

L. W. HARWOOD.

Grate.

No. 30,628.

Patented Nov. 13, 1860.

Fig: 1.

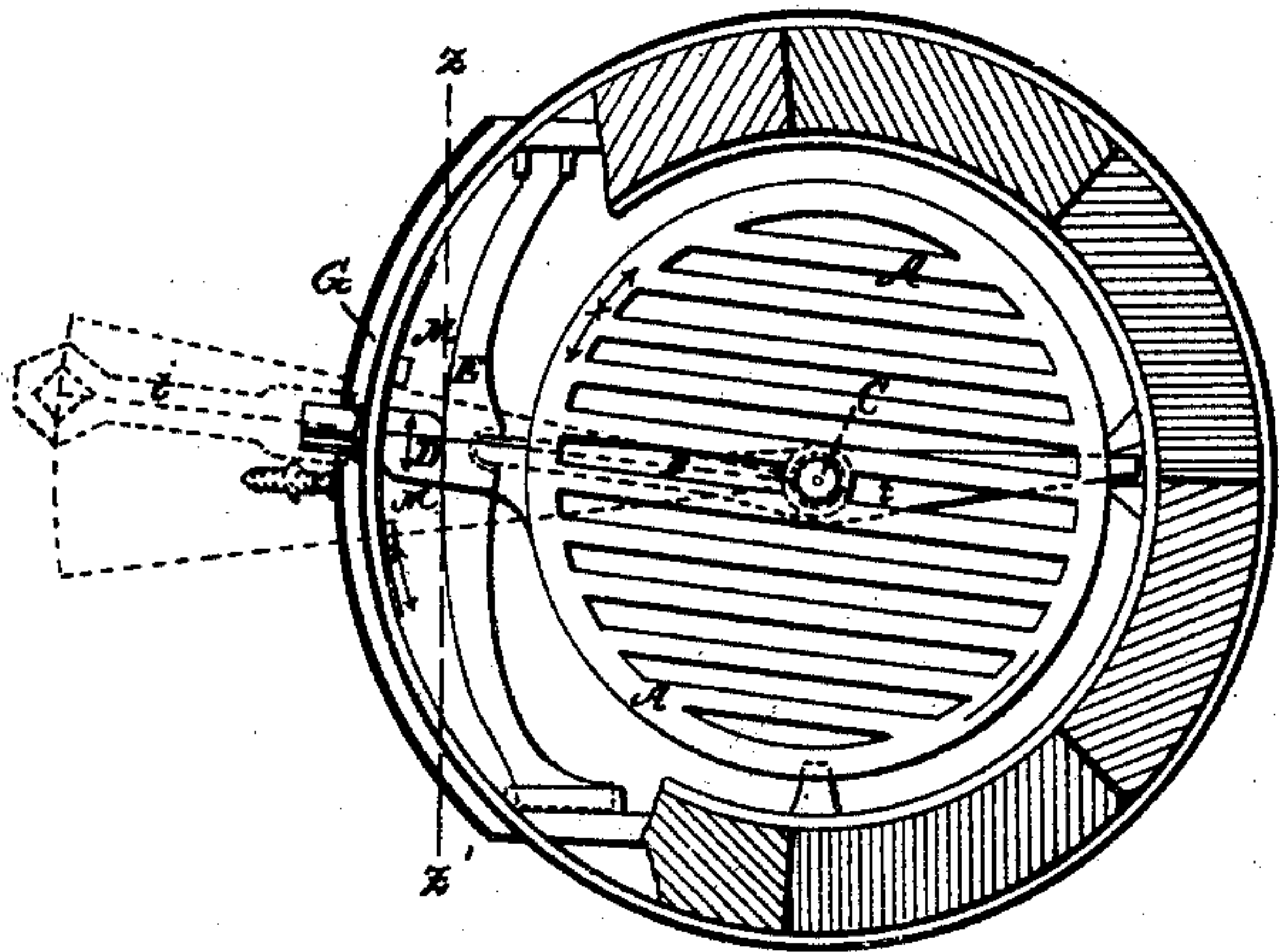


Fig: 2.

