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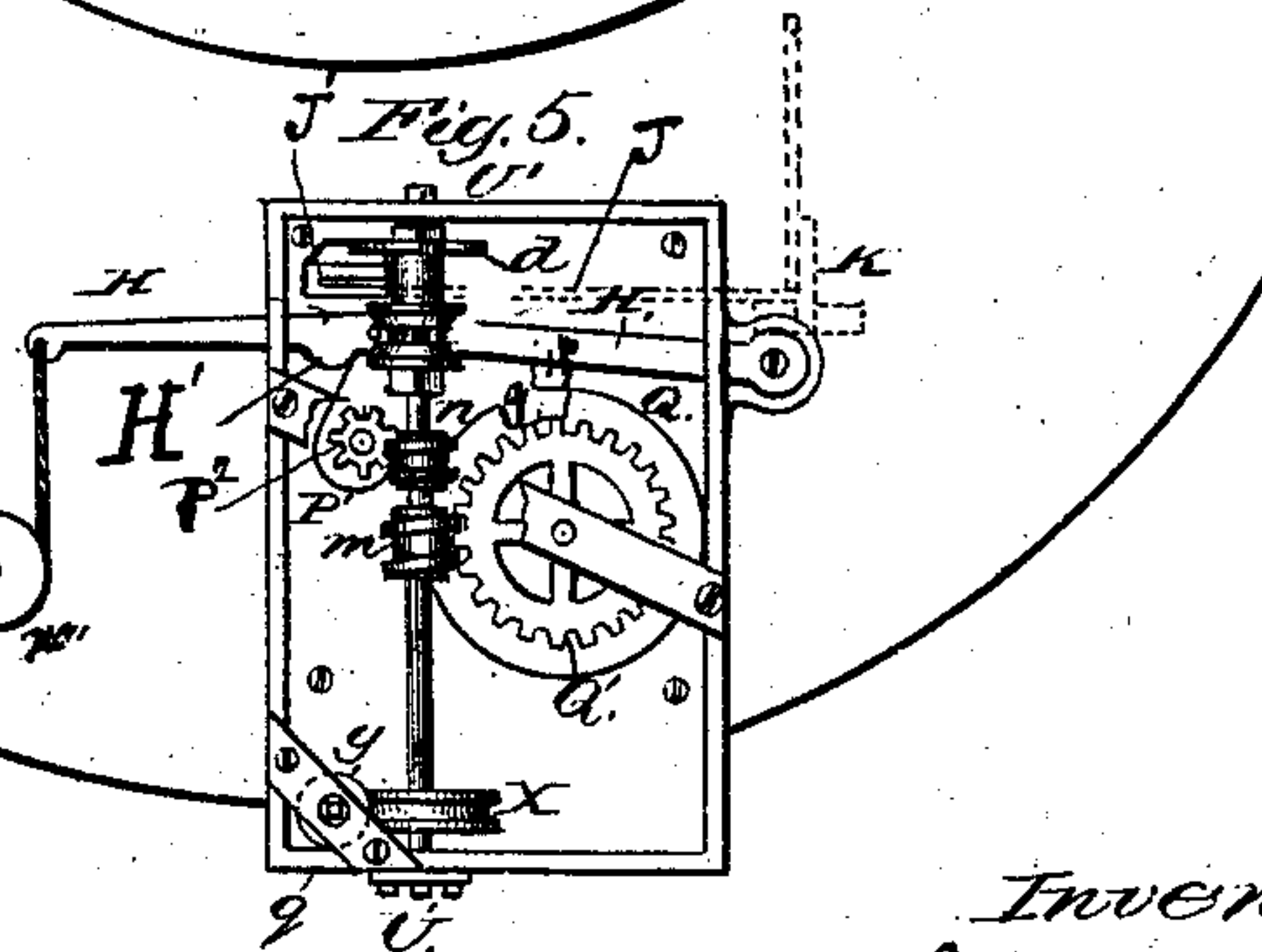
