(No Model.) 4 Sheets—Sheet 1.

G. E. BRUSH.

MACHINE FOR ATTACHING SWEATS AND BANDS TO HATS.

No. 424,458. Patented Apr. 1, 1890.

Fig. 2.

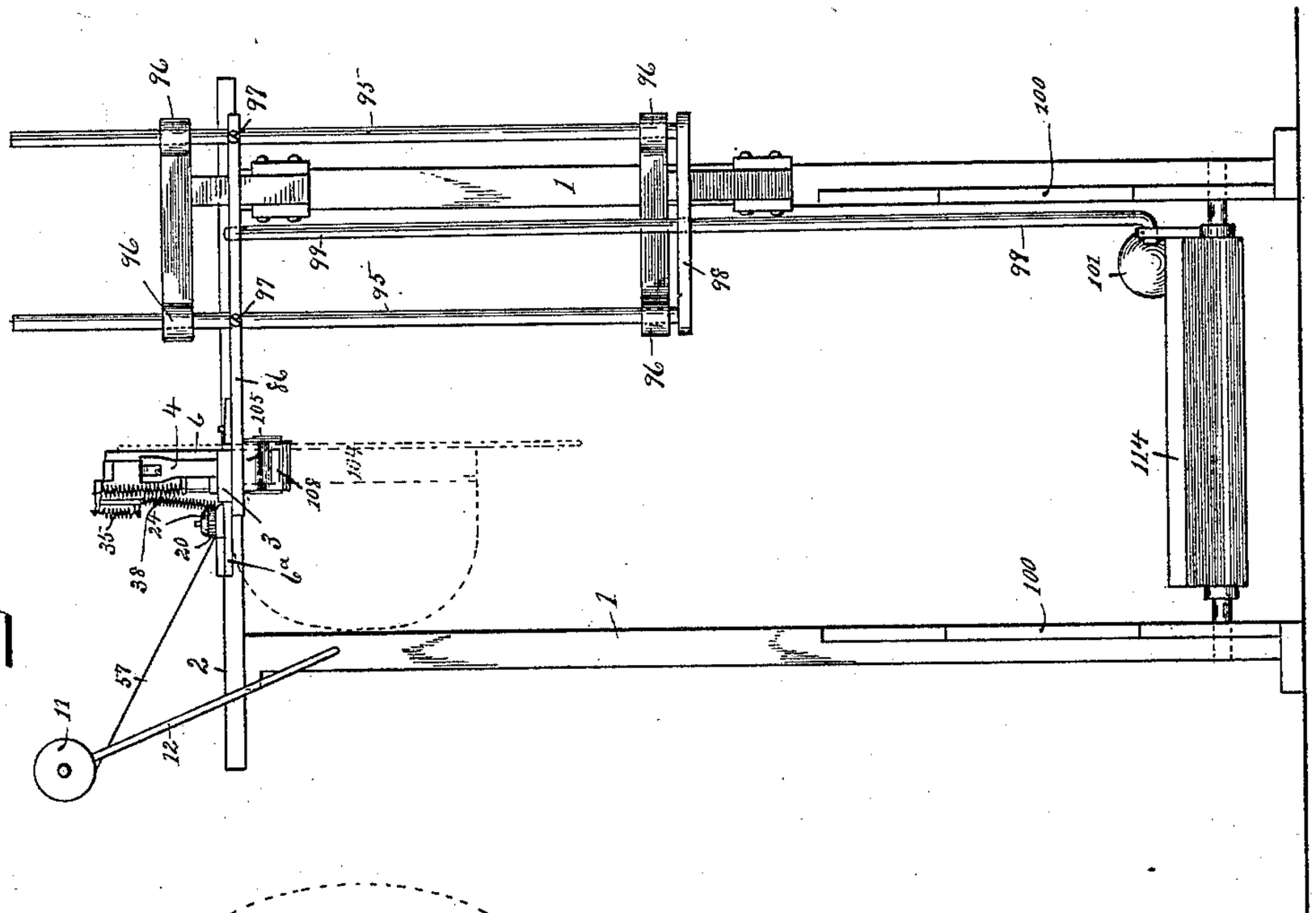
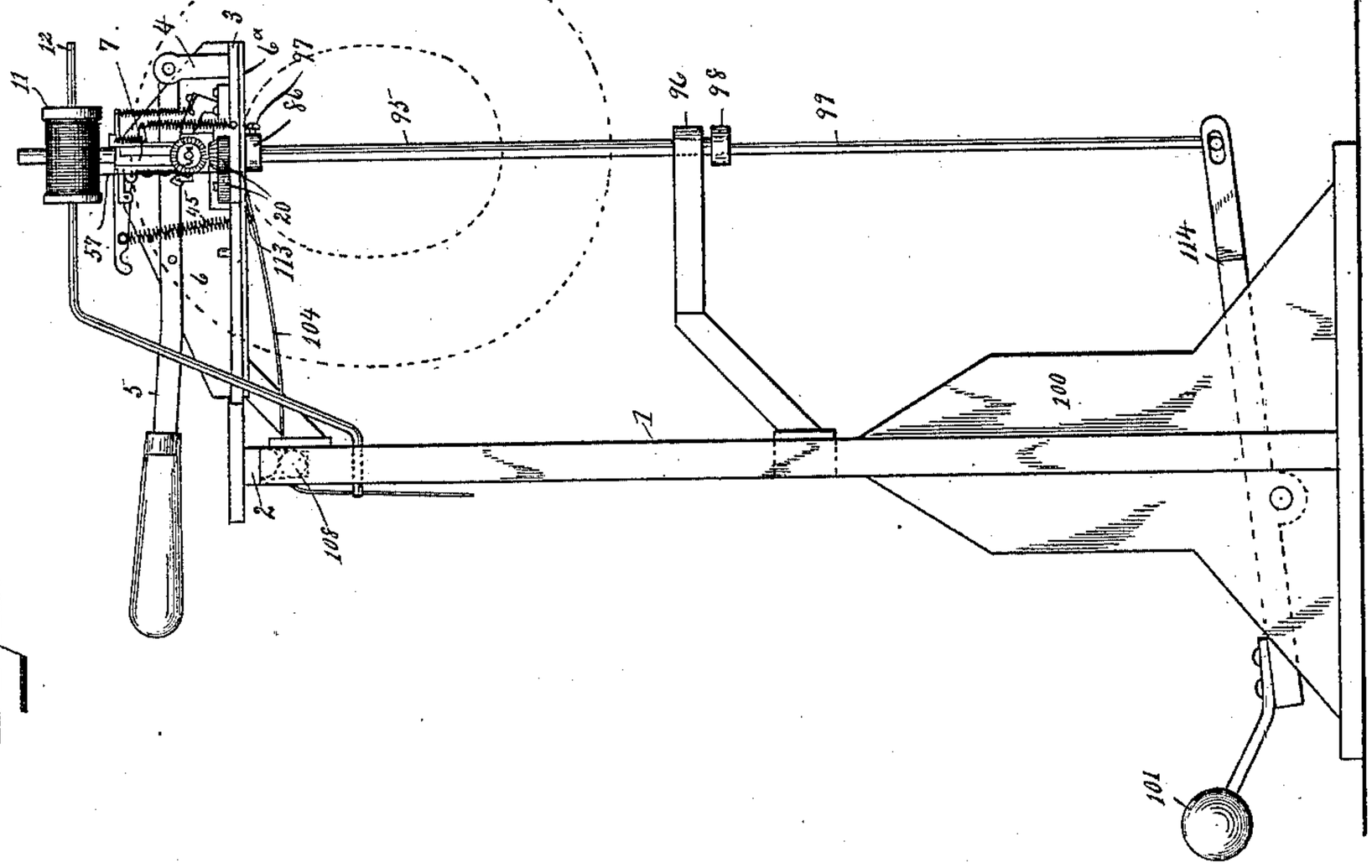


Fig. 1.



