

(No Model.)

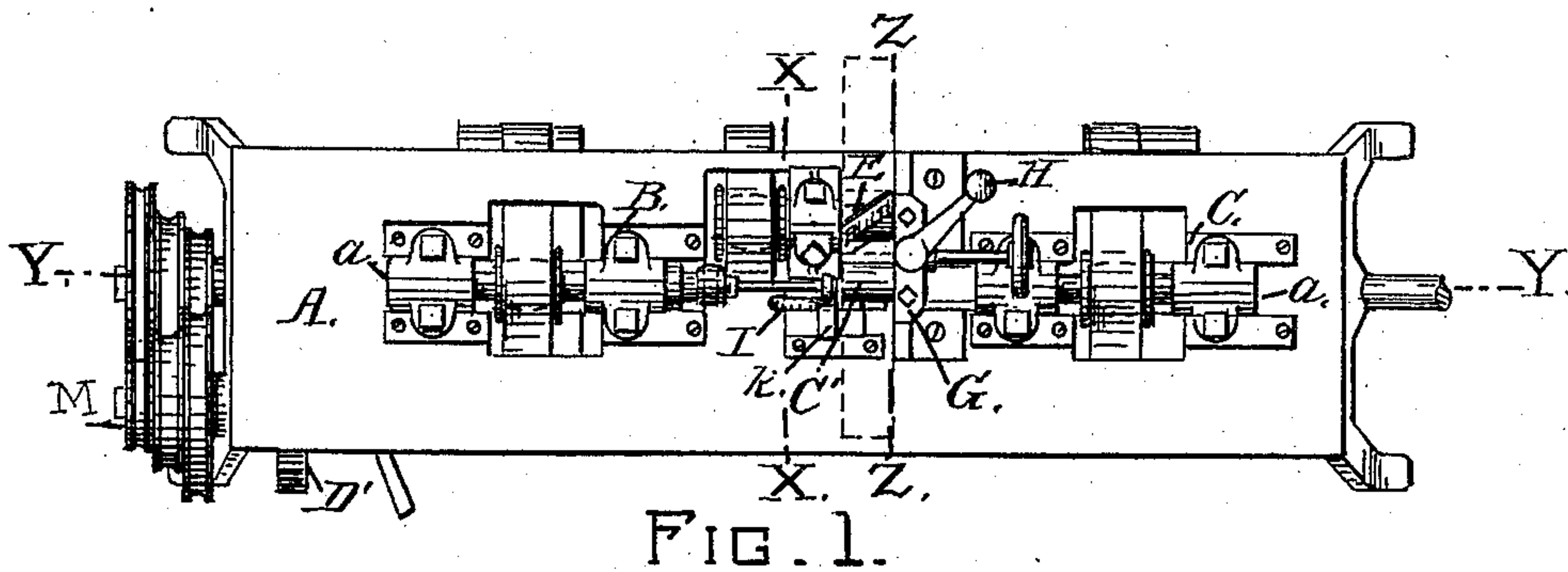
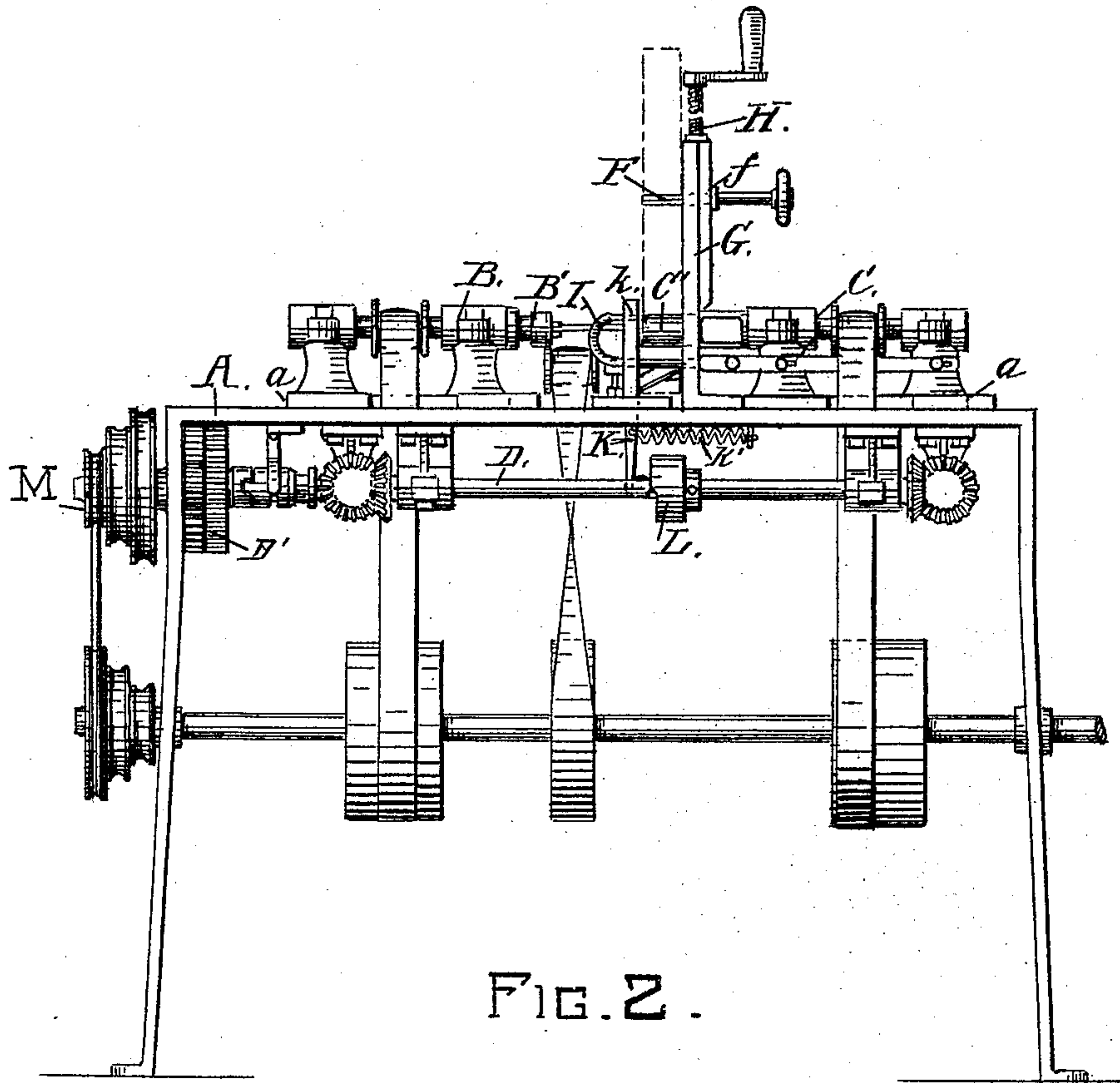
3 Sheets—Sheet 1.

