

No. 661,378.

Patented Nov. 6, 1900.

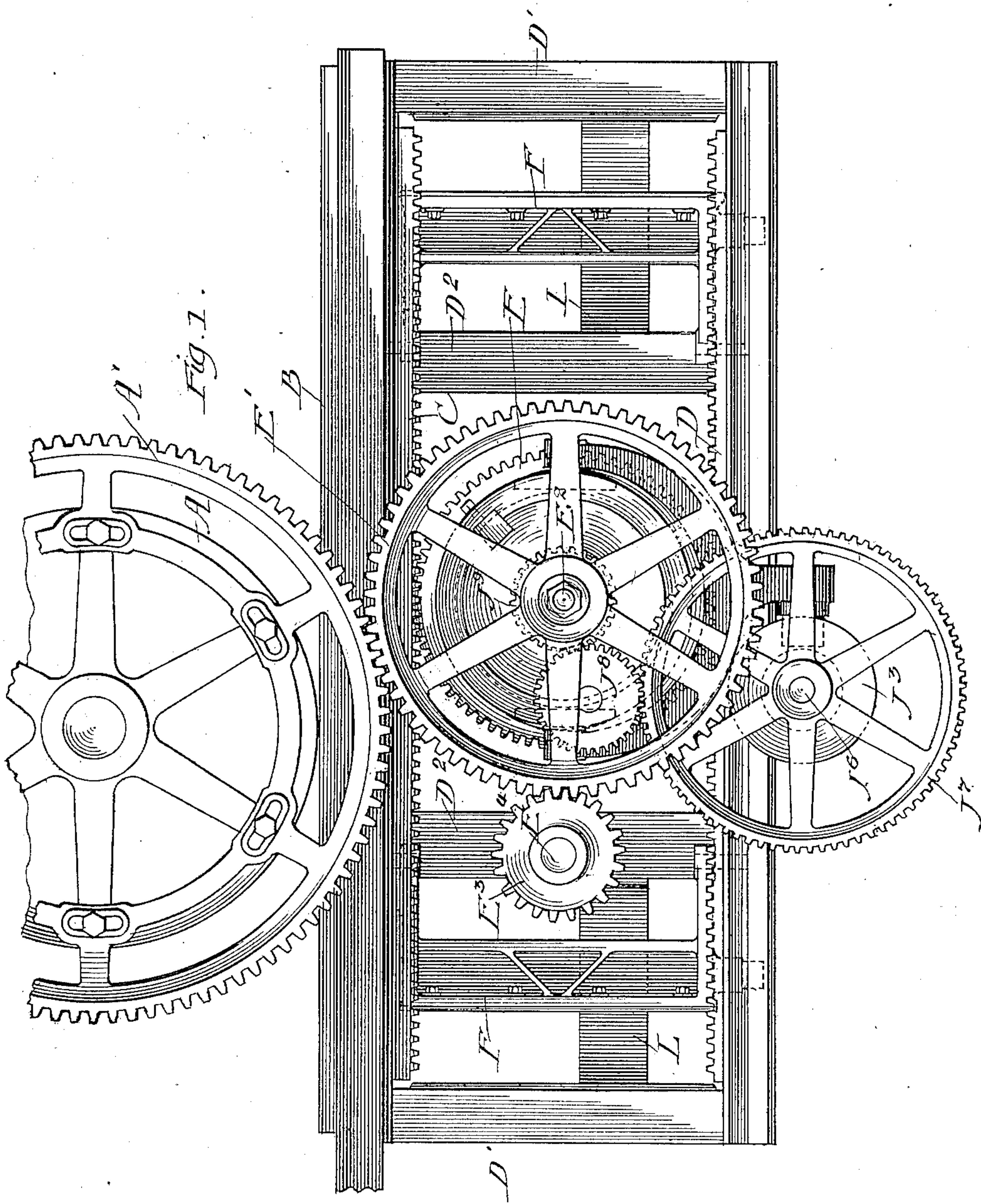
R. MIEHLE.

BED MOTION FOR PRINTING PRESSES.

(Application filed Mar. 27, 1899.)

(No Model.)

7 Sheets—Sheet 1.



Witnesses:

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H. W. Munday

Inventor:

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By Attorneys

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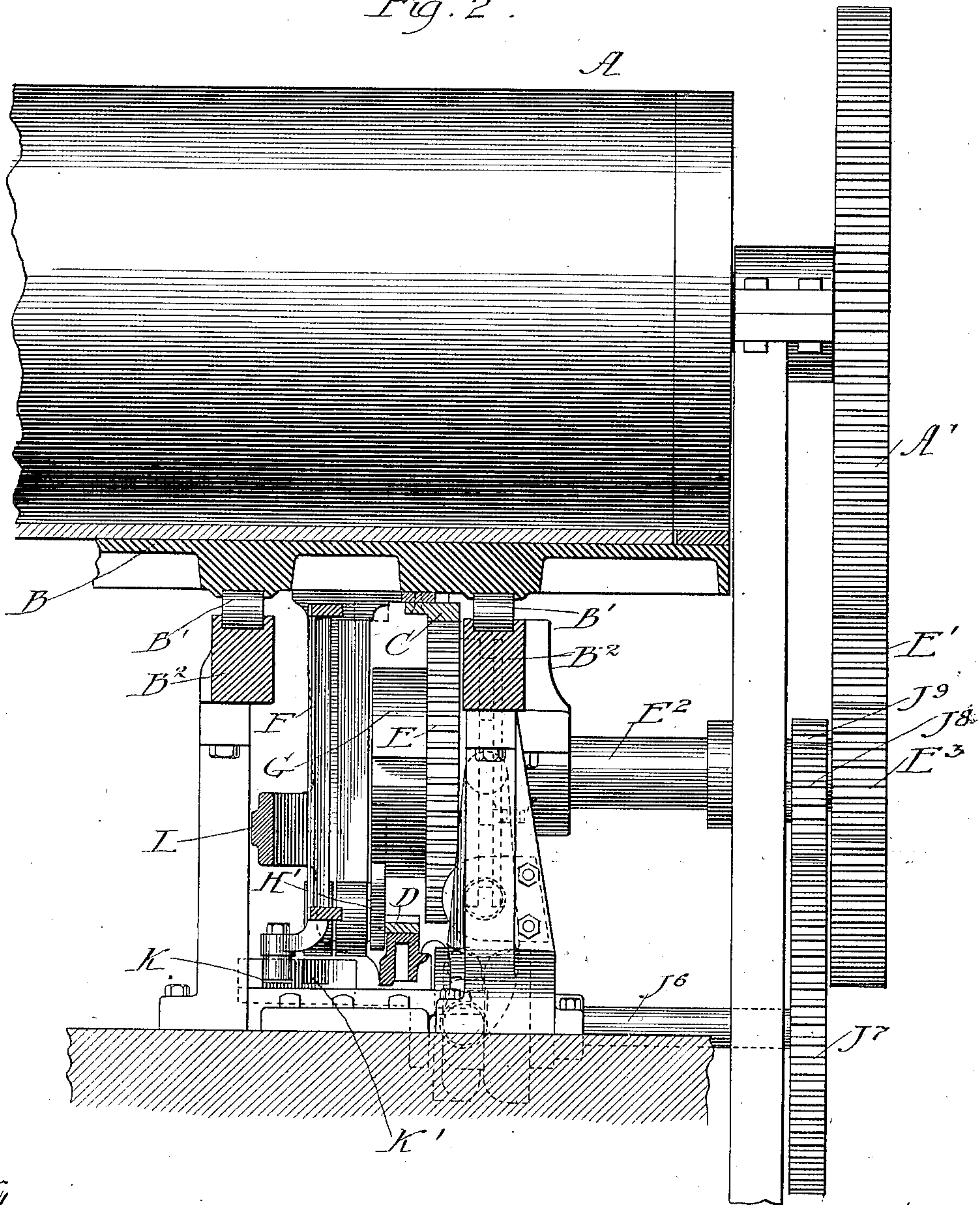
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Fig. 2.



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Fig. 3.

