

No. 789,789.

PATENTED MAY 16, 1905.

C. J. BELLAMY.
WINDING AND FEEDING MECHANISM.
APPLICATION FILED SEPT. 27, 1904.

2 SHEETS—SHEET 1.

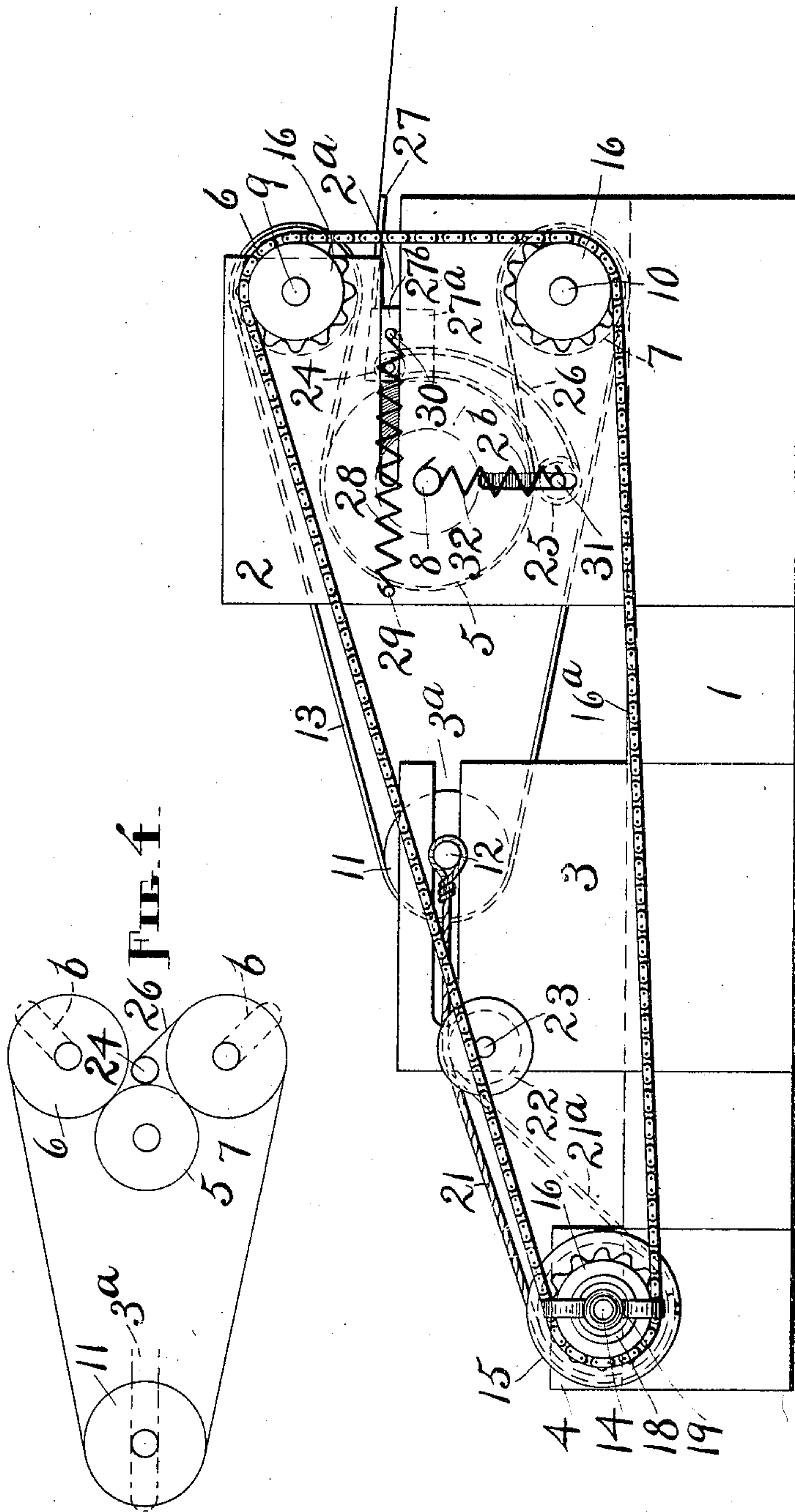


FIG. 1.

