

(No Model.)

J. G. SANDERSON.  
FURNACE.

No. 592,616.

Patented Oct. 26, 1897.

Fig. 1.

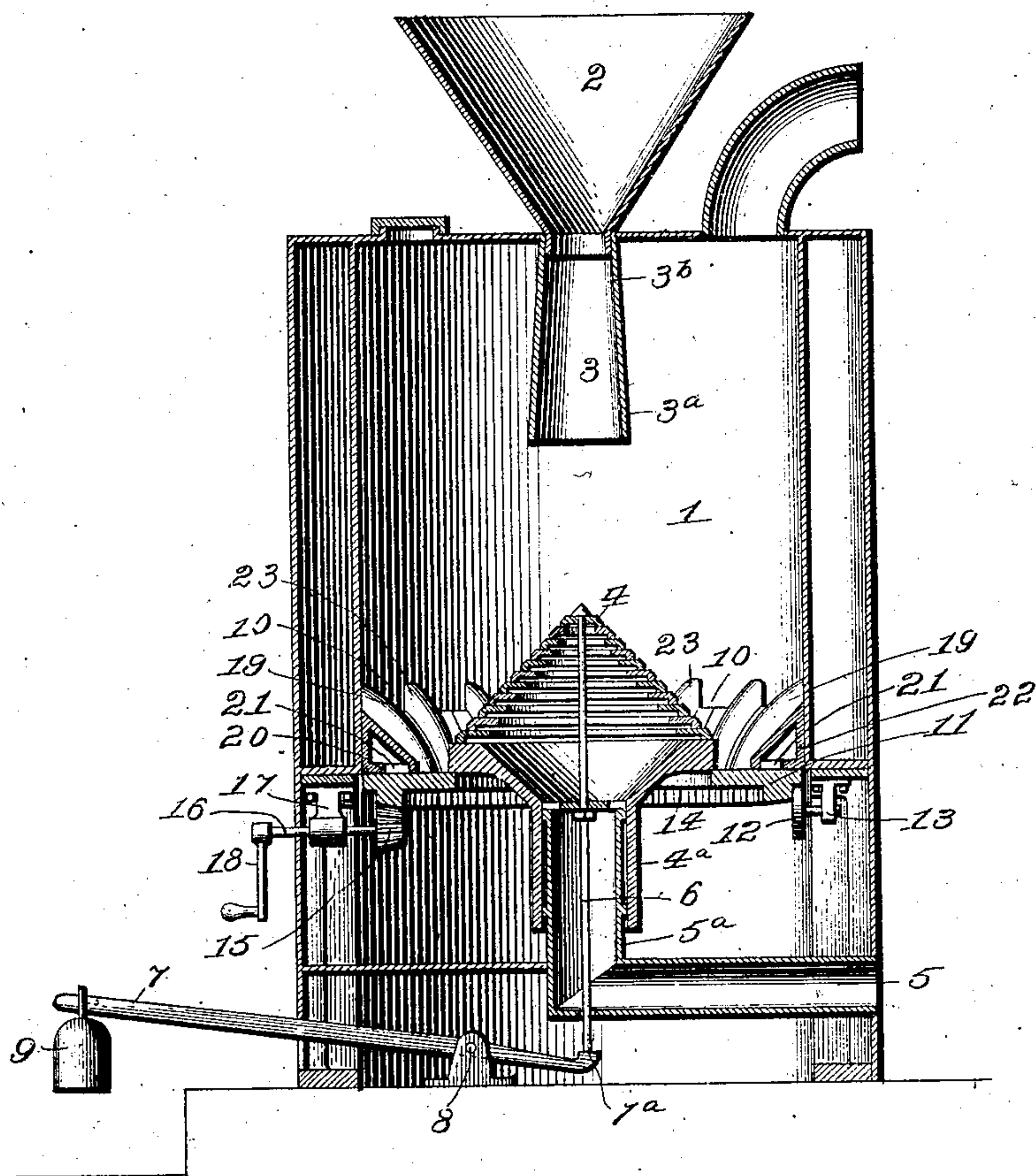


Fig. 3.

