

No. 736,207.

PATENTED AUG. 11, 1903.

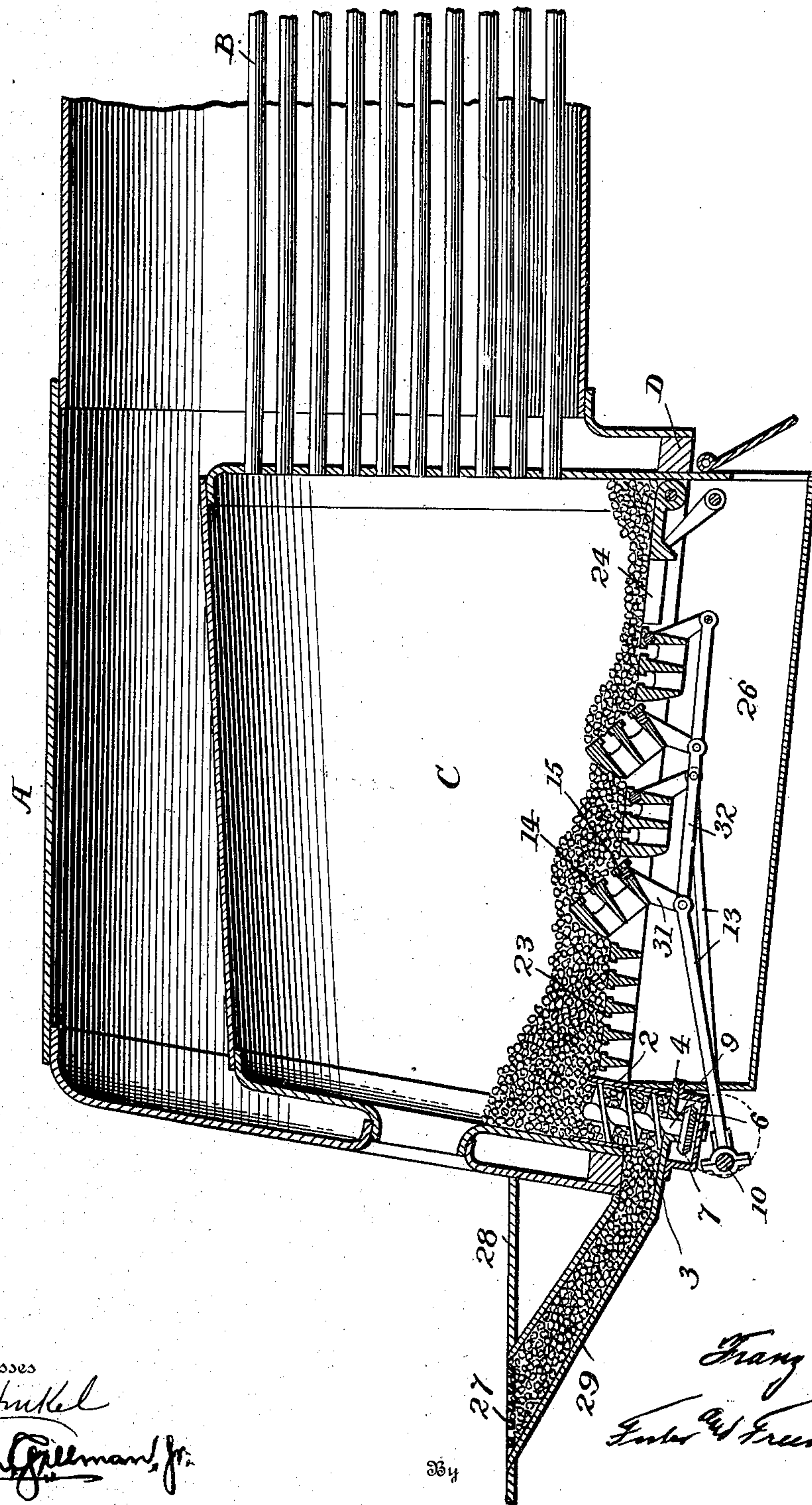
F. BURGER.
MECHANICAL STOKER FOR FURNACES.