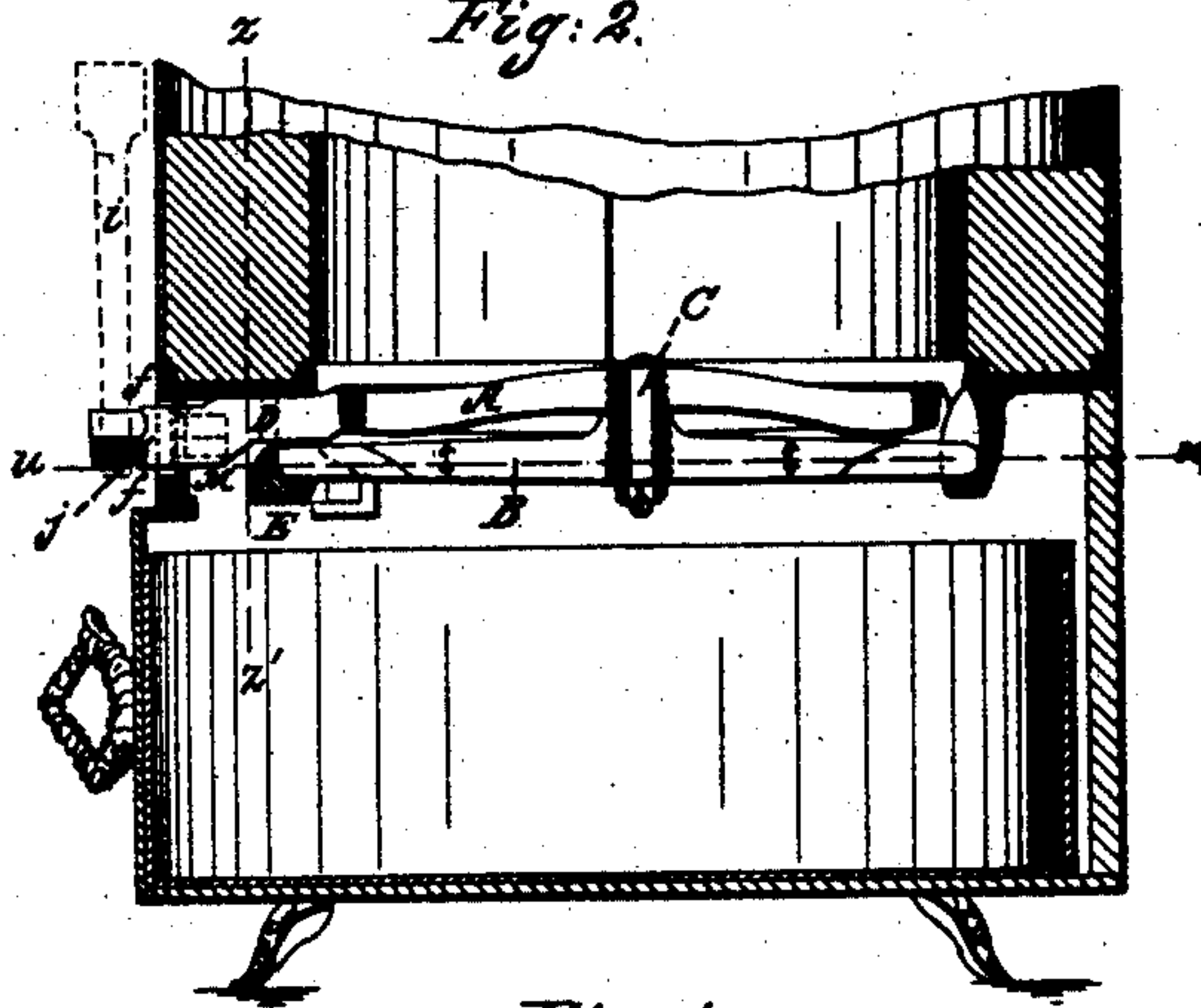


Fig: 4.

