

(No Model.)

3 Sheets—Sheet 1.

F. H. BREWSTER.  
FRICTION CLUTCH.

No. 450,790.

Patented Apr. 21, 1891.

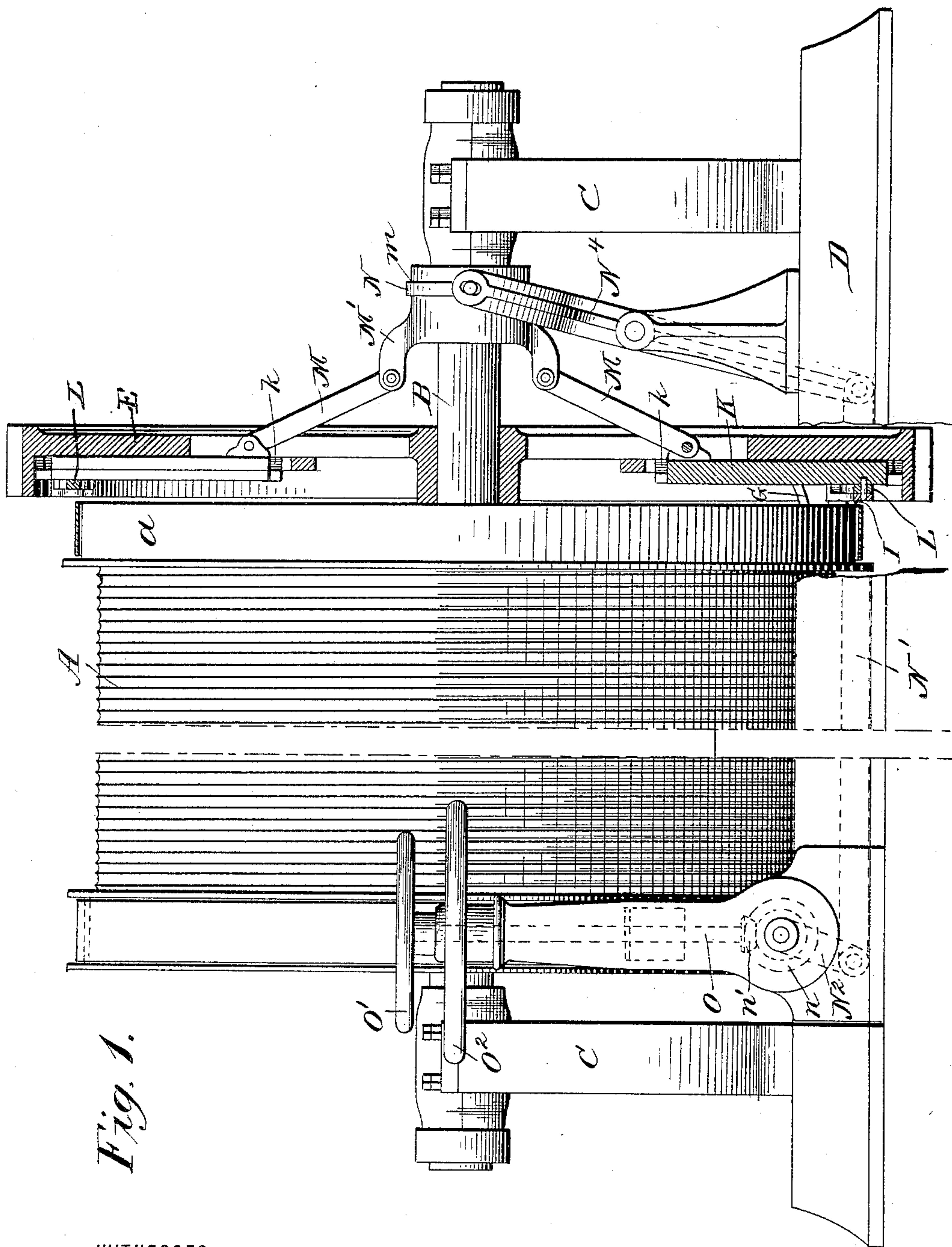


Fig. 1.