Witnesses

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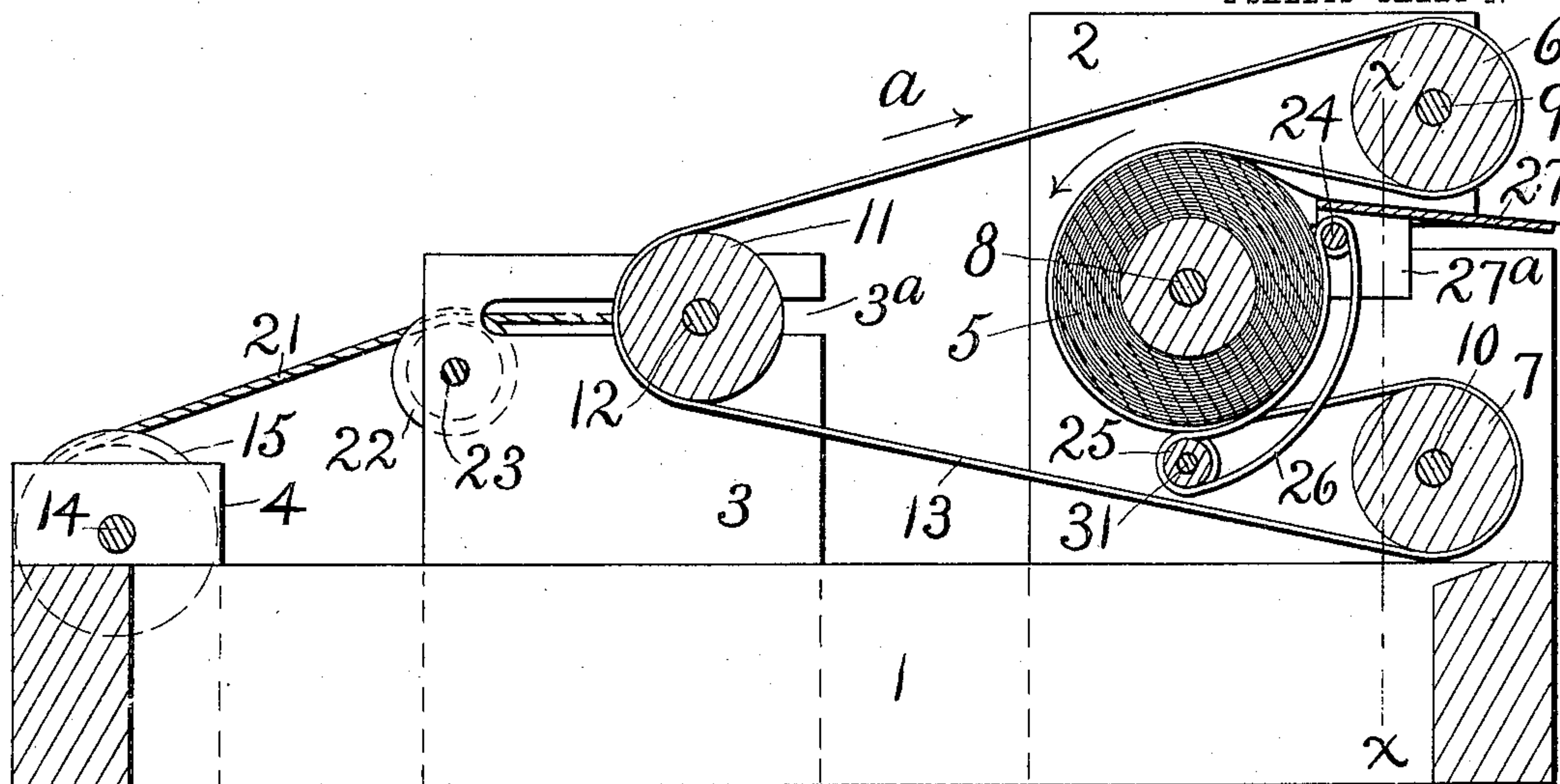


FIG. 2.

