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Patented Oct. 15, 1901.

R. S. MOORE.

TRASH FEEDER FOR BAGASSE FURNACES.

(Application filed Dec. 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.

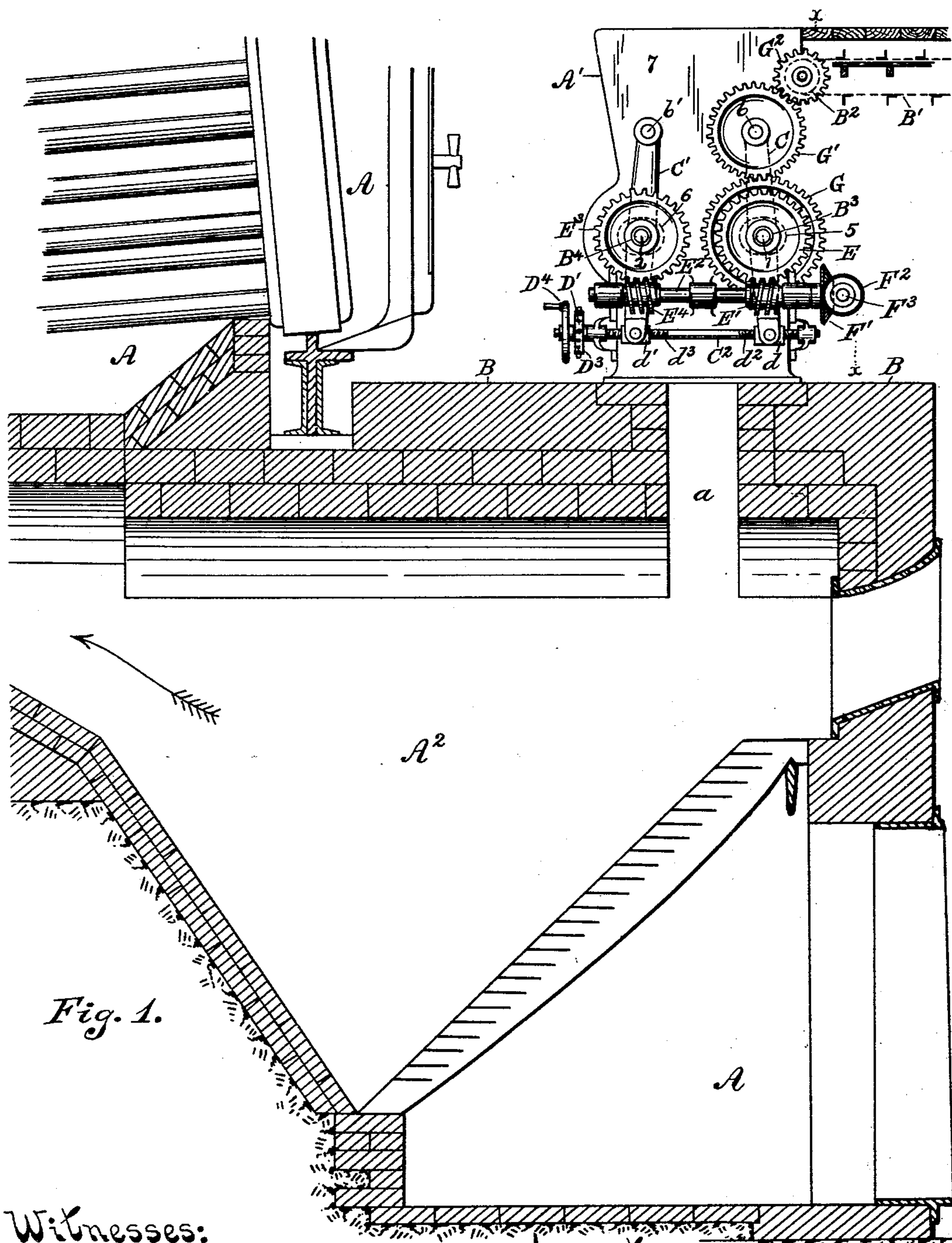


Fig. 1.

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TRASH FEEDER FOR BAGASSE FURNACES.

(Application filed Dec. 18, 1899.)

(No Model.)