WITNESSES:

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*Alon Macauley*

INVENTOR

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BY

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HIS ATTORNEYS

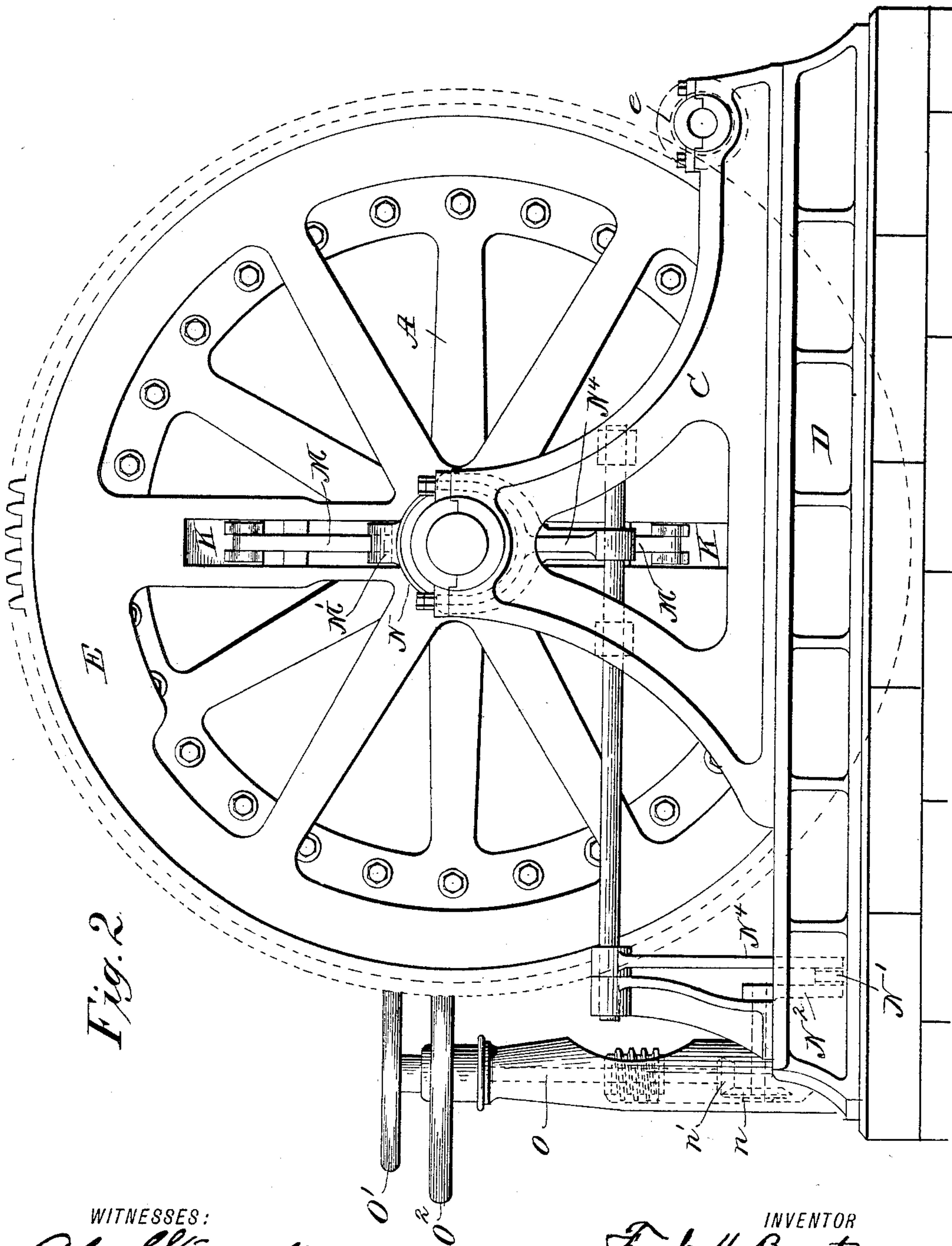
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*Fig. 2.*

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F. H. BREWSTER.  
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Fig. 3