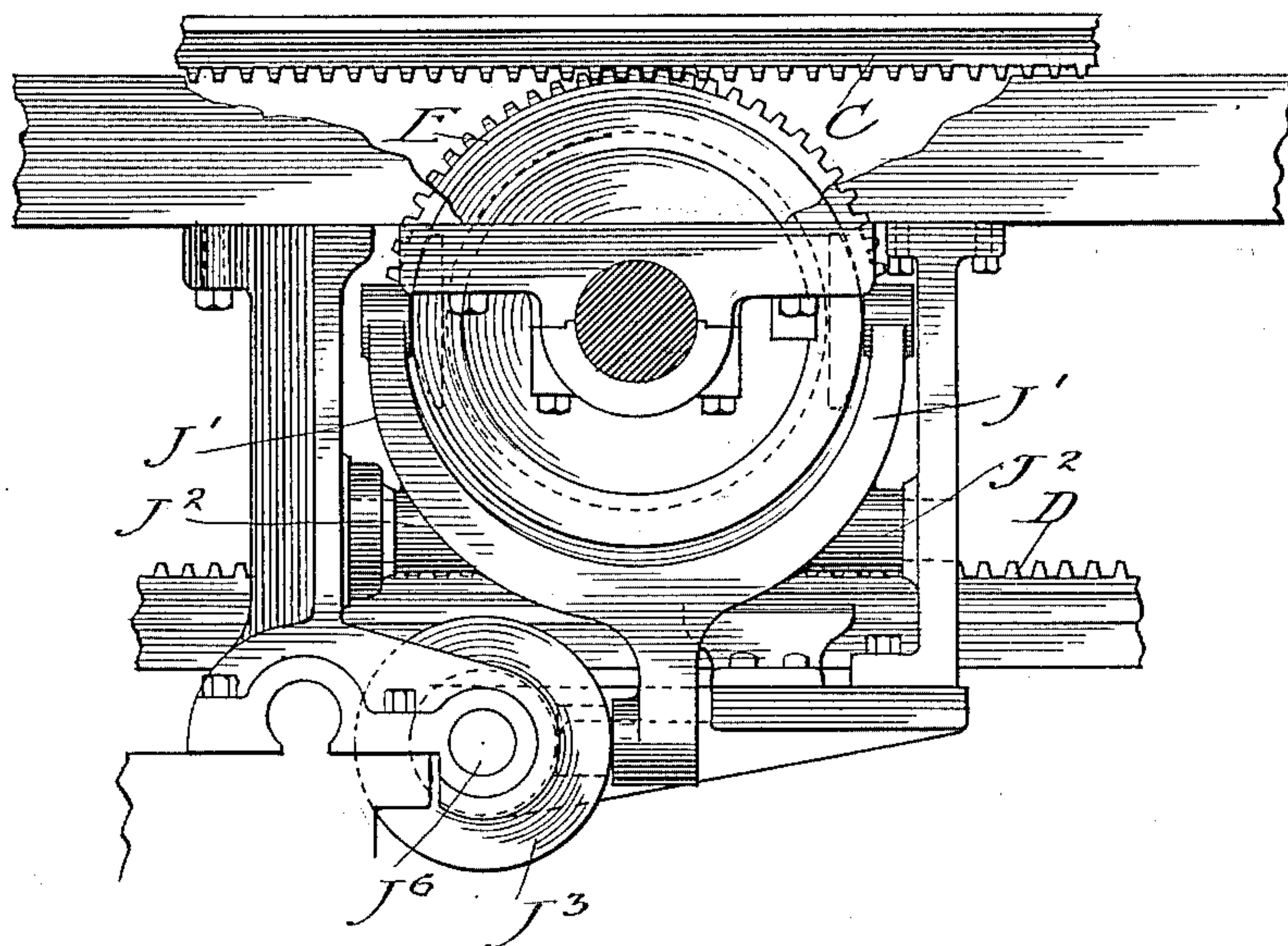
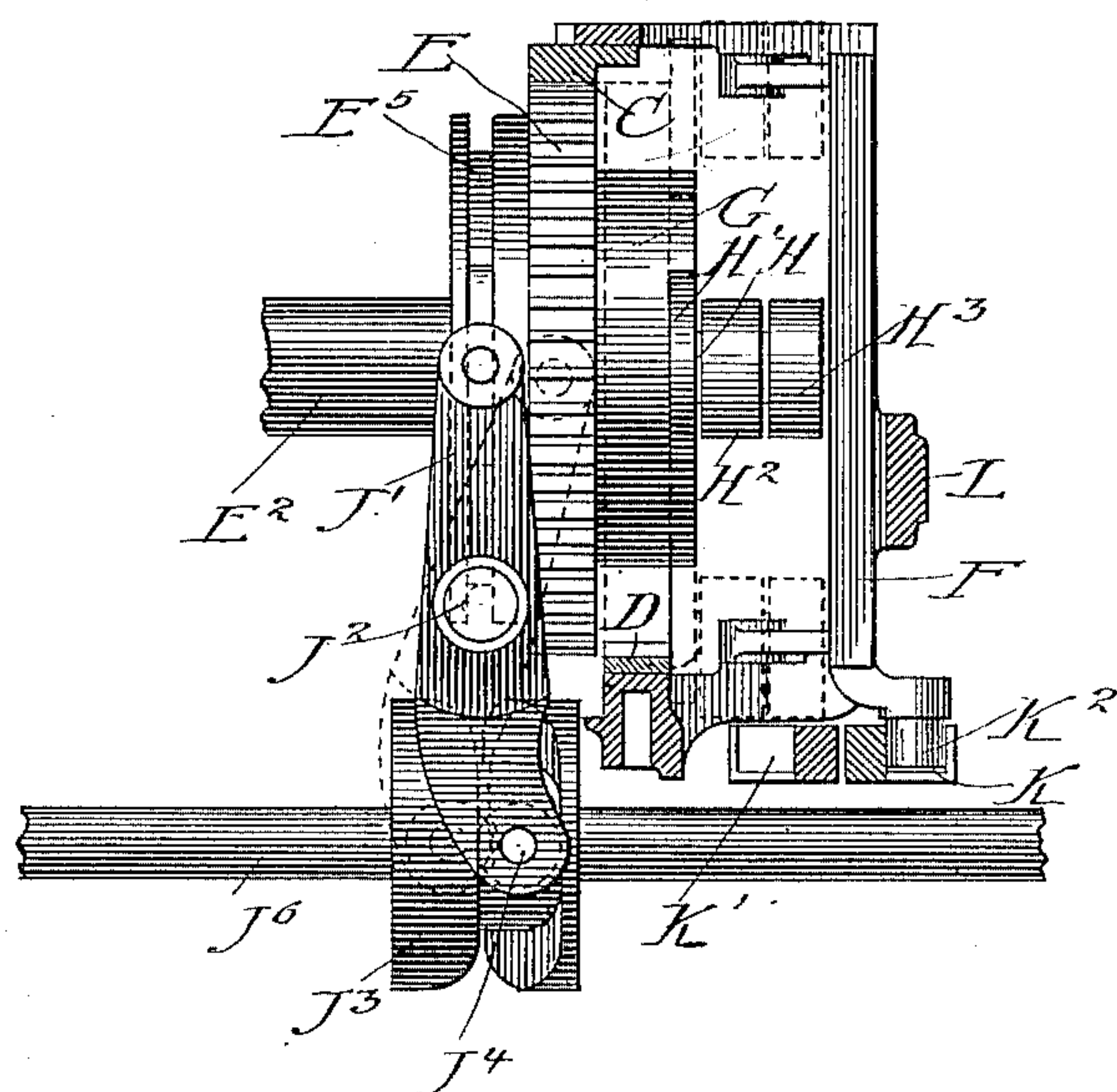


Fig. 4.



