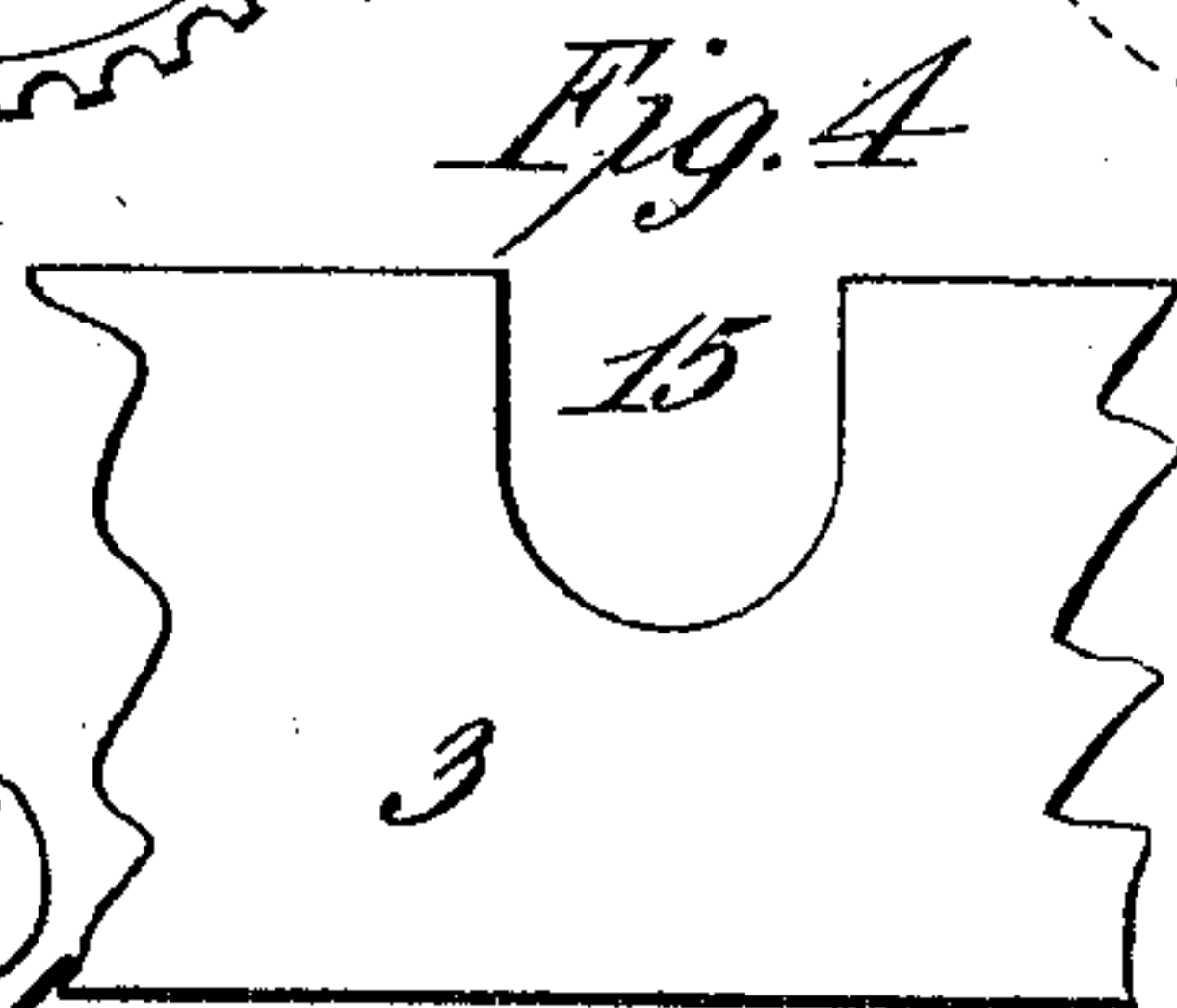