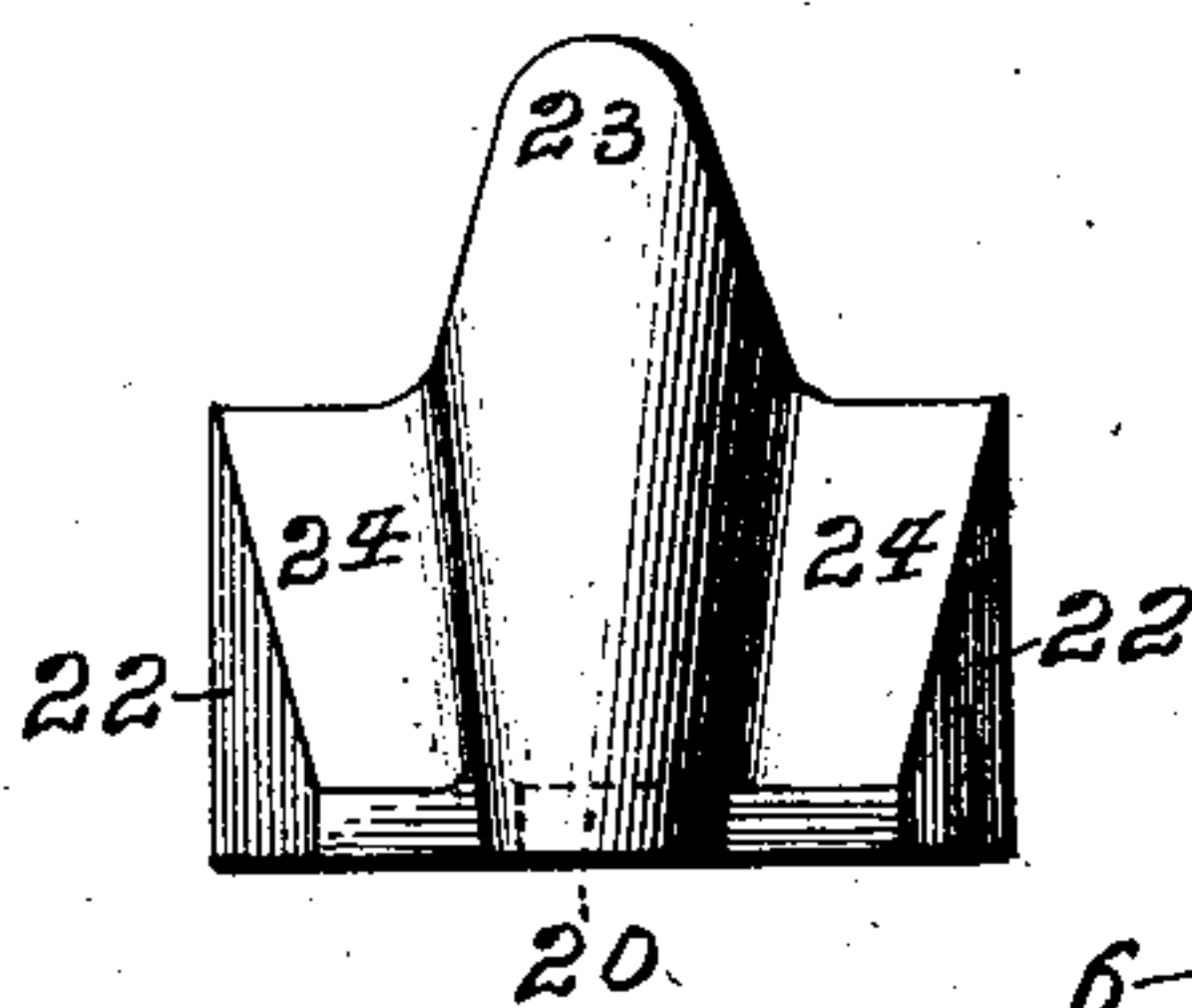


Fig. 2.