2 Sheets—Sheet 2.

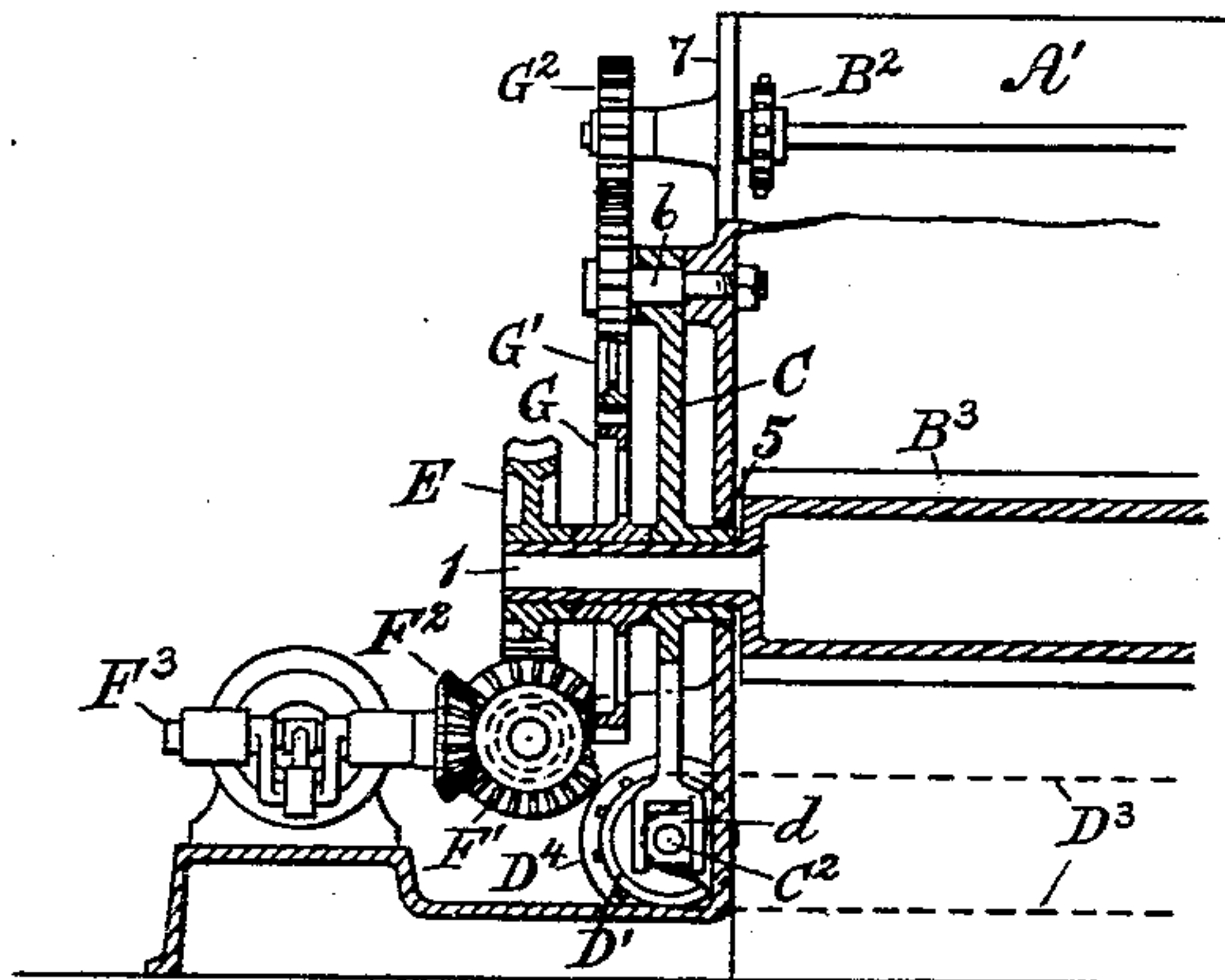


Fig. 2.