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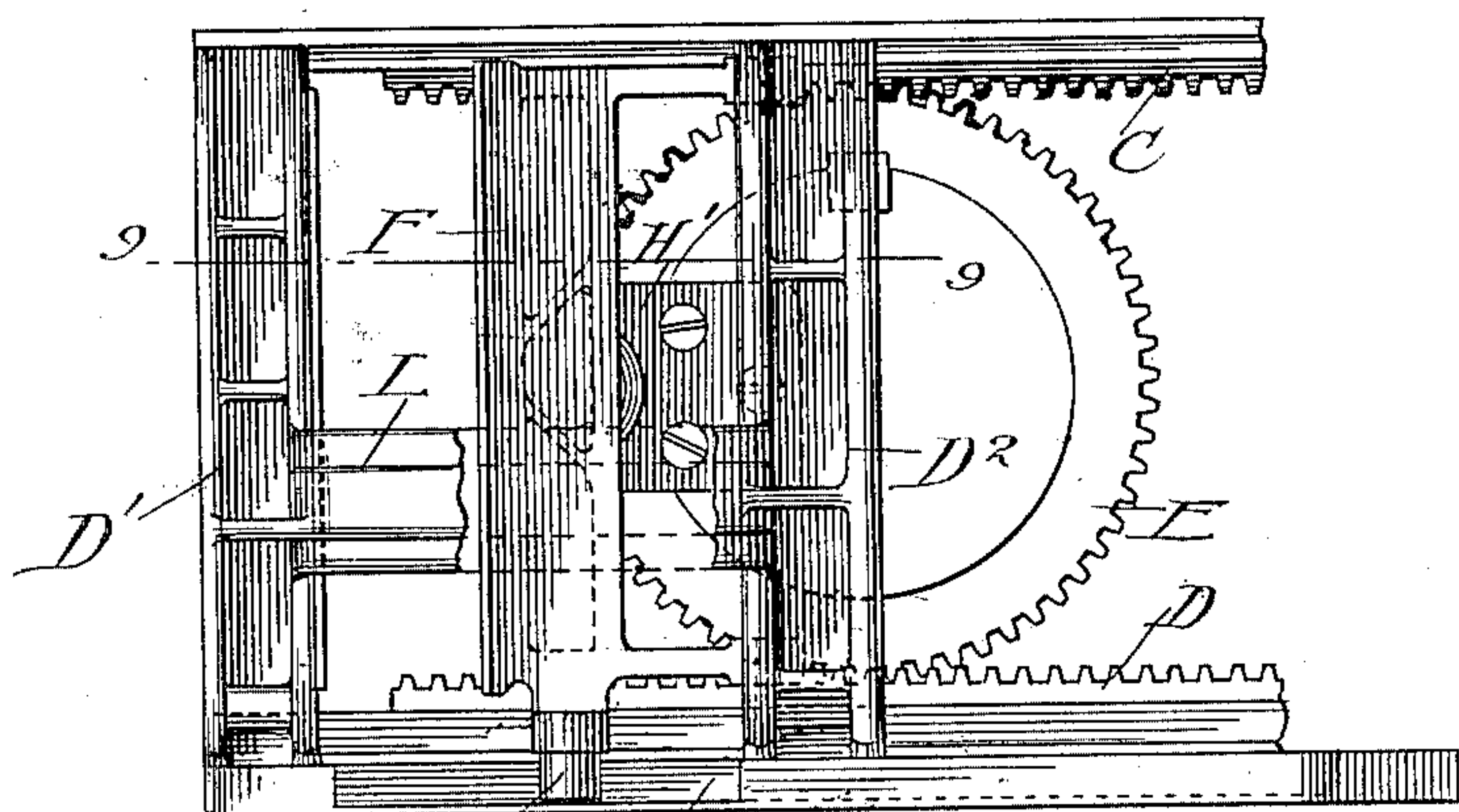
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Fig. 5.



K² K Fig. 6.

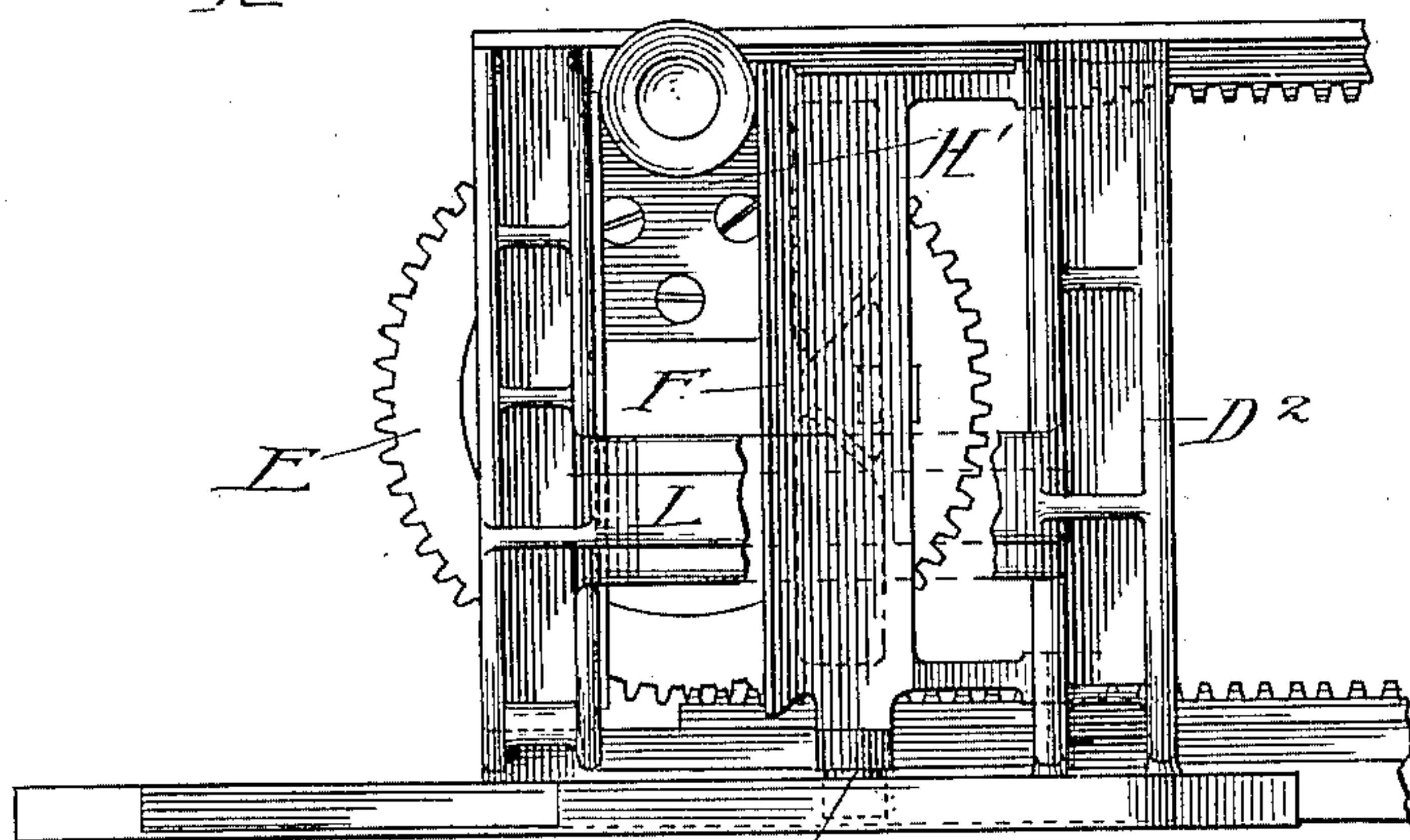
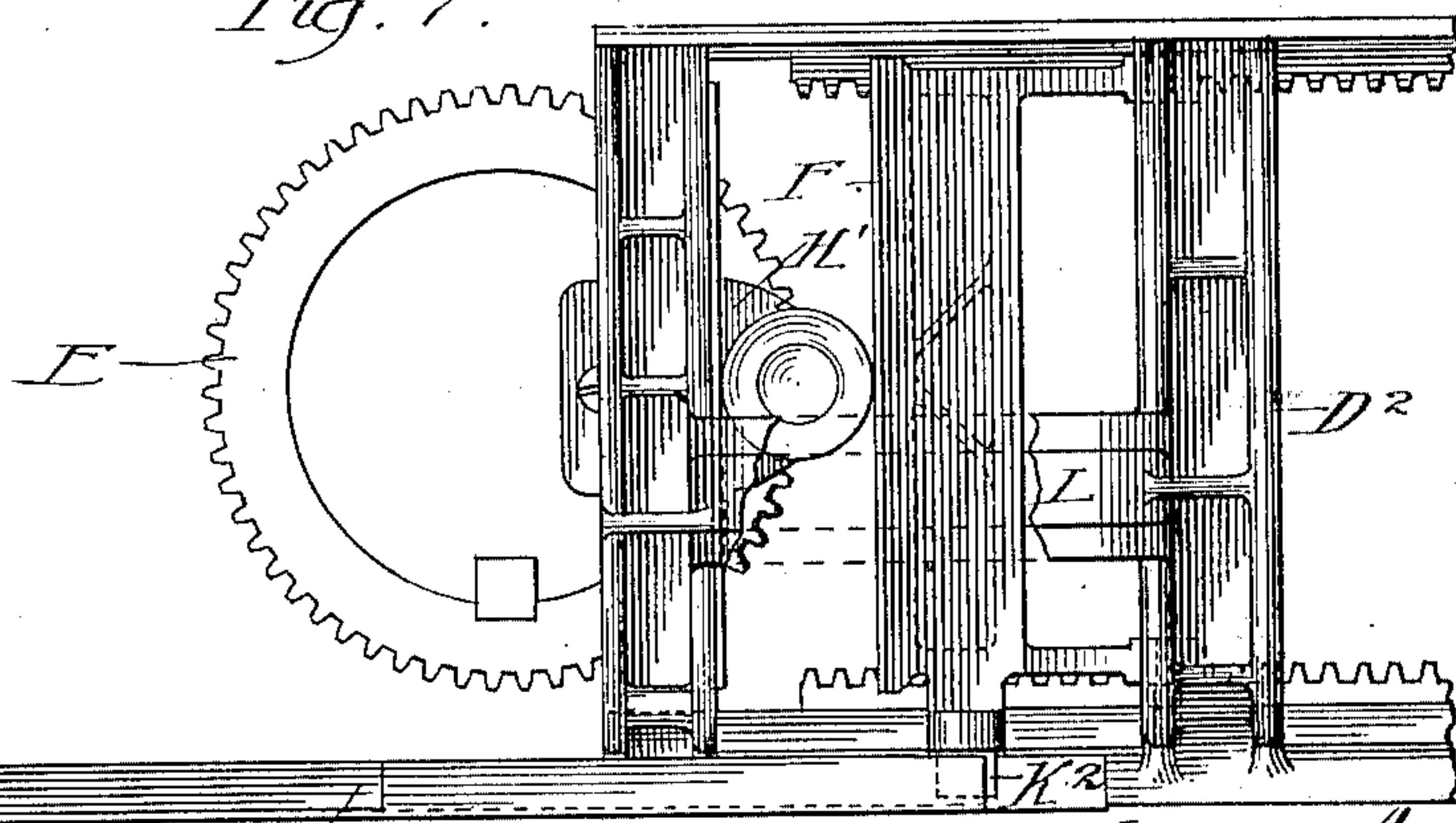


