

(No Model.)

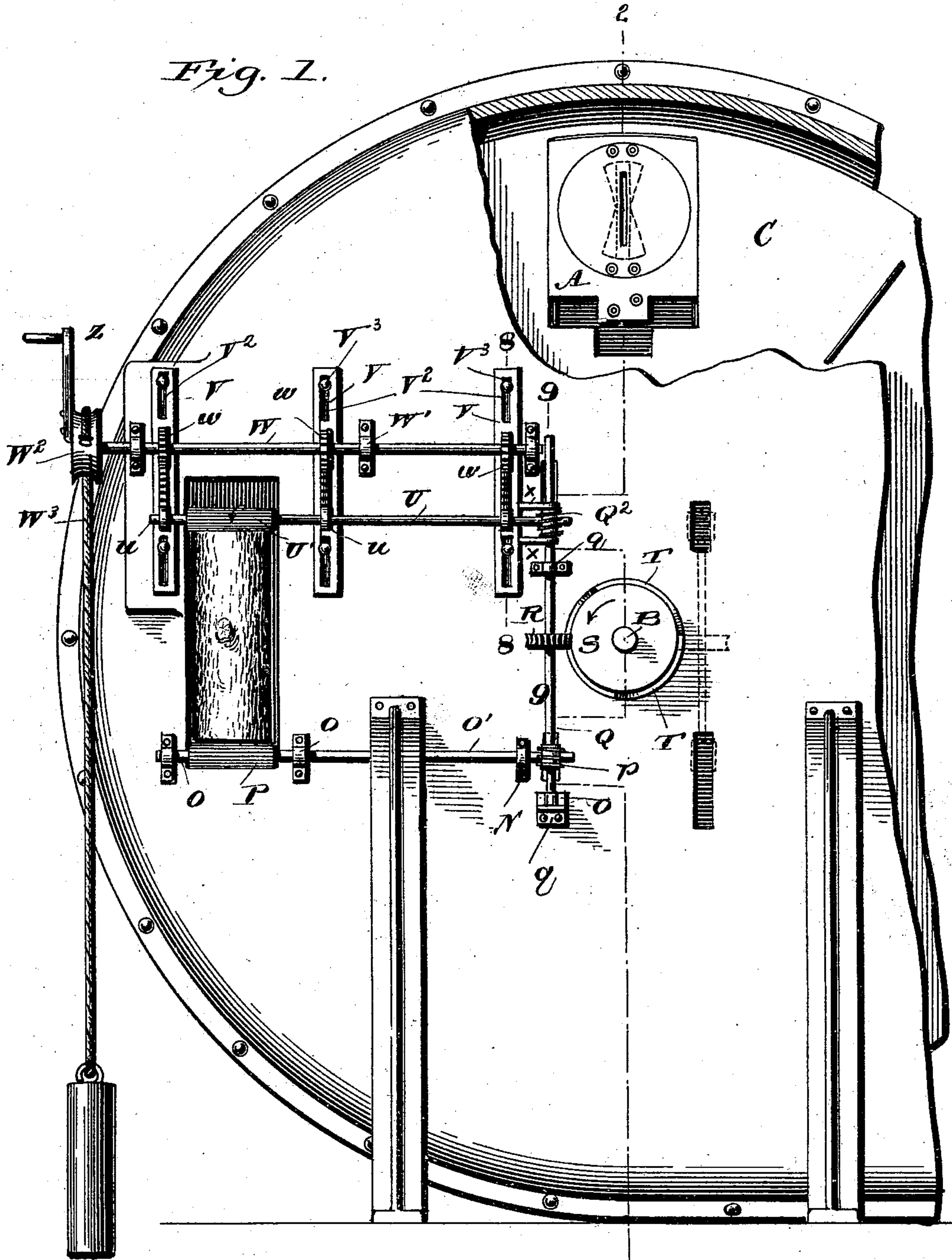
3 Sheets—Sheet 1.

**J. A. GRAY.**  
**EXCELSIOR MACHINE.**

No. 551,672.

Patented Dec. 17, 1895.

*Fig. 1.*



*Witnesses:*

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A. D. Hough

*Inventor:*

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by Franklin H. Hoag  
Att'y.

(No Model.)

