

No. 877,487.

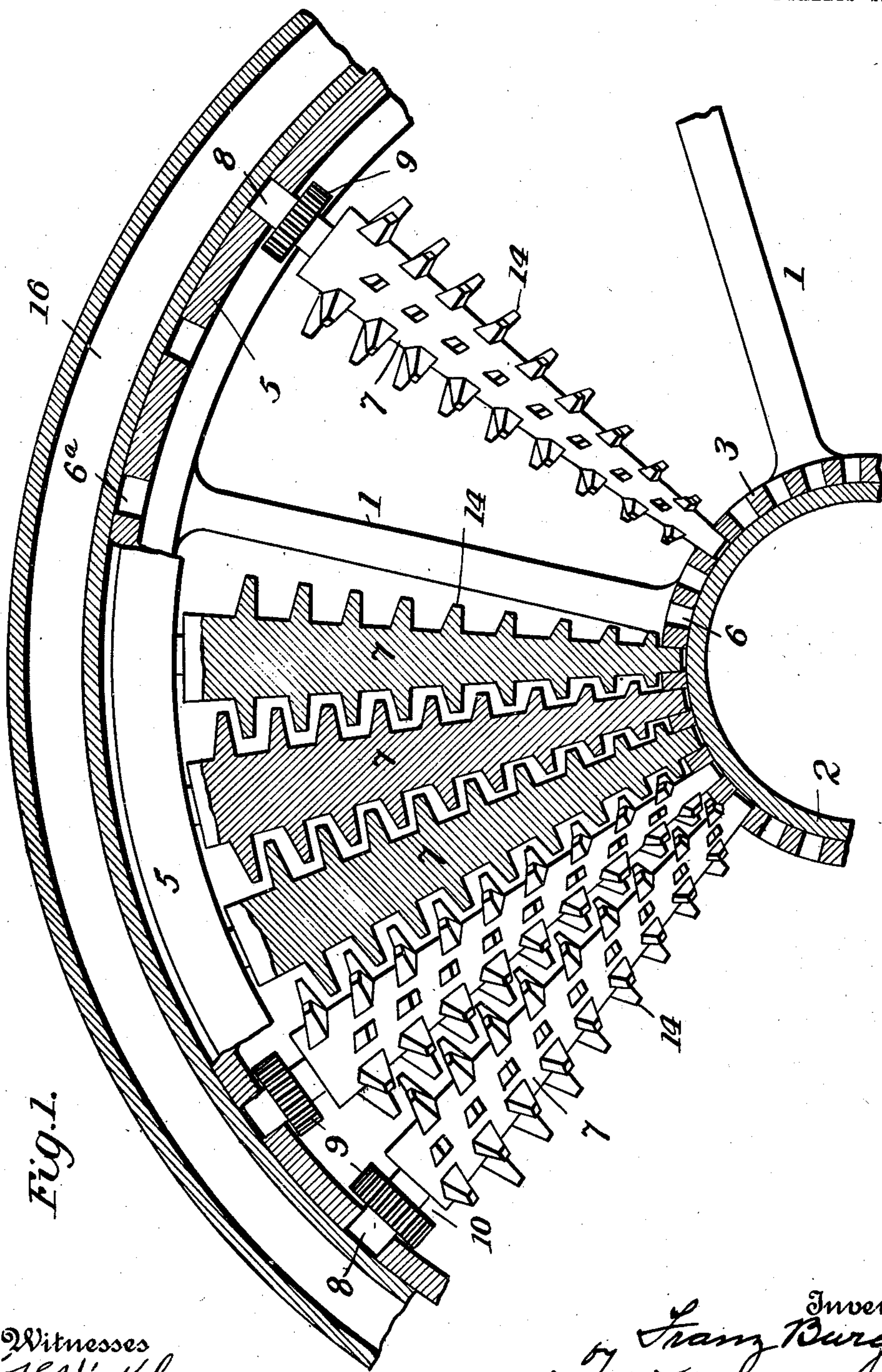
PATENTED JAN. 28, 1908.