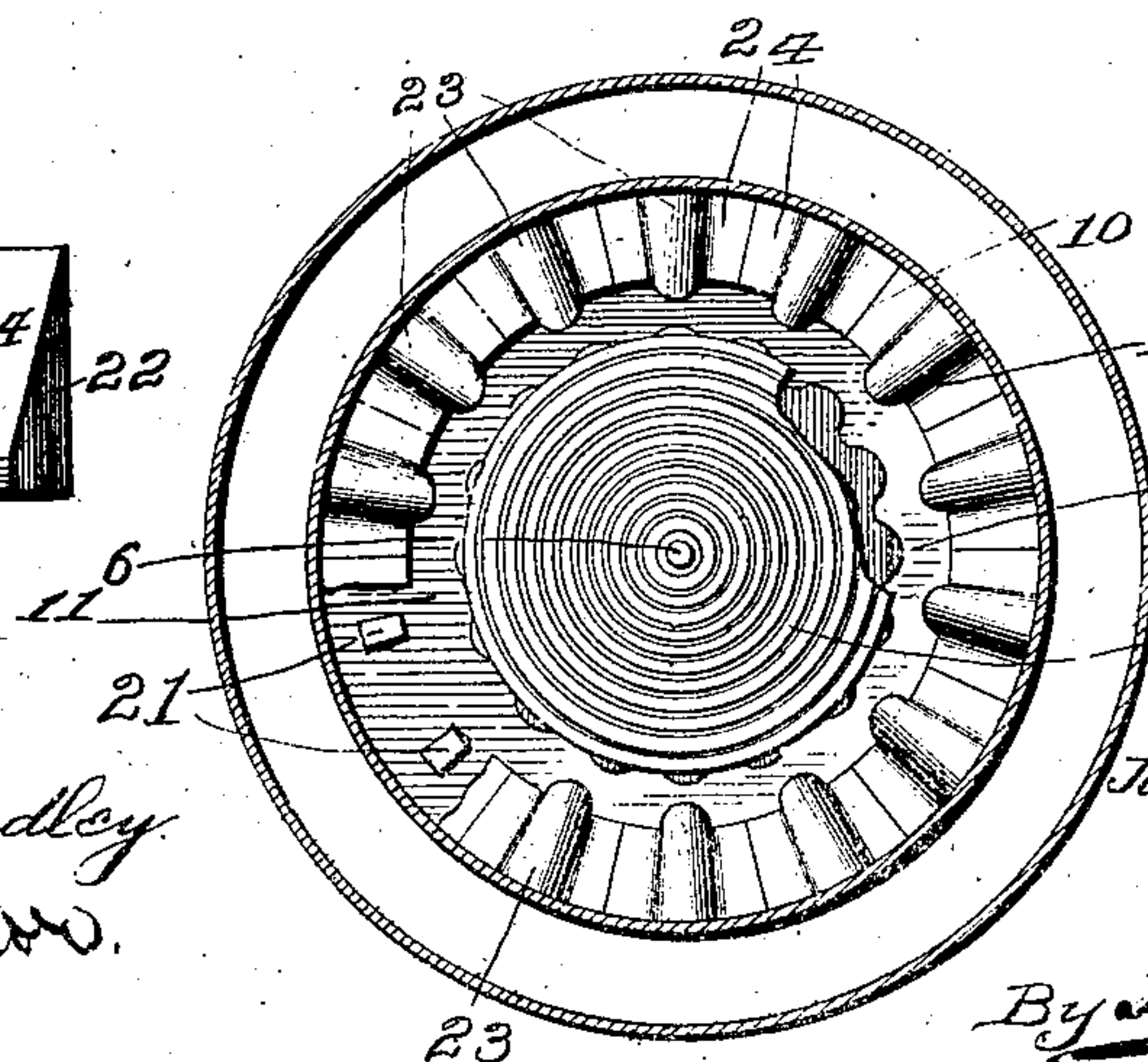
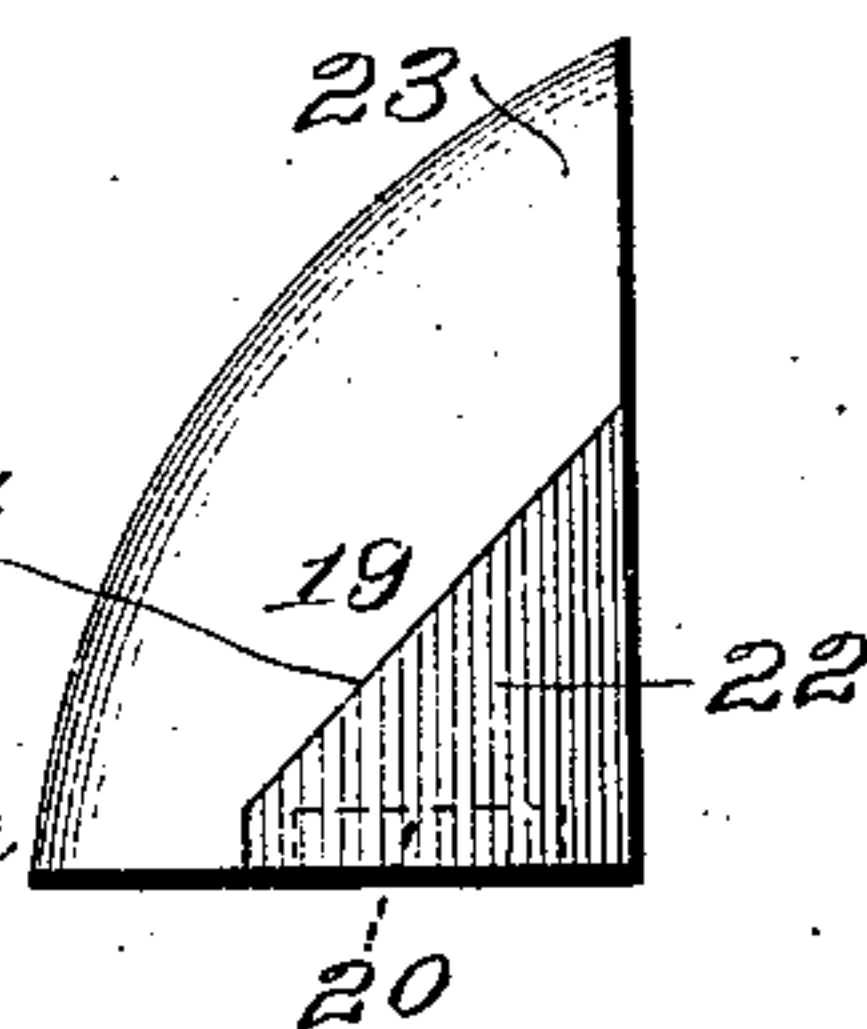


