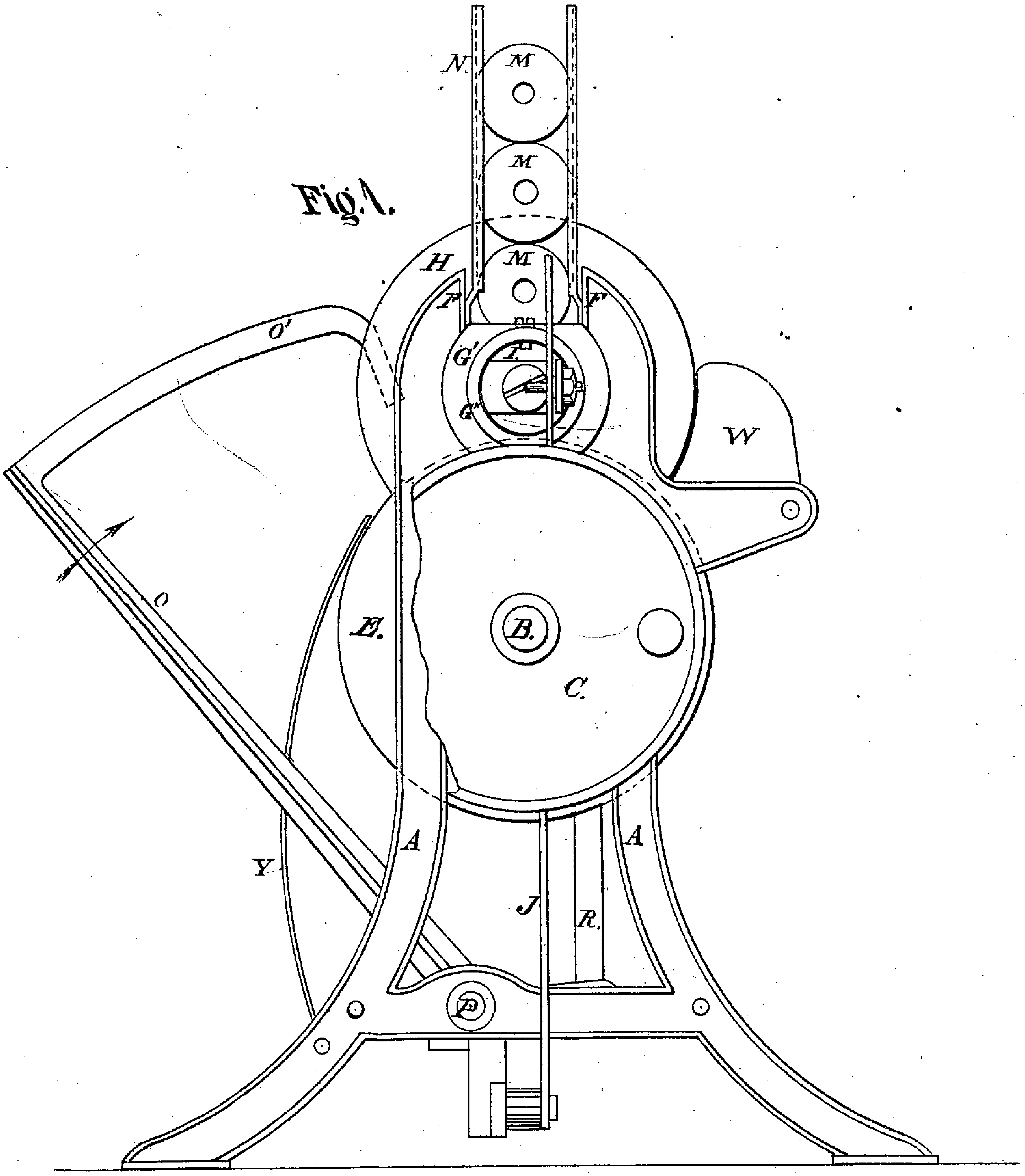
4 Sheets--Sheet 1.

J. GOODYEAR.

Machines for Winding Bobbins.

No. 141,434. Patented August 5, 1873.

Fig. 1.



Witnesses.

Right-Side Elevation.

Inventor.

