

(No Model.)

F. A. WESTBROOK.  
GRATE FOR FURNACES, &c.

No. 585,144.

Patented June 22, 1897.

Fig. 2

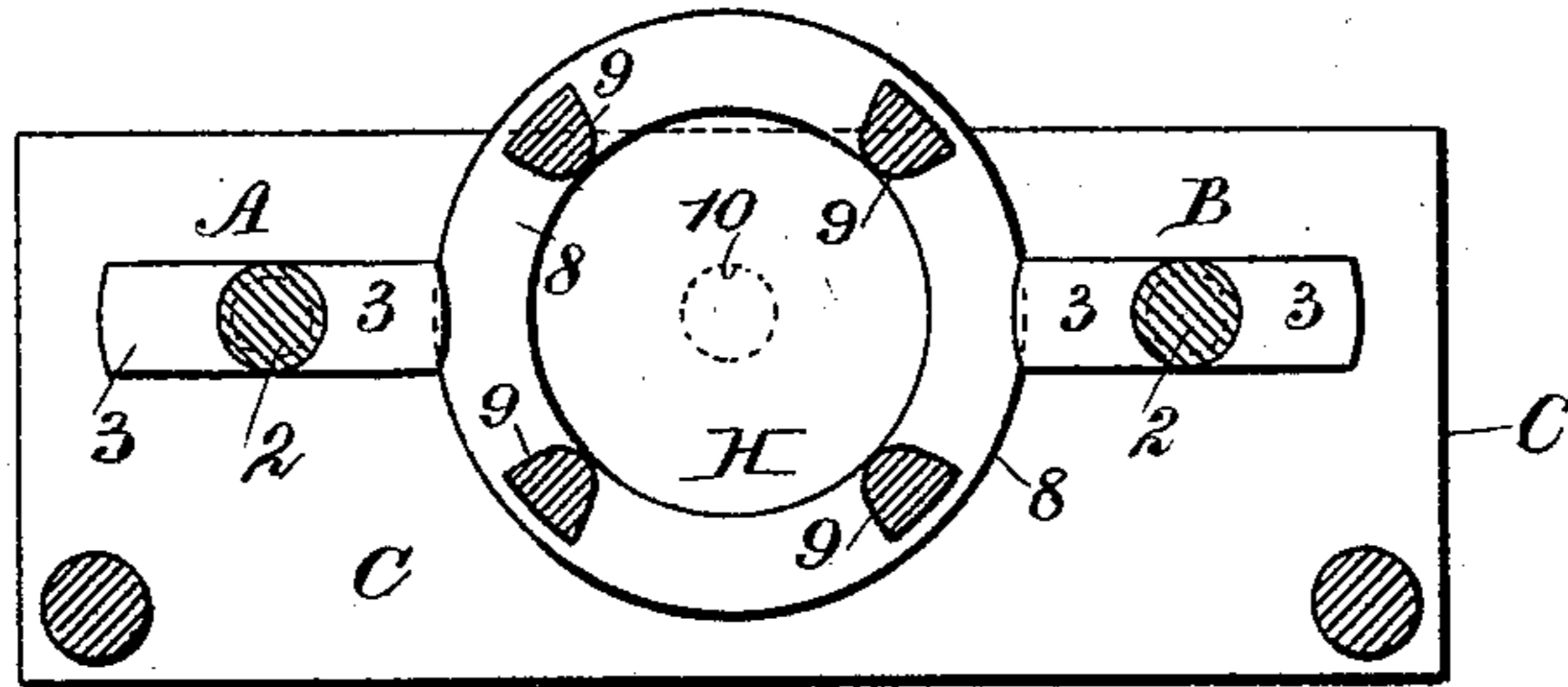


Fig. 3.

