

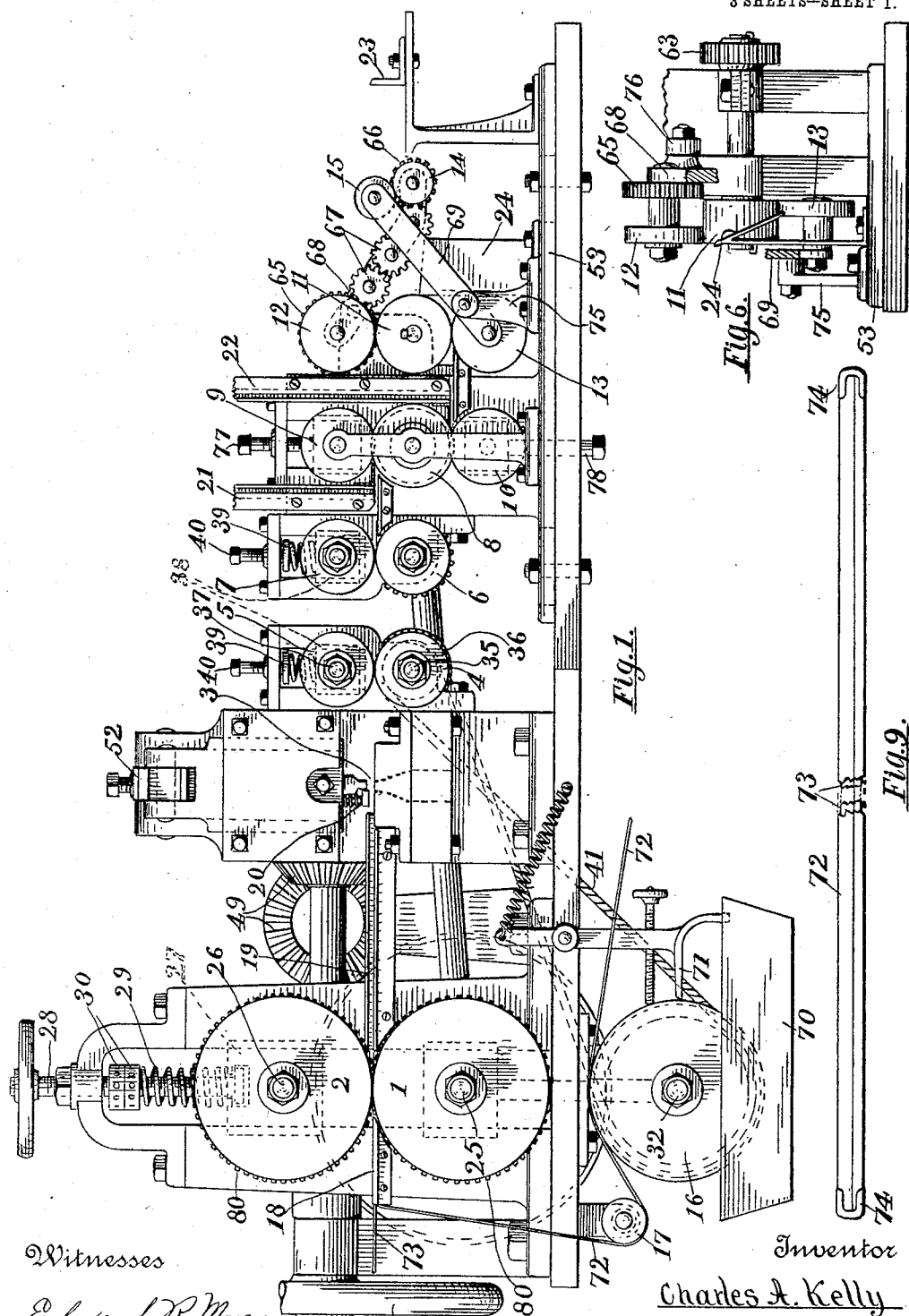
No. 797,005.