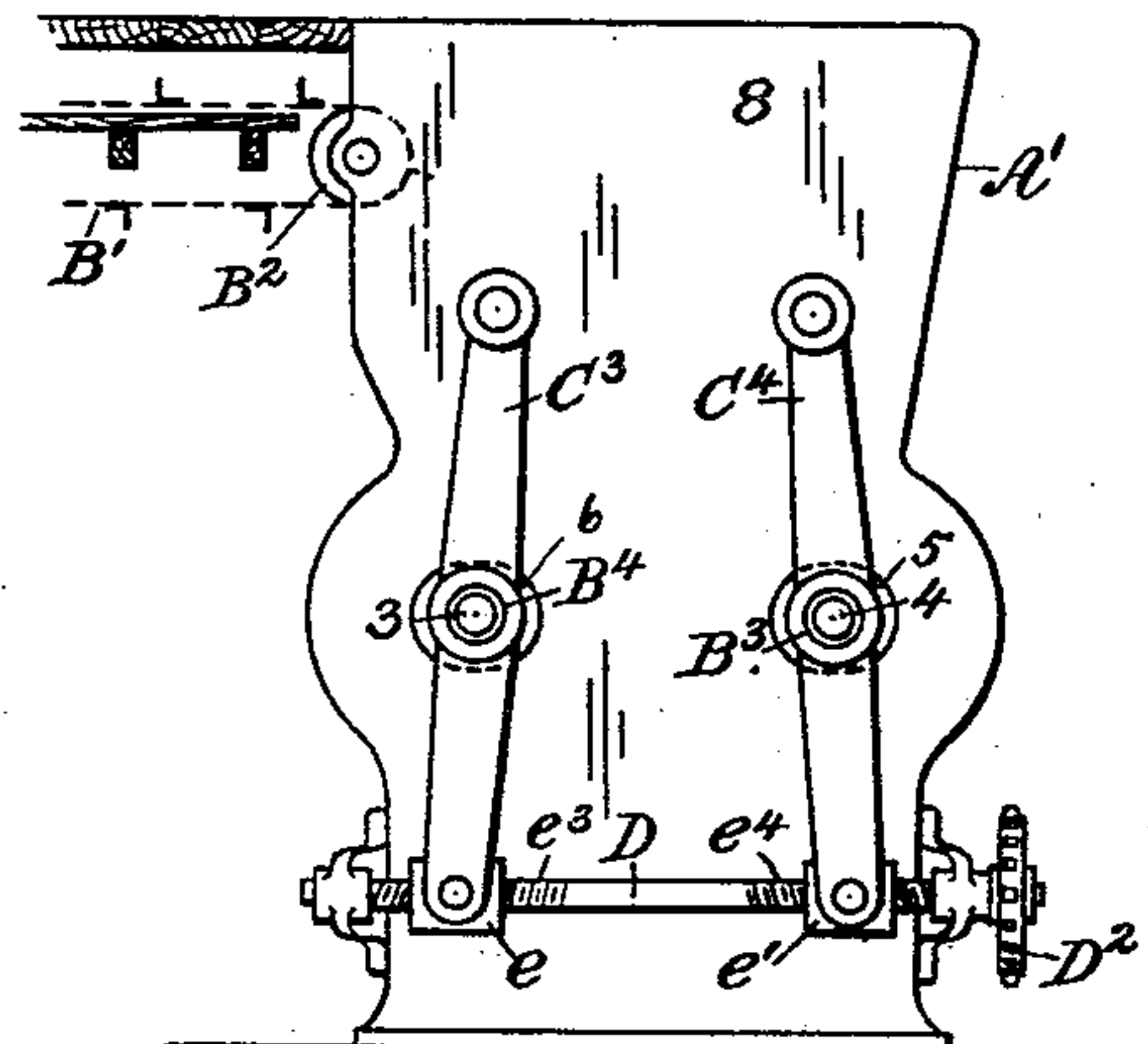


Fig. 4.