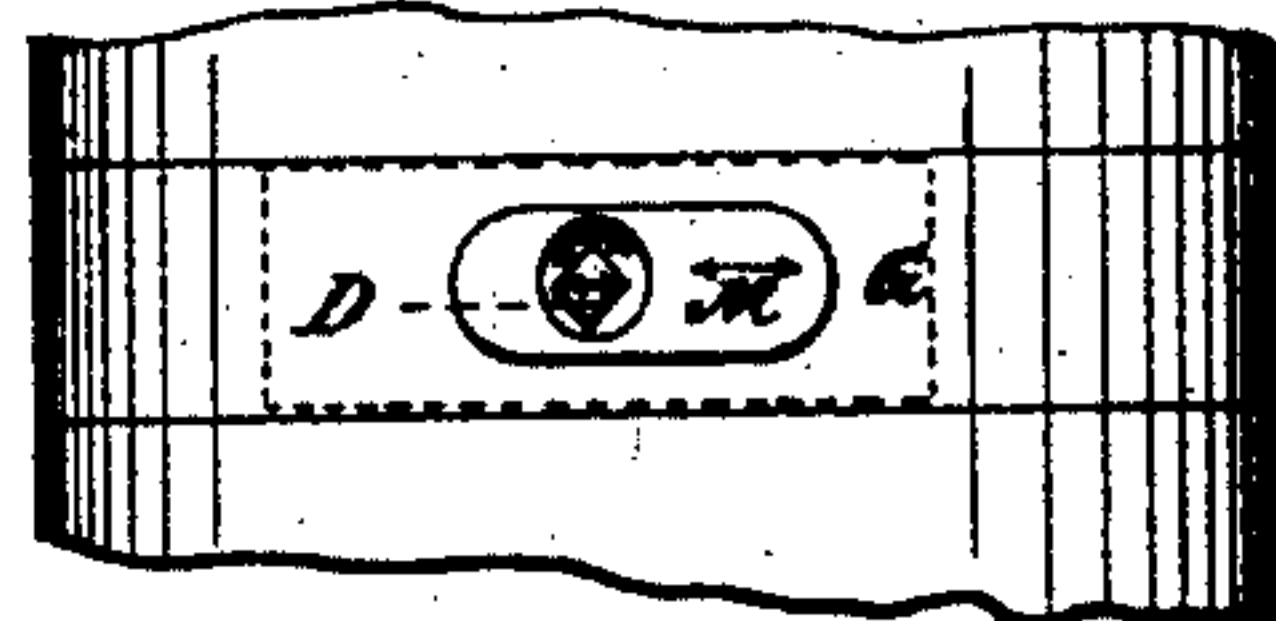


Fig: 3.

