No. 716,859.

Patented Dec. 30, 1902.

W. BROWN.

PAPER BAG MACHINE.

(Application filed Jan. 26, 1901.)

(No Model.)

2 Sheets—Sheet I.

Fig. 1.

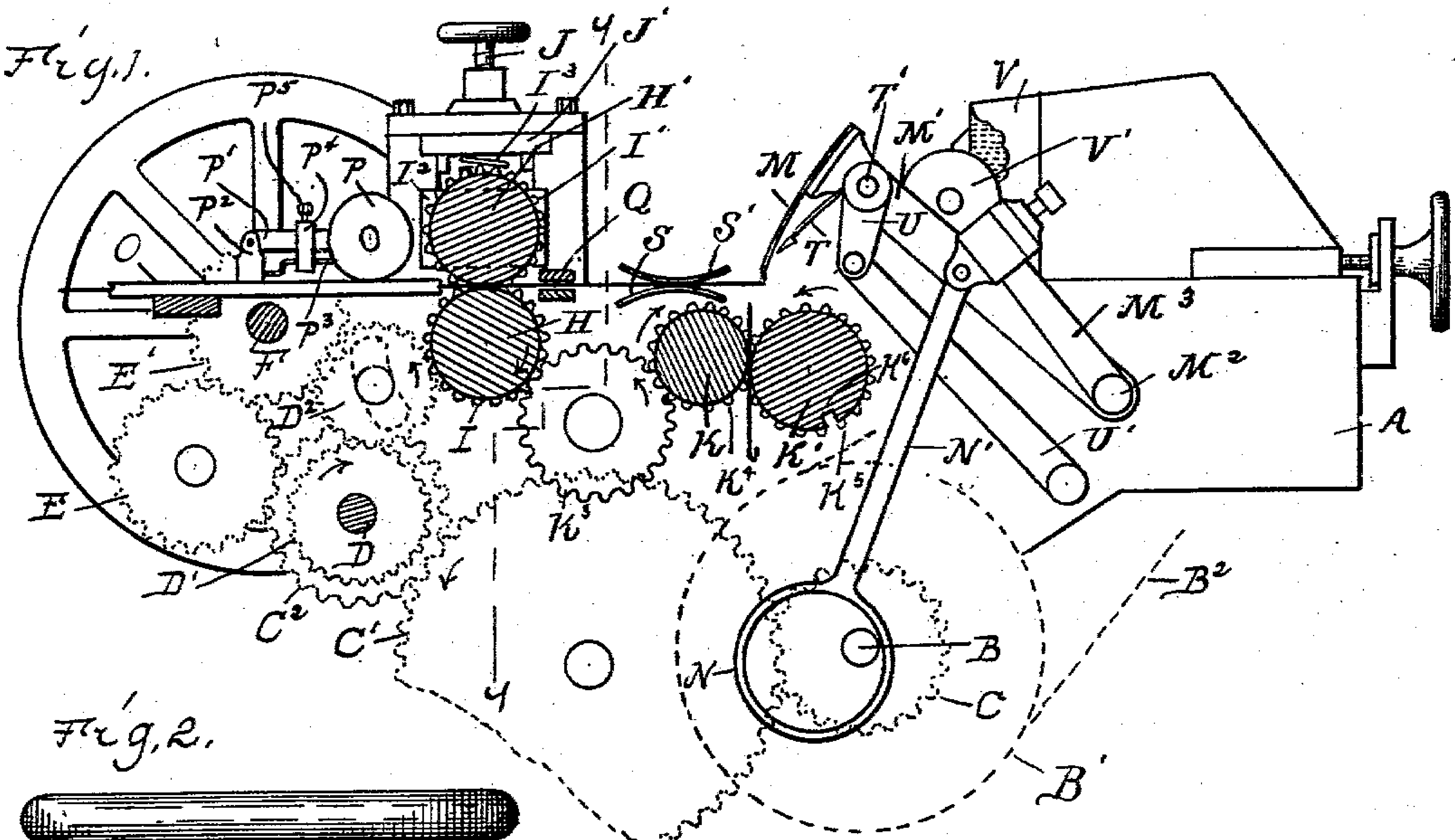
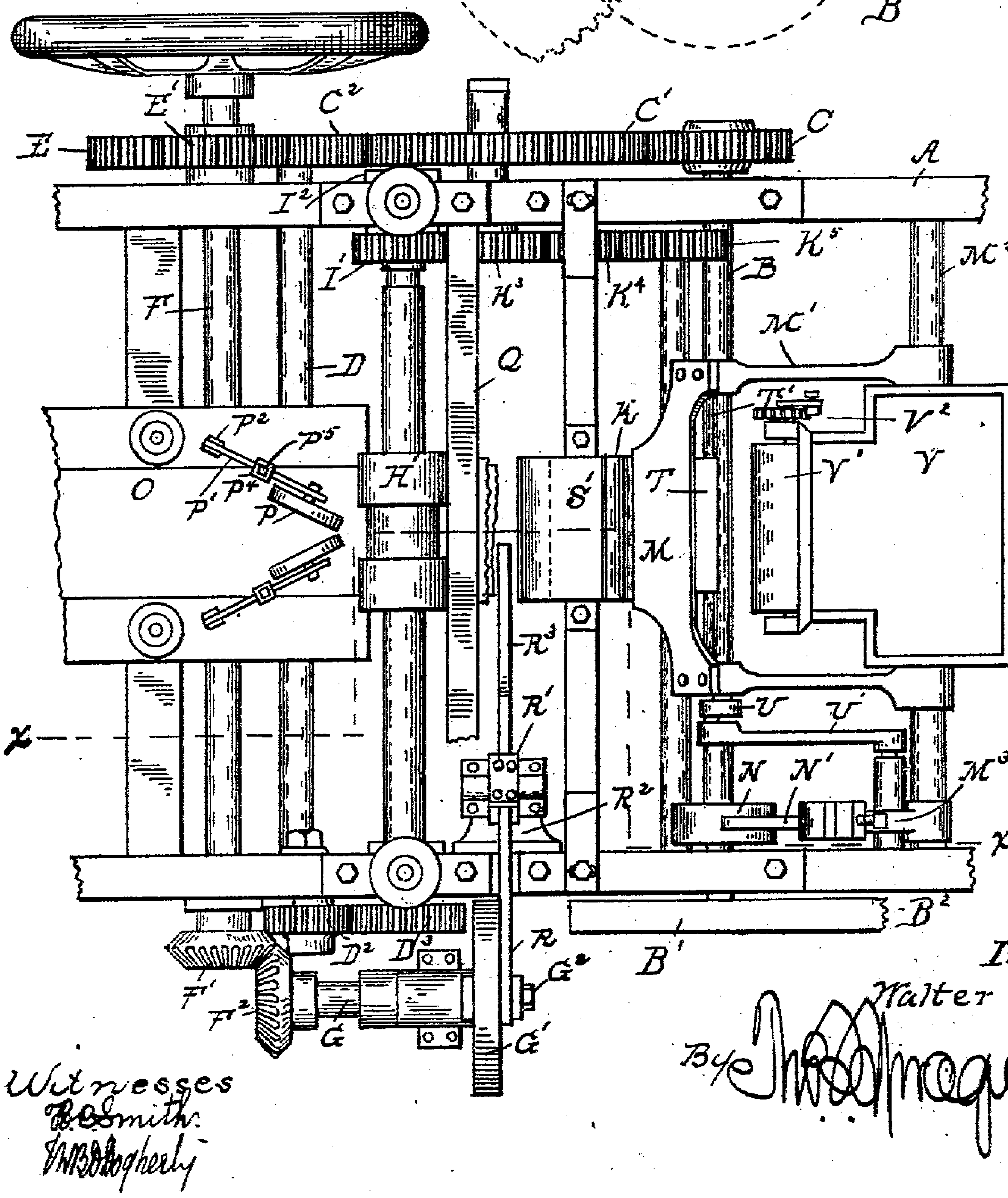


