

M. L. HIRSCH & M. H. EICHBERG.

MACHINE FOR MAKING PAPER BAGS.

APPLICATION FILED APR. 30, 1908.

Patented Nov. 10, 1908.

3 SHEETS—SHEET 1.

903,570.

Fig. 1.

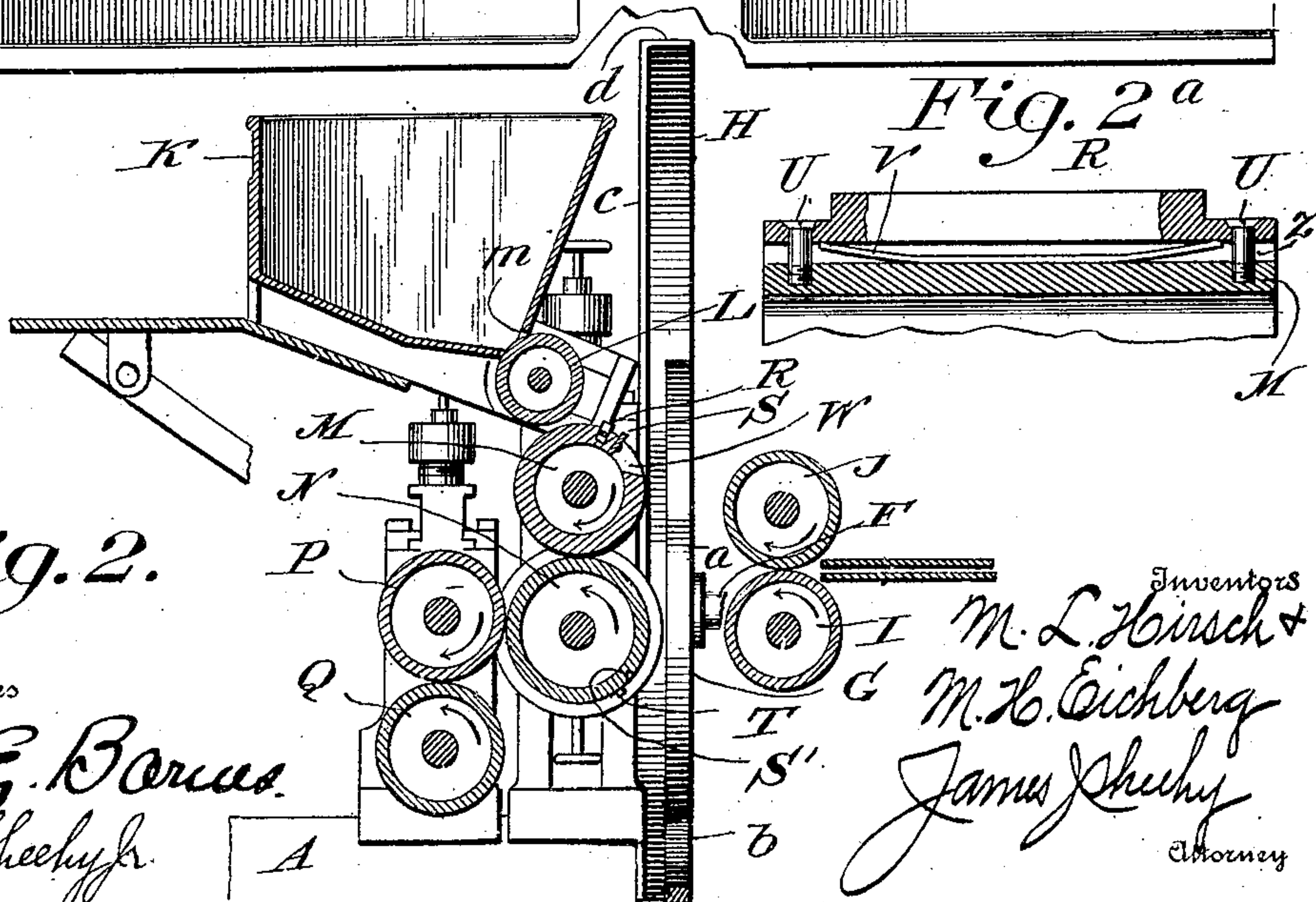
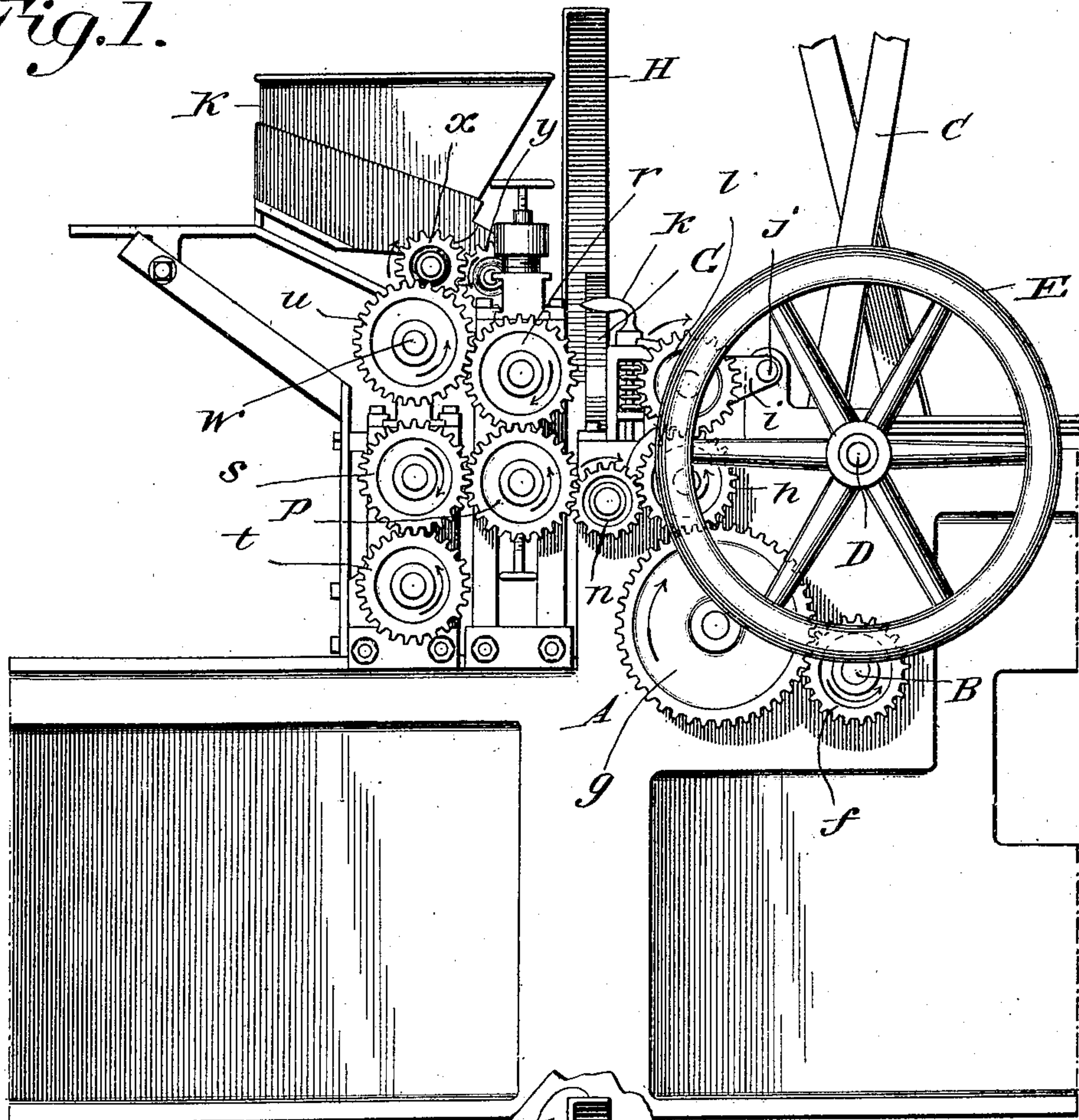