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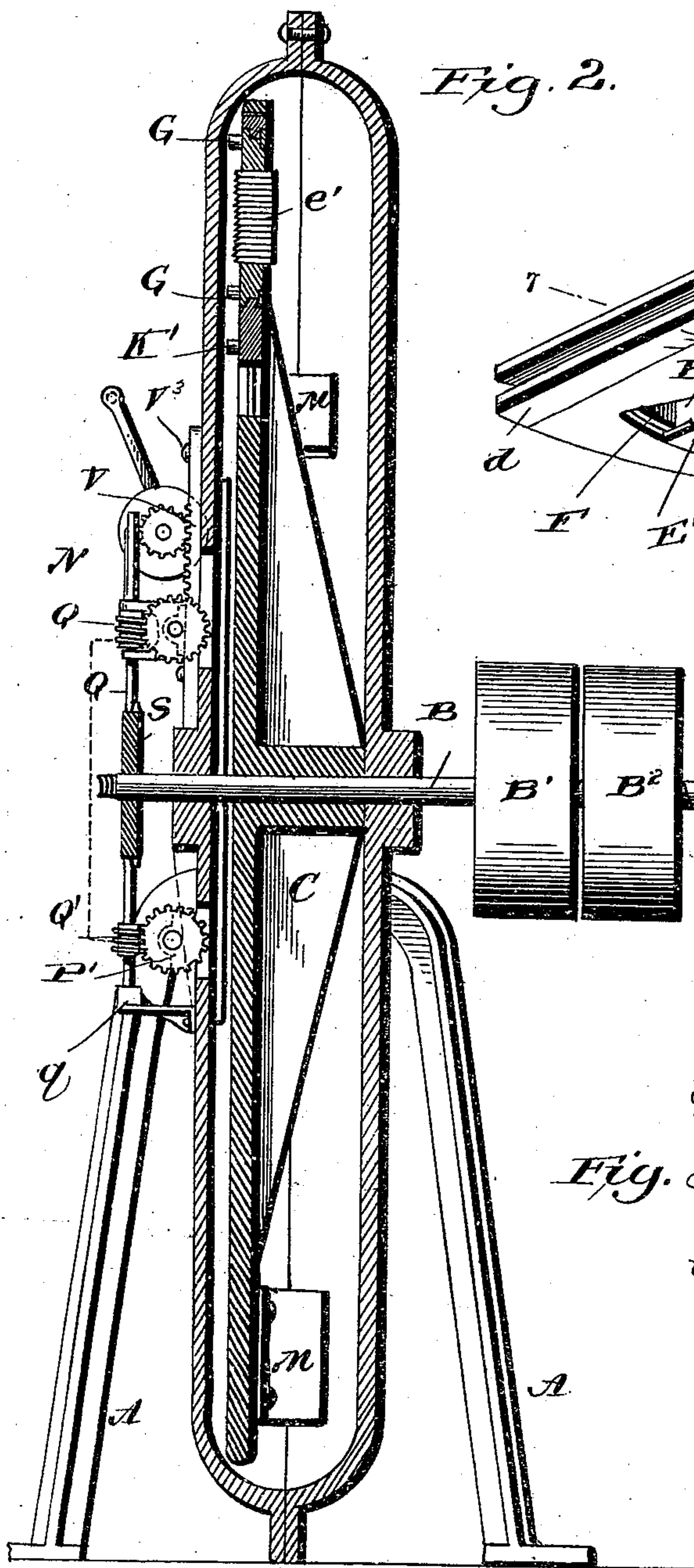


Fig. 2.