Fig. 2.



Witnesses
B. C. Smith.
W. B. Dougherty

Inventor
Walter Brown
By Thos. S. Sprague & Son.
Attys.

No. 716,859. Patented Dec. 30, 1902.

W. BROWN.

PAPER BAG MACHINE.

(Application filed Jan. 26, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

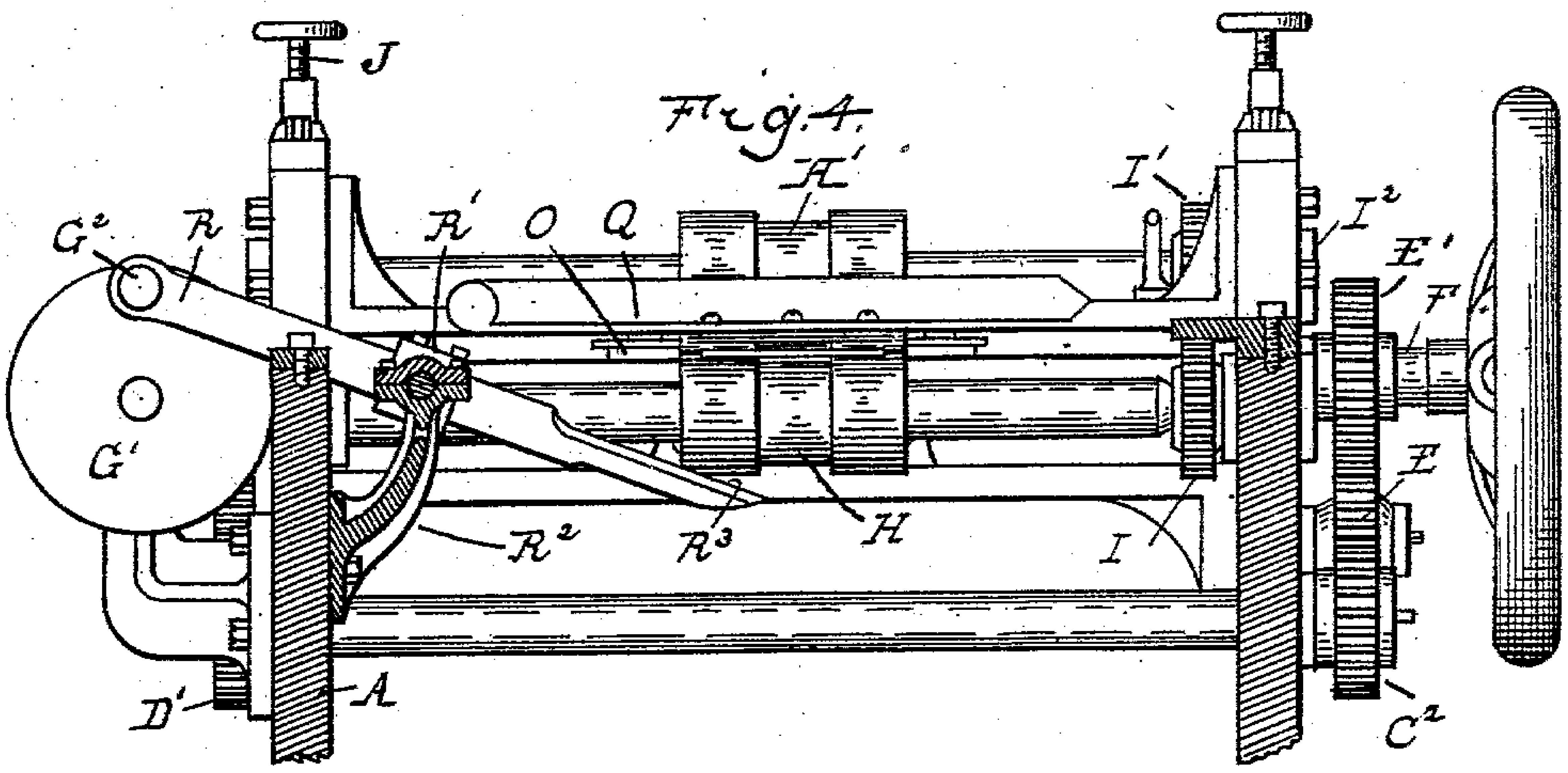


Fig. 6.