APPLICATION FILED SEPT. 26, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

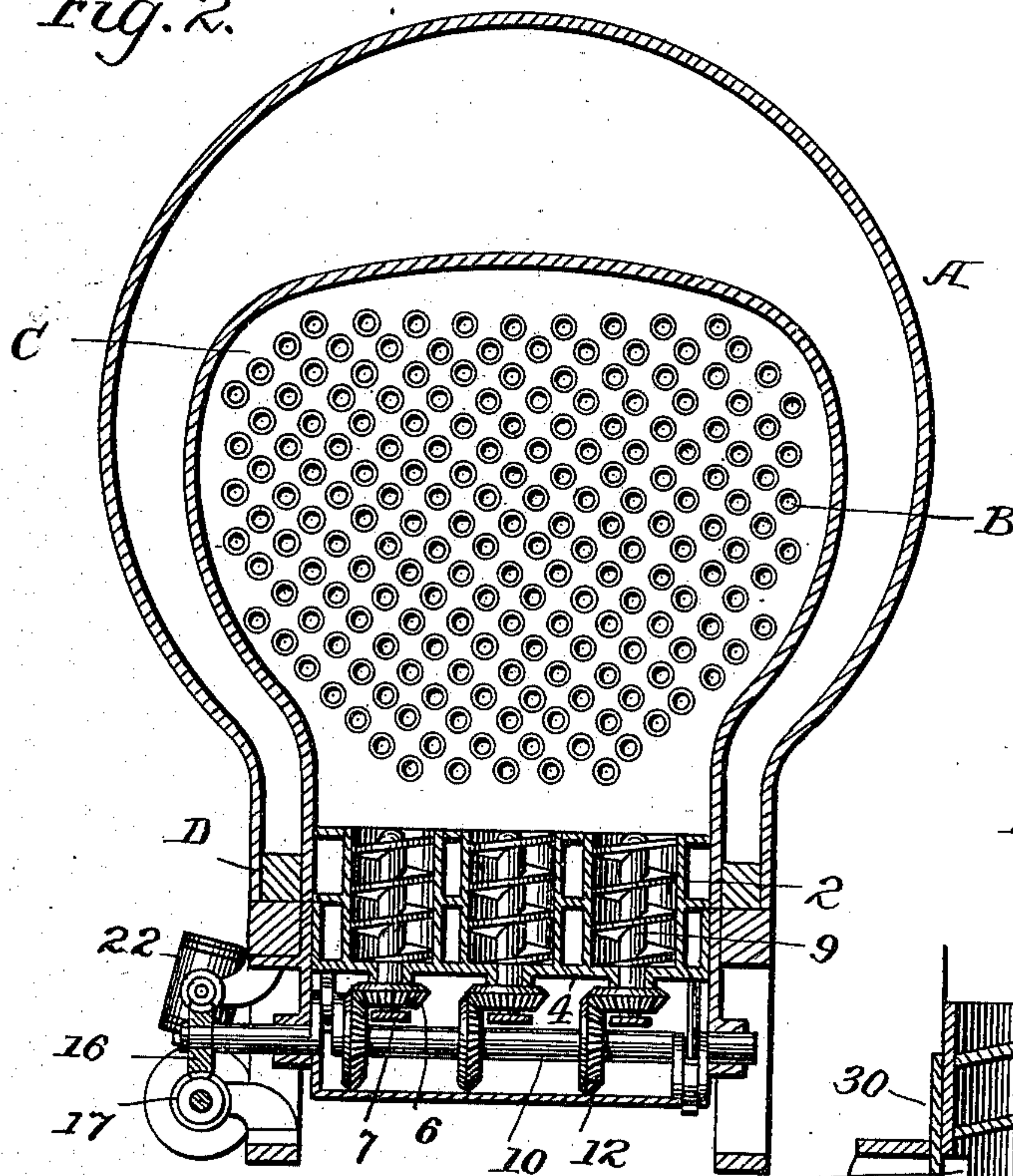


Fig. 4.