F. BURGER.

REVOLVING GRATE.

APPLICATION FILED FEB. 15, 1906

2 SHEETS--SHEET 1.



Witnesses
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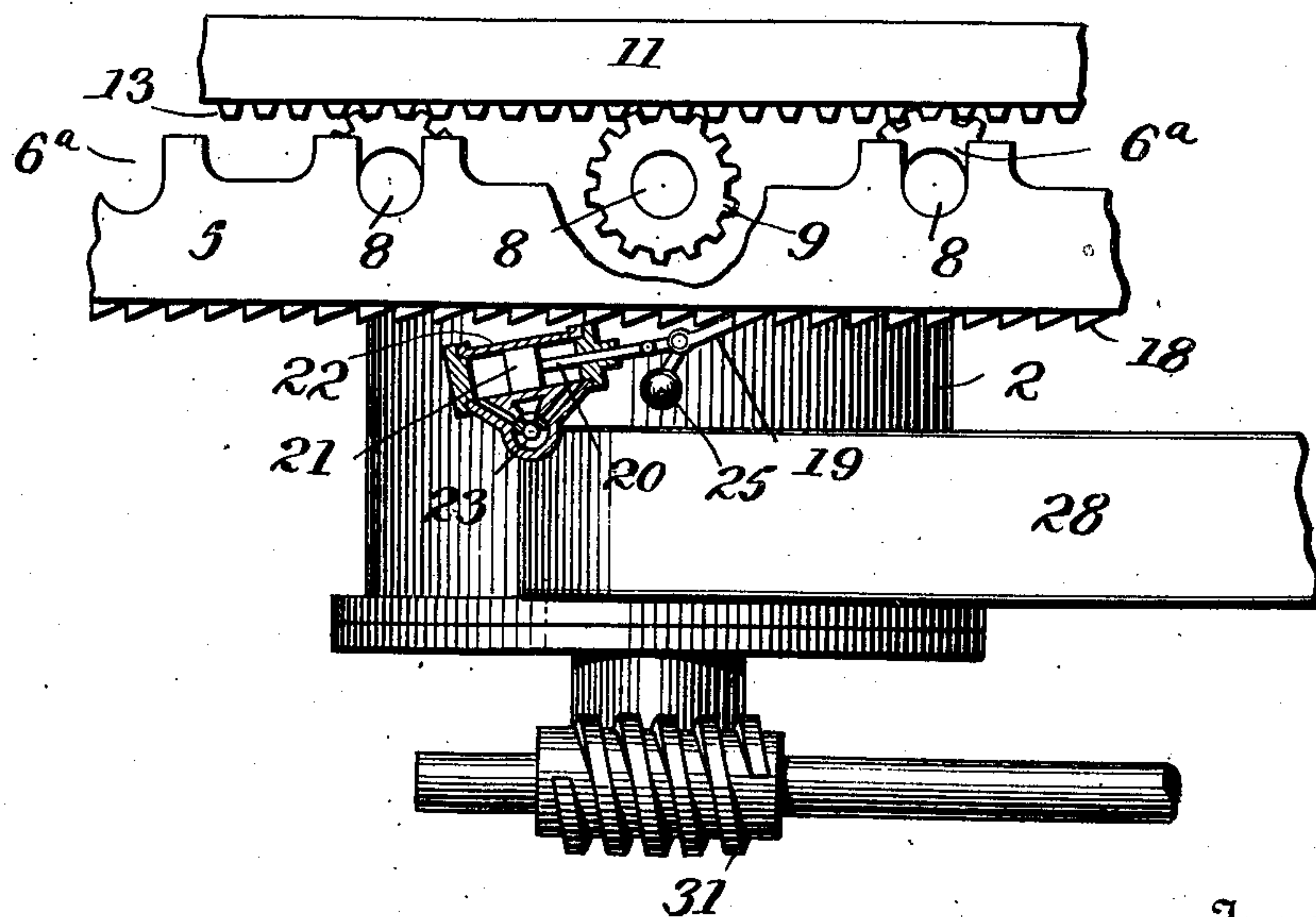