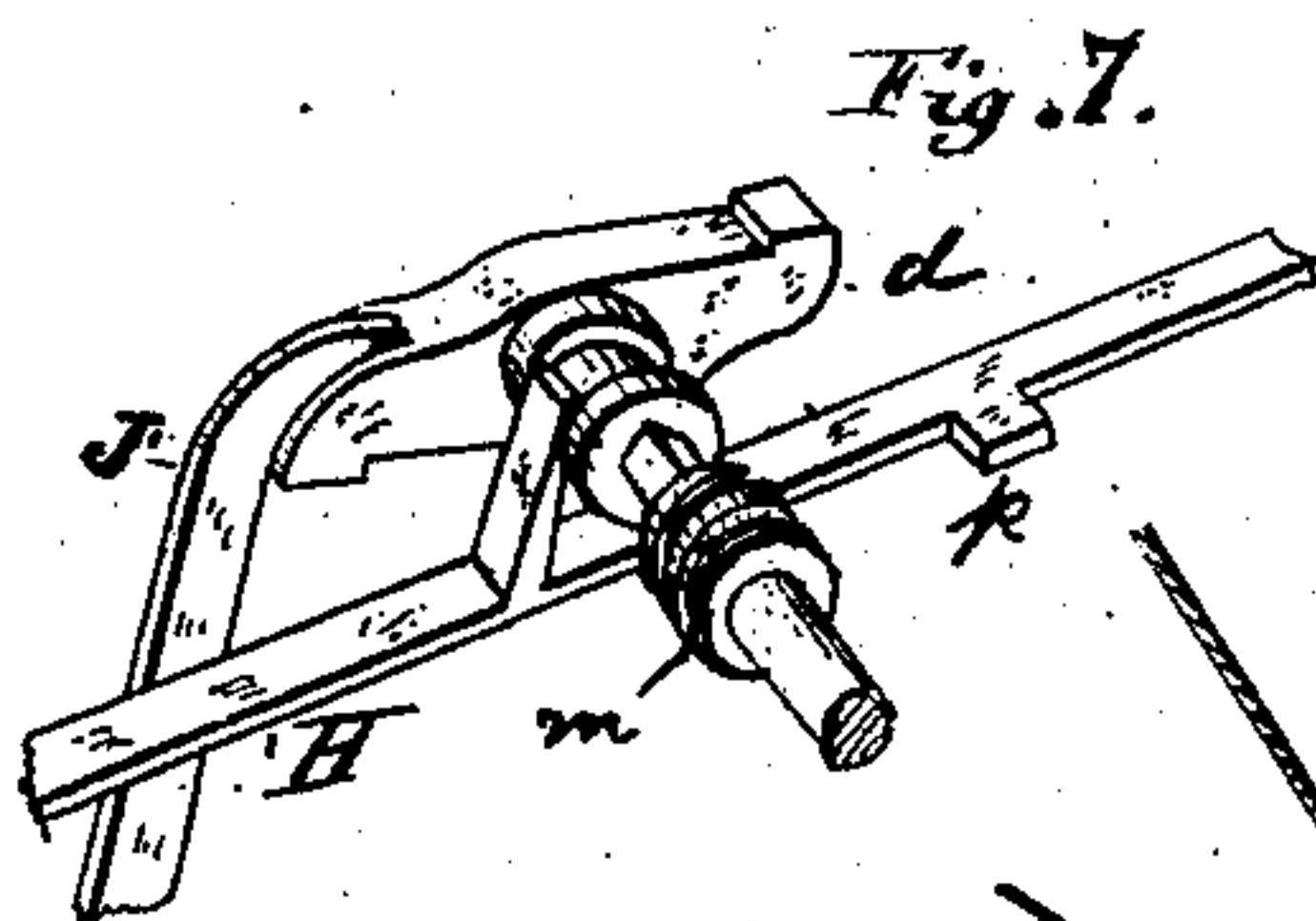
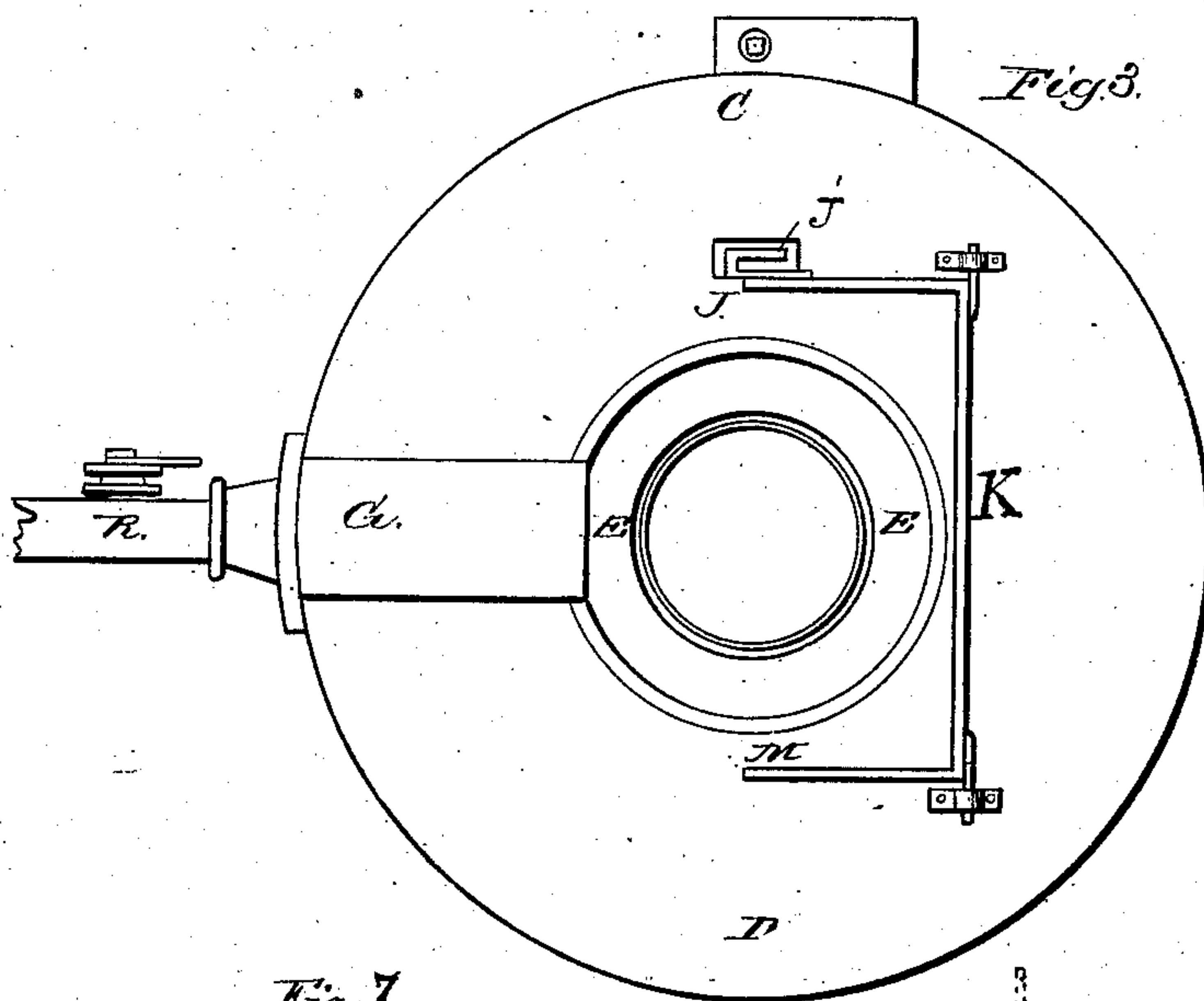