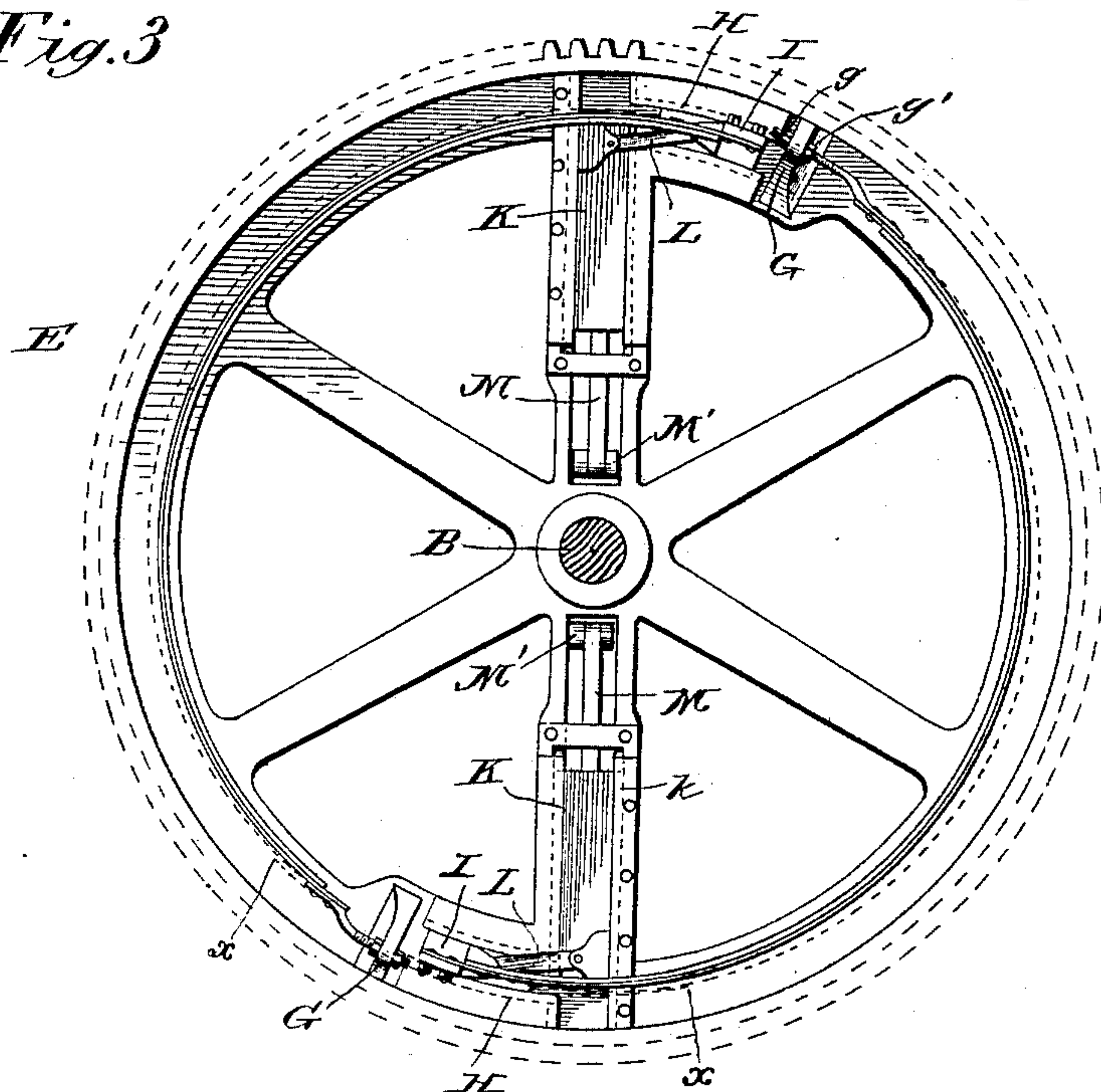


Fig. 4.