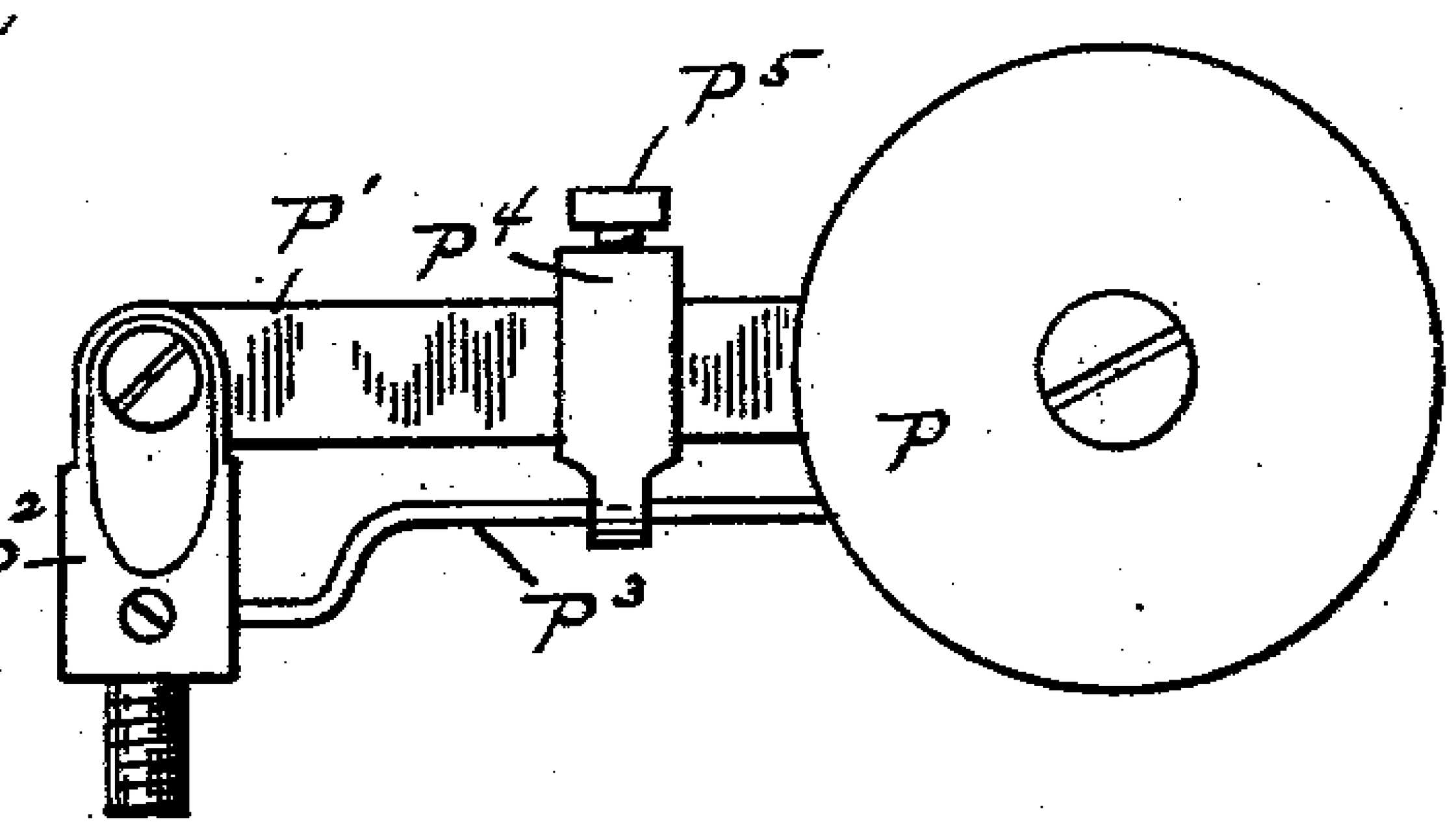


Fig. 3.