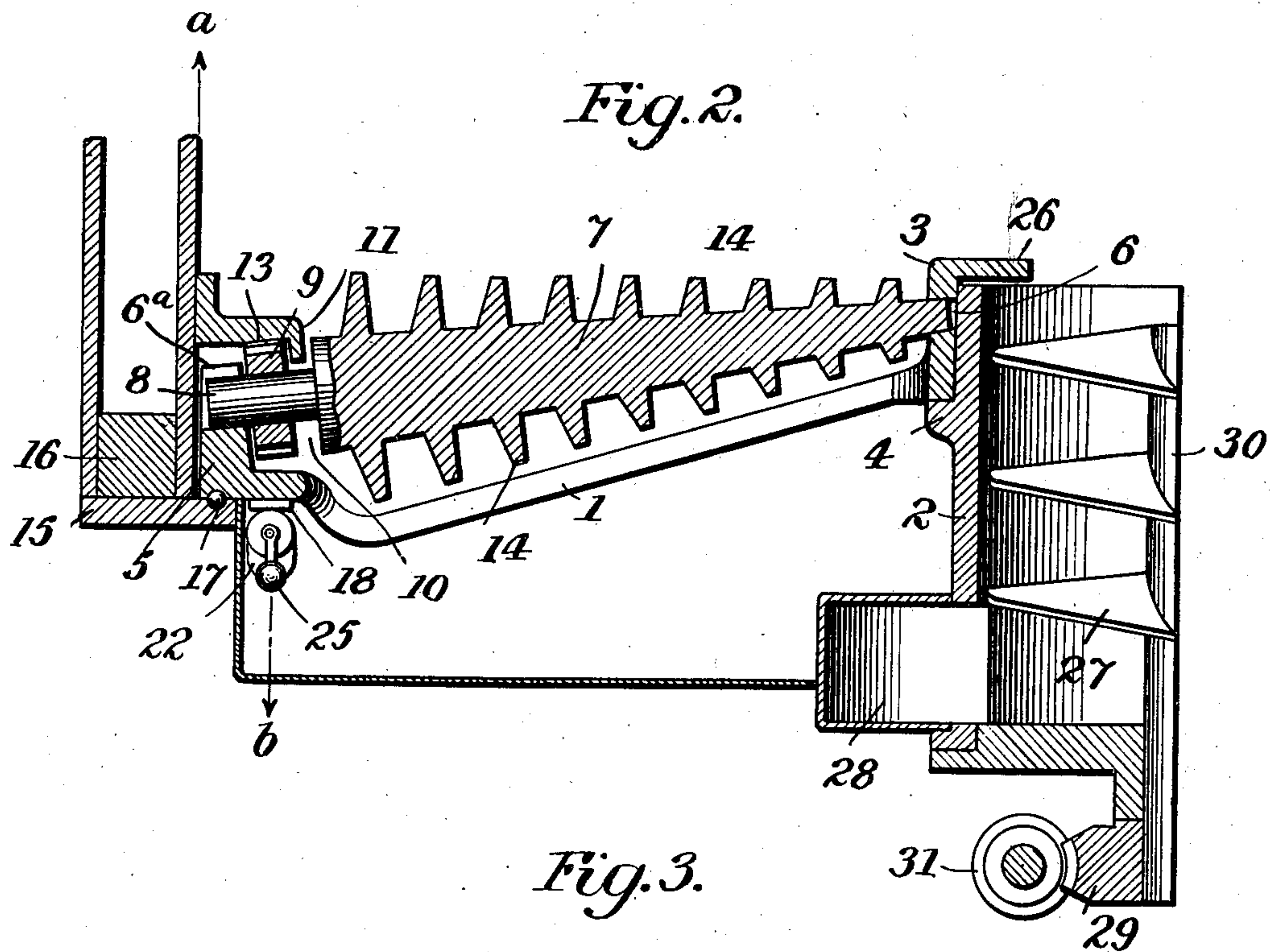
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UNITED STATES PATENT OFFICE.

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

REVOLVING GRATE.