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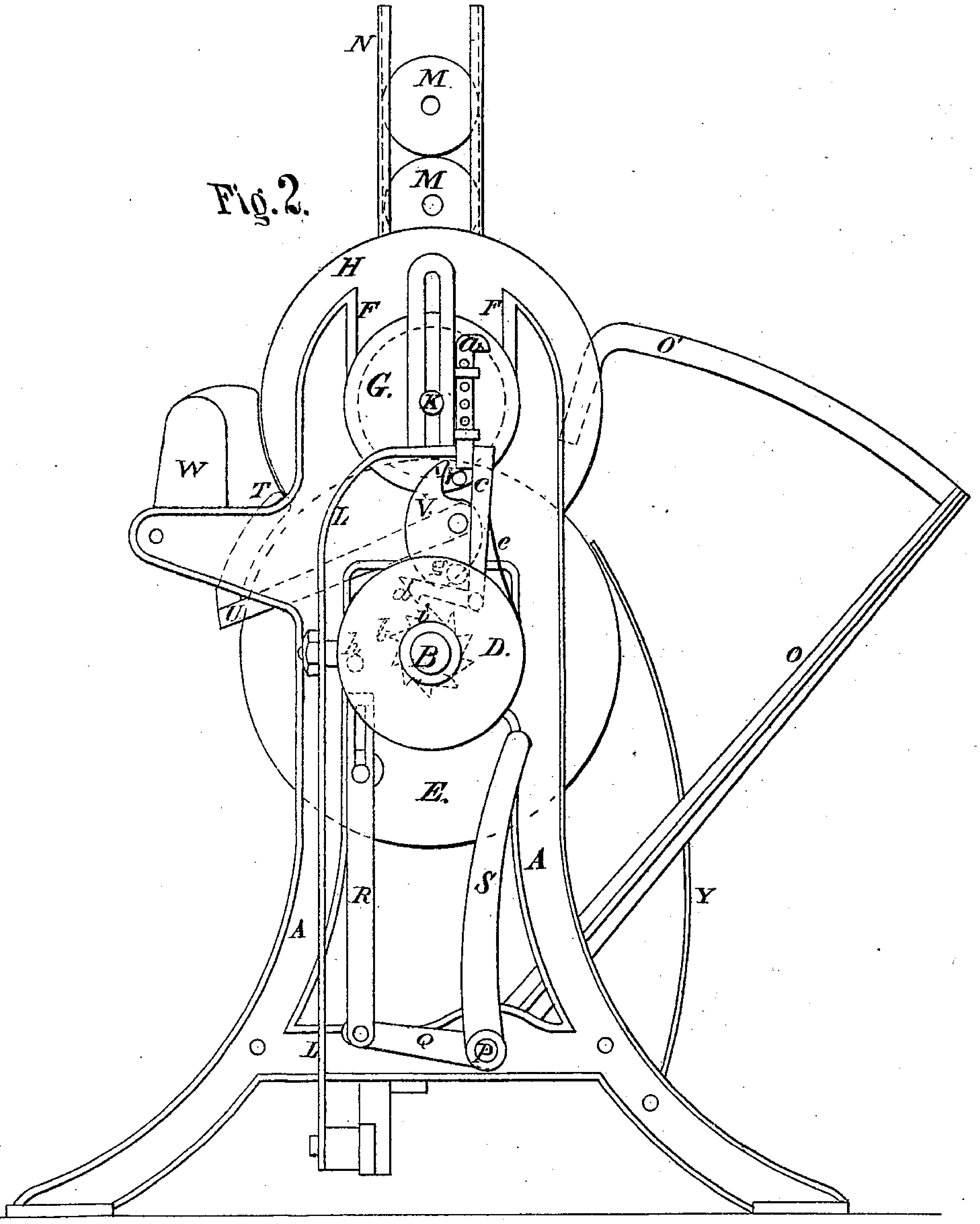
Fig. 2.



Witnesses. Left-Side Elevation. Inventor

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J. GOODYEAR.

Machines for Winding Bobbins.