Witnesses

C. M. Newman,

A. P. Munson.

Inventor

George E. Brush

By H. W. Wooster

Atty.

(No Model.) 4 Sheets—Sheet 2.

G. E. BRUSH.

MACHINE FOR ATTACHING SWEATS AND BANDS TO HATS.

No. 424,458. Patented Apr. 1, 1890.

Fig. 3.

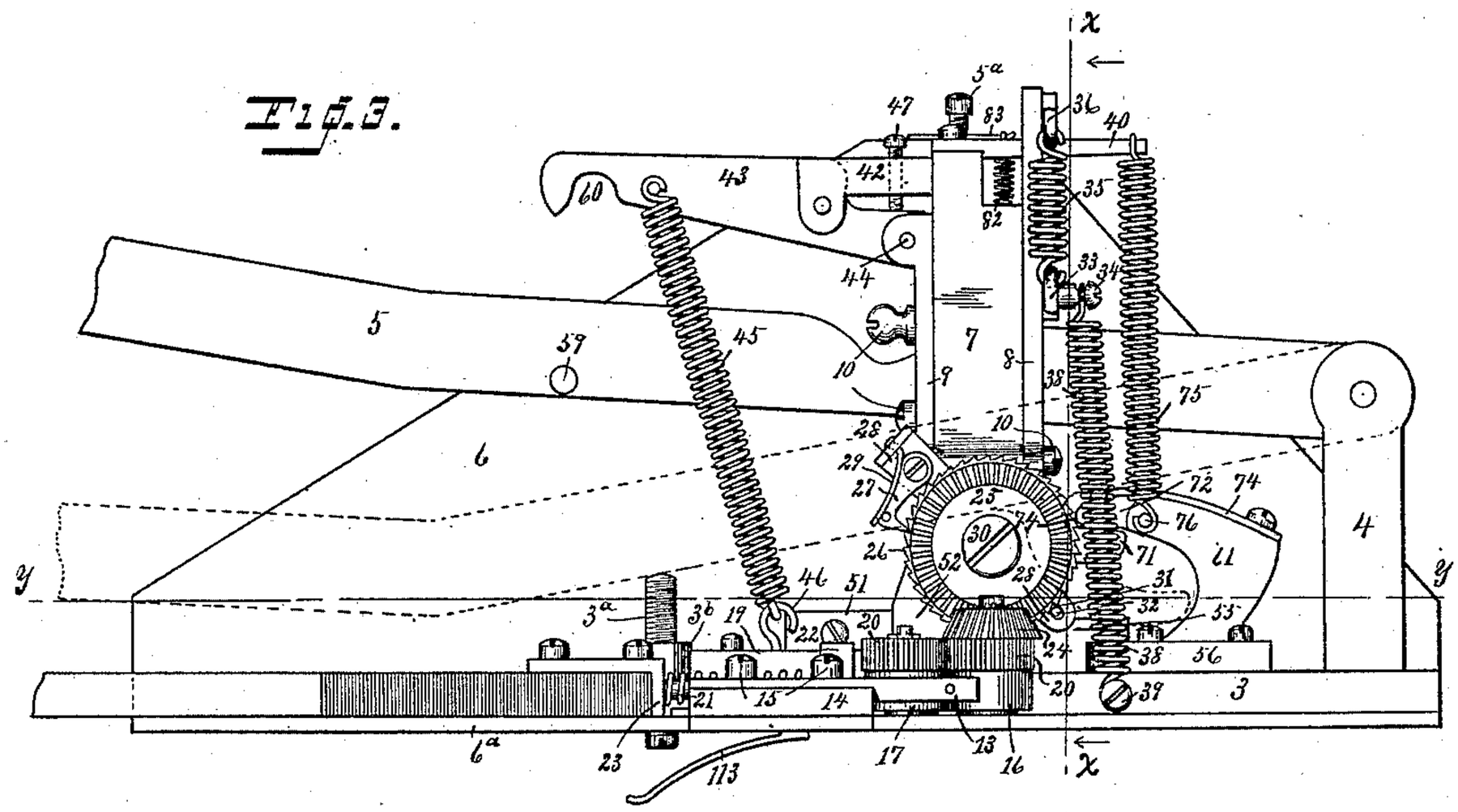
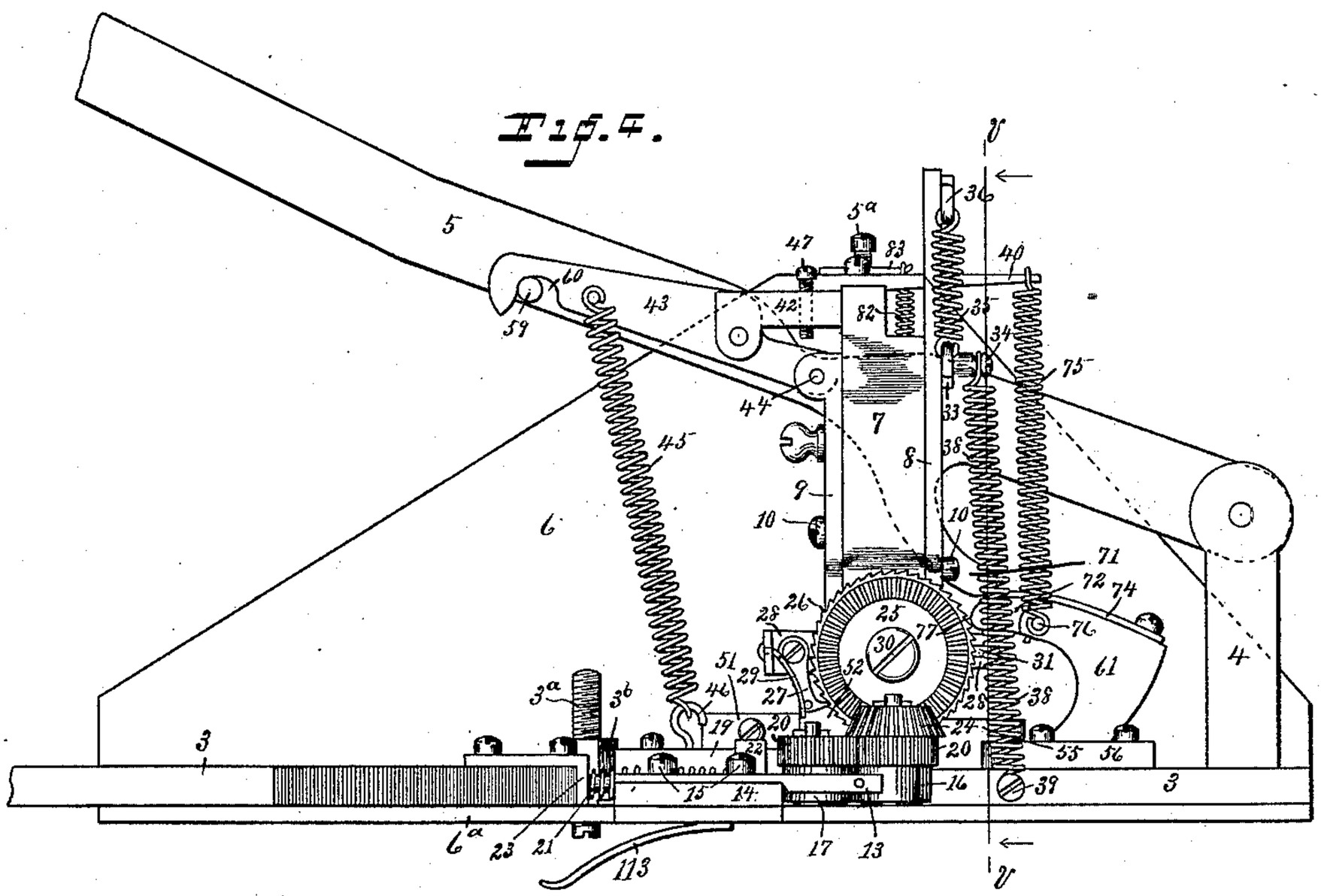


Fig. 4.