Fig. 7.



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7 Sheets—Sheet 5.

Fig. 8.

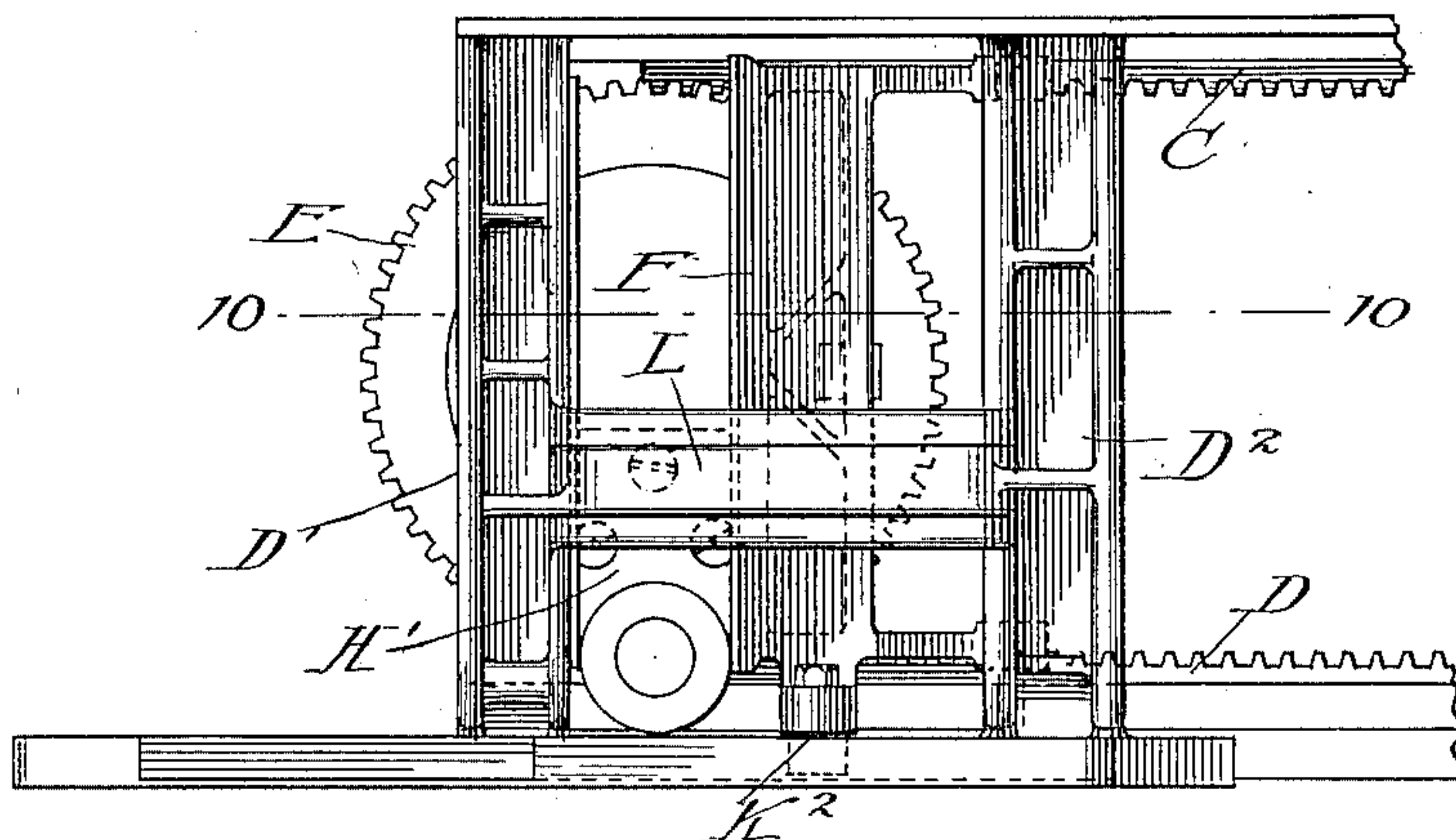


Fig. 9.