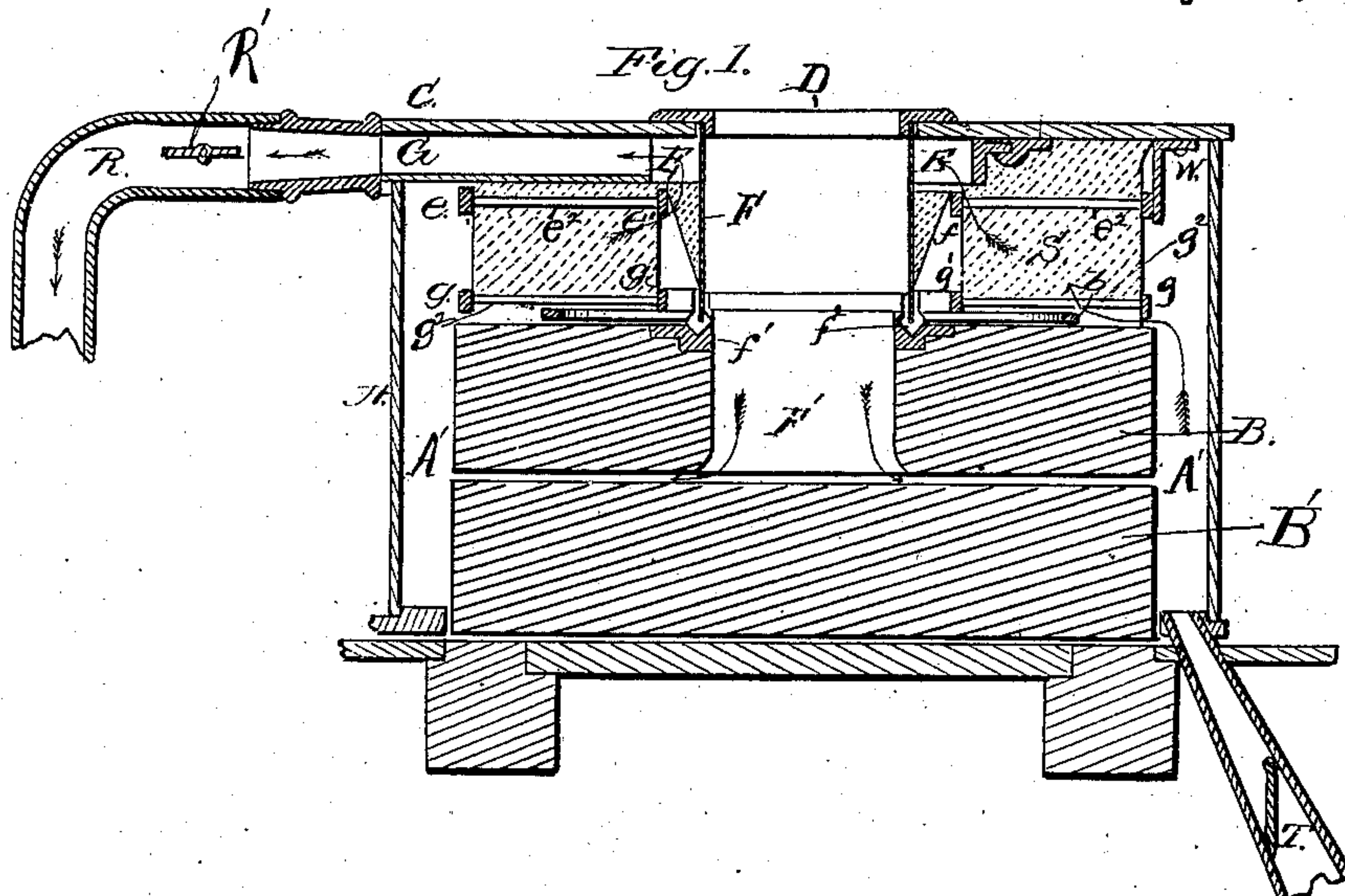
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G. KIEFER.

