

No. 697,913.

Patented Apr. 15, 1902.

W. H. CORBETT.
CLUTCH.

(Application filed Nov. 13, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

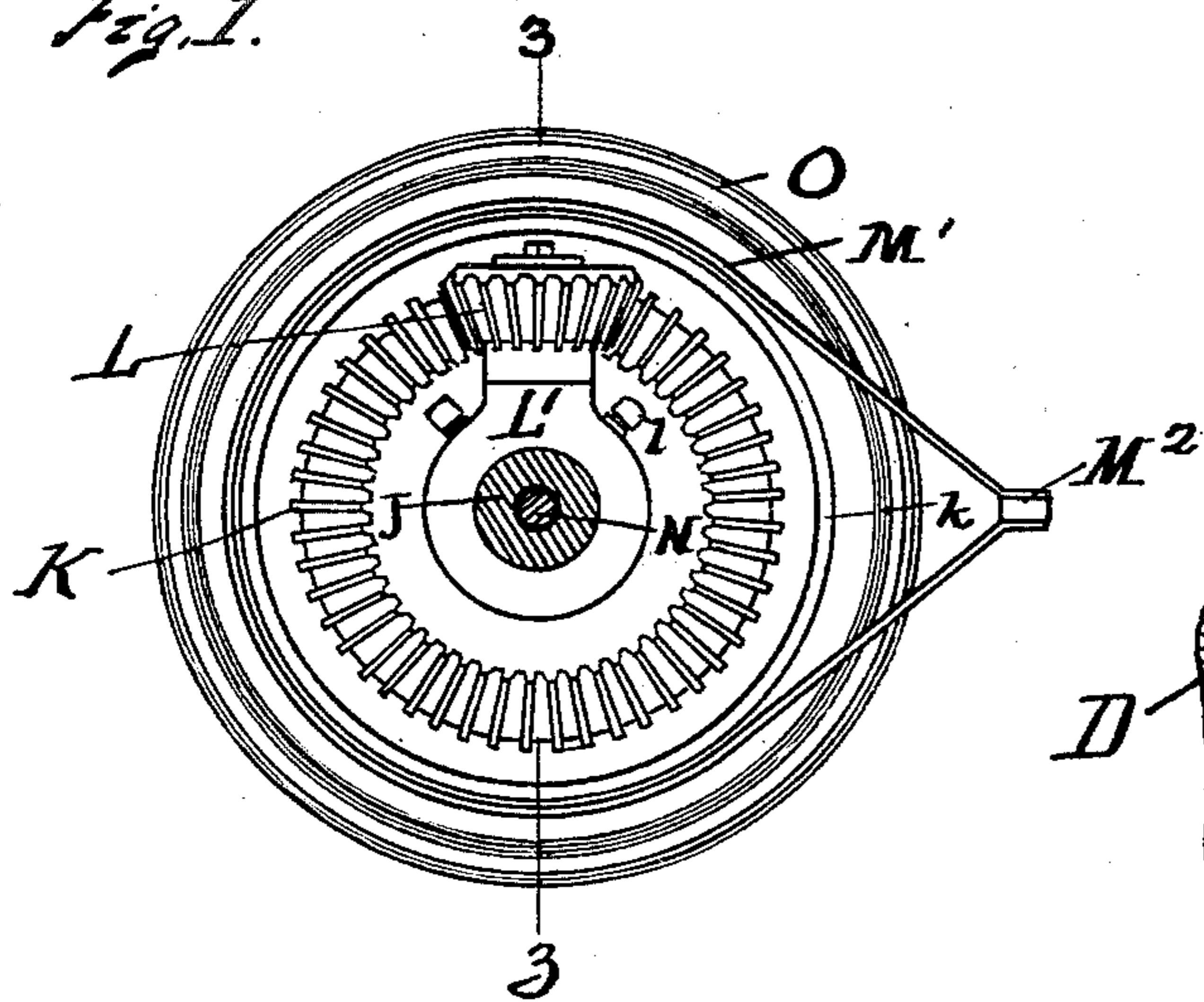


Fig. 2.

