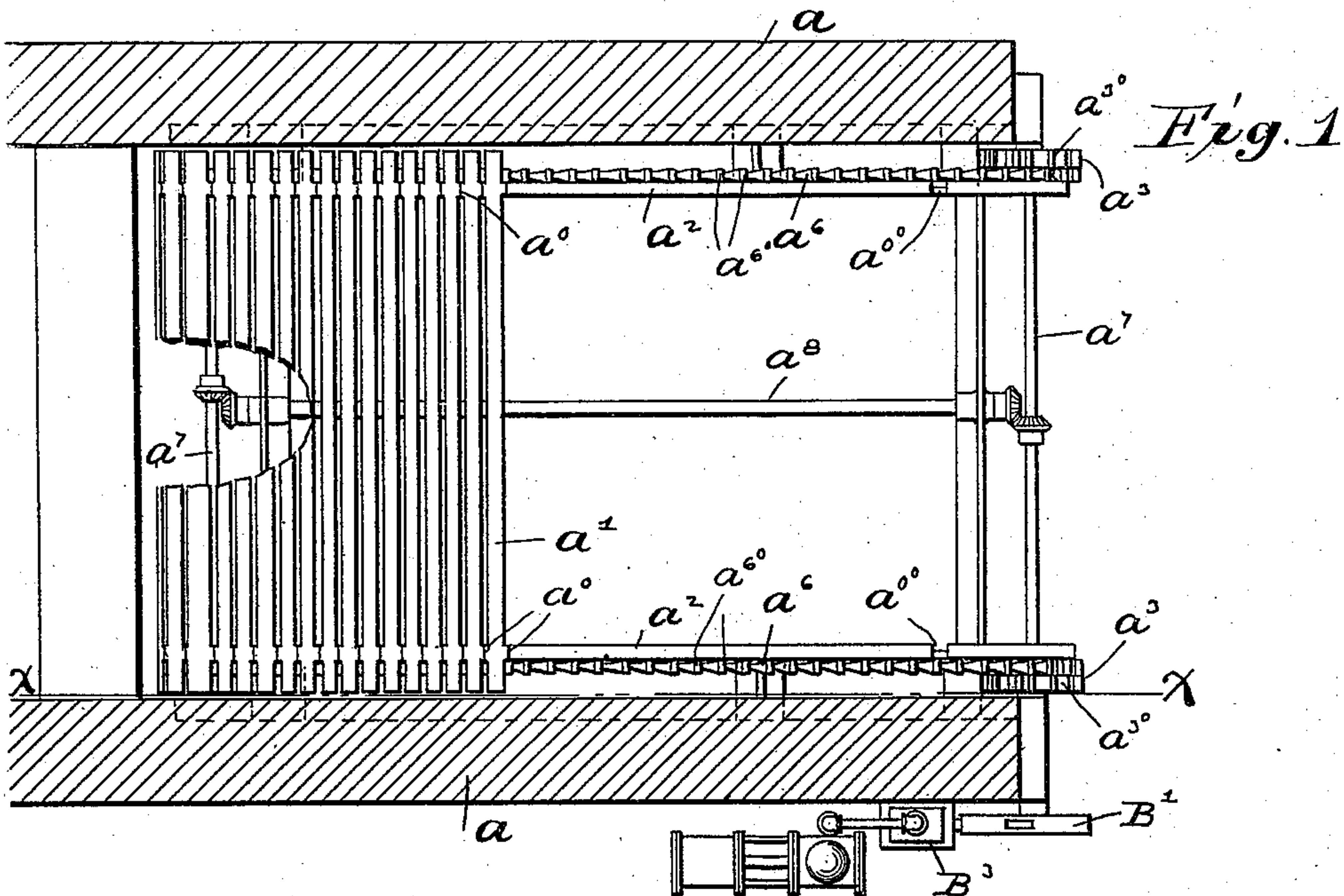
(No Model.)

2 Sheets—Sheet 1.

H. F. WEINLAND.
FURNACE GRATE.

No. 576,927.

Patented Feb. 9, 1897.