Witnesses
C. M. Newman,
A. D. Munson.

Inventor
George E. Brush
By A. M. Wooster
Atty.

(No Model.) 4 Sheets—Sheet 3.

G. E. BRUSH.

MACHINE FOR ATTACHING SWEATS AND BANDS TO HATS.

No. 424,458. Patented Apr. 1, 1890.

Fig. 5.

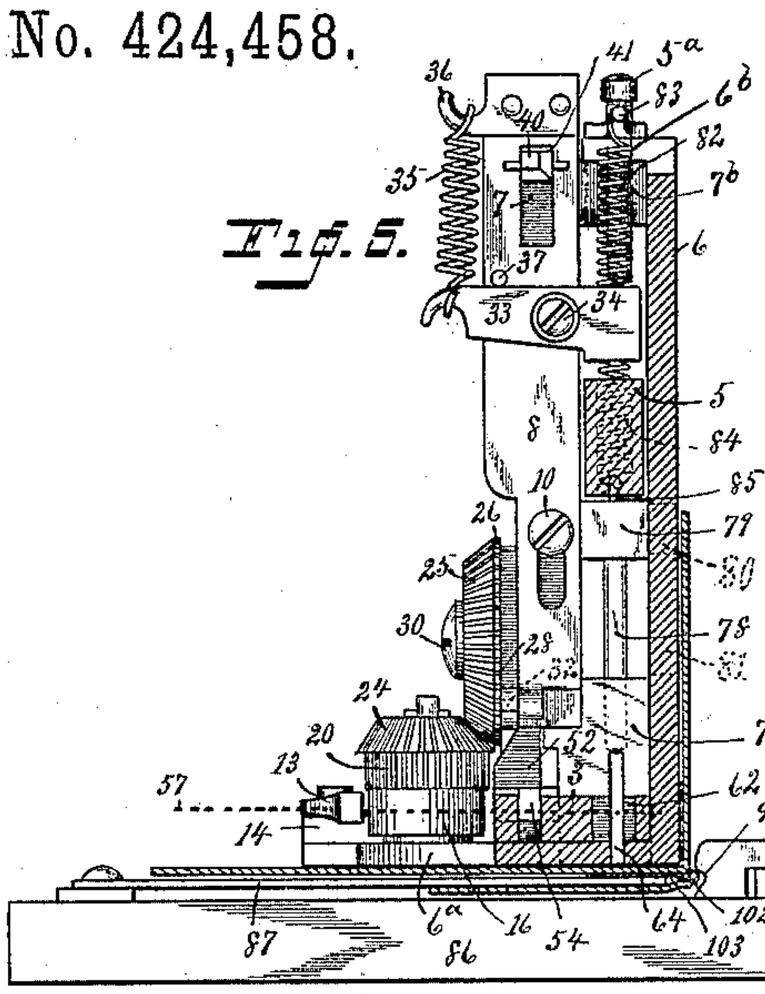


Fig. 8.

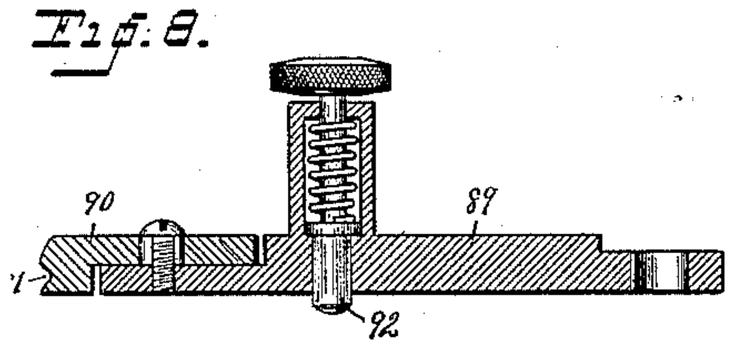


Fig. 7.

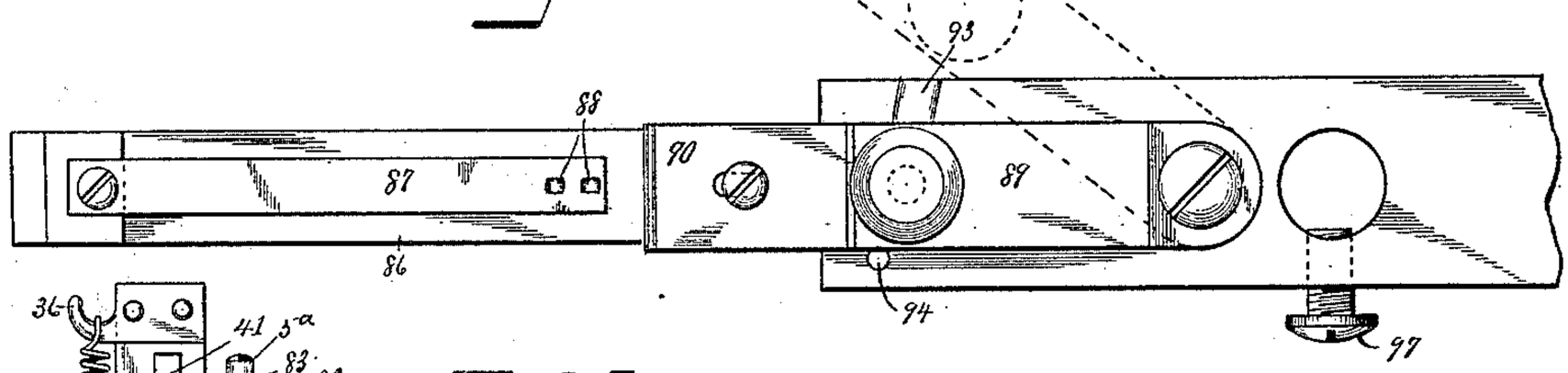


Fig. 6.

