

W. F. WEST.
Paper Bag-Machines.

No. 151,258.

Patented May 26, 1874.

FIG. 1.

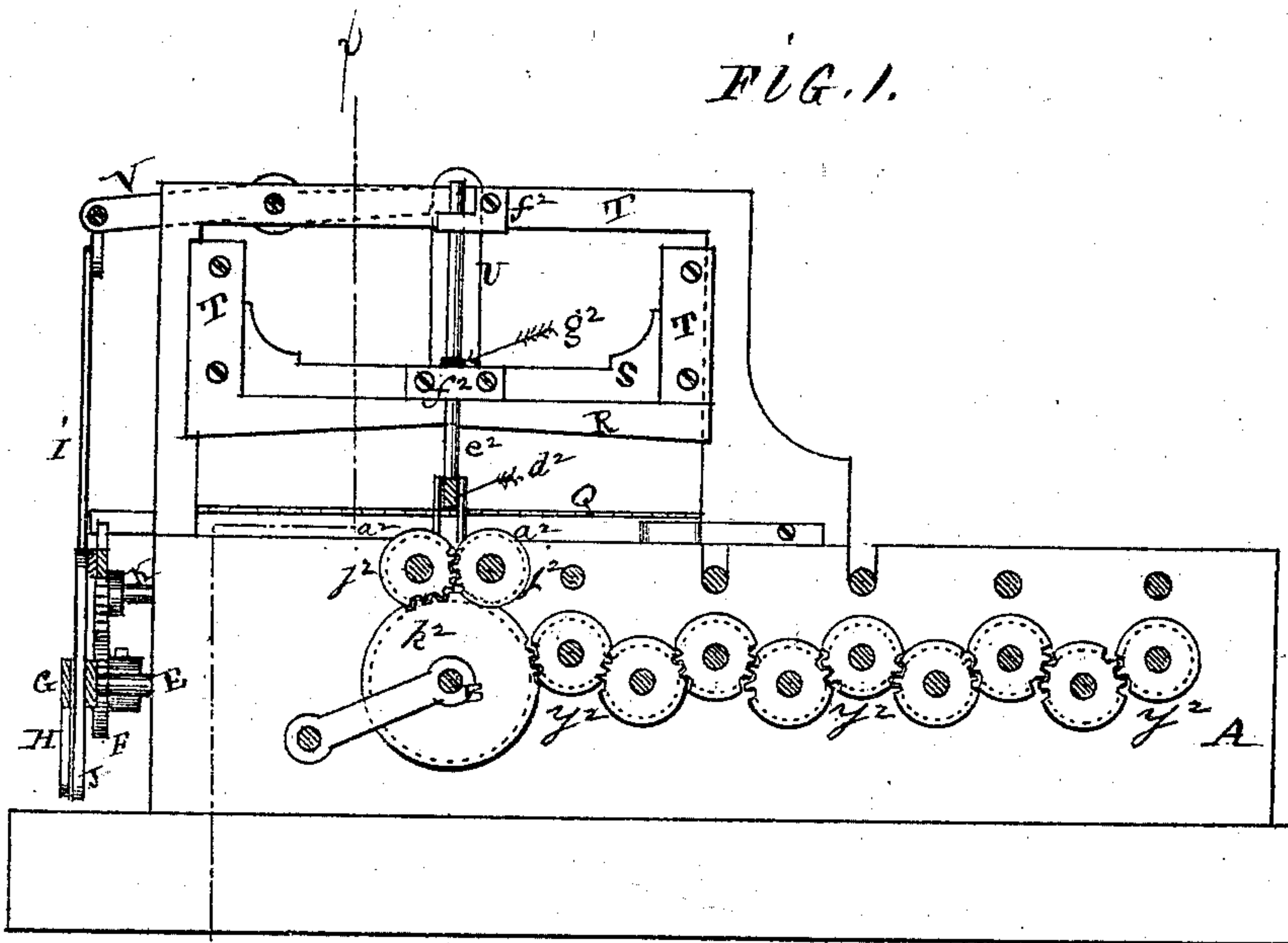
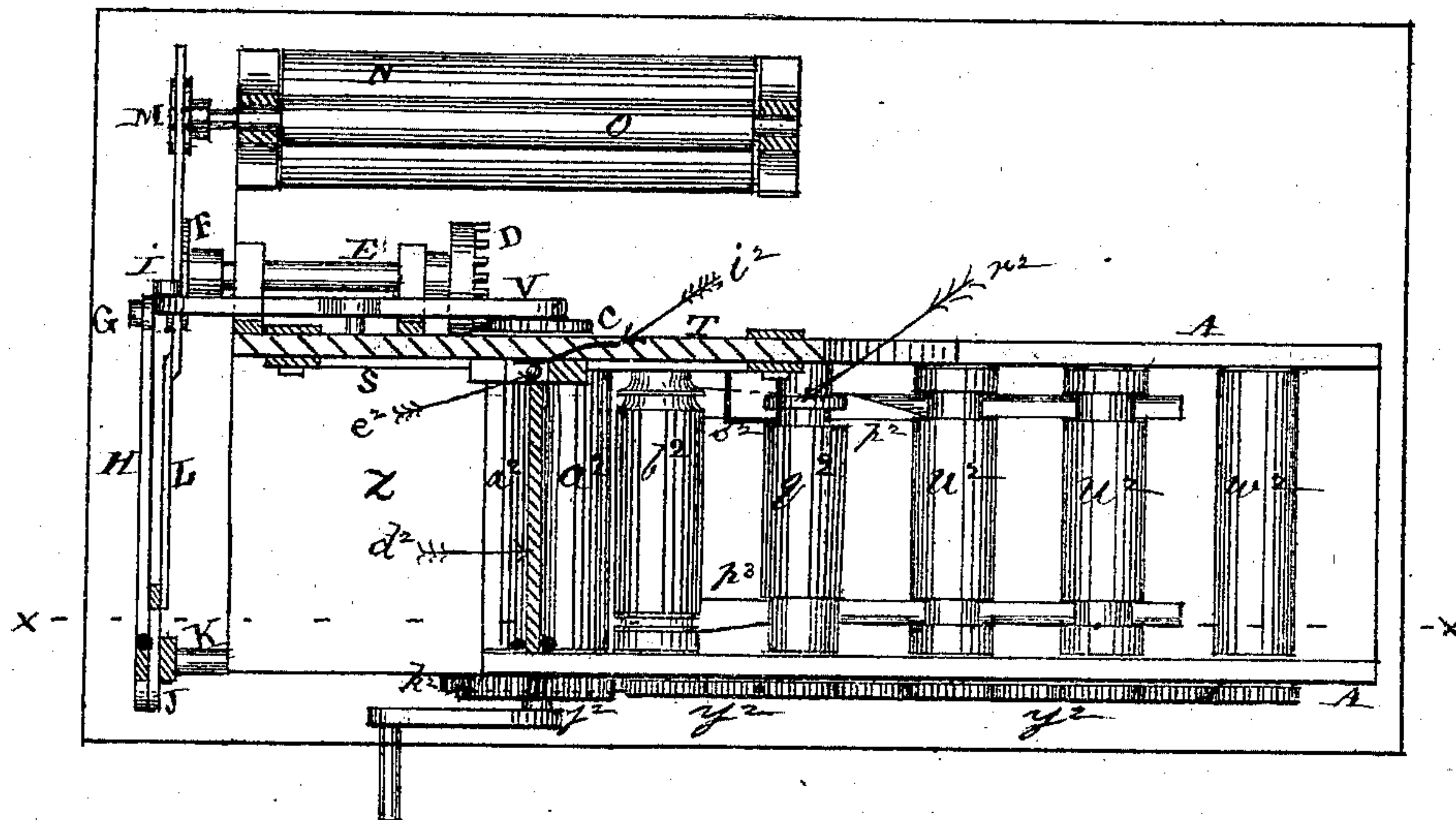