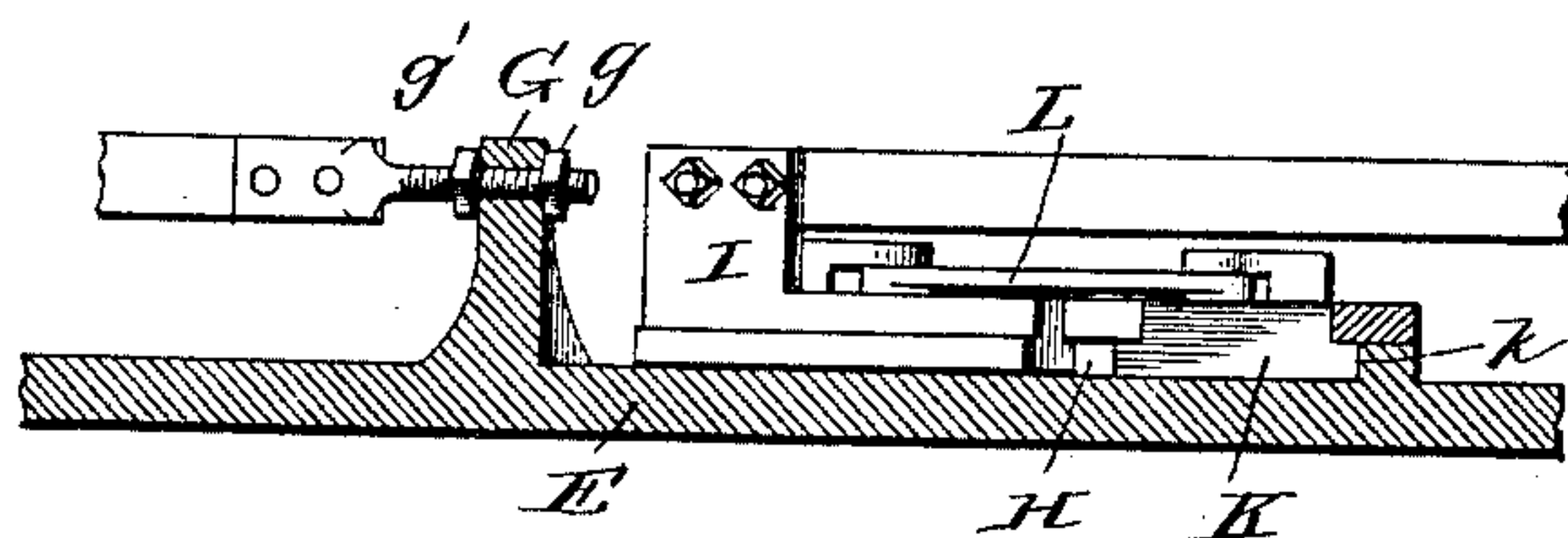


Fig. 6.

