

(No Model.)

3 Sheets—Sheet 1.

A. BARKER.

UNDULATING FURNACE HEARTH OR BASIN.

No. 410,343.

Patented Sept. 3, 1889.

Fig. 1

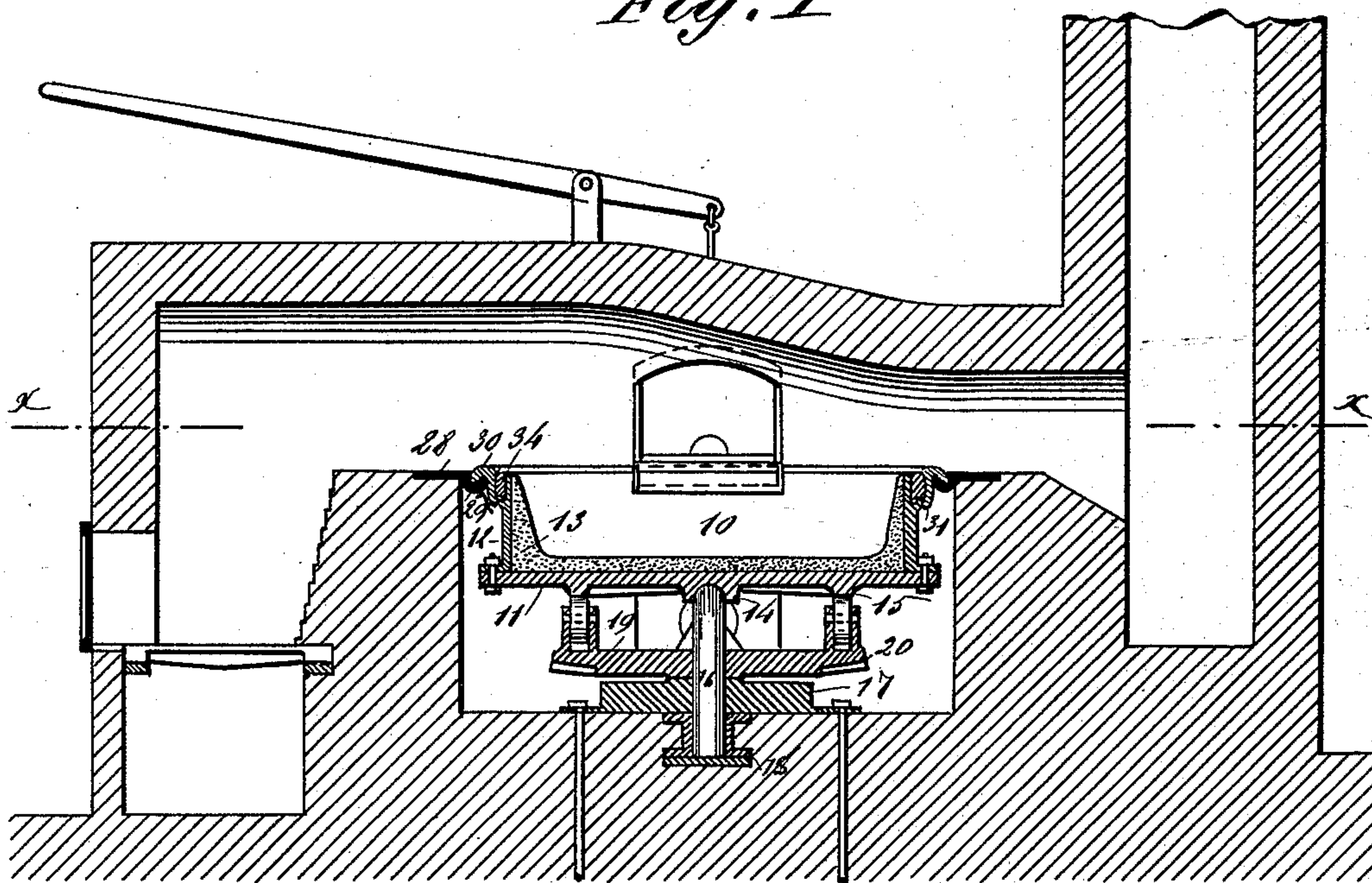
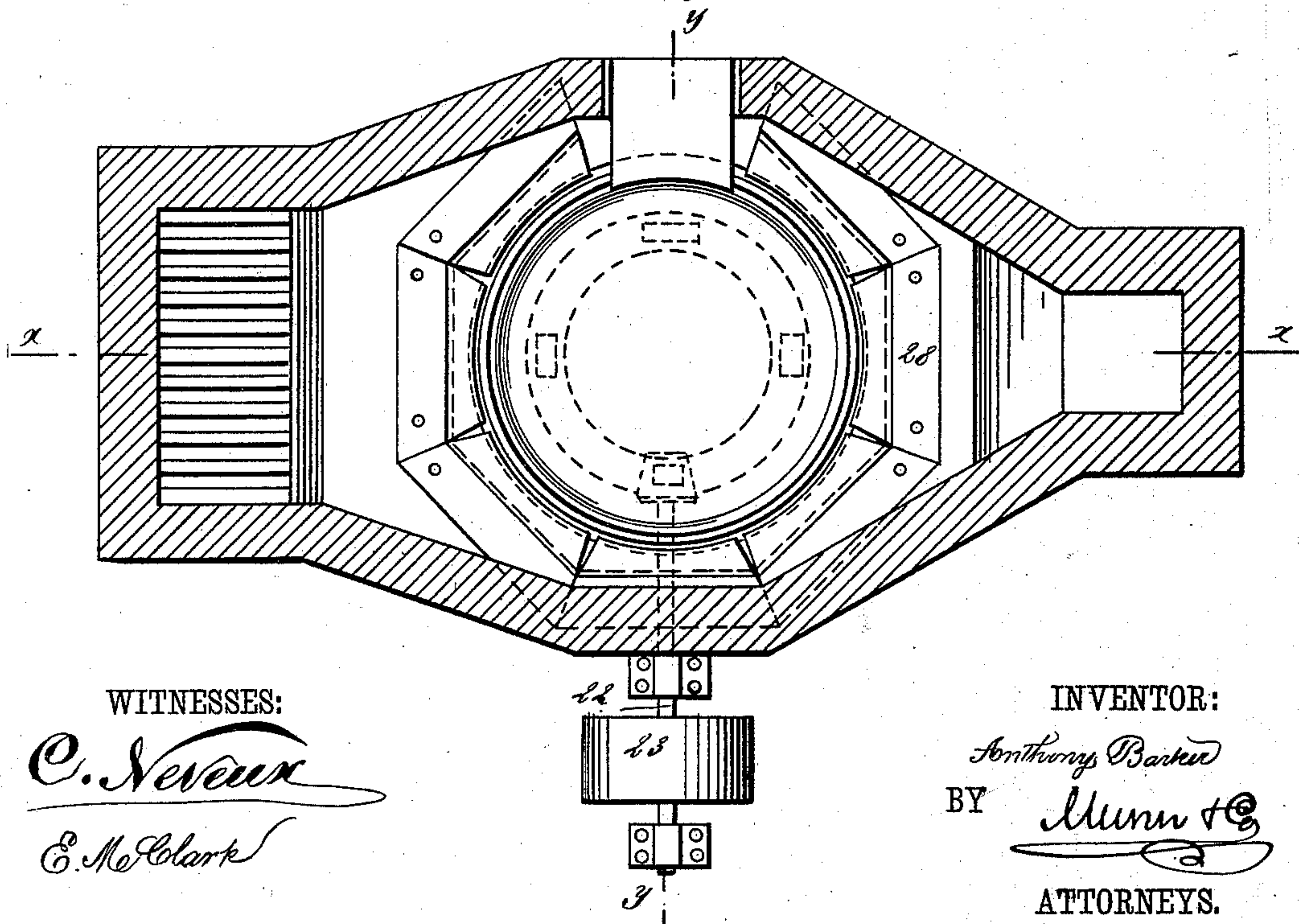