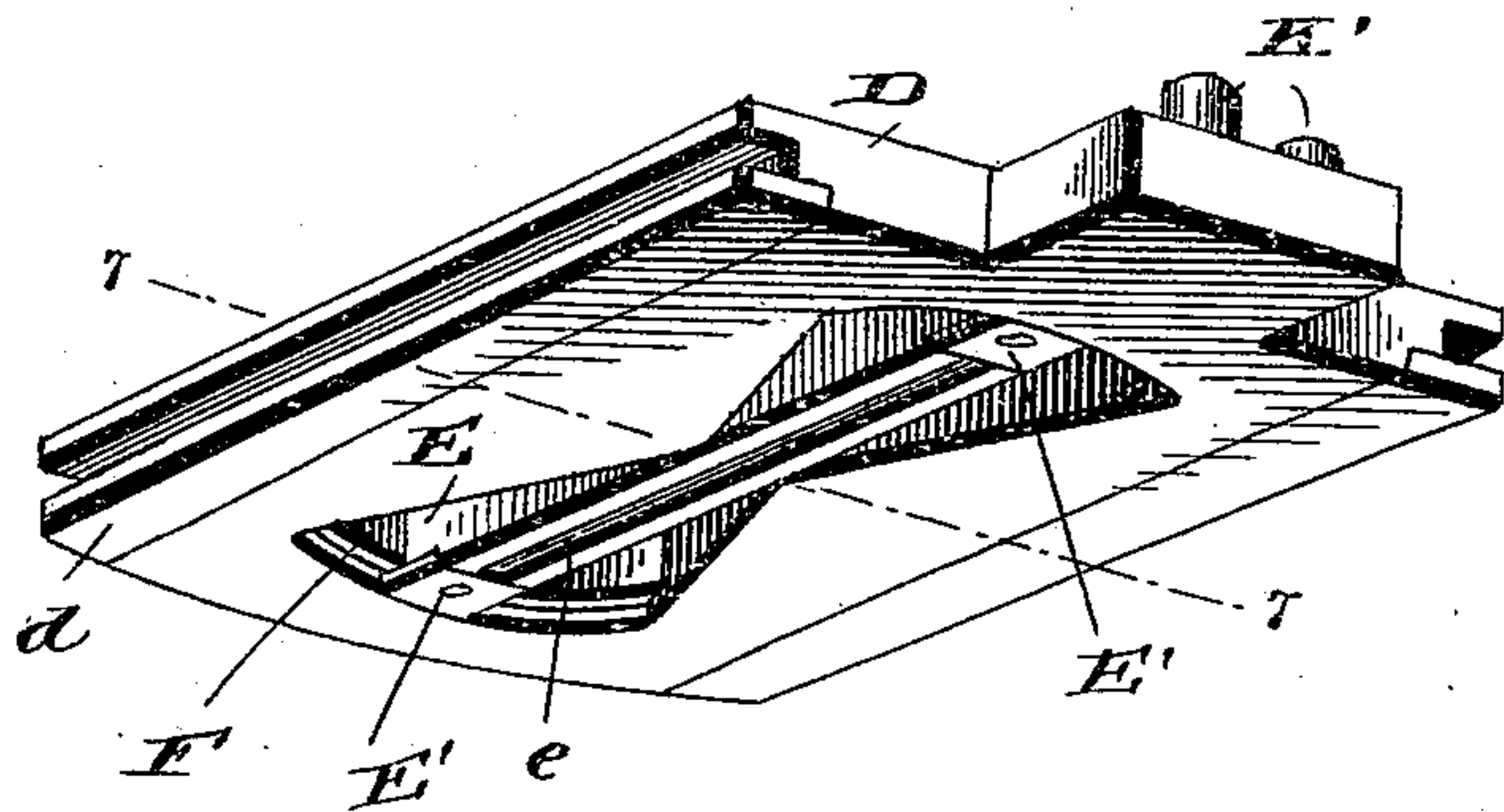


Fig. 6.