DUST CATCHER FOR MILLSTONES.

No. 260,877.

Patented July 11, 1882.



Witnesses  
John F. C. Prentiss  
Edward Siggers

Inventor  
G. Kiefer  
by  
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Attorney

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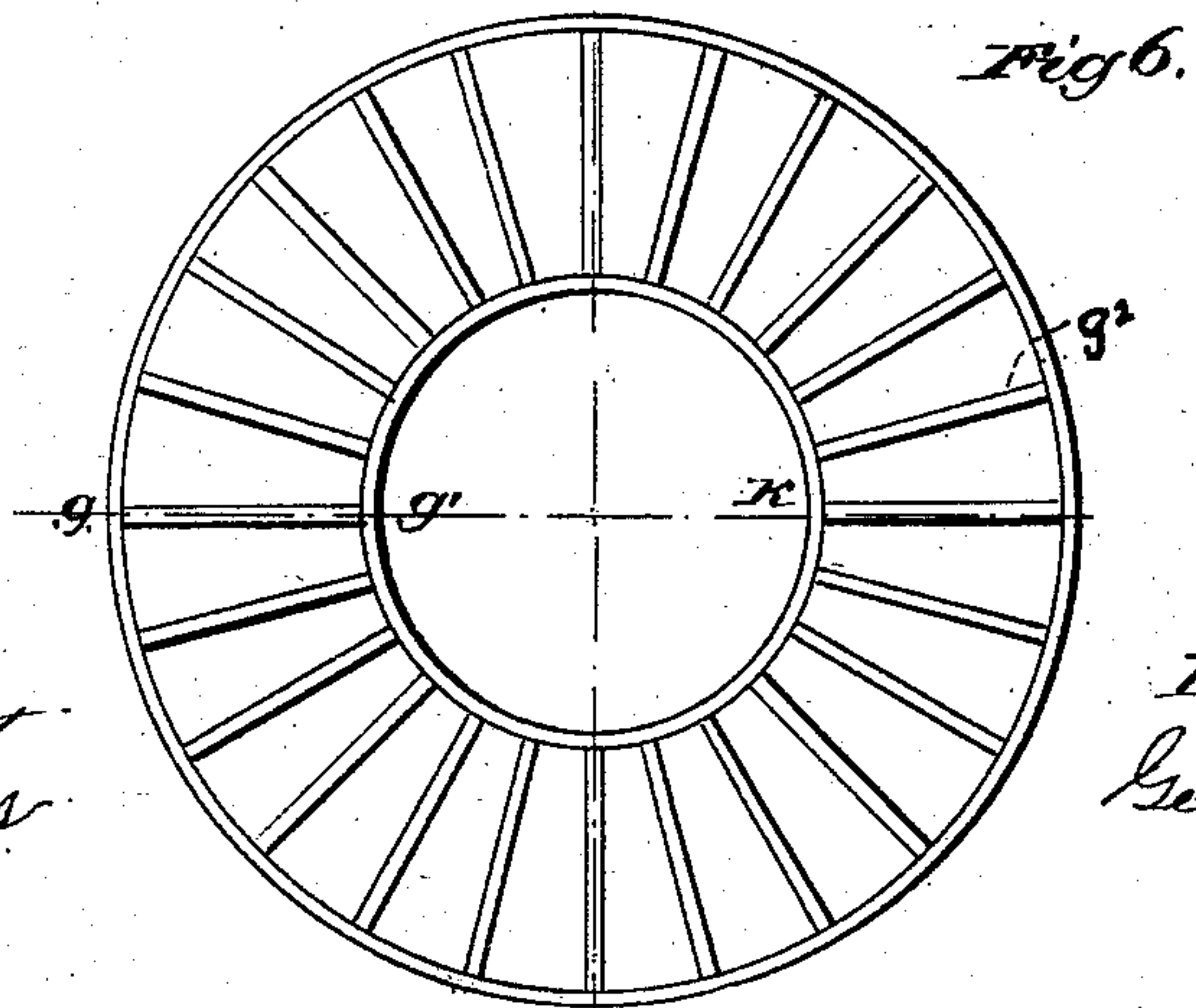