Fig. 2.

Witnesses

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Fig. 3.

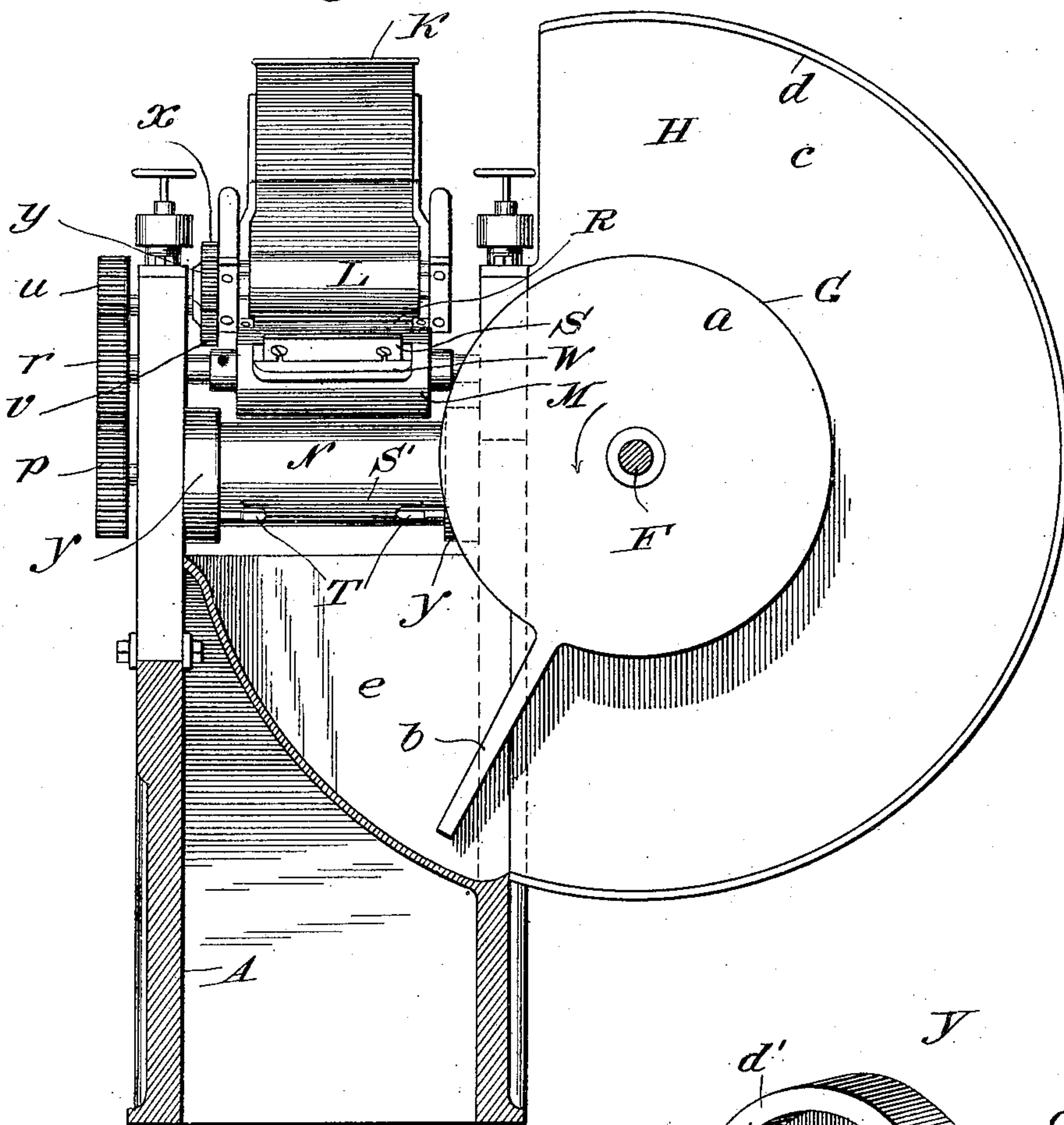


Fig. 4.