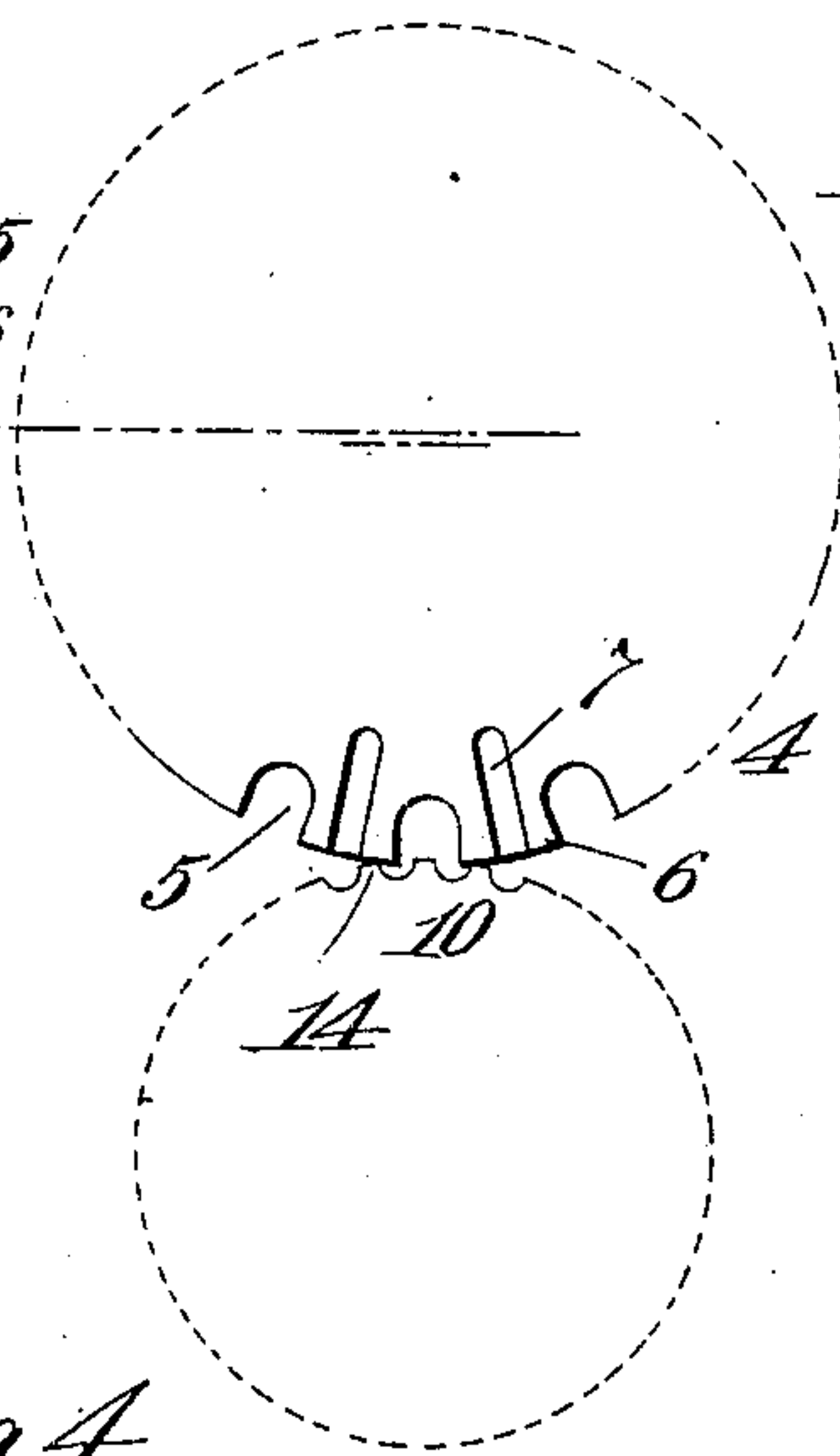
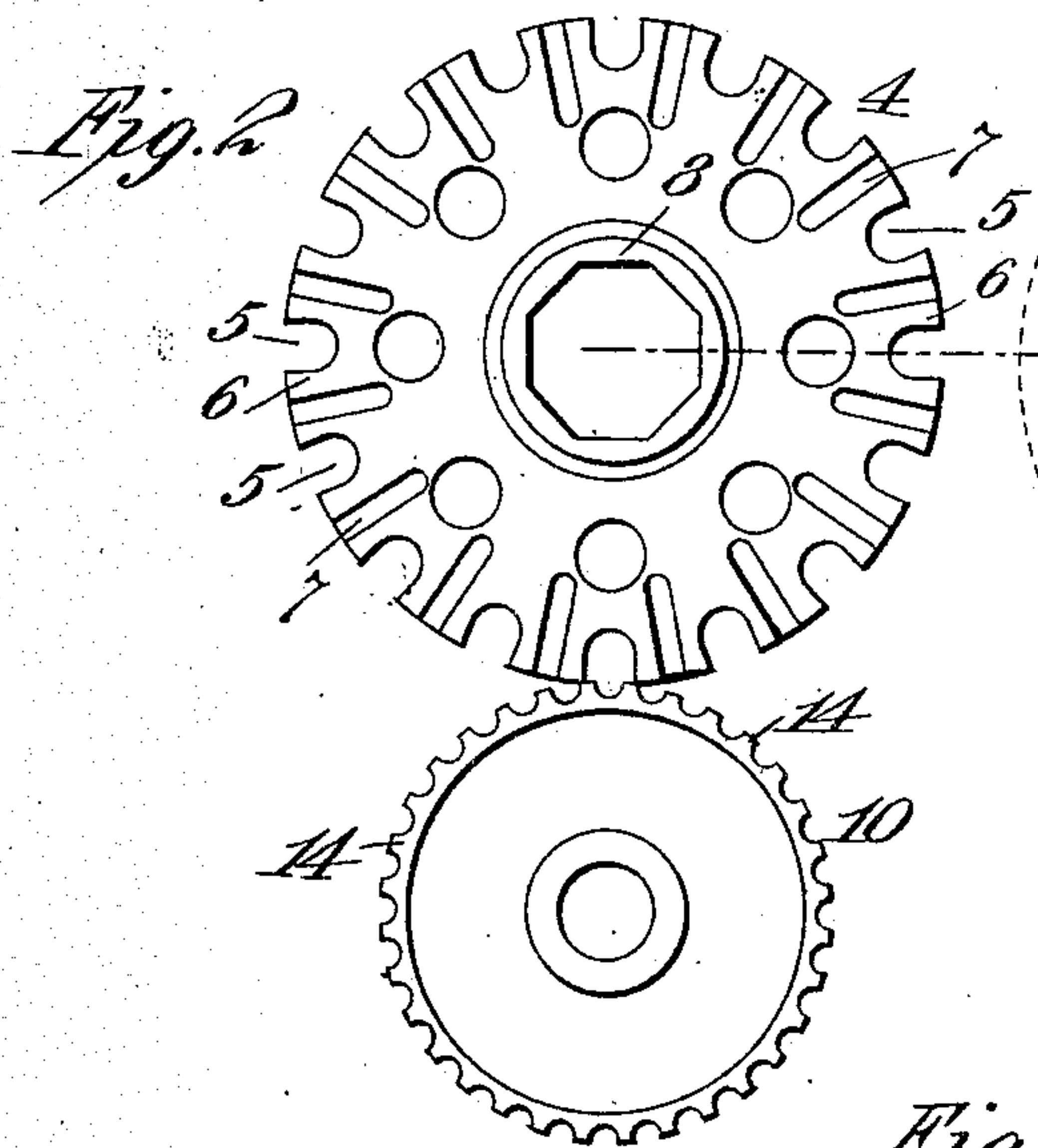