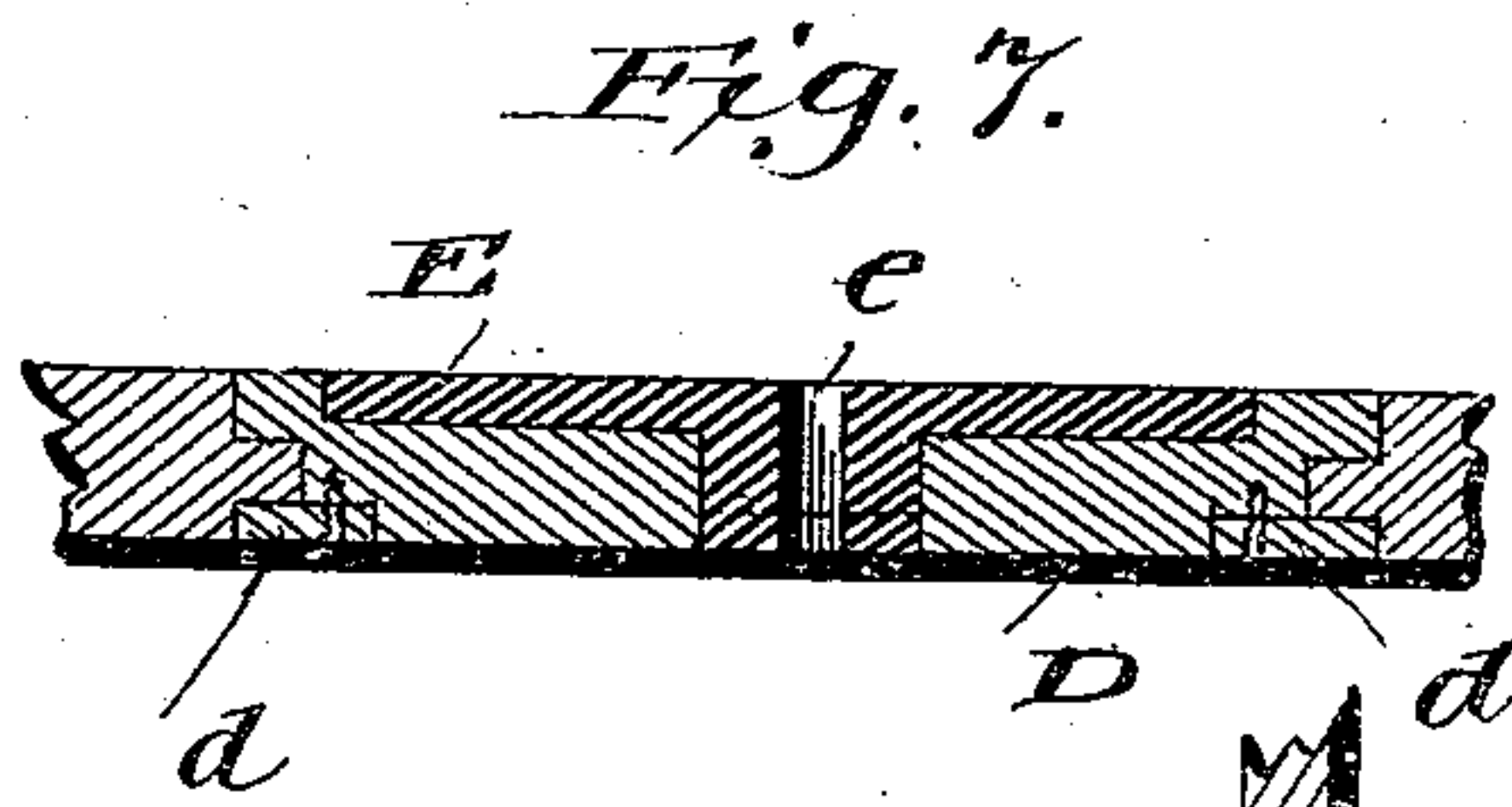
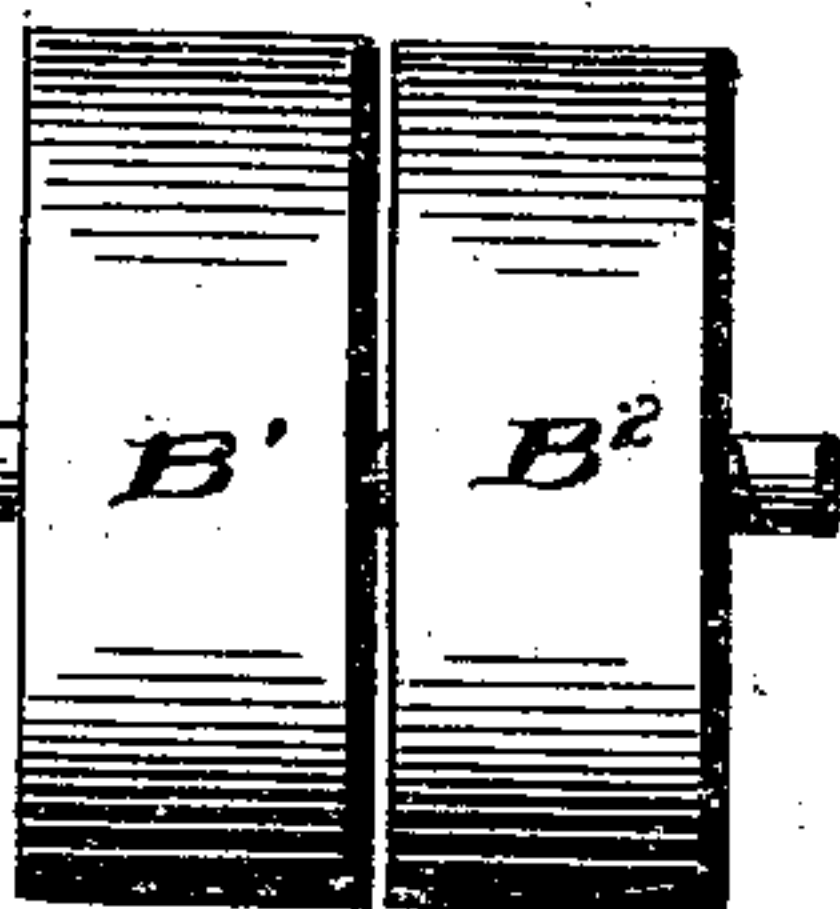