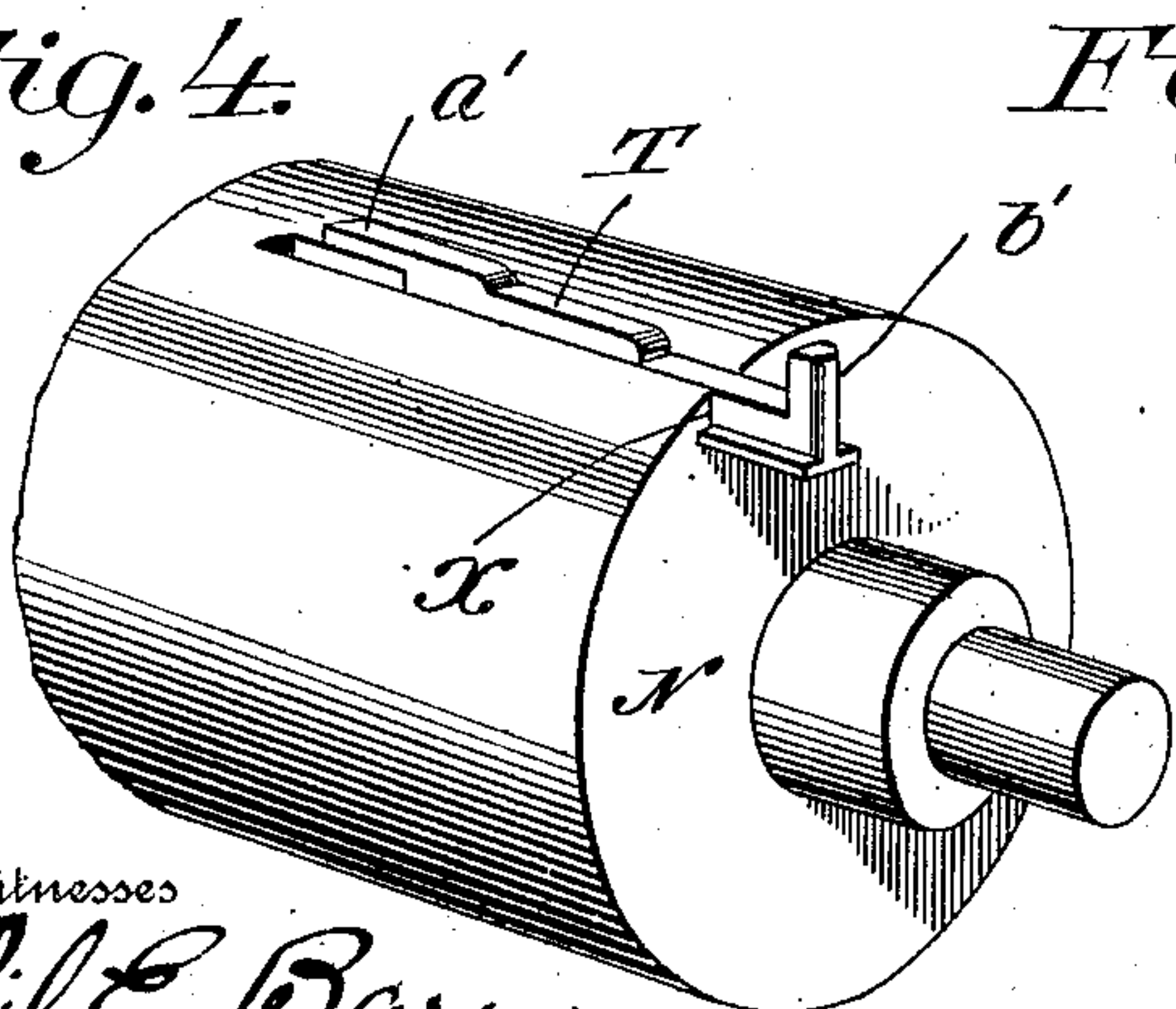
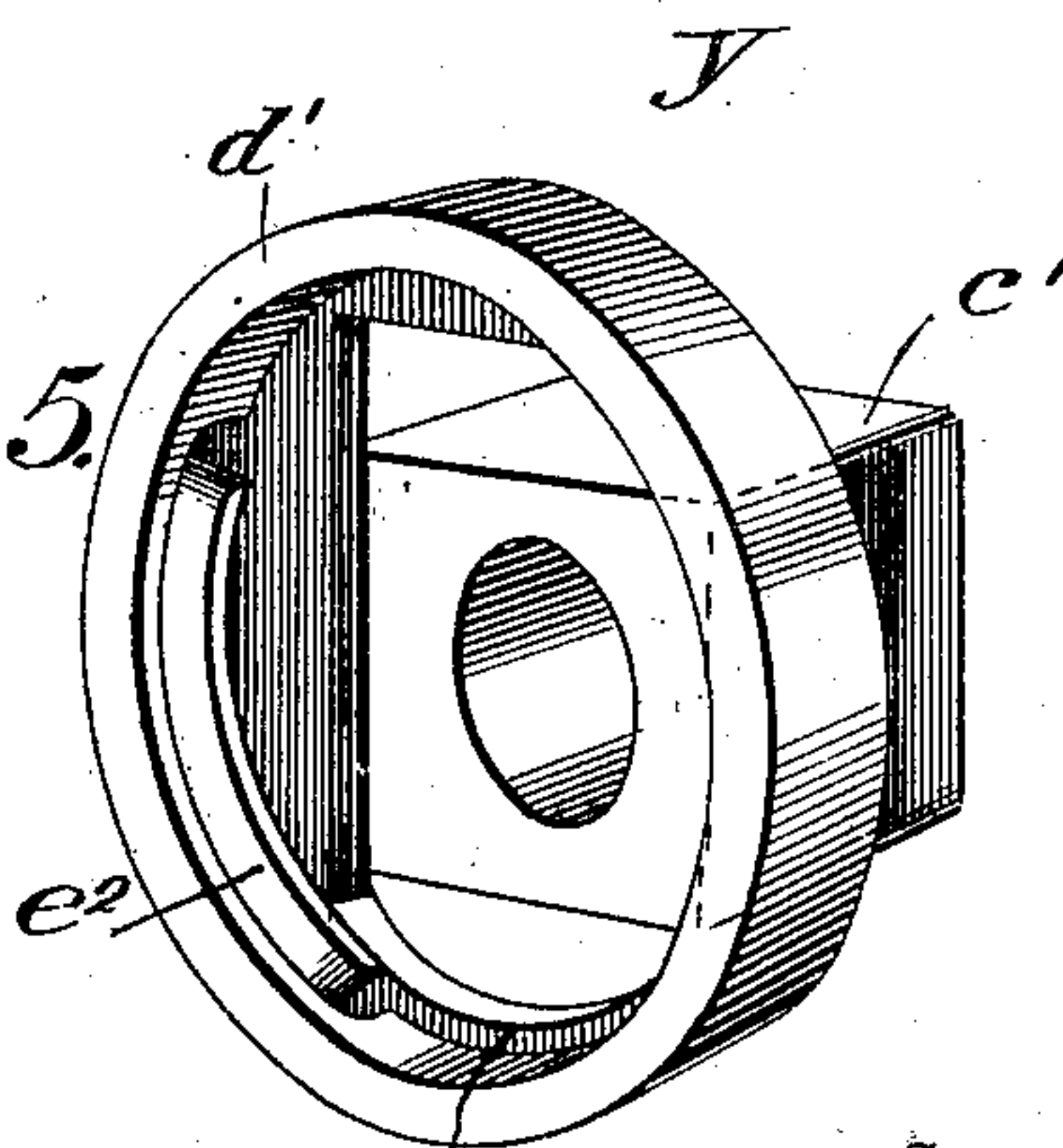


