

969,745.

C. A. CARLETON.
FURNACE.

APPLICATION FILED MAR. 30, 1910.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 1.

Fig. 2.

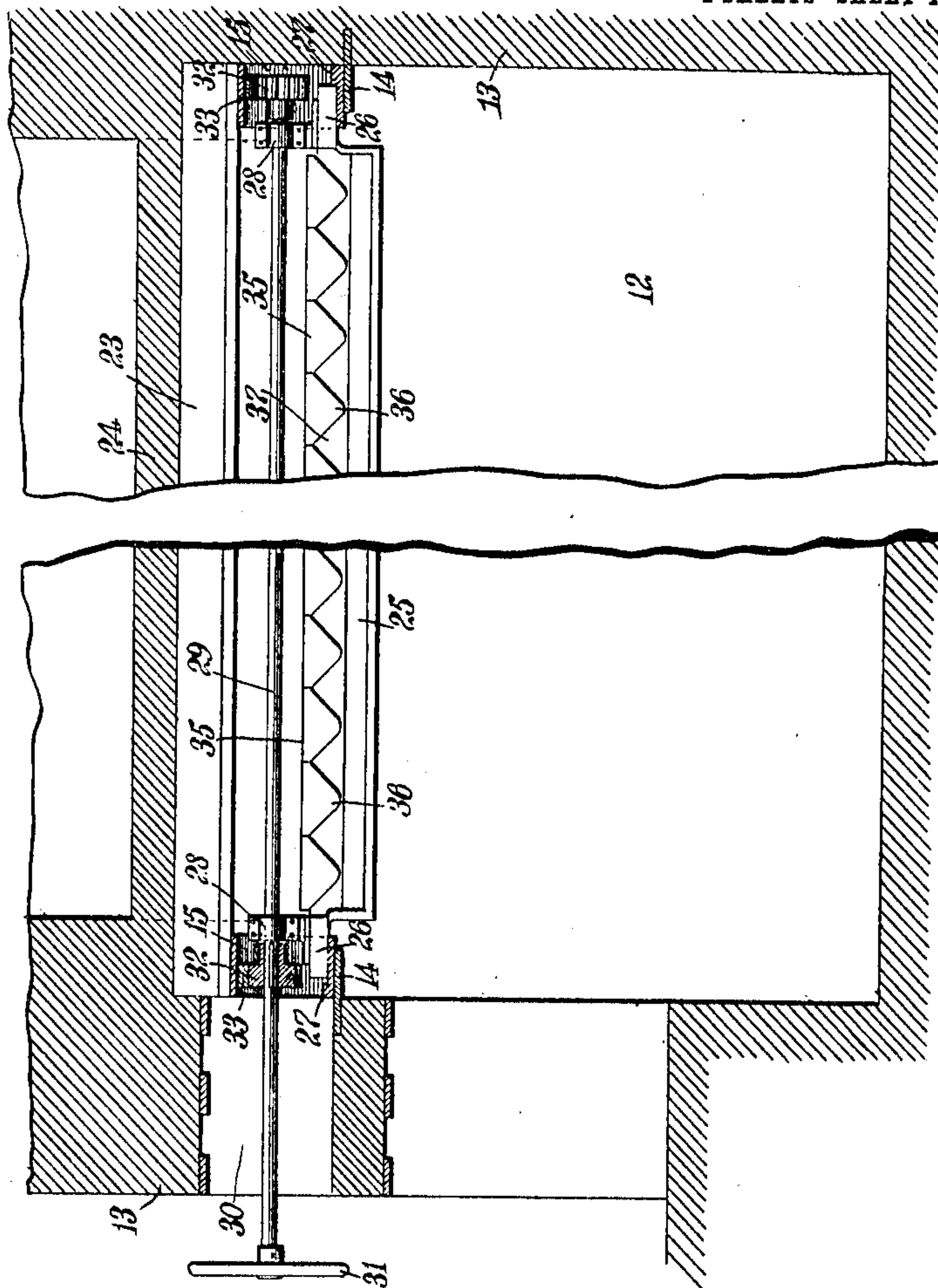
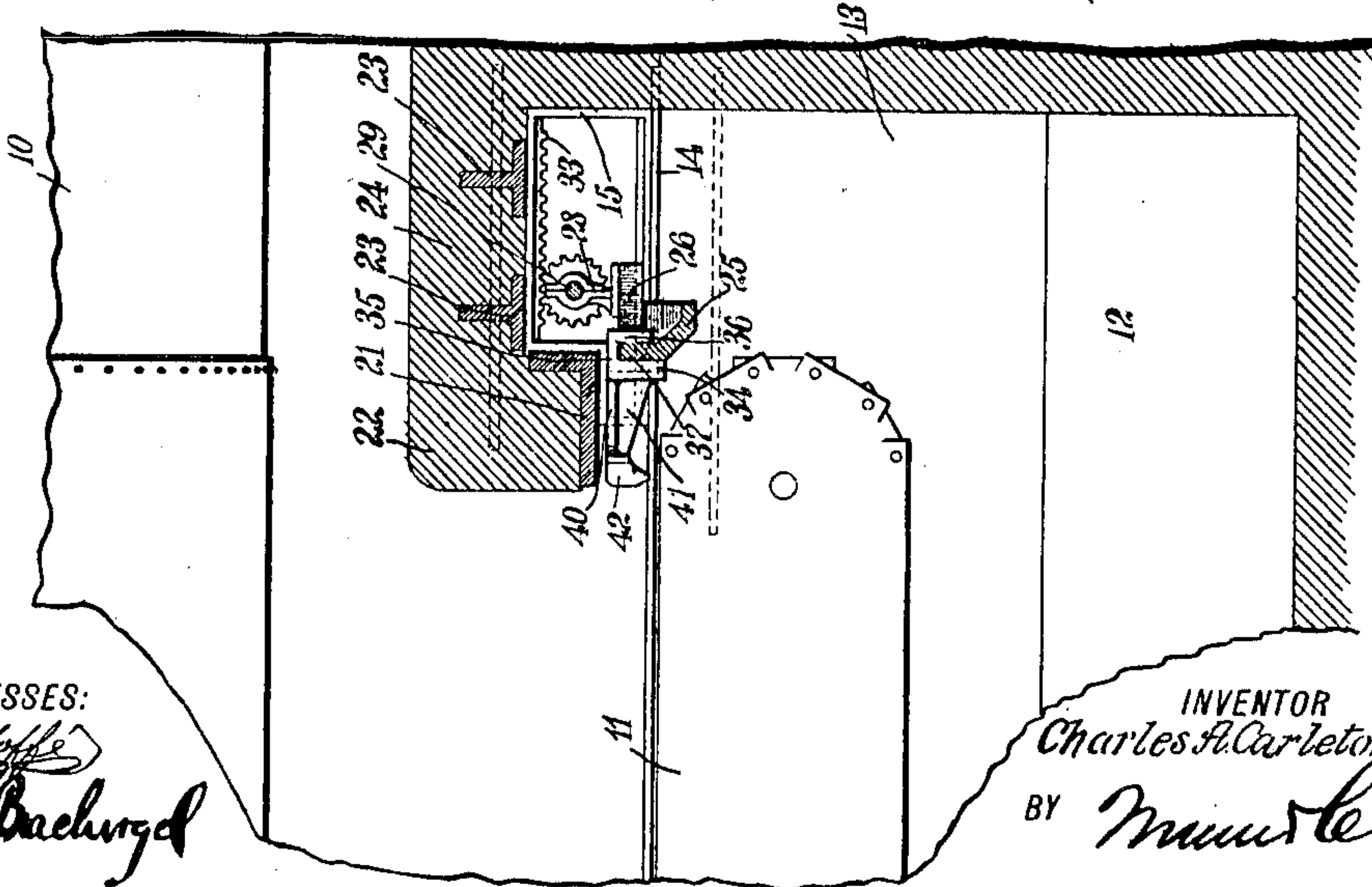


Fig. 1.