Witnesses
W. W. Spencer
E. F. Reissner

Inventor
Henry F. Weinland
By His Attorney
Alvaro S. Krotz

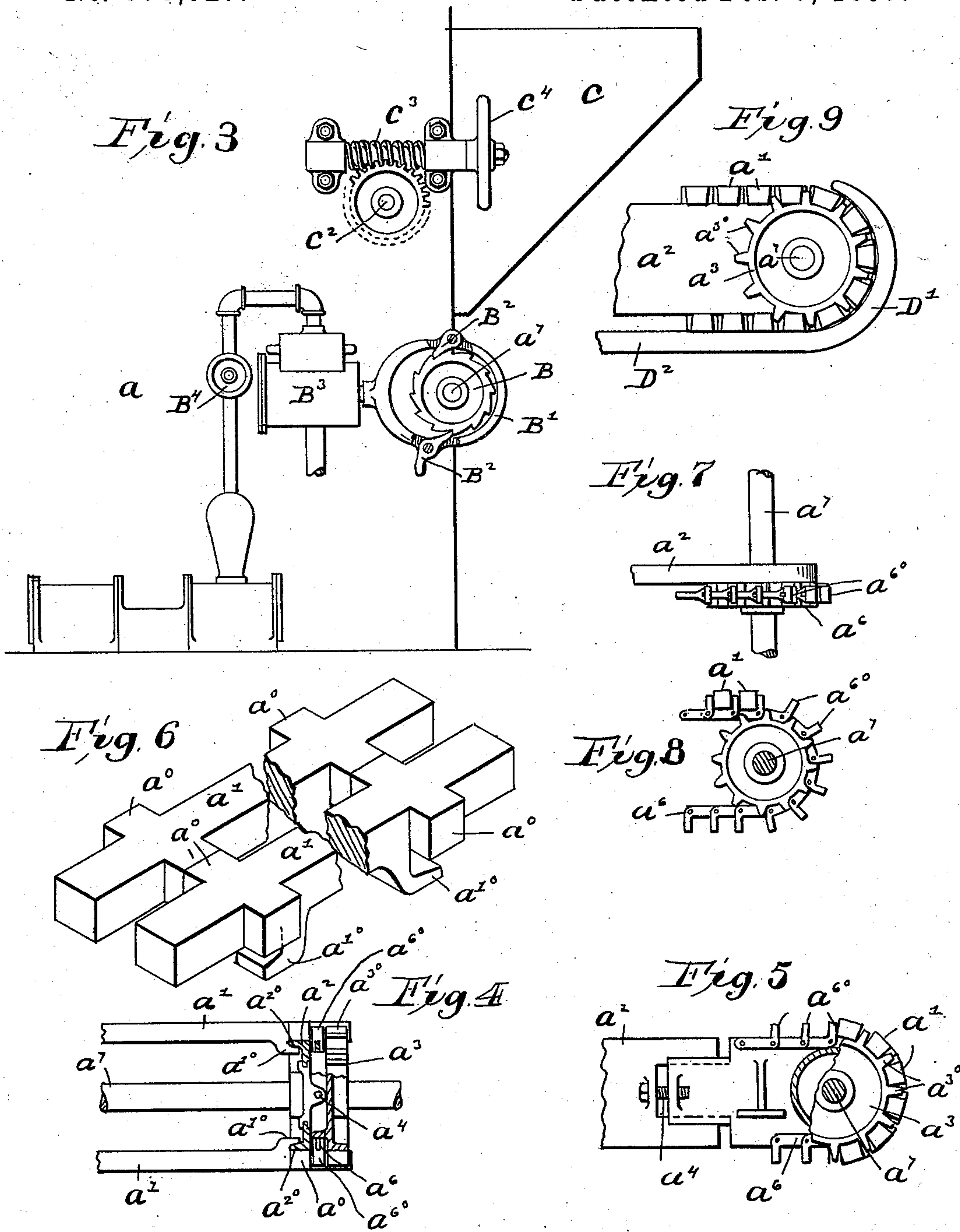
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UNITED STATES PATENT OFFICE.

HENRY F. WEINLAND, OF SPRINGFIELD, OHIO.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 576,927, dated February 9, 1897.

Application filed August 29, 1896. Serial No. 604,297. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, a citizen of the United States, residing at Springfield, county of Clark, State of Ohio, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification.

My invention relates to improvements in furnace-grates of the endless type.

10 The object I have in view is to produce a traveling grate simple in construction, economical in operation, and to provide an easy and convenient renewal of the grate-bars.

15 A further object I have in view is to provide a simple and efficient motive power.

I accomplish these results by the use of independent grate-bars with spacing-lugs placed around an endless frame, with driving-gears at each end, with teeth which mesh in the space between the grates, and by driving the grates by means of a reciprocating water-motor in combination with other novel features, as hereinafter described.

25 In the accompanying drawings, Figure 1 is a plan view with part of the grates removed; Fig. 2, a sectional side view taken on a line at X of Fig. 1. Fig. 3 is a view of the motor and connections and adjusting device. Figs. 4, 5, 6, 7, 8, and 9 are detailed drawings and 30 modifications.