Fig. 5.



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3 SHEETS—SHEET 3.

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Fig. 6.

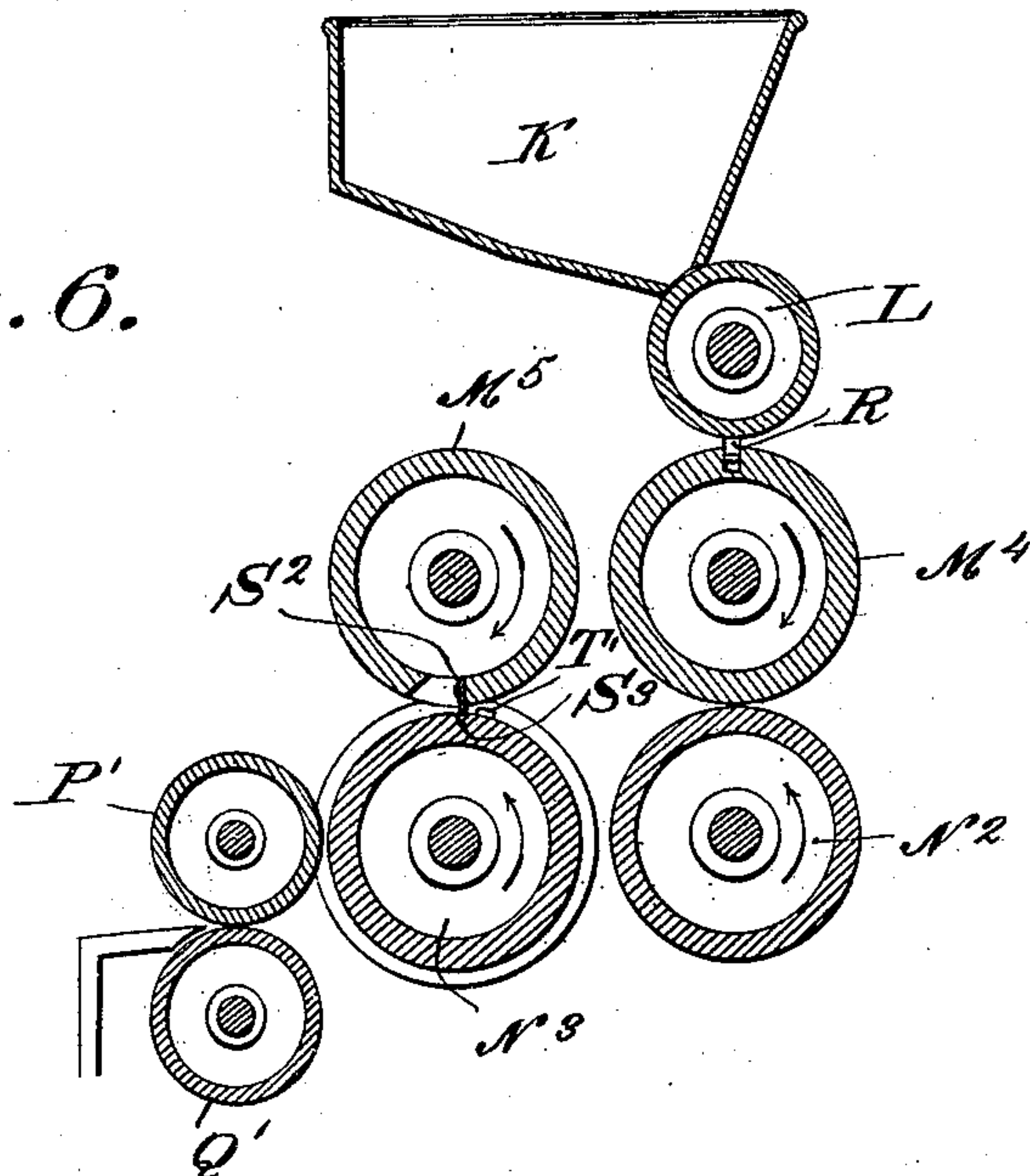


Fig. 7.

