

April 7, 1931.

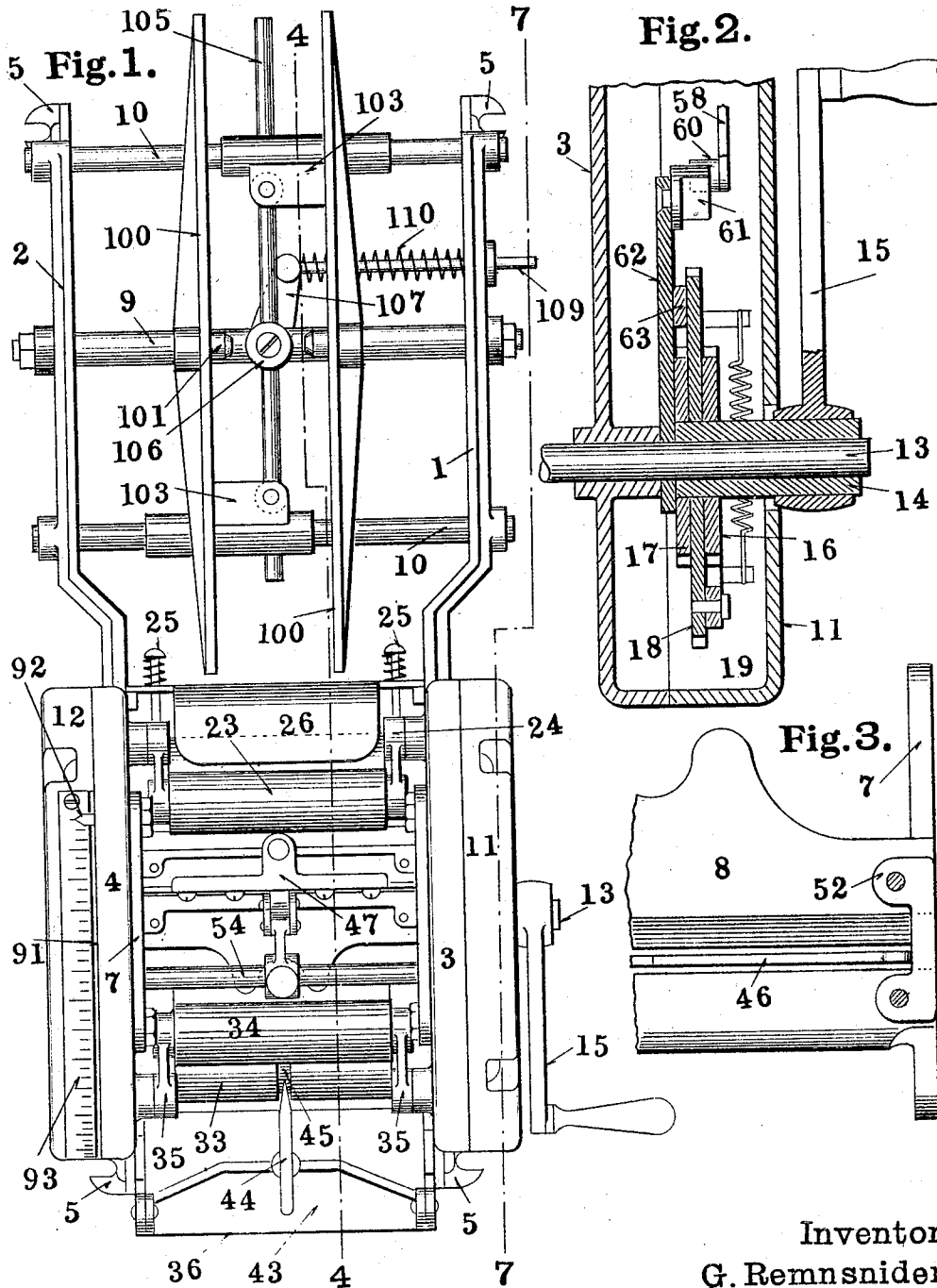
G. REMNSNIDER

1,799,533

TAPE DELIVERING MACHINE

Filed Dec. 2, 1927

