

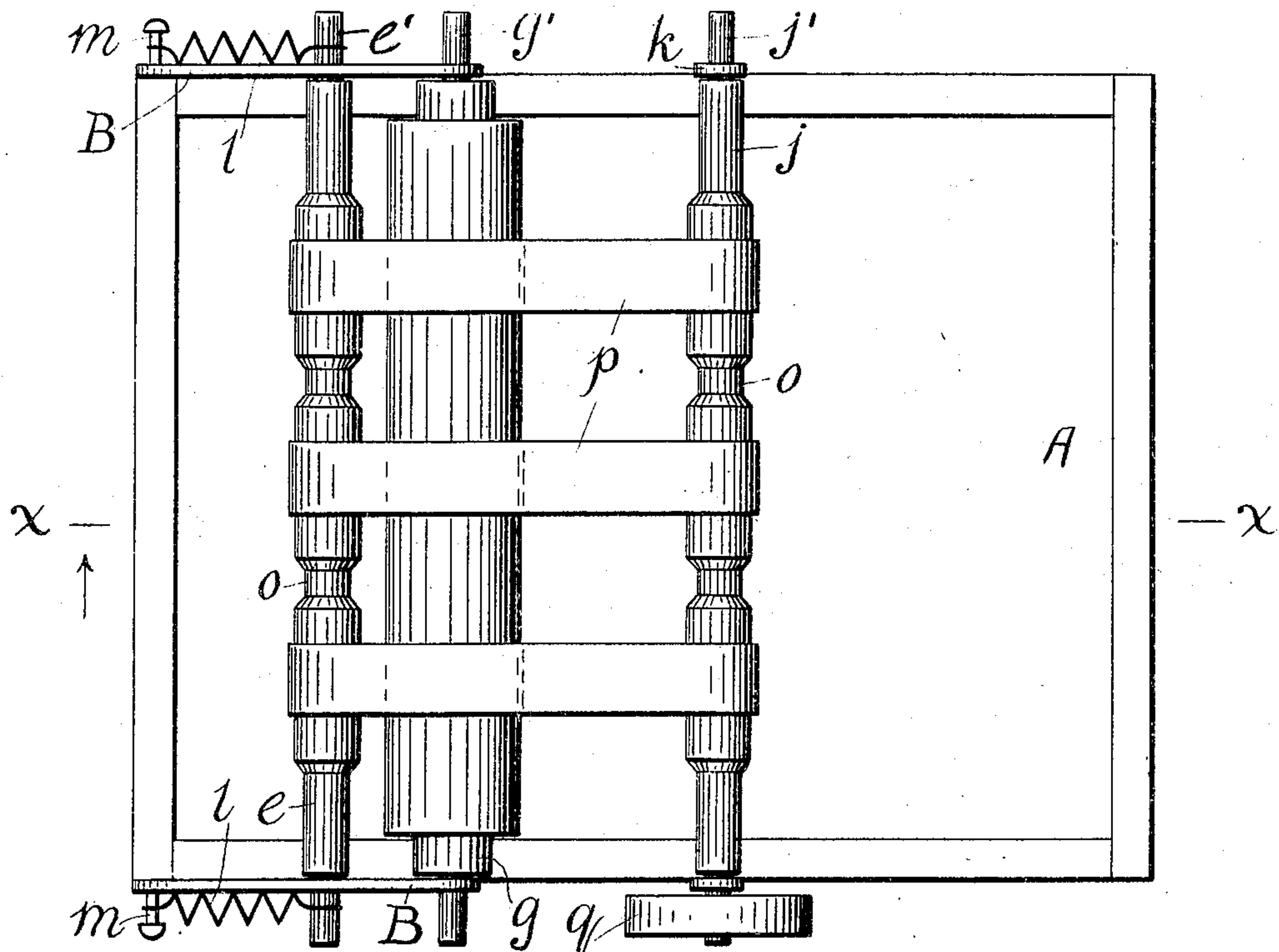
No. 789,787.