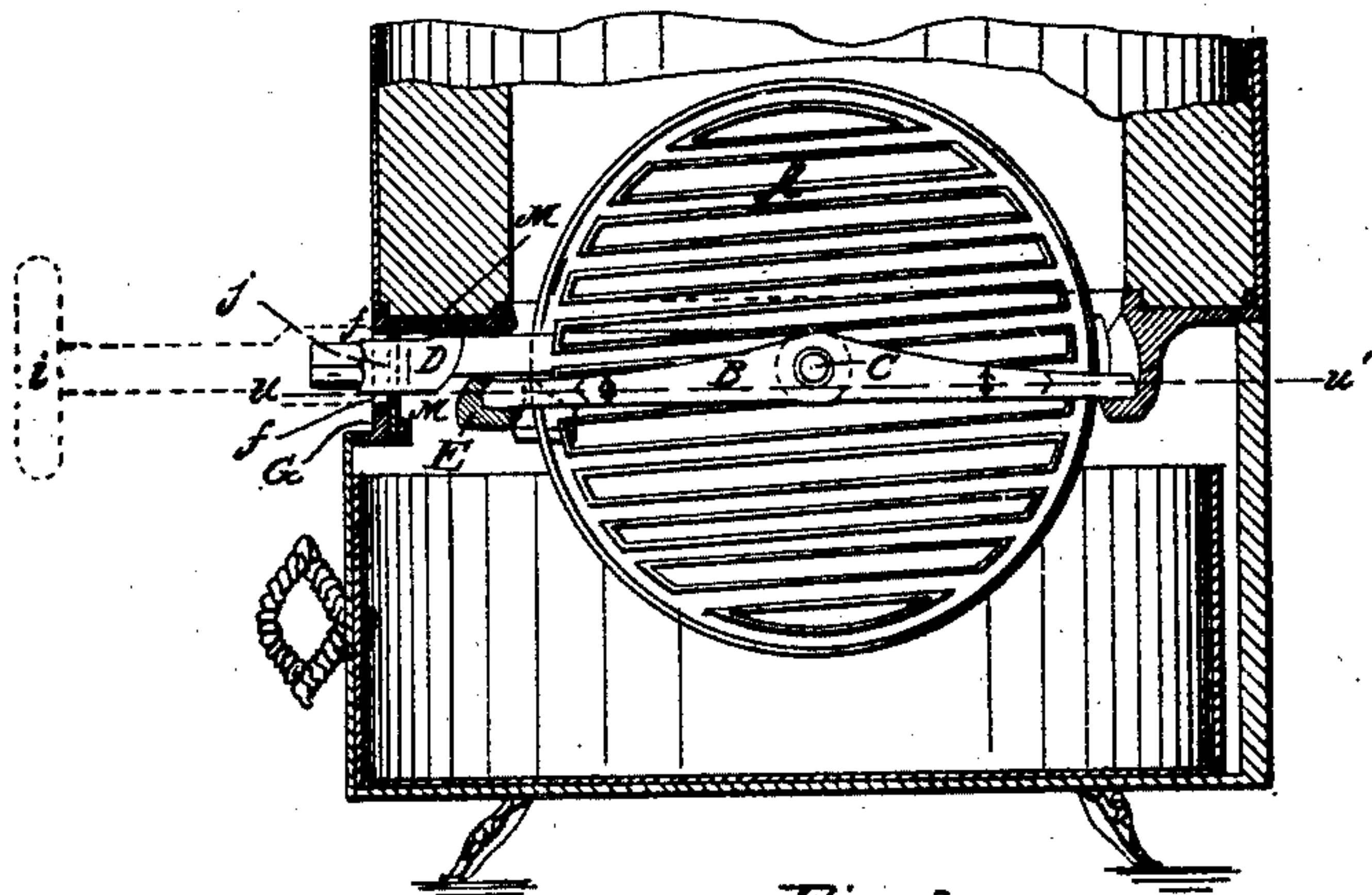


Fig: 5.

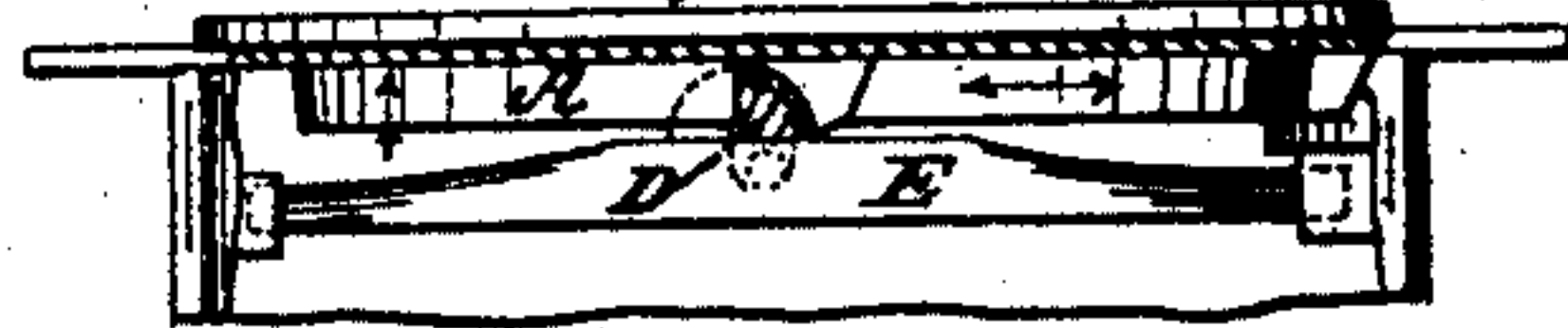


Fig: 6.