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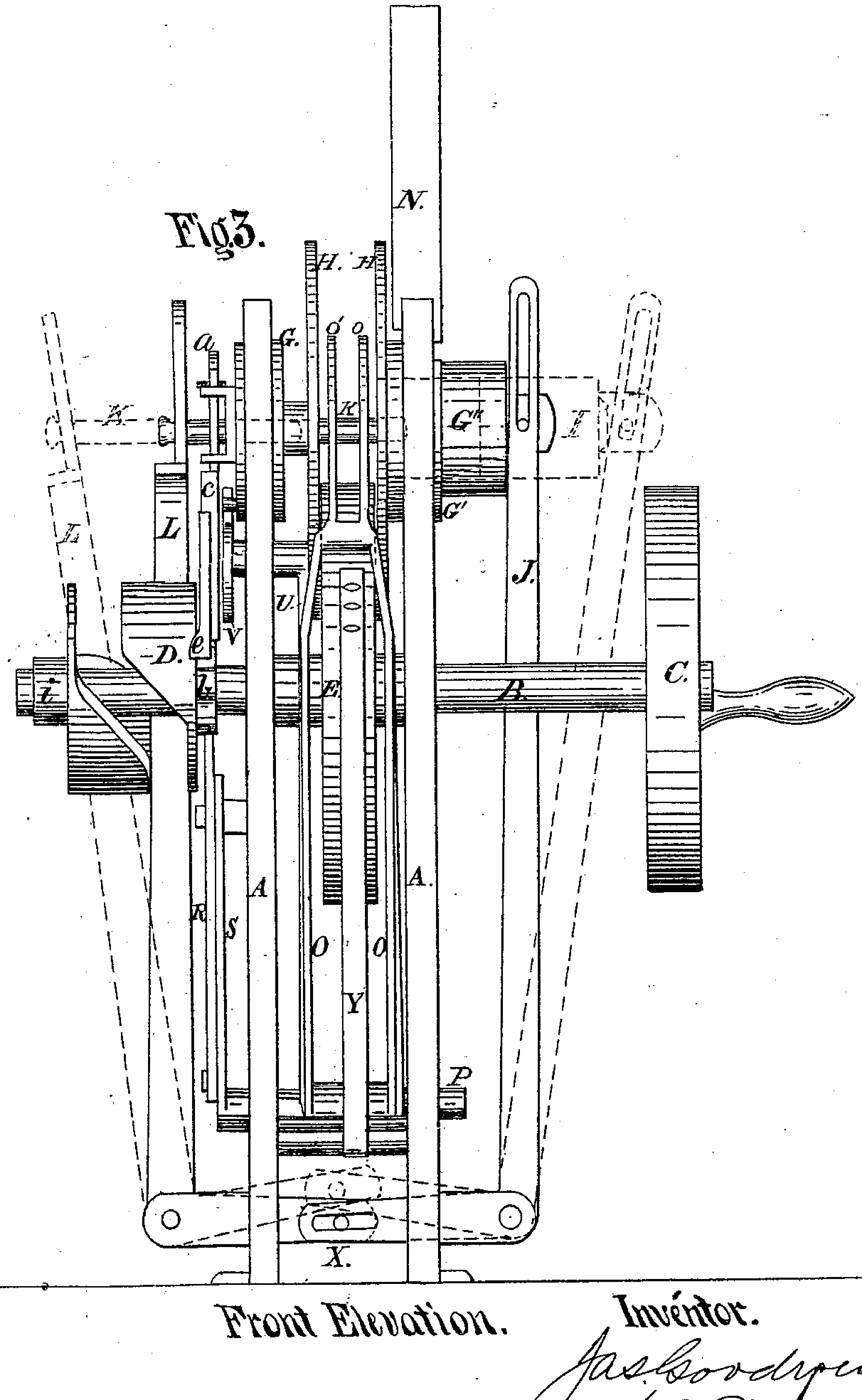
Fig 3.



Front Elevation.

Witnesses.

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J. GOODYEAR.

Machines for Winding Bobbins.

No. 141,434.

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Fig. 4.