FIG. 2.



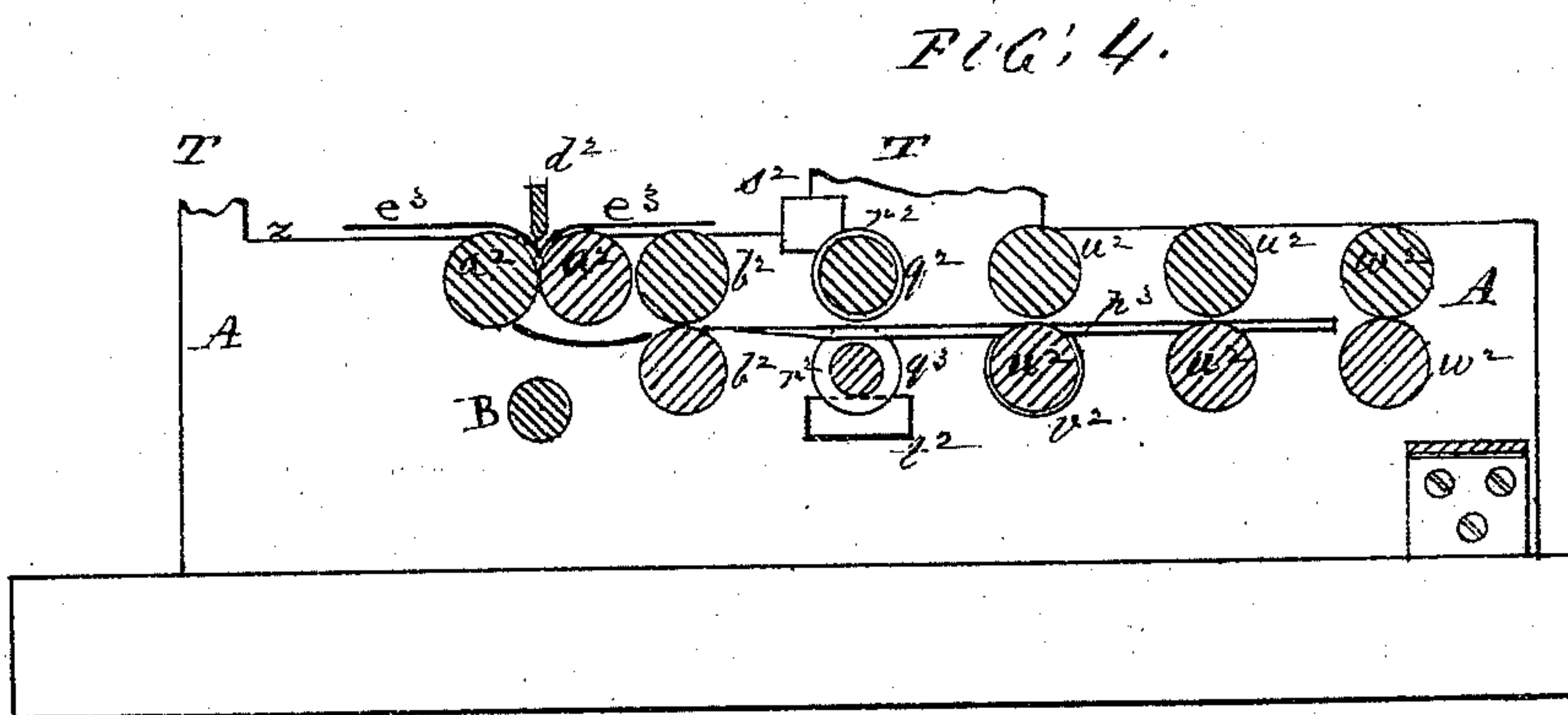
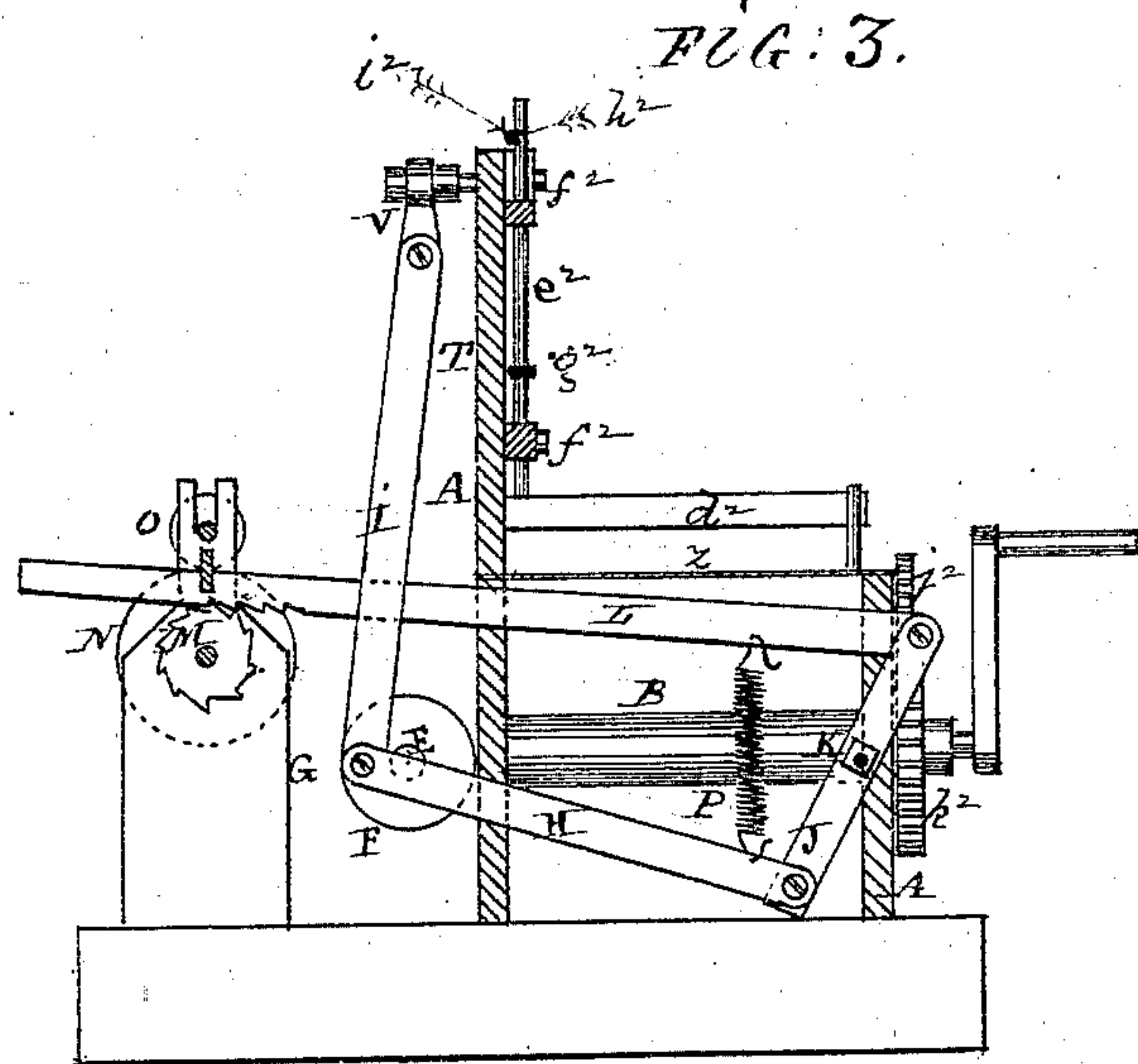
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FIG. 5.