PATENTED MAY 16, 1905.

C. J. BELLAMY.

### WINDING AND FEEDING MECHANISM.

APPLICATION FILED FEB. 1, 1904.



**FIG. 1.**

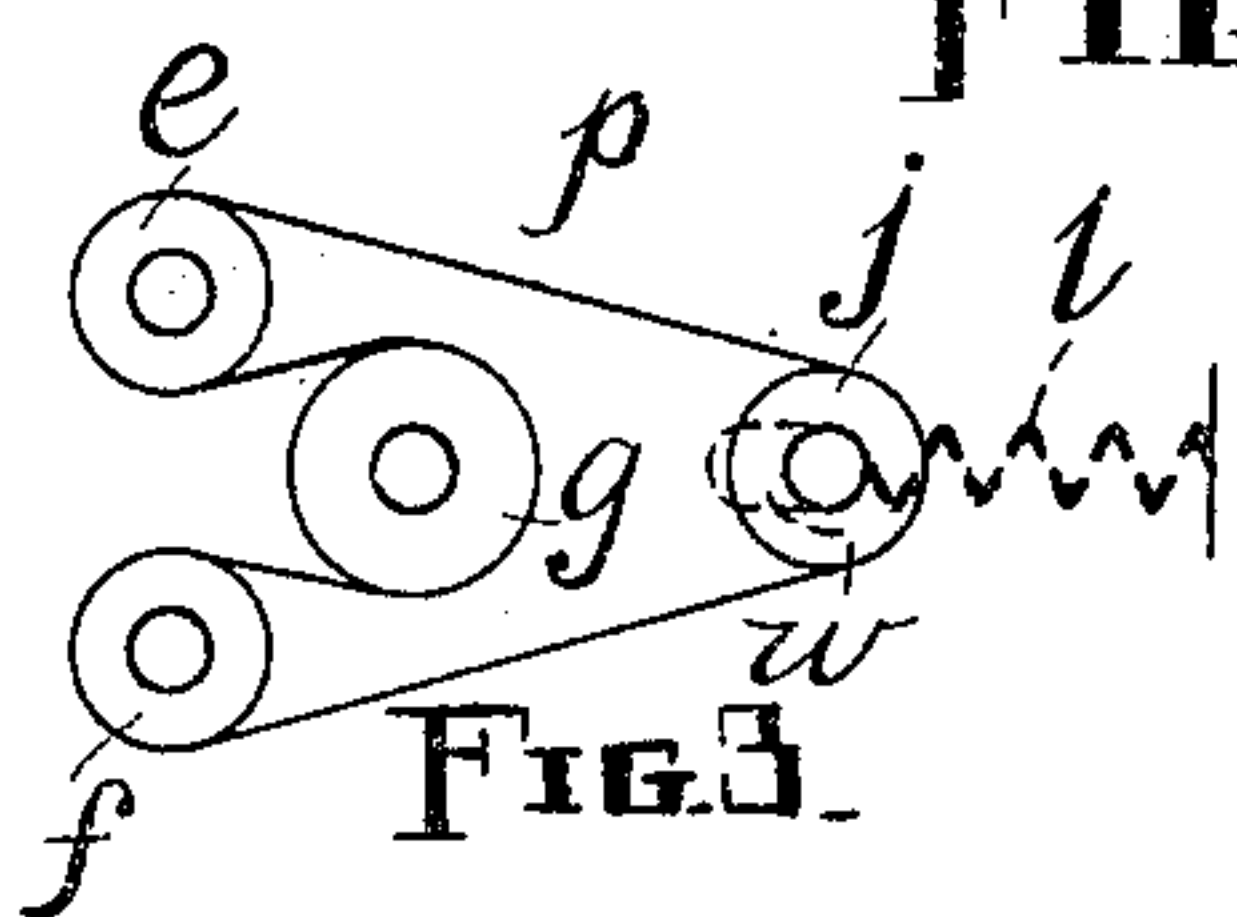
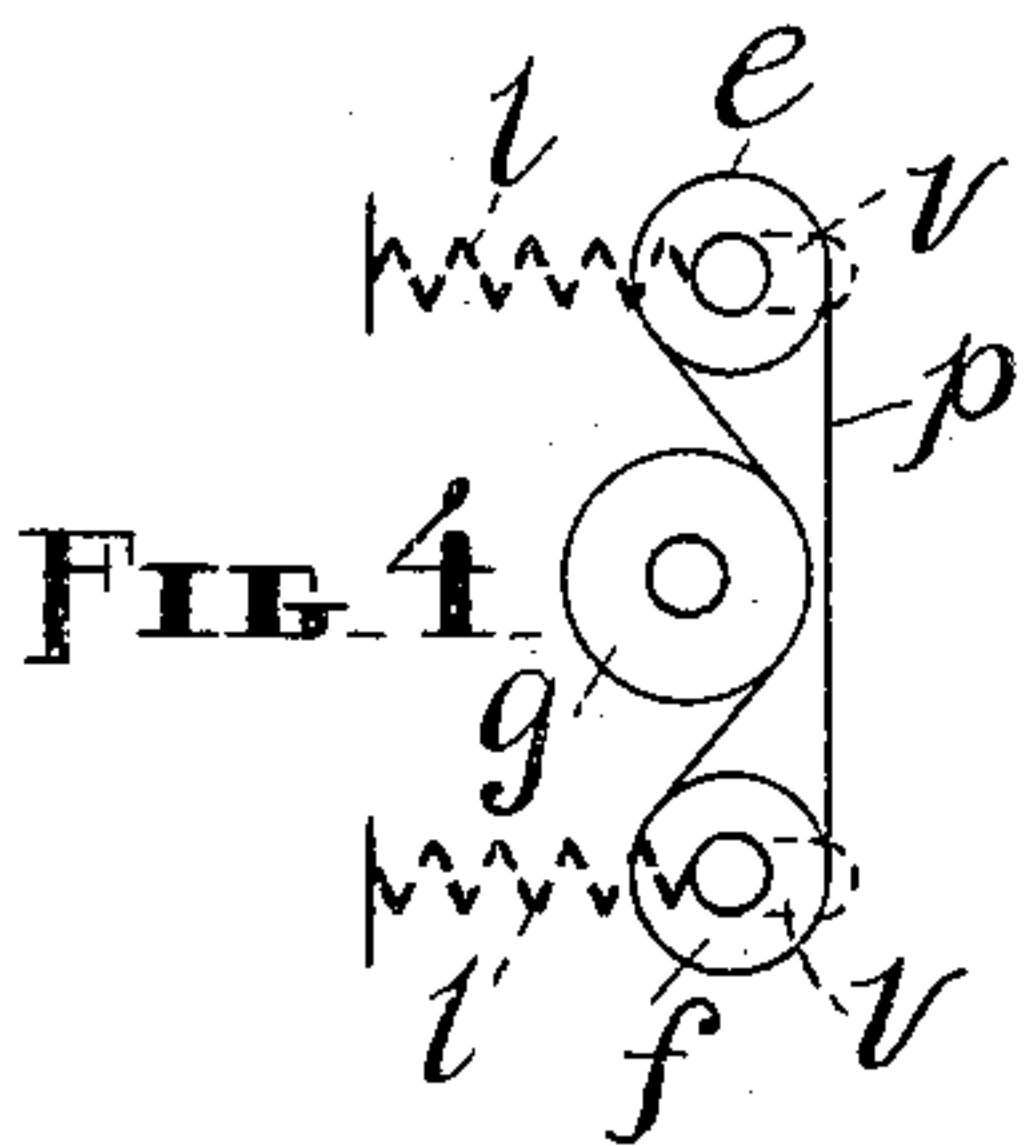
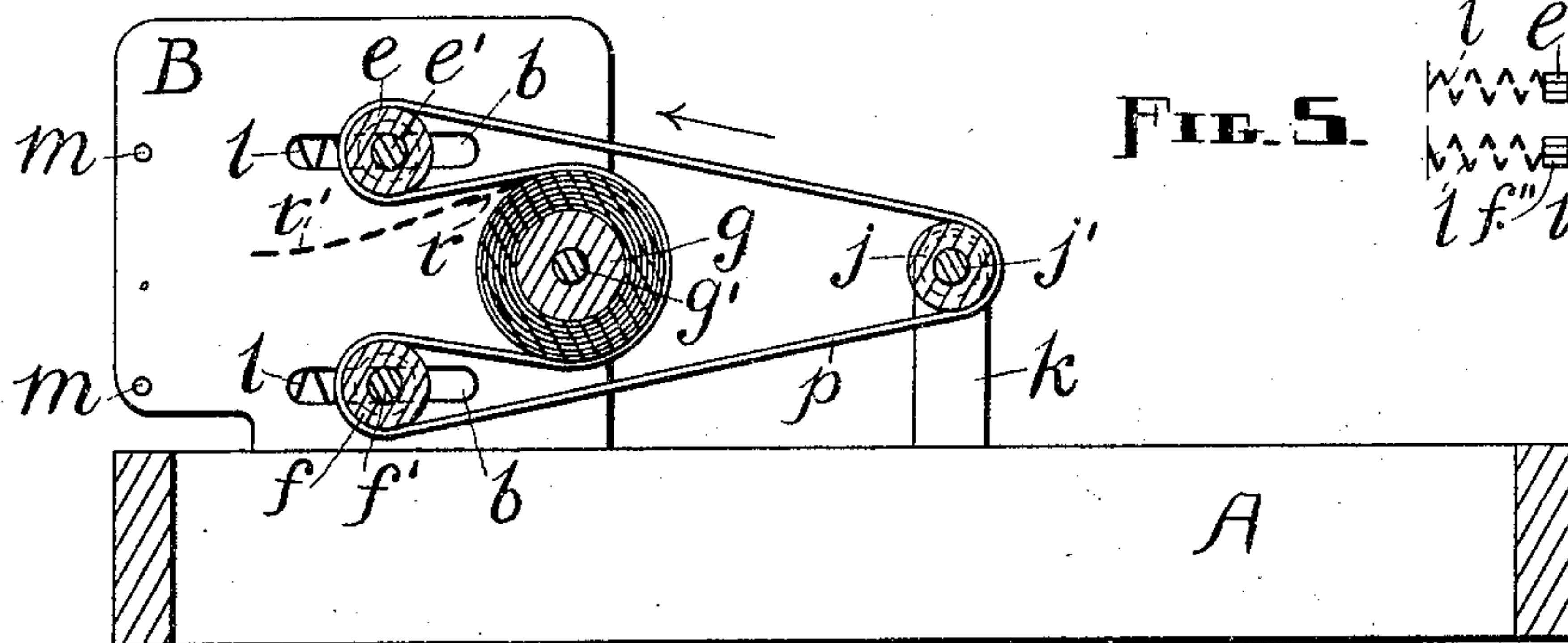