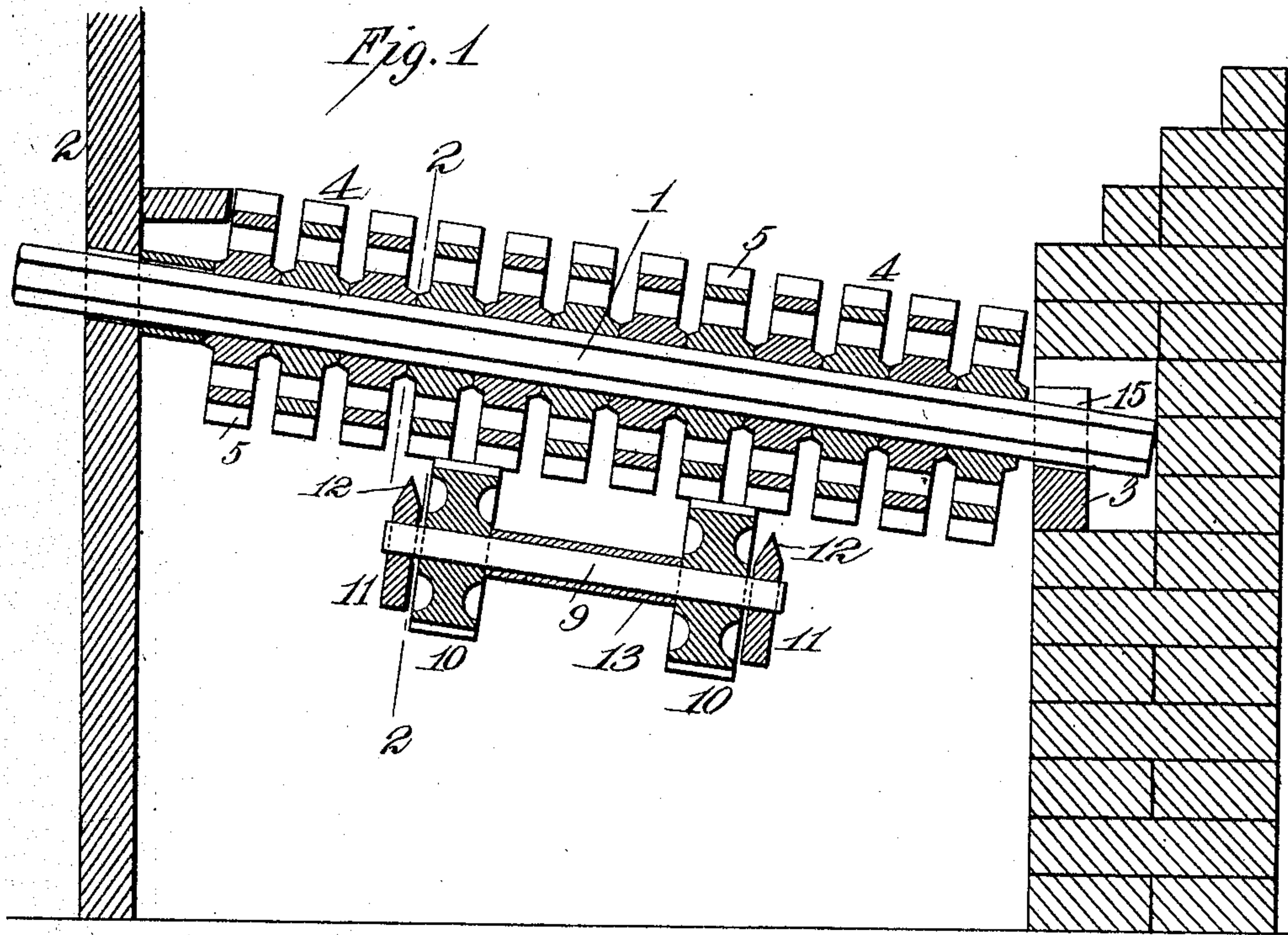