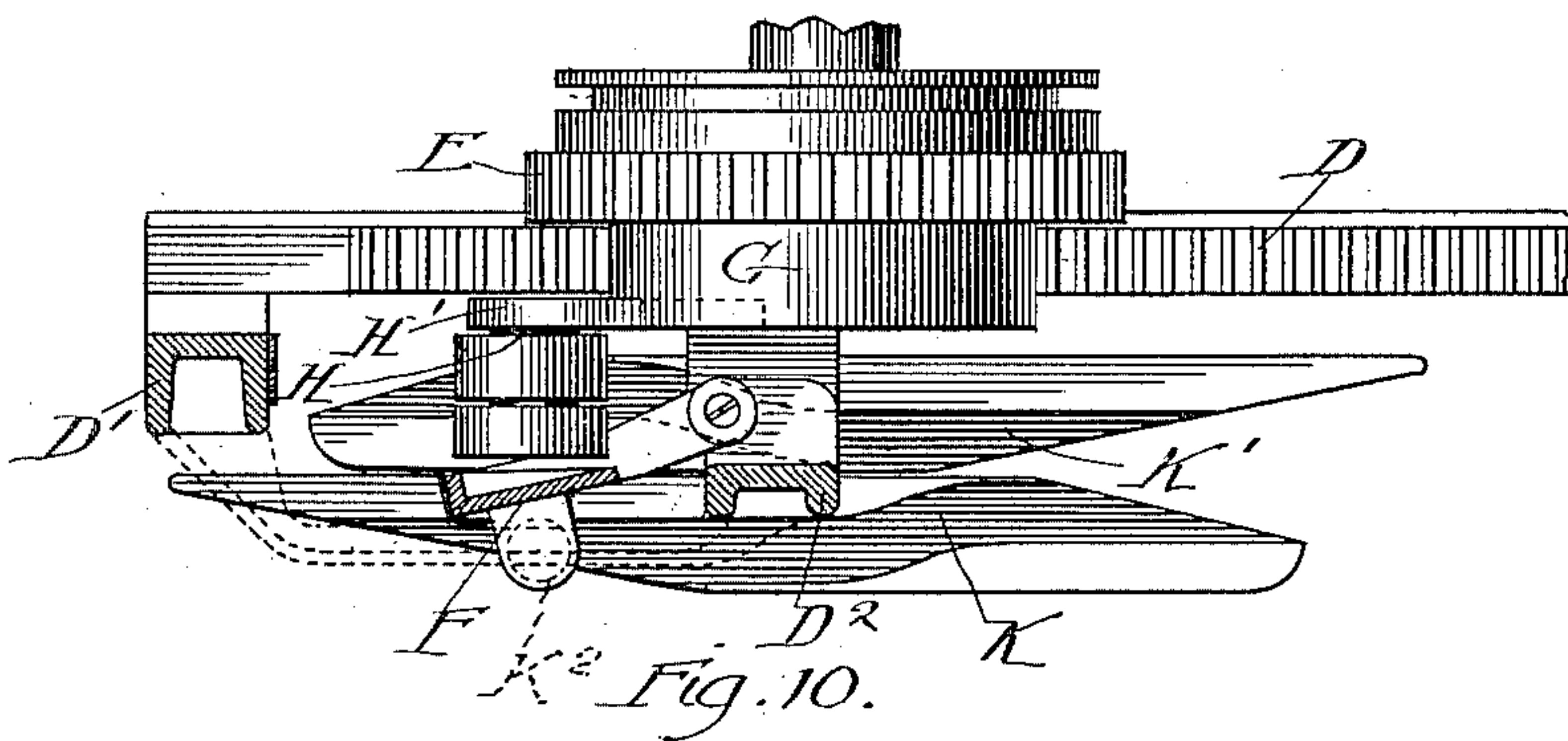
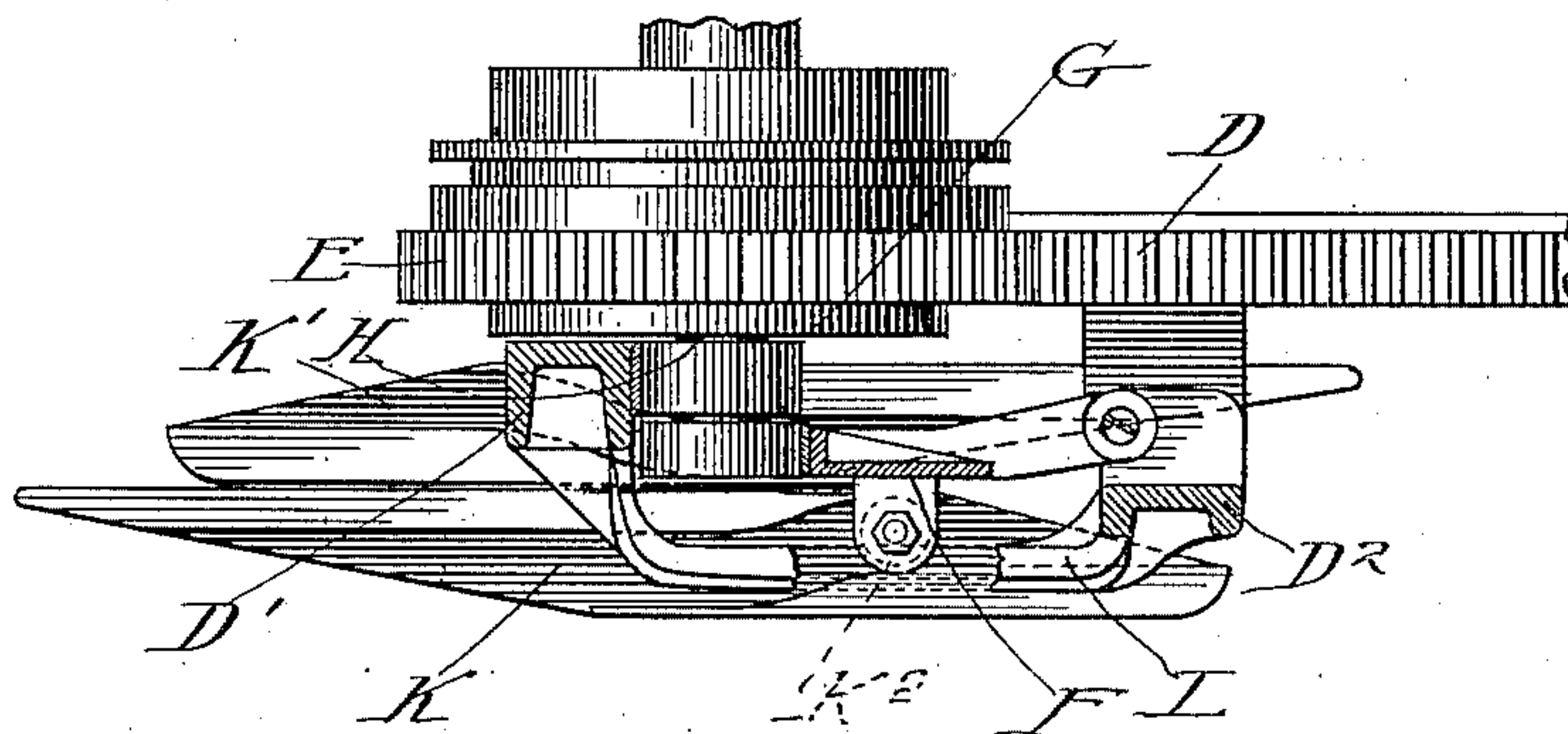


Fig. 10.



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(No Model.)

7 Sheets—Sheet 6.

Fig. 11.

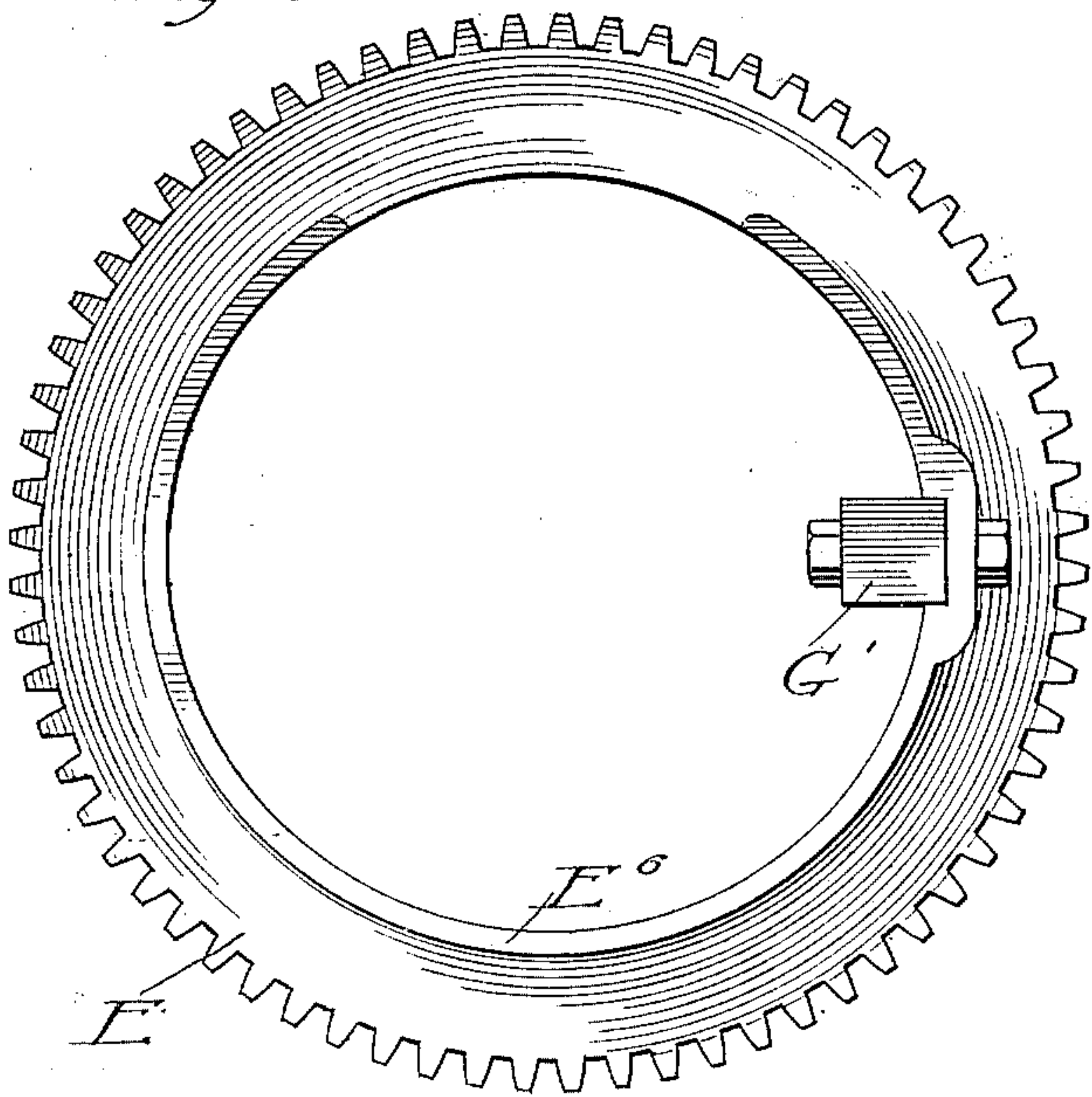


Fig. 12.