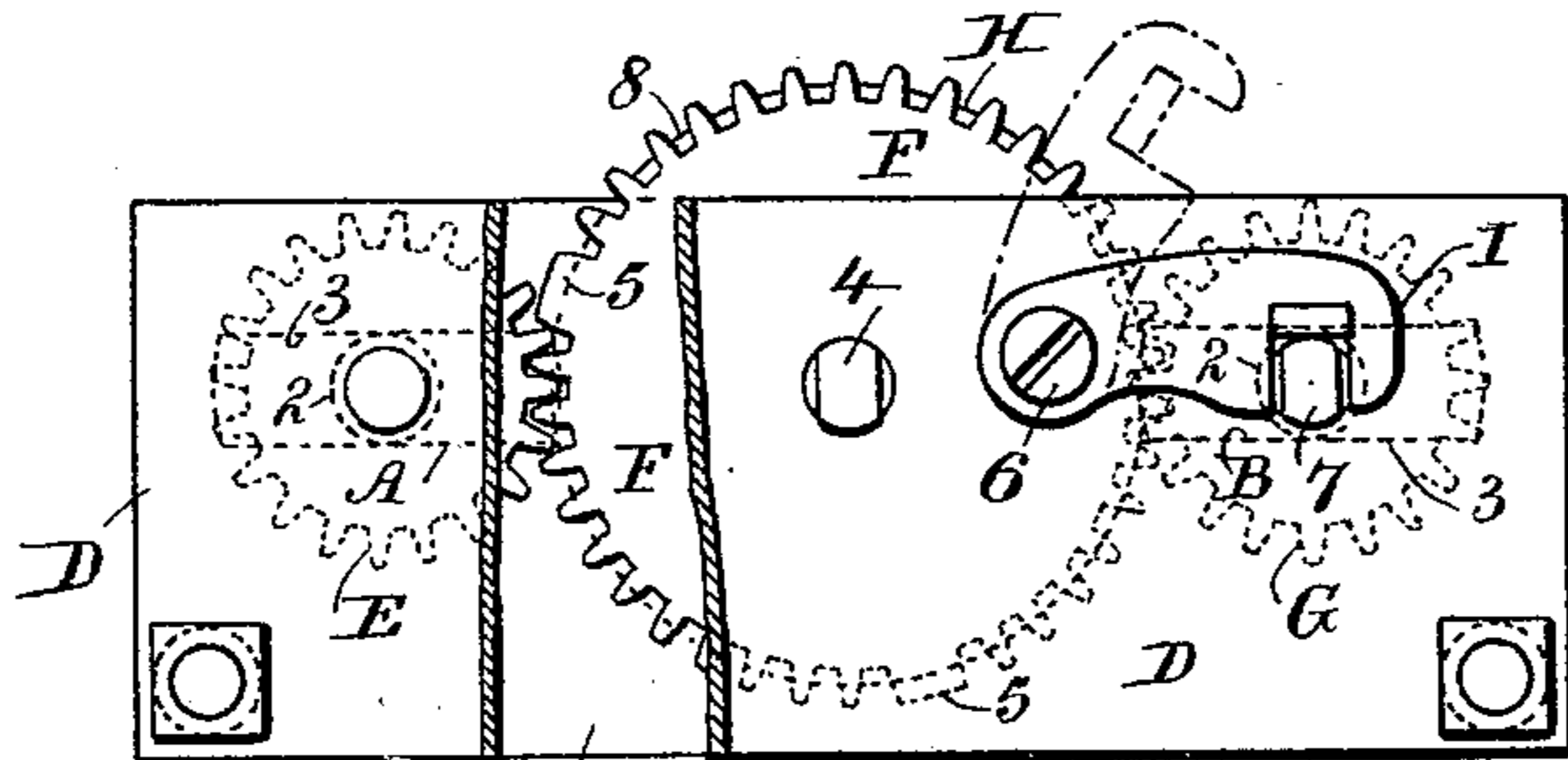
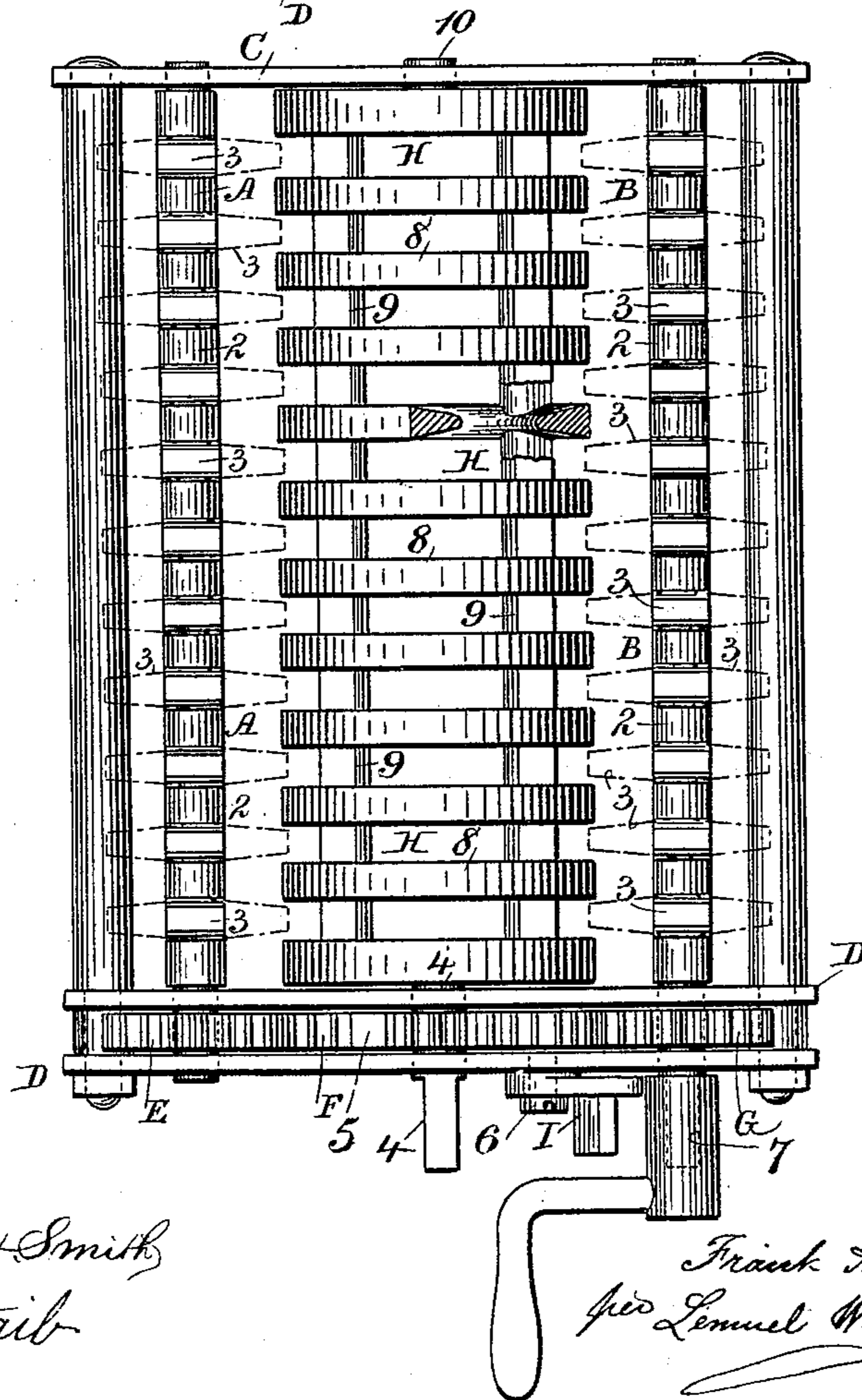