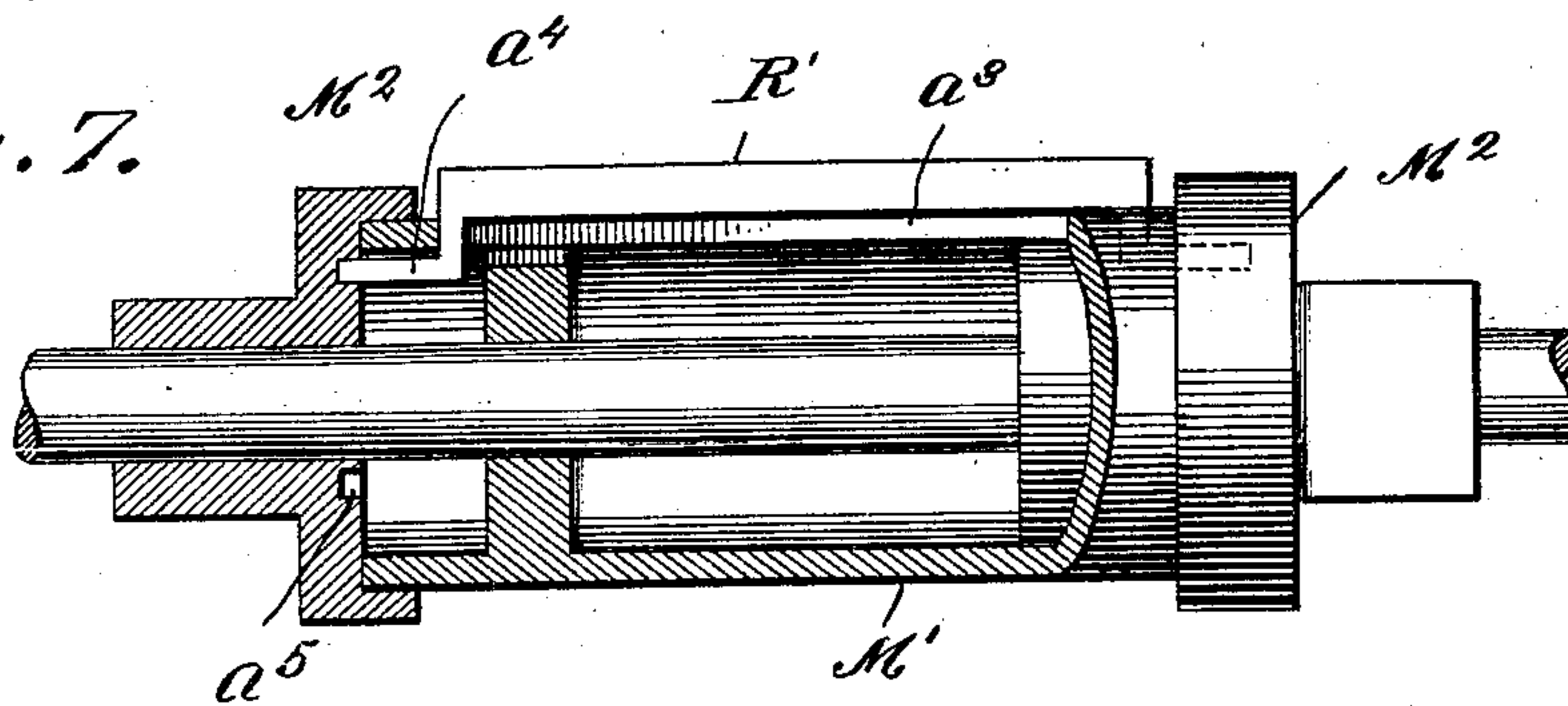
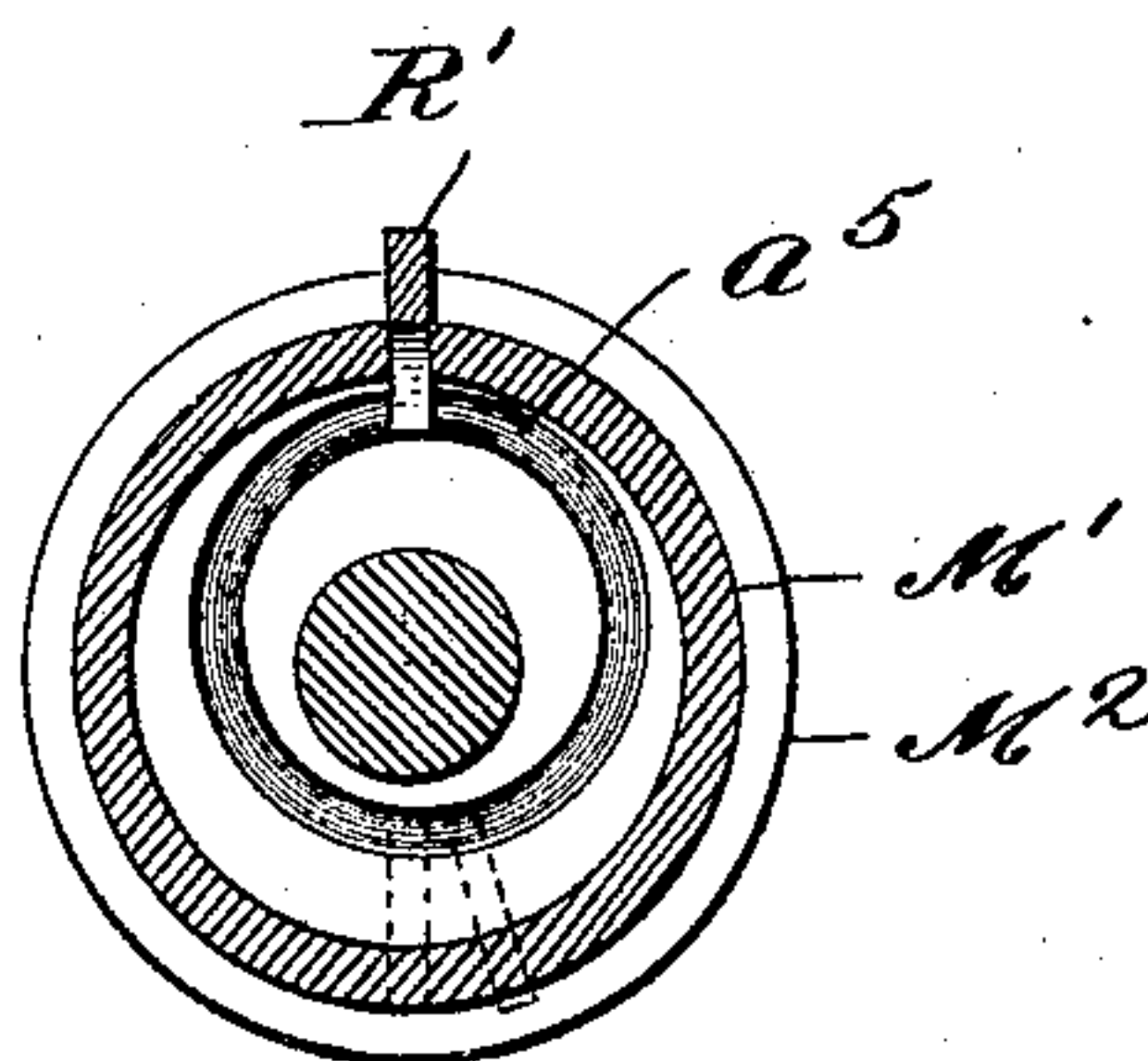


Fig. 8.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING PAPER BAGS.