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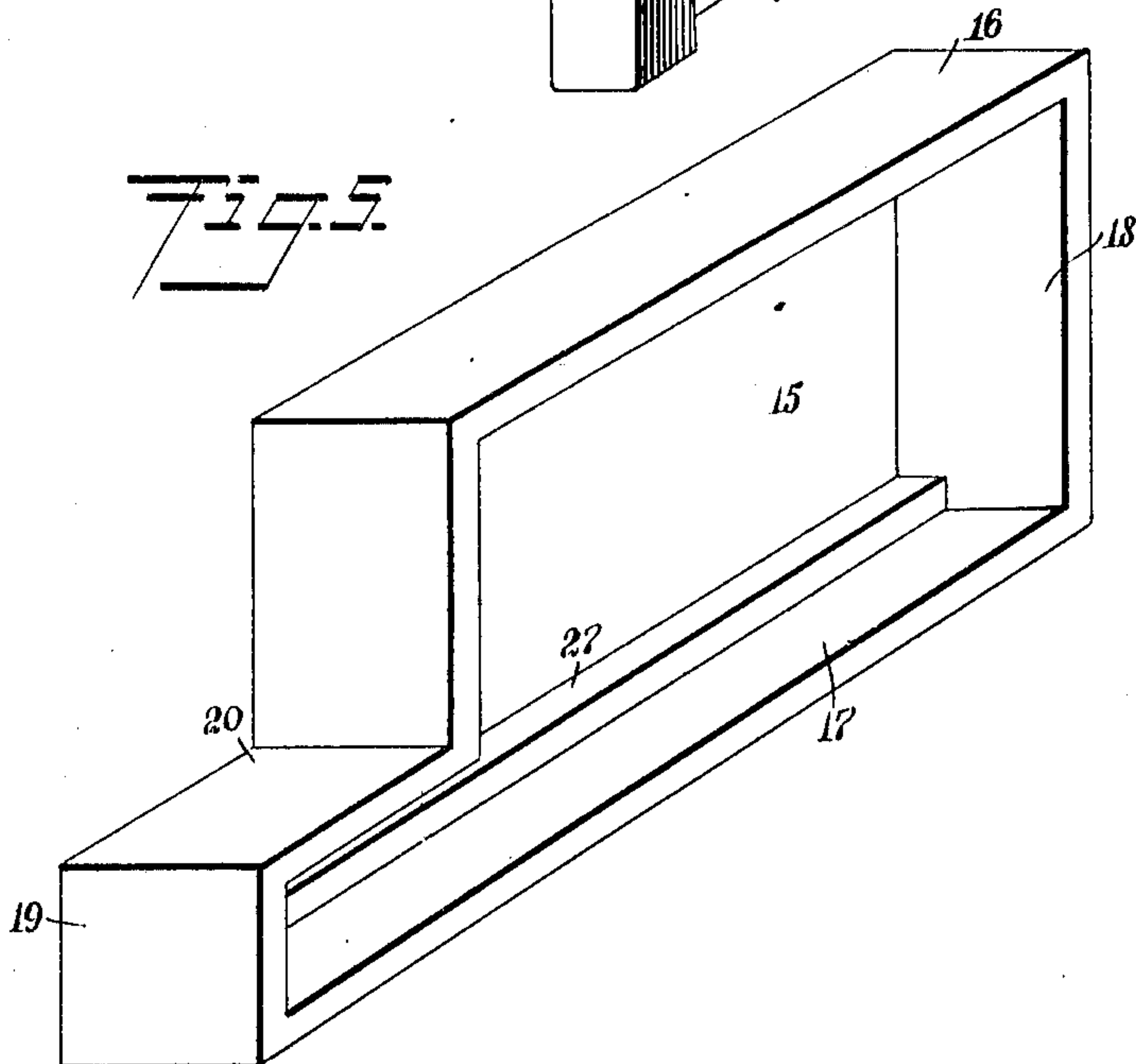