No. 877,487.

Specification of Letters Patent.

Patented Jan. 28, 1908.

Application filed February 15, 1905. Serial No. 245,772.

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 Revolving Grates, of which the following is a specification.

My invention relates to revolving grates adapted for use in connection with furnaces, and it has for its object to provide an improved grate of the character specified, and to these ends my invention consists in the various features of construction and arrangement of parts having the mode of operation substantially as hereinafter more particularly set forth.

Referring to the accompanying drawings, wherein I have illustrated parts of an embodiment of my invention sufficient to enable those skilled in the art to understand its mode of construction and arrangement, Figure 1 is a sectional view, showing some of the parts at different elevations, of a portion of a grate and connecting devices; Fig. 2 is a vertical section of the grate and part of the boiler and fuel-feeding devices; and Fig. 3 is a partial side view in part section on the line *a-b*, Fig. 2.

I have not deemed it necessary to illustrate a complete grate, but have preferred to show all the essential features of construction and arrangement of parts on a larger scale in a manner so that they will be readily understood by those skilled in the art.

My present invention, generally stated, has for its object to provide a revolving grate adapted for use in furnaces and capable of being revolved, preferably intermittently, and such a grate which not only revolves itself, but is provided with a series of grate-bars which are capable of rotation in the grate and are arranged to be rotated by some suitable mechanism, preferably from the power used to revolve the grate. Further these grate-bars are of peculiar shape and configuration and are adapted to aid in distributing the fuel on the grate, and other features of invention will appear from the description of the embodiment of the invention disclosed in the drawing.

The grate frame is shown in the form of a spider 1. This may be supported in the furnace in any suitable way, and I have shown

in the present instance a central fuel-feeding tube 2, provided with a collar 4 upon which the ring or rim 3 of the spider or frame rests. The outer rim or portion 5 of the spider or frame may be suitably supported in connection with the fire-box 16, and I have shown a portion of such fire-box wherein the base-plate 15 is extended inwardly to form a track or rim to support the outer portion of the grate, and have also shown ball or roller bearings 17 interposed between the track and outer rim. Any other practical means for supporting the grate may be used, depending of course upon the character of the furnace to which the grate is applied.

Some suitable means for revolving the grate should be applied, and in the present instance I have shown a rack or ratchet rim 18, secured to or formed in the under portion of the grate-bar rim 5. It is generally preferable to revolve the grate intermittently, and for this purpose any suitable motor may be used. I have shown a motor cylinder 22, containing a piston 21, having a piston rod 20, to which is pivotally connected a pawl 19, shown with a weight 25, and there is a suitable valve 23 adapted to control the motor fluid for the motor or engine, so that the piston will be reciprocated therein and the pawl will operate to successively engage the teeth of the ratchet rim and cause an intermittent or step-by-step revolution of the grate. Suitable connections may be supplied whereby the valve will be automatically operated to cause the intermittent or step-by-step revolution of the grate.

Mounted on the grate frame or spider is a series of grate-bars 7, and these are shown as of a general conical contour, tapering from the outside toward the center. Their inner ends are mounted in slots or bearings 6 in the ring 3, while the outer ends of said grate-bars are preferably provided with projections formed in the shape of axles 8 which are mounted in the slots or bearings 6^a in the outer rim 5 of the grate.

The grate-bars are provided on their surfaces with projections or teeth 14 of any desired shape, preferably such as clearly indicated in the drawing, and these teeth are arranged spirally upon the surfaces of the grate-bars in such a way that they have a tendency to cause the fuel to move outward

from the center of the grate as the grate-bars are rotated.

While various means may be used to cause the grate-bars to rotate, I have shown the axles 8 as provided with pinions 9 fixed thereon, which pinions are adapted to engage a stationary rack 13, and this rack in the present instance is formed in the under surface of the rim or projection 11 fastened to the inner fire-box sheet. This stationary rim 11 has a downward projection at its inner edge, which is shown as arranged to enter a space 10 between the pinion 9 on the axle 8 and the enlarged portion of the grate-bar. In this way not only does the stationary rim comprise a rack-bar, but the downwardly extended flange aids in protecting the operating mechanism of the grate-bars from dust and dirt.