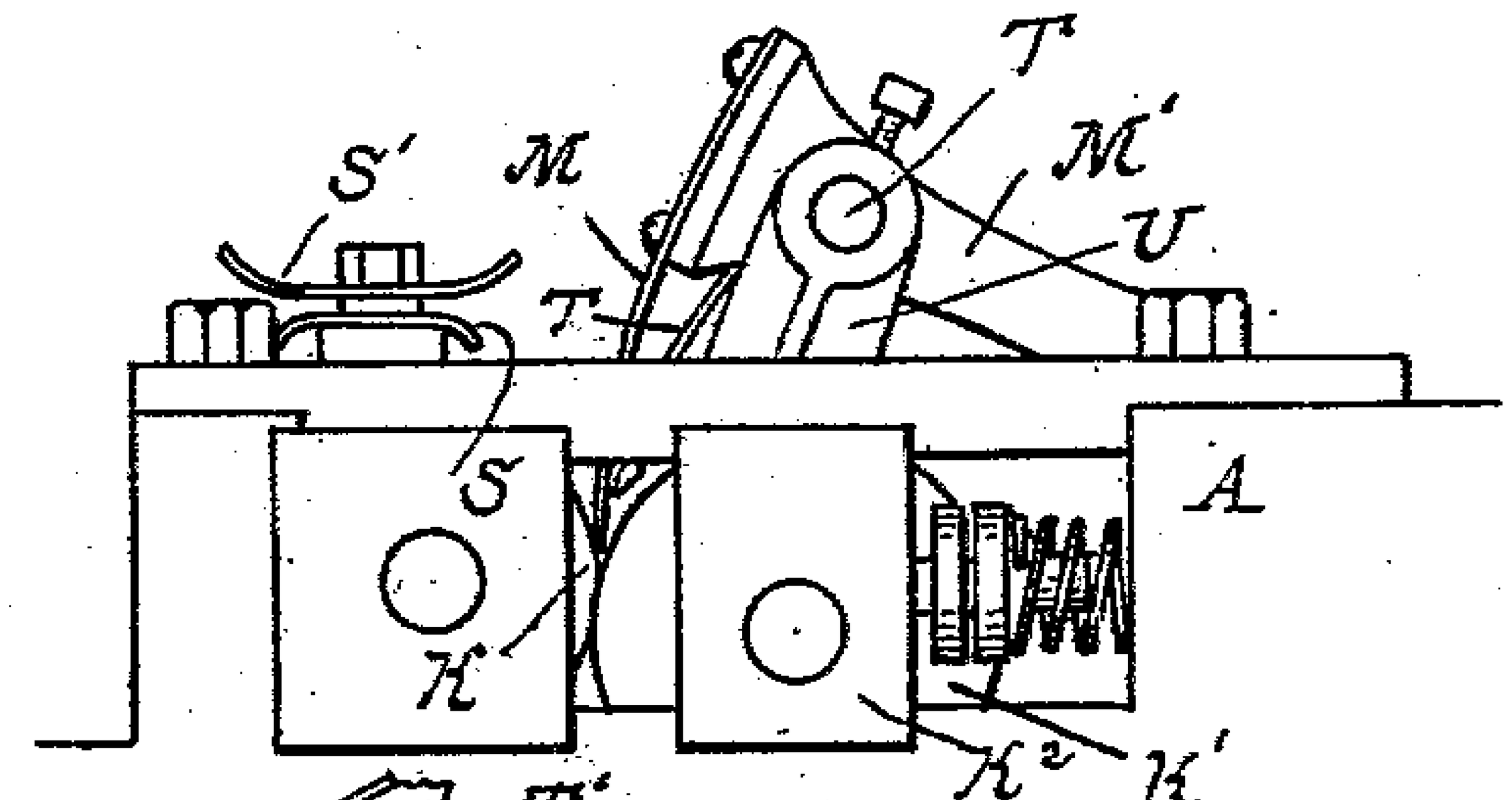
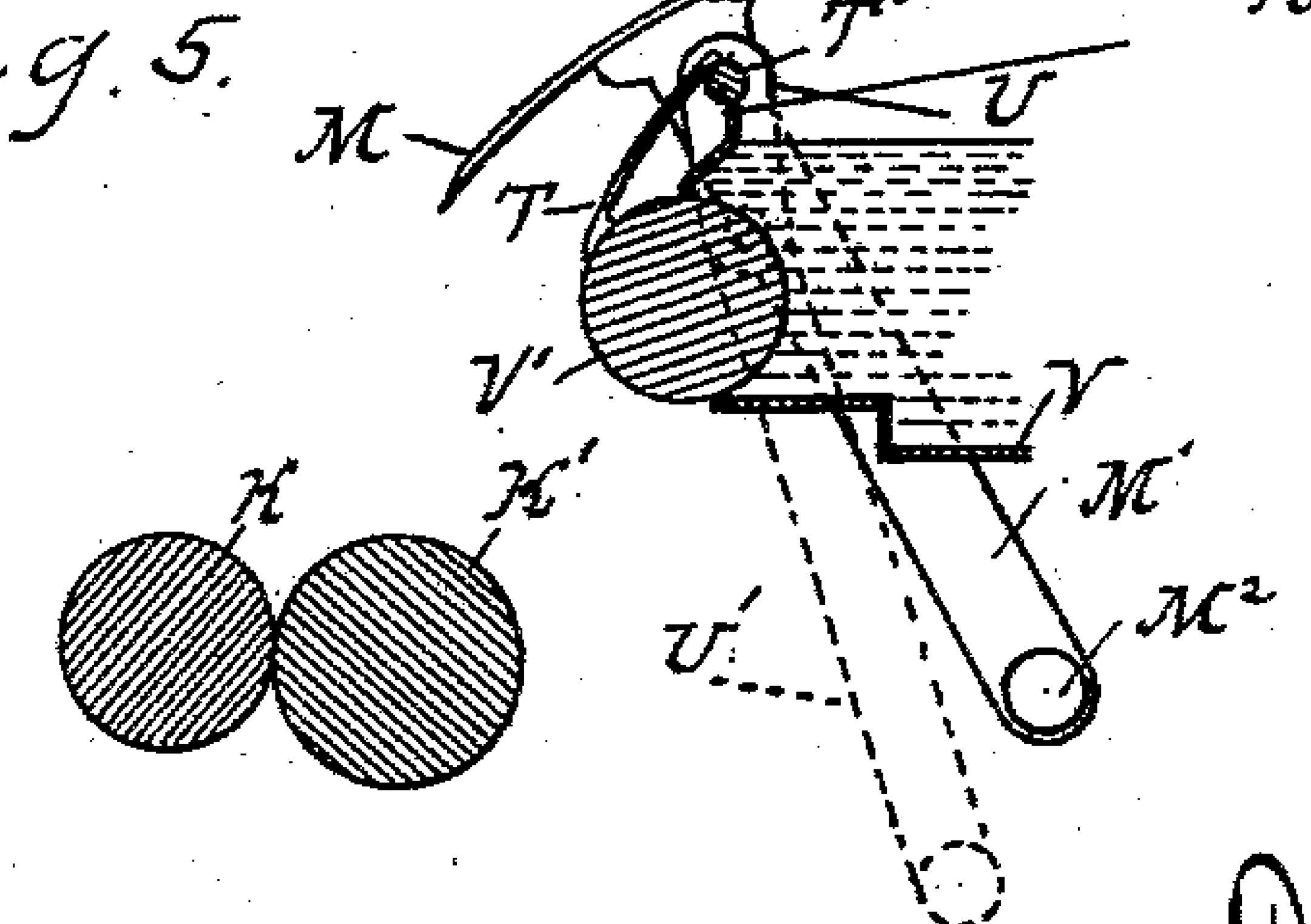