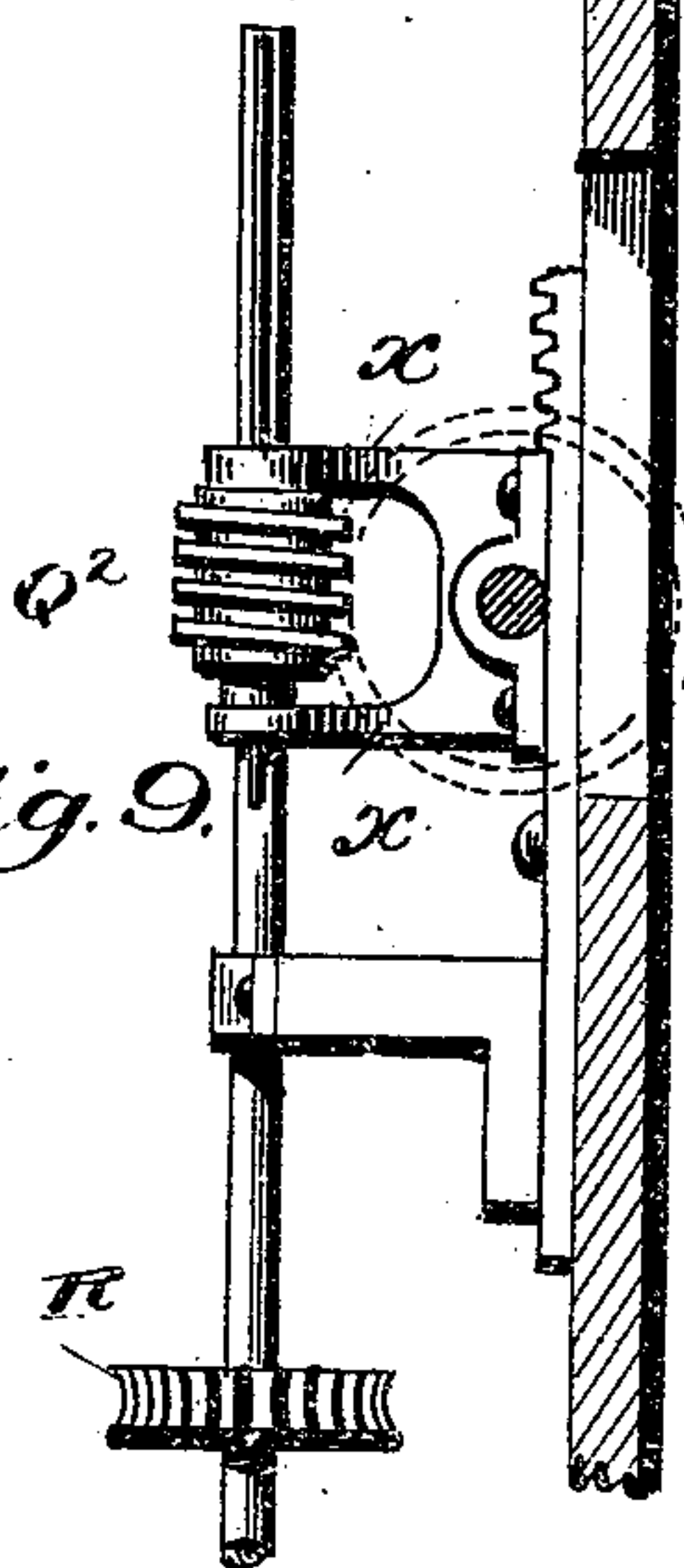