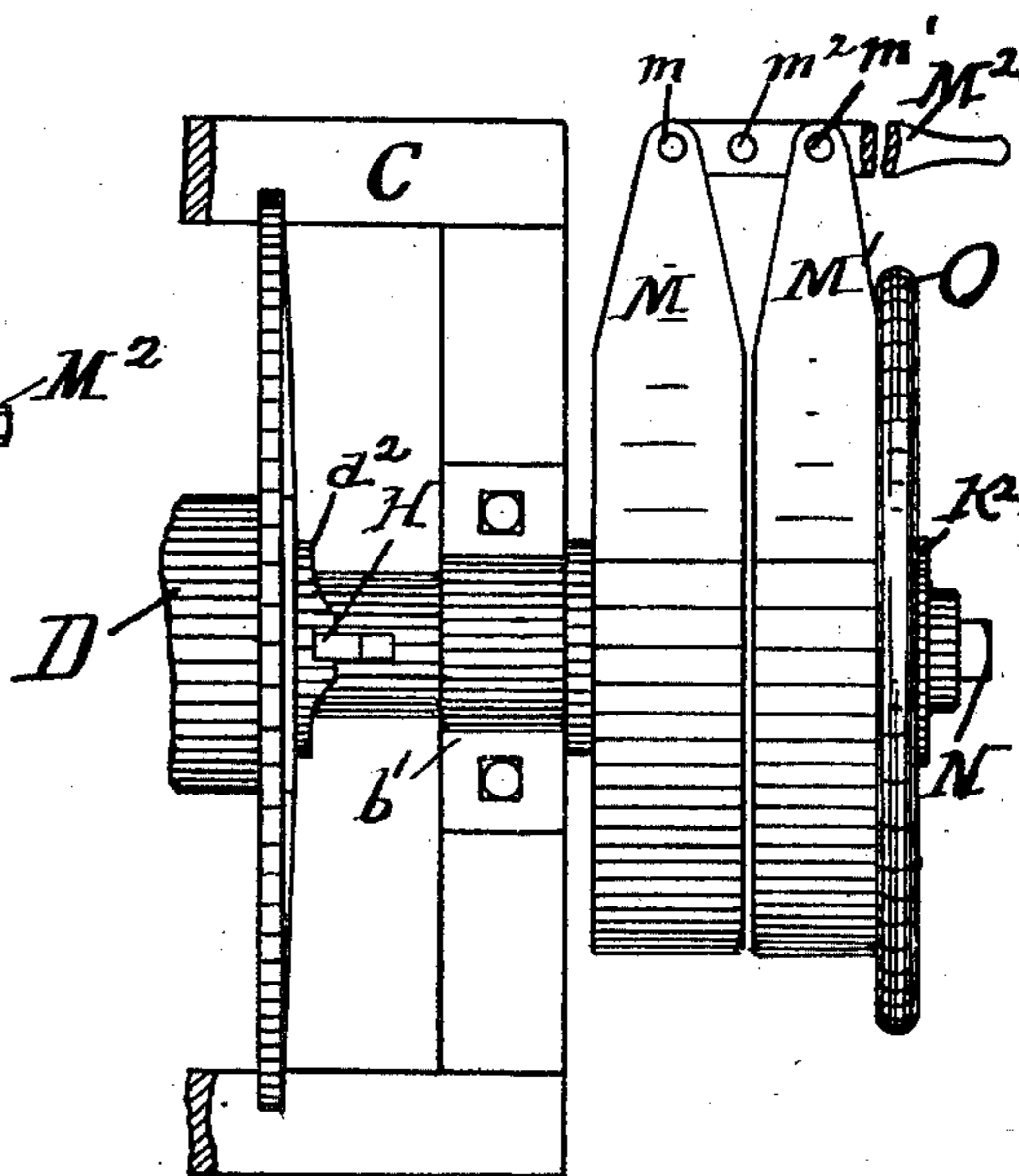