No. 860,211.

PATENTED JULY 16, 1907.

P. B. HARTFORD.
GRATE.

APPLICATION FILED AUG. 7, 1906.



Witnesses:

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UNITED STATES PATENT OFFICE.

PETER B. HARTFORD, OF NEW YORK, N. Y.

GRATE.

No. 860,211.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed August 7, 1906. Serial No. 329,547.

To all whom it may concern:

Be it known that I, PETER B. HARTFORD, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented an Improvement in Grates, of which the following is a specification.

This invention relates to grates employing disks strung upon grate bars, the disks being rotatable for the purpose of cleaning the fire. By my invention I support the bars intermediate their ends, and at the same time permit their rotation without excessive friction, and by means which will insure the continuity of the surface of the grate.

Further objects are to produce means for assisting the shaking of the ashes from the disks, to support the disk-supporting means so that it will not intercept the ashes, and to render the disks more readily adjustable and removable, and to utilize a shallower bridge-wall bearing bar than has heretofore been possible.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which

Figure 1 is a side view, partly in section, of a grate embodying my invention, Fig. 2 is an enlarged detail of parts of the same taken on the line 2—2, Fig. 1, Fig. 3 is a view similar to that of Fig. 2, but showing only a portion of the mechanism illustrated in that figure, and in a different position, and Fig. 4 is a detail of the bridge-wall bearing bar.

In all of the views, like parts are designated by similar reference characters.

In carrying out my invention, I provide a grate which comprises a number of bars 1, supported in an inclined position between the front wall 2 and the bridge-bar 3 of the furnace, as shown. The bars are so mounted at their extremities that they may be elevated a short distance, without being displaced from the bearings. Upon the bar 1 are strung the necessary number of disks 4 to produce a continuous grate surface. Any form of disk may be used, but I prefer to employ a disk similar to that shown in Fig. 2, which is similar to that disclosed in my co-pending application for patent filed December 6, 1905, Serial Number 290,524. These disk are circular in outline, having cut-away portions 5, between which are teeth 6, the said teeth having curved outward faces, the curve conforming to the periphery of the disk. On the sides of the teeth 6 are grooves 7. Each disk has a hub 8 with an octagonal opening therein through which passes the bar 1, the latter being shaped to conform to the opening. A square, hexagonal or other shaped opening, and correspondingly shaped bar, may be used if desired. The hubs 8 separate the peripheries of the disks 4 the necessary distance. If desired, washers may be interposed between the disks for this purpose, as shown in

my co-pending application. Below each of the bars 1, and parallel thereto, is an axle 9, supporting rollers 10, 10.