PATENTED AUG. 15, 1905.

C. A. KELLY.  
MACHINE FOR MAKING DRESS STAYS.

• APPLICATION FILED JAN. 9, 1905.

3 SHEETS—SHEET 1.



Witnesses

Edward R. Moore,  
Georgiana Chace.

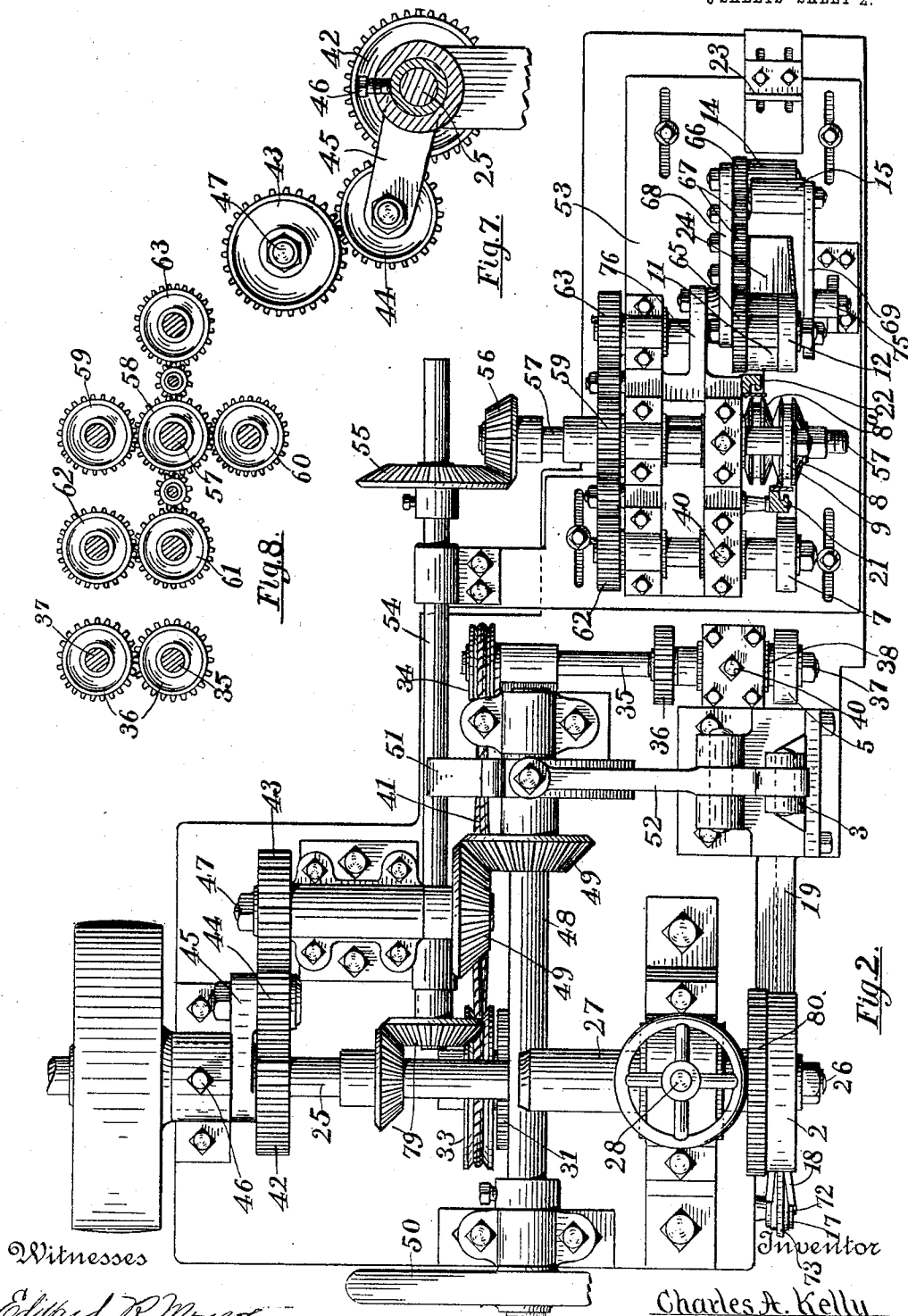
Inventor

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Witnesses  