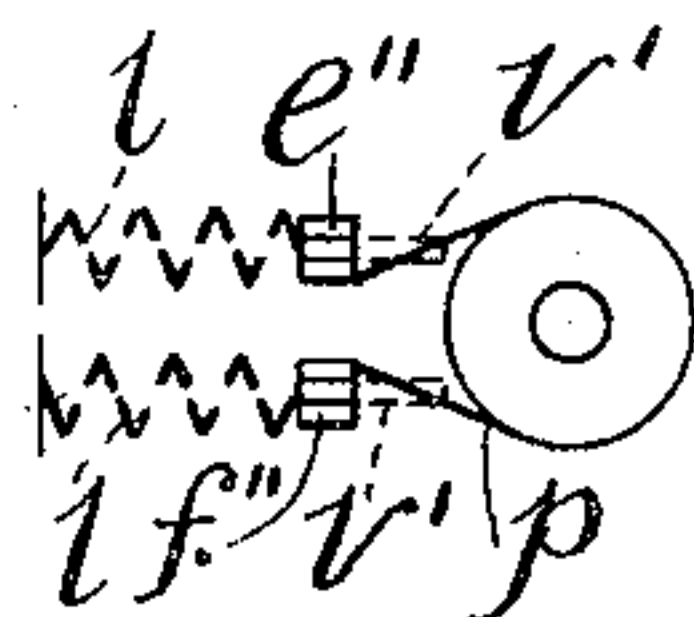
FIG 3.