4 Sheets-Sheet 1



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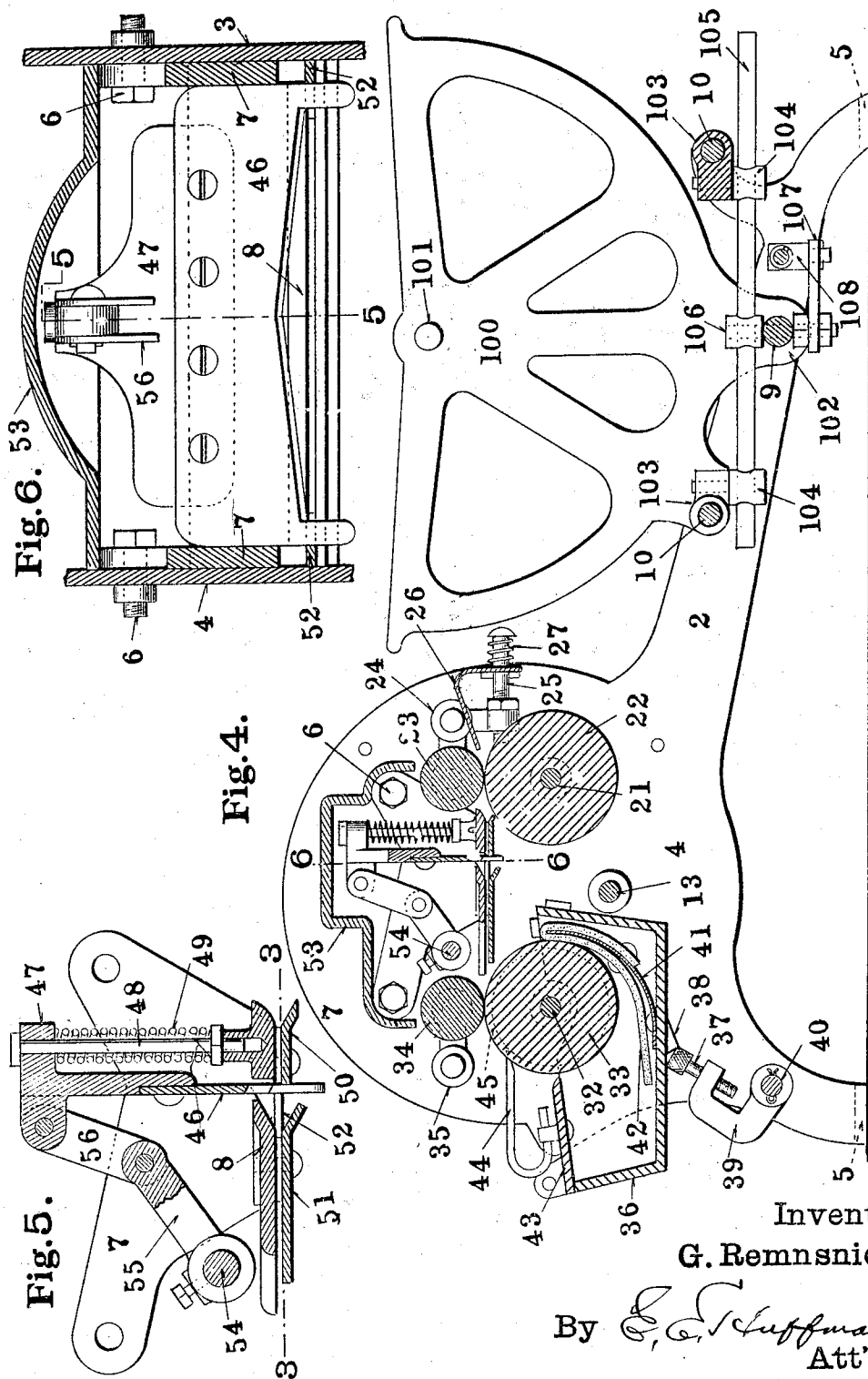