C. A. BROUGHTON.

METHOD OF AND MACHINE FOR FORMING SPOOL BLANKS.

No. 488,421.

Patented Dec. 20, 1892.



WITNESSES.

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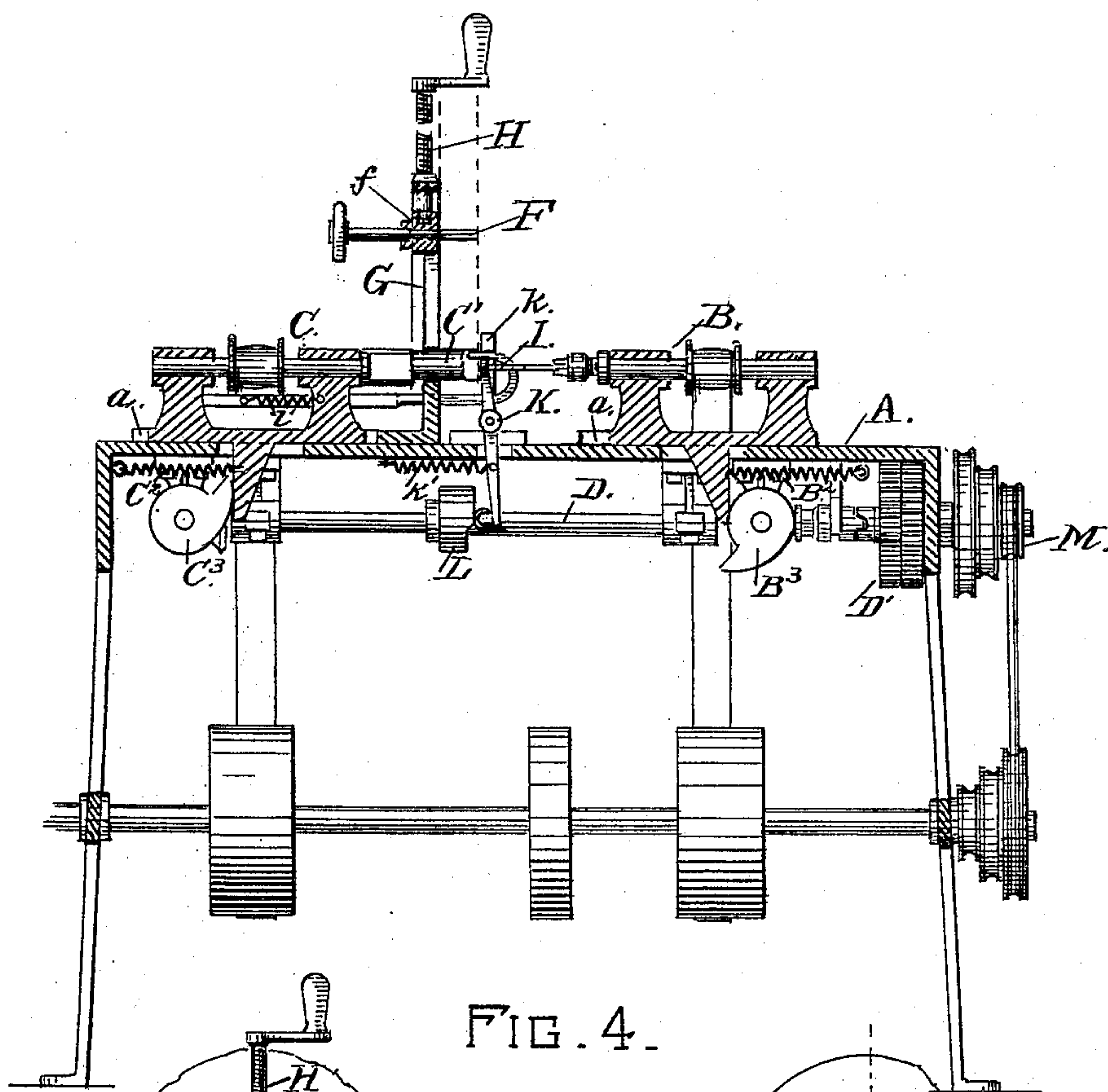


FIG. 4.

