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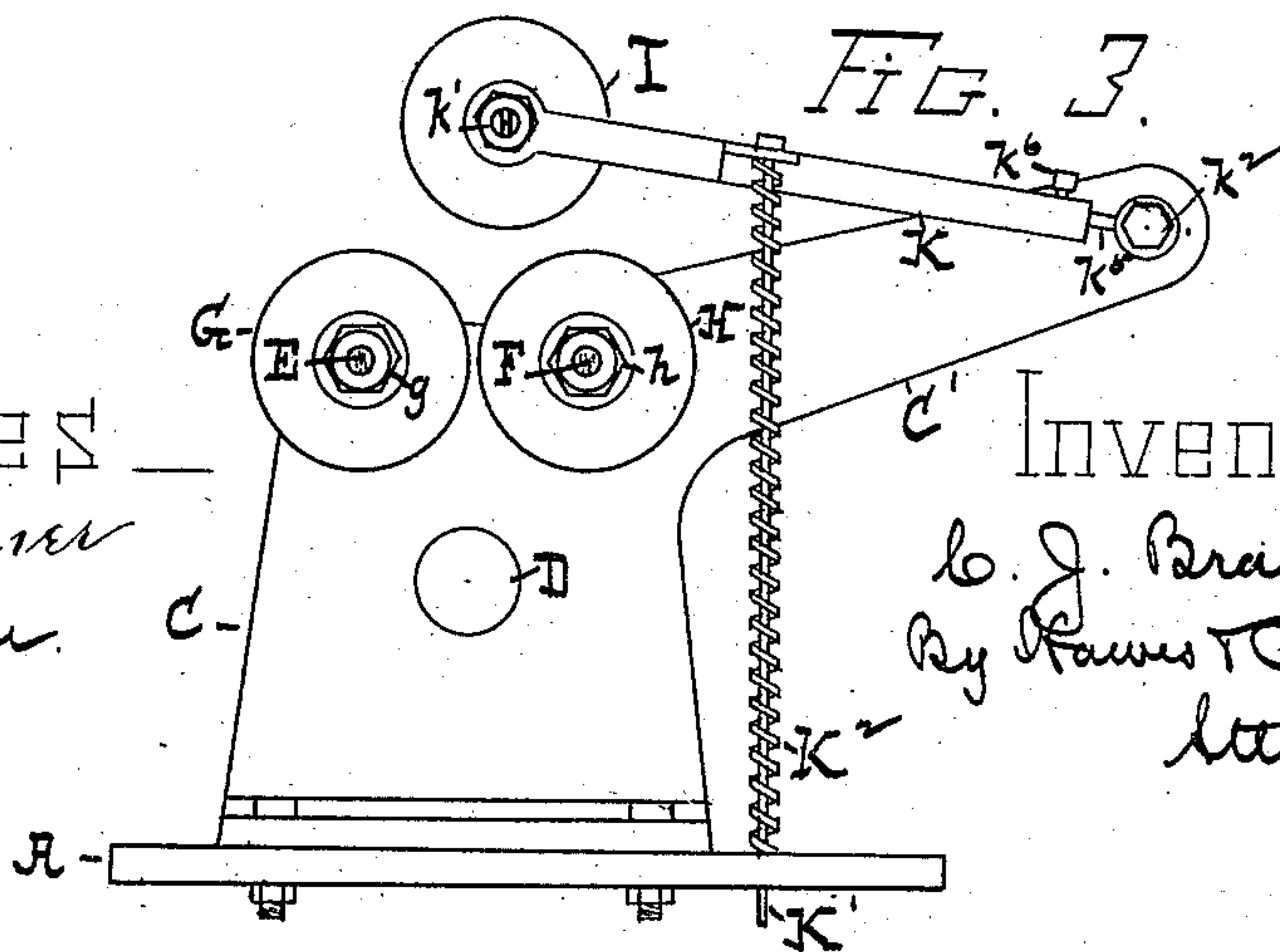