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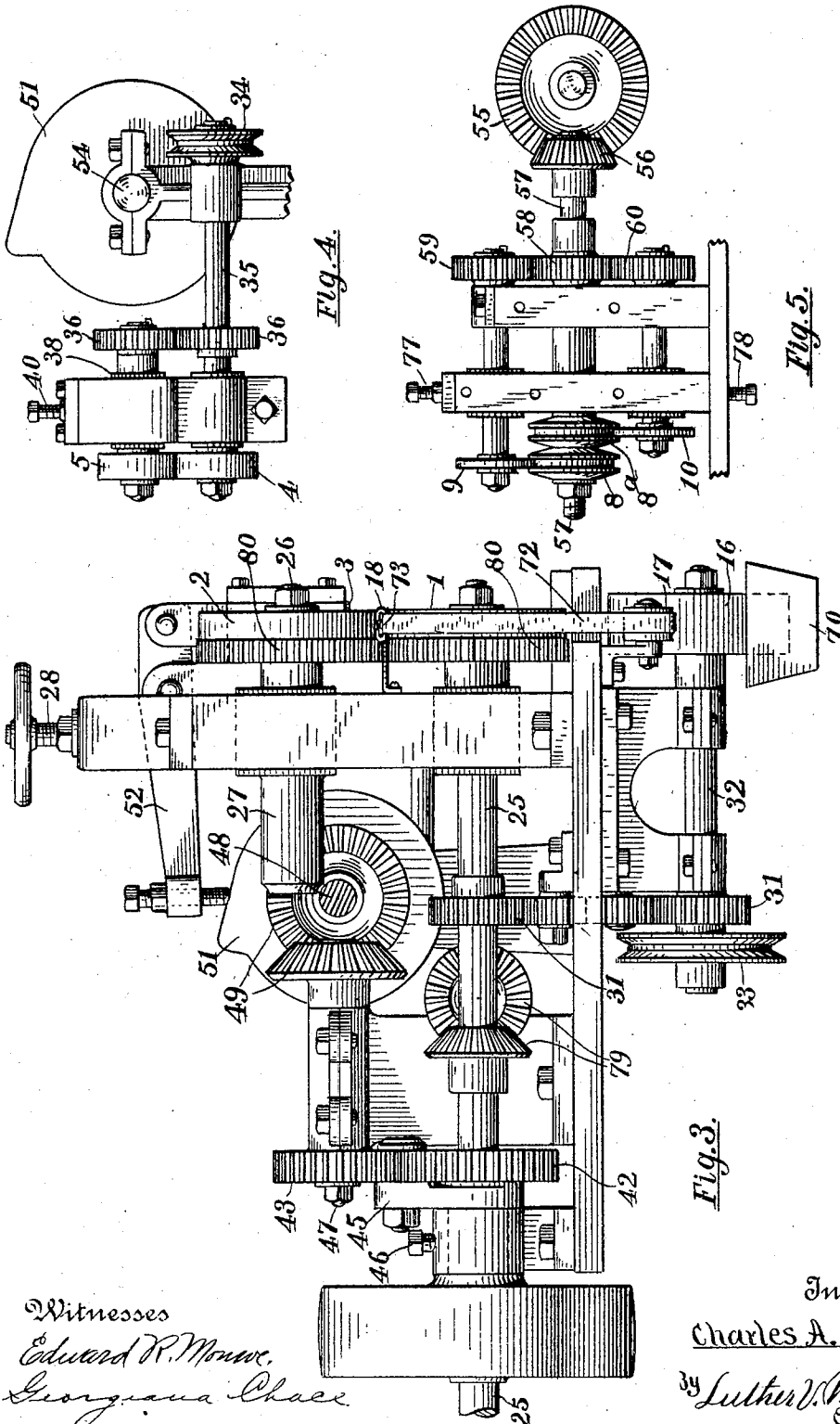
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3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

CHARLES A. KELLY, OF ANSONIA, CONNECTICUT, ASSIGNOR OF ONE-THIRD  
TO CHRISTOPHER M. KELLY, OF GRAND RAPIDS, MICHIGAN.