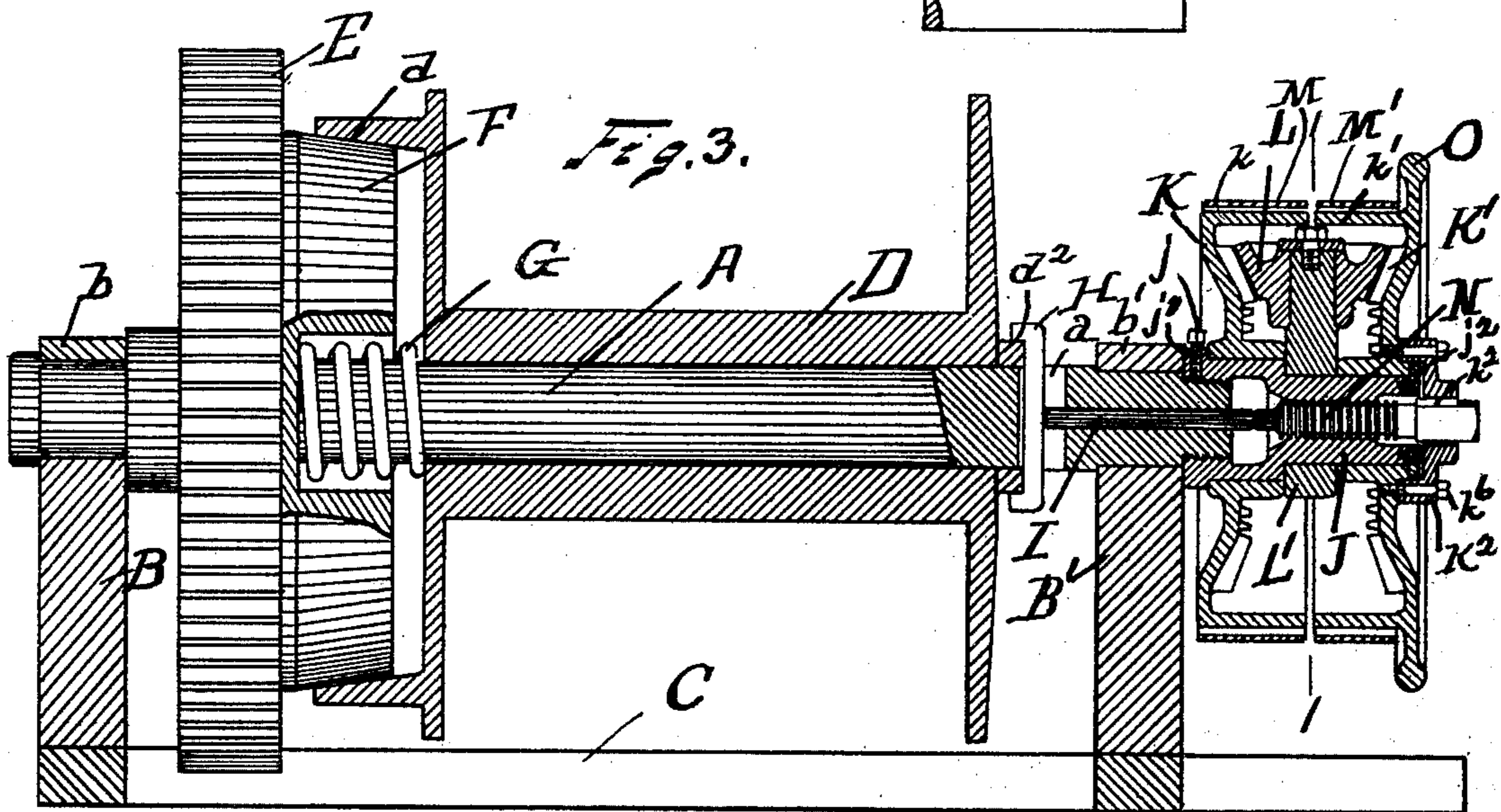