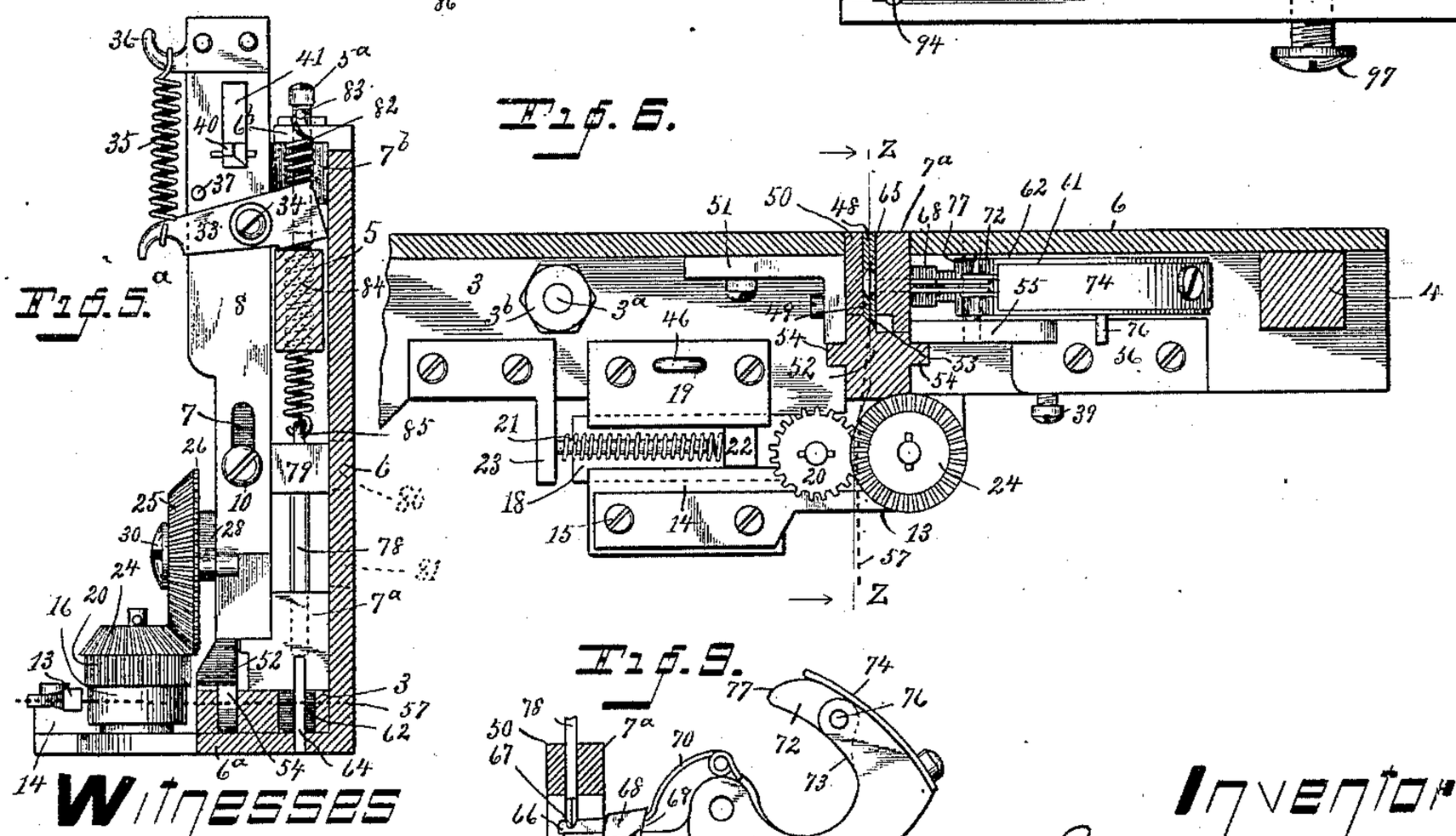


Fig. 5.

Fig. 9.

Witnesses

C. M. Newman,

A. P. Munson.

Inventor

George E. Brush

By A. M. Wooster Atty

(No Model.) 4 Sheets—Sheet 4.

G. E. BRUSH.

MACHINE FOR ATTACHING SWEATS AND BANDS TO HATS.

No. 424,458. Patented Apr. 1, 1890.

Fig. 10.

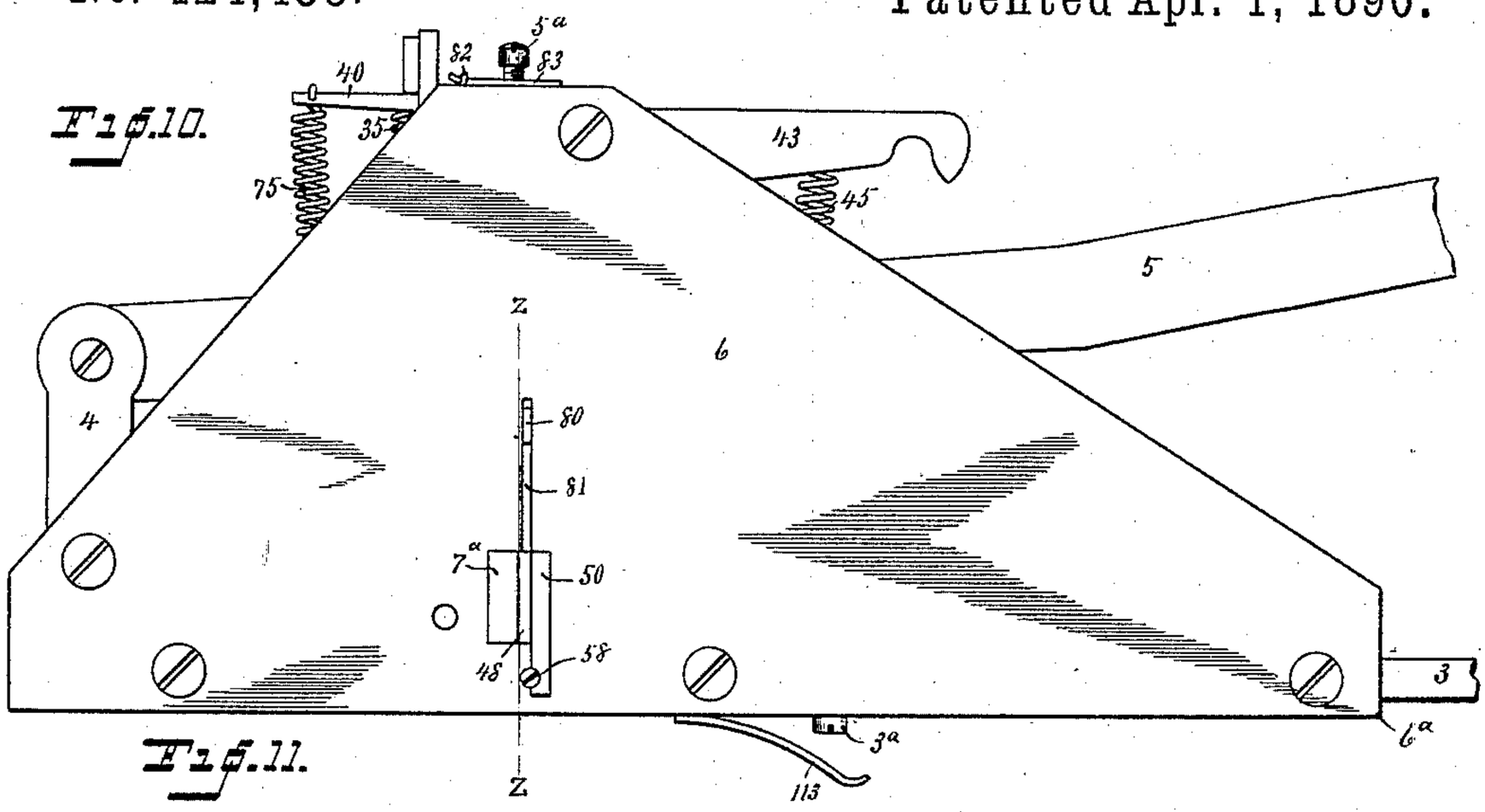


Fig. 11.