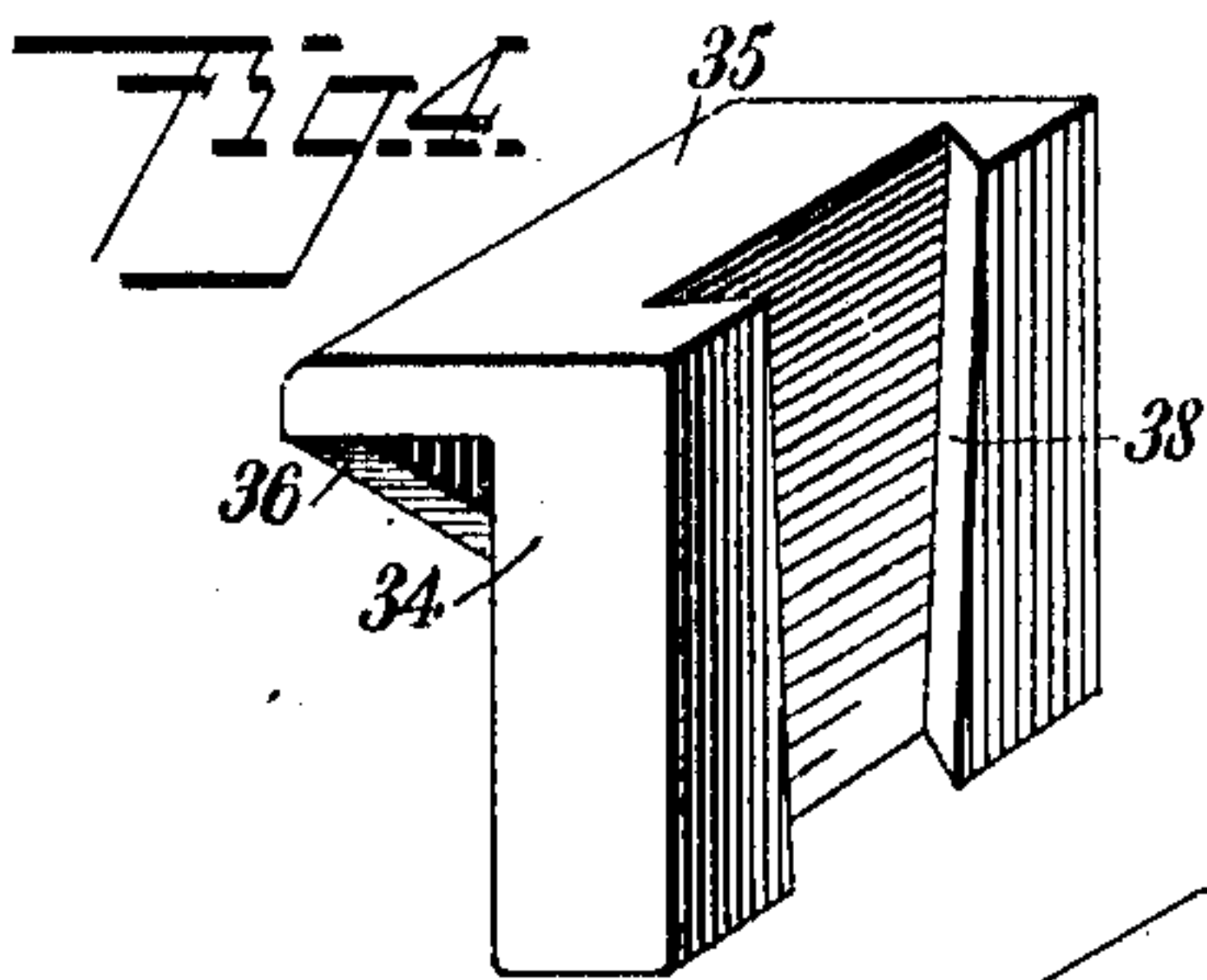
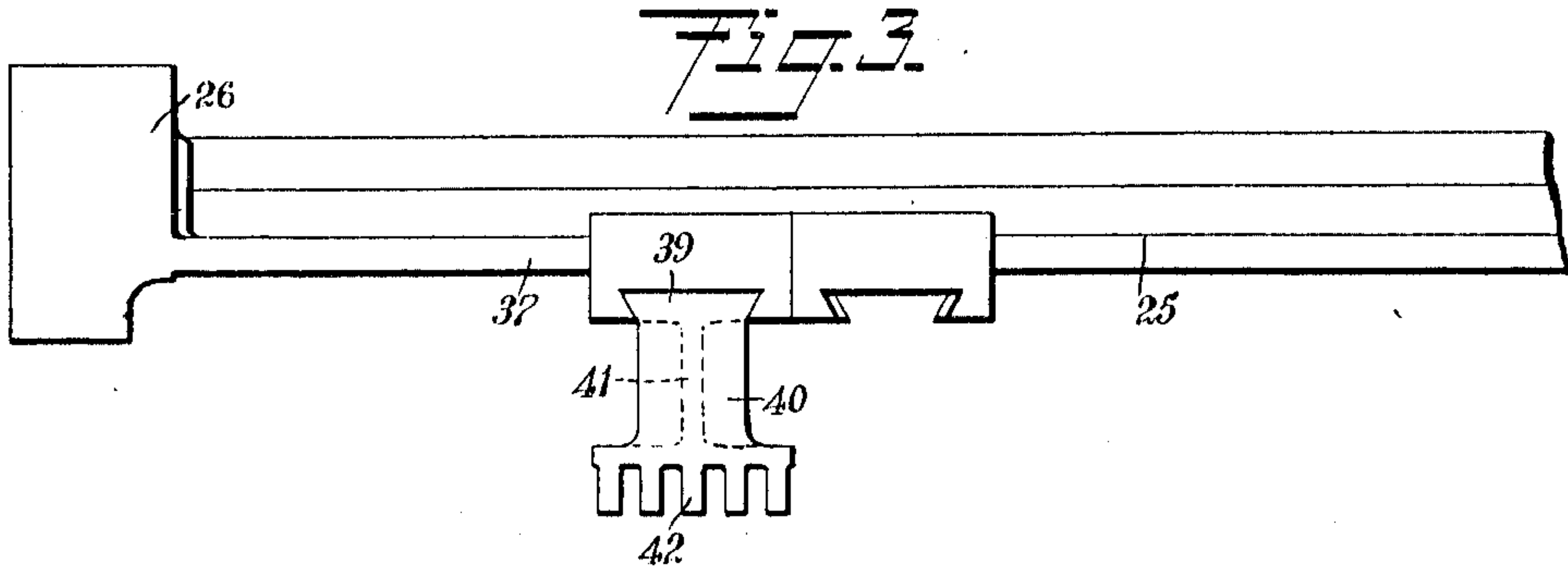
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2 SHEETS—SHEET 2.