Fig. 3.



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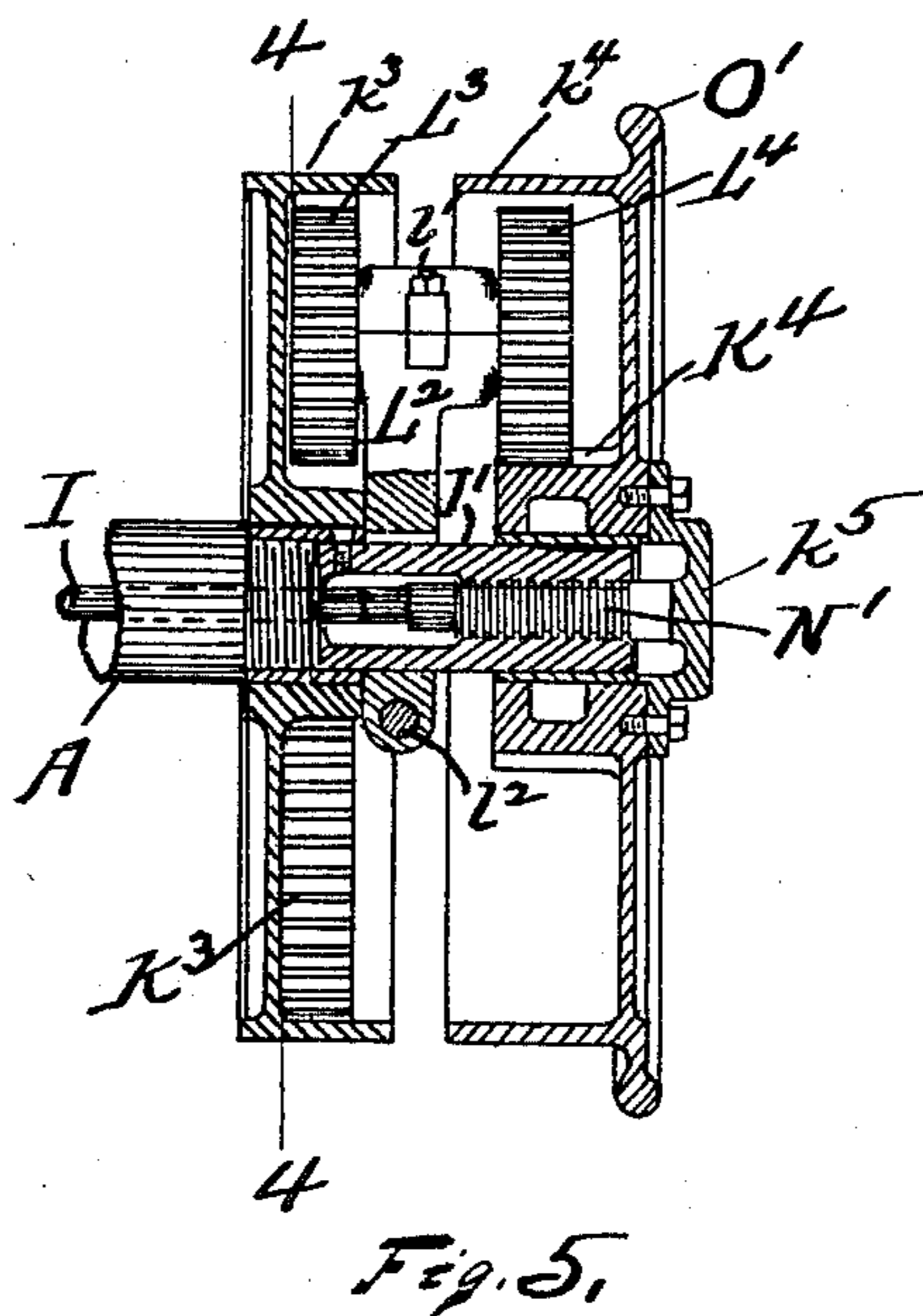