Fig. 2



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Fig. 5

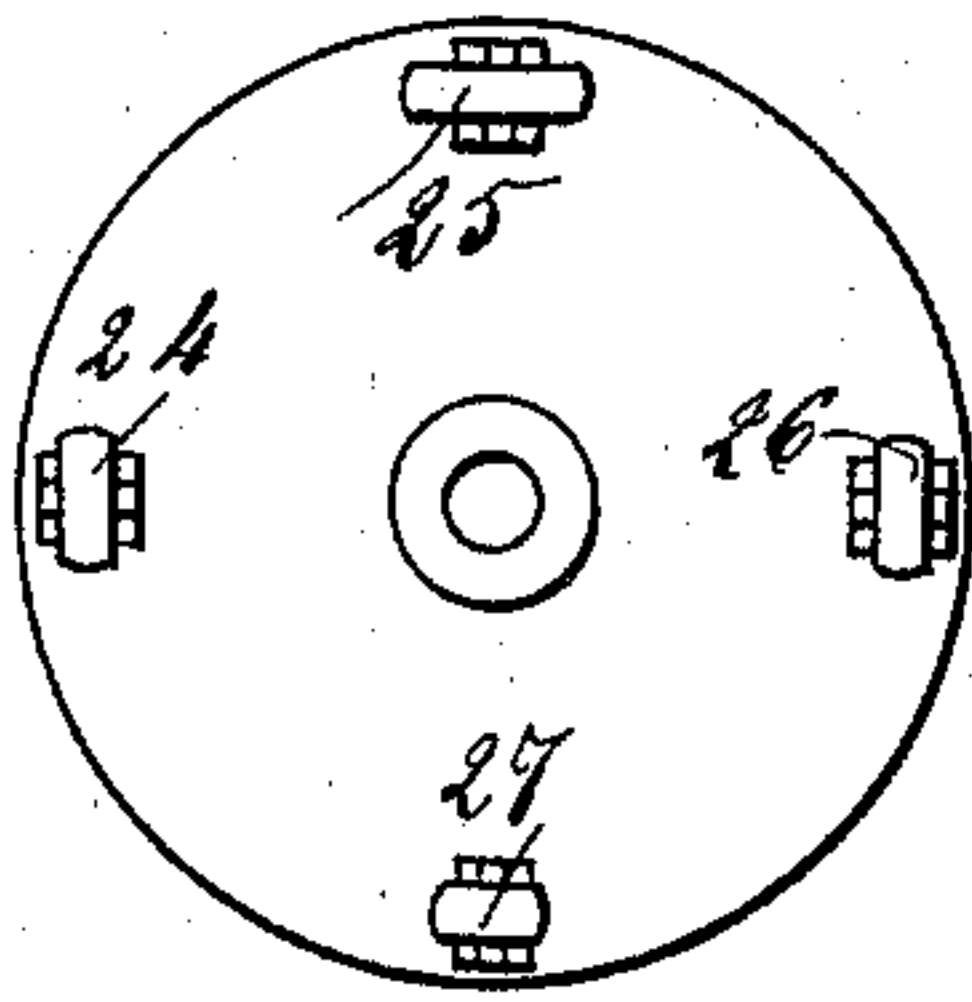


Fig. 5

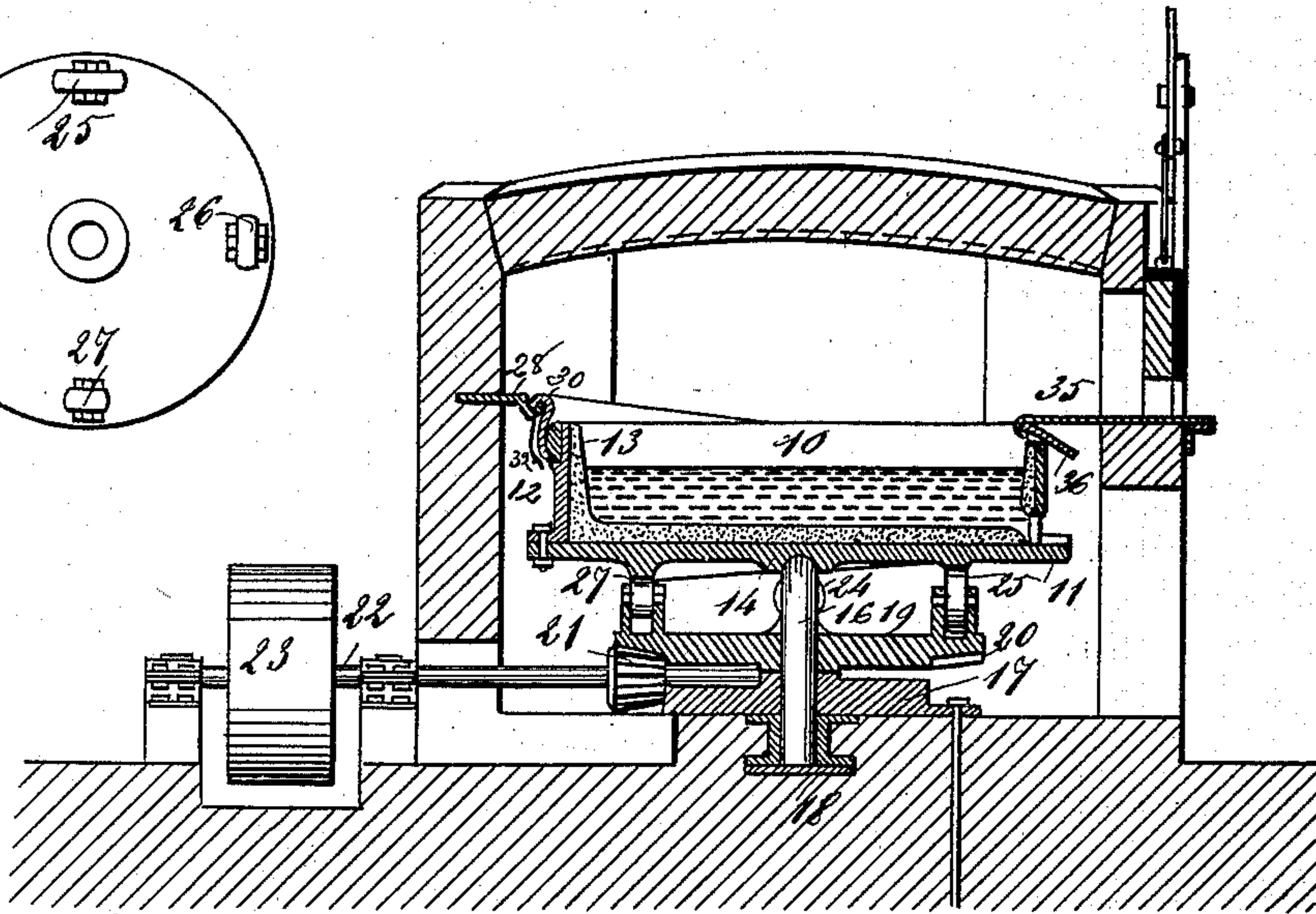


Fig. 6