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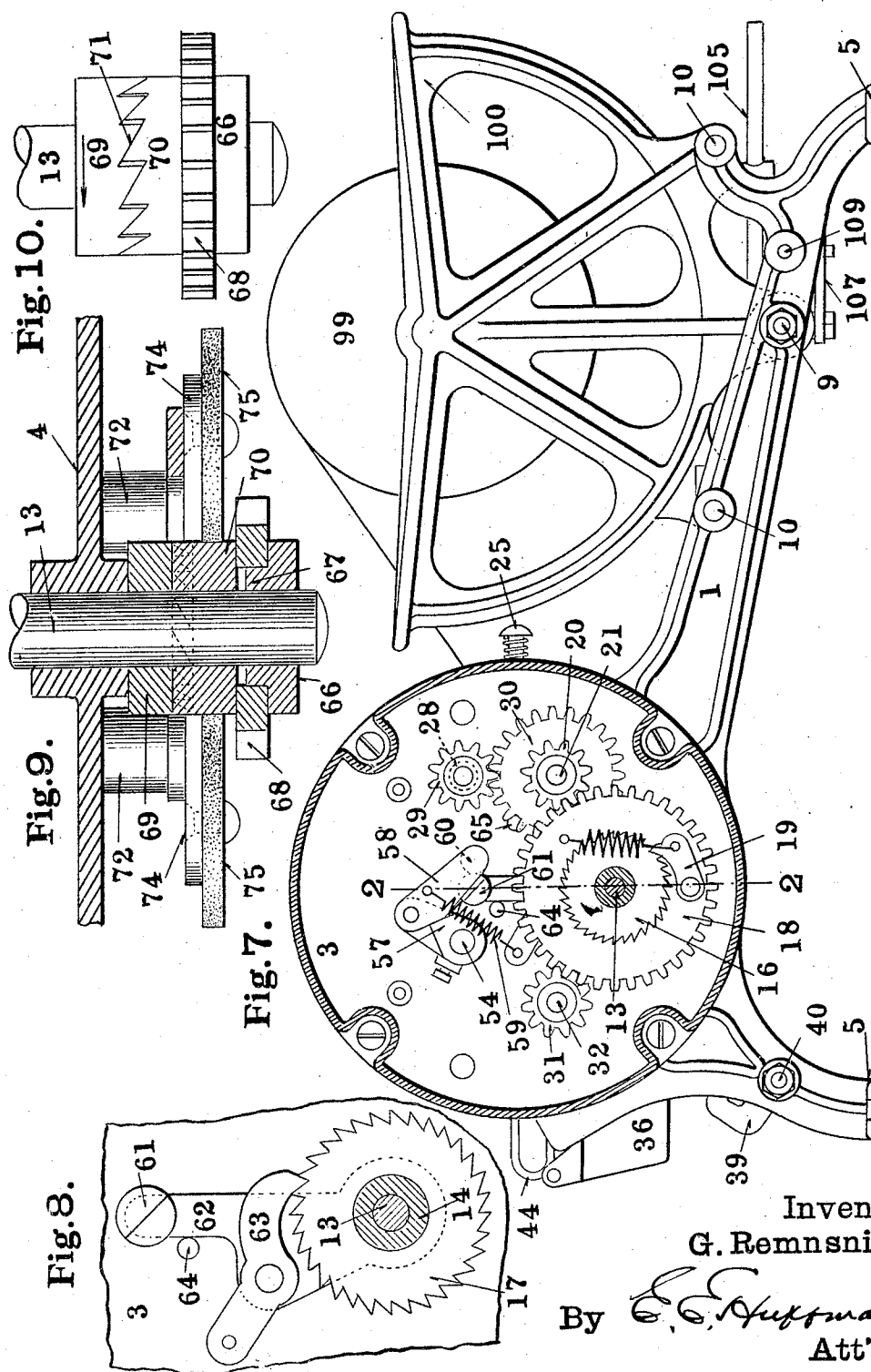
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Fig. 11.