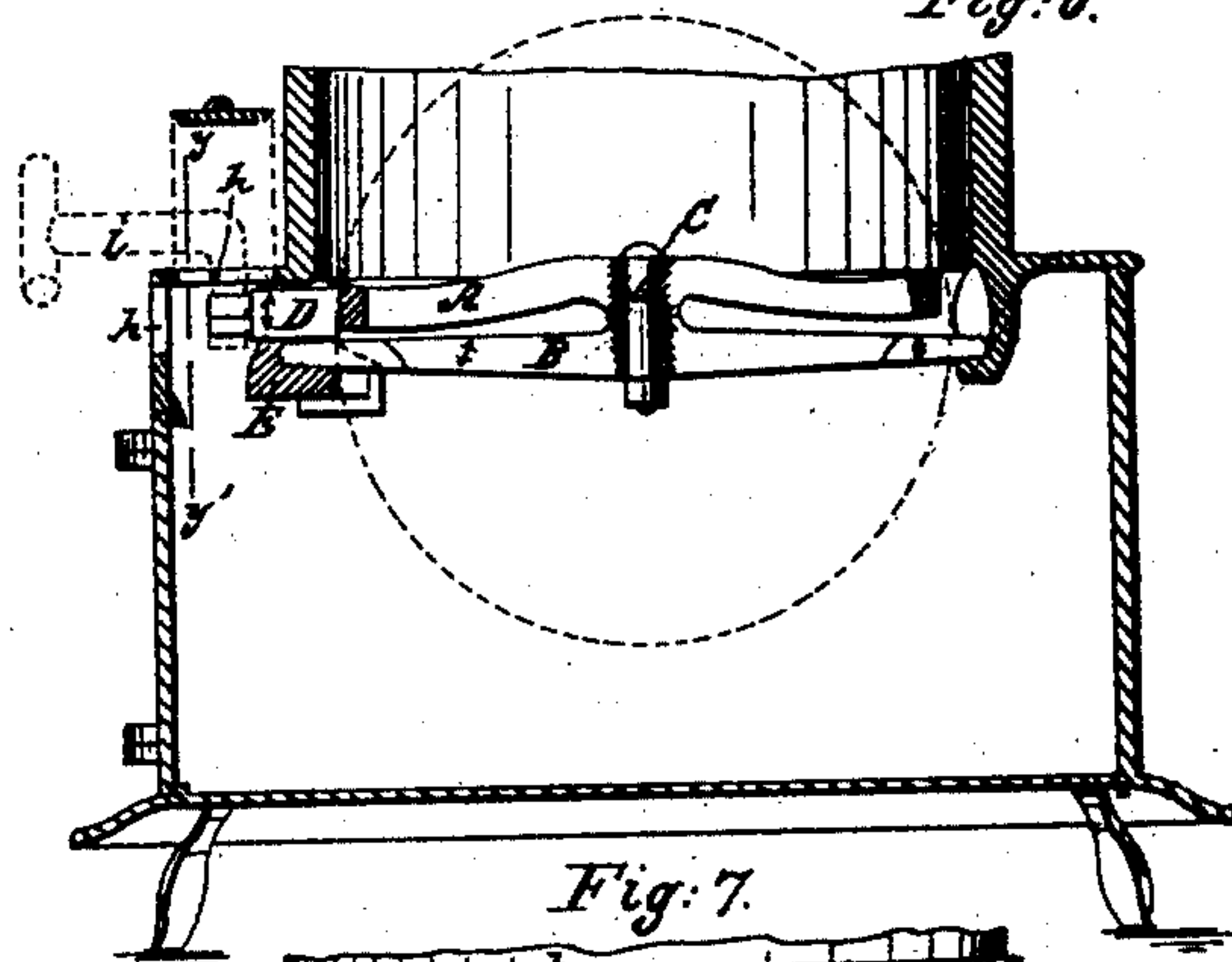


Fig: 8.