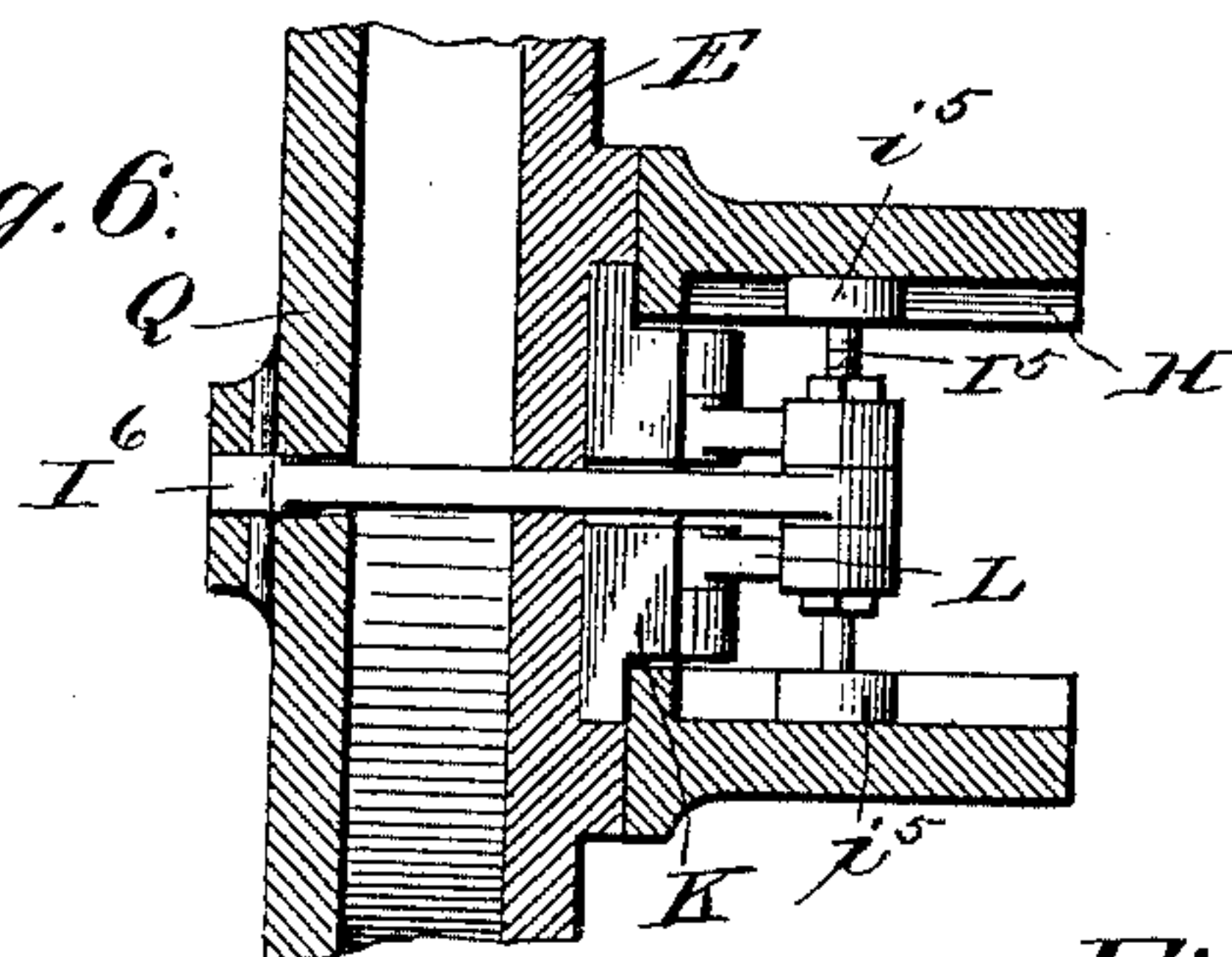


Fig. 5.