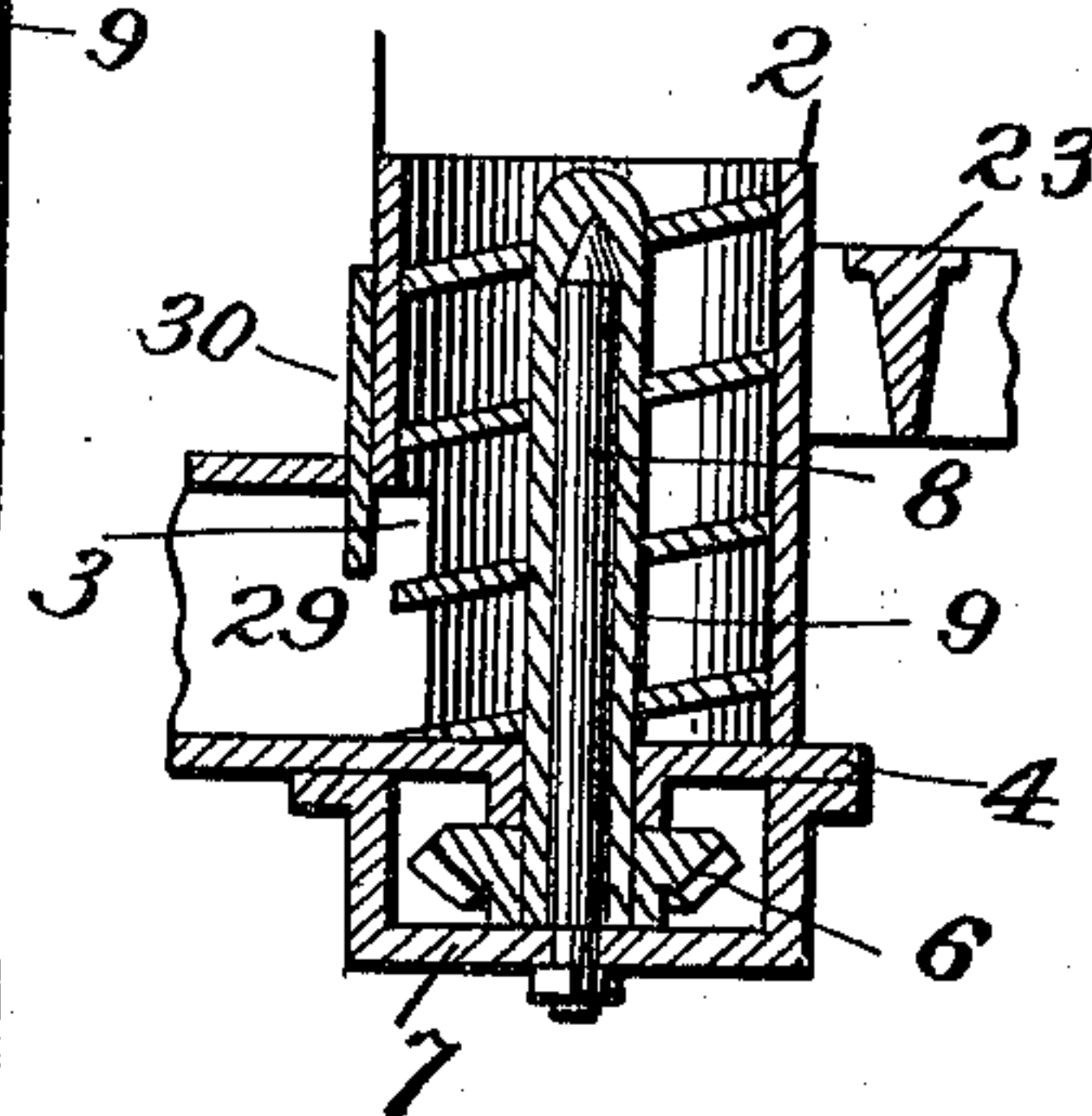
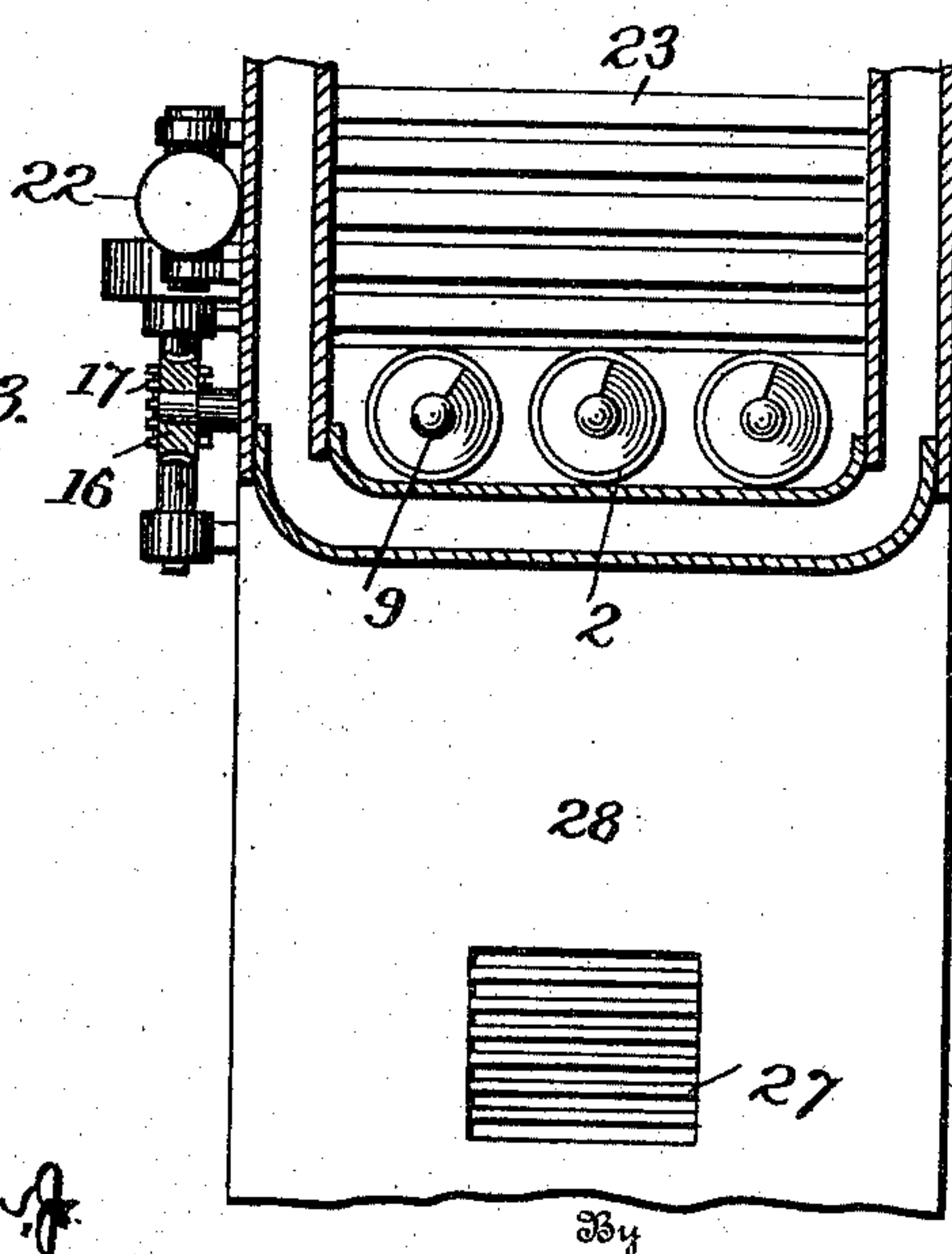