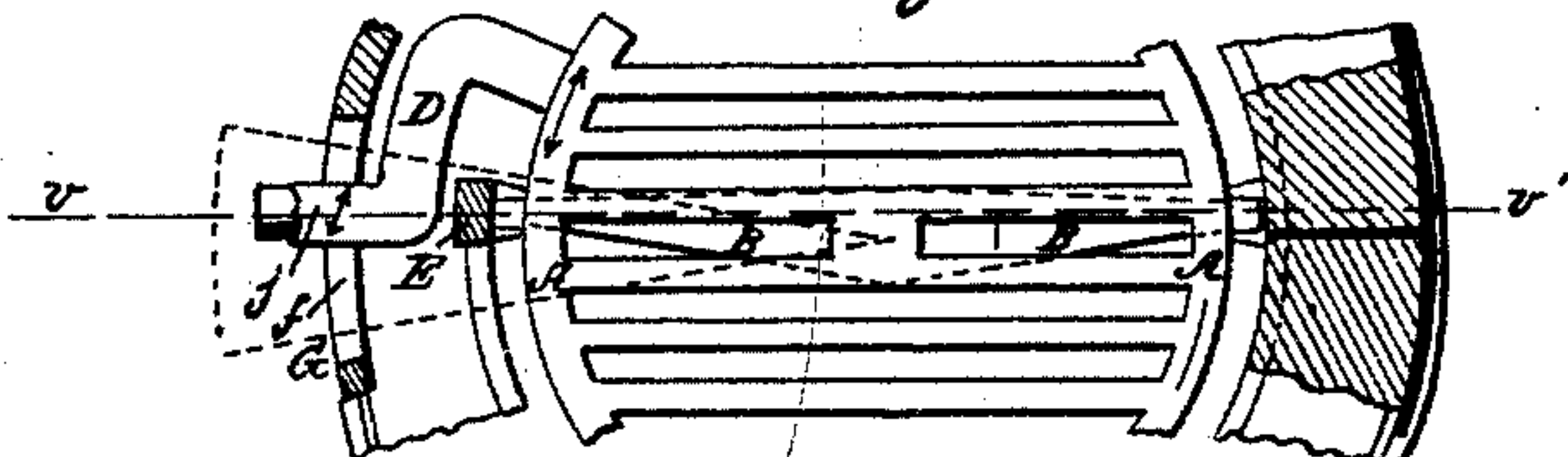


Fig: 9.

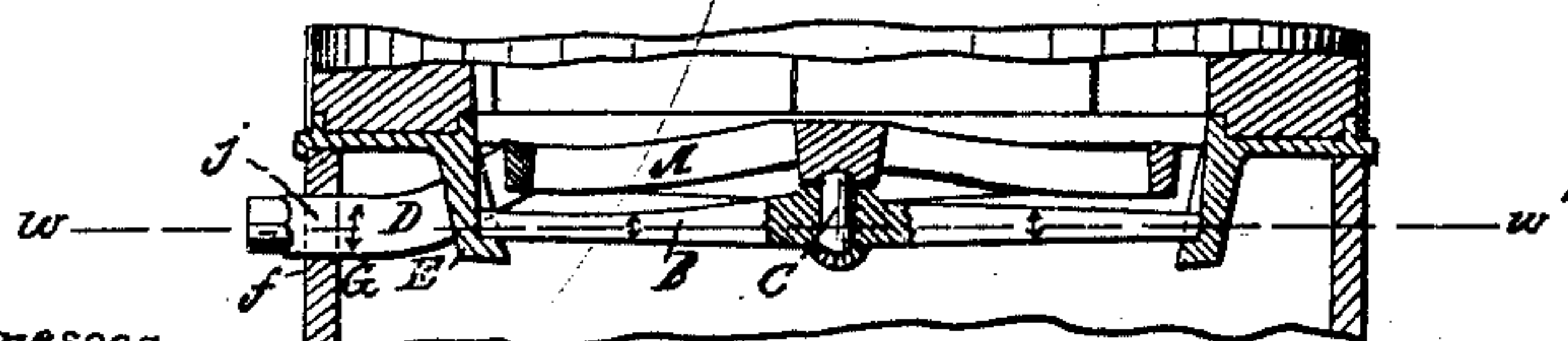
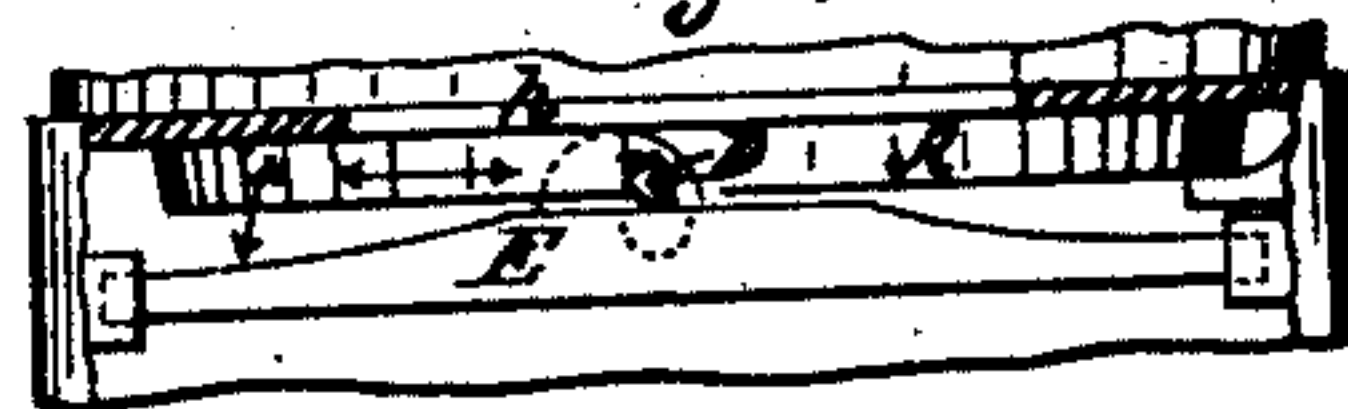


Fig: 7.