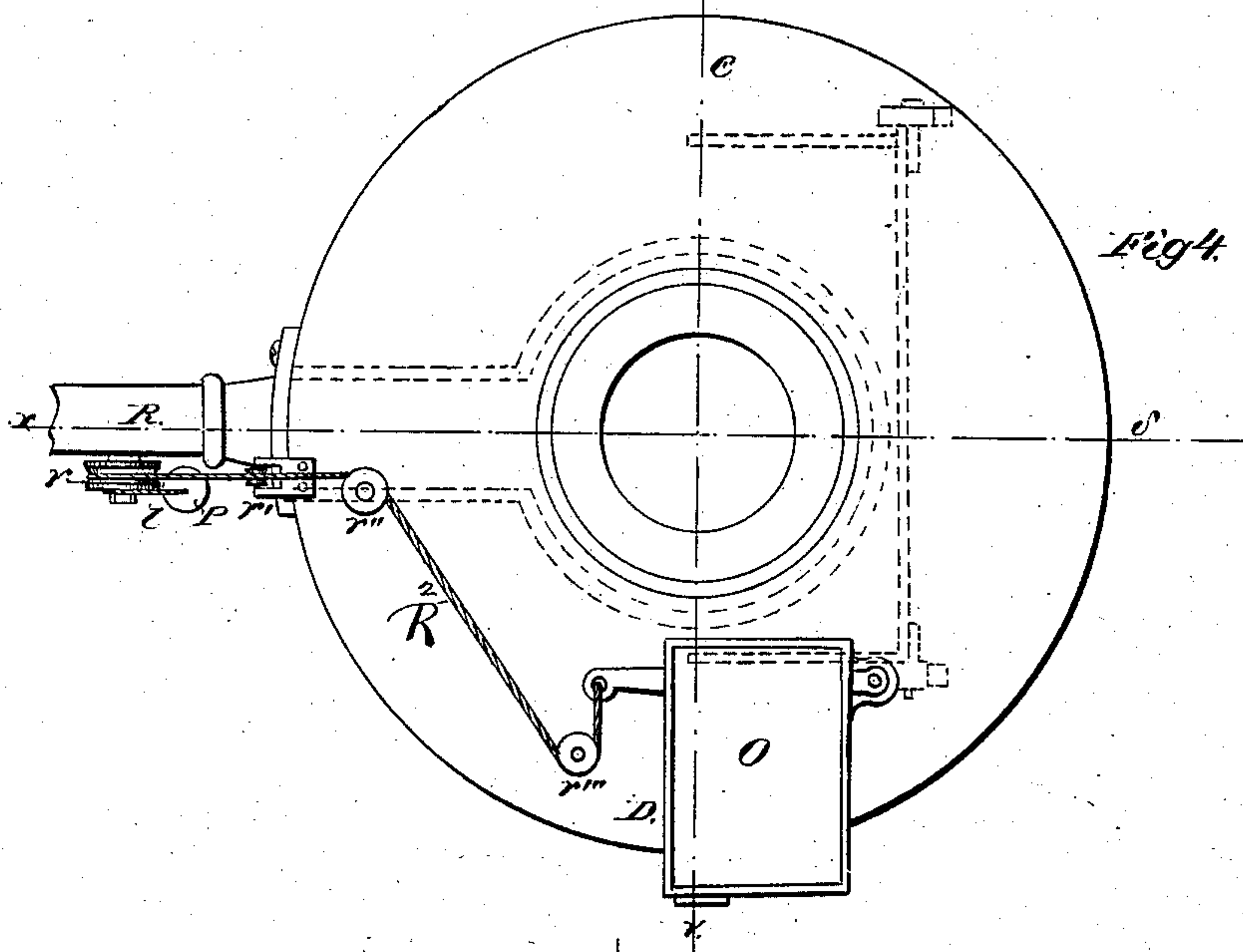
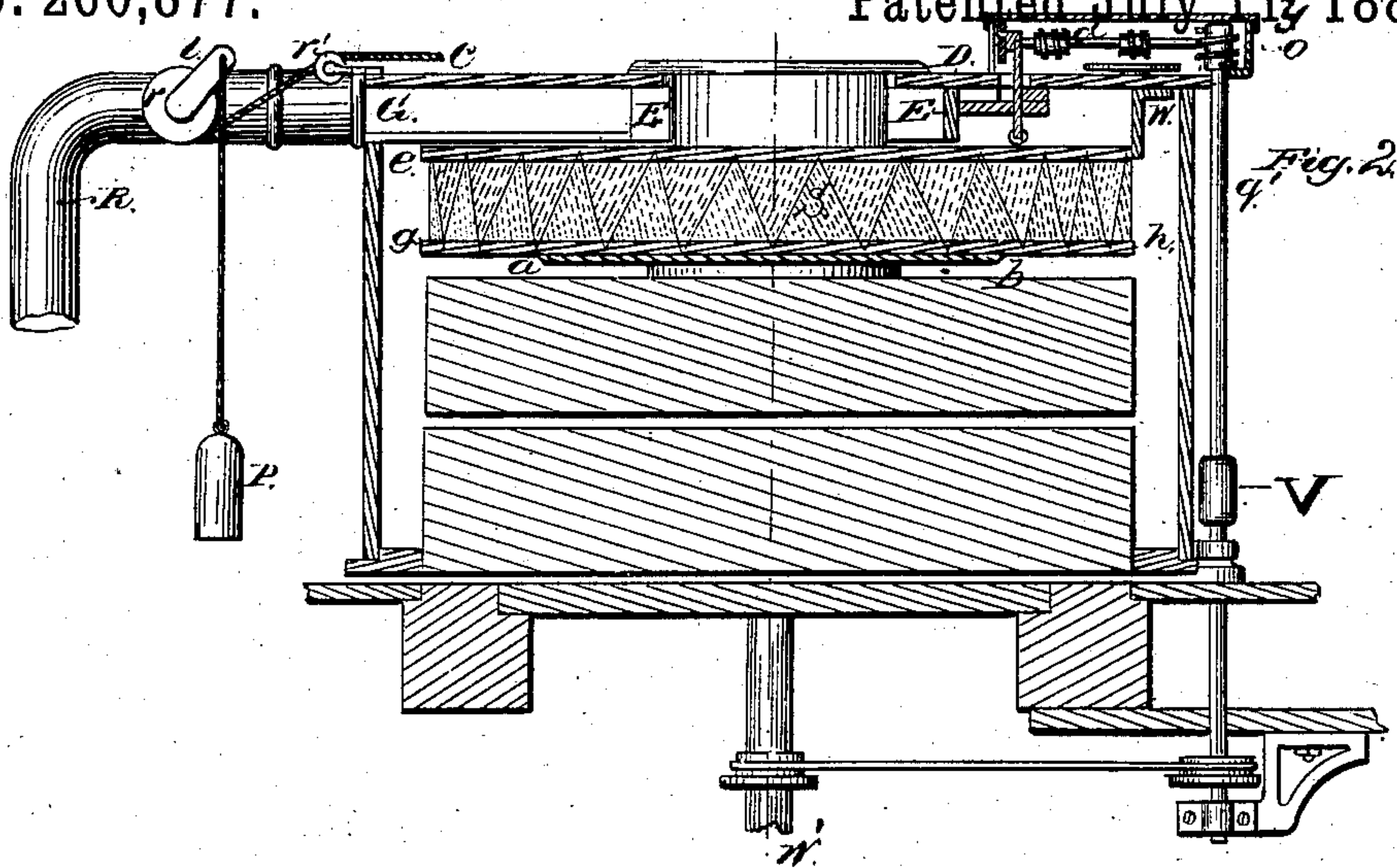
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## DUST CATCHER FOR MILLSTONES.