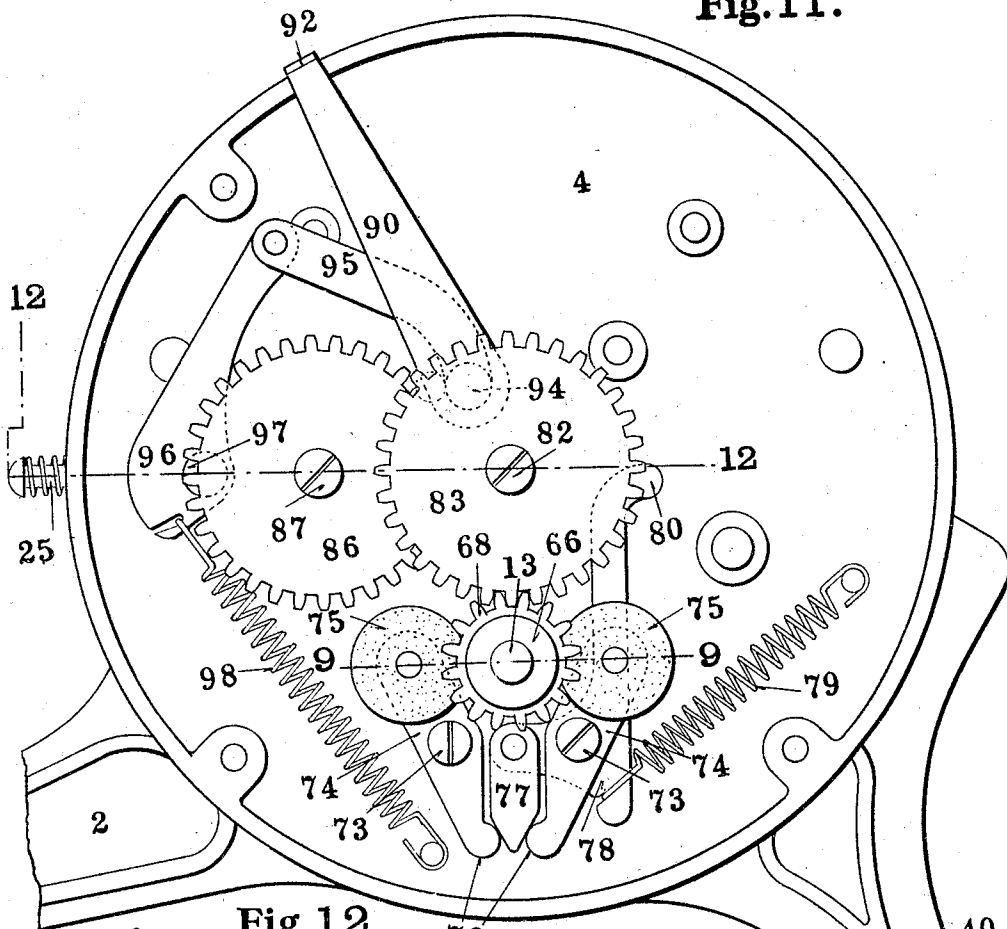
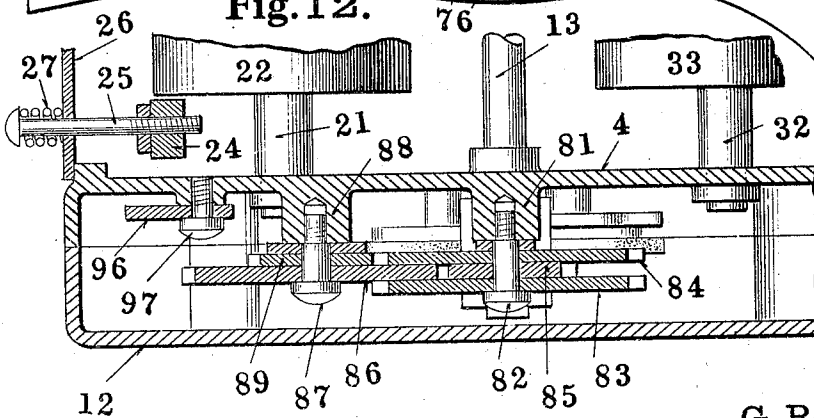