No. 903,570.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed April 30, 1908. Serial No. 430,100.

To all whom it may concern:

Be it known that we, MONTEFIORE L. HIRSCH and MAURICE H. EICHBERG, citizens of the United States, residing at Baltimore, in the county of Baltimore City and State of Maryland, have invented new and useful Improvements in Machines for Making Paper Bags, of which the following is a specification.

Our invention pertains to the manufacture of paper bags and more particularly to machines in which a web of paper is formed into a tube and the tube is divided into sections and each section is folded transversely adjacent to one end and pasted to effect the closure of said end.

One of the objects of our invention is the provision in a machine of the character stated, of simple means calculated to expeditiously and properly tuck, paste and fold the paper tube sections, and in that way contribute to the capacity of the machine and render it feasible to run the machine at a high rate of speed.

Another object of the invention is the provision in a machine for the purpose described, of an improved and highly efficient cutting-off device, and improved means for guarding said device and protecting the machine attendants against the same.

Other objects and advantageous features of our invention will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation of so much of a paper-bag making machine as is necessary to illustrate our invention. Fig. 2 is a longitudinal, vertical section of the same with some of the parts in elevation. Fig. 2^a is an enlarged, detail view, partly in section and partly in elevation, showing the arrangement of the paster-bar of our improvements in the roll carrying the same, and one means for moving said paster-bar outwardly. Fig. 3 is a vertical transverse section of the machine, taken in a plane at the opposite side of the striker or cutting-off device and its guard, with reference to the pasting, tucking and folding mechanism. Fig. 4 is an enlarged, broken perspective showing one of the rolls of the machine and one of our novel grippers carried by said roll. Fig. 5 is a perspective view, on a scale corresponding to

that of Fig. 4, showing the interior of one of the fixed cam devices which coöperate with the said grippers to move the latter inward and outward. Fig. 6 is a detail, longitudinal vertical section illustrating a modified embodiment of our invention in which the paster-bar is carried by one roll, the tucker is carried by another roll, and the grippers are carried by still another roll. Fig. 7 is a detail view, partly in section and partly in elevation, showing means for positively moving the paster-bar radially outward and inward. Fig. 8 is a transverse section of the said means.

Referring by letter to the said drawings, and more particularly to Figs. 1 to 5 thereof: A is the main frame of a machine constituting a practical embodiment of our invention. Journaled in the said main frame is a transverse shaft B designed to be driven by a motor (not shown) through the medium of a belt C and suitable pulley connections (also not shown), and connected with the said shaft B is a shaft D carrying a balance wheel E, and a longitudinally-disposed shaft F carrying our novel striker or cutting-off device G presently described in detail. The driving connections intermediate the shaft B and the shafts D, F, may be and preferably are conventional and form no part of our invention, and we have therefore deemed it unnecessary to illustrate the same.

The striker or cutting-off device G comprises a circular body *a*, of about the proportional diameter illustrated, fixed upon the shaft F and arranged to rotate as indicated by the arrow in a plane transverse of the machine, and a blade *b* fixed to and extending radially from the perimeter of said body *a* and positioned to intersect the path of the paper tube (not shown) of which the bags are formed. The said striker or cutting-off device is materially advantageous for the reason that the momentum gained by the body *a* renders the movement of the blade *b* steady and even, and at the same time the said body *a* lends stiffness and strength to the blade, which is of a length approximately corresponding to one half of the diameter of the body, and reduces to a minimum the liability of the blade breaking incidental to the operation of the machine. The striker blade *a* is preferably of a character to coöperate with the usual, well-

known serrated device for giving the ends of the bags a toothed appearance, but we have deemed it unnecessary to illustrate said serrated device inasmuch as the same forms no part of our invention.

Fixed with respect to the frame A is our novel guard or shield H for affording protection to attendants against the striker or cut-off device while the latter is in motion. The said guard or shield is preferably, though not necessarily of cast-metal, and is made up of a plate *c*, located at one side of and adjacent to the striker or cutting-off device and extending laterally outward from the main frame A and having a marginal flange *d* surrounding the orbit of the striker blade, and a trough *e* extending transversely across the space between the sides of the frame A and having one of its side walls arranged in transverse alinement with the plate *c*. As will be readily understood the plate *c* and its flange *d* will afford adequate protection to an attendant standing alongside the machine and at the opposite side of the plate, with reference to the striker, while the trough *e* will preclude the striker injuring an attendant in the event of it becoming necessary for the latter to reach into the frame.

I and J are feed rolls arranged in front of the path of the striker or cutting-off device G. The lower roll I, in the present embodiment of the invention, is journaled in the main frame A and is driven from the shaft B through the train of gearing comprising spur gears *f* *g* and *h*, while the upper roll J is journaled in a sub-frame *i*, hinged at *j* to the main frame and normally held down in working position by suitable fastening devices *k* one of which is shown in Fig. 1. The said roll J is driven from the roll I through the gear *h* and a gear *l*, and the directions in which the two rolls are rotated are indicated by arrows thereon.

Located at the opposite side of the path of the striker or cutting-off device G, with reference to the rolls I and J, is a paste-receptacle K having an outlet *m*, and mounted in the frame in position to receive paste from said outlet *m* is a paste-supplying roll L. Below the said roll L are positioned superposed rolls M and N, while in rear of the roll N is a roll P disposed above a roll Q which latter coöperates with the roll P to feed the closed bags rearwardly. The several rolls just described are rotated in the directions indicated by arrows by the gears shown in Figs. 1 and 3—that is to say, the roll N is driven from the roll I through the train of gears *h* *n* and *p*, the roll M from the roll N through the intermeshed gears *p* and *r*, the roll P from the roll N through the intermeshed gears *p* and *s*, the roll Q from the roll P through the intermeshed gears *s* and *t*, and the roll L from the roll M

through the intermeshed gears *r* and *u*, a gear *v*, Fig. 3, on the same shaft *w* as the gear *u*, a gear *x* intermeshed with the gear *v*, and a gear *y* intermeshed with the gear *x* and carried by the roll L.