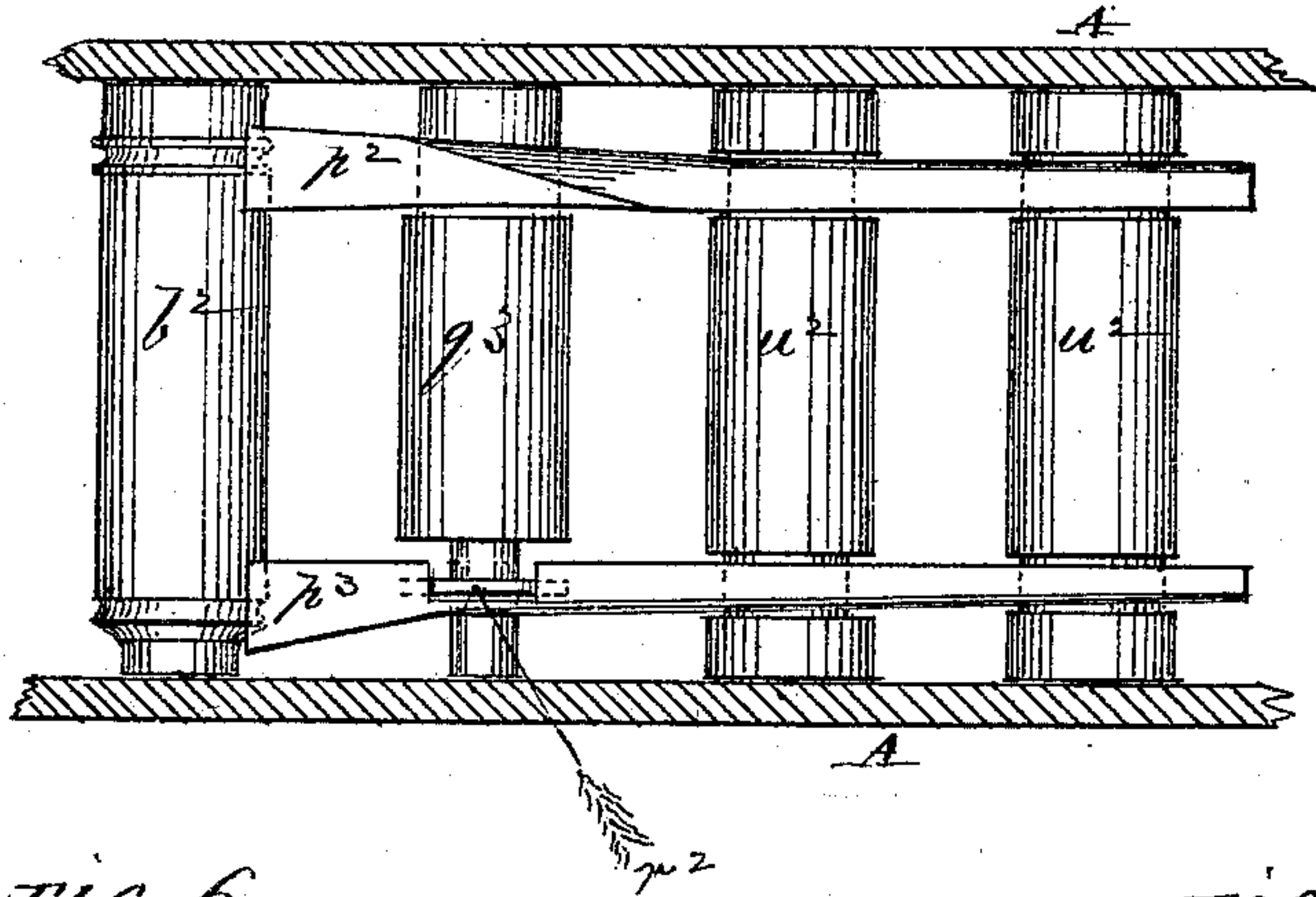


FIG. 6.