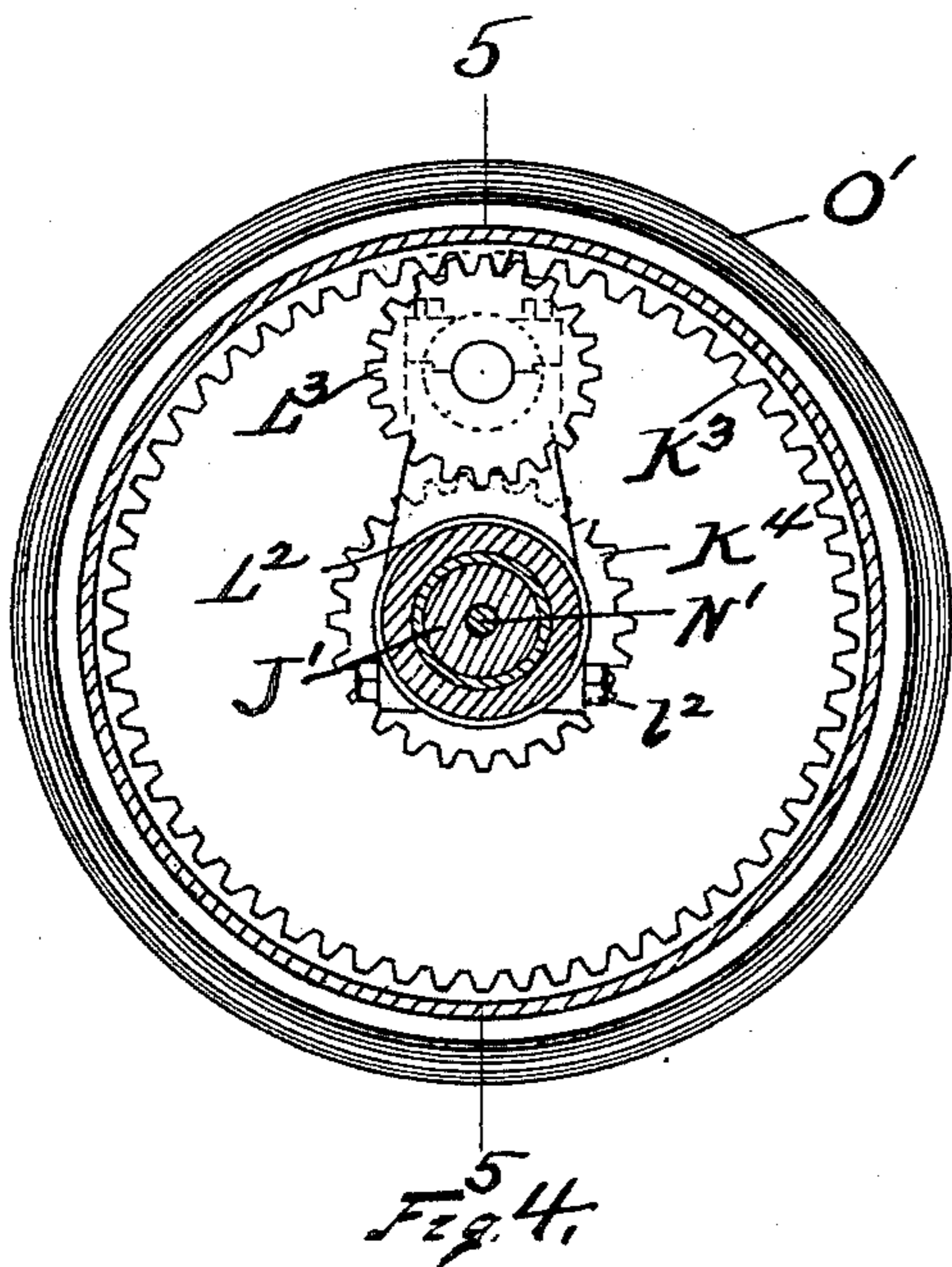
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UNITED STATES PATENT OFFICE.