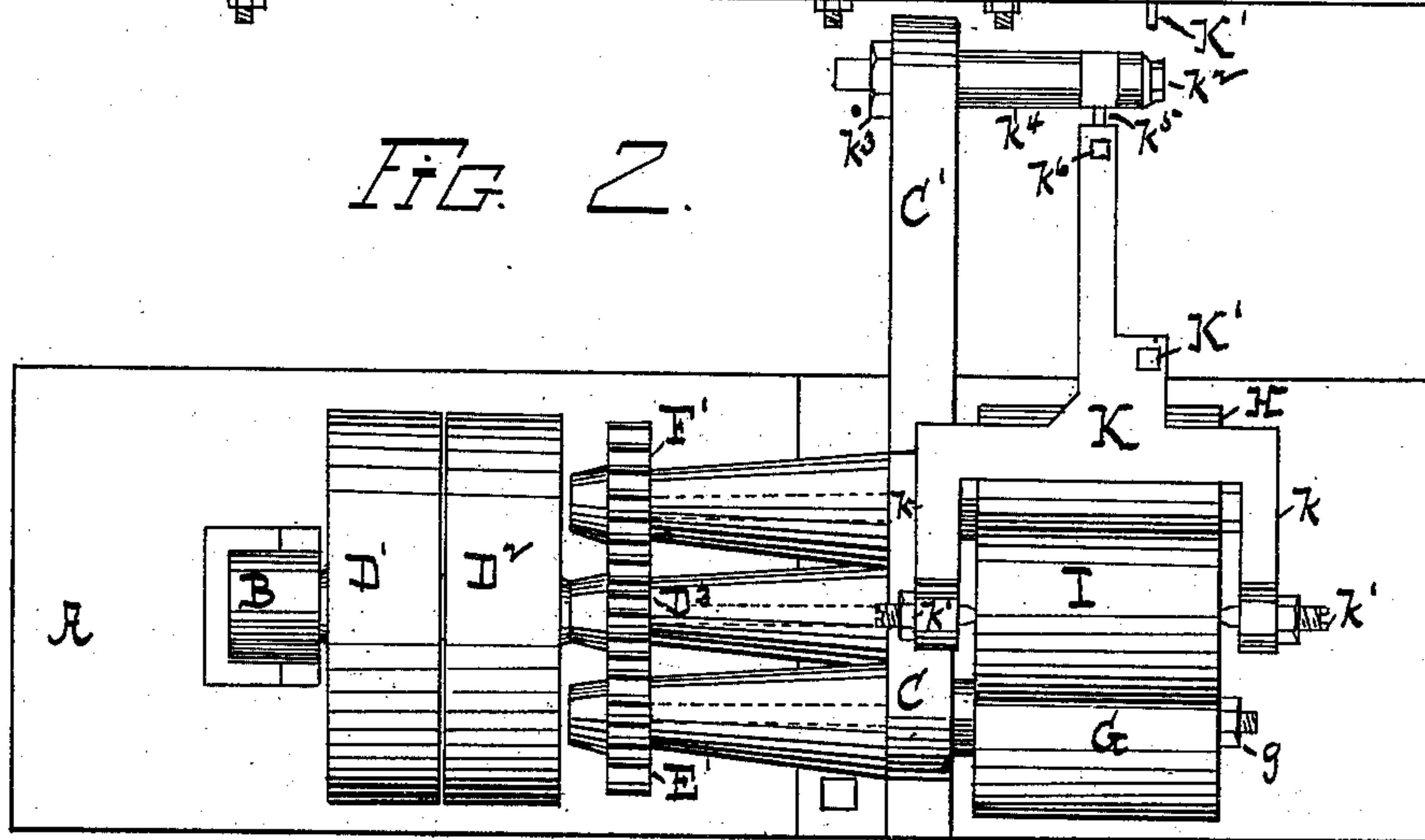
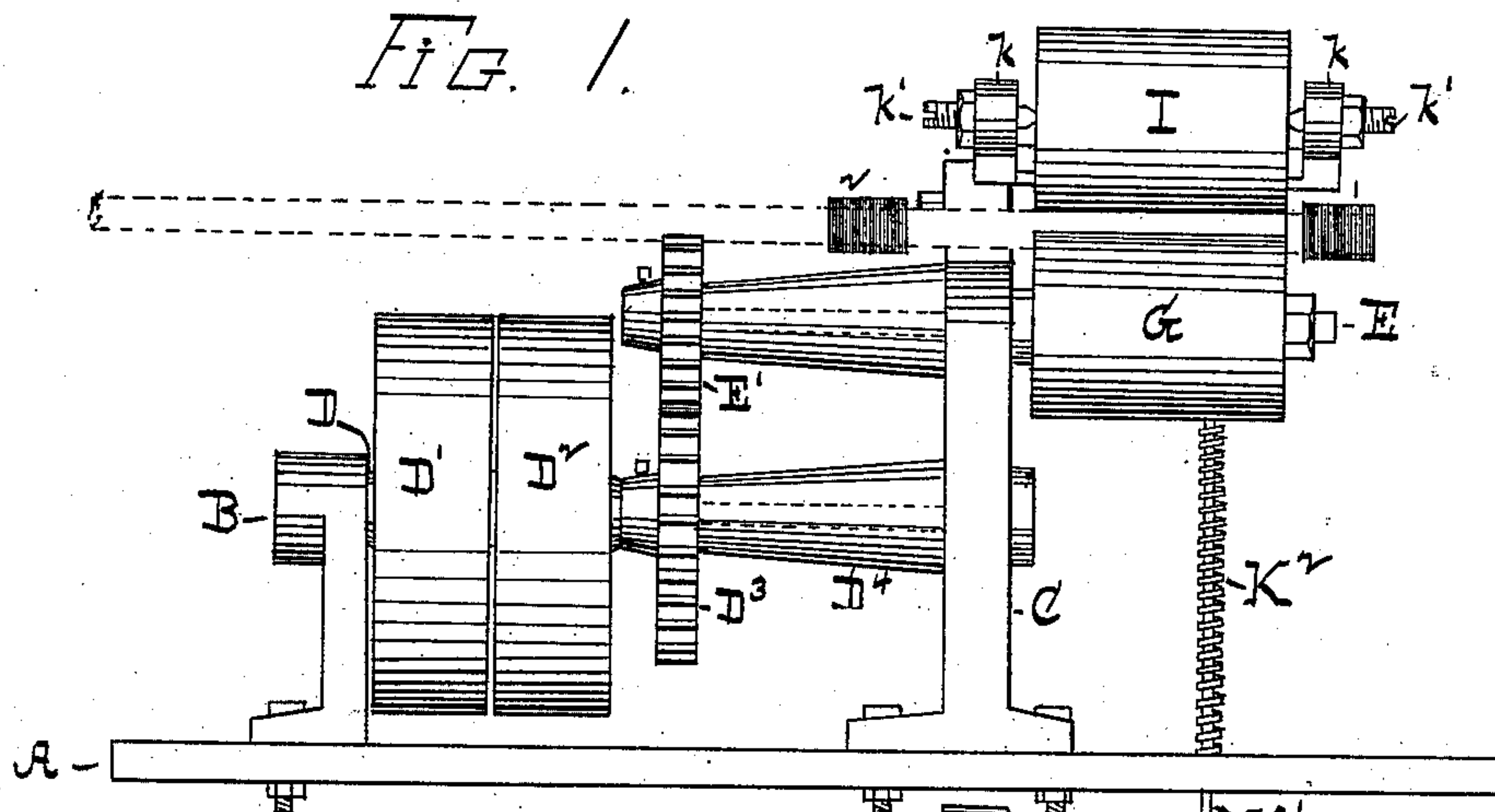
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C. J. BRADLEY.