**FIG. 4**



**FIG. 5.**



Witnesses

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**FIG. 2.**

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# UNITED STATES PATENT OFFICE.

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## WINDING AND FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 789,787, dated May 16, 1905.

Application filed February 1, 1904. Serial No. 191,499.

*To all whom it may concern:*

Be it known that I, CHARLES J. BELLAMY, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and Commonwealth of Massachusetts, have invented new and useful Winding and Feeding Mechanism, of which the following is a specification.

My invention relates to improvements in mechanism for winding and feeding paper, cloth, and other kinds of fabric in which are employed a plurality of tape-supporting members and the tape supported thereby, one of such members being a magazine-roll upon which the fabric is adapted to be wound and from which the fabric is adapted to be afterward fed, with or without certain other parts and members, all as hereinafter set forth; and the objects of my improvement are to provide mechanism both for winding paper, cloth, and other varieties of fabric upon a magazine-roll and for feeding the same from said roll, as desired. Such mechanism as this is adapted to successfully and conveniently handle paper, cloth, and other varieties of fabric, either in web or lengths, either in sheets or strips in sequence, or can be satisfactorily employed to handle short lengths in conjunction with a continuous web, or short lengths in double thickness, or two webs. Heretofore, in particular, much difficulty has been experienced in attempting to wind into a roll separate or independent sheets of paper. With my mechanism I am able not only to wind up the separate sheets in sequence, but to deliver them thereafter in like manner. In winding, the sheet or strip is pushed into the bite formed by the tape and the magazine-roll. Feeding is done either by directly actuating the tape-supporting members, the action of which is reversed from what it is in winding, or by sequentially pulling upon the exposed ends of the sheets or strips wound on the magazine-roll. The preferred method of feeding depends upon the use to which the sheets are to be put and the nature of the force available for actuating them.

A further object of my invention is to provide practicable, efficient, and comparatively simple mechanism which is capable of accomplishing the above-noted results.

I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a preferred form of my mechanism free from such attachments or connections as might be adapted to facilitate the intake and delivery under certain conditions and for certain uses; Fig. 2, a longitudinal vertical section on lines *xx* looking in the direction of the arrow in Fig. 1; Fig. 3, a diagram illustrating a construction with two of the tape-supporting members in fixed bearings; Fig. 4, a diagram illustrating a tri-tape-supporting-member construction, the magazine-roll having fixed bearings and the other two tape-supporting members having movable bearings; and Fig. 5, a diagram illustrating a modified form somewhat similar to the construction shown in Fig. 4.

Similar letters refer to similar parts throughout the several views.

The end of the device into which paper is taken or at which paper is delivered is herein termed the "working" or "front" end, the same being the left-hand end of each view, and this is to be kept in mind in the following description, so that no confusion may arise as to the relative position or location of certain of the members.

I will proceed first to describe in detail what is herein termed for the sake of clearness the "preferred construction" and will afterward explain the several modifications shown of the construction termed "preferred;" but it is obvious that some one or more of these "modifications" may constitute a construction or constructions equal in every particular to the one first to be described.