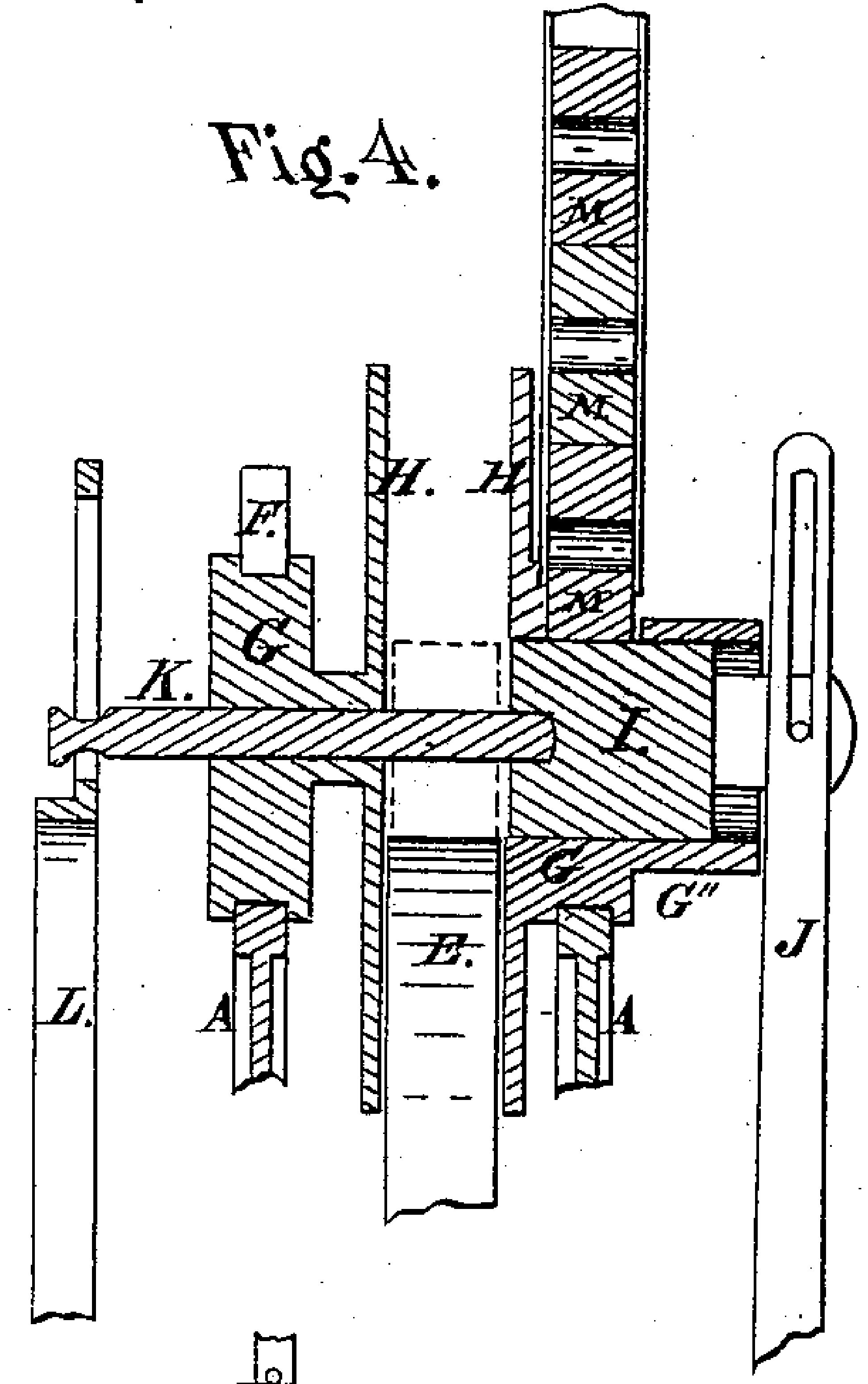


Fig. 5.

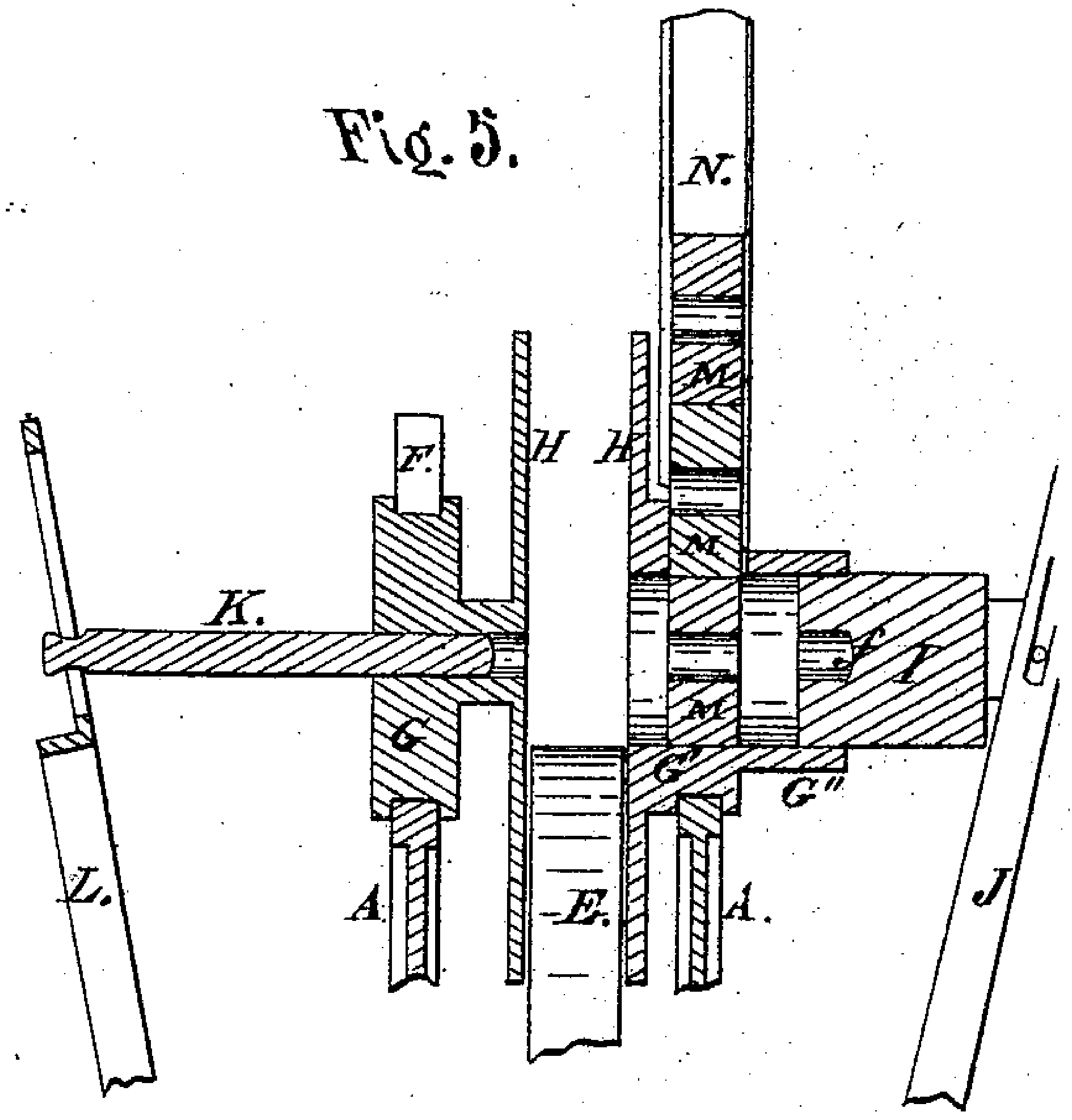


Fig. 6.