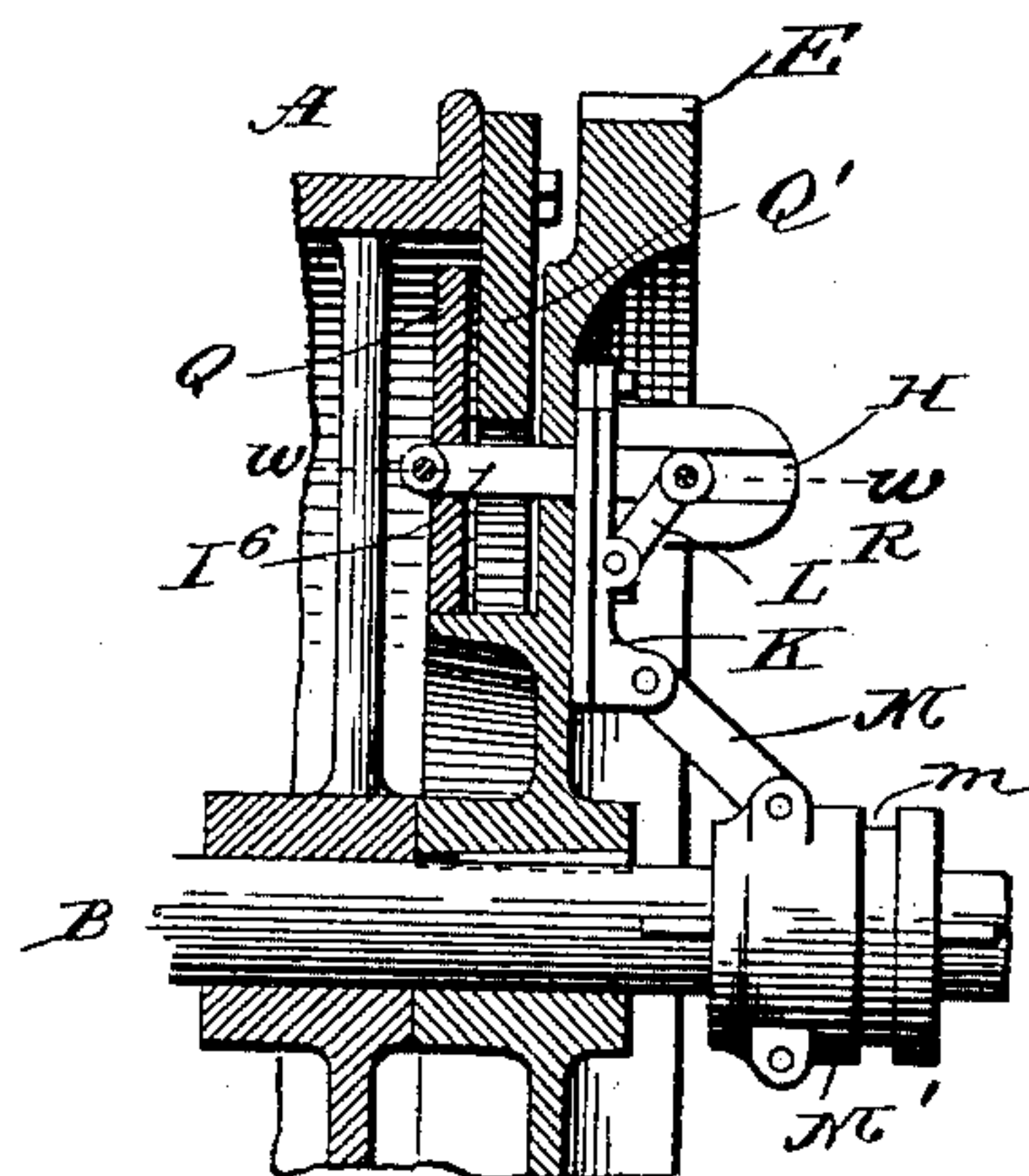
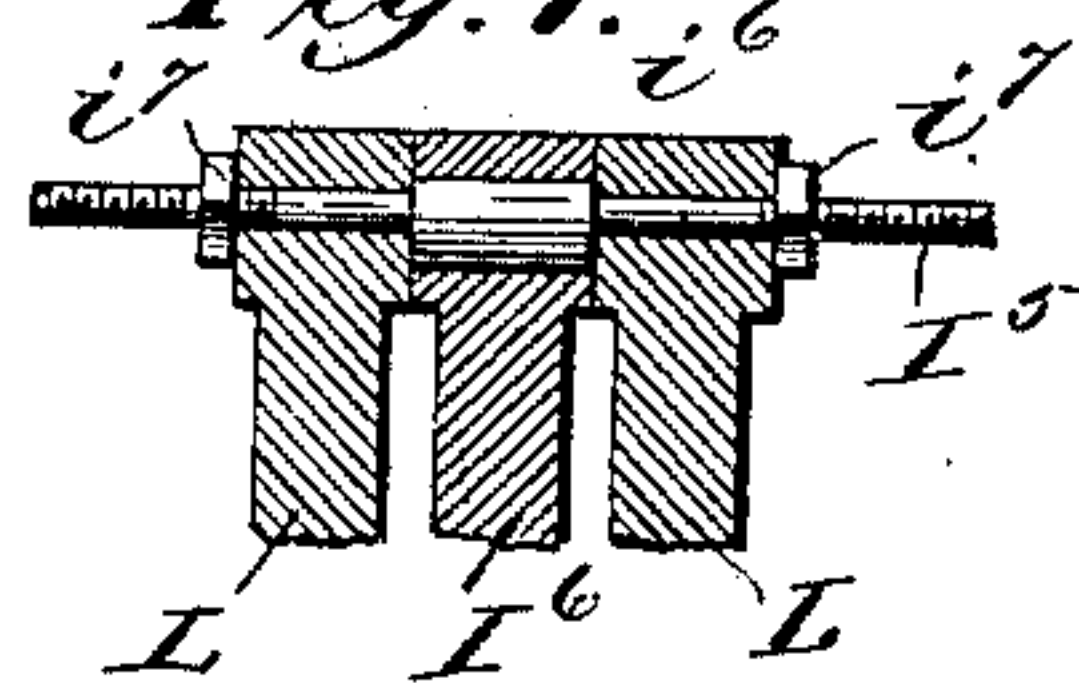


Fig. 7.



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# UNITED STATES PATENT OFFICE.

FRANK H. BREWSTER, OF ESCANABA, MICHIGAN.

## FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 450,790, dated April 21, 1891.

Application filed December 9, 1890. Serial No. 374,068. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK H. BREWSTER, of Escanaba, in the county of Delta and State of Michigan, have invented certain new and  
5 useful Improvements in Friction-Clutches; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification,  
10 and to the letters of reference marked thereon.

This invention relates to improvements in friction-clutches, such as are particularly applicable to hoisting-drums, and has for its object to provide an effective friction-band or  
15 clutch-member operating mechanism which will release or apply the same quickly and with little or no lost motion.

The invention consists in certain novel details of construction and combinations and arrangements of parts to be hereinafter described, and pointed out particularly in the claims at the end of this specification.