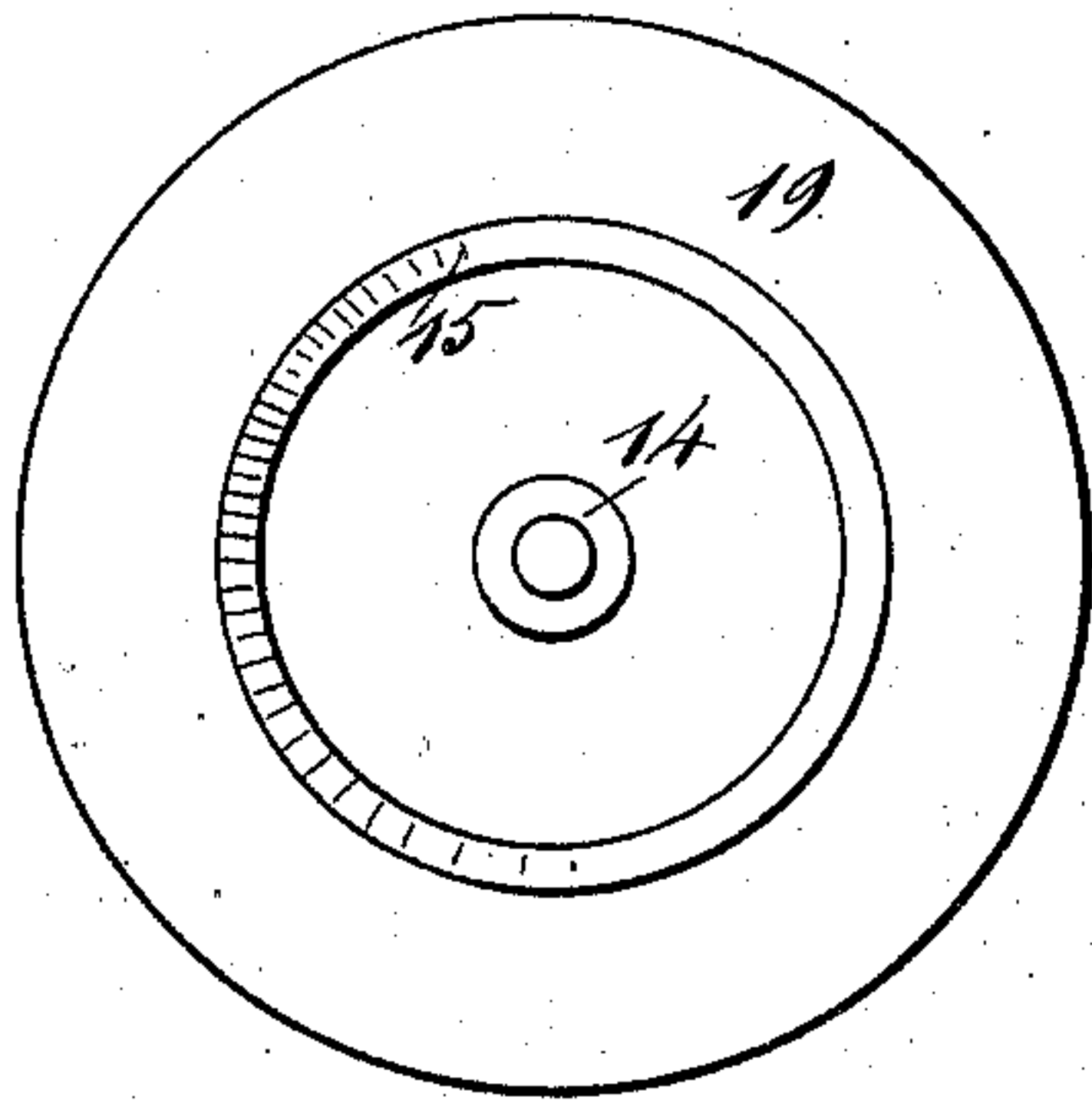
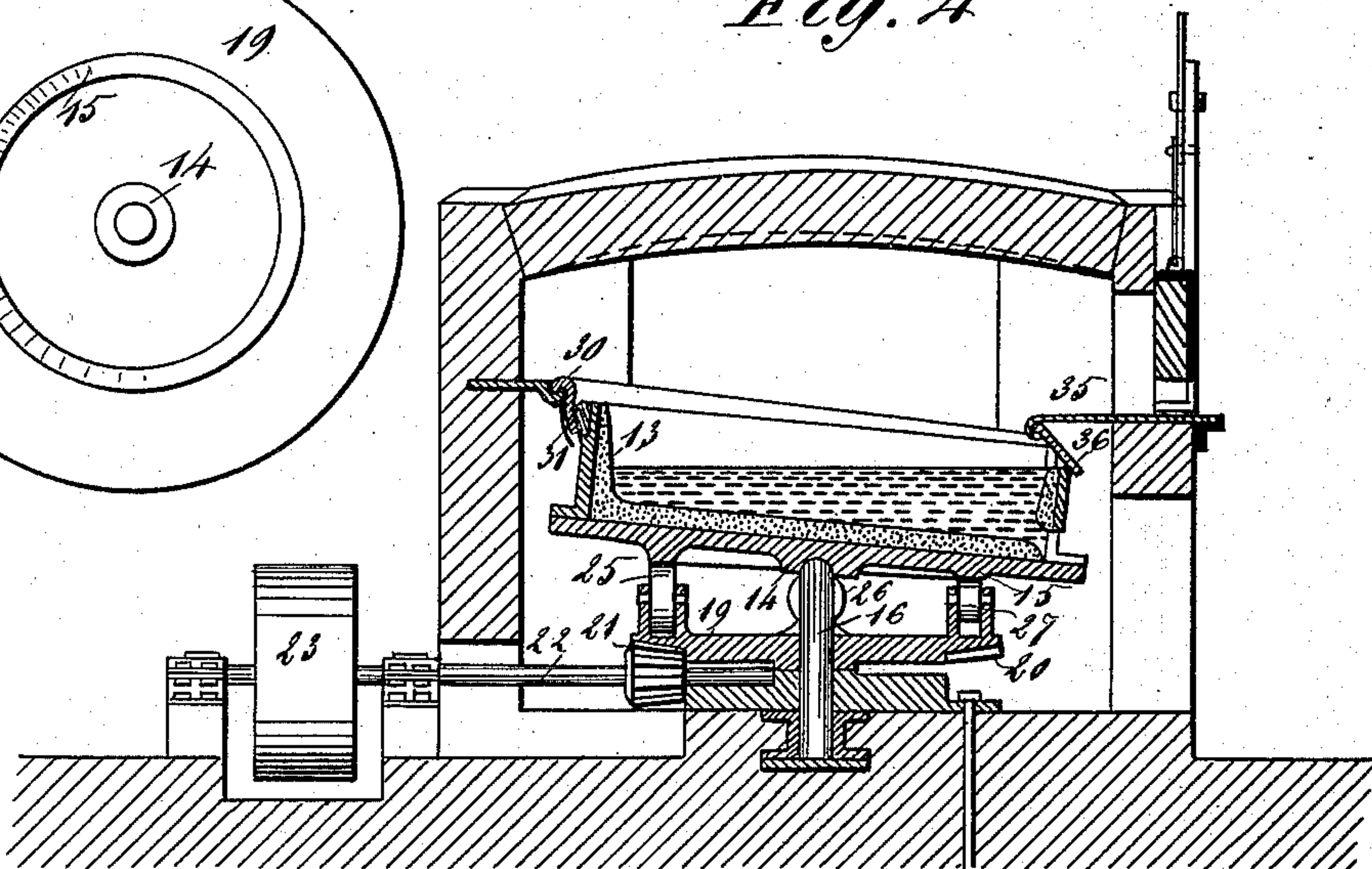