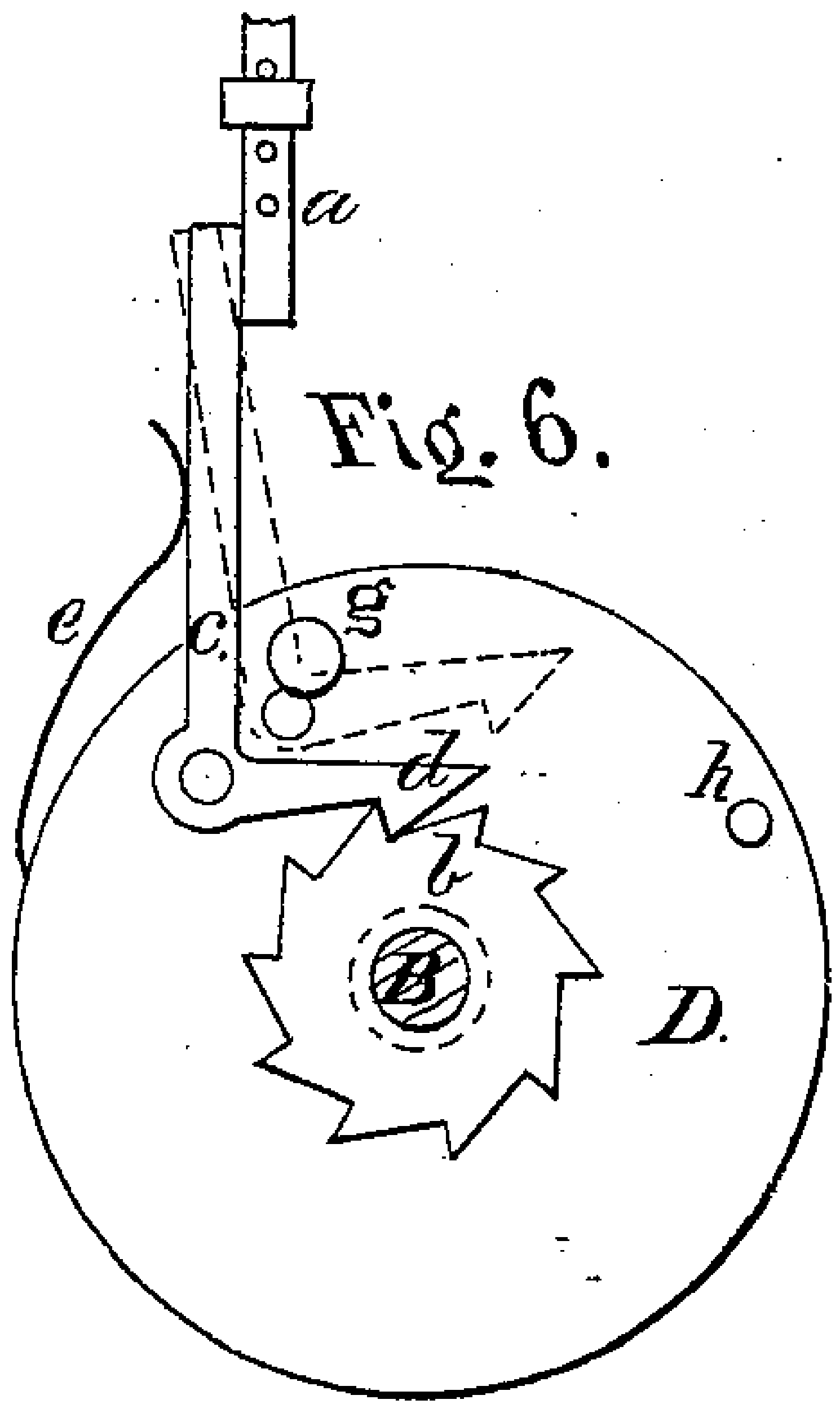


Fig. 7.