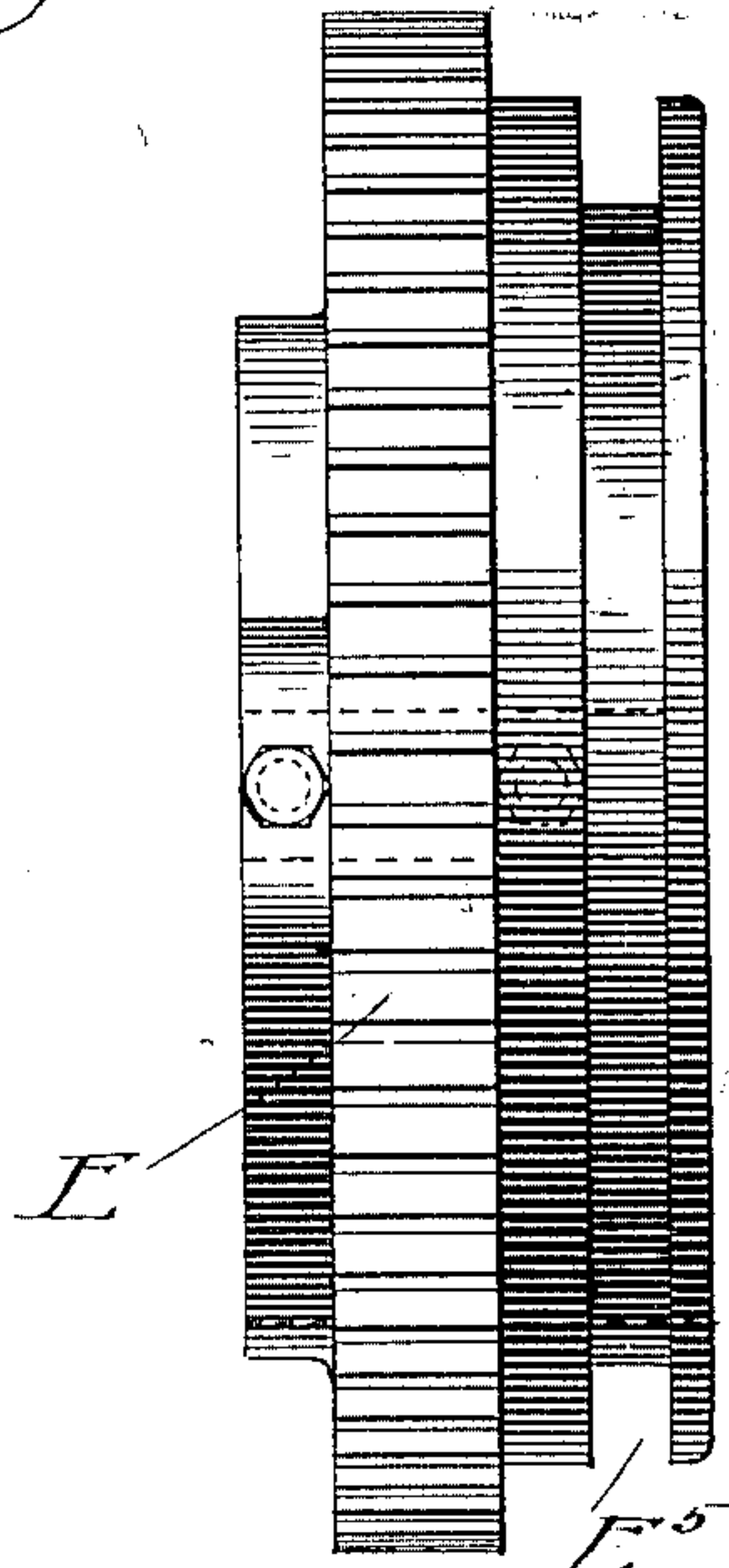


Fig. 13.

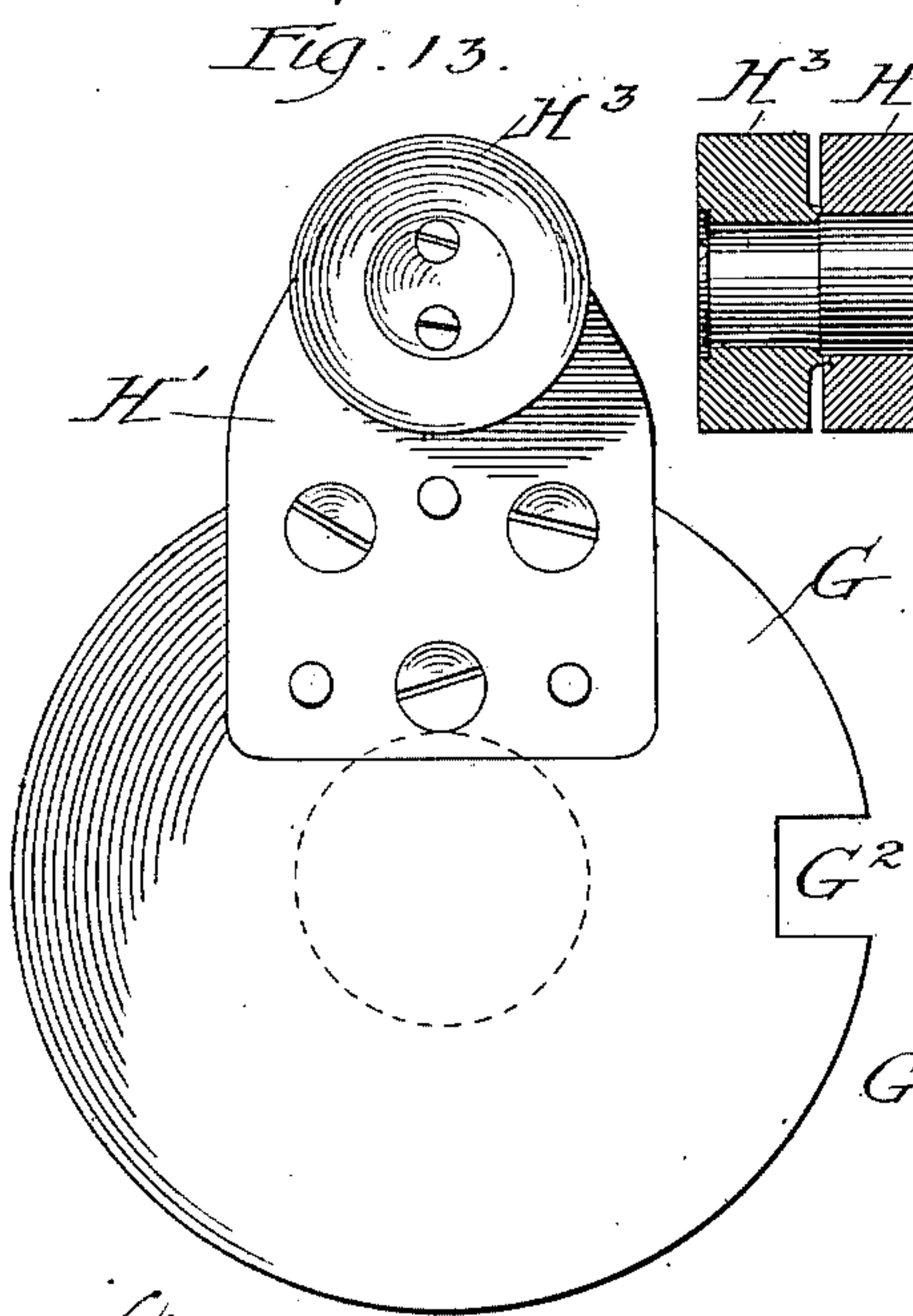
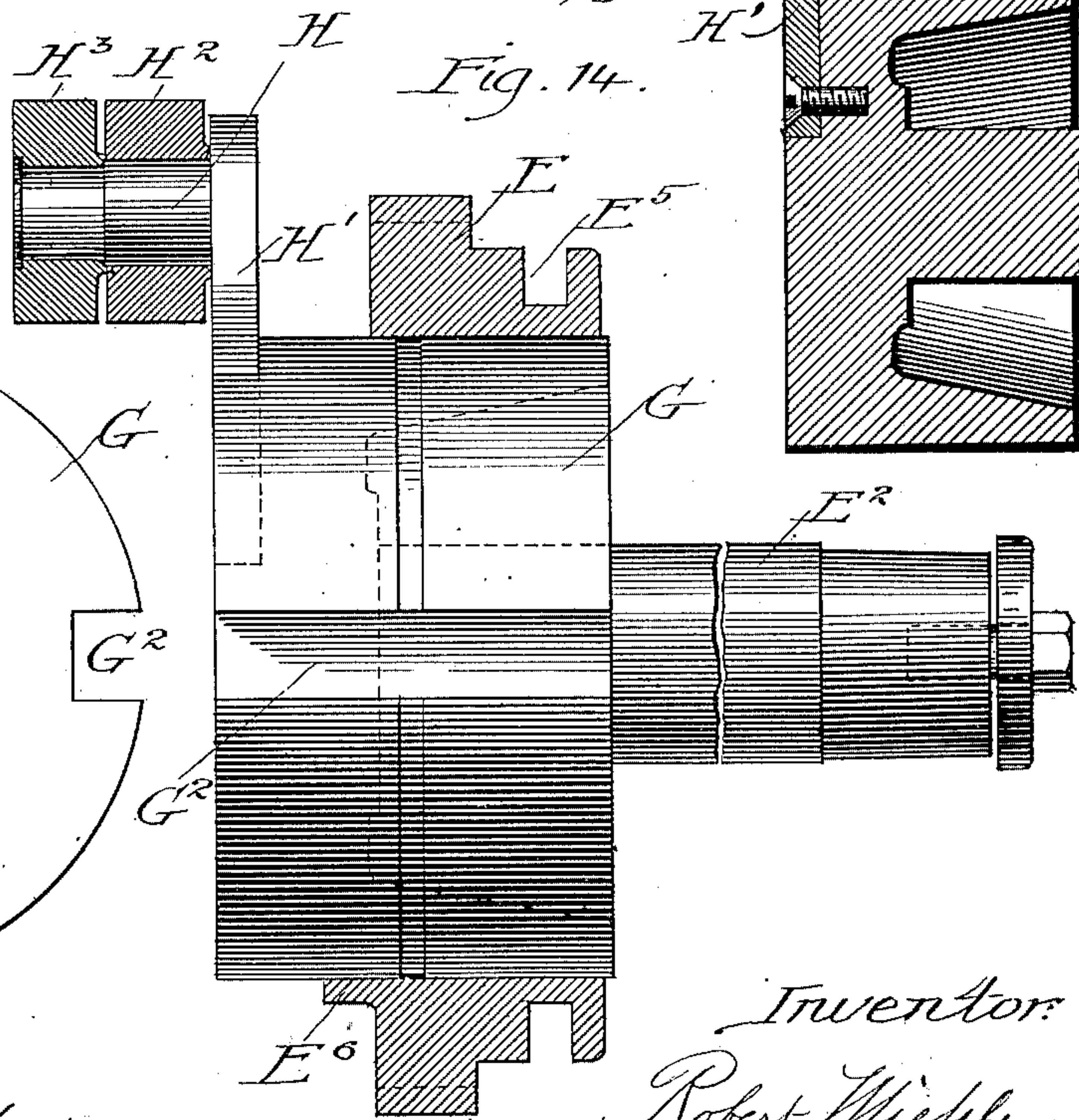