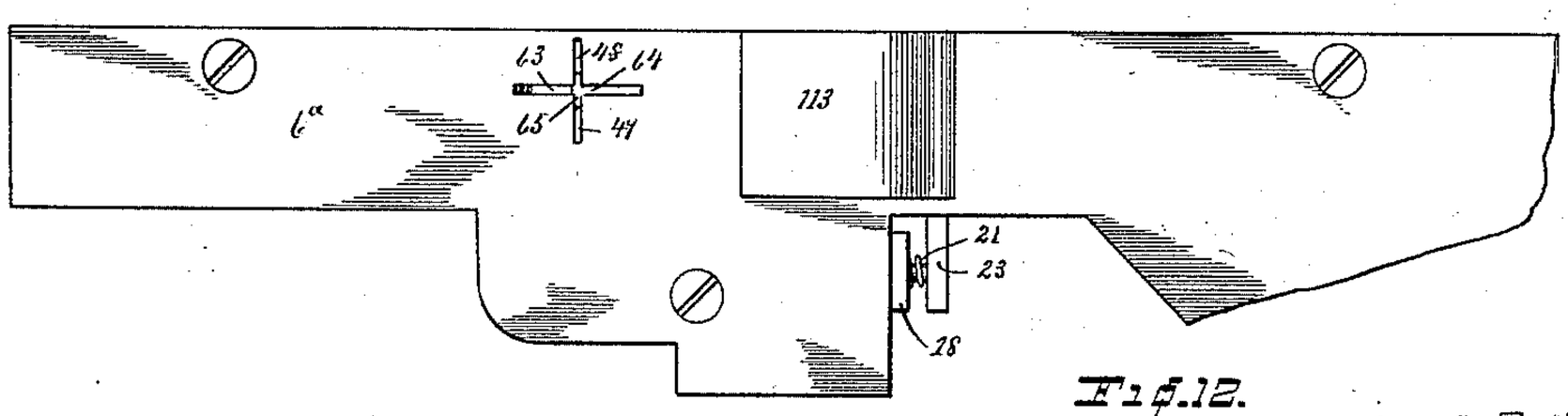


Fig. 12.

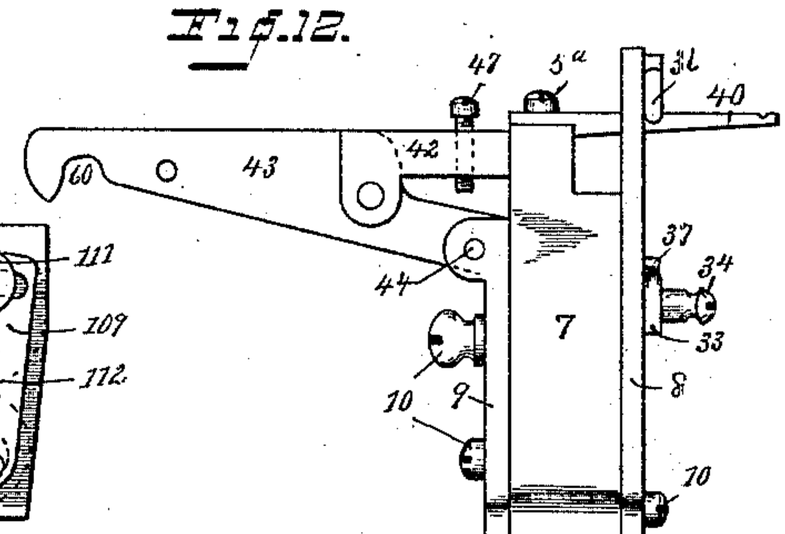


Fig. 16.

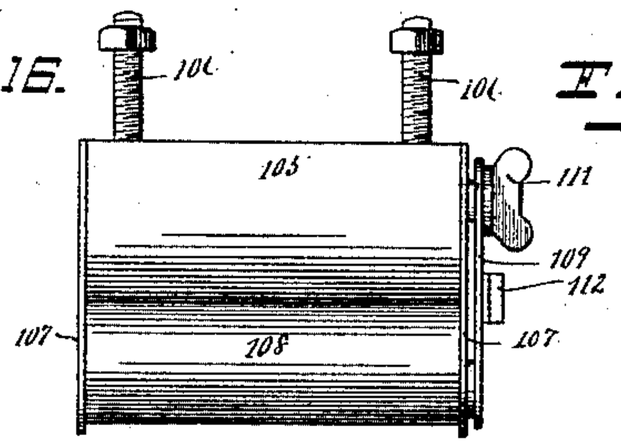


Fig. 17.

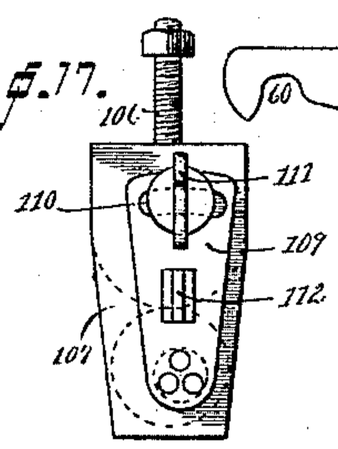


Fig. 13.

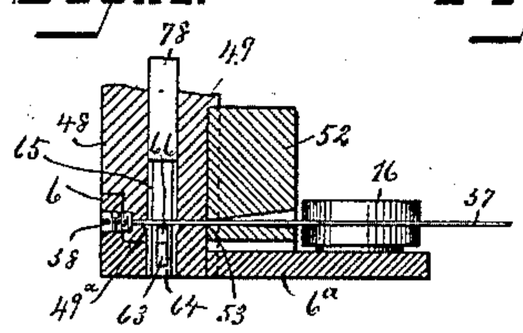


Fig. 14.

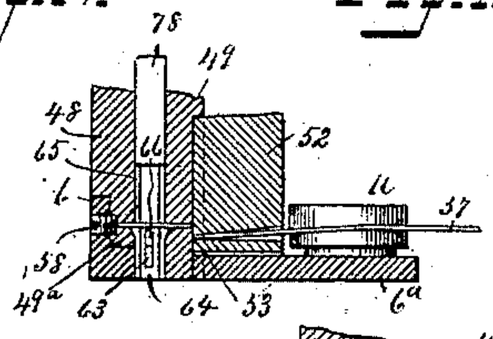


Fig. 15.

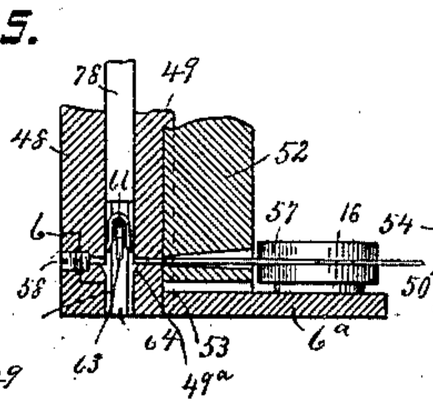


Fig. 15a.

Witnesses

C. M. Newman,

A. P. Munson.

Inventor

George E. Brush

By A. M. Wooster

Atty.

UNITED STATES PATENT OFFICE.

GEORGE E. BRUSH, OF DANBURY, CONNECTICUT.