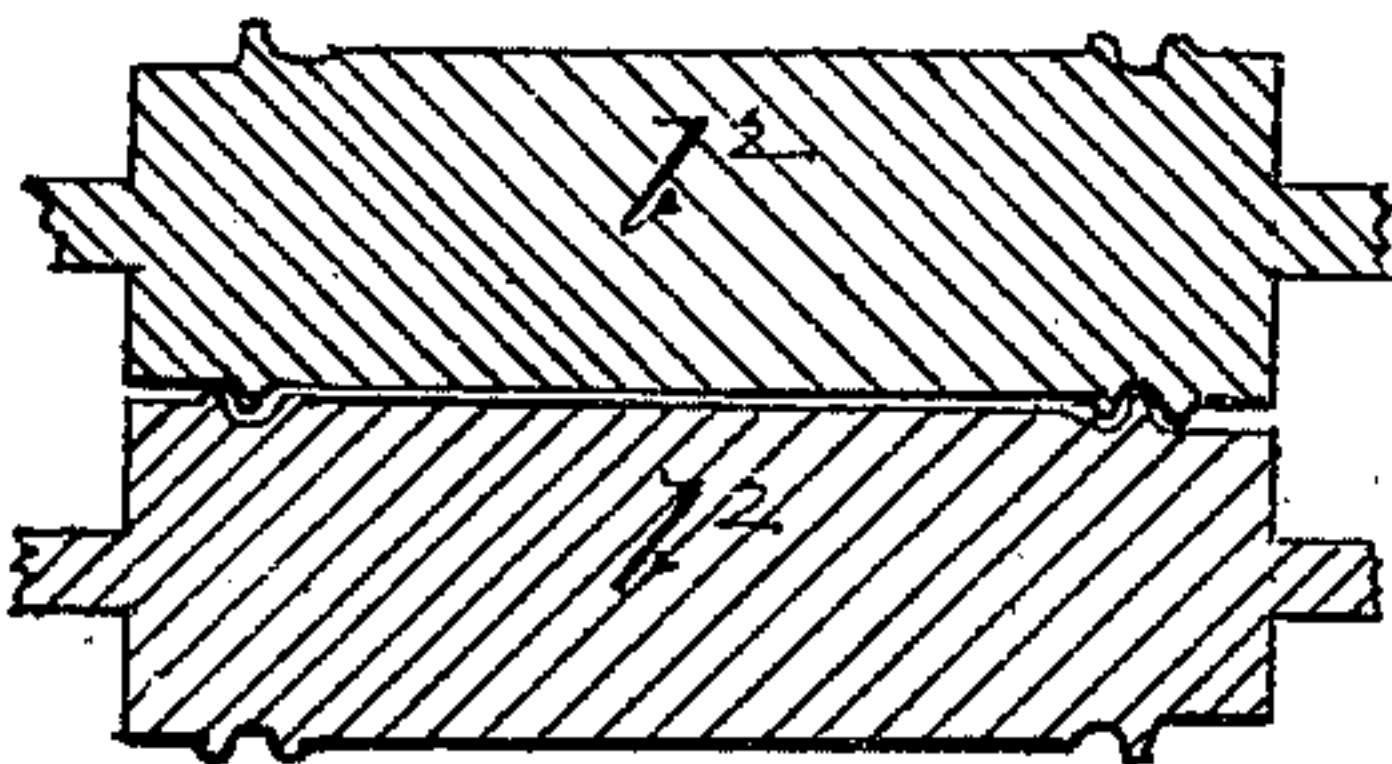


FIG. 7.