WILLIAM H. CORBETT, OF PORTLAND, OREGON.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 697,913, dated April 15, 1902.

Application filed November 13, 1901. Serial No. 82,121. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CORBETT, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Clutches; 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.

This invention relates to friction-clutches; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

The invention is peculiarly adapted to operate with drums on logging or hoisting engines, but may have other applications.

The invention is illustrated in the accompanying drawings, as follows:

Figure 1 shows a section on the line 1 1 in Fig. 3. Fig. 2 shows an elevation of a part of the device. Fig. 3 shows a section on the line 3 3 in Fig. 1. Figs. 4 and 5 show an alternative construction, Fig. 4 being a section on the line 4 4 in Fig. 5, and Fig. 5 being a section on the line 5 5 in Fig. 4.

A marks the drum-shaft or shaft upon which the means to be operated is journaled or mounted. The shaft is carried in the bearings $b\ b'$ on the uprights $B\ B'$. The uprights are mounted on any suitable frame C . The drum D is journaled on the shaft A and is provided with the internal conically-shaped friction-surface d . The shaft A is driven by a gear E , which is fixed with the shaft by any suitable mechanism, (not shown,) and fixed with this gear is a friction-cone F . A spring G is tensioned between the friction-cone F and the drum D and tends to crowd the drum out of frictional engagement with the cone F . It is desirable that the bearings $b\ b'$ be as near to the drum as possible, for the reason that there is great lateral strain on shaft A . It is also desirable that some suitable mechanism be provided for throwing the drum into and out of frictional engagement, the drum sliding longitudinally on the shaft A . A slot a extends through the shaft A , adjacent to the end of the drum. A key H is arranged in this slot and operates against a collar d^2 on the drum. A pin I extends through the center of the shaft A to communicate a thrust

action on the drum through the key H from outside of the bearing b' .

The mechanism heretofore described is in common use. My invention consists in adapting to this or similar mechanism a means for throwing the clutch into and out of engagement and is as follows: The outer end of the shaft A may be formed integrally with the shaft; but I prefer to form it by means of a sleeve-nut J . This is locked on the shaft by means of the set-screw j . Journaled on the shaft so extended are the beveled gears $K\ K'$. Fixed by means of the set-screws l on the end of the shaft formed by the sleeve-nut between the beveled gears is a carrier L' , carrying the beveled gear L . The gear L meshes the gears $K\ K'$. The carrier L' and the shoulder j' on the sleeve-nut secure the gear K on the sleeve-nut. The gear K' is held in position between the hub of the carrier L' and the plate j^2 , secured on the end of the sleeve-nut. The screw N is arranged to operate in the sleeve-nut J and extends out through the end of the shaft. It is locked to rotate with the gear K' by means of a plate K^2 . This plate K^2 is secured to the gear K' by means of the bolts k^6 and is locked with the screw N by means of a square cored hole fitting over square shank on screw. Extending from the gears $K\ K'$ are the friction-rims $k\ k'$, respectively. Surrounding these rims are the band-brakes $M\ M'$. The band-brakes are screwed to the lever M^2 by means of the pins $n\ n'$. The lever M^2 is carried by the fixed pin n^2 .

The operation of the device is as follows: It will be understood that the shaft A is rotating when the engine is in motion. When it is desired to throw the clutch into engagement, so as to lock the drum with the shaft, the band-brake M' is brought into engagement with the rim k' . This retards the gear K' , and consequently the screw N . As the shaft continues to rotate the screw is carried inwardly against the pin I , thus exerting the thrust on the drum to throw the clutch into engagement. As soon as the clutch is sufficiently set the lever M^2 is released, allowing the gear K' to revolve with the shaft. While the gear K' is being retarded the carrier L of course is rotating, and the gear K is being rotated through the action of the intermediate gear L ; but this has no effect on the clutch

mechanism, as the gear K is free to rotate. When it is desired to release the clutch, the lever M² is operated to bring the band M into engagement with the rim *k*. This retards the gear K, and as the carrier L' rotates with the shaft A, carrying the gear L, the gear L, being meshed with the gear K, rotates and causes the gear K' to rotate at a greater speed than the carrier L' or the shaft A. This operating upon the screw through the plate K² moves the screw out, so as to disengage the clutch. As soon as the clutch is released the lever M² is moved to carry the band out of engagement. The mechanism carried by the shaft then rotates with it and leaves the parts in this position until one of the parts is retarded by the mechanism described. In order that the clutch may be actuated while the shaft is stationary, I provide the hand-wheel O, by means of which the screw may be worked in or out by hand.

It will be noted that by this construction the bearings may be arranged very close to the drum. This permits a light shaft to be used, as the strain on the drum can have but little tendency to bend or strain the shaft so supported. It will also be noted that all the thrust of the clutch is sustained entirely by the shaft and parts carried by the shaft and that there is no end-thrust action upon the bearings.