MACHINE FOR ATTACHING SWEATS AND BANDS TO HATS.

SPECIFICATION forming part of Letters Patent No. 424,458, dated April 1, 1890.

Application filed July 1, 1889. Serial No. 316,202. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. BRUSH, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Attaching Sweats and Bands to Hats; 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 the trimming of hats, and has for its object the production of a machine for attaching the sweats and bands to the bodies by means of wire staples, which are formed from a roll of wire by the machine and then forced through the body and the band or the attaching-strip of the sweat and clinched on the under side. In order to accomplish this result in the simplest manner possible and at a high rate of speed, I have devised the novel mechanism of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts.

Figure 1 is a side elevation of the machine as seen from the right; Fig. 2, a rear elevation thereof; Fig. 3, a side elevation of the operative parts of the machine, the position corresponding with that in Fig. 1, the view being on a greatly enlarged scale and the parts shown at their normal position, the lowered position of the lever being shown in dotted lines; Fig. 4, a similar view, the lever being at the raised position and the position of the other parts corresponding therewith; Fig. 5, a section on the line *x x* in Fig. 3, looking toward the left, showing also the operative portion of the hat-support in elevation; Fig. 5^a, a section on the line *x x* in Fig. 4, showing the position of the operative parts when the operating-lever is at the extreme of its upward movement; Fig. 6, a section on the line *y y* in Fig. 3, looking down; Fig. 7, a plan view of the hat-support detached, a portion of the shank being broken away; Fig. 8, a longitudinal section of the guide detached, (see Fig. 7 for plan view;) Fig. 9, a view of the staple-former detached; Fig. 10, a side elevation as seen from the side opposite to that in Figs. 3 and 4, the position of the parts corresponding with Fig. 3; Fig. 11, a bottom plan view corresponding with Figs. 3, 4, and 10; Fig. 12, a detail view of the staple-cutting mechanism and the slide for the feed mechanism; Figs. 13, 14, and 15, sections on the line *z z* in Fig. 6, (see, also, Fig. 10,) showing the different steps in the formation of the staple; Fig. 15^a, a similar view showing the staple driven through and clinched, and Figs. 16 and 17 are respectively side and end elevations of the tension device for the band-ribbon.

Each of the numerals following denotes the same part wherever it appears.

1 denotes legs or supports for the machine; 2, a cross-piece connecting the legs at the top, and 3 the bed-plate of the machine, which is rigidly secured to or made integral with the cross-piece. At the right end of the bed-plate, as seen in Figs. 1 and 3, is a bracket 4, to which an operating-lever 5 is pivoted.

6 is a guard-plate, preferably formed separate from and secured to the bed-plate. This plate is in fact an angle-plate, the horizontal portion of which (designated by 6^a) extends under the bed-plate, being secured thereto by a screw 5^a and serving to give rigidity to the machine, said screw also serving as a stop to limit the upward movement of the operating-lever, as will be more fully explained, and as shown in Figs. 5 and 5^a. It will be noticed that all of the operating mechanism lies upon one side of the guard-plate. This is an important feature in use, as it gives a smooth surface against which to turn the hat-brim, there being no rough or irregular surfaces to interfere with its manipulation. (See dotted position of body and brim in Figs. 1 and 2.)

7 is a standard having at its lower end a block or enlargement 7^a, which engages a corresponding recess in the bed-plate, and at its upper end a block 7^b, which is secured to an inwardly-extending lip 6^b upon the guard-plate. It will of course be apparent that the exact shape of this standard and the manner in which it is secured in place are not essential features of my invention. Upon the right side of the standard, as seen in Figs. 1, 3, and 4, is a slide 8, which I term a "feed-slide," as it operates the feeding mechanism, and upon the left side thereof is a slide 9, which I term the "cutter-slide." These slides are

both provided with slots and are held in operative position by screws or studs 10, passing through said slots. (See Figs. 4 and 12.) The wire from which the staples are formed is carried by a reel 11, which turns upon a spindle 12. The wire as it enters the machine passes through a suitable guide 13. This guide rests upon a block 14 and is held in position by screws 15, which also pass through the block and secure the latter to portion 6^a of the guard-plate.

16 denotes the right feed-roller, as seen in Figs. 3 and 4, and 17 the left feed-roller. The left feed-roller is carried by a slide 18, held in position by block 14, and by a block 19, secured to the bed-plate. Both feed-rollers are provided with pinions 20, rigidly secured thereto or made integral therewith.

21 is a spring which bears against a stump 22 on slide 18, and also against a suitable abutment 23, secured to the bed-plate, thereby causing the feed-rollers to grip the wire firmly, and holding the feed-pinions in engagement. Above the right feed-pinion and formed integral therewith or rigidly secured thereto is a bevel-pinion 24. This pinion is engaged by a bevel-gear 25. Back of gear 25 and made integral therewith is a ratchet 26, which is engaged by a feed-pawl 27, carried by a feed-lever 28. A spring 29, carried by the lever, acts to hold the feed-pawl in engagement with the ratchet. A screw-stud 30 passes through the bevel-gear, the ratchet, and the feed-lever, and into standard 7, thereby holding said parts in operative position. At the opposite end of the feed-lever is a slot 31, which is engaged by a pin 32 upon feed-slide 8. The feed-slide is raised at each actuation of the machine by means of the operating-lever, which passes between standard 7 and side plate 6, as clearly shown in Figs. 5 and 5^a.

33 is a lever pivoted upon the face of the feed-slide by means of a screw-stud 34.

35 is a spring, one end of which is connected to the outer end of lever 33 and the other end to a hook 36 at the top of the feed-slide.

37 is a pin in the feed-slide, against which lever 33 rests, and by which the upward movement of the outer end of said lever is limited. The functions of lever 33 and spring 35 will presently be fully explained.

38 is a spring, one end of which is connected to screw-stud 34 and the other to a stud 39 in the bed-plate of the machine, as is clearly shown in Figs. 3 and 4. The action of this spring is to return the feed-slide to its normal position when the downward movement of the operating-lever takes place, as will be more fully explained. The upward movement of the feed-slide is checked by a stump 40, (see Fig. 5^a,) which is secured to the top of standard 7 and extends through a slot 41 in the feed-slide.

The operation of the feeding mechanism alone is, briefly, as follows, and will, it is thought, be clearly understood by reference to Figs. 3, 4, 5, and 5^a: In Figs. 3 and 5 the operating-lever is shown at its normal position—that is, a position intermediate between the two extremes of its movement. The operator in use raises the operating-lever from the position shown in full lines in Figs. 3 and 5 to the position shown in Figs. 4 and 5^a. The lever as it is raised engages lever 33 upon the feed-slide and raises said slide until the lower end of slot 41 engages the stump. As the feed-slide is raised, the engagement of pin 32 on said slide with the slot in the feed-lever swings said lever from the position shown in Fig. 3 to that shown in Fig. 4, and the engagement of the feed-pawl with ratchet 26 carries bevel-gear 25 forward, and by means of bevel-pinion 24 and the feed-pinions imparts a forward movement to the feed-rollers, causing them to feed into the machine the wire to form a staple. This position of the parts—that is, the stoppage of the upward movement of the feed-slide by stump 40—is the end of the feeding operation, although it is not the end of the upward movement of the operating-lever. The instant the feeding operation is completed the cutting operation takes place, and is finished at the instant that the operating-lever reaches its highest point—that is, the position in which it is shown in Figs. 4 and 5^a.