Witnesses:

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# UNITED STATES PATENT OFFICE.

LUTHER W. HARWOOD, OF TROY, NEW YORK.

## STOVE-GRATE.

Specification of Letters Patent No. 30,628, dated November 13, 1860.

*To all whom it may concern:*

Be it known that I, LUTHER W. HARWOOD, of the city of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Stove-Grates; and I do hereby declare that the following contains a full and exact description of the same, reference being had to the annexed drawings, which make a part of this specification, and in which—

Figure 1 is a top-view, and Fig. 2 a sectional elevation, of one of my improved grates, arranged in a stove, with the grate in a horizontal position; and Fig. 3 is a sectional elevation of the same with the grate tilted into a vertical position. Fig. 4 is a partial front view, and Fig. 5 a sectional front elevation at or about the line  $z z'$ , of the parts shown in Figs. 1 and 2. Fig. 6 is a sectional side elevation of another one of my improved grates in a stove, and Fig. 7 is a partial sectional elevation of the same at the line  $y y'$ . Fig. 8 is a partial plan, and Fig. 9 a central sectional elevation of another variety of my improved grate arranged in a stove.

Like letters of reference indicate similar parts in all the figures; and the arrows therein indicate the directions in which the parts move.

My invention relates to such a stove-grate A, as is pivoted at or near its center, so as to be thereby supported upon a rocking cross-bar B, placed below the grate and so arranged in a stove that the grate can be vibrated horizontally upon its central pivot C, as indicated by the arrows  $x$  in Fig. 1, to sift out the ashes from the burning coal on the grate; and also tilted or turned into a vertical position on its rocking support B, as shown in Fig. 3, to discharge the residuum from the grate.

The first part of my invention consists in so forming and arranging a radial arm D, fast on the grate A, and in line or so nearly in line with the axis of the rocking bar B, and in respect to the location of the pivot C and to the external form and position of the bar B and whatever part E supports that bar in the stove; that the grate A may be both vibrated horizontally on its central pivot C, and tilted into a vertical position upon its rocking support B, by the use or means of the said arm D alone, all substantially as hereinafter specified and represented by the annexed drawings.

As regards the first part of my invention the arm D may either extend through a horizontal slot or oblong aperture,  $f$ , in the outer casing G, of the stove as shown by Figs. 1, 2, 3, 4, 8 and 9; or may terminate within the stove as shown by Figs. 6 and 7; the casing G being in the latter case provided with an aperture  $h$ , to permit the application of a shaking and tilting bar  $i$ , to the arm D. The arm D must be cast or fastened upon such a part of the grate A, and must be of such a form that it will not be stopped or interfered with by coming in contact with either the bar B or its support E or any part of the stove, during either the operation of shaking horizontally or of tilting the grate by that arm; and will require to be varied in those respects according to the form and position of the support E, and other parts of the stove, as is illustrated by Figs. 1, 3, and 8, 9—the arm D in Figs. 1 and 3 proceeding from that half of the grate which is elevated when the grate is tilted, and in Figs. 8 and 9 from that side which is then depressed.

In Figs. 8 and 9 that part,  $j$ , of the arm D which extends through the horizontal slot,  $f$ , in the casing G of the stove, is in the form of a cylinder, and is so arranged that its central line or axis is constantly in the same horizontal or nearly horizontal plane with the axis of the rocking support B of the grate, as is indicated by the line  $w w'$  in Fig. 9. That part of the arm D is also so arranged that its axis may be brought into the same vertical plane with the axis of the supporting bar B as is indicated by the line  $v v'$  in Fig. 8; and when the cylindrical part  $j$  of the arm is in the latter place, the grate may be tilted into a vertical position by simply turning the part  $j$  one fourth part way around its axis, without giving either any horizontal or any vertical movement to the latter.