In the alternative construction the sleeve-nut J' is screwed into the end of the shaft A. An internal gear K³ is journaled on this shaft and a spur-gear K⁴ also journaled on the shaft. A carrier L² is fixed on the shaft by means of the bolt *l*², and the spur-gears *l*³ *l*⁴ are carried by a bearing *l*' on the gear L². The gear L³ meshes the internal gear K³, and the gear L⁴ meshes the spur-gear K⁴. The spur-gear K⁴ is secured to the screw N' by means of the plate *k*⁵. The spur-gear K⁴, as shown, is of course carried in and out with the gear N', the face of the gear K⁴ being of sufficient width to admit of this movement. Extending from the gears K³ K⁴ are the rims *k*³ *k*⁴, having the same function as the rims *k* *k*' in the preferred construction. The operation of this device will be readily understood from the description of the preferred construction.

What I claim as new is—

1. The combination with a shaft; bearings for said shaft; mechanism carried by said shaft between said bearings; and a clutch for locking said mechanism with said shaft; of means acting with the shaft outside of the bearings for throwing said clutch into and out of engagement with a yielding or frictional pressure, said means being arranged to confine the thrust for setting the said clutch to said shaft and the parts carried by said shaft.

2. The combination with a shaft; bearings for said shaft; mechanism carried by said shaft between said bearings; and a clutch for locking said mechanism with said shaft; of a

system of gears carried by said shaft outside the bearings; and means acting with said gears for actuating said clutch through the action of the shaft, said means being arranged to confine the thrust for setting said clutch to the shaft and the parts carried by said shaft.

3. The combination with a shaft; bearings for said shaft; mechanism carried by said shaft between said bearings; and a clutch for locking said mechanism with said shaft; of a system of gears carried by the shaft outside the bearings; and means acting with said gears for throwing said clutch into and out of engagement, said means being arranged to confine the thrust for setting said clutch to said shaft and the parts carried by said shaft.

4. The combination with a shaft; bearings for said shaft; mechanism carried by said shaft between said bearings; and a clutch for locking said mechanism with said shaft; and a system of gears normally moving with the shaft; means carried by said shaft and arranged to act with said gears to actuate said clutch when a part is retarded, said means being also arranged to confine the thrust for setting said clutch to said shaft and the parts carried by said shaft; and means for retarding a part of said gear system.

5. The combination with a shaft; bearings for said shaft; mechanism carried by said shaft between said bearings; and a clutch for locking said mechanism with said shaft; of a system of gears normally moving with the shaft; means carried by said shaft and arranged to act with said gears to throw the clutch into engagement when one part is retarded and throw the clutch out of engagement when another part of said gear system is retarded, said means being also arranged to confine the thrust for setting said clutch to said shaft and the parts carried by said shaft; and means for retarding the different parts of said system to throw said clutch into and out of engagement.

6. The combination with the shaft A; clutch carried by said shaft; the bearings *b* *b*' for said shaft; the pin I for communicating a thrust movement from without the bearing *b*' to the clutch; a shaft extension outside of the bearing *b*; two gears journaled on said shaft extension; an intermediate gear between said gears; a carrier for said intermediate gear fixed with the shaft extension; and means for retarding either of the gears journaled on the shaft extension; a screw arranged in the shaft extension against the pin I; and means for communicating the action of the gears to the screw.

7. The combination with the shaft A; the clutch carried by said shaft between the bearings *b* *b*'; the bearings *b* *b*'; the pin I for communicating the thrust to the clutch through the bearing *b*'; the shaft extension J; the screw N arranged in said shaft; the beveled gears K K' journaled on said shaft extension;

the carrier L' fixed on said shaft extension;
the intermediate gear L journaled on said
carrier and meshing with the gears K K'; the
rims k k' extending from the gears K K' re-
spectively; brake mechanism for said rims;
and a spline-and-groove connection between
the screw N and the gear K'.

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

WILLIAM H. CORBETT.

Witnesses:

FRANK T. WOODWARD,
GEORGE TAZWELL.