As shown in Figs. 2, 2^a and 3, the roll M is equipped with a paster-bar R and a tucker or creaser S, relatively arranged as shown, and, as shown in Figs. 2 and 4, the roll N is provided with a groove or depression *S'* complementary to the tucker or creaser S and is also provided with grippers T. The paster-bar is movable radially in a depression *z* in the periphery of the roll M, is connected with the roll and limited in its outward movements by bolts U and is pressed outward and yieldingly maintained in a projecting position by a bowed spring V interposed between it and the bottom of the depression *z*.

The tucker or creaser S is in the form of a blade and is attached, preferably in a detachable manner, to one wall of a recess W provided in the roll M and so as to extend slightly outward beyond the perimeter of the roll. The grippers T of which there are two, Fig. 3, are of T-form in cross-section, are arranged and adapted to be moved endwise in corresponding grooves X in the roll N, and are provided at their inner ends with bag-engaging portions *a'* which project beyond the perimeter of the roll, and at their outer ends with angularly-disposed arms *b'*. The ends of the roll N are journaled in bearing members Y, Fig. 3, which in turn are mounted and held against rotation in the frame A. The said bearing members Y are identical in construction and therefore a detailed description of the one shown in Fig. 5 will suffice to impart a definite understanding of both. The said member Y, Fig. 5, comprises an outer portion *c'*, of angular form in cross-section, by which it is held against turning in the main frame, and an inner circular and hollow portion *d'* designed to house one end of the roll and in the inner side of the circular wall of which is a cam groove having a portion *e'* which extends about three-fourths of the distance around the circular wall *d'*, and a portion *e''* which extends through the remaining one-fourth of said distance and is arranged in a vertical plane parallel to that of the portion *e'* and nearer the inner edge of said wall *d'*. The said cam groove receives the angularly-disposed arm *b'* of the adjacent gripper T, and when the said arm passes from the portion *e'* of the groove into the portion *e''* thereof it will be manifest that the gripper will be moved inward to grip or take hold of a bag; also, that during the turning of the roll N through about a fourth of a revolution the gripper will be retained in its inner position to carry the bag around with the roll, while when the arm *b'* passes from the

groove portion e^2 to the groove portion e' the gripper will be moved outward to release the bag, and said gripper will be retained in its outer position during the turning of the roll N through about three-fourths of the revolution or until the arm b' again passes from the groove portion e' into the groove portion e^2 . It will further be manifest from the foregoing that the members Y complementary to the grippers T are set to effect the inward movements of the two grippers synchronously and at the proper times incidental to the operation of the machine.

In the practical operation of the machine it will be seen that the grippers T will be moved inward to take hold of the tubular paper stock, and the striker or cutting-off device G will operate to sever the stock, at the proper times. It will also be seen that in wiping past the paste-supply roll L, the outwardly-pressed paste-bar R will take a proper quota of paste from said roll, and that afterward the blade S in coöperating with the groove S' will form a transverse tuck or crease in the bag adjacent to the end thereof, and the said outwardly-pressed paste-bar R will apply paste to the major portion of the bag at a point adjacent to the said tuck or crease. It will further be seen that after the rearward passage of the tuck or crease from between the rolls M and N, the front end portion of the bag—i. e., the portion in front of the tuck will fly up and the fold due thereto will be presented first to the opposed portions of the rolls N and P with the result that incidental to the passage of the bag between the said rolls N and P, the rolls will operate to press the end portion of the bag against the major portion thereof and the paste on the same and complete the closing or bottoming of the bag.

The grippers T move inward to take hold of the bag back of the tuck when said grippers are under the roll M, recesses being formed in the ends of roll M, between the paster R and tucker S, to receive the grippers. The grippers hold the bag until said grippers reach a position between rolls N and P, where the end portion of the bag is pressed against the paste on the major portion thereof, when the grippers are moved outward to release the bag which then passes from between the rolls N and P and then passes fold first between the rolls P and Q which also press the end portion of the bag against the major portion thereof and finish the operation.

In lieu of a paste-bar yieldingly pressed outward by a spring or analogous device, as described, the paste-bar R' of Figs. 7 and 8 may be employed in combination with a roll M' and members M^2 in which the end portions of the roll are arranged to turn. The said members M^2 are designed to be held against rotation in the frame A and the roll

M' , which will be used in lieu of the roll M, is provided with a longitudinal slot a^3 to receive the paste-bar R' which terminates within the roll in outwardly reaching end portions a^4 . These latter are disposed in eccentric or cam grooves a^5 in the heads M^2 with the result that incidental to each revolution of the roll M' the paste-bar will be positively moved outward and inward, after the manner shown by full and dotted lines in Fig. 8.

In Fig. 6 we have illustrated a modified embodiment of our invention in which a paste-bar R (similar to that of Figs. 1 to 2^a) is carried by a roll M^4 , positioned under a paste-supplying roll L (similar to that of Fig. 2) and over a plain roll N^2 , and superposed rolls M^5 and N^3 are arranged in rear of the rolls M^4 and N^2 , while superposed rolls P' and Q' are located in rear of the roll N^3 and the roll P' adjacent thereto. The roll M^5 carries a tucker or creaser S^2 (similar to the tucker or creaser S of the roll M in Fig. 2) and the roll N^3 is provided with a groove S^3 (similar to the before described groove S') and is equipped with grippers T' (similar to the grippers T of Figs. 2 to 5). In the practical operation of the said modified construction, the bar R applies paste to the bag incidental to the passage of the same between the rolls M^4 and N^2 , and the bag is engaged by the grippers T' immediately behind the tucking or creasing of the bag by the coöperating blade S^2 and groove S^3 . When the tuck or crease passes from between the rolls M^5 and N^3 the end portion of the bag flies up while the grippers T' hold the body portion of the bag until a point between the rolls N^3 and P' is reached. In consequence of this it will be manifest that a fold will be presented to the rolls N^3 P' which will press the end portion of the bag against the body portion thereof to effect the bottoming of the bag. The grippers T' then release the bag, after which the same passes fold first between the rolls P' Q' which also press the end portion of the bag against the major portion thereof.