Fig. 4



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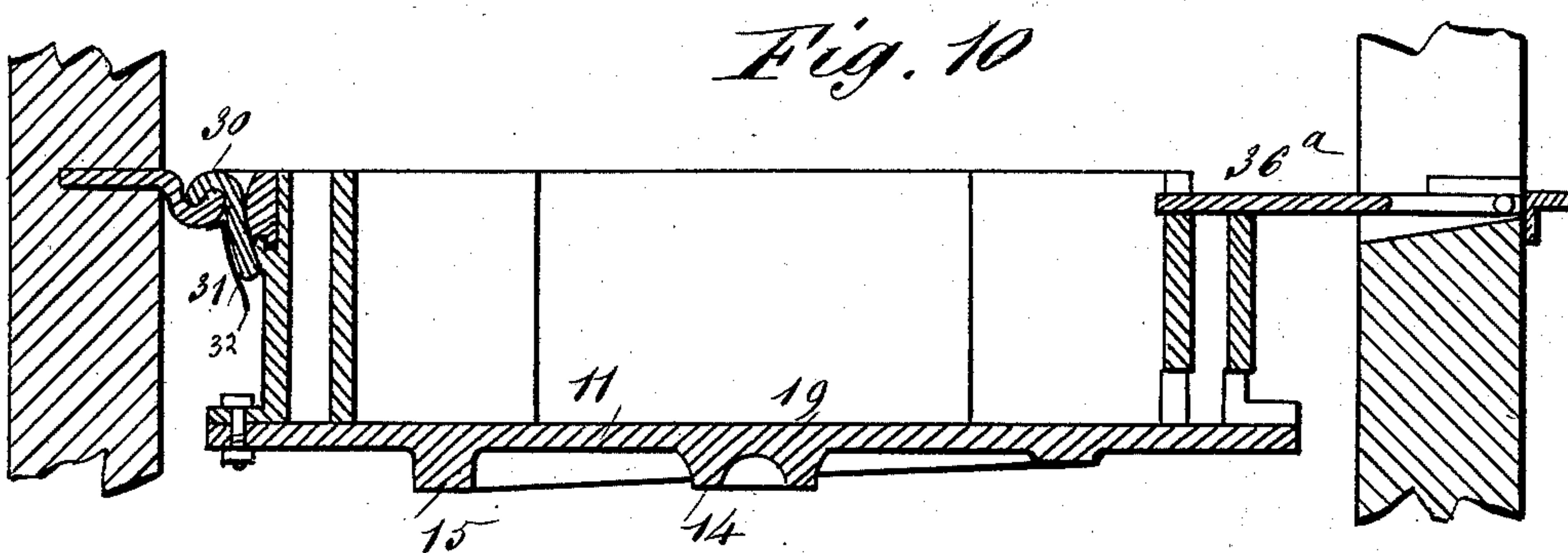
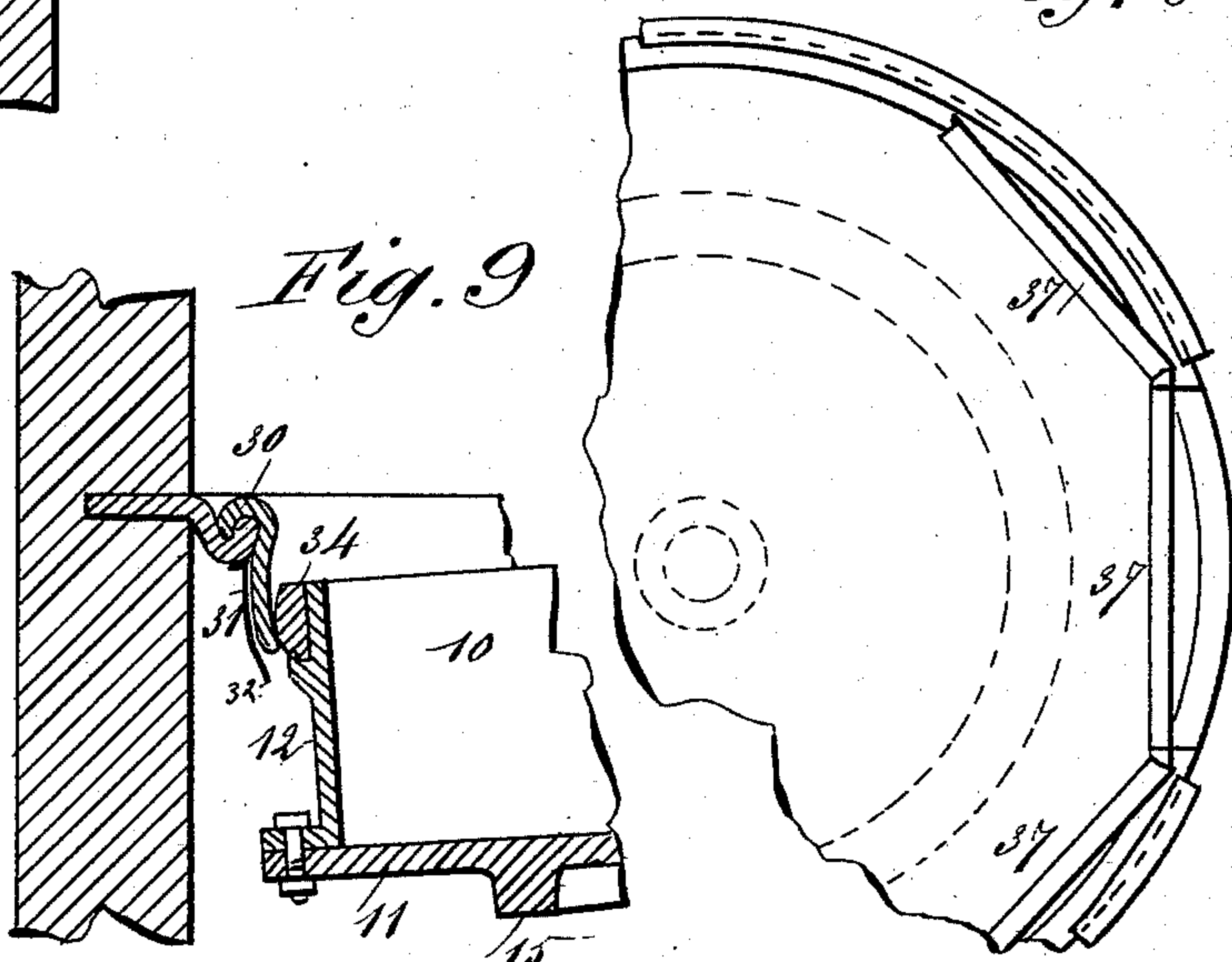