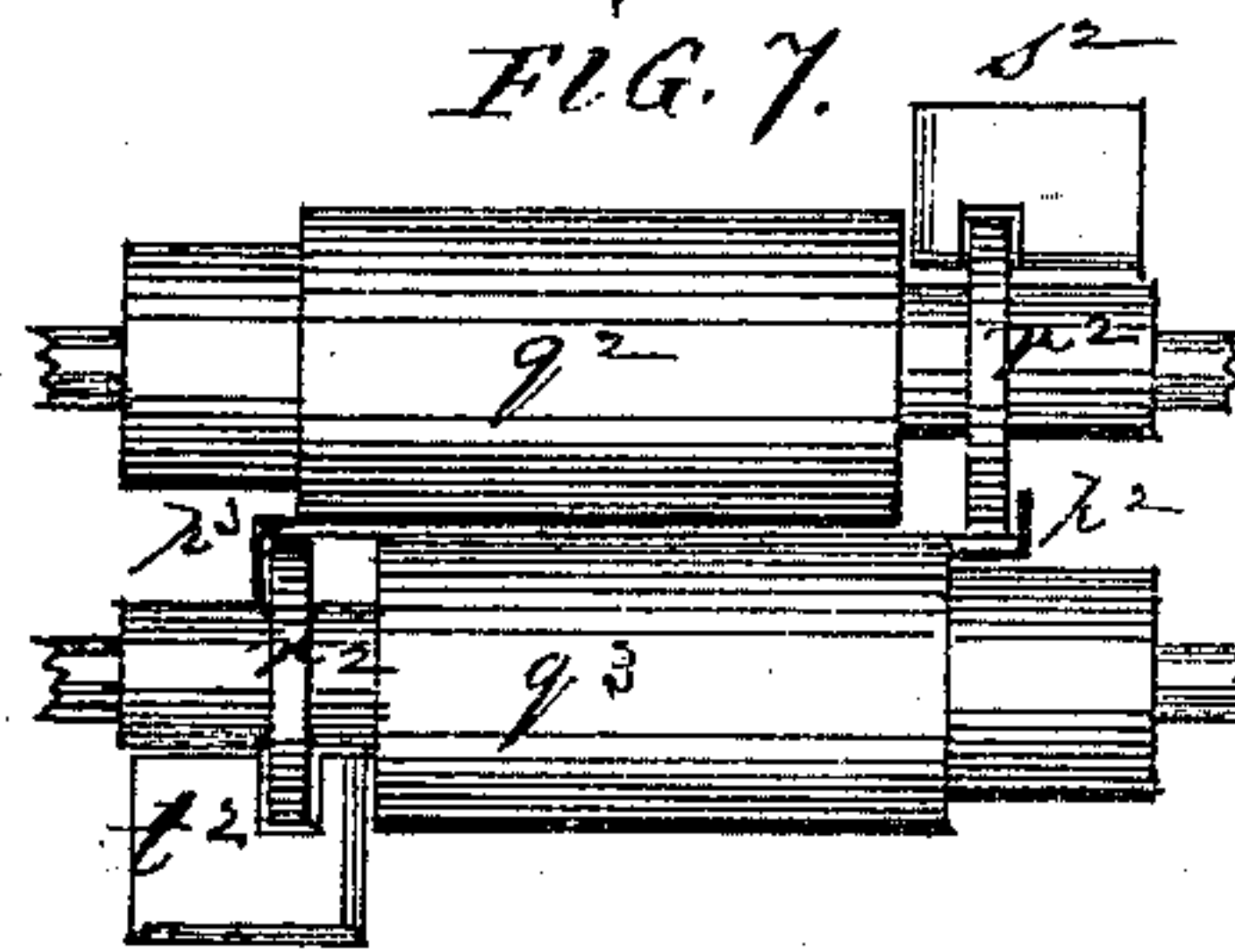


FIG. 8.

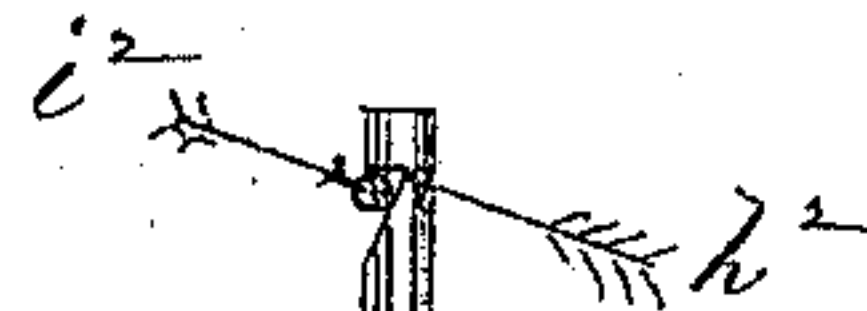
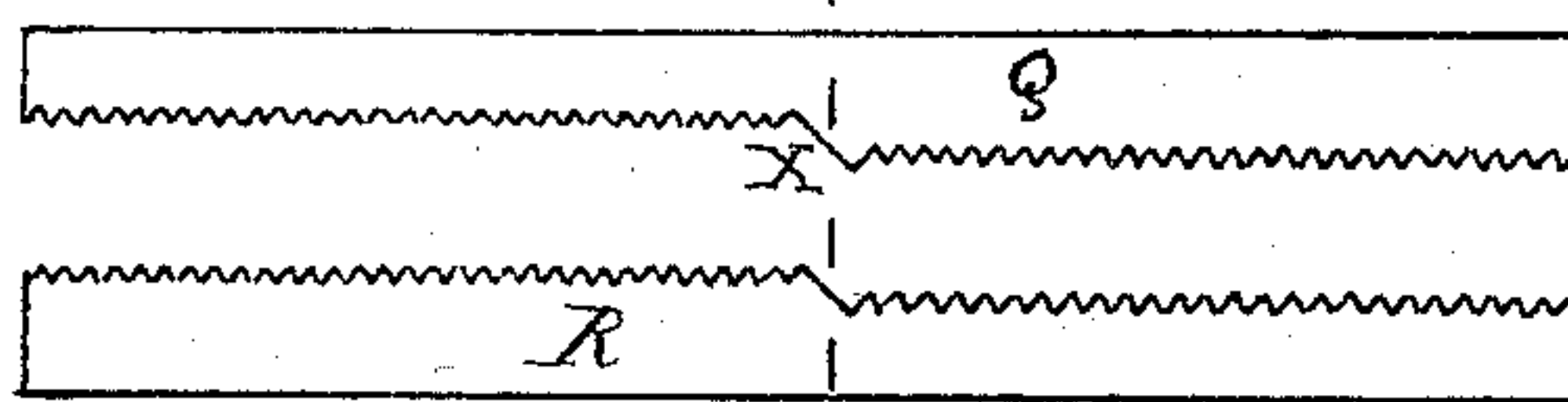


FIG. 9.