Fig. 1.



Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK A. WESTBROOK, OF PORT JERVIS, NEW YORK, ASSIGNOR TO  
HIMSELF AND JAMES J. MILLS, OF SAME PLACE.

## GRATE FOR FURNACES, &c.

SPECIFICATION forming part of Letters Patent No. 585,144, dated June 22, 1897.

Application filed January 27, 1896. Serial No. 576,921. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK A. WESTBROOK, a citizen of the United States, residing at Port Jervis, in the county of Orange and State of New York, have invented an Improvement in Grates for Furnaces, Stoves, &c., of which the following is a specification.

Grates for furnaces have been made by a cylinder of bars or of rings set together and supported by a central shaft, and these have either been rotated or oscillated and used in connection with projecting fingers or bars at opposite sides of such cylinder, and in some instances grate-bars have been pivoted at their ends so as to be rocked in shaking the ashes or tipped up edgewise in dumping the fire.

In the present invention I construct the grate-bar cylinder open in the interior from end to end and with longitudinal connections that are depressed below the surfaces of the rings, and the latter are beveled, so that pieces of clinker or cinder will not become wedged in position, but will drop out from between the grate-bars, and at the sides of the cylinder rocking bars are provided, which allow for dumping the contents of the grate, and these are connected together by gearing having stop-blocks which limit their rotation in opposite directions, so that the rocking grate-bars are stopped at a horizontal or nearly horizontal position when they have been partially turned in shaking the fire or in dumping clinker or other refuse materials.

In the drawings, Figure 1 is a plan view with the rocking grate-bars turned up edgewise to show the position of the stop and the gearing, the dotted lines representing the position of the rocking grates when in use. Fig. 2 is a cross-section; and Fig. 3 is an elevation, partially in section, representing the stop that is employed for holding the rocking grates.

According to the size of the fire-chamber and of the grate-surface, so a greater or less number of bars and grates are to be employed. I have represented two rocking bars and one circular grate.

The rocking bars A and B are each made with a central bar or connection 2 and with cross-bars or projecting fingers 3 upon oppo-

site sides, and at the ends of the central bar 2 are circular journals upon which the bars can be rocked or revolved.