It will be gathered from the foregoing that our improvements are simple and compact in construction and reliable in operation and that because of the latter quality are calculated to contribute greatly to the capacity of a paper-bag making machine; and it will also be observed that as a whole the improvements are strong and durable and hence well adapted to withstand the rough usage to which paper-bag making machinery is ordinarily subjected.

The constructions herein illustrated and described constitute the best practical embodiments of our invention of which we are cognizant, but it is obvious that in the future practice of the invention such changes or modifications may be made in the form, con-

struction and relative arrangement of parts as fairly fall within the scope of our invention as defined in the claims appended.

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

1. In a machine for making paper bags, the combination of a paste-receptacle having an eduction orifice, a paste-supply roll disposed under the receptacle and controlling said orifice and arranged to receive paste by gravity from the receptacle, a roll provided with a paster which is movable radially with respect thereto and is arranged to wipe paste from the paste-supply roll and apply the same to stock, a second roll, means for forming a transverse tuck or crease in stock, means on the second roll for taking hold of the stock behind the tuck or crease and holding the stock through a part of a revolution of the roll, and means arranged to coöperate with the second roll and press the portion of stock at one side of the tuck or crease against the portion of the stock at the opposite side thereof.

2. In a machine for making paper bags, the combination of a frame having sides, means for feeding stock longitudinally thereof, a longitudinally-disposed shaft located at one side of the frame, a striker or cutting-off device fixed with respect to said shaft and arranged to intersect the path of the stock, and a guard or shield comprising a plate fixed to and extending laterally outward from one side of the frame at one side of and adjacent to the striker and having a marginal flange, and a trough extending between the sides of the frame and joined to the said plate.

3. In a machine for making paper bags, the combination of a frame having sides, means for feeding stock longitudinally thereof, a longitudinally-disposed shaft located at one side of the frame, a striker or cutting-off device comprising a body fixed on the shaft, and a blade corresponding in length to about one half the diameter of the body and extending from the perimeter of said body and arranged to intersect the path of the stock, and a guard or shield comprising a plate fixed to and extending laterally outward from one side of the frame at one side of and adjacent to the striker and having a marginal flange, and a trough extending between the sides of the frame and joined to the said plate.

4. In a machine for making paper bags, the combination of a frame, a roll, an element carried by and movable with respect to said roll, a bearing member secured against turning and receiving and housing one end of the roll, and coöperating means contained in the member and on the movable element for moving the latter with respect to the roll by the former.

5. In a machine for making paper bags, the combination of a frame, a roll, an element carried by and movable with respect to said roll, and a bearing member secured against turning and receiving and housing one end of the roll and having an interior cam groove receiving the said element and arranged to move the same with respect to the roll incidental to rotation of the roll.

6. In a machine for making paper bags, the combination of a frame, a roll, a gripper carried by the roll and movable endwise with respect thereto, and a bearing member secured against turning and receiving and housing one end of the roll and having an interior cam groove receiving a portion of the gripper longitudinally and arranged to move said gripper inward and outward with respect to the roll incidental to rotation of the roll.

7. In a machine for making paper bags, the combination of a frame, a longitudinally-grooved roll, a longitudinally movable gripper disposed in said groove of the roll and having an inner stock-engaging portion projecting radially beyond the perimeter of the roll and also having an outer angularly-disposed portion, and a bearing member secured against turning and receiving and housing one end of the roll and having an interior cam-groove receiving the said angularly disposed portion of the gripper longitudinally and arranged to move the gripper inward and outward with respect to the roll incidental to rotation of the roll.

8. In a machine for making paper bags, the combination of a frame, a roll having longitudinal grooves in its perimeter at opposite sides of its transverse center, grippers movable in said grooves and having inner stock-engaging portions and outer angularly-disposed portions, and bearing members secured against turning in the frame and having circular portions in the inner sides of which are cam-grooves receiving the angularly-disposed portions of the grippers, the said circular portions of the bearing members receiving and housing the ends of the roll.

9. In a machine for making paper bags, the combination of a roll, means for forming a transverse tuck or crease in stock, means for applying paste to the stock, means on the roll for taking hold of the stock behind the tuck or crease and holding the stock through a part of a revolution of the roll, a second roll arranged to coöperate with the first-mentioned roll to press the portion of the stock at one side of the tuck or crease against the portion of the stock at the opposite side thereof, and means arranged to coöperate with the second mentioned roll to further press said portions of stock together.

10. In a machine for making paper bags, the combination of a roll, means for forming

a transverse tuck or crease in stock, means for applying paste to the stock, means on the roll for taking hold of the stock behind the tuck or crease and holding the stock through
5 a part of a revolution of the roll, a second roll arranged to coöperate with the first mentioned roll to press the portion of the stock at one side of the tuck or crease against the portion of the stock at the opposite side
10 thereof, and a third roll arranged to coöperate with the second mentioned roll to further press said portions of stock together.

11. In a machine for making paper bags, the combination of a roll, another roll pro-
15 vided with means for forming a transverse tuck or crease in stock during the passage of the same between the rolls, means for applying paste to the stock, means on the first mentioned roll for taking hold of the stock
20 and holding the stock through a part of a revolution of the roll, a third roll arranged to coöperate with the first mentioned roll and press the portion of stock at one side of the tuck or crease against the portion of
25 the stock at the opposite side thereof, and means for coöperating with the third roll

to again press said portions of stock together.

12. In a machine for making paper bags, the combination of a roll, another roll pro- 30
vided with means for forming a transverse tuck or crease in stock during the passage of the same between the rolls, means for applying paste to the stock, means on the first mentioned roll for taking hold of the stock 35
and holding the stock through a part of a revolution of the roll, a third roll arranged to coöperate with the first mentioned roll and press the portion of stock at one side of the tuck or crease against the portion of 40
stock at the opposite side thereof, and a fourth roll for coöperating with the third roll to again press said portions of stock together.

In testimony whereof we have hereunto 45
set our hands in presence of two subscribing witnesses.

MONTEFIORE LEWIS HIRSCH.

MAURICE H. EICHBERG.

Witnesses:

H. M. GURISON,

MORRIS PETERS.