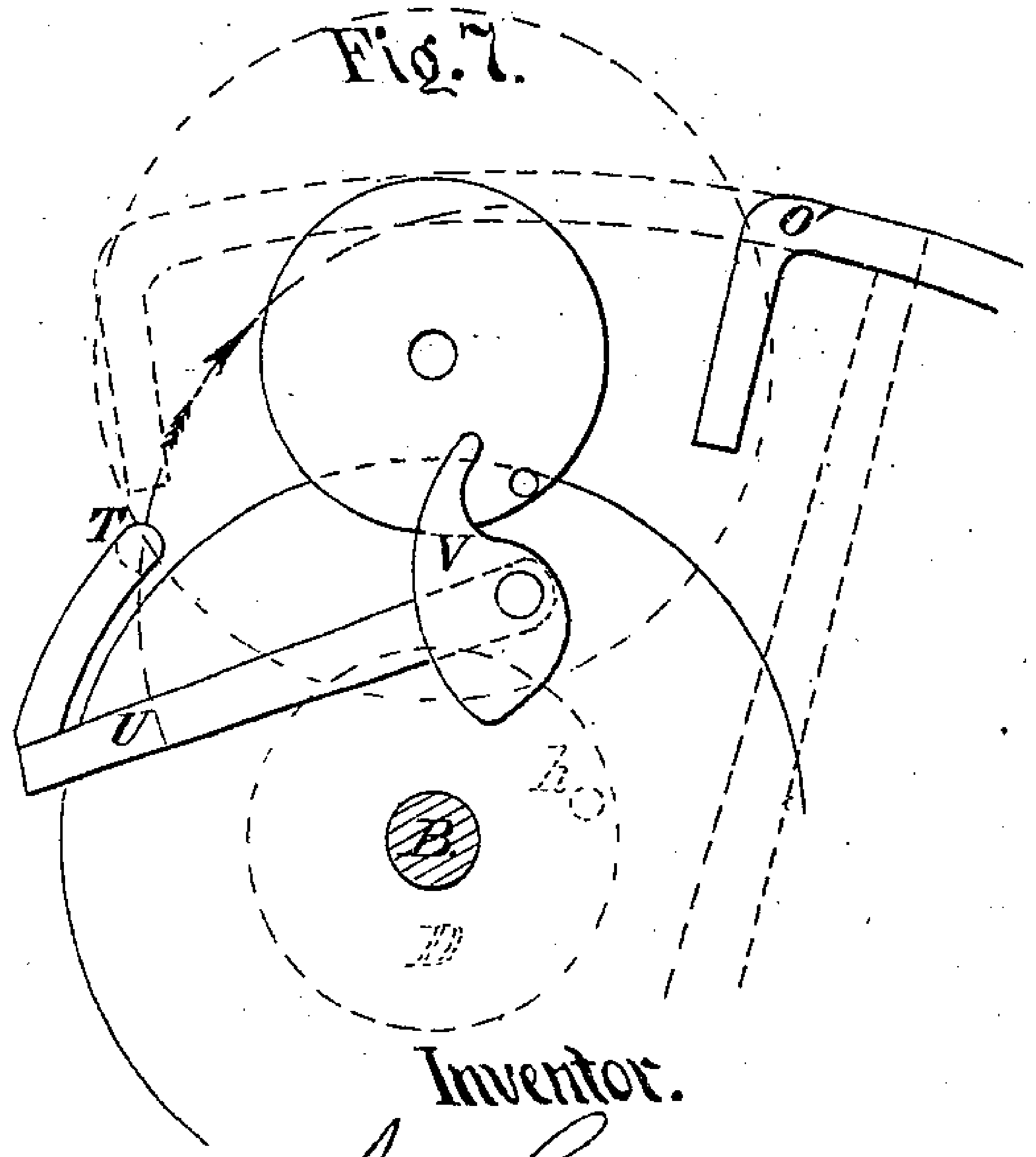
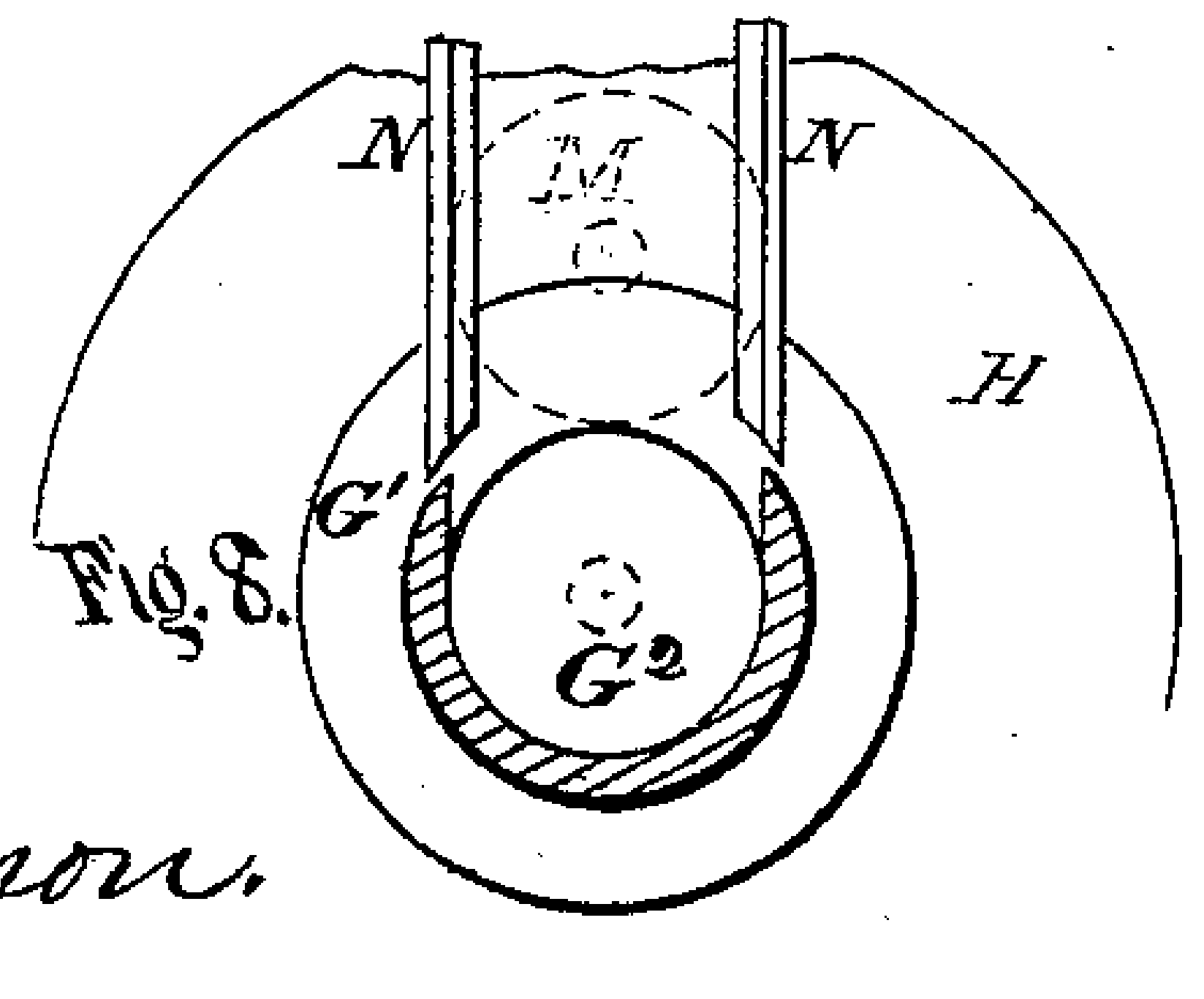