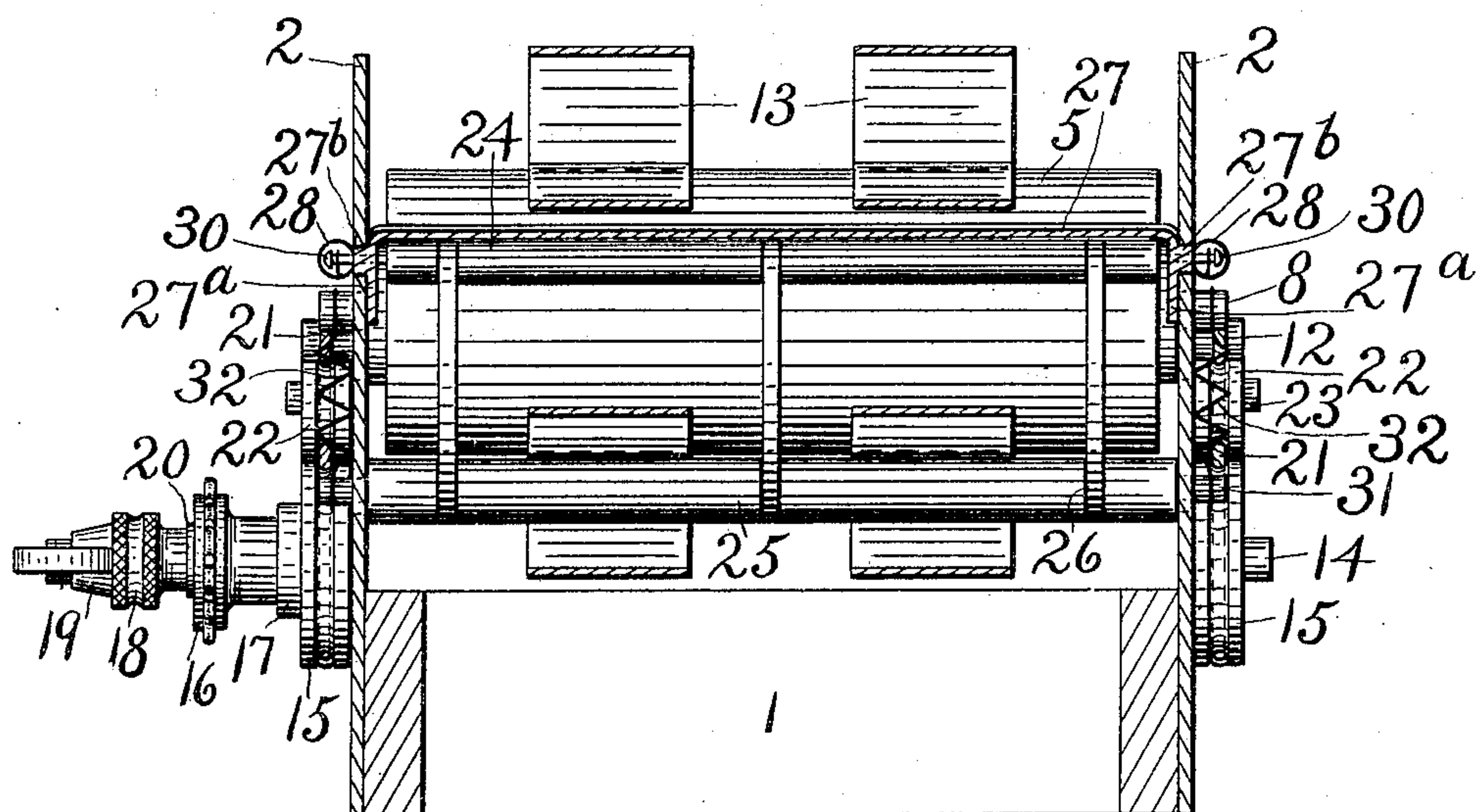


FIG. 3.

Witnesses

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WINDING AND FEEDING MECHANISM.

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

Application filed September 27, 1904. Serial No. 226,168.

To all whom it may concern:

Be it known that I, CHARLES J. BELLAMY, a citizen of the United States of America, residing at 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 handling flexible fabric or other material in which are employed a plurality of belt or tape supporting members and the belting or tape supported thereby, one of such members being a magazine-roll adapted to store the material operated upon with or without certain other parts and members, all as hereinafter set forth; and the object of my improvement is to provide mechanism for successfully and conveniently handling paper, cloth, and other varieties of flexible material either in web or lengths or detachments or which can be successfully employed to handle short lengths in conjunction with a continuous web or two or more such webs or two or more such lengths.

My mechanism is particularly adapted to satisfactorily handle separate or independent sheets or detachments of paper or other flexible fabric. For winding onto the magazine-roll the tape or belt supporting members are actuated in one direction, the sheet, strip, or detachment having first been pushed into the bite formed by the tape or belt and the magazine-roll, while feeding is done by actuating said members in the reverse direction after the magazine-roll is properly stocked with a supply of fabric.