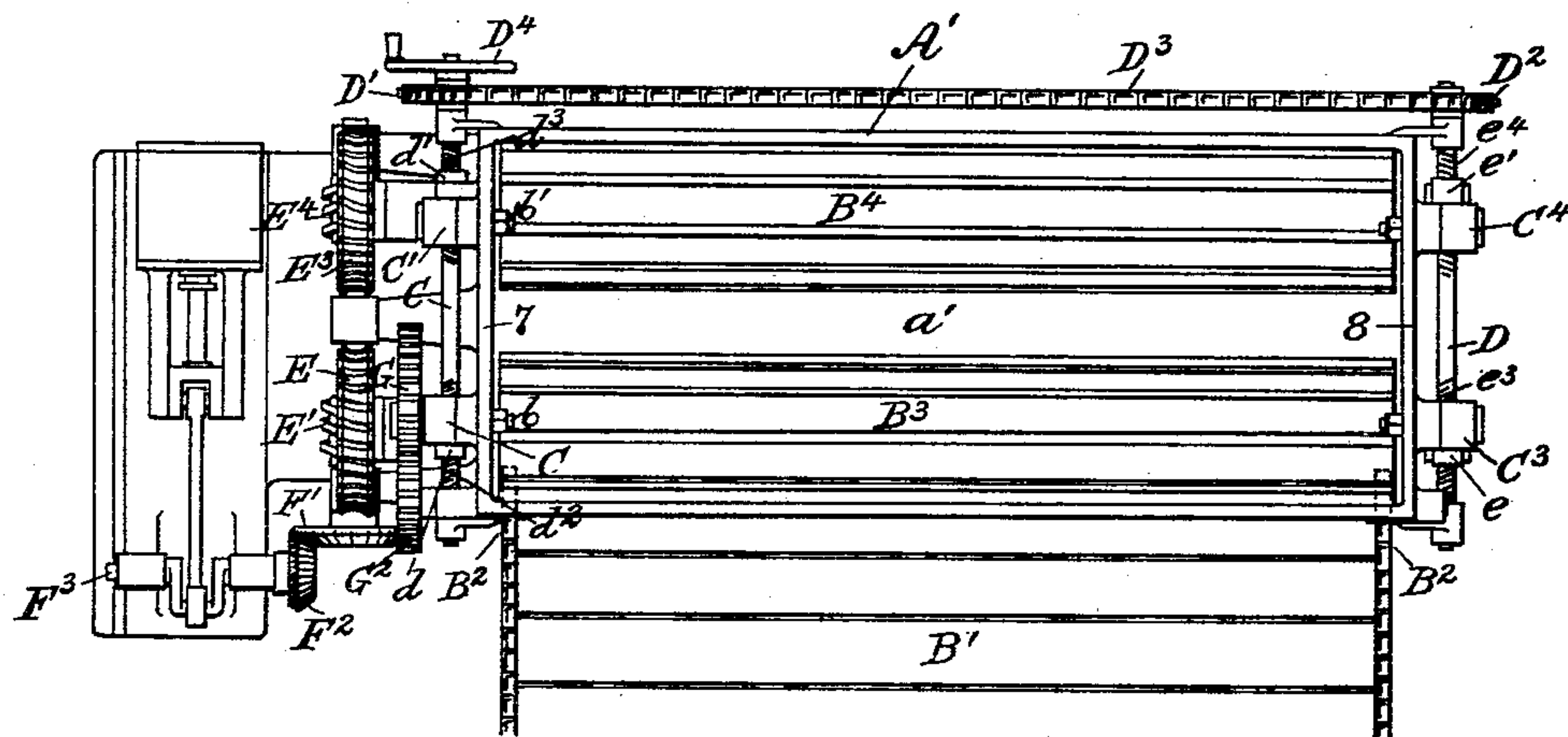


Fig. 3.

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UNITED STATES PATENT OFFICE.

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TRASH-FEEDER FOR BAGASSE-FURNACES.

SPECIFICATION forming part of Letters Patent No. 684,449, dated October 15, 1901.

Application filed December 13, 1899. Serial No. 740,203. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. MOORE, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Trash-Feeders for Bagasse-Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof.

10 The present invention relates to certain new and useful improvements in that class of machinery known as "trash-feeders for bagasse-furnaces" used in connection with the manufacture of sugar; and it consists in the
15 arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings and described and pointed out in the specification. Ordinarily the feed-rolls located within the trash-receiving hopper, located above and communicating with
20 the combustion-chamber of the furnace, are so arranged as to leave a passage-way therebetween through which the trash passes. Where the passage-way or clearance-space
25 between the feed-rolls is uniform, whether the feed of the trash into the feed-hopper be light or heavy, it is obvious that unless sufficient trash be maintained within the feed-hopper to cover or close the passage-way between
30 the feed-rolls a space will be left through which air will be drawn or sucked from the hopper into the combustion-chamber of the furnace. As the feed-hopper is an open one, it is required that the passage-way between
35 the feed-rolls be a closed one in order to provide against excess of air being drawn into the combustion-chamber. Such excess of air being admitted to the combustion-chamber serves to lower the temperature of the furnace to a considerable degree. This is a
40 serious objection where the furnace is utilized in connection with the sugar-reducing boiler, as an uneven temperature effects the process of manufacturing sugar to a considerable extent. It is this defect in the feed mechanism for the trash that the present invention
45 is designed to obviate. Hence the invention may be said to consist in so arranging that the feed-rolls shall be adjustable toward and
50 from each other in order to decrease or in-

crease the passage-way for the trash in accordance with the feed of the trash into the feed-hopper and so that the feed-rollers when adjusted will be positively held for the purpose of providing against excess of air being
55 drawn or sucked into the combustion-chamber of the furnace.