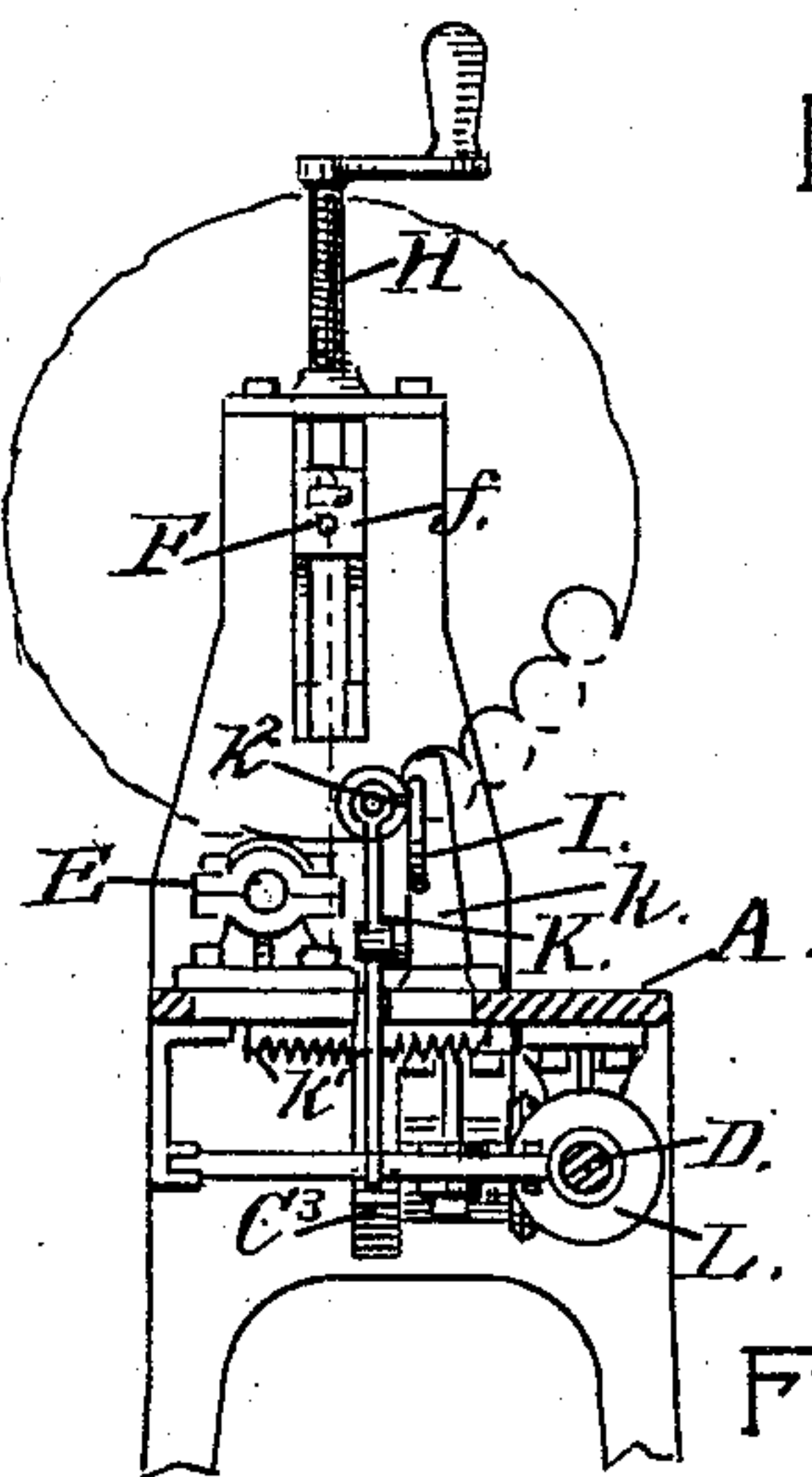


FIG. 3.