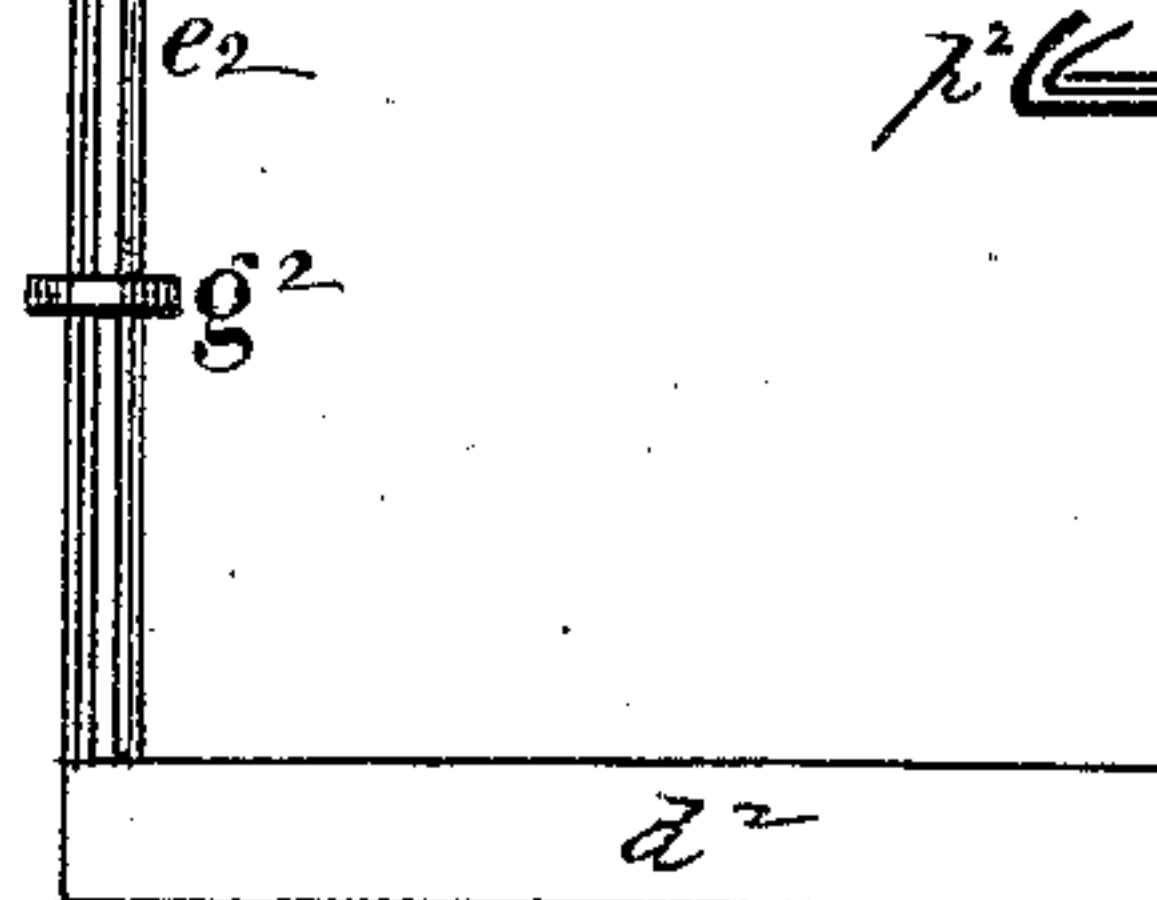
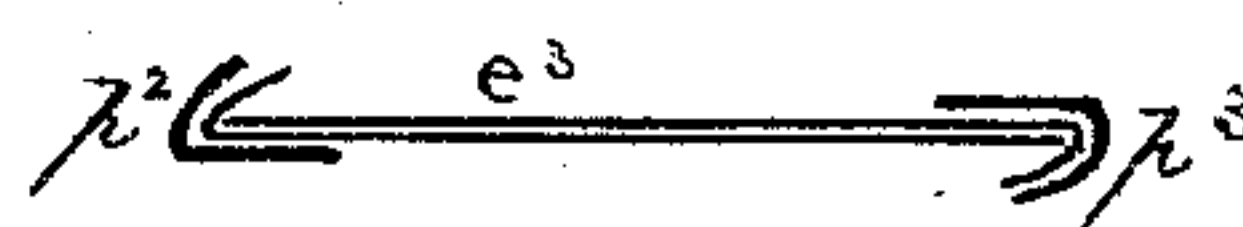


FIG. 10.



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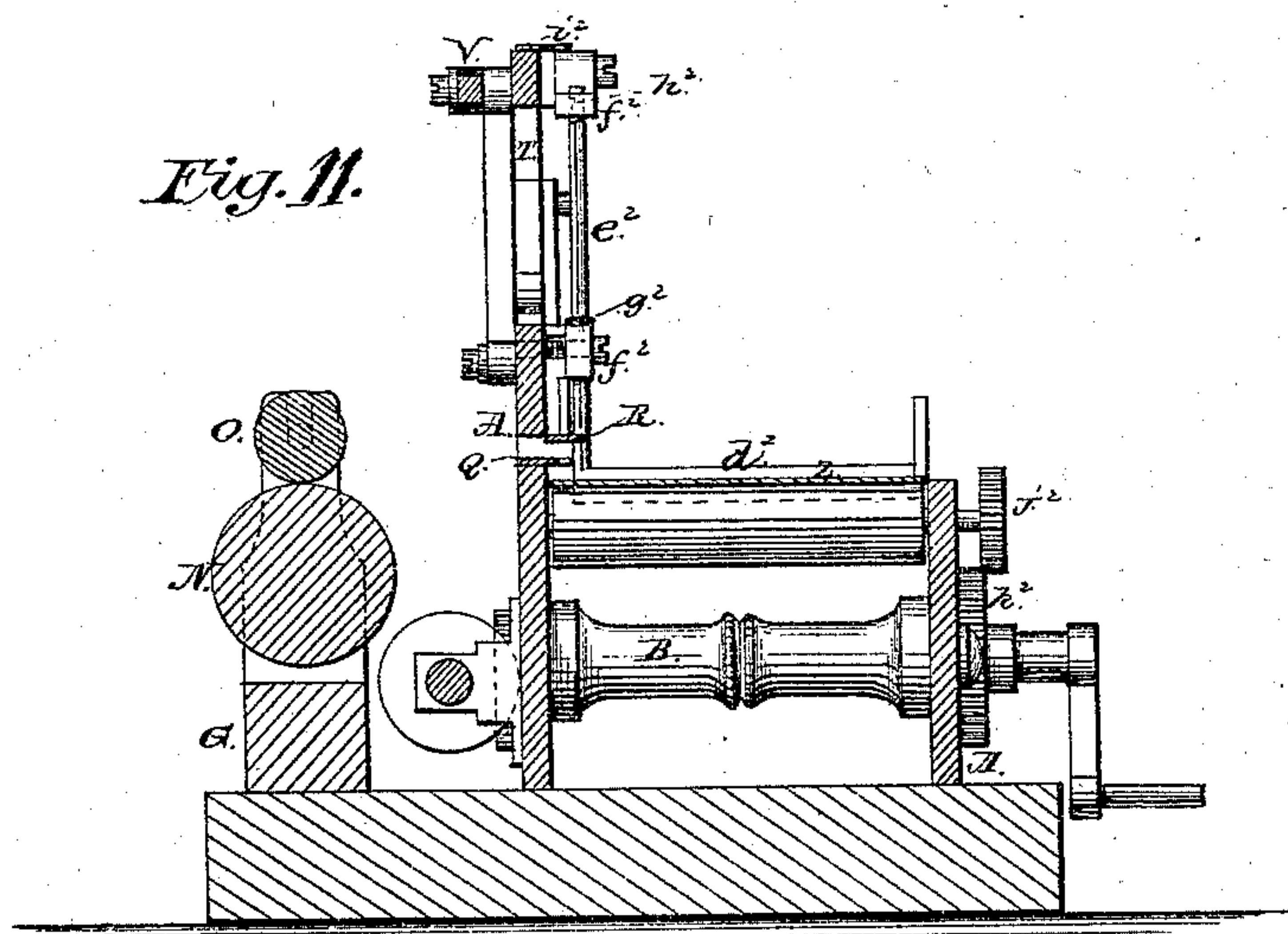
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Fig. 11.