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UNITED STATES PATENT OFFICE.

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FURNACE.

969,745.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application Filed March 30, 1910. Serial No. 552,295.

To all whom it may concern:

Be it known that I, CHARLES A. CARLETON, a citizen of the United States, and a resident of Cumberland Mills, in the county of Cumberland and State of Maine, have invented a new and Improved Furnace, of which the following is a full, clear, and exact description.

This invention relates to furnaces used in connection with boilers and the like, and has reference more particularly to a furnace in which the grate has associated therewith an adjustable stop for limiting the movement of the fuel bed.

The object of the invention is to provide a simple and efficient furnace for use in connection with steam boilers and the like, in which the fuel bed formed by the mass of burning coal or other combustible is gradually moved into the furnace, by means of a mechanical stoker or in any other manner, in which the movement of the fuel bed is limited, to prevent unconsumed fuel from falling into the ash pit, in which the movement of the ash to the ash pit is not hindered, in which the stop can be easily adjusted, and in which certain of the parts when worn out can be replaced without difficulty and without interfering with the operation of the furnace.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth 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 views, and in which—

Figure 1 is a longitudinal section of part of a furnace having an embodiment of my invention applied thereto; Fig. 2 is a transverse section of the furnace having parts broken away; Fig. 3 is an enlarged, front elevation of a part of the furnace, showing one of the stops and the means for mounting it in position; Fig. 4 is a perspective view of one of the saddles used for mounting the stops in position; and Fig. 5 is a perspective view of a housing or slide bearing used for adjustably carrying the stops.

Before proceeding to a more detailed explanation of my invention, it should be clearly understood that while the invention is particularly useful in connection with

furnaces having mechanical stokers of the chain-grate type, it can also be advantageously employed with other furnaces in which the fuel bed is gradually moved toward the rear of the furnace, mechanically or otherwise. The stops may be of any suitable number, depending upon the size of the furnace. They are arranged at the rear end of the grate, and spaced slightly above the same, so that they serve to limit the movement of the unconsumed fuel of the fuel-bed, while permitting the lower layers of ash to pass under them, into the ash pit. By preventing unconsumed fuel from falling into the ash pit, a considerable economy is effected, and needless waste of fuel is obviated. The stops are adjustable and can be withdrawn to permit clinkers to pass into the ash pit should the fuel bed include such aggregations of material.

In connection with my invention, I provide suitable means for supporting the bridge wall of the furnace and the fire-brick covering connecting the bridge-wall and the flame bed, as will appear more clearly hereinafter.

Certain of the details of construction form no part of the invention, and can be varied in accordance with individual preference and special conditions, without departing from the underlying spirit of the invention.

Referring more particularly to the drawings, I have shown, for example, a furnace of a boiler 10, having a chain-grate 11 terminating at the rear above the ash pit 12. Coal or other fuel is fed to the grate at the front of the boiler in the usual manner, and gradually progresses with the movement of the grate, to the ash pit. The side walls 13 of the furnace, at the rear end of the grate are provided with inwardly extending plate carriers 14, upon which are mounted housings or slide bearings 15. These are preferably fashioned from cast metal and comprise rectangular frames consisting of upper and lower members 16 and 17, and end members 18 and 19. The end members 19, at the upper corners are inwardly offset to form seats 20 for a bridge wall support 21, which is of L cross-section, and carries the bridge wall 22. The support, it will be understood, extends transversely of the furnace, from one of the housings to the other. The upper members 16 of the housings also carry T-iron

cross bars 23, which serve to support the cover 24 of fire-brick or the like, which connects the bridge-wall and the flame-bed of the furnace.

5 The lower members 17 of the housings constitute bearing surfaces for a slidable, transverse slide bar carrier 25 which is of angular cross section, and has upwardly offset bearing ends 26 which rest movably upon
10 the bearing surfaces 17 of the bearings 15. The lower members 17 have upwardly disposed flanges 27 at their outer edges, which serve to prevent the lateral displacement of the carrier 25. Bearings 28 are mounted
15 upon the ends 26 of the carrier, and have journaled therein a shaft 29. This extends at one end through an opening 30 in one of the side walls of the furnace, and at the projecting end is provided with a hand
20 wheel 31 by means of which it can be manipulated. The shaft has keyed or otherwise rigidly secured thereon, within the housings 15, gears 32 which mesh with racks 33 secured at the under sides of the upper mem-
25 bers 16 of the housings. The provision of the gearing permits the carrier to be moved longitudinally of the housings when the shaft is rotated by means of the hand wheel 31.