Referring to the accompanying drawings, Figure 1 is a front elevation, partially in section, of a hoisting-drum having my invention applied thereto. Fig. 2 is an end elevation of the same. Fig. 3 is an elevation looking at the inside of the power or drive wheel, showing the clutch-band at opposite extremes of its movement. Fig. 4 is a detail section on the line *xx*, Fig. 3. Fig. 5 is a section showing a modified arrangement of clutching-surfaces. Fig. 6 is a section on the line *ww*, Fig. 5; and Fig. 7 is a detail section of  
35 the eccentric for taking up wear.

Similar letters of reference in the several figures denote the same parts.

The hoisting-drum A (shown for convenience in the present illustration) is mounted  
40 on a shaft B, supported by pillow-blocks C on a base D, all of said parts being of any ordinary or well-known construction.

On one end of the shaft B is mounted what I term the "drive-wheel" E—that is, the  
45 wheel through which the power is transmitted from the engine to the hoisting-drum—said wheel in the present instance being a cog-wheel deriving its motion from a smaller cog-wheel *e* on or driven by the engine-shaft.  
50 The drive-wheel E is loose on the shaft in the present instance, while the drum is keyed thereto, although it is obvious that this ar-

range ment may be reversed and the power transmitted to the drive-wheel through the shaft or from the drum to the wheel. At one  
55 end the drum is provided with a friction-surface or clutch-rim *a*, around which pass the clutch band or bands connected to the drive-wheel at one end by the projections or lugs G and screw end and nuts *g g'*, respectively, and  
60 at the opposite by mechanical devices, in which the principal part of my present invention resides and to be now particularly described.

Suitable ways or guides H are provided on  
65 the face of the drive-wheel, preferably just beyond and conforming to the circumference of the clutch-rim on the drum, and in these ways are mounted the sliding blocks I, to which the ends of the clutch-bands are se-  
70 cured, the connection between the bands and blocks preferably being a rigid one and formed by passing the ends of the bands around or through studs on the blocks. The effect of this arrangement is to shift the center of the  
75 circle described by the bands when the blocks are moved in either direction, the result being that the bands are applied or removed from contact with the clutch-rim throughout their entire length. This action is illustrated  
80 clearly in Fig. 3, wherein the bands are shown in full lines in the position they occupy when in engagement with the clutch-rim and in dotted lines in inoperative or released position.  
85

The mechanism for shifting and locking the blocks at the movable ends of each band consists of a carriage or block K, sliding in guides *k*, formed in the drive-wheel radially from its axis, intersecting the line of the ways  
90 H, and connected to the block by a link L, giving a powerful wedging action, rapid during the portion of the stroke when the band is released, but slow and very powerful as the link approaches the dead-center, which it  
95 may be made to pass, as shown in full lines, Fig. 3, thereby forming an effective lock to prevent the accidental release of the band. The drive-wheel is preferably provided with slots coincident with the inner ends of the  
100 ways *k*, and through these slots pass the links M, connected at one end to the carriages and at the other to the collar or sleeve M', sliding longitudinally on the shaft and working on



a spline, so as to rotate therewith. An annular groove *m* is formed in the sleeve *M'*, into which fits a ring *N*, mounted on the bifurcated end of a pivoted lever *N<sup>4</sup>*, the movement of which, it will be seen, gives the carriages their radial movement to clutch or unclutch the bands. The lever *N<sup>4</sup>* may be moved in any manner. In the preferred mechanism, however, its lower end is connected by a link *N'* to a crank-shaft *N<sup>2</sup>*, (dotted lines, Figs. 1 and 2,) carrying a bevel gear-wheel *n*. A vertical shaft *O*, controlled by a hand-wheel *O'*, is provided with a small bevel gear-wheel *n'*, which meshes with the gear *n*. Thus by simply turning the hand-wheel in one direction or the other the clutch-sections are brought into operative engagement and the drum driven.

Below the hand-wheel *O'* is a hand-wheel *O<sup>2</sup>*, which, through appropriate connections, (forming no part of this invention,) controls the brake, thereby enabling the engineer to have the means for controlling the whole apparatus within convenient reach—an advantage which will be appreciated by those skilled in the art.

It is obvious that a single clutch-band may be employed in connection with my invention; but in the preferred form two bands are employed, passing half around the clutch-rim, as in this instance additional security is afforded and the short bands act more quickly and powerfully.