MACHINE FOR LAYING BUTTON MOLDS ON WHIPS.

No. 375,473.

Patented Dec. 27, 1887.



Witnesses \_\_\_\_\_  
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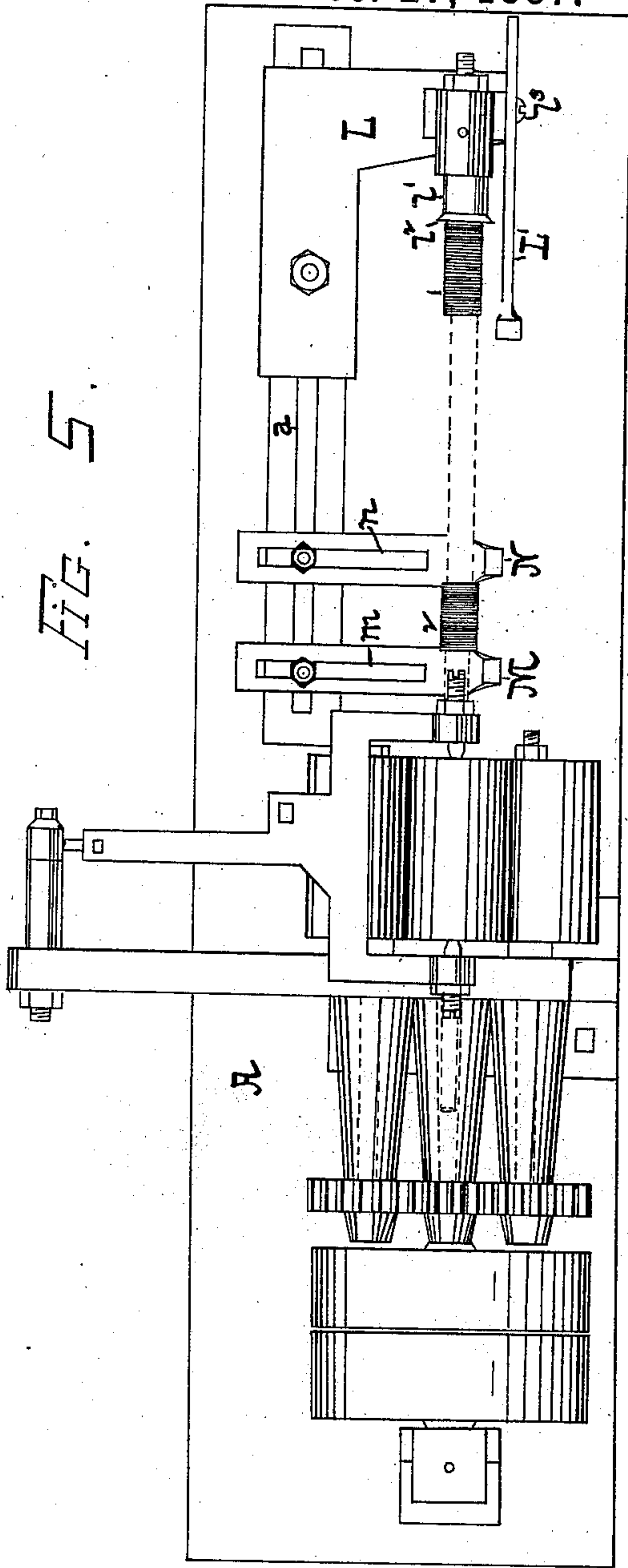
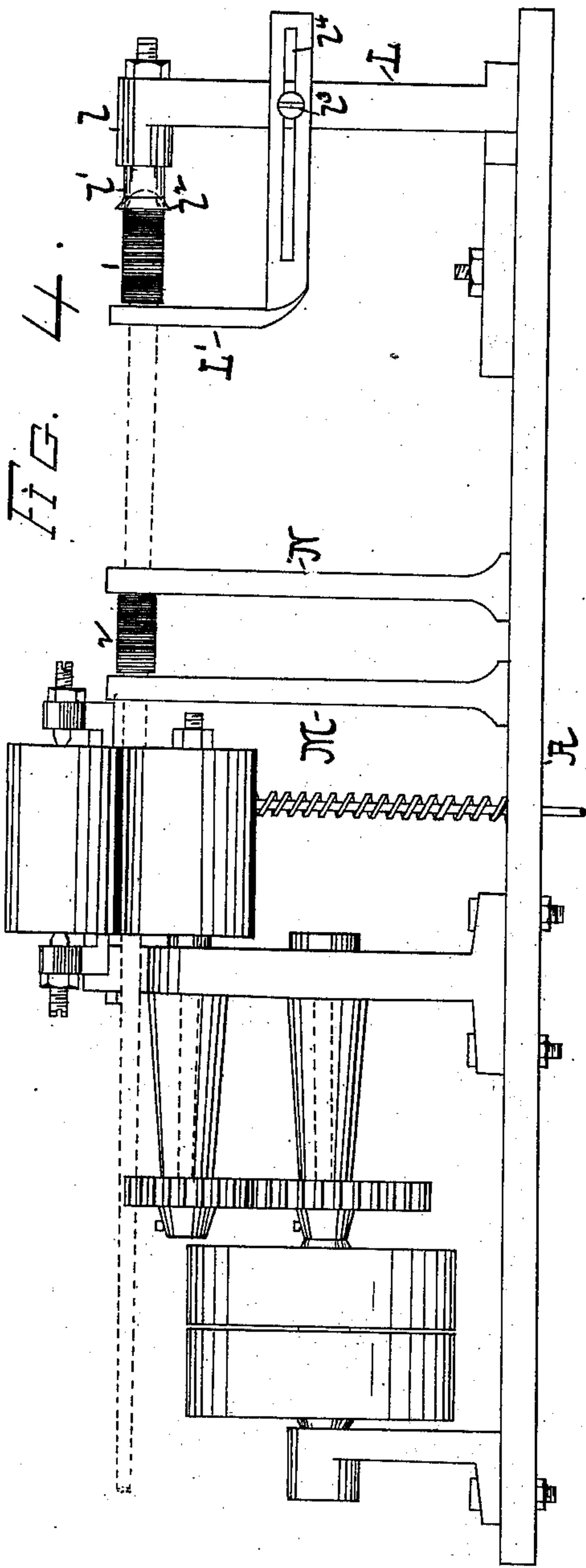
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# UNITED STATES PATENT OFFICE.