Fig. 5.



Witnesses
H. C. Smith
M. B. O'Dogherty

Inventor
Walter Brown
By Thos. S. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WALTER BROWN, OF ELKHART, INDIANA, ASSIGNOR TO THE NATIONAL MANUFACTURING COMPANY, OF ELKHART, INDIANA, A CORPORATION OF INDIANA.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 716,859, dated December 30, 1902.

Application filed January 26, 1901. Serial No. 44,860. (No model.)

To all whom it may concern:

Be it known that I, WALTER BROWN, a citizen of the United States, residing at Elkhart, in the county of Elkhart and State of Indiana, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to paper-bag machines of that class designed for making square or flat bags having tucked bottoms.

It is the object of the invention to obtain a machine in which the paper tube is fed continuously and at uniform velocity and is severed into proper lengths and the bottoms of the bags are formed without interruption.

The invention therefore consists, first, in the peculiar construction of a machine provided with uniformly-rotating feed and tucker rolls and a cut-off intermediate said rolls; further, in the peculiar construction and arrangement of said cut-off and its operating mechanism; further, in the means employed for preventing interference between succeeding lengths of the paper tube; further, in the construction and arrangement of the tucking and pasting appliances, and, further, in the peculiar construction, arrangement, and combination of parts, as hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section through the machine substantially on line *x x*, Fig. 2. Fig. 2 is a top plan view thereof. Fig. 3 is a front elevation of a portion of the machine. Fig. 4 is a cross-section on line *y y*, Fig. 1. Fig. 5 is a longitudinal section through the tucking and pasting appliances, and Fig. 6 is a detached elevation of one of the presser guide-rolls.

A is a suitable frame supporting the operating mechanism.

B is a drive-shaft journaled in bearings in the lower part of the frame and deriving its power from any suitable source by a drive connection, such as a pulley B′ and belt B^2. The shaft B is connected by a train of gearing, comprising the gear-wheels C, C′, and C^2, with a shaft D, journaled in bearings near the central part of the machine. The gear-wheel C^2 is connected by an intermediate gear E with a gear-wheel E′ on the shaft F, which extends transversely across the frame parallel to but above the plane of the shaft D. At its opposite end the shaft F is connected, through the medium of the miter gear-wheels F′ F^2, with a shaft G, extending longitudinally of the frame and arranged at one side thereof.

The particular construction and arrangement of the parts thus far described is not essential to the invention, as they merely form a suitable drive mechanism for the operating parts, which are constructed as follows: H and H′ designate a pair of feed-rolls journaled in bearings arranged in a vertical plane and near the top of the frame. These rolls are connected to each other by intermeshing gears I I′ on one side of the frame, and the upper roll is journaled in vertically-slidable bearings I^2, having springs I^3 for pressing the roll in contact with the lower one. The tension of these springs may be altered by adjusting-screws J, which actuate a block J′, against which the upper ends of the springs abut. The roll H is driven from the shaft D by a train of gearing comprising the gear-wheels D′, D^2, and D^3. The gear-wheel D′ is removable and may be replaced with gears of various sizes, thus constituting a change-gear, while the intermediate gear D^2 is adjustable in position to permit of this change.