Fig. 4.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JAMES GARDNER SANDERSON, OF SCRANTON, PENNSYLVANIA.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 592,616, dated October 26, 1897.

Application filed October 8, 1896. Serial No. 608,258. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES GARDNER SANDERSON, a citizen of the United States, and a resident of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in and Relating to Furnaces, of which the following is a full, clear, and exact specification.

My present invention relates to the same general class of furnaces as that set forth in my Letters Patent of the United States No. 561,729, granted June 9, 1896. In said Letters Patent I describe and claim a furnace having a magazine-feed, a conical grate located centrally beneath said feed, a tapered, corrugated, or ribbed fire-pot, means for raising and lowering the grate and rotating it to discharge ashes, and certain means for feeding air and steam to the grate for promoting combustion or producing gas, as might be desired.

My present invention consists in the novel construction and arrangement of the parts of such a furnace, as will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical axial section of a gas-producing furnace to which is applied my present improvements. Fig. 2 is a horizontal section of the same above the grate, looking downward; and Figs. 3 and 4 are respectively a front view and side elevation of the removable segments which form the ribbed or corrugated and tapered upper surface of the fire-pot.

1 represents a furnace of any common construction—such, for instance, as a gas-producing furnace—and 2 is the hopper for feeding fuel into the combustion-chamber through the interposed magazine 3. The magazine 3 is constructed with its lower end 3<sup>a</sup> of larger diameter than its upper end 3<sup>b</sup>, whereby the magazine is made flaring, and I obtain therefrom the important result of preventing the packing of the wet fine fuel which may be burned in the furnace and which results in a stoppage of the feed at times.

4 represents the vertically adjustable and lifting grate, which is of conical form and located centrally or axially beneath the flaring magazine. This grate has a short downward tubular projection 4<sup>a</sup>, which telescopes with an upward projection 5<sup>a</sup> of a draft-flue

5. The grate depends for its support mainly or wholly upon a rod 6, which is seated at 7<sup>a</sup> upon the lever 7, which is fulcrumed at 8 and carries at its outer end a counterbalance-weight 9, which is adjustable on the lever and is designed to counterbalance the load of the grate and the fuel upon it. By employing this means of support for the grate the extension 4<sup>a</sup> may be made much shorter and the draft-flue may be elevated from the floor of the ash-pit and offer no inconvenience to cleaning the latter. It will be understood that the present mounting of the grate admits of the same manipulation—namely, raising and lowering it—as described in my Letters Patent aforesaid.