CHARLES J. BRADLEY, OF WESTFIELD, MASSACHUSETTS.

## MACHINE FOR LAYING BUTTON-MOLDS ON WHIPS.

SPECIFICATION forming part of Letters Patent No. 375,473, dated December 27, 1887.

Application filed July 14, 1887. Serial No. 244,242. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES J. BRADLEY, of Westfield, in the county of Hampden and Commonwealth of Massachusetts, have invented a new and useful Machine for Laying Button-Molds on Whips, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention relates to the art of making what are known as "thread buttons" upon whips. These buttons are formed by winding successive layers of thread about the whip to form a mold of the desired length and thickness, after which the outer covering consisting of several strands of thread braided together is formed upon said mold.

One object of my invention is to provide a machine which by holding and rapidly revolving the whip will enable the first-mentioned operation--viz., laying the mold--to be performed with much greater speed than has been possible heretofore; and a further object of the invention is to provide means whereby molds of any desired length can be laid with perfect accuracy without the exercise of any particular care by the operator.

To these ends my invention consists in the machine and also in the thread-guiding devices for use in connection therewith, herein-after fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like letters designate like parts in the several figures, Figure 1 is a side elevation of the machine. Fig. 2 is a plan view thereof. Fig. 3 is an end view thereof, looking toward the left in Figs. 1 and 2. Fig. 4 is a side elevation of the machine and the thread-guiding devices. Fig. 5 is a plan view of the parts shown in Fig. 4.

Referring to Figs. 1, 2, and 3, the letter A designates the bed upon which the machine rests, and to which it is secured by bolts, as shown, or in any convenient manner, said bed preferably consisting of the top of a bench or table.

The letters B and C designate, respectively, two standards, which support within suitable bearing the opposite ends of a shaft, D, said shaft having mounted thereon a loose pulley, D', a fixed pulley, D<sup>2</sup>, and a gear-wheel, D<sup>3</sup>, a sleeve, D<sup>4</sup>, preferably surrounding said shaft between

the gear-wheel and standard C, as shown. Mounted within bearings in standard C, above shaft D, are two shafts, E and F, said shafts being in the same horizontal plane and being parallel with shaft D. The shafts E and F are provided at one end with gear-wheels E' and F', respectively, which mesh with and are operated by gear-wheel D<sup>3</sup>, sleeves similar to sleeve D<sup>4</sup> preferably surrounding said shafts between the gear-wheels and standards C, as shown. Two rolls, G and H, are secured to the outer ends of said shafts E and F, respectively, said rolls being preferably held between hubs on the shafts adjacent to the standard and nuts g and h, as shown. These rolls are of the same diameter and are of such size that a narrow space only is left between their peripheries, as shown in Fig. 3.

The function of the rolls G and H being to impart axial rotation to a whip laid between them by means of friction, I prefer to construct them of soft rubber, with a metallic core or hub, as I thus secure perfect friction between their peripheries and the whip without marring the braided or otherwise finished surface of the latter. It will be understood, however, that rolls made of wood, iron, or other material, having their peripheries covered with rubber, leather, felt, &c., could be employed, if desired.

The letter I designates a third roll, which I will call the "presser-roll," its function being to press the whip down upon rolls G and H, and thereby insure its rotation by said rolls.

The roll I is mounted between the arms k of a bar, K, preferably by means of the conical bearings k', as shown, by which wear between the roll and its bearings can be taken up. At its rear end the bar K is pivoted to a rearwardly-extending arm, C', of standard C, as shown in Fig. 3, in such manner as to permit roll I to be moved vertically toward and away from the rolls G and H. As shown, the pivot consists of a bolt, k<sup>2</sup>, held to the arm C' by a nut, k<sup>3</sup>, said bolt having between its head and the arm a loose collar, k<sup>4</sup>, to which the bar is connected at its rear end; but other well-known means for securing this result could be employed.