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# UNITED STATES PATENT OFFICE.

GEORG KIEFER, OF STUTTGART, WÜRTEMBERG, GERMANY.

## DUST-CATCHER FOR MILLSTONES.

SPECIFICATION forming part of Letters Patent No. 260,877, dated July 11, 1882.

Application filed September 3, 1880. (Model.) Patented in Germany September 2, 1877, No. 2,286, and December 20, 1878, No. 6,318; in Belgium August 17, 1879, No. 47,242; in France August 25, 1879, No. 130,867, and in Italy December 12, 1879, No. 11,416.

*To all whom it may concern:*

Be it known that I, GEORG KIEFER, engineer, citizen of the German Empire, residing at Stuttgart, in the Kingdom Würtemberg, of the German Empire, have invented certain new and useful Improvements in Dust-Catchers for Millstones; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to dust-catchers for millstones; and it consists in the improvements hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a vertical central section of a pair of millstones having my improvements applied thereto. Fig. 2 represents a vertical section of the same on a plane nearer to the observer. Fig. 3 represents an under view of the cover for the curb or casing and the devices attached thereto. Fig. 4 represents a top view of the same. Fig. 5 represents a detail plan view of the shaking mechanism. Fig. 6 represents in detail one of the two double-hoop wheels that form part of the dust-catcher. Fig. 7 represents in detail the cam and bar which operate the shaking mechanism for the dust-catcher.

A designates the curb or casing of a pair of millstones, B B', an annular air-space, A', being left between said curb and the periphery of said stones.

C designates the cover of said curb, and D the feed-opening in the center of said cover. From this opening a leather or other tube, F, extends down to the upper millstone, B, the lower edge of said tube entering an annular groove,  $f^2$ , formed in the upper face of a ring or re-enforce,  $f'$ , which is set into the upper face of said millstone B so as to surround the upper end of its eye F'. Thus the grain supplied to the stones is made to pass through opening D, tube F, and eye F' to the dressed faces of the stones.

Surrounding the upper part of tube F is an annular space, E, which communicates in-

wardly with space A' and outwardly through an opening, G, with a suction-pipe, R.

Within the curb, in the space immediately above runner B, a dust-catcher surrounds tube F. This consists of an upper double hoop,  $e$   $e'$ , spokes  $e^2$ , extending across from the outer hoop,  $e$ , to the inner hoop,  $e'$ , a corresponding lower double hoop,  $g$   $g'$ , having connecting-spokes  $g^2$  and a piece or strip of flannel wound from the alternate spokes of one double hoop to those of the other, as indicated in Fig. 2. Under ordinary circumstances, and with no external interference, the weight of the lower double hoop will hold the dust-catcher distended; but as this lower hoop is without any attachment except that to said flannel there is nothing to prevent said lower double hoop from being raised and lowered at will. Such motions, when rapidly and sharply given, will suffice to dislodge any meal which may cling to the flannel, and which would soon render it impervious.

When suction is applied to pipe or tube R the air is drawn down through opening D, tube or passage F, and eye F', thence between the dressed faces of the stones to space A', thence through dust-catcher S to space E, and finally out of the curb through opening G and suction-pipe R. This suction-pipe may be closed by means of a check-valve, R', mounted on a small shaft, which carries outside of said pipe a vertical pulley,  $r$ . The outer end of this shaft is bent to form crank  $l$ , from which hang cord and weight P, which tend to close said valve. From roller  $r$  a cord or chain, R<sup>2</sup>, passes over a second vertical roller,  $r'$ , that turns in bearings on the top of the curb. Thence it passes (to change direction) partly round two horizontal guide-rollers,  $r''$   $r'''$ , and is attached to the moving end of a shipper-lever, H, which extends through a casing, U', attached to the top of the curb. This lever has horizontal vibratory motion, its other end being pivoted to a lug on said box or casing. It is provided with a vertical stud or pin, which sets into an annular groove formed in a sleeve which is splined on a horizontal rotary shaft, U. This groove is near the outer end of the sleeve. The inner end of said sleeve carries a double cam,  $d$ , consisting of two similar rigid horns, which



extend outward on opposite sides from said shaft and are curved on their operating-faces.