Fig. 14.



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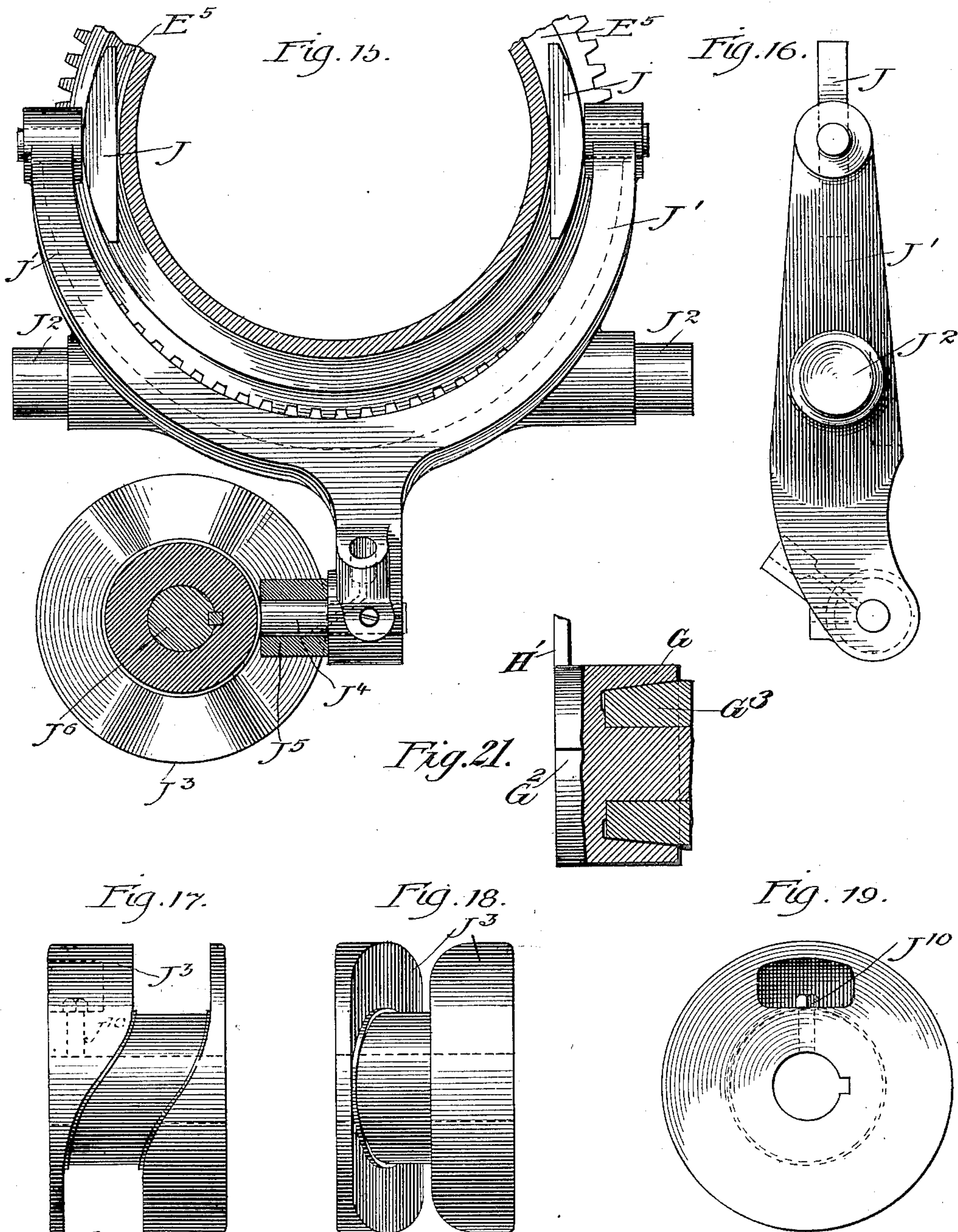
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(No Model.)

7 Sheets—Sheet 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MIEHLE PRINTING PRESS AND MANUFACTURING COMPANY, OF SAME PLACE.

BED-MOTION FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 661,378, dated November 6, 1900.

Application filed March 27, 1899. Serial No. 710,629. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bed-Motions for Printing-Presses, of which the following is a specification.

In the patent to me, No. 429,695, dated June 10, 1890, I show a mechanical movement for use in the bed-motion of those printing-presses in which the racks are stationarily attached to the bed, are located in adjacent and parallel planes, and are operated by a gear mounted upon a stationarily-located shaft and sliding on said shaft, so as to cause engagement with the racks alternately.

My present invention is an improvement upon said patented construction; and my main object therein has been to devise a construction which will permit the shifting or sliding movement of the gear to take place at times when the gear is performing no work, so that such movements may be comparatively free from friction and easy of accomplishment.

The nature of my improvement is fully set forth in the subjoined description and also fully illustrated in the accompanying drawings, in which latter—

Figure 1 is a partial side elevation of the press containing my improvement. Fig. 2 is a transverse vertical section. Fig. 3 is a view similar to Fig. 1, the gears in front of the latter figure being omitted. Fig. 4 is a transverse vertical section of the parts shown at Fig. 3. Figs. 5, 6, 7, and 8 show the parts in different stages of the reversing operation. Figs. 9 and 10 are horizontal sections on the lines 9-9 of Fig. 5 and 10-10 of Fig. 8, respectively. Figs. 11 and 12 are side and face views of the hub supporting said gear, the last-mentioned figure showing the gear in section. Figs. 13 and 14 are respectively face and side views of the hub and pinion. Figs. 15 and 16 show the details of the gear-shifting mechanism. Figs. 17, 18, and 19 are detail views of the cam actuating said mechanism, and Fig. 20 is a detail sectional view of the rotating crank or hub.