The axle 9 is arranged immediately below the bar 1, as shown in Fig. 2, and each of the rollers 10 engages with the lower faces of certain of the disks 4. These rollers 10 are interposed, as shown, between the extremities of the bar 1, and as many of such rollers as are necessary or desirable may be used, two being shown for the purpose of illustration. They sustain the weight of the bar 1, and with it the disks 4 strung thereon, and prevent the bending or buckling of the bar 1 when subjected to excessive strains or great heat, and they also reduce the pressure of the bar 1 upon the end bearings in 2 and 3. The rollers may sustain the entire weight of the grate, in which case the ends of the bars will rest very lightly within their bearings, or they may assist in supporting the grates, and will come into use only when the bars become flexed by weight or heat.

The rollers 10 have wider faces than the disks 4, so that two of the latter will engage with one of the former, as shown in Fig. 1. In the event of one of the two disks becoming broken, the weight of the disks and bar will be sustained by the other disk.

The shaft 9 is mounted in cross-bars 11, arranged below the grate. The upper faces of the cross-bars are beveled at 12, so that they will serve to divert ashes passing downward from the grate and prevent an accumulation of ashes on the cross-bars. A sleeve 13, surrounds the axle 9, between the two rollers 10, 10, and holds the latter at the desired distance apart.

The peripheries of the rollers 10, 10 are serrated, being provided with teeth 14, such teeth having curved outer faces conforming to the curvature of the periphery of the roller. The width of the faces of the teeth and the separating interstices are about equal, and each is considerably less than the separating interval between the teeth 6 of the disk 4 and is also less than the width of the face of such teeth. Upon the disk 4 being rotated by the rotation of the bar 1, the roller will be similarly rotated, and the disk 4 will be supported upon such roller, the faces of the teeth 6 ordinarily engaging with the faces of the teeth 14. At varying intervals, however, during the rotation of the disk, one of the teeth 14 will engage between the teeth 6 of the wheel 4, as shown in Fig. 3. As the parts approach this position, the disk 4 will drop down to the position shown in Fig. 3, thereby jolting the disk and the bar upon which it is supported. It is to be understood that the bar 1 should have sufficient vertical movement within the bearings at its ends to permit this to be done, or the bars should be sufficiently flexible. This movement of the bar 1 is a vertical movement, and will be more or less

irregular and will effectively clean the grate of ashes and clinkers.

The bridge-wall bearing 3 is provided with notches 15, within which the rear ends of the bars 1 rest. By 5 using notches in lieu of holes, as disclosed in my co-pending application, a less depth of bridge-wall is required, and the grate bars 1 may be adjusted with greater facility.

It will be seen that by supporting the grate bars and 10 disks intermediate the ends of the bars, by the rollers, the bars and disks may be rotated without excess of friction. It will also be seen that the intermediate support will properly sustain the grate without inter-rupting the continuity of surface of the latter, as would 15 be the case if the bar were engaged by intermediate bearings between adjacent disks.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

20 1. A grate comprising separate disks mounted on bars, the said disks being circular, and the said bars being rota-

table, the said disks being additionally supported upon rollers arranged intermediate the bearings of the bars.

2.. A grate having disks supported upon bars, the said bars being rotatable and the said disks being circular, with 25 teeth thereon, the said disks being additionally supported by rollers which are serrated, whereby the disks will be shaken and jarred when rotated.

3. A grate comprising disks supported upon bars, the said bars being rotatable and the said disks being sup-ported intermediate the bearings of the bars by rollers, the 30 periphery of each disk being notched and the rollers being serrated, the serrations being smaller than the notches.

4. A grate having disks supported upon bars, the said bars being rotatable, rollers engaging with the disks in-termediate the bearings of the bars, and supports for the 35 rollers below the disks, the said supports having sharp upper edges.

This specification signed and witnessed this 6th day of August, 1906.

PETER B. HARTFORD.

Witnesses:

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