Attest.

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UNITED STATES PATENT OFFICE.

WILLIAM F. WEST, OF HAVERSTRAW, ASSIGNOR OF ONE-HALF HIS RIGHT
TO THOMAS N. AVERY, OF COLD SPRINGS, NEW YORK.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. 151,258, dated May 26, 1874; application filed
December 5, 1873.

To all whom it may concern:

Be it known that I, WILLIAM F. WEST, of Haverstraw, Rockland county, State of New York, have invented an Improved Machine for Making Paper Bags, of which the following is a specification:

The object of my invention is to make a seamless-bottom paper bag from roll or sheet paper having the fiber or grain of the paper running transversely of the length of the bag, whereby the bag will be better able to bear the lateral strain upon it when filled with sugar, flour, or other articles than if the fiber of the paper run lengthwise of the bag, as they are commonly made; but to describe my invention more particularly, I will refer to the accompanying drawings forming a part of this specification, the same letters of reference, wherever they occur, referring to like parts.

Figure 1, Sheet 1, is a side elevation of the machine. Fig. 2, Sheet 1, is a plan view of the same. Fig. 3, Sheet 2, is an end view of the same. Fig. 4, Sheet 2, is a longitudinal sectional view of machine through the line x , Fig. 2, Sheet 1. Fig. 5, Sheet 3, is a plan view of the lower creasing, pasting, and carrying rollers and folders. Fig. 6, Sheet 3, is a detached sectional view of the creasing-rollers. Fig. 7, Sheet 3, is a detached view of the pasting-rollers. Fig. 8, Sheet 3, is a detached view of the paper-cutters. Fig. 9, Sheet 3, is a detached view of the paper-doubler. Fig. 10, Sheet 3, is an edge view of the paper to form the bag, showing the overlap to close its side seams, and the edge of the folders. Fig. 11 is a sectional view on line x of Fig. 1.

Letter A represents the frame of the machine, composed principally of two side pieces. Between these side pieces is arranged, in suitable bearings, a main propelling-shaft, B, having on its back end a cog-wheel, C, into which gears a face or bevel cog-wheel, D, on the end of a shaft, E, so as to rotate at right angles to the shaft B. The shaft E is secured in suitable bearings on the outer face of the back side piece, and extends outward just beyond the front end of the machine. On its outer end is secured a crank or eccentric wheel, F, to the crank-pin G of which is attached two connecting-rods, H and I. The rod H works on a horizontal line, or nearly so, and connects,

at its outer end, to the lower end of a lever, J, working on a center-pin, K, secured to the end of the machine. To the upper end of the lever J is attached a feed ratchet-bar, L, to engage in a feed ratchet-wheel, M, on the end of the shaft of the paper-roller N, arranged axially parallel with the sides of the frame of the machine, so as to deliver the paper from the continuous roll of paper at right angles to the doubling, folding, creasing, and pasting motions of the machine for making the bag. The object of delivering the paper at right angles to the rollers of the bag-forming devices is, first, for the purpose of utilizing the longitudinal strength of the paper, as compared with its transverse strength, owing to the fact that the fiber of which continuous rolls of paper are made run or lie more freely lengthwise of the continuous sheet, and therefore will resist a greater effort to tear it across the sheet of paper than will be required to tear it with the grain or lengthwise of the sheet; and as paper bags more generally split up and down their lengths when being filled, because all machine-bags are made with the grain of the paper so running.

By my method of delivering the paper to the machine at right angles to its mode of forming the bag, the grain of the paper runs transversely of its length. Thus, while the two side seams strengthen it lengthwise, the grains of paper strengthen it laterally.

The second object in view in delivering the paper to the bag-forming rollers at right angles to their motion is, to make the bag with a seamless bottom, thus making the bag with two side seams to strengthen it lengthwise, and at the same time make the bag without any scrap or waste paper.

Letter O is a pressure-roller on the paper-roller, and P is a spiral spring or other equivalent device for keeping the ratchet feed bar or rod L in gear with the ratchet-wheel M, to feed the paper intermittently into the machine as it is successively cut off by the serrated knives or cutters Q and R. These cutters are made with serrated edges, with the teeth on the stationary cutter Q alternating with the teeth of the movable cutter R, so that when the cutter-gate S (to which the cutter R is attached, and which gate is worked in guide-ways T, secured to the upper edge of the back

piece of the frame A) is forced down by the levers U, V, and I, connecting with the crank-pin G of the eccentric wheel or crank F, the serrated edges of the cutters will just pass each other, and thus sever the blank of paper to admit of its being folded or doubled to be made into the bag. For the purpose of assisting the cutters to sever the paper, the movable cutter R is made widest at its outer ends, so that they will strike the paper first, and thus, as it were, make a gradually-increasing cut to the middle part of the cutter. Another feature of these cutters is that they cut the blank of paper off on two different lines from the middle part of them, with an oblique blank space, as shown at X, Fig. 8, Sheet 3, connecting the two cutting-lines of the knives. The object of this formation of the cutters is, first, to cut the blank of paper so as to leave at opposite sides of the bag when doubled up on the line y^3 , Fig. 8, Sheet 3, an overlap of paper to make the side seams on the upper and lower sides of the bag e^3 , as shown in Fig. 10, Sheet 3—that is, the overlap on one side of the bag being on the upper side of it, and the opposite overlap being on the under side of the bag; and, second, for the purpose of tapering off the ends of the overlap at the bottom of the bag, that it may be more securely pasted to prevent being torn loose by the exposure of an unpasted end, should such occur. When the blank of paper has been severed from the roll of paper it is delivered upon a table, z , covering the end of the machine in front of the cutters, and extends over the doubling, creasing, and pasting rollers a^2 , b^2 , and q^2 and q^3 , except at the intersection of the doubling-rollers, where it is slotted for the paper to be doubled and carried in between the doubling-rollers. In the drawings the half of the table to cover the creasing and pasting rollers has been omitted for the purpose of showing the rollers and configuration of them. For the purpose of doubling the paper a striker-bar or paper-doubler, d^2 , is automatically and intermittently, at the proper time, made to fall upon the blank of paper on the table at the point of intersection of the doubling-rollers. By this means the paper e^3 , Fig. 4, is doubled down between the two rollers that they may seize hold of it to complete the doubling of the bag to form the bottom of it. To operate the striker-bar it is attached, at its back end, to a vertical rod, e^2 , working in guideways f^2 on the face of the cutter-gate, and having a lifting-shoulder, g^2 , thereon near its lower end, and a detent-notch, h^2 , at or near its upper end, to engage with a detent-latch or spring, i^2 , on the upper edge of the cross-head of the cutter-gate frame T. Thus when the cutter-gate is elevated, the lower guideway f^2 of the rod e^2 comes in contact with the shoulder g^2 and lifts the striker till the upper end of the rod engages with the detent-spring i^2 , and is there held till the paper has been carried in upon the table and the gate descended to sever the paper, which instantly this severance of the paper has taken place,