## MACHINE FOR MAKING DRESS-STAYS.

No. 797,005.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed January 9, 1905. Serial No. 240,209.

*To all whom it may concern:*

Be it known that I, CHARLES A. KELLY, a citizen of the United States, residing at Ansonia, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Machines for Making Dress-Stays; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for making dress-stays; and its object is to provide an automatic machine that will complete the stay by one continuous and automatic operation and to provide the machine with various new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My invention consists, essentially, of the combination and arrangement of mechanism for applying a covering to a strip of steel or other flexible material, cutting the same into portions of predetermined length and applying suitable tips to the respective ends of each portion, and in the combination and arrangement of means for performing the various steps of the operation, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation of the same with portions omitted. Fig. 4 is a detail of the first pair of feeding-rolls and parts connected therewith shown in elevation; Fig. 5, the same of the tip-compressing rolls and means for operating the same; Fig. 6, a detail of the shifting-rolls and means for driving the same; Fig. 7, a detail of the change-gearing for varying the length of the stays; Fig. 8, a detail of the gears for driving the mechanism for applying the tips, and Fig. 9 an enlarged detail of the finished product of the machine.

Like numerals refer to like parts in all of the figures.

The machine is adapted to manufacture dress or corset stays, which stays each consists of a body composed of a flat strip of flexible material, usually of spring-steel, covered by paper or cloth and provided with a metal tip at each end, applied in such manner as to cover the ends of the covering, as shown in

Fig. 9 of the drawings, in which 73 is the flexible body, 72 a covering of paper, cloth, or other material, and 74 the metal tips, which are previously formed in substantially the shape shown before being placed in the machine.

Referring to the machine for doing the work, 1 and 2 are a pair of rolls for pressing the cover upon the strip of steel.

3 represents cutting-dies operated at proper intervals to sever the proper length of material for a stay.

4 and 5 are a pair of feed-rolls that take the stays from the cutting-dies and pass them on to the tipping machinery.

6 and 7 are feed-rolls to pass the stay under the first tip-hopper 21.

8 and 8<sup>a</sup> represent two grooved rolls for pressing the tips upon the end of the stay; 9 and 10, upper and lower compressing-rolls, respectively, engaging the rolls 8 and 8<sup>a</sup>.

11 is the main shifting-roll engaged at its respective upper and lower sides by rolls 12 and 13, which latter are mounted on pivoted levers, so as to move toward and from the roll 11 as the stay passes between them.

14 and 15 are rolls to automatically grip the stay and shift the same from between the rolls 11 and 12 to between the rolls 11 and 13.

24 is an inclined guide to shift the stay laterally as it passes downward.

16 is a roll to apply the adhesive material to the covering material 72.

17 is an idler-roll to maintain the material 72 in contact with the roll 16.

18 is a folder of the usual construction to fold the material 72 around the steel 73.

19 is a grooved guide to direct the covered steel from the rolls 1 and 2 to the cut-off dies 3.

20 is a spring-actuated pressure-foot attached to the upper cutting-die and vertically movable therewith to grip the stock when the cutter operates upon the same.

21 is a tip-hopper to supply tips to the forward end of the stay.

22 is a tip-hopper to supply tips to the rear end of the stay after it has been reversed in its movement.

23 is an adjustable stop to limit the movement of the stay.