It being desirable, for a purpose presently to be described, that the roll I shall be capable of adjustment toward and away from the pivot



$k^2$ , I prefer to provide for such adjustment by boring the rear end of bar K to receive a rod,  $k^5$ , secured to the collar  $k^4$ , and by providing a set-screw,  $k^6$ , the end of which bears against said rod within the bar, to secure the bar in different positions upon the rod. A rod,  $K'$ , secured at its upper end to bar K, as shown, and extending downwardly through the bed A to the floor, where it will preferably be connected with a foot-lever, serves to depress said bar and roll I, while a spring,  $K^2$ , surrounding said rod between the bar and the bed, serves to normally retain said bar and roll in an elevated position, as represented in Fig. 3.

The roll I will preferably correspond with rolls G H as to its material and construction.

The operation of the machine thus constructed is as follows: The roll I being elevated above the rolls G H, as described, the whip is placed between the latter rolls, the distance between their peripheries being such that a portion of the body of the whip projects above said rolls, as indicated by dotted lines in Fig. 1. Ordinarily a button is formed at the butt-end of the whip, another at the upper end of the handle portion, and sometimes others between the latter and the tip, and the whip is therefore so placed upon the rolls G H that the butt projects beyond the end of said rolls, as indicated in Fig. 1. The roll I is then depressed upon the whip, its adjustability with respect to pivot  $k^2$  enabling its axis to be located in the vertical plane of the axis of the whip whatever the diameter of the latter may be, and thus insure the steady and even rotation of the whip. The pulley D' being connected by belt with any convenient source of power, the belt is shifted to the fixed pulley D<sup>2</sup>, whereby rotation is imparted to shaft D and, through gears D<sup>3</sup> E' F', to shafts E F and rolls G H. As said rolls revolve in the same direction, the whip is revolved in the opposite direction by friction with their peripheries, and as the whip revolves the operator winds the thread in successive layers thereon to form mold 1, for instance, at the butt, having completed which he forms in the same manner mold 2 at the upper end of the handle portion, and by changing the position of the whip between the rolls can form additional molds at such other points thereon as it may be desired to place buttons. A suitable rest for the tip end of the whip will be employed whenever the elasticity of the whip would render it liable to come in contact with the gears or pulleys.

It will be observed that the machine as thus constructed is simple and inexpensive, and that by its use button-molds can be laid upon whips with great rapidity. By the exercise of due care the operator can form the molds of the desired length without the aid of auxiliary guiding devices for the thread; but in order to enable even an unskilled operator to form molds of exactly the same length upon each whip of the same grade and style I have also devised means for mechanically limiting

the travel of the winding thread at each end of the mold, which means I will now describe, referring to Figs. 4 and 5 of the drawings.

The letter L designates a standard which is adjustably secured to the bed A, preferably by means of a bolt passing through a longitudinal slot,  $a$ , in the bed and through the base of the standard, and having a nut upon its upper end, as shown, whereby, by loosening and tightening said nut, the standard can be moved lengthwise of the bed and secured in any desired position thereon. At its upper end the standard L is provided with a bearing,  $l$ , within which is mounted so as to revolve freely a socket-head,  $l'$ , adapted to receive the end of the whip-butt, as indicated by dotted lines in Figs. 4 and 5. The socket-head is also provided with a flaring rim,  $l^2$ , to limit the movement of the winding thread at the end of whip. A guide-arm,  $L'$ , is adjustably secured to standard L by a screw,  $l^3$ , passing through a slot,  $l^4$ , in said arm. As shown, said guide-arm, near its inner end, is bent at a right angle to the main portion thereof, and said end extends vertically to a point slightly above the plane occupied by the whip when being operated upon, as hereinafter described. The function of said guide-arm is to co-operate with the rim  $l^2$  on the socket-head to limit the movement of the winding thread at each end of mold 1 when forming said mold. The letters M and N designate, respectively, two additional guides, preferably secured to the bed by bolts passing through the slot  $a$  in the latter and through slots  $m n$  in the bases of said guides, whereby the latter are adjustable both lengthwise of the bed and transversely thereof. As shown, said guides M N are also bent to form vertical portions extending slightly above the whip when the latter is placed in the machine, as shown in Fig. 4.