the lower side of the lowermost guideway f^2 strikes the upper edge of the striker-bar to release it from the detent-spring i^2 , and thus causes it to fall with a sudden blow upon the paper to force it between the doubling-rollers, to be doubled up to make room for the succeeding blank of paper on the table by the rotation of the eccentric feed-wheel. The doubling-rollers are geared together by cog-wheels j^2 , which are rotated by gearing with a cog-wheel, k^2 , on the outer end of the main driving-wheel shaft B. Letters b^2 are a pair of rollers for creasing the overlap at the sides of the bag, so that it will be readily and evenly folded by the folders on entering the groove or channel therein. The creasers, as shown in Figs. 5 and 6, Sheet 3, are formed by a raised thread around one end of the upper and lower rollers and a channel or groove in the rollers opposite to the thread, and into which the raised thread matches. The object of this formation of the creasers is to crease the overlap paper at the sides of the bag in opposite directions—that is, as the overlap on each side of the bag is only on each half, the creaser on the back end of the upper roller breaks the paper so as to bend up and fold over upon the upper half of the bag, as shown at m^2 , Fig. 10, Sheet 3, while the creaser on the front end of the lower roller breaks the paper, so as to bend down and fold over upon the lower half of the bag, as shown at n^2 , Fig. 10, Sheet 3. Letters p^2 and p^3 are two overlap-folders composed of a strip of metal (of a suitable width, according to depth of overlap of paper and length to complete the fold) folded lengthwise like a flat tube, with an open side, terminating at the mouth in an expanded or funnel-shaped mouth, so that as the bag is carried forward between the creasing-rollers to the pasting-rollers q^2 q^3 the overlapping edges of the paper will readily enter the mouths of the folders, and be bent over and down upon the sides of the bag. In the folder p^2 the mouth is open upward, while in the folder p^3 the mouth is open downward, as shown in Figs. 5 and 10, Sheet 3.

As will be obvious from an understanding of the special manner of making the bag with a seamless bottom, and cutting the blanks of paper so as to have no waste in leaving marginal overlaps to make the side seams, the arrangement of the folders, with their mouths opening as described, is essential to the practical operations of making the bag.

Just at the throat of the folders are arranged the paster-rollers q^2 and q^3 , as shown in Fig. 7, Sheet 3. On the back end of the upper roller q^2 , and the front end of the lower roller q^3 , is formed endless paster-rings r^2 , by cutting away the metal of the body of the rollers, so as to leave the rings of metal on a line with the throat of the overlap-folders, upon which their peripheries impinge. The object of these rings is to apply the paste to the overlap just in advance of the overlap folding down to enter the flattened part of the folder, so that as the sides of the bag are carried through the fold-

ers, the overlap will be thoroughly pasted upon the sides of the bag. To supply the paste, reservoirs s^2 and t^2 are secured to the frame of the machine close in contact with the paster-rings. Thus the reservoir s^2 supplies paste to the paster on roller q^2 , from above it, by means of a slit in its lower edge, through which the paster-ring projects into the body of the paste, and thus, as it rotates, carries off on its periphery sufficient paste for the purpose required, while the reservoir t^2 supplies paste to the paster on the roller q^3 , from below it, by means of a slit in its upper side or edge, through which the paster-ring projects into the paste, to apply in the manner as before mentioned. Of course it will be obvious that these paster-rings, though rotating in the slits in the paste-reservoirs, are, nevertheless, intended to fit so closely to the edges of the slit as to prevent leakage of the paste, or overcharging the peripheries of the rings. To regulate this latter operation, adjustable scrapers or clearers are to be used, to regulate the flow of the paste according to density or capacity to flow. Letters w^2 are two pairs of carrying-rollers, to take the bag through the tubular folders. To prevent the folders from being carried out of the machine by the rollers, their ends are channeled so as to permit the folders to lie in them below the feeding-surfaces of the rollers, and held in the channels by means of straps v^2 , looping around the channels of the lower rollers, and attached to the under side of the tubular folders. Letters w^2 are a pair of compressor-rollers at the tail of the machine, designed, principally, for the compression of the pasted overlapping seams, and incidentally

for the purpose of carrying the bag out of the machine. Letters y^2 are a series of cog-wheels, on the axles of the lower rollers, for creasing, pasting, carrying, and compressing, as before mentioned, and intermediate carrying cog-wheels, for transmitting a uniform rotary motion to the rollers, as aforesaid, by means of their gearing with the cog-wheels k^2 on the main driving-shaft B.

Having now described my improvements, I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States.

1. The combination of the web roll N, knife R, folding-rollers a^2 , and folding or striker bar d^2 , the said parts being so related that the feeding of the web of paper shall be at right angles to the folding, and the blank doubled in its transverse center, as above set forth.

2. The combination of the lifting-shoulder g^2 , detent-notch h^2 , latch-spring i^2 , with the striker-rod e^2 , cutter-gate S, and guide f^2 , substantially as described, and for the purposes set forth.

3. In combination with the folders p^2 and p^3 , the straps or loops v^2 , as a means of holding the folders in place between the upper and lower pasting and carrying rollers, as set forth.

4. The combination of the paster-rollers q^2 and q^3 , carrying-rollers w^2 , made as described, with the folders p^2 and p^3 , and straps v^2 all arranged and operating as set forth.

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Witnesses:

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