42 denotes a bracket projecting outward from the top of standard 7.

43 denotes the cutter-operating lever, which is pivoted in the outer end of said bracket and also to the top of the cutter-slide, as at 44.

45 is a spring, one end of which is connected to the cutter-operating lever and the other to a hook 46 in block 19, as shown in the drawings, or in the bed of the machine, if preferred. The operation of this spring is to return the cutter-operating lever to its normal position after it has been raised by the operating-lever and the latter has been moved downward. The downward movement of the cutter-operating lever, and consequently the upward movement of the cutter-slide, is determined by a stop-screw 47 in bracket 42, against which the inner end of the cutter-operating lever strikes when the outer end of said lever is drawn downward by spring 45.

48 and 49 (see Figs. 6, 13, 14, and 15) denote dies between which the staple is formed, die 48 serving simply as a forming-die and die 49 as both a forming and cutting die. These dies are held in position between block 7^a, at the base of standard 7, and a plate 50, which is rigidly secured to said block by screws or in any suitable manner.

51 is an angle-plate secured to guard-plate 6 and also to plate 50, by which the parts are additionally braced and strengthened. (See Fig. 6.)

It will be clearly seen in Fig. 6 that the edges of the die lying toward each other are provided with grooves, in which the staple is formed, and that the opposite edge of die 49 is beveled to form a cutting-edge.

52 denotes the cutter-block, which is secured to the lower end of cutter-slide 9. The cutting-edge 53 of said block is beveled to correspond with the cutting-edge of die 49, as is clearly shown in Fig. 6. Upon the opposite sides of the cutter-block are ribs 54, which slide in ways formed in the bed-plate.

The wire, which is designated by 57, is shown in full lines in Figs. 13, 14, and 15, and by dotted lines in Figs. 5 and 6. As the wire is fed forward it passes through the cutter-block and through the dies until its end abuts against a stop-screw 58, (see Figs. 10, 13, 14, and 15,) which passes through side plate 6, and the thread of which engages both the forming-die and plate 50, as is clearly shown in said figures. The cutter-block in fact carries the wire, and after the staple-blank is severed raises the wire back to position to be fed forward again. It will be clearly seen from Fig. 6 that each time the wire is severed it is given a beveled cut, and from Fig. 15 that the bevels come upon the inner sides of the staple when the latter is formed. This is essential in order to insure the clinching of the staples, all of which will be more fully explained.

The operation of the cutting mechanism is as follows: I have already explained the operation of the feeding mechanism, and also that said operation is terminated by the engagement of the feed-slide with stump 40 before the operating-lever has reached the extreme of its upward movement. As the operating-lever continues to move upward, it comes in contact with lever 33 and tilts said lever against the power of spring 35. (See Fig. 5ª.) The operating-lever is thus permitted to move upward, but without effect on the feed-slide. At this instant a pin 59 on the operating-lever engages a recess 60 in cutter-operating lever 43 and carries the outer end of said lever upward, which of course forces the inner end, and with it the cutter-slide, downward, thereby severing the wire. The pin which connects the cutter-operating lever to the cutter-slide passes through a slot in the lever, so as to permit the latter to swing in an arc of a circle. This connection, being an ordinary one in mechanics, is not deemed to require illustration. It will of course be apparent that but a slight downward movement of the feed-slide is required to sever the wire, the edges of the cutting-die and cutter-block being in close contact, as is clearly shown in Fig. 6. It will be noticed (see Figs. 13 and 14) that the opening in the cutter-block through which the wire passes is largest at the outer side and tapers inward. This is in order to hold the wire firmly in the act of cutting and at the same time to give ample room for the wire at the outer end to prevent shifting in the feed-rollers when the cutter-block moves upward or downward. At the instant the cutting operation is completed the operating-lever is at its highest point, its movement being stopped by screw 5ª. (See Figs. 5 and 5ª.) The first operation accomplished by the downward movement of the operating-lever is the formation of a staple between the dies. In Fig. 9 I have illustrated the oscillating staple-former detached, the device as a whole being designated as 61. It consists of a curved body, which is pivoted between a flange 55 on a plate 56, secured to the bed-plate and guard-plate 6, as clearly shown in Fig. 6, the lower portion of the body lying in a groove 62 in the bed-plate. The extreme lower or inner end of the staple-former consists of a blade-shaped portion, which I designate specifically by 63. This portion vibrates in a slot 64 in the bed-plate, (see Fig. 11,) the end of the blade portion in one position of the staple-former extending down below the bottom of the bed-plate, all of which will be more fully explained.

65 is a slot in the bed-plate, crossing slot 64 at right angles. The staple, after being formed by the staple-former in connection with the dies, is forced out of the machine through slot 65, all of which will presently be fully explained. It will be noticed (see Fig. 11) that the lower ends of both dies extend through slot 65, lying flush with the under side of the bed-plate. Slot 64, however, extends up a sufficient distance into block 7ª to permit free oscillation of the blade portion of the staple-former. As the space between the dies in which the staple is formed is a vertical slot, while the operative—that is, the blade portion of the staple-former—oscillates in an arc of a circle, it becomes necessary to give to the operating-surface of the staple-former a yielding movement. This I accomplish by means of a slide 66, having a groove 67 to receive the wire. This slide is provided at its rear end with flanges 68, one only being shown, which lie on opposite sides of blade portion 63 and engage block 7ª on opposite sides of slot 64, each flange being provided with a slot to receive a pin 69, extending outward from the blade portion of the former. (See Fig. 9.) The slide is held forward in operative position by means of a spring 70, which yields and allows the slide to move inward as the operative end of the staple-former swings upward, carrying the wire with it to form a staple. When the upward movement takes place, the flanges act as cams and force the slide inward by engagement with block 7ª. The staple-former is operated by means of a downwardly-extending curved lug 71 on operating-lever 5. At the upper end of the staple-former is pivoted a dog 72. This dog is provided with a stop 73, (see dotted lines, Fig. 9,) whereby the dog is held rigidly in position when the pressure is upon the upper side, but permits the dog to yield when the pressure is upon the lower side thereof. A flat spring 74, secured to the staple-former and bearing upon the back of the dog, acts to hold the latter in operative position, and a spring 75,

connected to stump 40 and to a pin 76 on the staple-former, acts to hold the staple-former at its normal position—that is, as shown in Fig. 4—the upper end of the staple-former being at its extreme position toward the left and the blade portion thereof swung to its extreme position toward the right, as is indicated in the reverse plan view, Fig. 11. In this position slot 65 is unobstructed, and the staple may be forced out.

The operation of the staple-former is as follows: Suppose the operating-lever to be in the position shown in dotted lines in Fig. 3. As it is raised, lug 71 will engage upon the under side of the dog. Owing, however, to the special manner in which the staple-former is pivoted relatively to the operating-lever, and to the fact that the staple-former is held in position by spring 75, the staple-former is not moved in the slightest by the upward movement of the operating-lever, the dog simply yielding and allowing lug 71 to slip past, as shown in Fig. 4. The instant the lug has slipped past spring 74 returns the dog to its normal position. In the downward movement of the operating-lever lug 71 comes in contact with the curved back of dog 72 and acts to force stop 73 against the solid metal of the dog. It follows, therefore, that as the operating-lever is forced down lug 71, as it rides over the operating-surface of the back of the dog, which I denote specifically by 77, (see Figs. 4 and 9,) will act to force the upper end of the staple-former toward the right, swinging it on its pivot and throwing portion 63 of the staple-former upward from the position shown in Figs. 13 and 14 to that shown in Fig. 15, thereby forming the staple. This upward movement of the lower end of the staple-former and the formation of the staple takes place almost instantaneously. An instant later lug 71 has slipped past the end of the dog. Spring 75 then acts to draw the staple-former to the position shown in Fig. 3, and also in Fig. 4, while lug 71 moves downward to the position shown in dotted lines in Fig. 3. This return of the staple-former to the position shown in Figs. 3 and 4 instantly returns the blade portion of the staple-former to the position shown in Figs. 11, 13, and 14, in which slot 65 is unobstructed to permit the driving out of the staple. The operation of driving the staple takes place the instant after the staple has been formed and the staple-former has returned to its normal position.