In the modified form of the invention shown in Figs. 5 to 7, inclusive, the flexible clutch-band or member is dispensed with, and in its stead a movable clutch member, in the form of a disk *Q*, is mounted on the drive-wheel (see Figs. 5 and 6) and adapted to engage a clutch member *Q'*, in the form of an annular inwardly-projecting rim, bolted or otherwise secured to the edge of the drum. The ways *H'*, in which the block slides, in this instance extend out at right angles to the plane of the wheel, as shown at *R*, the ways in every instance being so arranged as that the block will be caused to travel substantially in the line of movement of the movable member of the clutch. The carriages *K'* and ways therefor are the same as in the first-described form, and the links *L'* are also similar to the links *L*, the only difference being that the links work toward and from the face of the wheel instead of in a plane parallel therewith, as will be readily understood by those skilled in the art. Two links *L'* are preferably employed, and the block *I* is replaced by an eccentric pin *I<sup>5</sup>*, which passes through the links *L'* and a connecting-link *I<sup>6</sup>* to give a neat and effective apparatus. This eccentric-pin *I<sup>5</sup>* has anti-friction rollers *i<sup>5</sup>* at each end, which run in the ways *H'*, and in Fig. 7 it will be seen that the eccentric *i<sup>6</sup>* is in the link *I<sup>6</sup>*, the rotation of the pin being prevented by two set-nuts *i<sup>7</sup>*, with which arrangement the eccentric may be turned to take up wear on the friction-surfaces and the pin at once clamped in adjusted

position. This form of clutch members (by which are meant the co-operating members having the clutching surfaces) has some advantages in that the area of the clutching-surfaces may be materially increased without lengthening the drum, and the whole device presents a neat and symmetrical appearance.

In an application, Serial No. 386,325, filed March 25, 1891, I have shown, described, and claimed more broadly certain features, particularly the modified structure shown, and hence I do not wish to be understood as abandoning any part of the invention not claimed herein.

Having thus described my invention, what I claim as new is—

1. In a friction-clutch, the combination, with the clutch-rim and wheel having the co-operating clutch member attached thereto, of the block to which the last-mentioned clutch member is secured, mounted to slide in ways on the wheel substantially in line with the direction of motion of the clutch member, the sliding carriage, and the link connecting said carriage and block for tightening or releasing the clutch, substantially as described.

2. In a friction-clutch, the combination, with the clutch-rim and wheel having the co-operating clutch member attached thereto, of the block to which the last-mentioned clutch member is secured, mounted to slide in ways on the wheel substantially in line with the direction of motion of the clutch member, the sliding carriage mounted in ways in the wheel at substantially right angles to the ways in which the block is mounted, and a link connecting said carriage and block, whereby the block and clutch member may be moved into operative position and locked, substantially as described.

3. In a friction-clutch, the combination, with the clutch-rim and drive-wheel having ways therein substantially in line with the line of movement of the movable clutch member and the radial ways intersecting the same, of the movable clutch member mounted on the wheel, the block sliding in the first-mentioned ways and connected to said movable member, the carriage mounted in the radial ways, the link connecting said carriage and block, the longitudinally-movable sleeve on the shaft of the wheel, and the link connecting said sleeve and carriage, substantially as described.

4. In a friction-clutch, the combination, with the clutch-rim and co-operating drive-wheel having the ways therein substantially parallel with the clutch-rim and the radial ways intersecting the same, of the band connected to the wheel at one end, the block sliding in the first-mentioned ways and connected to the opposite end of the band, the carriage sliding in the radial ways, the link connecting said carriage and block, the longitudinally-movable sleeve on the shaft of the wheel, and the link connecting said sleeve and the carriage, substantially as described.

5. In a friction-clutch, the combination, with



the clutch-rim and the co-operating drive-wheel, the band engaging the rim mounted on the wheel, and means, substantially as described, for moving the said band to clutch  
5 or release from the rim, of the longitudinally-movable sleeve, the lever engaging the same, the link, the crank-shaft having the bevel-gear thereon, the link connecting said crank-shaft and lever, and the vertical shaft having the hand-wheel and bevel-gear co-operating to with the corresponding gear on the crank-shaft, substantially as described.

FRANK H. BREWSTER.

Witnesses:

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A. M. KELLY.