Fig. 12.



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UNITED STATES PATENT OFFICE

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TAPE-DELIVERING MACHINE

Application filed December 2, 1927. Serial No. 237,189.

My invention relates to a tape delivering machine and particularly to one for delivering and at the same time moistening gummed tape, such as is used for sealing cartons, bundles, etc.

One of the objects of my invention is to provide a machine in which the delivery of the tape is controlled by a handle in such manner that strips of any desired length within the capacity of the machine may be delivered without special setting of the machine by observing a suitable indicating device.

Another object of my invention is to provide means for severing the tape by a reverse movement of the handle; and still another object is to provide improved means for holding and centering the tape roll.

My invention also has for its object the provision of various new and improved details of construction as hereinafter set forth.

In the accompanying drawings, which illustrate one form of machine made in accordance with my invention, Figure 1 is a top plan view, the roller guard being removed; Figure 2 is an enlarged section taken on the line 2—2 of Figure 7; Figure 3 is a section taken on the line 3—3 of Figure 5; Figure 4 is a section taken on the line 4—4 of Figure 1; Figure 5 is a section taken on the line 5—5 of Figure 6; Figure 6 is an enlarged section taken on the line 6—6 of Figure 4; Figure 7 is a view partly in side elevation and partly a section taken on the line 7—7 of Figure 1; Figure 8 is an enlarged detail of some of the parts hidden in Figure 7; Figure 9 is an enlarged section taken on the line 9—9 of Figure 11; Figure 10 is a plan view of the clutch shown in Figure 9; Figure 11 is an enlarged side elevation of the front part of the machine taken from the side opposite Figure 7, the gear cover plate being removed; and Figure 12 is a section taken on the line 12—12 of Figure 11.

The framing of the machine comprises a right hand casting 1 and a left hand casting 2 terminating at their forward ends in flanged circular plates 3 and 4, respectively, and provided with feet 5 upon which the machine is supported. Extending between plates 3 and 4, and secured thereto by bolts

6, is a U-shaped frame formed of a pair of side plates 7 and a bottom plate 8, which frame serves not only to space the plates 3 and 4 apart, but, also to carry the tape-clipping mechanism hereinafter to be described. A central cross-rod 9 spaces the rear ends of the castings 1 and 2 apart and together with a pair of cross-rods 10 arranged one at the front and the other at the rear of the rod 9, forms the support for the roll carrying mechanism. Secured to the plate 3 is a cover 11, and to the plate 4 a cover 12.

The main or driving shaft 13 is journaled in the plates 3 and 4 and projects at the right hand side through an opening in the cover 11, as shown in Figure 2. Non-rotatably mounted on the shaft at the end is a sleeve 14, and on the sleeve a handle 15. Rigidly mounted on the inner end of the sleeve 14 are a pair of ratchet wheels 16 and 17 having their teeth arranged in reverse directions and between them is loosely mounted a gear wheel 18. Carried on the gear wheel is a spring pawl 19 engaging with the ratchet wheel 16 so that when the handle is rotated in a forward or clockwise direction the wheel will move with it but will remain stationary when the handle is reversed. Meshing with the wheel 18 is a pinion 20 on the end of a shaft 21 carrying a feed roll 22. Cooperating with the feed roll 22 is a second and smaller feed roll 23 journaled in the horizontal arms of bell-crank levers 24 mounted on studs in the plates 3 and 4. Adjustable screws 25 carried by the vertical arms of these levers project rearwardly through a tape guide 26 and are surrounded by coil springs 27 which tend to move the arms rearwardly and thus hold the roller 23 in yielding contact with the roller 22. The right hand trunnion of the roller 23 extends through an opening 28 (shown in dotted lines in Figure 7) in the plate 3, which opening is of larger diameter than the trunnion to allow the slight relative movement of the feed rollers to accommodate varying thicknesses of tape. Mounted on the end of the trunnion is a pinion 29 meshing with a gear wheel 30 on the shaft 21. The pitch lines of the pinion 29 and gear 30 correspond with