Fig. 8.



Fig. 9.



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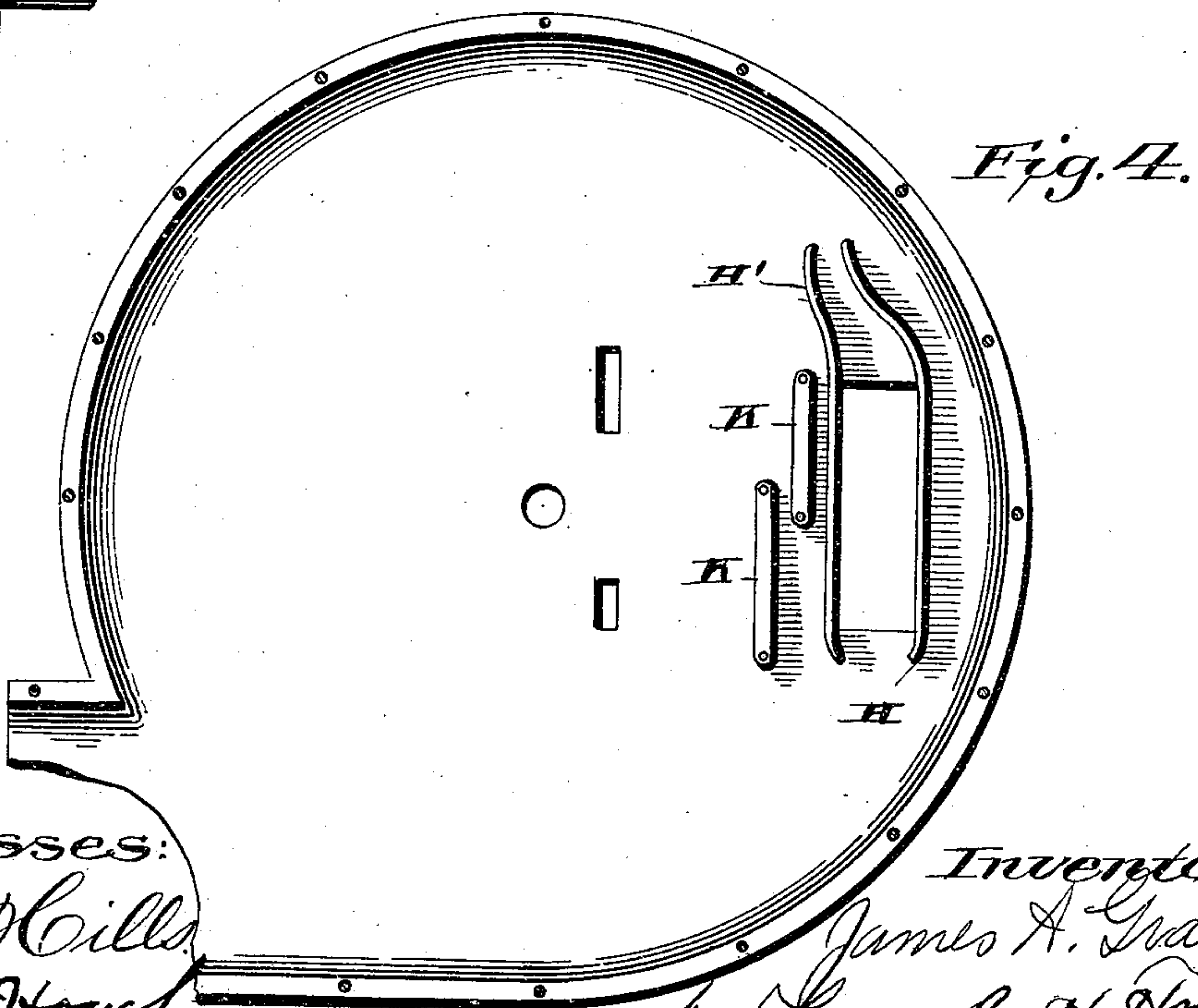
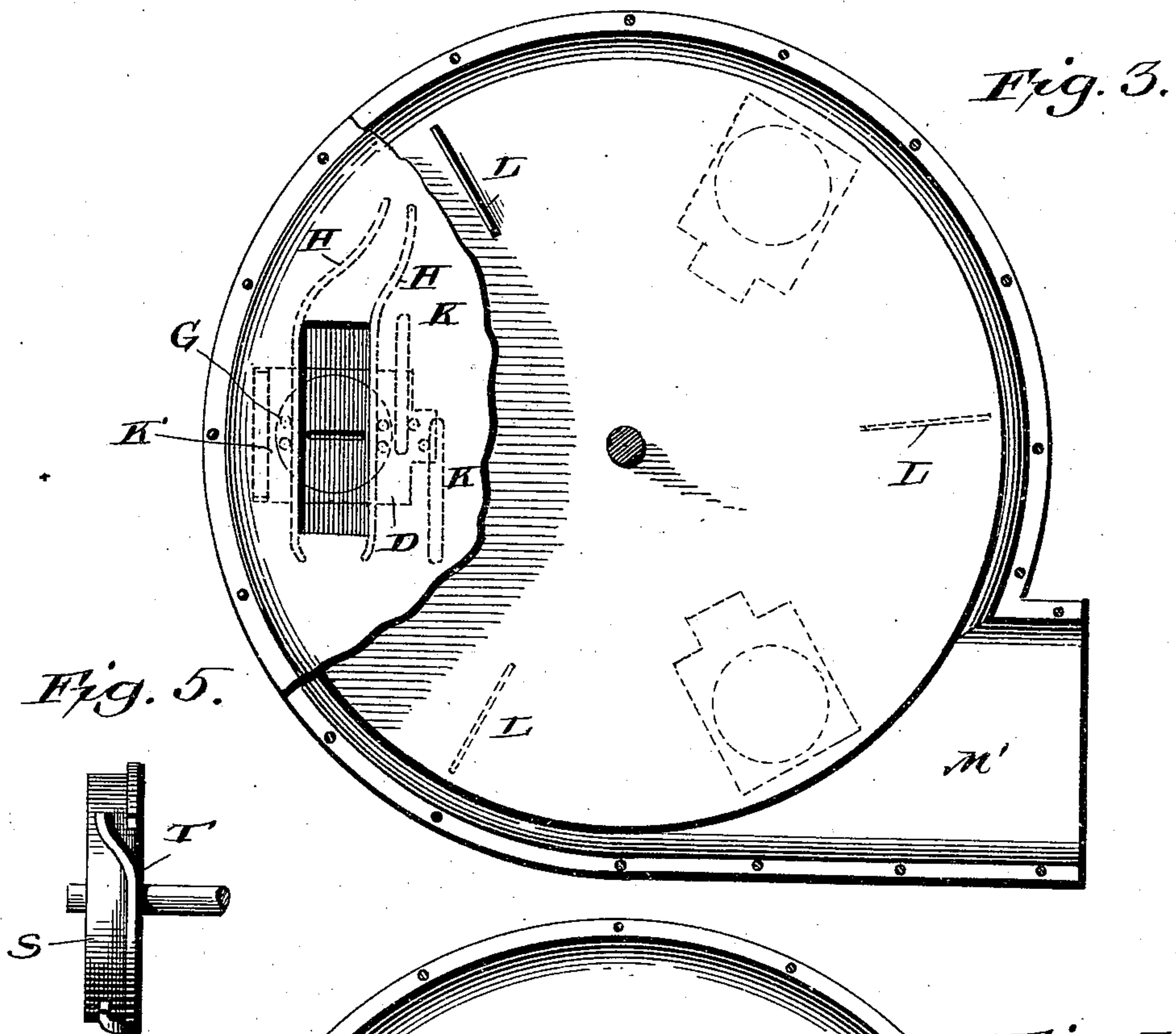
(No Model.)