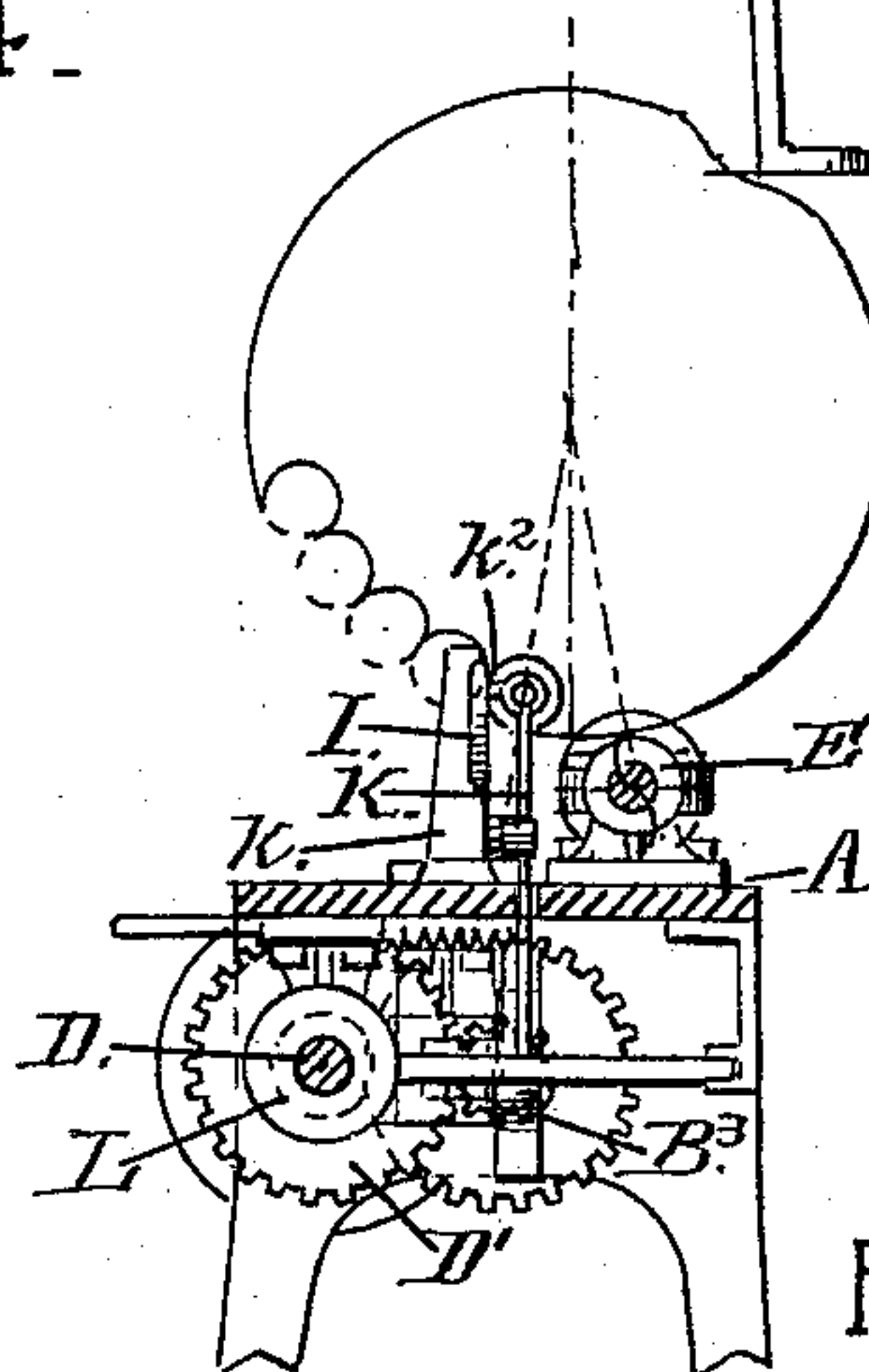


FIG. 5.

WITNESSES.