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 mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a device embodying my improved mechanism; Fig. 2, a longitudinal vertical section through the same; Fig. 3, a transverse vertical section on lines *x x*, Fig. 2, looking toward the rear of the

machine; and Fig. 4, a diagram illustrating a modification.

Similar figures refer to similar parts throughout the several views.

Referring to the first three views, it will be observed that a suitable frame 1 is provided, from the sides of which rise uprights 2, 3, and 4, each upright 3 being horizontally slotted at 3^a. The uprights 2 are at what may be termed the "front" or "working" end of the device, and between these uprights appear a magazine-roll 5 and two tape supporting or actuating rollers 6 and 7, the rotary members being provided with trunnions or shafts which are suitably journaled in said uprights. 8 indicates the magazine-roll shaft, and 9 and 10 the upper and lower tape supporting or actuating roller-shafts, respectively. A tension-roller 11 is supported by its shaft 12 between the uprights 3, the terminals of said shaft being placed in the slots 3^a. Belts or tapes 13 are supported by the rotary members already described in the manner shown, the magazine-roll 5 being received into the reaches or loops of said tapes which are between the rollers 6 and 7. In order to keep the tapes 13 taut at all times and under the varying conditions which the magazine-roll assumes in winding and unwinding, it is necessary to bring the roller 11 under tension. This may be done by means of springs; but in lieu thereof I here employ certain peculiar tension mechanism which, however, forms the subject-matter of another application filed on even date herewith—namely, September 27, 1904—and numbered Serial No. 226,167. A brief description of the aforesaid tension mechanism will next be given.

A shaft 14 is journaled in the uprights 4 at the rear of the device, and pulleys 15 are tightly mounted on the projecting terminals of said shaft. Outside of one of the pulleys 15 is a sprocket-wheel 16, loosely mounted on the shaft 14, with a friction-washer 17 interposed between said sprocket-wheel and pulley. The terminal of the shaft 14 beyond the sprocket-wheel 16 is screw-threaded, and a friction-nut 18 and thumb-nut 19 are screwed onto this threaded part, a washer 20 being in-

terposed between said friction-nut and the sprocket-wheel. One end of a cord 21 is made fast to each of the pulleys 15, and said cord passes upward over the pulley to have its other end attaching to the associated projecting terminal of the shaft 12. Idlers 22, mounted on a shaft 23, journaled in the uprights 3, are so located as to support the cords 21 in such manner as to prevent the same from drawing the shaft 12 against the lower edges of the slots 3^a, and thereby producing an undesirable amount of friction at these points. The ends of the shafts 9 and 10 which project on the same side with the sprocket-wheel 16 are provided with similar sprocket-wheels, all of which are connected by a sprocket-chain 16^a. The operation of this tension mechanism will be hereinafter described. The sprocket-chain 16^a not only operates the tension mechanism, but also drives the rollers 6 and 7 with the tapes and magazine-roll.

In order to facilitate the operation of the magazine-roll, I prefer to provide an improved device comprising a substantially horizontally movable guide-roller 24 and a substantially vertically movable roller 25, connecting loops or bands 26, and a movable guide-table 27. A trunnion on each end of the guide-roller 24 is mounted in a carrier-piece depending from each side edge of the table 27, which latter extends forward some distance from a position in line with the rear edge of said roller. A lug 27^b projects from the outer face of each carrier-piece 27^a into a slot 3^a in the associated upright 2, said lug being adapted to reciprocate in said slot. Springs 28, extending between pins 29 and 30, projecting laterally from the uprights 2 and the lugs 27^b, respectively, always tend to draw the guide-roller 24 against the periphery of the magazine-roll 5 at the front and above the horizontal center thereof. The roller 25 has each of its trunnions or each end of its shaft 31 mounted in a vertical slot 2^b in each upright 2, the centers of the magazine-roll 5 and said roller 25 being in the present instance in the same vertical plane, and springs 32, extending between the projecting ends of the shafts 8 and 31, outside of the uprights 2, serve to cause the roller 25 to bear against those portions of the tapes 13 which are here in contact with the magazine-roll. The loops or bands 26 are preferably let into grooves in the rollers 24 and 25, so that the major portions of the rear reaches of said loops or bands are in contact with the magazine-roll, and so also in the roller 24.

The term "magazine-roll" as herein used relates to a core upon which fabric may be wound or from which it may be unwound, either with or without the fabric thereon.