It will be seen that as the grate frame 1 is revolved, carrying the grate-bars in bearings on the frame, the pinions on the independent bars will engage the stationary rack and all of the bars will be rotated in accordance with the revolution of the grate, and as that is preferably intermittently revolved or moved step-by-step, so too will the grate-bars be rotated on their axes step-by-step. This is accomplished by a single motor operating preferably directly upon the revolving grate.

While the fuel may be supplied to the revolving grate in any desired way, either from above or below, it is preferable to supply it from below, and for this purpose I have shown the fuel-feeding tube 2 which, as before stated, also forms a support for the inner portion of the grate. Mounted in this fuel-feeding tube is preferably some means for delivering the fuel at the center of the grate, and I have indicated a shaft 30, supporting an elevating screw 27 and having a worm wheel 29 adapted to be operated by a worm 31 which may be driven by any suitable power, either continuously or intermittently. The fuel is supplied to the worm through the feed tube 28, and as the worm rotates it is gradually lifted through the fuel feeding tube and tends to spread itself over the surrounding grate. In order to aid this spreading the inner rim of the grate is provided with a number of wiper bars or fingers 26, which tend to stir the fuel and cause it to spread more readily over the rotating grate-bars, and as these are intermittently rotated they tend to move the fuel toward the outer portion of the grate and at the same time to keep the fuel clean and free from dust and ashes.

While I have thus indicated the general features of construction and arrangement of my grate and have described a preferred embodiment thereof and pointed out in general the mode of operation of the parts, it will be understood that my invention is not limited to the specific details of construction shown and described, but may be varied by those

skilled in the art to adapt it for use in different conditions and in connection with different styles of furnaces and the like.

What I claim is:—

1. The combination with a central fuel feeding tube, of a revolving grate, grate bars mounted radially thereon and arranged to positively feed the fuel toward the outer portion of the grate, substantially as described.

2. The combination with a central fuel feeding tube, of a circular revolving grate, rotating grate-bars mounted radially thereon, and means for simultaneously and intermittently revolving the grate and rotating the grate-bars step by step, substantially as described.

3. The combination with a central fuel feeding tube, of a revolving grate, rotating grate-bars mounted radially thereon, and a motor connected to simultaneously and intermittently revolve the grate and rotate the grate bars step by step, substantially as described.

4. The combination with a grate, of rotating grate-bars mounted radially thereon and having conical shaped body portions, said grate-bars being provided with teeth spirally arranged on said body portions, substantially as described.

5. The combination with a suitable support, of a revolving grate, rotating conical grate-bars mounted in bearings on the grate and having teeth spirally arranged on their surfaces, and means for rotating the grate-bars, substantially as described.

6. The combination with a central fuel-feeding tube, of a revolving grate, means for revolving the same intermittently, grate-bars radially mounted on the grate, and means for rotating the grate-bars, substantially as described.

7. The combination with the central fuel-feeding tube, of a revolving grate having wipers extending over the face of the tube, substantially as described.

8. The combination with the central fuel-feeding tube, of a revolving grate having wipers extending over the face of the tube, rotating grate-bars mounted on the grate and provided with spirally arranged teeth, and means for rotating the grate-bars, whereby the fuel will be spread outwardly from the central tube, substantially as described.

9. The combination with the central fuel-feeding tube, and means for feeding fuel therethrough, of a revolving grate, means for revolving the grate, rotating grate-bars radially mounted on the grate, and means for rotating the grate-bars, substantially as described.

10. The combination with the central fuel-feeding tube and means for feeding fuel therethrough, of a revolving grate having

rotating grate-bars provided at their outer ends with axles and pinions mounted thereon, a stationary rack-bar above said pinions, a flange on said rack-bar extending downward between the pinions and the ends of the grate-bars, and means for revolving the grate.

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

FRANZ BURGER.

Witnesses:

GEO. K. TORRENCE,
C. B. WATERS.