In order to comprehend the invention, reference should be had to the accompanying sheet of drawings, wherein— 60

Figure 1 is an end view in elevation of the feed mechanism applied to a bagasse-furnace, the furnace being partly broken and illustrated in longitudinal section and the
65 endless feed-carrier partly broken. Fig. 2 is a vertical sectional view in elevation taken on line *xx*, Fig. 1. Fig. 3 is a top plan view of the mechanism illustrated in Fig. 2, and Fig. 4 is a view similar to Fig. 1 looking at
70 the opposite end of the feed-hopper.

In the drawings the letter A is used to indicate an ordinary bagasse-furnace, and A' the trash-feed hopper, located above the combustion-chamber A² of the furnace, communication between the chamber A² and interior
75 of the hopper being established by the opening *a*, which opening or slot extends across and through top wall B of the furnace. The feed-hopper is supported by wall B directly
80 over the opening *a*, Fig. 1 of the drawings, and is made, preferably, equal in width to that of the furnace. These features are old and well known in connection with trash-feeders for bagasse-furnaces, and the trash is
85 fed into the feed-hopper by means of an endless conveyer B', which conveyer or carrier works over end rollers, only one, B², being shown, and delivers the trash into the hopper at its upper end, as is usual in this class
90 of feeders. As stated, the foregoing parts being old and well known to those familiar with this class of machinery detailed description of the same is not deemed necessary. Within the hopper A' the toothed feed-rollers B³ B⁴
95 are located, which rollers receive the trash fed into the hopper and convey the same downward toward the opening *a*, leading to the combustion-chamber A². These toothed rollers serve to break or mash the trash as
100 passed therebetween. Said rollers are located

a short distance apart, thus forming, when the hopper is emptied of trash, a direct communication or passage-way a' between the upper portion of the hopper or, as the hopper is an opened-top one, the atmosphere and the opening a , leading to the combustion-chamber. The journals 1 2 3 4 of feed-rollers $B^3 B^4$ extend through elongated openings 5 6, cut through each end wall 7 8 of feed-hopper A' . Upon journal 1 of roller B^3 is loosely fitted arm C, which arm at its upper end is fulcrumed to stud b , projecting from end wall 7, while upon journal 2 of roller B^4 is loosely fitted arm C' , which arm at its upper end is fulcrumed by pin b' to end wall 7, Fig. 1 of the drawings. The lower end of arm C is attached to slide-block d , while lower end of arm C' is attached to slide-block d' . These blocks are internally screw-threaded and work, respectively, upon the right and left screw-threaded portions $d^2 d^3$ of adjusting-rod C^2 , which rod works in suitable bearings attached to end wall 7 of feed-hopper. Upon journals 3 4, projecting through opposite end wall 8 of the feed-hopper, is loosely fitted arms $C^3 C^4$, respectively, which arms at their upper end are fulcrumed to end wall 8. Arm C^3 is attached at its lower end to slide-block e and arm C^4 at its lower end to slide-block e' . Each slide-block, like slide-blocks $d d'$, is internally screw-threaded and works, respectively, upon the right and left screw-threaded portions $e^3 e^4$ of adjusting-rod D, which rod works in suitable bearings attached to end wall 8 of the feed-hopper. To the inner end of adjusting-rod D is attached a small sprocket-wheel D^2 and to the inner end portion of adjusting-rod C^2 is attached a similar sprocket-wheel D' , over which sprocket-wheels works the sprocket-chain D^3 . By means of the connecting sprocket-chain the rotation of adjusting-rod C^2 is imparted to adjusting-rod D in order that the adjusting mechanism located at each end of the hopper for the feed-rollers may work in unison. The adjusting-rod C^2 is rotated by means of the hand-wheel D^4 , secured to the inner end thereof, Fig. 1 of the drawings. To the outer end of journal 1 is keyed or otherwise rigidly secured the worm-gear E, which worm-gear meshes with worm E' of shaft E^2 , while to the outer end of journal 2 is keyed or otherwise secured the worm-gear E^3 , which meshes with worm E^4 , also secured to shaft E^2 . These worms may be said to constitute a part of shaft E^2 , which works in bearings attached to end wall 7. To one end of shaft E^2 is secured the bevel-gear F' , which meshes with pinion F^2 , secured upon the drive-shaft F^3 . This shaft is driven in any suitable manner and the motion thereof is transmitted to shaft E^2 through the medium of gear and pinion $F' F^2$. Motion of the shaft E^2 is in turn transmitted to the feed-rollers through the medium of the described intermeshing gear and worm mechanism. The pitch of the worms $E' E^4$ is such that the gears

$E E^3$ are driven in opposite directions, so as to cause the feed-rollers to rotate toward each other. To journal 1 of roller B^3 , intermediate of gear E and arm C, is keyed the gear G, which gear intermeshes with gear G' , loosely fitted upon stud b . The gear G' intermeshes with gear G^2 , secured to one end of roller B^2 . In this manner the rotation of feed-roller B^3 is imparted to roller B^2 for driving of the endless conveyer B' .