To operate the hereinbefore-described mechanism for the purpose of storing fabric on the magazine-roll 5, the actuating-rollers 6 and 7 are revolved by applying power to either of

the shafts 9 or 10 in any suitable manner, so that the tapes 13 travel in the direction of the arrow α in Fig. 2. The successive sheets, strips, or detachments of fabric are in turn inserted in the bite formed by the tapes 13 and the magazine-roll 5 above and to the rear of the back edge of the table 27 and wound upon said roll, since said tapes are kept taut. Before the first sheet, strip, or detachment has been entirely drawn in the head or top of another is inserted in the aforesaid bite, and so on until the magazine-roll has reached its maximum size. The fabric is fed over the top of the table 27, which forms a very convenient rest and guide for the same, and is always held in close proximity to the magazine-roll through the medium of the springs 28. The tapes 13 are kept taut by the continuous tension of the roller 11 away from the magazine-roll, although the space between the two rotary members is continually decreasing as each successive sheet, strip, or detachment is wound upon said roll. As the tapes shorten between the tension-roller and the magazine-roll the pulleys 15 are caused to rotate in the opposite direction to that normally given them by the rear sprocket-wheel, the pulley adjacent said sprocket-wheel slipping at such times in spite of the resistance offered by the friction-washer 17. In case, however, it is desired to use the mechanism for feeding from a magazine-roll already stored with sheets, strips, or detachments the actuating-rollers are operated in the reverse direction, thus rotating the magazine-roll in the opposite direction to that it took when the mechanism was operated for winding or storing the same. Now the slack produced in the tapes by the delivery of successive sheets, strips, or detachments is taken up as fast as it occurs by the shifting of the roller 11, which is drawn toward the rear instead of toward the front, as in the other case, though said roller is always tensioned rearward regardless of the horizontal direction in which it may actually travel.

For winding purposes the pulleys 15 should be rotated to the right until the cords 21 pass from below instead of from above the same, as indicated by dotted lines 21^a in Fig. 1. The full lines show the cords 21 in position for unwinding fabric from the magazine-roll. Whether the mechanism is used for winding or unwinding, the tendency of the operation is to rotate the pulleys 15 through the medium of the sprocket-chain 16^a, the sprocket-wheel 16, and the tension or friction members on the shaft 14 further than is necessary to keep the tapes taut; but since the sprocket-wheel on the shaft 14 can rotate independently with the sprocket-chain, although against frictional resistance, it does no active service—that is, does not move the roller 11 when the mechanism is used for unwinding,

except as said roller is permitted to move toward the rear by the tapes as the magazine-roll grows smaller.

From the foregoing it will be readily understood how the tapes are kept taut by the tension mechanism regardless of the purpose for which the winding and feeding mechanism may be employed.

For certain purposes it is believed the herein-described method of tensioning the tapes or belts is preferable, especially, perhaps, in storing magazine-rolls with fabric at the mill or shipping center, greater steadiness and positiveness being obtained, it is thought, by the use of this means of resistance. On the other hand, it is believed that under certain conditions in feeding the present tension mechanism is more convenient than a spring or springs would be, particularly in view of the fact that the feed can be more conveniently regulated and governed by merely tightening or loosening the thumb-nut 19 and the tension-nut 18, so as to increase or decrease the amount of friction produced by the washer 17 between the pulley 15 and the sprocket-wheel on the shaft 14.

The improved guide device, consisting of the bands or loops 26 and their supporting-rollers 24 and 25, will now be explained so far as the operation thereof is concerned. These guiding loops or bands, which are preferably of elastic material, so as the better to accommodate themselves to the varying periphery of the magazine-roll, contact with each sheet, strip, or detachment for the greater part of the distance of the magazine-roll left exposed by the tapes 13 and prevent displacement of the fabric either in winding or unwinding. As the magazine-roll grows larger the rollers 24 and 25 are respectively forced forward and downward, their supporting members moving in the slots 2^a and 2^b against the resiliency of the springs 28 and 32, and as said magazine-roll grows smaller said rollers respectively move rearward and upward, in all cases being held by said springs in substantial contact with the periphery of the magazine-roll. The guide-table 27 also moves back and forth with the guide-roll 24 and always maintains substantially the same relative position to the magazine-roll.

The movable guide device is applicable to a magazine-roll which is in movable bearings, as well as to one which is in fixed bearings, as illustrated in connection herewith.