I have represented bearings C and D at the respective ends of the fire-chamber, and the bearing D is double in order that the gear-wheels E F G may be made use of for connecting the rocking bars A and B, the gears E and G being fixed upon square portions of the journals or shafts of the rocking bars or otherwise secured to such rocking bars, and the gear F being between the gears E and G and preferably loose upon the shaft or axis 4 of the circular grate H, so that the rocking bars may be operated together and the cylindrical grate be operated independently, and in the teeth of the gear-wheel F there are blocks at 5 for filling the spaces between the teeth of the gear at such positions as to limit the turning movement that may be given to the gears in communicating to the rocking bars A B a half-rotation. By applying these blocks or stops in the wheel F, as indicated in the drawings, one of the stops 5 will come against the wheel E when the gears are rotated in one direction and prevent the further movement, and the other block or stop will come against the teeth in the same gear E and form a stop when the parts are turned in the opposite direction, and the positions of these blocks 5 or stops are to be such that the grate-bars A and B will be level or nearly so when stopped in either one direction or the other, and it will be apparent that the grate-bars A and B can be rocked to a greater or less extent for shaking out ashes, and it is advantageous to extend the journal or shaft of the gear G and square the same to receive a crank or shaking-lever.

The latch I, pivoted at 6, is made with a forked end to set over the square or elongated prismatic end of the shaft or journal of the gear G, so that when this latch I is swung down it will hold the square end 7 and the grate-bars and gearing from turning or changing their position while in use.

The grate H is made substantially cylindrical, and it is composed of parallel rings 8 with connections 9, passing from one ring to the next, and these connections 9 pass longitudinally of the cylinder, and the outer sur-

faces of the connections are below the surfaces of the rings, so that the circular grate can be rotated with but little risk of the connections 9 being stopped against any clinkers or similar materials in the fire.

At one end of the circular grate II is a head and a journal or trunnion 10, passing into a hole in the bearing C, and at the other end of such cylinder is a head and a shaft 4, passing through the bearing D and through the center of the gear-wheel F, and the projecting end of the shaft 4 is squared or made polygonal for the reception of a suitable crank or lever by which the grate can be rotated or turned backward and forward in shaking out the ashes in clearing the fire. The parallel rings composing the cylindrical grate are preferably thicker from the outer to the inner surfaces than they are wide, and they are triangular in section, or approximately so, the surfaces being inclined or converging inwardly, as seen in the sectional bar, Fig. 1.

It will be observed that by this improvement the fire can be rattled or cleared from ashes to a greater or less extent from time to time, and either the center or the side portion of the fire can be thus freed more or less from ashes and the combustion thereby regulated, and when the ashes or clinkers accumulate upon the rocking grates A and B they can be shaken for the discharge of the ashes or tipped up edgewise for the discharge of clinkers and similar foreign substances, and the circular grate H can be made use of in sustaining the body of the fire, while the bars A and B may receive a half-revolution to discharge clinker or similar material, and it is generally advantageous to construct the parts in such a manner that the cross-bars or fingers 3 of the rocking grates A and B come adjacent to the spaces or openings between the rings 8 of the circular grate H, so as to keep the openings between the rings 8 in the circular grate free from clinkers or other foreign substances that might wedge therein.

I claim as my invention—

1. The combination with a revoluble cylindrical grate, composed of parallel rings, each ring tapering sectionally from the outside to the inside so as to present continuous cutting edges at its periphery, of a second grate situated adjacent to the cylindrical grate and adapted to not only extend the grate-surface, but to hold clinkers while the cutting edges are acting upon them, substantially as set forth.

2. The cylindrical grate, open in the center from end to end and composed of parallel rings thicker from the outer to the inner face than they are wide, and preferably approximately triangular in cross-section so that their surfaces are inclined or converging inward, and integral connections with their outer faces below the surfaces of the rings and extending from one ring to the next, and integral heads and journals or shafts at the respective ends of the cylindrical grate, and upon which the same is turned, and longitudinal bars with fingers adjacent to the openings between the parallel rings, substantially as set forth.

3. The combination with a cylindrical grate and the shafts or journals at its respective ends, of longitudinal rocking grate-bars one at each side of such cylindrical grate and each having a central bar and projecting fingers and end journals, gears E, and G, fastened on the respective journals, and an intermediate gear F, engaging such gears E, and G, and loose on the shaft of the cylindrical grate whereby the central cylindrical grate is separately revoluble and the side longitudinal bars may be simultaneously moved while the central cylindrical grate is unmoved, substantially as specified.

Signed by me this 29th day of December, 1895.

FRANK A. WESTBROOK.

Witnesses:

CHARLES ST. JOHN,  
S. T. MOFFETT.