10 represents the fire-pot, which comprises a rotatable base-ring 11, mounted horizontally upon rollers 12, having hangers 13 projecting inward from the wall of the ash-pit. The ring 11 is concentric with the grate, and the inner edge of said ring projects slightly beneath the base of the grate, so that it will support the grate in the event of the normal support of such member becoming disarranged or the lever being raised too high. A further object in thus making the grate and ring overlap is to make a tight connection at this point when the parts are in normal operation. The base-ring 11 has cast or otherwise provided on its under face an annular bevel gear or rack 14, with which engages a bevel-pinion 15, driven by a shaft 16, mounted in a hanger 17, and having without the ash-pit means for turning it, such as crank 18. The annular ring 11 is of such width as to provide a space 10<sup>a</sup> between the grate and the fire-pot. To impart a tapering, ribbed, or corrugated upper surface to the fire-pot 10, the ring 11 has mounted upon it a number of independent castings or other suitably-constructed segmental parts 19, formed with recesses 20, in which project bosses 21 on the upper face of the ring 11, in order to keep the segmental parts 19 in place, as will be best understood upon referring to Figs. 2, 3, and 4. The segments 19 have their side faces 22 formed in planes radial with respect to the ring 11, so that a given number of them will fit closely upon and cover the said ring. Each segment is further provided with a rib or crest 23 and lateral straight shoulders 24, so that when the segments are



assembled on the ring they impart to the fire-pot which is thereby constructed a ribbed or corrugated form. The ribs and straight shoulders are, moreover, inclined downwardly toward the center of the ring, so that the fire-pot is given the necessary tapered or dished form. These segments and ring afford a cheap construction for the fire-pot, all the segments being but reproductions of a single form, and they offer ready and cheap means for keeping the fire-pot in repair by replacing the individual parts as soon as they become impaired. The segments can obviously be made hollow for economy of construction.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, a fire-pot mounted on the base-ring, means for supporting the base-ring, means for rotating the base-ring, and means for raising and lowering the grate; substantially as described.

2. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, means for supporting the base-ring, means for rotating the base-ring, means for raising and lowering the grate, and a counterbalance-weight for supporting the grate at desired height with relation to the base-ring; substantially as described.

3. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, and a bevel-gear, brackets having rollers on which the base-ring is mounted, a bracket in which a shaft is mounted, a bevel-pinion located on the shaft and meshing with the bevel-gear, and means for raising and lowering the grate, substantially as described.

4. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, a fire-pot consisting of toothed and ribbed segments mounted on the base-ring, means for supporting the base-ring, means for rotating the base-ring, and means for raising and lowering the grate, substantially as described.

5. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, a fire-pot mounted on the base-ring, means for supporting the base-ring, means for rotating the base-ring, means for raising and lowering the grate, and a down-

wardly-flaring magazine for feeding the fuel centrally onto the grate; substantially as described.

6. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, a lever for raising and lowering the grate provided with an adjustable counterbalance-weight for supporting the grate at desired height with reference to the base-ring; substantially as described.

7. A furnace comprising a conical grate, having a tubular extension, a base-ring having an opening over which the edge of the grate projects slightly, a draft-flue telescoping with the tubular extension, a rod mounted axially in the grate and extending downward beyond the flue, a lever on which the rod is supported, and a weight adjustable on the lever for counterbalancing the weight of the grate and supporting it at desired height with reference to the base-ring, substantially as described.

8. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located, a fire-pot consisting of an annular series of segments secured to the base-ring, having their side faces formed in planes radial with respect to the base-ring and provided with crests and lateral straight shoulders, and means for rotating the base-ring; substantially as described.

9. A furnace comprising a conical grate, a base-ring having an opening over which the grate is located and formed with bosses on its upper surface, a fire-pot consisting of an annular series of segments having recesses in the base thereof which receive the bosses, and means for rotating the base-ring; substantially as described.

10. A furnace comprising a conical grate, a base-ring formed with bosses on its upper surface, and having an opening over which the grate is located, a fire-pot mounted on the base-ring consisting of an annular series of segments having recesses in the base thereof which receive the bosses, means for supporting the base-ring, means for rotating the base-ring, and means for raising and lowering the grate; substantially as described.

In testimony whereof I have set my hand.

JAMES GARDNER SANDERSON.

In presence of—

F. L. HITCHCOCK,  
J. ATKINS ROBERTSON.