In Figs. 1, 2, 3 and 4, the position of the pivot C on the bar B, and the motion of the grate A about the pivot C as a center during the tilting movement of the grate, is such as to allow the central line or axis of motion of the cylindrical part  $j$  of the arm D to be somewhat above the line,  $u, u'$ , of the axis of the rocking bar B, as is indicated by those drawings. But it is not essential to the first part of my invention that a part of the arm D should be in the form of a cylinder; for, as is shown by Figs. 6 and 7, the



whole of the arm D may have a different form and the grate still be both vibrated horizontally and tilted into a vertical position by means of the arm D alone, while  
 5 that arm remains in the same horizontal plane or within the same or nearly the same vertical limits in the stove.

The second part of my invention consists in so combining a perforated sliding plate,  
 10 M, with the slotted casing G of a stove and with the arm D and grate A, pivot C, and rocking bar B, all formed and arranged together and in the stove, substantially as herein described and represented by Figs. 1,  
 15 2, 3 and 4 of the annexed drawings; that the horizontal slot or oblong aperture *f* through or to which the arm D extends, is thereby so closed as to either wholly or mainly prevent the escape therethrough of the gases,  
 20 dust and ashes from the stove, both while the arm D is being vibrated laterally along, and turned on its axis within that oblong aperture *f*, in the operations of vibrating the grate A horizontally on its central pivot  
 25 C, and tilting it into a vertical position on the rock-bar B, by means of the arm D fast on the grate.

Instead of extending the arm D so that it projects from the stove, as shown in full  
 30 lines in Figs. 1, 2 and 3, the arm D may merely extend into or through the slide M so as to carry the latter along with it in its lateral movements; there being a female socket formed in the end of the arm D, as  
 35 indicated by the red dotted lines in Fig. 2, for the insertion of a shaking and tilting bar.

I know that it has long been common to employ in coal-stoves a circular grate, A,  
 40 pivoted at or near its center upon a rocking-cross-bar B, so that the grate could be vibrated horizontally on its central pivot C, and also turned into an upright position upon its rocking support B. That I do not  
 45 claim. I am also aware that such a grate has been vibrated horizontally on its central pivot C by means of an arm fast on the grate; and I do not claim that. An example was shown in No. 21,410 of United  
 50 States Letters Patent. But in that case the arm by which the grate was vibrated horizontally on its central pivot, was not, as it is in my improved grate, so formed and arranged in line or so nearly in line with the  
 55 axis of the rocking support B, that the grate

could be tilted into a perpendicular position by means of the same arm by which the grate was vibrated horizontally; and the grate was tilted by means of its rocking support, instead of by that arm; and by that  
 60 difference may my improved grate be distinguished from that one, which is far less simple and convenient to operate than my improved grate.

I am also aware that circular grates have  
 65 been heretofore so constructed and arranged in stoves that the grate could be vibrated horizontally and circularly, and also tilted into a vertical position by means of one and the same arm or spindle fast on the grate.  
 70 That I do not broadly claim. An example of such a stove-grate is shown in No. 18,434 of United States patents. But such cases do not present the same combination and arrangement of parts as my improved grate;  
 75 and do not have the grate mounted at its center on a pivot, C so that the grate can be vibrated horizontally about its center with the greatest ease;—the grate in those cases being worked around back and forth horizontally with great difficulty, and with too  
 80 much grinding action and shaking or jarring of the stove, upon bearings arranged outside of the circumference of the grate.

What I claim as new and my improvement  
 85 on such stove and furnace grates as have the grate, A, pivoted at or near its center upon a rocking bar, B, and arranged and supported in a stove or furnace substantially as herein described, and desire to secure by Letters Patent is—  
 90

1. So forming and arranging an arm, D, fast on the grate A, and in line or nearly in line with the rocking support B of the grate, substantially as herein described, that the  
 95 grate may be both vibrated horizontally on its central pivot C, and tilted into a vertical position upon its rocking support B, by the use of the arm D alone, substantially as herein represented.  
 100

2. The combination and arrangement of a perforated sliding plate M, with the slotted casing (G,) of the stove or furnace, the arm D and grate A, pivot C, and rocking bar B, substantially as and for the purpose herein  
 105 described.

LUTHER W. HARWOOD.

Witnesses:

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 AUSTIN F. PARK.