It will be readily understood that as the trash is fed into the hopper A' by the endless conveyer or carrier B' it is received between the rotating feed-rollers $B^3 B^4$, which rollers feed the trash downward and deliver same into the combustion-chamber A^2 through the passage-way a . So long as the feed of the trash into the hopper is sufficient to maintain the passage a' between the feed-rollers covered the positions of the feed-rollers remain unchanged. However, should the feed of the trash be light or less than the delivery of the same to the combustion-chamber of the furnace, then it becomes necessary to place the feed-rollers closer together in order to reduce the passage-way therebetween. By thus part closing the passage-way between the feed-rollers I not only reduce the feed of the trash to the combustion-chamber in proportion to the feed of the trash into the feed-hopper, but at the same time prevent an excess of air being drawn or sucked into the combustion-chamber from the feed-hopper. This closing or reducing the passage-way is accomplished through the medium of the adjusting-rods C^2 and D and the fulcrumed arms C, C' , C^3 , and C^4 . When the operator desires to reduce the distance between the feed-rollers, the hand-wheel D^4 is turned to operate the rod C^2 , so as to draw the slide-blocks $d d'$ inward, which serves to bring the fulcrumed arms C and C' together and likewise arms C^3 and C^4 by the inward movement of slide-blocks $e e'$ upon the adjusting-rod D, the motion of adjusting-rod C^2 being transmitted to rod D by means of the sprocket-chain D^3 . As the adjusting-rods work in unison, the fulcrumed arms at each end of the feed-hopper gradually come together. Inasmuch as the journals of the feed-rollers pass through these fulcrumed arms, any movement of the said arms is imparted to said rollers, the journals of which will slide within the elongated openings in the end walls of the feed-hopper for this purpose. When desired to increase the distance between the feed-rollers, it is only necessary to turn the hand-wheel D^4 in an opposite direction, which will reverse the movement of the parts above described. The feed-rollers may be brought together until the passage-way a' is entirely closed by the teeth thereof overlapping. It will thus be seen that I am enabled to move or regulate the position of the feed-rollers in proportion to the feed of the trash into the feed-hopper in order to provide against

excess of air being drawn into the combustion-chamber of the furnace through the feed-hopper.

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

1. In a trash-feeder for furnaces, the combination with a hopper adapted to be located over a feed-opening in a furnace, of a pair of
10 bearing-arms fulcrumed at each of two opposite ends of said hopper, two feed-rollers suspended by and rotatable in said arms, adjusting means at one end of the hopper for adjusting one pair of arms toward and from
15 each other, adjusting means at the opposite end of the hopper for adjusting the other pair of arms, connecting means to cause the simultaneous operation of said two adjusting means, and mechanism for positively driv-
20 ing both feed-rollers irrespective of their adjustment, substantially as described.

2. In a trash-feeder for furnaces, the combination with the feed-hopper, of the endless
25 conveyer for feeding the trash into the hopper, the feed-rollers arranged within the hopper, connected mechanism for imparting travel to the endless conveyer and rotation to the feed-rollers, the arms fulcrumed to each end of the hopper carrying the rollers and
30 through which the journals of the feed-roll-

ers extend, and of devices for throwing the fulcrumed arms in or out in order to adjust the feed-rollers toward and from each other.

3. In a trash-feeder for furnaces, the combination with a hopper adapted to be located
35 over a feed-opening in a furnace, of a pair of bearing-arms fulcrumed at each end of said hopper, two feed-rollers arranged in said hopper, each having journals projecting through openings in the ends of the hopper and jour-
40 naled in one bearing-arm at each end, a rotatable adjusting-rod mounted in bearings at one end of the hopper and having worms engaging one pair of bearing-arms, a rotatable
45 adjusting-rod mounted in bearings at the opposite end of the hopper and having worms engaging the other pair of bearing-arms, connecting means to cause the simultaneous ro-
50 tation of said adjusting-rods to move both rollers toward or from each other simultaneously, and mechanism for positively driving both feed-rollers irrespective of their adjustment, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 10th day of
55 November, 1899.

ROBERT S. MOORE.

Witnesses:

N. A. ACKER,
D. B. RICHARDS.