In rear of the rolls H H′, and preferably arranged centrally of the frame of the machine, are the tucker-rolls K K′. These rolls are arranged below the feeding plane of the rolls H H′ and are adapted to feed downward. One of the rolls K′ is journaled in spring-pressed bearings K^2, which yieldingly hold it in contact with the roll K. It is also readily removable to permit of exchanging it for rolls varying in diameter. The tucker-rolls K K′ are driven by a gearing, the gears K^3, K^4, and K^5 connecting them with a roll H, and this gearing is so proportioned that the rolls H, K, and K′ are given the same peripheral speed.

M is a tucker which consists of a segmental blade connected to a rock-frame M′ and adapted to be moved so as to press the paper strip

into engagement with the rolls K K′, and thereby form the fold or tuck. The rock-frame M′ is attached to a rock-shaft M^2, which is connected to the mechanism for intermittently actuating the same. As shown, this connection comprises an eccentric N on the drive-shaft B, connected by a link N′ with a rock-arm M^3 on the rock-shaft M^2.

O is a guide or forming device for the paper tube, arranged in front of the feed-rolls H H′ and from which the paper tube is adapted to be continuously fed by said rolls. This guide is of a form to deliver the flattened tube with its opposite edges folded in, as is usual with paper-bag machines of this class. In order to draw the tube tightly around the guide or forming plates before it leaves the same and enters between the rolls H H′, I preferably provide a pair of presser-rolls P. These rolls are journaled at the free ends of the arms P′, which are pivoted at their opposite ends to a stationary support, such as the post P^2, secured to the guide O. Each of the arms P′ is pressed downward by the spring P^3, which is secured at one end to the post P^2 and is connected to the arm P′ by means of the yoke P^4. This yoke is adjustably secured to the arm P′ by a set-screw P^5, whereby an adjustment of said yoke outward or inward on the arm P′ will vary the tension of the spring thereon.

Immediately in the front of the rolls H H′ is preferably arranged a guide Q for the flattened paper tube, and between this guide and the tucker mechanism is arranged an intermittently-actuated cut-off, preferably of the following construction: G′ is a disk secured to the forward end of the shaft G and arranged in a plane slightly in front of the guide Q. This disk is provided with a crank-pin G^2, to which is pivotally connected the rod or arm R. The latter is slidingly supported in a bearing R′, which is pivotally secured in a bifurcated bracket R^2, secured to the frame. The free end of the rod R has formed on the upper side thereof a cutting edge R^3, which is of sufficient length to extend completely across the flattened paper tube. The parts just described are so arranged that the rotation of the crank-pin G^2 will cause the arm R to first be projected beneath the paper tube and then be moved quickly upward to sever said tube. The further movement of the crank will cause the withdrawal of the arm, so as to clear the path of the tube before the blade is again moved downward.

With the arrangement of parts as thus far described it will be readily understood that the paper tube is fed continuously and with uniform velocity from the guide O to the feed-rolls H H′ and from said rolls to a position between the tucker-plate M and the tucker-rolls K and K′. The timing of the mechanism is such that as the end of the tube is fed beneath the tucker-plate the latter is caused to descend by the operation of the eccentric N, link N′, rock-arm M^3, rock-shaft M^2, and rock-frame M′. As the plate M descends it will press the paper tube downward, making the fold therein and pressing the same into contact with the tucker-rolls K K′, which feed the folded strip downward. When the proper length of tube is fed from the rolls H H′ to form a bag, the blade R^3 is moved upward, as before described, to sever the tube. This severing is accomplished by a quick movement of the blade, so as not to interfere with the continuous feeding of the tube, and as the blade is returned through a different path, clearing said tube, the latter may be fed forward without obstruction until again in position for tucking.

As the distance between the feed and tucking rolls is considerable, it is necessary to provide some intermediate support for the paper tube which will prevent the end from dropping, and thereby interfering with the preceding one. This I have shown as a guide or table S, having a cover S′, the tube being fed between the two. The ends of this guide are preferably flared, as shown, so that the end of the tube may easily enter in the space between. This guide serves to support the paper tube in the plane in which it is fed from the rolls H H′ until within a short distance of the tucker, and thus interference between the succeeding bag lengths is prevented. It is also made longitudinally adjustable by supporting it upon a cross-bar S^2, having slotted bearings for the securing-screws S^3.