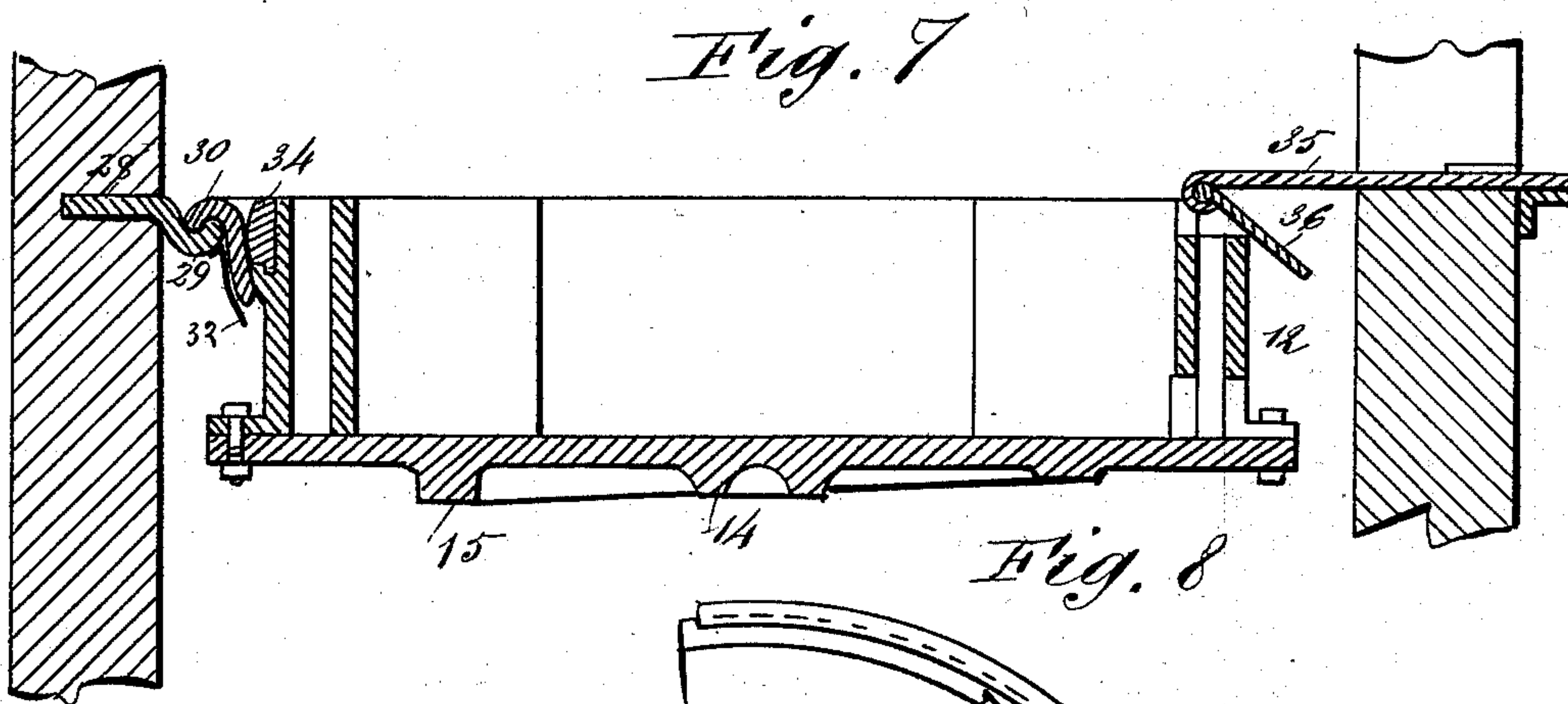
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UNITED STATES PATENT OFFICE,