It will be obvious that the guides M N are thus adapted to be secured in position with their vertical portions adjacent to the body of the whip and to be set at a distance from each other corresponding to the desired length of mold 2, and that, when so adjusted, the vertical portions thereof serve to limit the movement of the winding thread at each end of said mold. It will also be obvious that by changing the position of standard L and guides M N additional molds can be formed on the whip at such points as may be desired.

The operation of the machine when used in connection with the devices just described is as follows: The standard L being adjusted to a proper position with relation to the size and a style of whip to be operated upon, the whip is laid upon the rolls G H, as previously described, and the end of the butt is inserted in the socket-head  $l'$ . Arm  $L'$  is then adjusted to such position that the distance between its vertical portion and the rim  $l^2$  on the socket-head will correspond to the length of the mold which it is desired to make at the butt. Guides M N are adjusted transversely of the bed to bring their vertical portions adjacent



to the whip, and are adjusted lengthwise of the bed to bring them opposite the point on the whip at which it is desired to form the second mold, and to make the distance between them correspond to the desired length of such mold. The roll I is then depressed and the machine started, as previously described. The operator now simply directs the thread to the space between guides M N, or between arm L' and the rim on the socket-head, where it is wound in successive layers, being started back in an opposite direction by its contact with the stop at either end of its travel, until a mold of the desired thickness is formed.

It will thus be seen that not only is perfect accuracy in making molds of the desired length upon a single whip attained without requiring the exercise of skill by the operator, but that perfect uniformity in the length of the molds on any number of whips of the same grade can also be secured, which has heretofore been practically impossible. Again, it will be obvious that it is entirely practicable to form all the molds upon a whip at the same time by arranging the delivery-spools of thread upon spindles adjacent to the point where each mold is to be located and applying suitable tension to said spools to cause the proper amount of draft upon the thread. In such case the operator would simply attend to placing the whips in and removing them from the machine and to starting the threads in the proper places to form the molds.

I do not wish to limit myself to the means shown for adjusting the guiding devices, as such means could be replaced by others to produce the same result without the exercise of invention. It is obvious, also, that modification of the various parts of the machine shown and described could be made within the spirit of my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The machine for laying button-molds on whips herein described, comprising, in combination, two rolls located adjacent to each other and in the same horizontal plane, means, substantially as described, for positively operating said rolls in the same direction, and a presser-roll mounted within bearings in a pivoted and longitudinally-adjustable bar, whereby said presser-roll is adapted to be moved toward and away from said first-mentioned rolls, and also laterally thereof, substantially as set forth.

2. The combination, with rolls G H, mounted and operated substantially as described, of bar K, pivoted at its rear end so as to swing vertically, said bar having at its front end

the arms k, and roll I, supported between said arms by means of the conical bearings k', substantially as set forth.

3. The combination, with rolls G H, mounted and operated substantially as described, of bar K, pivoted at its rear end so as to swing vertically, and having the roll I mounted within bearings at its front end, a spring normally retaining said bar in an elevated position, and a rod for depressing said bar against the stress of said spring, substantially as and for the purpose set forth.

4. The combination, with the machine for laying button-molds on whips, constructed and operating substantially as described, of an independent support for the butt of the whip and guiding devices located between said support and the machine for mechanically controlling the back-and-forth movement of the winding thread, whereby said thread is laid in successive layers upon the whip to form molds, substantially as set forth.

5. The combination, with the machine for laying button-molds on whips, constructed and operating substantially as described, of an adjustable support for the butt of the whip and independently-adjustable guides for mechanically controlling the back-and-forth movement of a winding thread, whereby the thread is laid in successive layers upon the whip to form molds, substantially as set forth.

6. The combination, with the machine for laying button-molds on whips, constructed and operating substantially as described, of the standard L, having the socket-head l' mounted within a bearing at its upper end, and having the guide-arm L' adjustably secured thereto, means, substantially as described, for adjusting said standard toward and away from the machine, guides M N, and means, substantially as described, for adjusting said guides both toward and away from the machine and laterally thereof, substantially as and for the purpose set forth.

7. The combination, with the bed A, having the longitudinal slot a, of standard L, adjustably secured to the bed by a bolt passing through said slot a and through the base of the standard, said standard having at its upper end the socket-head l', provided with rim l'', guide-arm L', adjustably secured to said standard by a screw passing through a slot, l'', in said arm, and guides M N, having the slots m n, respectively, secured to the bed by bolts passing through said slots and through slot a in the bed, substantially as set forth.

CHARLES J. BRADLEY.

Witnesses:

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T. M. BROWN.