3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

JAMES A. GRAY, OF HAMILTON, ILLINOIS.

## EXCELSIOR-MACHINE.

SPECIFICATION forming part of Letters Patent No. 551,672, dated December 17, 1895.

Application filed March 6, 1895. Serial No. 540,734. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. GRAY, a citizen of the United States, residing at Hamilton, in the county of Hancock and State of Illinois, have invented certain new and useful Improvements in Excelsior-Machines; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in excelsior-machines and especially to a revolving cutter in which a disk is provided with a sliding carriage carrying a spur-block having a series of cutters inserted therein which are adjusted so as to cut the strands lengthwise of the block of wood, provision being made to hold the series of spurs in a horizontal plane while they are passing by the opening in the shell of the machine, which is provided to receive the block of wood from which the excelsior is to be cut.

A further object of the invention resides in the provision being had for imparting an intermittent motion to the feed wheels or rollers, which, after the spurs and cutting-knife have passed by the block, cause the block to be fed within the path of the spurs as the disk on which they are carried makes another revolution. I also aim to improve upon the mechanism for holding the block of wood from which the strands are to be cut, whereby the block is held by two corrugated rollers, one at each end of the said block and securely held against the ends of the block by means of weighted receptacles passing over pulleys keyed to shafts which carry gear-wheels meshing with racks, which racks have journaled at their lower extremities the ends of one of the corrugated rollers which bears against the end of the block of wood. When it is desired to replace a block the weight is raised, the racks are drawn up and with them the top roller, thus allowing the stub of the old block to be removed.

The invention consists further of the novel construction, combination and adaptation of

the parts, as will be hereinafter more fully described and then specifically defined in the appended claims.

I clearly illustrate my invention in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which drawings similar letters of reference indicate like parts throughout the several drawings, in which—

Figure 1 is a side elevation of the shell and feeding mechanism. Fig. 2 is a central sectional view on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of the shell, with parts broken away to show the position of the spur-block while passing the block of wood. Fig. 4 is a reverse view of the front wall of the shell, showing the guides and tracks. Fig. 5 is a side elevation of the feed-wheel; Fig. 6, a detail in perspective of the spur-block and carriage carrying the same. Fig. 7 is a sectional view on the line 7 7 of Fig. 6. Fig. 8 is a detail view of the rack of the feeding mechanism, and Fig. 9 is a detail view of the feather and spline of the feeding mechanism.

Reference now being had to the details of the drawings by letter, A A designate the legs supporting the shell A', made up of two complementary portions mounted on a shaft B, provided with suitable driving-pulley B' and idler B<sup>2</sup> mounted thereon. C is a disk mounted on the said shaft within the shell, and at various locations about the face of the said disks are perforations for the reception of the carriages D, (only one of which being shown in the drawings,) which are held in place by means of the cleats *d*. The aperture containing the said carriage is somewhat longer than the carriage, and is so provided for the purpose of allowing a reciprocating motion to the said carriage while the same is passing the block of wood being cut from, to be hereinafter more fully described. E is a spur-block seated in the said carriage and held in place by means of the strips E', the space F being provided to allow the spur-block to tilt or slightly rock on a central axis, this rocking motion being for the purpose of causing the spur-block or the series of spurs carried in the slot *e* to be held in a horizontal position while traversing the surface of the block of wood.

G G are friction-rollers mounted on the



front face of the block E, there being preferably four of these rollers, as seen in Figs. 1 and 3.

H H' are guide-tracks secured to the inner wall of the front side of the shell, one guide-rail being located on each longitudinal edge of the aperture through which the block of wood to be cut is inserted. The said friction-rollers, while the spur-block is passing the face of the block, contact with the outer sides of the tracks H, causing the series of spurs to be held in a horizontal position while the spurs are cutting, the said spur-block during its travel across the opening lengthwise thereof of slightly rocking, as will be readily seen.