the diameter of the feed rolls so that these are driven at the same peripheral speed. Meshing with the gear 18 is a second pinion 31 on the end of a shaft 32 carrying a roll 33 acting both as a feed and moistening roll. Cooperating with this roll is a roll 34 journaled in arms 35 mounted on studs in plates 3 and 4. This roll bears on the roll 33, or on the tape passing between the rolls, by gravity and is driven by friction alone.

The detachable water pan 36 is held against lugs on the plates 3 and 4 by the conical end of a screw 37 bearing against the bottom of the pan and a lug 38 thereon and threaded in a U-shaped bracket 39 loosely mounted on a rod 40. This rod extends between the castings 1 and 2 and in addition to carrying the bracket serves as a spacing member. By retracting the screw out of contact with the pan the bracket may be swung away from the pan so that the latter may be removed for cleaning. Riveted, or otherwise secured to the bottom of the pan, is a curved strip 41 of thin spring metal to which is secured a strip 42 of felt, wicking, or other capillary material for applying the water in the pan to the periphery of the roller in a thin film. Water is introduced into the pan by means of a hinged cover 43 which carries a stripping finger 44, the pointed end of which projects into a central groove 45 in the periphery of the roller to insure the detachment of the tape from the roller.

Formed in the plate 8 is a slot for the passage of the clipping knife 46 which is shaped as shown in Figure 6 so as to make a double shearing cut beginning at each side of the tape and terminating at the center. This knife is secured to a frame 47 slidably mounted on a guide rod 48 and normally held in raised position by a coil spring 49 surrounding said rod. Secured to the bottom of the plate 8 is a guide plate 50 and a second guide plate 51 separated from the said plate 8 by spacing strips 52 (shown in detail in Figure 3) to form guide passages for the tape, first from the rollers 22 and 23 to the knife, and secondly from the knife to the rollers 33 and 34. On the rear edge of the plate 50 is an inclined lip cooperating with the rounded rear edge of the plate 8 to form a receiving mouth for the first guide passage and on the plate 51 a similar lip cooperating with the beveled edge of the slot of the plate 8 to form a receiving mouth for the second guide passage. The side plates 7 carrying the plate 8 are so shaped as to form supports for the removable roller guard 53.

Journaled in the plates 3 and 4 is a rock shaft 54 provided with a central arm 55 connected by links 56 to the knife frame 47. Secured to the right hand end of this rock shaft is a second arm 57 (Figure 7) to which is pivoted a knuckle 58 normally held against a shoulder on said arm by spring 59. On the

inner face of the knuckle 58 is a roller 60 (see also Figure 2). This roller is adapted to contact with the upper rounded face of a cam 61 when said cam is moved in a forward or clockwise direction, in which case the knuckle is swung upwardly on its pivot against the tension of the spring 59 without moving the rock shaft 54. Upon the return movement of the cam the lower inclined face engages the roller depressing the knuckle and with it the arm 57 thus rocking the shaft 54 to actuate the knife 46 to clip the tape. The cam is carried on a plate 62 loosely mounted on the shaft 13 and having pivoted to it a pawl 63 engaging with the ratchet wheel 17. The pawl is held in engagement with the ratchet wheel by the coil spring 59 extending between it and the knuckle. Movement of the plate 62 is limited in one direction by stop 64 and in the other by stop 65.