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES GOODYEAR, OF YONKERS, NEW YORK.

IMPROVEMENT IN MACHINES FOR WINDING BOBBINS.

Specification forming part of Letters Patent No. **141,434**, dated August 5, 1873; application filed April 22, 1873.

To all whom it may concern:

Be it known that I, JAMES GOODYEAR, formerly of Rochdale, in the county of Lancaster, England, now residing in Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machines for Winding Bobbins, which said improvements were patented in the Kingdom of Great Britain, dated February 22, 1869, No. 547, of which the following is a specification:

My invention relates to machinery for winding fibrous material, particularly slivers of wool, cotton, flax, &c., on bobbins, and consists in a novel construction, combination, and arrangement of parts which have for their object to automatically perform all the functions necessary for feeding the bobbins, winding on the material and delivering them complete, as will be fully set forth hereafter.

Figure 1 is an elevation of the right side of my improved machine. Fig. 2 is an elevation of the left side. Fig. 3 is a front elevation. Fig. 4 is a transverse vertical section taken through the center of the machine. Fig. 5 is the same with the parts in different positions, and Figs. 6, 7, and 8 are parts in detail.

Similar letters of reference indicate like parts in all the drawings.

A A represent the side frames of the machine. B represents a shaft carrying on one end a driving-pulley, C; on the other a cam, D, and on its middle a friction-drum, E, which revolves the bobbin. Over the shaft B, in either side frame, are perpendicular guides or ways, F F, between which the slides G G′ are placed. These slides are provided with disks H H, which serve as the flanges of the bobbin while it is being wound. Through the center of the slide G′ and its disk runs a circular aperture, in which the piston I is reciprocated by the lever J. When at its outer extremity the piston I is guided and supported by the ring G″, forming part of the slide. The other slide G and its disk has a central hole drilled in it, through which the pin K passes, and is reciprocated by the lever L. Immediately over the disk G′ are perpendicular flanged guides N N, between which the bobbins M M are placed, one above the other, and from which they are fed into the aperture in the slide, one at a time, each stroke of the piston I. (See Figs. 1, 4, 5, and 8.) The levers J L, which reciprocate the piston I and pin K, are L-shaped, and are pivoted at their lower extremity, outside of the machine, to suitable supports, their shorter arms extending inward, where they are coupled at X, so that the operation of the lever L, which is accomplished by the groove in the cam D, imparts motion to the lever J. On the inside of this cam is provided a pin, *g*, and at each revolution this pin depresses the bar R connected to the arm Q, and throws the ejecting-lever O O′ forward, it being returned to its position either by gravity or by the pin coming in contact with the arm S and throwing it back. The arm O has at its upper extremity a segmental bar, O′, shaped as shown in Figs. 1, 2, and 7, which plays back and forth between the flanges H H, and ejects the completed bobbin from between the flanges to the receiving-flume W. Between the frame and the drum E an arm, U, provided with a segmental projection and pin T, is oscillated by the pin *h*, on the cam D coming in contact with the cam V and moving it forward. Y represents a traverse-bar, which receives an oscillating motion by any suitable mechanism, and is provided at its upper extremity with holes, through which the sliver or other material to be wound is passed. The bobbin is revolved by the revolution of the friction-drum E, which is keyed to the shaft B, and the number of revolutions which it will be necessary for this drum to make to complete the winding on of the material will depend on the thickness of the sliver and the amount desired to be wound on; but it will generally require much more than one revolution before the wound bobbin is of the required size, and if the cam D were immovably attached to the shaft B it would operate both the levers J L and withdraw the piston I and pin K at each revolution of the drum E, irrespective of the size of the wound bobbin, and therefore to regulate this the cam D is loose on the shaft B, being kept in its place by a collar, *i*, on its outside and a ratchet-wheel, *b*, on its inside, in which ratchet a pawl, *d*, pivoted to the cam and provided with an arm, *c*, is engaged by the spring *e*, and on the slide G a finger or adjustable stop, *a*, is arranged, so as to be capable of being adjusted vertically by means of pins or equivalent devices. As the ratchet is affixed to the shaft and the pawl to the loose cam, the revolution of the shaft will carry the cam around, but as the arm C, which forms a part of the pawl *d*, reaches its upper point, it strikes against the stop *a*, and the pawl is thrown out of the ratchet, and the revolution of the cam consequently stopped, allowing the friction-drum to revolve