K K are tracks which serve to guide the friction-rollers K' on the carriage, which contact therewith while the spurs are traversing the block of wood, thus allowing a slight reciprocating motion to be imparted to the said carriage while the strands are being cut, this sliding of the carriage thus relieving the spur-block guides of some strain as the tracks K draw the carriage in and out, so that the center of the carriage will always be traveling in a vertical line while crossing the face of the block.

L are cutting-knives which are fastened to the disk at points behind the spur-blocks, which knives cut loose the strands of excelsior that have been cut by spurs of well-known construction.

M are fans secured to the revolving disk, which blow the excelsior through the outlet M' to a receiving reservoir or chamber.

To the outer face of the shell is secured the mechanism for holding the block of wood to be converted into excelsior. Journaled in the boxes N is a shaft O' carrying a corrugated roller P, the said shaft having keyed thereto a cog-wheel P', which is designed to mesh with the worm-screw p on the spline-shaft Q. R is a cog-wheel keyed to the shaft Q, and is disposed in the path of the feed-wheel S, which latter is keyed to the end of the shaft B, and has the three broken curved offset-tracks about its periphery, each track designed to mesh with the threaded screw R, so that at every revolution of the said feed-wheel the shaft Q is given three partial intermittent revolutions. The shaft Q is journaled in the boxes q q, and carries the worm-wheel Q' meshing with the wheel P', and the worm-wheel Q<sup>2</sup> is slidingly mounted on the shaft Q.

U is a shaft carrying the feed-roller U' and is mounted in the boxes u carried on the sliding racks V, having the teeth V' and the slots V<sup>2</sup>, which allow the said racks to move vertically on the pins V<sup>3</sup>.

W is a shaft journaled in the boxes W' and having keyed to the said shaft the cog-wheels w meshing with the teeth of the said racks, the outer end of the shaft W carrying the pulley W<sup>2</sup>, over which a rope W<sup>3</sup> passes, to the lower end of which a weight is attached.

X X are fingers secured to the sliding rack

nearest to the shaft Q, and the said fingers are designed to be disposed one each side of the threaded wheel Q<sup>2</sup> for the purpose of raising and lowering the latter as the racks are raised and lowered for the purpose of replacing the block Y.

From the foregoing description it will be seen that the block of wood is firmly held between the feed-rollers P and U' by the weights holding the racks at their lowest limit, and the corrugated rollers securely gripping the ends of the blocks. When it is desired to raise the racks the weight may be elevated by turning the crank Z.

Several of these feeding mechanisms may be used at various locations about the shell, so that several blocks may be held in place at the same time, only one of the blocks and mechanism for feeding the same being shown in the drawings.

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

1. In an excelsior cutting machine, the combination with a revoluble disk mounted on a shaft in a suitable shell, knives carried by said disk, a reciprocating carriage carrying friction rollers, said carriage seated in a recess of the disk, tracks K, K, secured to the inner wall of said casing, and adapted to be engaged by said friction rollers, of an independently rocking spur block provided with friction rollers and carried by said carriage, and the tracks H, all substantially as shown and described.

2. In an excelsior cutter, the combination with the disk and cutting apparatus as described, of a shaft B having keyed to an end thereof a feed wheel having a series of offset tracks integral with its circumference, of the shaft Q mounted in suitable bearings on the shell of the machine, pinion R on said shaft Q designed to engage with the offset tracks of the feed wheel, a sliding worm Q<sup>2</sup> mounted on a splined portion of shaft Q, the yoke X having arms extending below and above said worm and the corrugated roller U' designed to move up and down with the worm Q<sup>2</sup>, substantially as shown and described.

3. In combination with the shaft of a rotary excelsior cutter, a feed wheel S mounted thereon, offset tracks or flanges integral with the circumference of said wheel and flush with the edge thereof a portion of their lengths, the shaft Q mounted in suitable bearings on the shell of the machine, pinion R on said shaft adapted to engage with said offset tracks, and a sliding worm Q<sup>2</sup> working vertically on a portion of said shaft Q, a feed wheel U' mounted on a shaft U, and a pinion mounted on said shaft U and designed to mesh with the said sliding worm, and means for raising and lowering said worm and pinion meshing therewith, substantially as shown and described.

4. In an excelsior cutter the combination with the revoluble disk, of a carriage A slid-



ingly held on cleats in a recess therein, by  
means of the strips *b*, of an independently  
rocking spur block having on one side a  
round disk seated in a recess of the said car-  
riage, and a spur carrying extension passing  
5 through the carriage, and the face of said ex-  
tension being flush with the rear face of the  
carriage, and the strips or plates *E'* secured  
to shoulders near the ends of said extension,

and their free ends resting on curved shoul- 10  
ders of the carriage, substantially as shown  
and for the purpose set forth.

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

JAMES A. GRAY.

Witnesses:

GEORGE S. KLING,  
RUFUS A. HARLAN.