ANTHONY BARKER, OF PITTSBURG, PENNSYLVANIA.

UNDULATING FURNACE HEARTH OR BASIN.

SPECIFICATION forming part of Letters Patent No. 410,343, dated September 3, 1889.

Application filed December 19, 1888. Serial No. 294,076. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY BARKER, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Undulating Furnace Hearth or Basin, of which the following is a full, clear, and exact description.

The object of my invention is to provide for the agitation of molten iron, so that every separate particle of iron will be brought into contact with the reagent—such as metallic oxide found in cinder, slag, or scale—employed for its purification; and to this end the invention consists, essentially, of a centrally-supported hearth or basin and a means for undulating the basin, as will be hereinafter more fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central longitudinal sectional view of a reverberatory furnace, representing the same as it appears when provided with my improved undulating hearth or basin. Fig. 2 is a sectional plan view taken on line *x x* of Fig. 1. Fig. 3 is a cross-sectional view taken on line *y y* of Fig. 2, the basin or hearth being represented as it appears when in a horizontal position. Fig. 4 is a similar view, the basin or hearth being, however, represented in its position of greatest depression. Fig. 5 is a plan view of the roller-carrying disk. Fig. 6 is an inverted plan view of the hearth or basin. Fig. 7 is an enlarged detail view in central cross-section. Fig. 8 is an enlarged plan view of a portion of the hearth or basin. Fig. 9 is an enlarged detail view of the construction illustrated in Fig. 7, the basin or hearth, however, being represented in its inclined position; and Fig. 10 is a cross-sectional view representing a modified construction.