Rigidly secured on the left hand end of the shaft 13 is a collar 66 (Figures 9, 10 and 11) having a hub 67 on which is loosely mounted a pinion wheel 68. A second collar 69 is also rigidly mounted on the shaft with a loose collar 70 between it and the pinion. Formed on the opposing faces of the collars 69 and 70 are crown teeth 71. When the collar 69 is rotated in the direction indicated by the arrow in Figure 10 and the rotation of the collar 70 is retarded these teeth will act as cams to force the collar 70 toward the end of the shaft and thus clamp the pinion between the said collar and the collar 66, while a slight movement in the reverse direction will allow the collar 70 to recede and release the pinion. The device thus forms a quick acting clutch and release mechanism. In order to retard the collar 70 I pivot to bosses 72 on the plate 4, by means of screw studs 73, a pair of lever arms 74 carrying at the upper ends friction blocks 75 bearing on the collar. In the drawings I have shown these blocks in the form of fiber disks, their shape, however, not being of importance as they do not revolve but simply act as brakes. The lower ends of the arms terminate in rounded fingers 76 between which is a wedge-shaped member 77 the action of the inclined faces of which on the fingers holds the friction blocks against the disk. Mounted on one of the studs 73, at the rear of the lever 74, is a double bellcrank lever 78 to one arm of which the member 77 is pivoted. A coil spring 79 is attached to the second arm of the lever to force the member 77 downwardly, and the third arm is extended upwardly and terminates in a releasing cam 80.

Located in the center of the plate 4 is a boss 81 carrying a screw stud 82 on which are loosely mounted a pair of gear wheels 83 and 84, the outer wheel 83 meshing with the pinion 68. Situated between the wheels 83 and 84 and rigidly secured to the former, is a smaller wheel 85 meshing with a wheel

86 mounted on a screw stud 87 in a boss 88. Rigidly secured to the wheel 86 is a second small wheel 89 which meshes with the wheel 84. These wheels act as a reducing train of
 5 gearing for the indicating arm 90 which is secured to the rear face of the wheel 84. This arm extends through a slot 91 (Figure 1) formed by cutting away a portion of the cover 12 throughout an arc of somewhat less
 10 than 180 degrees. A pointer 92, formed by bending over the end of the arm, cooperates with a scale 93 secured to the cover adjacent to the slot. Pivoted to the rear face of the wheel 84 by a screw 94, preferably at the
 15 point where the arm 90 is attached, is a link 95, pivoted to a lever 96 carried on a stud 97 in the plate 4. A spring 98 attached to the lower end of the lever 96 normally holds the indicator-arm against the upper end of the
 20 slot 91.

The tape roll 99 (Figure 7) is carried between a pair of sliding frames 100 each provided on the inner face with a boss 101 adapted to enter the usual hole on the center block
 25 on which the roll is wound. Each of the frames is provided with a short central bearing 102 engaging the rod 9 and with a long side bearing 103 engaging with one of the rods 10. Pivoted in each of the bearings
 30 103 is a stud 104 in which slides a bar 105 rigidly secured in a stud 106 passing down through the rod 9 and provided on its lower end with an arm 107. Pivoted in the end of the arm 107 is a stud 108 carrying a rod 109
 35 surrounded by a coil spring 110 and extending through the casting 1. The tension of the spring 110 tends to move the arm 107 toward the left (Figure 1) and thus force the frames 100 toward each other. To insert a roll of
 40 tape in the machine the rear end of the bar 107 is forced toward the right against the spring 110 until the frames 100 are separated a sufficient distance to allow the roll to enter between the bosses 101 until the hole in the center block is in alignment with said bosses
 45 when the bar is released so that the spring causes the frames to move toward each other, the bosses entering the center hole and the frames bearing against the ends of the roll.
 50 The device thus automatically adjusts itself to the width of the tape used and accurately centers the roll of tape in the machine. The pressure of the frames on the ends of the roll also acts as a brake to prevent the over
 55 rotation of the roll as the tape is unwound.