As a convenient support for the rotary and other parts which enter intimately into the device shown in the first two views a frame A may be provided, from the sides of which near one end rise side pieces or upright supports B. Two tape-supporting members *e* and *f* and a third tape-supporting member or magazine-roll *g* for the paper or other fabric have their trunnions or ends of their shafts *e'*, *f'*, and *g'*, respectively, journaled in the supports B, the shafts *e'* and *f'* being received in slots *b* in said supports, while the shaft *g'* has stationary bearings therein. The slots *b* are arranged



horizontally in the supports B. Springs  $l$  outside of the supports B, having their ends fastened to pins  $m$  and the projecting ends of the shafts  $e'$  and  $f'$ , serve to tension said shafts with their tape-supporting members toward the left or forward.

The magazine-roll  $g$  generally consists of a substantial core and whatever fabric may be wound thereon, or if there be no fabric thereon then of course there is only the core to the roll. Hence it will be seen that the appellation for this tape-supporting member is intended to have a wide range and to be broadly interpreted.

A tape-supporting member  $j$  has its trunnions or the ends of its shaft  $j'$  journaled in brackets  $k$   $k$ , securely attached to the sides of the frame A back of the supports B.

The tape-supporting members  $e$ ,  $f$ , and  $j$ , by preference, have a plurality of annular grooves  $o$  to divide each into as many annular ridges as there are tapes  $p$ , which are adapted to run on said ridges. I have shown three endless tapes  $p$ , although the number may be greater or less, arranged side by side on their supporting members. These tapes are supported on raised portions of the members  $e$ ,  $f$ , and  $j$ , as hereinbefore stated, which they encompass, and are so arranged that in passing from the member  $e$  to the member  $f$  they partially embrace the magazine-roll  $g$ . In other words, the aforesaid members support and are encircled by a series of parallel tapes. The members  $e$  and  $f$  form approximately the base of a triangle and the member  $j$  forms the apex thereof, while the magazine-roll  $g$  is pushed into the slack between said members  $e$  and  $f$  and held or cradled there by the tapes. Thus it will be seen that owing to the influence of the springs  $l$  on the members  $e$  and  $f$  the tapes must always hold the magazine-roll in a partial but effective embrace, controlling the varying periphery thereof—varying as material is wound on or off of said magazine-roll. This arrangement of tape-supporting members accomplishes two purposes—first, it secures simultaneous movement of members, and, second, it furnishes the means for successfully manipulating the magazine-roll regardless of its varying diameter, the latter being an absolutely essential feature in a device of this kind.

Assuming that it is desired to form a roll of independent sheets of paper with the device just described, the operation is as follows: Actuate the mechanism by means of a hand-wheel or pulley  $q$  on one end of the shaft  $j'$ , so that the tapes  $p$  travel in the direction of the arrow in Fig. 2, and insert the end of a sheet of paper in the bite formed by said tapes and the upper portion of the magazine-roll  $g$ . The sheet is immediately wound onto the magazine-roll by the tape passing over and around said roll. Before the sheet has entirely disappeared—that is to say, before

the bottom of the sheet has passed into the aforesaid bite—the head or top of a second sheet is inserted in said bite above the foot or lower portion of its predecessor. The second sheet follows the first, a third follows the second, and as many more as are required to make up the roll. As the paper accumulates on the magazine-roll the tapes  $p$  draw the members  $e$  and  $f$  backward against the resiliency of the springs  $l$ , the shafts  $e'$  and  $f'$  moving rearwardly in the slots  $b$ . When the magazine-roll becomes larger, it calls for more length of tape in the reach in which it is partially embraced, and accordingly the members  $e$  and  $f$  are moved back just enough to yield the needed length of tape which goes about the circumference of the magazine-roll, the extent of tape in the reach between said members  $e$  and  $f$  always remaining the same. To feed the paper from the device or unwind it from the magazine-roll, actuate the mechanism so that the tapes  $p$  shall travel in the opposite direction to that indicated by the arrow in Fig. 2 or draw out one sheet after another by pulling upon an exposed end. The broken lines  $r$  and  $r'$  in Fig. 2 represent adjacent and lapped ends of two sheets, by which it will be observed that before one sheet is clear of the magazine-roll and the tapes the end of another sheet becomes exposed or is brought into position, where it can be readily seized with the fingers and thumb of the operator, since the sheets always feed with the same lap given them in winding. As the size of the magazine-roll diminishes the members  $e$  and  $f$  move forward again, because the springs  $l$  always keep the tapes taut. In other words, as the circumference of the magazine-roll decreases it requires less of the tape, and the latter yields to the tension of the springs  $l$ ; but the length of tape given off the circumference is taken up by reaches between the members  $e$  and  $f$  and the magazine-roll.