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS
TO HENRY M. WILLIAMS, OF FORT WAYNE, INDIANA.

MECHANICAL STOKER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 736,207, dated August 11, 1903.

Application filed September 26, 1901; Serial No. 76,665. (No model.)

To all whom it may concern:

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Mechanical Stokers for Furnaces, of which the following is a specification.

My invention relates to mechanical stokers for furnaces by means of which the fuel is fed from beneath the grate to and upon the grate of the furnace, and the same are applicable to locomotive or other furnaces.

The object of my invention is to produce a mechanical conveyer of simple and convenient construction, one which is not readily clogged and which uniformly feeds fuel and which may be readily combined with means for advancing the fuel along the grate after it has been fed thereto.

My invention consists in a mechanical stoker of a form hereinafter to be described, and it also consists in my improved stoker placed at one end of a furnace, as at the front end, in combination with means connected with the grate of the furnace for advancing the fuel along the grate after it has been mechanically fed thereto by the stoker.

My invention is more fully described and shown in its many details of construction and operation in the accompanying specification and drawings, in which—

Figure 1 is a sectional elevation of my improved apparatus, partly in section, including my mechanical stoker. Fig. 2 is a transverse section through the fire-box of a locomotive-boiler to which my mechanical stoker has been applied. Fig. 3 is a plan view, partly in section, of a part of the fire-box, showing the stoker and also the means for actuating the same; and Fig. 4 is an enlarged section of one of the conveyers of the stoker.

Referring to the drawings, A represents the shell of a boiler, in the present instance a locomotive-boiler being shown of the fire-tube type, with tubes B and a fire-box C with a mud-ring D.

My mechanical stoker is adapted to feed fuel from beneath the grate of a furnace to and upon the same, and I prefer to arrange the stoker at one end of the furnace, preferably at the front end, as shown in Fig. 1, and,

as shown, the fuel-feeding devices of the stoker are arranged transversely of the furnace. These fuel-feeding devices according to my invention comprise screw conveyers, which, as shown, are arranged substantially vertically, and they are inclosed in casings consisting of substantially vertical cylinders 2, suitably supported from the fire-box. The bottom of the cylinders is formed by a plate 4, which also serves as a bearing for the screw conveyers, which are constructed in the following manner: The plate 4 is provided with apertures, and beneath each aperture is arranged a step 7, supporting shafts 8, suitably secured to the steps, while these shafts support the hollow spindles 9 of the conveyers. Connected to each conveyer are bevel-gears 6, meshing with gears 12 upon a transverse cranked shaft 10, actuated by any suitable means, as through a worm 17 and wheel 16, operated by an oscillating steam-engine 22, receiving steam from the locomotive-boiler.