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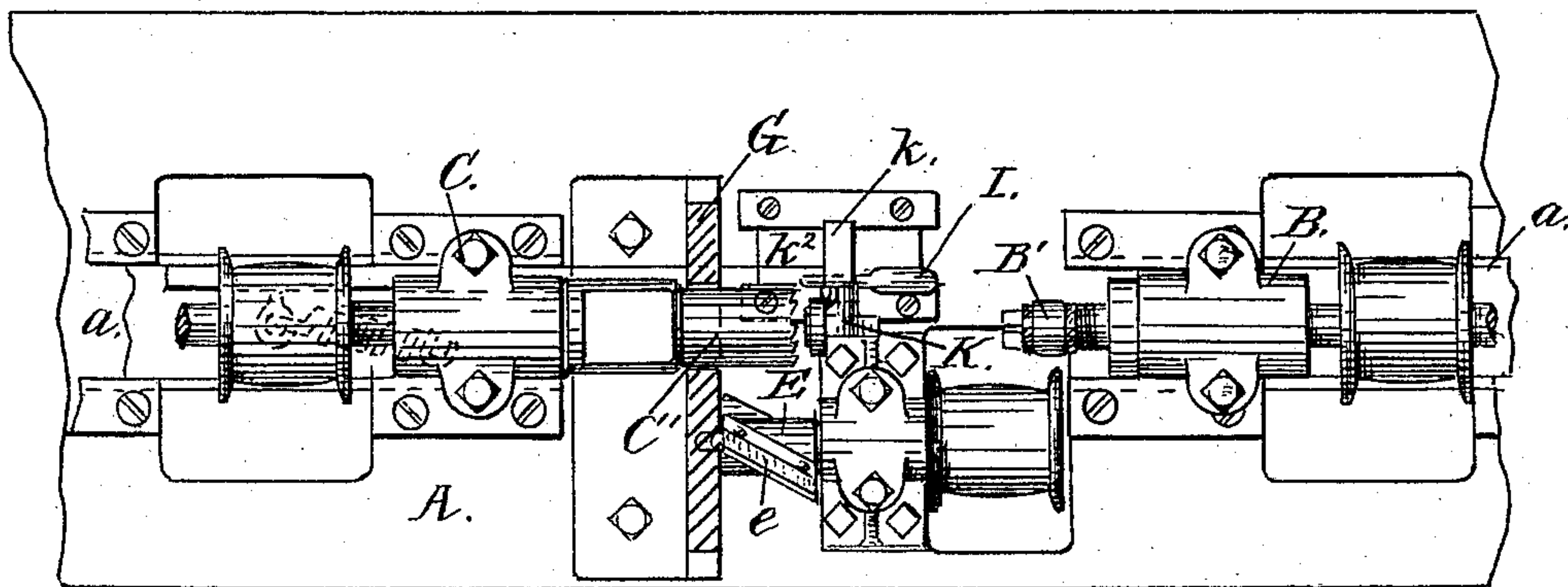
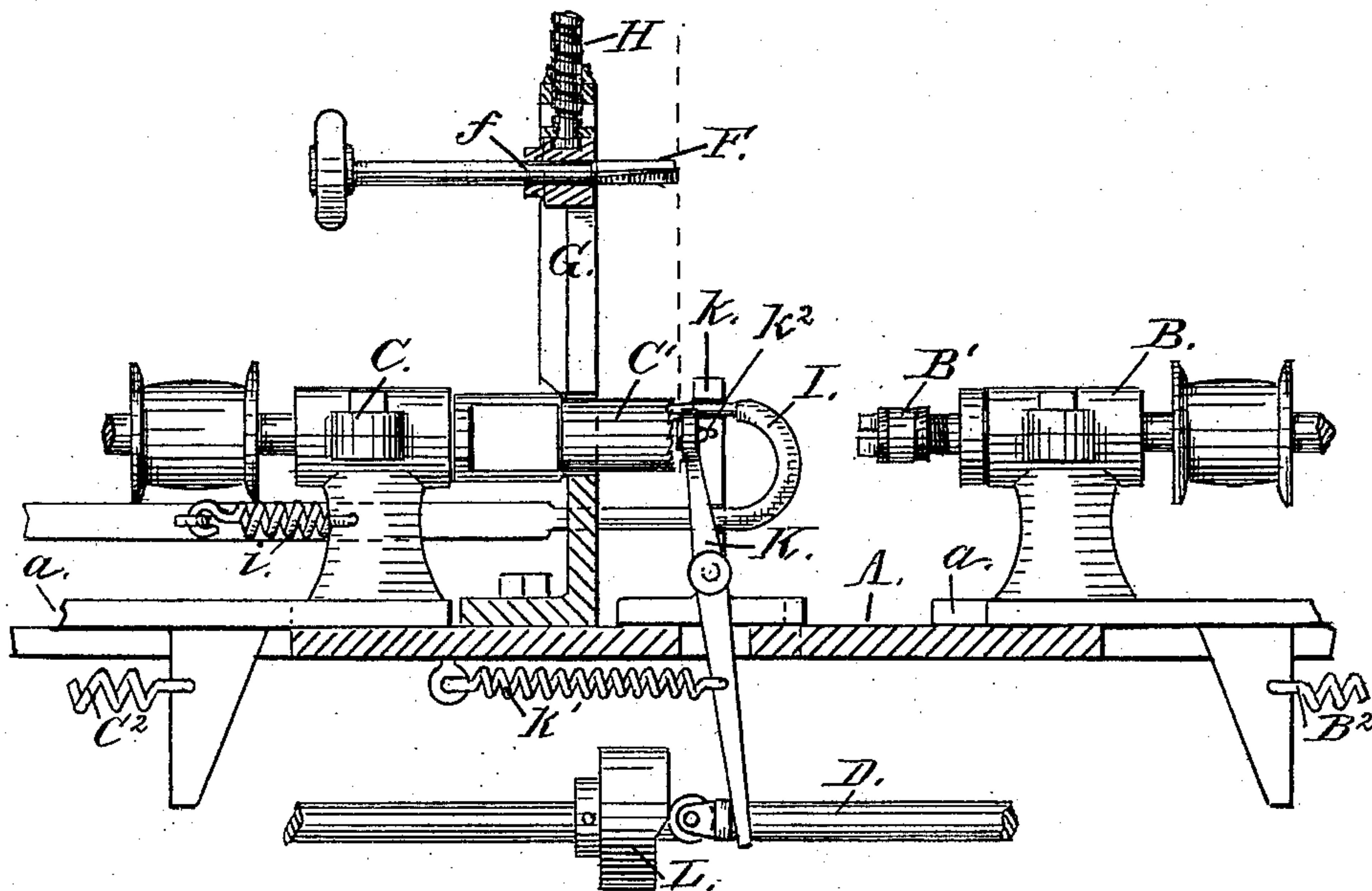
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UNITED STATES PATENT OFFICE.

CHARLES A. BROUGHTON, OF CONWAY, NEW HAMPSHIRE.

METHOD OF AND MACHINE FOR FORMING SPOOL-BLANKS.

SPECIFICATION forming part of Letters Patent No. 488,421, dated December 20, 1892.

Application filed December 4, 1891. Serial No. 413,973. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BROUGHTON, a citizen of the United States, residing at Conway, in the county of Carroll and State of New Hampshire, have invented certain new and useful Improvements in Methods of and Machines for Forming Spool-Blanks, of which the following is a specification.