From the foregoing the complete operation of the mechanism will be understood, and it will be seen, furthermore, that continuous strips, either singly or in plurality, may be handled, as well as a line of independent sheets, or such a line of sheets together with a continuous strip. In short, various combinations of sheets or strips or sheets and strips may be successfully manipulated by my mechanism.

Renewed attention is called to the fact that although I have described the mechanism as being used in winding or feeding paper it is applicable as well to many other kinds of fabric for which, as in the case of paper, it will be found useful both for web and sheet lengths or for the two together, one over the other, to be wound upon or fed from the same magazine-roll.

I will now proceed to briefly describe in detail the diagrams constituting Figs. 3, 4 and 5.



In Fig. 3 the tape-supporting members  $e$  and  $f$  are mounted in fixed bearings. The magazine-roll is also in fixed bearings. The tape-supporting member  $j$  is shown in movable bearings, (represented at  $w$ ,) springs, as indicated at  $l$ , being used to tension  $j$  and keep the tapes taut.

In Fig. 4 the number of tape-supporting members is reduced to three, the magazine-roll is fixed, and the members  $e$  and  $f$  are mounted in movable bearings (represented at  $v$   $v$ ) under tension to the left, so as to keep the tape tight against the magazine-roll. The Fig. 4 construction is similar to the Fig. 2 construction.

Fig. 5 is a modification of the tritape-member construction shown in Fig. 4, in which the members  $e''$  and  $f''$ , which correspond with the members  $e$  and  $f$  in the other views, consist of bars slidably mounted in bearings (represented at  $v'$   $v'$ ) and spring-tensioned forward. It will be observed that the tape in this case is not endless.

In view of the many forms which my invention takes I do not wish to be confined or restricted to any one of the exact constructions and arrangements herein shown and described, as minor changes therein may be made without departing from the nature of my invention. It is plainly to be seen that the sizes of the different members and shapes of some of them will vary under different circumstances, both actual and relative, and that they may be differently mounted. Especially will numerous kinds of resilient or yielding bearings for the tape-supporting members readily occur to those skilled in the art. Hence I do not wish to be limited to the particular forms shown. Moreover, the rotary members may be actuated by applying power elsewhere than to the shaft  $j'$ .

Certain of the tape-supporting members, which are herein shown and described at least

inferentially as rollers having rotary motion, need not always have such motion nor be of roller formation, but may consist of stationary parts of some other suitable formation, and even the tape need not move in all cases.

As before intimated, a single tape, band, or belt may be substituted for a plurality of such members in some cases, and it is quite possible to conceive of a construction wherein mere cords, strings, or even threads may be employed in place of tapes.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In fabric winding and feeding mechanism, the combination of a plurality of tape-supporting members and the tape supported thereby, and a magazine-roll partially embraced by said tape in the reach between two supporting members, which said members are at an unvarying distance apart, the potential extent of the tape being more than sufficient to connect all of the supporting members when the magazine-roll is thus embraced and is of its smallest circumference.

2. In fabric winding and feeding mechanism, the combination of a plurality of tape-supporting members, at least one of which is in movable bearings, and the tape supported thereby, and a magazine-roll partially embraced by said tape in the reach between two supporting members, which are at an unvarying distance apart the potential extent of the tape being more than sufficient to connect all of the supporting members while embracing said magazine-roll when it is of its smallest circumference.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES J. BELLAMY.

Witnesses:

S. S. TAFT,

F. A. CUTTER.