In Fig. 1, A A are the furnace-walls. A' are the grates placed crosswise in the furnace and supported on the framework A². The framework A² is provided with a flange A²⁰, as shown in Fig. 4.

35 The grate-bars A', Fig. 6, have on their under side a lug A¹⁰, which fits loosely around the flange A²⁰. This serves to hold the grates in place and prevents their leaving the framework. A piece of the flange is cut away at A⁰⁰ to provide for inserting the grates, and lugs A⁰ are provided for holding the grates the desired distance apart. The space thus provided between the grates corresponds in 45 width and distance apart with the teeth on the driving-wheels A³. The framework A² supports the flange A²⁰ on a line between and around the periphery of the driving-wheels A³. The frame A² is made adjustable in length by means of set-screw A⁴. Thus when 50 the entire length of framework, top, bottom, and end, is filled or covered with bars the

frame A², Fig. 5, is shortened by means of the set-screw A⁴ until the lugs A⁰ come together and the teeth A³⁰ mesh between the grates. Thus if the wheel A³ is revolved the entire set of bars will be shoved around the framework.

In some cases I prefer to use a spring in place of the set-screw A⁴ to prevent the spreading of the grates, and as a further modification and for a positive spacing of bars A', I provide endless chains A⁶ with lugs A⁶⁰ on the links. This chain, which I term a "spacing-chain," fits around an extension of the frame A² and wheels A³, so that the lugs on the links fit between the bars A'. The chain is carried around by the grates, which are in turn held the proper distance apart, so as to always mesh with the driving-teeth A³⁰. The driving-wheels A³ are mounted on a shaft A⁷ and when preferable a driving-gear A⁸ is provided. The front shaft A⁷ extends through the wall A and is provided on its outer end with a sprocket-wheel B, around which is located a rack B', with dogs B², and adapted to turn the gear B when the rack B' is reciprocated, which movement is accomplished by means of the reciprocating water-motor B³, the speed being adjusted by means of the valve B⁴. In some cases I prefer to place this motor in circuit with the feed-water pipe to the boiler or heater, and in other cases the water for operating the motor is taken from any convenient source.

Referring to Fig. 2, C is the receptacle for the coal. C' is the coal-adjusting gate for regulating the thickness of the bed through the medium of a supporting-shaft C² and worm-gear C³ and hand-wheel C⁴. A wall or partition D is located below and near the back end of the grate, so that the ash-pit can be cleaned and yet enough ash remain to prevent air passing into the furnace around the back end of the grates.

95 Figs. 7 and 8 show a modified form in which the links of the spacing-chain mesh with the driving-wheel teeth. The grate-bars being placed independently between the lugs A⁶⁰ the lugs A⁰ can be dispensed with in this case, as the bars would be held the proper distance apart by the links and their lugs. I do not wish to confine myself to any particular detail construction, as it is evident 100

slight changes could be made without departing from the scope of the invention. In some cases I prefer to make the grate-bars wider, providing an opening within the said bars for the driving-teeth or the lugs on the chain-links, and in some cases I dispense with the lugs A¹⁰ and provide a supplementary frame D², Fig. 9. Thus the grates slide on the upper surface of the frames thus provided, the curved part D', which is attached to the lower part D², thus preventing the grates from leaving the wheels A³.

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

1. In a furnace-grate the combination with a frame with flanges as described, grate-bars located around said framework and held to the same by a lug supported loosely under said flange, and an endless chain with lugs on the links, said lugs adapted to hold the grates in proper relation with each other, the chain passing around a frame or guide to correspond with the travel of the grate-bars, driving-wheels with teeth located at and corresponding with the curved part of the framework, the teeth of the said driving-wheels meshing into or between the grates and adapted to drive the same around the frame.

2. In a furnace-grate of the endless type the combination with an endless framework

or guide, driving-wheels with teeth located to correspond with the curved part of the endless frame, an endless chain passing around the wheels on opposite ends of the framework, the links of said chain having raises or lugs which are adapted to keep grate-bars placed around the endless frame in position and to move them around the endless frame when the driving-wheels are revolved substantially as shown and described.

3. In a furnace the combination with endless driving-chains supported around driving-wheels as shown and described, the links of said driving-chains having raises or lugs between which are placed the grate-bars, said lugs keeping the grate-bars the desired distance apart.

4. In a furnace-grate the combination with a frame or framework, adapted to guide and support grate-bars in an endless chain, an endless chain with spacing-lugs on the links supported on a line with the framework, the said lugs meshing into or between the grates as and for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY F. WEINLAND.

Witnesses:

ROBERT C. RODGERS,
OLIVER H. MILLER.