The bottom of casing U' has an opening through which protrudes up into said casing the hooked end J' of an arm, J, which is rigid with a rock-shaft, K, that is journaled to bearings on the under side of the curb-cover aforesaid, said hooked end being in proximity to cam d. When the horns of cam d are horizontal the sleeve may be shifted backward and forward over said hooked end without touching the latter, said horns being in a higher horizontal plane than said end. When said cam is thus moved into its innermost position it will rotate without touching said curved end, its vertical plane then being nearer to the center of the curb-cover than is the vertical plane of the said hooked end. When, however, the said cam is shifted into its outermost position, either one of its horns will engage with and lift said hooked end, as their vertical planes correspond and their lengths are sufficient to let them extend under said hooked end. The vertical planes referred to above are those at right angles to a radial line. The movements inward and outward of said sleeve and cam are effected through the medium of shipping-lever H, aforesaid. The weight P tends to move said sleeve and cam outward into position to let said cam engage and lift said hooked end. This it is prevented from doing, except at certain intervals, by a rotary disk, Q, which has contact with the end of a lug or stud, p, on the proximate side of lever H, said disk being of sufficient diameter to hold said lever, sleeve, and cam in their innermost position, (the terms "inner" and "outer" being used in this specification with reference to the axis of the millstones or the center of the curb-cover,) so that the said cam may turn without lifting arm J. This disk has, however, one or more peripheral recesses, q, into which lug or stud p may pass, and which are of sufficient depth to allow the cam to be shifted by weight P and lever H into its outermost position, where its rotation will cause said cam to engage and lift said arm J. Thus whenever a recess q comes opposite to stud p said arm J is lifted by each horn of cam d as often as the hooked end J' is engaged by either horn of said cam, while said pin or stud remains in said recess. As the horns are curved and rounded at the ends, they easily drop said hooked end after passing a certain point in their rotary movement. Thus there is a succession of rising and falling motions of arm J, the number of which is regulated by the length of the recess. Of course a cam with a single horn or with more than two horns might be employed. The up-and-down motion of arm J is used for shaking the dust-catcher, before described, so that it may be kept unclogged and in condition for use. This is effected by means of a lifting-ring, b, located under the lower double hoop, g g', and suspended by means of rods passing up through said dust-catcher to

the aforesaid arm J and another arm, M, formed on shaft K. The weight of said lower double hoop pulls down said arms as often as arm J is released by the cam d. When arm J is lifted again the upward draft of said arms J M on ring b once more lifts said lower double hoop. Thus rapid alternate expansions and contractions of the dust-catcher are produced for the purpose of shaking out the dust or clogging materials. Except when stud p is in recess q, the dust-catcher remains fully expanded.

Disk Q derives rotation from a worm, m, on shaft U and a gear-wheel, Q', meshing with said worm and permanently secured to said disk, so as to turn therewith. Said shaft U receives rotary motion through gears X Y from a vertical shaft, q', which is journaled in bearings attached to the outside of the curb. This upright shaft has a belt-and-pulley connection to the spindle W of the millstone-runner.

Of course the stud p and recessed disk Q would lock if some device were not employed to move the former out of recess q. For this purpose I use a rigid arm, P', carried by a cog-wheel or pinion, P<sup>2</sup>, meshing with a worm, u, on shaft U. This arm is adapted to engage with a swell or inclined lug, H', on the proximate side of lever H whenever the entrance of stud p into recess q allows said lug or swell H' to come within the circle described by the rotary motion of the outer end of arm P'. These parts are so arranged with reference to each other that arm P' operates on lever H when the stud is in contact, or nearly in contact, with the rearward end of recess q, using the term "rearward" with reference to the direction of rotation of disk Q. Of course all possibility of locking is thereby avoided.

The disk Q, cam d, and the other parts are so arranged with relation to one another that the said cam will be in horizontal position whenever the stud p enters a recess, q, so that there may be no possibility of said cam coming in contact with the side of hooked end J', as said cam is moved outward by weight P and shipping-lever H.

The dust-catcher is supported by an angle-iron, W, attached to curb-cover C and to hoop e. T designates the outlet-chute for the meal, which is provided with a valve. The shaft g' is preferably made in two parts, which are connected by a coupling, V. This allows the millstones to be conveniently separated.

Having thus described my invention, what I claim is—

1. A dust-catcher consisting of an upper double hoop and spokes, a lower double hoop and spokes, and a strip of flannel wound from the alternate spokes of one double hoop to those of the other, the lower double hoop being attached solely to said flannel, substantially as set forth.

2. The lower hoop, g g', of the dust-catcher, in combination with lifting-ring b, rock-shaft K, having arms J M, connected thereto, lever

H, sliding cam *d*, shaft U, and dog P', substantially as set forth.

3. The combination of shaft U, wheel Q', disk Q, notched at *q*, lever H, having lug *p* and swell H', weight P, cord R<sup>2</sup>, dog P', its gears, cam *d*, rock-shaft K, having arms J M, lifting-ring *b*, and the dust-catcher, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

G. G. KIEFER.

Witnesses:

A. KAPP,

R. M. JACKSON.