The various means for operating the described mechanism is preferably as follows:

25 is the main driving-shaft, operated by any suitable motor, on the end of which shaft

is mounted the lower roll 1. The upper roll 2 is mounted on a shaft 26, journaled in a vertically-movable bearing 27, adjusted by a screw 28 and yieldingly holding the roll 2 in contact with the roll 1 by means of a spring 29, the tension of which spring is adjusted by suitable nuts 30 on the screw 28. Gears 80 connect the rolls 1 and 2. Gears 31 transmit motion from the driving-shaft 25 to a counter-shaft 32, on which latter is mounted the pasting-roll 16.

33 is a pulley on the shaft 32, which pulley is connected by a belt 41 to a pulley 34 on the shaft 35, on which shaft is mounted the roll 4. The roll 5 is mounted on a shaft 37, journaled in a vertically-movable bearing 38, depressed by a spring 39 to hold the rolls 4 and 5 in yielding contact, the tension of the spring being adjusted by a screw 40.

To operate the cutting-dies 3, a gear 42 is mounted on the shaft 25 and connected to a changeable gear 43 by means of an idler-gear 44, mounted on an adjustable arm 45 and held in adjustment by a screw 46. The gear 43 can be changed for another of different pitch diameter and the arm 45 properly adjusted, whereby the periodical operation of the dies 3 may be varied to vary the length of the stays produced by the machine. The shaft 47 is connected to a cam-shaft 48 by bevel-gears 49, and on this cam-shaft is a cam 51 to operate a lever 52, which lever operates the cutting-dies 3. This cam-shaft is also provided with a hand-wheel 50 to manually operate the machine as occasion requires.

The tipping mechanism is mounted on a bed-plate 53, adjustable toward and from the dies to conform to the various lengths of stays to be produced, and this tipping mechanism is operated by means of miter-gear 79, connecting the driving-shaft 25 with the counter-shaft 54, on which counter-shaft is adjustably mounted a bevel-gear 55, engaging the bevel-gear 56, which latter gear drives the tipping mechanism, and thus when the bed-plate 53 is adjusted the gear 55 can be adjusted on the counter-shaft 54 to conform to such adjustment. The gear 55 is of enough greater pitch diameter than the gear 56, so that the rolls 6 and 7 will rotate considerably faster than the rolls 4 and 5, whereby as soon as a stay passes into the tipping mechanism its forward movement is accelerated, thus leaving a space between it and the next succeeding stay to enable the reversing mechanism to properly operate, as hereinafter described. The gear 56 is mounted on the shaft 57, which constitutes the driving-shaft of the tipping mechanism, and on this shaft is mounted the two tip-compressing grooved rolls 8 and 8<sup>a</sup> side by side.

Above the roll 8, which first receives the stay, is an upper tip-compressing roll 9, extending within the groove of the roll 8 and mounted on a shaft driven by a gear 59, engaging the gear 58 and vertically adjusted by

means of a screw 77. The lower tip-compressing roll is in like manner mounted on a shaft vertically adjustable by means of a screw 78, and engages the under side of the groove in the roll 8<sup>a</sup>, and is driven by a gear 60 engaging the gear 58. The rolls 6 and 7 are driven by means of mounting the roll 6 on a shaft driven by a gear 61, connected by an idler-gear to the gear 58, and the roll 7 is mounted on a shaft journaled in a vertically-movable bearing 38, yieldingly depressed by a spring 39 and adjusted by a screw 40, said shafts being connected by means of the gears 61 and 62.