I employ a plurality of saddles 34 having
30 laterally disposed, upper portions 35 provided with downwardly extending retaining flanges 36 by means of which the saddles can be removably mounted upon the slide carrier, the upwardly disposed web 37 of the
35 carrier being received between the flanges 36 and the body of the saddles, so that the laterally extended parts 35 thereof seat upon the upper edge of the web as is shown most clearly in Fig. 1. The saddles have down-
40 wardly tapered, undercut or dovetailed grooves 38 which receive the correspondingly formed rear ends 39 of the stops 40. These consist of elongated members having strengthening webs 41, and notched or ser-
45 rated ends 42 which are downwardly extended and normally positioned above the rear end of the chain-grate. The ends 42 are spaced above the grate a distance such that the lower layers of ash can be passed
50 under them, and fall into the ash pit, while the ends are operative to prevent the movement of the unconsumed fuel over the end of the chain-grate. They therefore act as stops to limit the movement of the fuel bed.

55 The stops can be easily replaced when worn out, by moving the carrier back as far as possible from the grate. Owing to the upward draft through the furnace, the ash pit is comparatively cool, and it is possible
60 for a person to have access through the opening 30 to remove and replace the stops when the carrier is retracted. A pair of tongs is all that is necessary for this operation. It does not interfere with the working of the
65 furnace, and can be effected in a very short

time. The withdrawal of the stops from the end of the furnace also permits clinkers to be advanced into the ash pit. As soon as the clinker has fallen over the end of the grate the stops can be returned to their operative 70 positions.

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

1. In a furnace, an ash pit, bearings, a 75 movable grate adapted to carry the fuel bed toward said ash pit, a movable stop carrier located in said furnace and supported by said bearings, and a manually-operable member supported upon said carrier and in 80 operative engagement with said bearings, whereby it can be actuated from the outside of the furnace, to adjust said carrier toward and away from said grate, said carrier having means for limiting the movement 85 of the fuel bed.

2. In a furnace, a movable grate, an ash pit at the rear thereof, bearing housings at each side of said furnace adjacent to said ash pit, a carrier slidably engaging said 90 housings, and having a plurality of stops, a shaft journaled upon said carrier and projecting to the outside of the furnace, said shaft at the projecting end having means permitting its manipulation, a gear rigid 95 with said shaft, and a fixed rack in mesh with said gear.

3. In a furnace, a movable grate, an ash pit at the rear thereof, bearing housings at each side of said furnace adjacent to said 100 ash pit, said housings comprising rectangular frames having upper and lower members, end members inwardly offset to form seats, a bridge wall supported upon said seats, said lower members of said housings 105 constituting bearing surfaces and having upwardly-disposed flanges at their outer edges, a carrier slidably mounted on said lower members of said housings between said flanges and having a plurality of stops, 110 a shaft journaled upon said carrier and projecting to the outside of the furnace, said shaft at the projecting end having means permitting its manipulation, and gears rigid with said shaft, said housings having fixed 115 racks in mesh with said gears.

4. In a furnace, a movable grate, bearing housings at the sides of the furnace, a support extending transversely of said housings, a bridge wall carried by said support, 120 a further support carried by said housings and extending transversely of the furnace, a covering wall carried by said other support and extending to said bridge wall, and an adjustable stop supported by said hous- 125 ings and serving to limit the fuel bed.

5. In a furnace, a movable grate, a carrier adjustably mounted adjacent to said grate, saddles mounted upon said carrier, and stops carried by said saddles. 130

6. In a furnace, a movable grate, a movable carrier positioned adjacent to said grate, saddles removably mounted upon said carrier and having retaining flanges engaging the same, each of said saddles having a dovetailed groove, and stops having parts removably mounted in said dovetailed grooves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. CARLETON.

Witnesses:

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W. M. LAMB.