without disturbing the other parts of the machine; but as the winding on proceeds the bobbin increases in diameter and gradually lifts the slides and flanges in the guides F F, and the stop *a*, being attached to the slide G, rises along with it until the bobbin has attained its desired diameter, (which is regulated at pleasure by the stop *a*,) when the arm *c* of the pawl *d* is released from the stop *a*, and the spring *e* throws the pawl on the ratchet-wheel *b*, when the cam is again revolved, throwing out the levers J L, piston I, and pin K, and ejecting the completely-wound bobbin by the ejecting-lever O O′. (See Fig. 7.) As the piston I is withdrawn from under the column of bobbins they fall on the seat G″ of the slide G′, (see Fig. 8,) and as the piston moves forward the lowest one is pushed before it onto the pin K, which meets it and passes through its central hole to form its spindle or bearing during winding. (See sectional Figs. 4 and 5.) As the completely-wound bobbin is delivered to the flume W a fresh one is brought in position, and the arm U, with the pin T, is thrown up by the pin on the cam D coming in contact with the cam V, and the pin T carries up the sliver and throws it over the fresh bobbin, while any suitable mechanism, not shown in the drawing, gripes the sliver in front of the bobbin, and as the latter winds the sliver is separated from the preceding bobbin; or the pin T may be provided with points to engage the sliver and separate it from the wound bobbin. Thus the operation is continuously and automatically carried on. The piston and pin separating, the bobbins drop from the trough onto the seat of the slide or receiver, and one being introduced on the pin between the disks is wound by the friction-drum till, increasing in diameter, it elevates the stop *a* above the arm *c*, and causes the parts to be again operated by the cam D withdrawing the pin K, and plunger I, ejecting the bobbin by means of the arm O, throwing the sliver over the new bobbin and separating the material wound from the completed cne.

It will be readily perceived that various alterations may be made in the arrangement of the parts of the machine without departing from the spirit of my invention—as, for instance, the bobbin may be held in a spring-jaw on the end of the segmental arm of the lever O, and thus introduced between the flanges H H, where the pin is pushed through it, and, when wound, the pin being withdrawn, the succeeding bobbin forces the completely-wound one out, thus dispensing with the piston I.

Another modification might be effected by making the friction-drum sufficiently large, and placing slides and flanges, arranged substantially like the top ones, at each side, and having them work horizontally, thus having three bobbins wound at the same time on one friction-drum; and yet another modification might be in having an endless belt or a revolving wheel to feed the bobbins; or in having spindles attached to the bobbin, and working in holes in the slides, which are thrown apart when the full bobbin is to be ejected and a fresh one inserted in its place.

These would be all embraced by my invention, and might doubtless be used in practice, as circumstances dictate.

I claim—

1. In combination, the hopper N, receiver G″, reciprocating piston I, reciprocating pin K, supporting disks or walls H H, and frictional drum E, constructed and operating together substantially in the manner described.

2. The hopper N, receiver G″, disks or walls H H, and supporting-pin K, piston I, and slides G G′, in combination with the slotted side frames, constructed and operating substantially in the manner described.

3. The cam D and arm L, combined with and operating the supporting-pin K, substantially in the manner described.

4. The mechanism for discharging the bobbin, consisting of the ejecting-arm O O′ and bar R, or the equivalents thereof, constructed and operating substantially in the manner described and specified.

5. The device for regulating the size or filling of the bobbins, consisting of the cam-lever and pawl *c d*, ratchet *b*, and adjustable stop *a*, or equivalents, constructed and operating substantially in the manner described.

6. In combination with the hopper N, receiver G″, and disks or walls H H, the ejector O O′ for automatically discharging the filled bobbin, constructed and operating substantially in the manner described.

7. A machine for automatically winding bobbins having the following elements, namely, a hopper to receive, hold, and deliver the bobbins, a receiver to receive and hold the bobbin in position to be introduced between the supporting-disks H H, a vibrating bearing, K, to support and retain the bobbins properly during winding, a reciprocating piston or plunger, I, to deliver the bobbin on the supporting-pin, an oscillating discharger, O O′, and a vibrating lever, U T, to automatically engage the sliver with the empty bobbin, all acting together in co-operative relation, substantially in the manner described.

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Witnesses:
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