The mechanism for returning the stay after it has received the first tip is operated as follows: The roll 11 is mounted on a shaft driven by a gear 63, connected by an idler to the gear 58. This roll 11 is of such length as to come opposite the roll 12 at one end and opposite the roll 13 at the other end, (see Fig. 6,) the rolls 12 and 13 being respectively in alinement with the respective compressing-rolls 8 and 8<sup>a</sup>. The roll 12 is mounted on one end of a lever 68, which lever is pivoted at a short distance from this end to a bracket 76 and extending oppositely therefrom supports the roll 14 at its other end. Attached to the roll 12 is a gear 65, and to the roll 14 is attached a gear 66, and a train of gears 67 connect these gears, and thus transmit motion from the roll 12 to the roll 66. The roll 13 is mounted on the lower end of a lever 69, pivoted to a bracket 75 near this end and extending across the direction of the lever 68 at its upper end supports the roll 15, which roll is freely rotative about its axis. 70 is a reservoir for supplying the paste or other adhesive material to the roll 16. 71 is an adjustable scraper to partially remove the adhesive material, and thus leave the proper quantity on the roll.

The operation of the machine is as follows: Being properly adjusted and set in motion, the covering material 72 passes from any suitable reel over the roll 16 and there receives a coating of adhesive material. It passes thence to a folder 18, through which is passing the continuous strip 73 of suitable material to form the body of the stay and supplied from another suitable reel. The folder 18 forms the covering material 72 around the steel 73. They then pass between the rolls 1 and 2, which compress the covering material upon the steel, after which they pass through the guide 19 and between the cutting-dies 3, which dies are periodically operated at regular intervals by a projection on the cam 51, and thus the dies sever the stock in uniform lengths depending upon the relative pitch diameters of the gears 42 and 43. The severed stays then pass between the rolls 4 and 5 and then between the rolls 6 and 7, which latter rolls impart accelerated forward motion to the same, thus leaving a space between it and the next succeeding stay, and in passing

under the tip-hopper 21 the front end of the stay enters the lower tip in the hopper and carries the same forward upon its end between the compression-rolls 8 and 9, by which the tip is firmly secured on the end of the stay. The stay then passes by the hopper 22 and between the rolls 11 and 12. Whenever a stay is between these rolls or between the rolls 11 and 13, the rolls 14 and 15 will be separated a considerable distance, and thus the stays be permitted to pass freely therebetween and against the stop 23. Thus as a stay is discharged from between the rolls 11 and 12 its headway will carry it against the stop 23 and with its rear end clear of the roll 11, and it will there remain until gripped by the rolls 14 and 15 for the return movement. It will be noted that the roll 15 is nearer to the rolls 11 and 12 than is the roll 14, and thus as these rolls grip the stay they turn the rear end of the stay downward and carry it along the surface of the guide 24 to a proper lateral adjustment to enter between the rolls 11 and 13. This will occur, however, only after the preceding stay has passed through between the rolls 11 and 13, and thus the movement of the following stay is timed entirely by the advance of the preceding stay, each one following the other in quick succession regardless of their length. The gap between the stays will vary with the different lengths of stays; but in no case will a stay follow close enough to get between the rolls 11 and 12 until after a stay has been shifted and reversed by the rolls 14 and 15, which occurs as soon as a stay escapes from between the rolls 11 and 13. The tipping mechanism thus operates on stays of various lengths. As a stay passes between the rolls 11 and 13 the direction of its movement being reversed and passing under the tip-hopper 22 it there enters the lower tip in the same and carries this tip forward on its end and between the compression-rolls 8 and 10, where this tip is thereby securely compressed upon the end of the stay. The stay is finally discharged from the machine by these rolls.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of means for applying a covering to a strip of steel, means for severing the same in predetermined lengths, and means for applying metal tips to said lengths, all combined and arranged to operate in succession, and means for automatically operating the same.

2. The combination of a pasting-roll, a folder, a pair of cover-compressing rolls, cutting-dies, two pairs of tip-compressing rolls, two tip-hoppers, rolls to reverse the motion of the stock, and means for automatically operating the various rolls and the cutting-dies.

3. The combination of a pasting-roll, a

folder, a pair of cover-compressing rolls, a guideway, cutting-dies, feed-rolls, two pairs of tip-compressing rolls, a tip-hopper at one side of each pair of tip-compressing rolls, rolls adapted to reverse the motion of the stock, an inclined guide to direct the stock, and means for automatically operating the various pairs of rolls and the cutting-dies.