My invention relates to machines and methods especially adapted for producing spool blanks or similar articles from stock of substantially the thickness of the length of the blank and of an area sufficient to furnish several blanks from the same piece of stock. The stock ordinarily used for this purpose is obtained by cross-cutting the trunks of trees of suitable diameter, and the blanks cut from it are cylindrical with a cylindrical central perforation. I have heretofore patented by Letters Patent No. 401,997, dated April 23, 1889, a machine in some respects resembling that about to be described and shown as an embodiment of my present invention, the object of which is to improve the efficiency of such machines.

In the accompanying drawings Figure 1 is a plan view of a machine embodying my present improvements; Fig. 2 a side elevation thereof; Fig. 3 a vertical section on line X X of Fig. 1. Fig. 4 a longitudinal section on line Y Y of Fig. 1, Fig. 5 a vertical section on the lines Z, Z of Fig. 1 looking in a direction opposite to that of Fig. 3. Fig. 6 is an enlarged plan view, with partial section through the standards of the frame G, and Fig. 7 an enlarged view of a portion of Fig. 4, to illustrate the detail of the work holder.

According to my present invention the machine is best adapted and is therefore intended to be arranged horizontally as distinguished from the vertical arrangement, which was the form shown in my prior patent. Furthermore, in my former machine, the stock was intended to be shifted from time to time to bring fresh portions under the cutter upon a horizontal table, the feeding operation being performed entirely by the hands of the workman. In my present machine, the manipulation and feeding of the stock are or may be more nearly mechanical.

In the drawings A represents the bed of the

machine, which is provided with suitable legs or supports as shown. Upon the table are formed ways *a*, within which carriages B, C, for the boring tool and saw respectively, are adapted to slide longitudinally on the frame. One of these carriages B supports and carries the pulley and mandrel by which the boring tool B' (see Fig. 4) is rotated, and the carriage C in a similar manner supports and carries the pulley and mandrel by which the hollow or tubular saw C' is rotated. The boring tool and saw are each connected to its operating mandrel by means of suitable adjustable chucks. As thus far described, the parts of the machine correspond substantially with those described in my prior patent.

Instead of the path cams and studs described in my former patent, I have substituted in my present machine spur cams for bringing the tool carriages toward the stock at the desired times and rates, which may be substantially as set forth in my former patent. But for withdrawing these carriages, or bringing them back to their outermost position, I employ springs B², C², whereby a much quicker return motion of the tool carriages is obtained than would be practicable with the path cam and stud device.

The cams B³, C³ are operated by cross-shafts, bevel geared to a shaft D, (Figs. 2 and 4,) which extends longitudinally of the machine, and which is suitably connected, as in the present instance, by speed reducing gearing, to a suitable driving pulley M, which, together with those which drive the boring tool and saw, may be conveniently driven from any appropriate source of power and by any appropriate connection to give the desired speed, which in the case of the boring tool and saw is much than higher than that of the shaft D by which the carriages are operated.

I have found in practice with my previously patented machine a tendency of the saw to clog by reason of the saw-dust not escaping freely, the only avenue of escape in a machine constructed on that principle being the lateral slot or kerf leading into the aperture left by the previous cut block or blank. To obviate this, I have now designed a method and apparatus for so treating or preparing the periphery of the stock, in advance of the

blanks being sawed from it, as that an additional escape for the saw-dust may be had in the form of an additional slot or kerf running lengthwise of the blank, and across the periphery of the stock, through which the saw-dust may escape. To do this I cause the periphery of the stock while it is being fed to the saw, to pass in contact with a suitable tool, preferably a revolving cutter E with two or more knives (see Fig. 6), whereby a suitable portion of the periphery is brought to a true circle. The portion so trued is subsequently exposed to the action of the saw, which is so arranged relatively thereto that its inner edge shall be substantially coincident with the periphery of the stock. In this way the slight overlapping of the thickness of the saw beyond the edge of the stock will leave a kerf or aperture in the periphery of the stock as the saw advances, which aperture will form an additional means of escape for the saw-dust.