In the drawings above referred to, 10 represents a hearth or basin that is made from a cast-iron base 11 and cast-iron side walls 12, that are bolted to the base, the whole being lined with the refractory material 13. A boss 14, formed with a concave recess, extends downward from the under side of the center of the base 11, and about this boss there is formed a

concentric cam-faced flange 15, the face of said flange being in a plane that is at a slight angle to that of the base.

The hearth is supported by a vertical post or standard 16, which passes through a bed-plate 17 to a step 18, the upper end of the shaft or post being convex to fit within the concave recess of the boss 14. A disk 19 is loosely fitted upon the post 16 and rests upon the plate 17, and this disk is formed with a bevel-gear 20 about the edge of its under side, which gear is engaged by a pinion 21, that is carried by a horizontal shaft 22, which may be driven in any manner desired—as, for instance, by means of a belt passing over a pulley 23, that is carried by the shaft. The disk 19 carries four wheels or rollers 24, 25, 26, and 27, of which the rollers 24 and 26 are of the same size and are located at points diametrically opposite the axis of the disk. The roller 25 is larger than the rollers 24 and 26, while the roller 27 is smaller than said rollers 24 and 26. The rollers 25 and 27 are arranged at right angles to the rollers 24 and 26. About the hearth there are secured a number of flanges 28, that are formed with hook-like projections 29, which are engaged by correspondingly hook-shaped projections 30, that are formed upon plates 31, said plates being lined with fire-brick, while a loose fold 32 of asbestos cloth is attached, as represented. About the upper portion of the side walls or flange 12 there is fitted a collar or rim 34, which may be removed when exceedingly worn. To the working-door of the hearth there is connected a working fore-plate 36, which rests against the flange 12, as shown in the drawings, the fore-plate moving from the position in which it is shown in Fig. 3 to the position shown in Fig. 4 as the hearth or basin is tilted; or instead of such a fore-plate as the one shown a fore-plate 36^a (see Fig. 10) might be employed, this fore-plate being pivotally connected to the furnace-wall just inside of the working-door in a manner so that it will rise and fall as the hearth or basin is tilted. In Fig. 8 I have shown three straight plates 37, of which the center plate is a breast-plate, while the others are jam-plates.

Such being the general construction of my improved undulating furnace, the operation is as follows: A rotary motion being imparted

to the shaft 22, the disk 19 will be revolved, and the rollers carried by said disk will travel around the cam-faced flange 15, the wheels or rollers 24, 25, 26, and 27 being so proportioned
5 that when the roller or wheel 25 is beneath that portion of the flange 15 which extends to the least degree from the plate 11 the basin or hearth will be in a horizontal position; but
10 when the wheel or roller 25 is beneath the opposite side of the hearth—that is, beneath that portion of the flange which has the greatest projection—the hearth or basin will be tilted, as illustrated. By following the motion necessarily imparted to the basin it will be seen
15 that an undulation will be established in the molten liquid contained in the basin or hearth, such undulation, however, being checked when the basin is brought to a horizontal position, the arrangement being such that an exceedingly thorough agitation of the molten metal
20 is obtained, so that all particles thereof will be subjected to the action of the reagent. In order to prevent the rotation of the hearth or basin, it is held by clutches 40, which work in
25 slots formed in the fire-bridge and flue-bridge, as shown in Fig. 1.

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

30 1. In an undulating furnace, the combination, with a basin or hearth, of a central post or standard upon which the hearth is free to turn, a revoluble disk, and wheels of unequal diameter carried thereby and arranged to bear

against the under side of the hearth, substantially as described. 35

2. In an undulating furnace, the combination, with a hearth formed with a central boss or projection having a concave central recess, of a cam-faced flange surrounding said boss, a post or standard entering the recess of the central boss, a revoluble disk, and wheels carried
40 by said disk and arranged to bear against the cam-faced flange, substantially as described.

3. The combination, with a hearth supported by a central standard and a means for tilting
45 the hearth, of swinging aprons or flanges mounted to bear against the outer edge of the hearth-flange, substantially as described.

4. The combination, with a hearth, of a central supporting post or standard, a means for
50 undulating the hearth, swinging aprons or flanges bearing against the outer face of the hearth-flange, and an asbestos fold arranged about the hearth, substantially as described.

5. The combination, with an undulating
55 hearth or basin, of a swinging fore-plate arranged in connection therewith, substantially as described.

6. The combination, with a non-revoluble tilting hearth or basin, of a swinging fore-plate
60 resting against one edge thereof, substantially as described.

ANTHONY BARKER.

Witnesses:

JOHN H. CRATTY,
HARRY HOOVER.