4. The combination of a pasting-roll, a folder, a driving-shaft, cover-compressing rolls one of which is mounted on said shaft, gears connecting said rolls, cutting-dies, a cam to operate the dies, a cam-shaft, change-gearing connecting the cam-shaft and the driving-shaft, two pairs of tip-compressing rolls, two tip-hoppers, gearing to drive the tip-compressing rolls, means for connecting said gearing with the driving-shaft, and means for conveying the stock from one pair of tip-compressing rolls to the other pair of the same.

5. The combination of means for applying a covering to a strip of material, a cutting-die, a driving-shaft, means for applying tips to the ends of the severed portions of the stock, a bed-plate supporting said means and adjustable toward and from the cutting-dies, a counter-shaft connected to the driving-shaft, a gear to operate the means for applying tips, and a gear engaging the same and adjustable on the counter-shaft.

6. The combination of a pasting-roll, a shaft to operate the same, a folder, a pair of compressing-rolls, a driving-shaft supporting one of said rolls, gears connecting said rolls, gears connecting the driving-shaft and pasting-roll shaft, cutting-dies, a lever to operate the same, a cam to operate the lever, a cam-shaft supporting the cam, gears connecting the cam-shaft and the driving-shaft, feed-rolls, means for operating the same, two grooved rolls mounted on a single shaft, means for connecting said shaft with the driving-shaft, a roll engaging the upper side of one grooved roll, a roll engaging the under side of the other grooved roll, means for operating the said rolls, and means for transferring the stock from one grooved roll to the other grooved roll.

7. The combination with a pasting-roll, a folder, a pair of compressing-rolls, gears connecting the same, a driving-shaft supporting one of the compressing-rolls, a shaft supporting the pasting-roll, gears connecting the said shaft with the driving-shaft, cutting-dies, a cam to operate the dies, a shaft on which the cam is mounted, a change-gear to drive the cam-shaft, a gear on the driving-shaft, an idler-gear connecting the same with the change-gear and mounted on an adjustable arm, and a set-screw to hold the arm.

8. The combination of two grooved rolls, mounted side by side, a roll engaging the upper side of one grooved roll, a roll engaging the under side of the other grooved roll, rolls

to receive the stock from one grooved roll and transfer it to the other grooved roll, and an inclined guide to move the stock laterally.

9. The combination of two pairs of tip-compressing rolls one of each pair being on the same shaft side by side, a middle roll extending opposite the same, rolls at opposite sides and opposite ends of the middle roll, and mounted on the ends of pivoted and crossed levers, rolls on the other ends of said levers, gearing connecting the rolls on one of the levers, means for operating the rolls, and an inclined guide to direct the stock.

10. The combination of two pairs of tip-compressing rolls, two tip-hoppers, means for operating said roll, a middle roll, rolls normally engaging the opposite sides of the middle roll, pivoted levers movably supporting said rolls at one end, intermediate pivot-supports for said levers, rolls supported on the opposite ends of said levers one of which is nearer the first-named rolls to change the direction of the stock, gearing connecting the rolls on one lever and means for operating the rolls.

11. In combination with tip-compressing rolls and means for operating the same, transfer mechanism comprising a middle roll, rolls normally engaging opposite sides of the middle roll, pivoted levers movably supporting the said rolls and extending diagonally across each other, rolls supported on the other ends of said levers, one of said rolls being nearest to the middle roll and gears connecting the rolls on one lever.

12. In a machine for making dress-stays, in combination with cutting-dies for severing the stock, a presser-foot adapted to yieldingly engage the stock during the operation of the cutting-dies.

13. In a machine for making dress-stays, in combination with cutting-dies, a spring-actuated presser-foot attached to the movable die and adapted to yieldingly engage the stock.

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

CHARLES A. KELLY.

Witnesses:

FREDERICK M. MCCARTHY,  
C. M. KELLY.