In the drawings, A represents the impression-cylinder, and B the reciprocating type-bed of the press, the latter supported on roll-

ers B', traveling in ways B², the latter stationarily supported in the frame of the machine. The bed is provided with two opposing racks C and D, one above and one below the operating-gear E. These racks are arranged parallel, but in adjacent planes, so that the gear may be brought into mesh with them alternately by shifting its position on its carrying-shaft. The gear E is an annular or ring gear and is supported upon a large circular crank or "crank-disk," as it may be termed, fixed upon the end of a driven shaft, said rotating crank carrying a wrist-pin which is adapted to engage guideways on the rack-frame to accomplish the reversal of movement of the bed while the main pinion is disengaged from both racks. The lower rack is carried by depending arms D' at each end, and between these arms and the swinging gates F F are formed the guideways, by means of which the wrist-pin is enabled to control the bed during the intervals between the cessation of the engagement by the gear with one rack and the commencement of its engagement with the other rack. The cylinder is operated by the gear A', receiving its power from a gear E' on the shaft E², carrying the rack-gear E. Power is imparted to the gear E' by the gear E³ on the shaft E⁴. For convenience I will hereinafter in the description refer to this rotating crank carrying the wrist-pin and upon which the main pinion is supported as a "hub." It is shown at G, is of large diameter, rigid upon the shaft, and the gear, which consists in reality of a toothed ring, slides on this hub G and is keyed thereto by means of the key G', attached to the gear and moving in a longitudinal slot G² in the hub, and the wrist-pin (shown at H) I attach directly to the hub by means of a projecting plate H'. The hub, being rigid upon the shaft, actuates both the wrist-pin and the gear in their respective functions; but each of those parts is wholly independent of the other, and the wrist-pin devolves no labor upon the gear as it does in those presses where it is attached to the gear, and in consequence of this during the time when the wrist-pin is doing its accustomed work in slowing down and reversing the bed the gear, not being then in mesh with either rack, will be performing no labor and be un-

der no strain. I find it also very important that the gear be absolutely free from all unnecessary and extraneous friction at the time it is shifted, and hence instead of the construction shown in my said patent I make the gear without any lateral enlargement at the hub except such as is necessary for the groove engaged by the shifting mechanism and to give the gear a bearing on the hub sufficiently broad to prevent binding when the shifting power is applied, and I also avoid passing any part attached to it through the shaft-bearing, as was the case in the patented construction. In fact, I prefer that the hub should encircle the bearing G^3 , and it is so shown in the drawings at Fig. 14, where the broken lines indicate the recess for the bearing. By making the hub of large diameter and keying the gear to it the evil effect of any lost motion existing between the gear and key is reduced to a minimum.

The shifting of the gear upon the hub is accomplished by the following devices: The gear E is provided with a lateral extension in which is formed an annular groove E^5 , and in this groove at opposite sides of the gear are placed shoes J J, Fig. 15, pivotally carried by the arms of a yoke J' , supported and rocking upon trunnions J^2 , having bearings in stationary parts of the machine, as seen at Fig. 3, and actuated in its rocking movements by the grooved cam J^3 , the yoke carrying at its lower end below the trunnions a pin and roller J^4 and J^5 , working in the slot of said cam. The cam J^3 is mounted upon a shaft J^6 , carrying a gear J^7 , meshing with a pinion J^8 , receiving power from a pinion J^9 on the shaft E^2 . The shaft J^6 is of course actuated so as to cause the cam to rock the yoke at the end of each stroke of the type-bed, and by these operations the gear is shifted back and forth on its hub, so that it is enabled to engage the racks alternately. It is shown in Fig. 2 as meshing with the upper rack, and it is also shown in this same position in Fig. 14, and it will be noticed from these figures that room is provided upon the hub to allow for the shifting of the gear from the upper rack to the lower rack. The gear is preferably provided with a lateral flange E^6 upon the side toward the wrist-pin, and such flange is cut away opposite the plate H' , so that it and said plate may not interfere, but, on the contrary, may allow the gear to move flush up against the plate. I prefer to let the plate into the side of the hub, as shown. The cam J^3 is preferably splined to its shaft and may be held in its adjusted position by the screw J^{10} . The wrist-pin is preferably provided with two separate antifriction-rollers H^2 and H^3 , as plainly seen at Fig. 14, one of these rollers being adapted to bear against one side of the vertical guideways and the other against the other side thereof, as will be understood later on.

The wrist-pin operates in the present invention in much the same way as it does in

former patents granted to me and now in extensive use in what are known as the "Miehle" presses. I have shown at Figs. 5 to 8, inclusive, the various stages of one of the reversing operations. At Fig. 5 the gear is in mesh with the upper rack and nearing the end of its stroke. At Fig. 6 the engagement between the rack and gear has ended and the wrist-pin has entered the vertical guideway. At Fig. 7 the wrist-pin has moved from its uppermost position to an intermediate one and in so doing has brought the bed to a stop. In Fig. 8 the wrist-pin has moved back to its lowermost position and started the bed on its return stroke and brought it into position where the gear may engage with the upper rack. During the interval between the positions of Figs. 6 and 8 it will be understood that the gear is shifted on its hub so that it will be in position to engage the lower rack when the position of Fig. 8 is reached.

The gates F are hinged as illustrated, so they may be swung out of the way to allow the wrist-pin to enter the guideways and also be swung into operative position relative to the pin as soon as the latter has entered the guideways. These operations of the gates are caused by stationary grooved cams K and K' , (best shown at Figs. 9 and 10,) one acting upon the gate at one end of the rack-frame and the other upon the gate at the other end of said frame. Each gate is provided with a roller K^2 , entering the groove of the cam. The cams being arranged parallel with the line of motion of the bed, it will be seen that the movements of the latter will cause the proper movements of the gates. In Fig. 9 the gate is shown as opened to admit the wrist-pin and in Fig. 10 as closed upon the pin, the roller H^2 bearing against the stationary side of the guideway and the roller H^3 against the gate or movable side thereof.

L L are braces connecting the arms D' with adjacent arms D^2 , also extending between the racks.

I claim—

1. The combination with the gear for operating the wrist-pin, and the racks having guideways at their ends whereby the pin controls the bed during the reversing operations, one side of each guideway being movable, of a wrist-pin having two separate rollers one bearing against the stationary side of the guideways and the other against the movable side thereof, substantially as specified.

2. In a bed-motion for printing-presses, the combination of guideways each having a movable side, with a wrist-pin entering the guideways and carrying two rollers, one for engaging the stationary sides of the guideways and one for engaging the movable sides thereof, substantially as specified.

3. The combination of the rack-frame provided with a slotted guideway and a crank provided with a wrist-pin adapted to engage the guideway and reverse the movement of

the rack-frame, with separate rollers on said wrist-pin respectively adapted to engage the opposite side walls of the guideway.

4. In a bed-movement for printing-presses, the combination of a rack-frame provided with racks and guideways; a pinion adapted to engage the racks and impart the main stroke to the bed; and a wrist-pin on the pinion adapted to engage the guideways and reverse the movement of the bed, said wrist-pin being provided with two rollers respectively adapted to engage the opposite side walls of the guideways, for the purpose and substantially as described.

5. In a bed-movement, the combination of a pair of racks, a revolving crank, a wrist-pin thereon and revolving therewith, a vertical guide-slot at each end of the rack-frame alternately coöperating with the wrist-pin to reverse the movement of the bed at each end of the working stroke of the racks, an annular pinion slidably mounted on and supported by said revolving crank, and means for shifting the pinion on the crank so as to engage it alternately with the racks, substantially as described.

6. In a bed-movement, the combination of a pair of racks attached to the bed and a vertical guide-slot at each end of the rack-frame, a revolving crank, a wrist-pin thereon adapted to alternately engage the guide-slot, at the ends of the working strokes of the racks, to reverse the movement of the bed, an annular pinion slidably mounted on and supported by

said revolving crank, and means for shifting the pinion on the crank so as to engage it alternately with the racks, substantially as specified.

7. In a bed-movement, the combination of a rotatable shaft having a large hub or crank-disk on one end, a wrist-pin on said disk and revolving therewith, a rack-frame provided with parallel racks disposed in different planes, an annular or ring pinion slidably mounted on but rotating with said crank-disk, vertical guide-slots, one at each end of the rack-frame, adapted to be alternately engaged by the wrist-pin to accomplish the reversal of movement of the rack-frame at each end of its stroke, and means for shifting the pinion upon the disk from engagement with one rack into engagement with the other during the period of reversal.

8. The combination of the racks attached to the bed and vertical guide-slots one at each end of the racks, with a rotary shaft having a large hub, a gear slidably keyed to and supported on said hub, alternately meshing with the racks, a wrist-pin independent of said gear supported from said hub and revolving therewith and alternately engaging said guide-slots, and means for sliding the gear on the hub, substantially as specified.

ROBERT MIEHLE.

Witnesses:

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