The operation of my machine is as follows: the end of the tape from the roll 99 is passed down over the guide plate 26 and between the feed rollers 22 and 23. Rotation of the handle 15 in a clockwise direction
 60 rotates the wheel 18 through ratchet wheel 16 and pawl 19, thus driving feed rollers 22 and 23 as well as feed roll 33. Friction of the pawl 63 on the ratchet wheel 17 carries the plate 62 forward until it engages the stop
 65

65. During this movement the knuckle 58 is forced upwardly on its pivot by the engagement of the upper face of the cam block 61 with the roller 60. The cam block is now
 70 in position at the rear of the roller to actuate the rock shaft 54 upon the reversal of the handle. The ratchet 17, however, allows further forward movement of the handle without further movement of arms
 75 62. At the first movement of the shaft 13 the collar 70 being retarded by the friction block 75 clutches the pinion 68 so that the movement of the shaft is communicated through the reducing gearing to the indicating arm 90 which is thus caused to move along
 80 the scale 93 to indicate the length of the tape unwound from the roll. When the desired length of tape is indicated on the scale 93 the direction of relation of the handle 15 is reversed. As soon as the direction of rotation of the shaft 13 is reversed the pressure
 85 of the collar 70 on the pinion 68 is relieved so that the spring 98 acting through lever 96 and link 95 may return the indicator arm 90 to its initial position shown in Figure 1. The reverse movement of the handle is
 90 communicated through ratchet wheel 17 and pawl 63 to plate 62 causing the lower inclined face of the cam block 61 to engage with the roller 60 on the knuckle 58, thus
 95 depressing the latter and consequently actuating the rock shaft 54. The movement of this shaft communicated through arm 55 and links 56 depresses the knife 46 to clip the tape. When the cam block 61 has passed the
 100 roller 60 allowing spring 48 to return the tape clipping mechanism to normal position, the plate 62 will come into contact with the stop 64 thus arresting the reverse movement of the handle. The tape may now be grasped
 105 and its short end extending from the rollers 33 and 34 to the knife be drawn over the now stationary roller 33 as it is held against said roller only by the weight of the roller 34.

The above is the operation of the machine
 110 when lengths of tape no longer than that indicated by the scale 93 are delivered. Greater lengths may be delivered by a continued rotation of the handle. In this event when the indicator-arm has reached the lower end
 115 of the slot the screw 94 will contact with the cam end 80 of the bellcrank lever 78 and thus raise the wedge member 77 and relieve the pressure of the friction blocks 75 on the roller 70. The clutch mechanism will thus be released and will not interfere with the further
 120 rotation of the handle.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, the combination with tape carrying means, of tape feeding mechanism, tape severing mechanism, a ratchet connection between said shaft and tape feeding mechanism, and a sec- 130

and ratchet connection between said shaft and tape severing mechanism, said second ratchet connection operating in the reverse direction from said first named ratchet connection.

2. In a device of the class described, the combination with tape carrying means, of feed rollers, a driving shaft for said rollers, tape severing means, indicating mechanism to denote the amount of tape delivered, and clutch connections between said shaft and indicating mechanism, the reversal of said shaft operating said tape severing means and also releasing said clutch connections.

3. In a device of the class described, the combination with tape carrying means, of feed rollers, a driving shaft for said rollers, tape severing means, indicating mechanism to denote the amount of tape delivered, clutch connections between said shaft and indicating mechanism, the reversal of said shaft operating said tape severing means and also releasing said clutch connections, and means operative when the indicating mechanism has reached the limit of its travel for independently releasing the clutch mechanism.

In testimony whereof, I hereunto affix my signature, this 29th day of November, 1927.

GEORGE REMNSNIDER.