I will now describe a mechanism by which the above method of working may be carried out. The truing tool I prefer to construct in the form of a revolving head E provided with suitable knives or cutters *e*, the construction being well shown at Fig. 7. The stock itself is supported in the machine by means of a spindle F rotatable in a suitable bearing *f*, which in turn is mounted in a suitable frame G, and adapted to be raised and lowered therein for a purpose hereinafter to be described. This spindle is driven into the center of the stock so that when the spindle is rotated the stock will move with it, and by the gradual rotation of the stock a fresh portion will be exposed to the saw after each blank has been sawed. The truing tool E, which is rapidly rotated when in use, is so arranged relatively to the location of the saw, that as the stock is rotated, its periphery will be carried over and trued or formed to a true circle by the cutters of the truing tool, and subsequently each blank will be cut from the previously trued portion of the periphery, so that with the saw located relatively thereto as above described, the additional kerf or slot will always occur.

I believe it to be obvious that some other mechanical device for so truing the periphery of the stock might be substituted for the revolving cutting tool, and therefore, so far as the method of truing is concerned, I desire to point out that it may be availed of by other mechanism than that herein shown and described, and at the same time the benefit of this portion of my invention be preserved.

After the stock has been fed once round and the corresponding number of blanks cut from it, it is obvious that it will ordinarily be required to be fed bodily toward the saw, so as to enable an inner circle of blanks to be obtained. This feeding may be accomplished by making the bearing *f* movable in its supports, and by moving it therein by means of a suitable device, as for example a screw H, to

the required distance. With the truing device located and arranged as above described, it is obvious that the fluted or notched portion of the stock left by the saw in cutting the first circle of blanks will be removed as the stock is fed toward the truing tool, so that when the stock is in position to commence the cutting, its periphery will be ready to be again trued when the rotary feeding is resumed.

The operations above described may be continued until as many blanks as may be have been obtained from the stock, when a fresh piece of stock may be put into the machine to be formed into blanks thereby.

As a means of holding the stock against rotation while the blank is being formed, I employ a stop I. (See Fig. 7.) This is constructed and operates substantially as the so called gage device of my former patent and for the same purpose. I have, however, improved its construction in my present machine by introducing a slot connection (see Fig. 2) between the stop and the carriage C, and by connecting the two by a spring *i* (see Figs. 4 and 7) so as to allow the stop to be drawn out a little to rest against the solid wood while the first block of a circle, or the first block cut from fresh stock is being formed. In this case, there being no cavity already formed, the stop must bear against the solid wood while the first blank is being cut and until after the stock is fed for a new blank, whereupon the spring draws the stop into the first cavity formed, the slotted connection between the stop and carriage permitting this operation as above described. I have also improved the device whereby the stock is held against the thrust of the saw and at the same time is permitted to yield and avoid breaking the saw, when for any reason, as for example a knot or other imperfection in the stock, the friction of the saw therein is suddenly increased. My improved abutment device, or work-holder is clearly shown at Fig. 7 and consists of a lever K, one end of which impinges upon a cam L, driven by the shaft D, and so timed that while the saw is entering and passing through the stock, that portion of the lever K on the other side of its fulcrum is pressed or forced by the action of the cam against the stock to hold it against the thrust of the saw. In order, however, that the lever may yield and let the stock move outwardly under an unusual thrust from the saw, I form the fulcrum of the lever upon a post *k*, adapted to slide upon the bed of the machine outwardly or away from the saw and against the tension of a spring *k'* which tends to keep the fulcrum of the lever in its normal position. I also provide a pin and slot connection as shown at Figs. 7 and 6, at *k*², between the upper end of the lever and its post, so that the motion of the lever relatively to the post is only so much as may be required for the stock to be inserted and grasped. Therefore if unusual thrust be brought upon the stock, when the pin fetches up at the end

of its slot, the post will slide outwardly against the tension of the spring and thus permit the stock to move with the advancing saw.

I claim:

- 5 1. The combination of the sliding post *k*, the work-holder lever *K* fulcrumed thereon, the spring *k'*, pin and slot connection *k*², and cam *L*, for the purpose set forth.
 - 10 2. In the art of forming spool blanks, the improved method of preparing the stock which consists in first truing its periphery, and after-
 - 15 3. The combination with suitable devices
- ward sawing out the blanks from the periphery so trued by a cut slightly intersecting the same, whereby is secured an additional kerf for the relief of saw-dust as described.

for feeding the stock circularly, of a cutter *E* located in the path of the stock when so fed, and adapted thereby to true the periphery of the same, and a hollow saw set opposite the said trued periphery and slightly intersecting the same for the purpose set forth.

In testimony whereof I have hereunto subscribed my name this 18th day of September, A. D. 1891.

CHARLES A. BROUGHTON.

Witnesses:

ELLEN B. TOMLINSON,
JOHN H. TAYLOR.