For pasting the tucked end to the bag the following mechanism is provided: T is a paste-dasher, which is secured to a rock-shaft T′, journaled in bearings in the rock-frame M′, said dasher being provided with a wedge-shaped nose-piece. U is a rock-arm on the shaft T′, and U′ is a link pivotally connected to said rock-arm at one end and at its opposite end pivotally secured to the frame. V is a paste-receptacle arranged in rear of the tucker and dasher, which receptacle is provided at its forward side with a paste-roll V′, intermittently rotated by a ratchet V^2, having a suitable connection with the drive mechanism. The arrangement of the parts above described is such that when the frame M′ is rocked upward to withdraw the tucker M from the path of the paper tube the shaft T′ will be rocked in its bearings in said rock-frame by means of the rock-arm U and link U′, so as to press the wedge-shaped free end of the dasher against the paste-roll. When the frame M′ is rocked in the opposite direction, the dasher will be moved into a position with its free end in proximity to the wedge-shaped free end of the tucker, where the paste will be spread in the inner faces of the fold or tuck in the paper tube. Thus when the fold is pressed together by the rolls K K′ the paste will cause it to permanently adhere. In order to prevent the paste from being forced out from between the folded sections, the roll K′ is preferably provided with a lon-

gitudinal groove K^2, so arranged that it will register with the folded end of the bag and prevent the paste from being squeezed out onto the rolls.

The function of the rolls P is to draw the paper tube tightly around the longitudinal guide or forming strip before said tube is passed between the feed-rolls.

In the above specification and in the claims that end of the machine toward which the paper tube is fed is designated as the "front" of the machine.

The function of the guide-table S is to prevent interference between the rear end of each bag length and the forward end of the unsevered strip during the operation of tucking the latter. This is accomplished by reason of the fact that the unsevered portion of the strip is held by the table S in a plane at an angle to the plane of feed of said tucking-rolls and, further, because said guide terminates slightly in advance of said plane of the tucking-rolls. Thus in operation the adjajent ends of the severed and unsevered strip will remain in proximity to each other until the rear end of the guide-table is reached, at which point the end of the severed section will spring away from the following unsevered strip and will remain separated therefrom until completely fed between the tucking-rolls. This separation of the ends is caused by the spring of the paper, which tends to straighten the severed section into the plane of feed of the tucking-rolls.

What I claim as my invention is—

1. In a paper-bag machine, the combination with feed and tucking rolls rotating uniformly at the same speed, of a coöperating tucker for engaging the end of the unsevered strip fed from said feed-rolls with said tucking-rolls, a cutter for subsequently severing said strip between said feed and tucking rolls and means intermediate said cutter and tucking-rolls for causing said severed ends to separate.

2. In a paper-bag machine, the combination with feed and tucking rolls rotating uniformly at the same peripheral speed, of a coöperating tucker for engaging the end of the unsevered strip fed from said feed-rolls with said tucking-rolls, a cutter for subsequently severing said strip between the feed and tucking rolls and means intermediate said cutter and tucking-rolls for guiding the strip from said feed-rolls at an angle to the plane of feed of said tucking-rolls whereby the rear end of each severed length will be separated from the adjacent end of the unsevered strip by the spring of the paper.

3. In a paper-bag machine, the combination with feed-rolls rotating uniformly, of tucking-rolls traveling at the same peripheral speed arranged to feed at an angle to the plane of said feed-rolls, a coöperating tucker for engaging the end of the unsevered strip fed from said feed-rolls with said tucking-rolls, a cutter for subsequently severing said strip between said feed and tucking rolls and a guide intermediate said cutter and tucking-rolls comprising separate horizontally-arranged planes between which said strips are fed in substantially the plane of said feed-rolls, said upper guide-plate terminating in advance of the plane of feed of said tucking-rolls to permit the rear end of each length to separate from the adjacent end by the lateral spring of the paper.

4. In a paper-bag machine, the combination with the guide or forming strip around which the paper tube is fed, of a presser guide-roll comprising a pivoted arm, a roll journaled at the free end thereof, a spring-arm adjacent to said pivotal arm, and an adjustable yoke connecting said spring-arm and pivotal arm.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER BROWN.

Witnesses:
WARD O. COLLINS,
AGNES MYERS.