In Fig. 4 I show the magazine-roll in contact with the two actuating-rollers, which latter must therefore be placed in movable bearings, as indicated by the dotted lines *b b*. As the magazine-roll increases in size the supporting-rollers 6 and 7 are forced diagonally forward, and when said magazine-roll decreases in size said actuating-rollers converge toward the center of the magazine-roll. In

this case the guide-roller 24 is used as before; but the lower roller 25 is omitted, the band or loop 26 passing around said roller 25 and the roller 7 to accomplish the same purpose as in the other construction. The guide-table is not indicated in this diagram nor any tension means for the roller 11; but it is to be understood that such table may be used in a construction of this kind and that some tension means for the roller 11 should be provided. If the tension mechanism shown in the other views is to be here employed, the tension sprocket-wheel or its equivalent may be driven from an independent shaft or from the magazine-roll shaft.

It is very apparent that the belts or tapes may in many instances be made of elastic material, if desired, in which case the roller 11 could be mounted in fixed bearings, thus dispensing with springs or other tension means connected with the same.

By the term "tentative" as used herein it is intended to express the idea of trying, attempting, endeavoring, or essaying.

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

1. In mechanism for handling flexible material, the combination of tape-supporting members and the tape supported thereby, and a magazine-roll in fixed bearings, said magazine-roll being partially embraced by the tape in the reach between two supporting members, the linear extent of tape in said reach varying in equal proportion with the circumference of said magazine-roll.

2. In mechanism for handling flexible material, the combination of tape-supporting members and the tape supported thereby, and a magazine-roll in fixed bearings, said magazine-roll being partially embraced by the tape in the reach between two supporting members the distance between which increases with an increasing diameter of said magazine-roll and decreases with a decreasing diameter thereof.

3. In mechanism for handling flexible material, the combination with a plurality of tape-supporting members and the tape supported thereby, and a magazine-roll whose perimeter is partially embraced by said tape, of a loop or band supporting member parallel with the axis of said magazine-roll on the exposed arc thereof, and looped material partially supported thereby and intersecting the course of said tape between the magazine-roll and a supporting member.

4. In mechanism for handling flexible material, the combination with 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 other supporting members, of a loop or band supporting member parallel with the axis of said magazine-roll on the exposed arc of the same and in movable bearings, said loop

or band supporting member being tensioned toward said arc, and looped material partially supported by said last-mentioned member intersecting the course of said tape between the magazine-roll and a supporting member.

5 In mechanism for handling flexible material, the combination with a plurality of tape-supporting members and the tape supported thereby, and a magazine-roll the periphery of which is partially embraced by said tape, of a movable guide adapted to conform to the changing periphery of said magazine-roll.

6 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is in movable bearings and one of which is a winding member subject to a continuously-tentative actuating strain, means to impose such strain, and a chain, cord or strap connecting said winding member with said member in movable bearings.

7 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is a winding member subject to a continuously-tentative actuating strain, a rotating tension member connected therewith, a member in movable bearings, a chain, cord or strap connecting said winding member and said member in movable bearings, and an actuating medium between said tension member and another rotary member the axes of which are parallel.

8 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is a member in movable bearings, a winding member subject to a continuously-tentative actuating strain, a rotating tension member connected therewith, means to actuate said tension member, and a chain, cord or strap connecting said winding member and said member in movable bearings.

9 In mechanism for handling flexible ma-

terial, the combination of a plurality of parallel members, one of which is a member in movable bearings, a winding member subject to a continuously-tentative actuating strain in either direction and means to so actuate the same, and a chain, cord or strap connecting said winding member and said member in movable bearings.

10 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is a member in movable bearings, a winding member subject to continuously-tentative actuating strain in either direction, a tension member connected therewith, means to actuate said tension member in either direction, and a chain, cord or strap connecting said winding member and said member in movable bearings.

11 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is a member in movable bearings, a winding member subject to continuously-tentative actuating strain and means to so actuate the same, a chain, cord or strap connecting said winding member and said member in movable bearings, and means to increase or decrease said strain.

12 In mechanism for handling flexible material, the combination of a plurality of parallel members, one of which is a winding member subject to continuously-tentative actuating strain in either direction, means to actuate said tension member in either direction, a chain, cord or strap connecting said winding member and said member in movable bearings, and means to increase or decrease said strain.

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

CHARLES J. BELLAMY.

Witnesses:

F. A. CUTTER,
J. M. STERNS.