I have simply described a convenient and suitable form of means for actuating the screw conveyers to turn them upon vertical axes, but any desired means may be provided, since it is no part of my present invention.

It will be seen that the lower portions of the screw conveyers are beneath the grate of the furnace, while the cylindrical casings 2 extend substantially to the surface of the grates. Fuel may be fed to the lower portions of the conveyers through a suitable chute 29, the top of which is covered with means for determining the granulation of the fuel, (shown as a grating 27,) so that the fuel shall be of uniform size. The chute 29 and grating 27 extend to the foot-plate 28. Upon feeding fuel to the chute 29 it passes downward and reaches the screw conveyers through side openings 3 in the casings 2, which side openings may be opened or closed at will by plates 30, forming means for regulating the number of conveyers which are in operation at one time, since by simply lowering one of the plates 30 communication from the chute to the conveyer-casing is cut off, and hence feeding of the fuel will not take place so rapidly to the furnace-grate. The fuel upon reaching the conveyers while they are being rotated upon their vertical axes will of course

be carried upward by means of the screw portions of the same and will be uniformly deposited upon the grate at the forward end. The grate is formed with a stationary portion 23 immediately adjacent the casings of the conveyers, while adjoining this portion 23 are arranged tilting portions 14, each pivoted transversely by pivots 15 and each provided with arms 31, rigidly connected thereto. The arms of alternate tilting portions 14 are then connected by suitable connections 32, these connections 32 in turn being pivoted to connecting-rods 13, connected to the cranks of the crank-shaft 10, the angle of the cranks being such that pairs of tilting portions of the grate will be actuated alternately during the rotation of the shaft 10, the tilting taking place upon the pivots 15.

I have simply described a suitable arrangement of tilting grate portions and am not to be understood as limiting myself to the precise details of construction shown and described, nor to the precise arrangement of tilting portions, my object being to advance the fuel along the grate after it has been deposited thereon by the screw conveyers, and different forms of mechanical constructions may readily be devised for tilting the portions of the grate, not necessarily in pairs.

It will be readily seen that as portions of the grate are tilted the fuel will be advanced, in this instance from the front to the rear of the grate, and deposited upon the next adjacent tilting portions, which in turn advance it farther when they are tilted. Finally the fuel reaches a drop-plate 24, as shown, arranged to be dropped when desired, but at this point the fuel has been substantially burned out and consists principally of ashes and perhaps clinkers, which may be removed to the ash-pit 26 through the operation of the drop-plate 24.

Without limiting myself to the precise details of construction shown and described, I claim, and desire to obtain by Letters Patent, the following:

1. The combination with a grate, of a mechanical stoker therefor consisting of a substantially vertical conveyor for introducing fuel to the grate from below the same, a chute leading to the lower end of the conveyor, and

a grating over the receiving end of the chute, substantially as set forth.

2. The combination with a grate, of a mechanical stoker therefor consisting of a substantially vertical screw conveyor for introducing fuel to the grate from below the same, a chute leading to the lower end of the screw conveyor, and a grating over the receiving end of the chute, substantially as set forth.

3. In a furnace, the combination with a grate, of a mechanical stoker therefor consisting of a plurality of substantially vertical screw conveyers at the front end of the furnace for introducing fuel to the grate from below the same, a chute leading to the lower end of said conveyers, and a grating over the receiving end of the chute, substantially as set forth.

4. In a furnace, the combination with a grate, of a mechanical stoker therefor, consisting of screw conveyers arranged in substantially vertical cylindrical casings at one end of the grate, said mechanical stoker extending from below the grate to the surface of the same, a chute for feeding fuel to the conveyers, a grating over the receiving end of the chute, means for regulating the number of conveyers in use at one time, and means for actuating said conveyers, substantially as described.

5. In a furnace, the combination with a grate, of a mechanical stoker therefor, consisting of screw conveyers arranged in substantially vertical cylindrical casings at one end of the grate, said mechanical stoker extending from below the grate to the surface of the same, a chute for feeding fuel to the conveyers, a grating over the receiving end of the chute, sliding plates for cutting off the entrance of fuel to the conveyers, and means for actuating the conveyers, substantially as described.

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

FRANZ BURGER.

Witnesses:

JOHN OTTO,
GEO. D. CRANE.