Turning now to Figs. 5, 13, *et. seq.*, 78 denotes the staple-driver, and 79 a block by which it is carried. 80 denotes lugs on the opposite sides of block 79, one of which engages a slot 81 in guard-plate 6, the other (not shown) engaging a suitable slot in standard 7, (see Fig. 5,) in which slot 81 is indicated in dotted lines, and the general arrangement of the parts relatively to each other is clearly shown.

82 is a spring, the upper end of which is connected to a suitable hook 83, the lower end passing through an opening 84 in the operating-lever, (see dotted lines in Fig. 5,) and being connected to a hook 85 on the top of block 79. This spring acts to hold the staple-driver at its raised position—that is, the position shown in Figs. 5, 13, 14, and 15. It will be understood from Fig. 5 that the upward movement of block 79 of the staple-driver is limited by the engagement of lugs 80 with the corresponding slots. As soon as the upward movement of the operating-lever takes place and the pressure of the operating-lever upon the top of the block is relieved, spring 82 will instantly return the staple-driver and block to the position shown, in which position it remains during the wire-feeding, the cutting, and the staple-forming operations already described. During this time the operating-lever passes from the position shown in Figs. 3 and 5 to that shown in Figs. 4 and 5^a, and then back again, the staple-forming operation, as already stated, being performed while it is passing from the position shown in Figs 4 and 5^a down to that shown in Figs. 3 and 5. It will of course be understood that this downward movement of the operating-lever is made quickly, although no great amount of force is required. As soon as the operating-lever in its downward movement comes in contact with block 79, it forces said block and the staple-driver from the position shown in Fig. 15 to that shown in Fig. 15^a, thereby driving the staple out from between the grooves and through the body of the hat and the band or sweat-leather, as may be, and clinching the ends of the staple upon the under side. It will be noticed (see Figs. 13 to 15^a, inclusive) that each of the dies is cut out slightly below the wire-groove-forming bevels 49^a, which prevent the beveled ends of the staples from engaging the wire-groove, and insure that they will be forced out by the staple-driver. As already stated, the ends of the staples are beveled upon their inner sides, so that they are forced to clinch outward when they come in contact with the clinching-plate, presently to be described. The downward movement of the operating-lever is limited by a stop-screw 3^a in the bed-plate, which is retained in position by a lock-nut 3^b. The stop-screw prevents the possibility of the staple being driven through the hat or the staple-driver coming injuriously in contact therewith.

The position of the hat while being operated upon by the machine is clearly shown in Figs. 1, 2, and 5. It is held by a suitable support, which as a whole I designate as 86. (See Figs. 5 and 7.) At the forward end of the support—that is, the left end—as seen in Figs. 3, 5, and 7, is a go-between or clinching-plate 87. This plate is preferably made of spring metal and is attached at the end of the holder and extends inward sufficient distance to allow it to pass in over the hat-sweat—that is, between the sweat and the body of the hat—as is clearly shown in Fig. 5.

88 denotes depressions near the free end of the clinching-plate, which are so located as to receive the ends of the staple when it is driven downward by the staple-driver and turn them outward, as shown in Fig. 15ª.

89 denotes a swinging latch, by which the hat is held in position on the support. The forward end of the latch consists of an adjustable block 90, having at its forward end a groove 91, which receives the reed of the sweat-leather. As the sweats project outward farther in some hats than in others, I make this block adjustable by an ordinary screw-and-slot connection to adapt the support to different styles of sweats. The slotted connection is clearly shown in Fig. 8. The latch is locked in operative position by a spring-bolt 92. As the latch is swung to its operative position—that is, its locking position—the end of the bolt rides up an incline 93, and when in the engaged position drops down into an opening in the support to receive it. (See dotted lines in Fig. 5.)

94 is a stop-pin to limit the movement of the latch in swinging to the locking position.

In placing a hat in the machine the latch is swung to the position shown in dotted lines in Fig. 7, the clinching-plate is passed under the sweat—that is, between the covering-strip and the body—and then the latch is swung to the position shown in full lines, the outer edge of the sweat resting in groove 91. In removing a hat bolt 92 is lifted against the power of the spring (see Fig. 8) until it is disengaged from the support, and then swung around to the position shown in dotted lines, which permits the hat to be readily removed. The hat-support is carried by rods 95, which are adapted to slide vertically in guides 96, which are suitably secured to any fixed portion of the machine—for example, the legs and cross-piece—as shown in the drawings. The hat-support is locked to rods 95 by set-screws 97. The lower ends of these rods engage a cross-piece 98.

99 is a treadle-rod extending through the cross-piece and engaging the hat-support itself, as clearly shown in Fig. 2. The treadle 114 is pivoted in any suitable manner—as, for example, to strengthening-pieces 100 at the base of the machine. At the forward end of the treadle is a counter-weight 101, by which the hat-support is held in its raised—that is, its operative—position. When it is desired to insert or remove a hat, the operator places his foot forward of the pivotal point of the treadle and presses the rear end downward, thereby lowering the hat-support; but an instant's time is required to remove a hat and to place a new one in position to be operated upon. The instant the operator lifts his foot from the treadle the counter-weight acts to raise the hat-support and the hat thereon into position to be operated upon.

It is of course well understood by those familiar with the art that hat-sweats ready for use are an article of commerce. Each sweat is provided with a reed (see 102, Fig. 5) and a covering-strip 103, by which the reed is secured to the sweat, one edge of the covering-strip lying on the inner side of the sweat, and being left sufficiently wide to give a ready means of attachment of the sweat to the hat-body.

Each sweat is trimmed to fit the hat in which it is to be used. For this purpose I preferably use the machine which forms the subject-matter of my pending application, Serial No. 309,998, although the sweat may be trimmed in the ordinary manner with shears, if preferred. In placing the hat in the machine the clinching-plate is placed under the flap of the covering-strip—that is, between the sweat and the covering-strip and reed—as is clearly shown in Fig. 5. In this position a sufficient number of staples are driven through the hat-body from the outer side, close to the brim and through the covering-strip, where they are clinched on the under side. (See Figs. 5 and 15ª.) Any number of staples is used that may be required to hold the sweat firmly in place. Having fastened the sweat in place, the band is then attached without removal of the hat from the machine.

104 (see Fig. 1) denotes the ribbon for the band, which may be supplied to the machine in suitable lengths for the bands or may be fed in a continuous strip, as shown in the drawings, each band being cut with shears after being attached in place.

In order that the bands may always be drawn forward straight and free from wrinkles, I provide a suitable tension device therefor, which is shown in operative position in Fig. 2. (See, also, dotted lines in Fig. 1 and on an enlarged scale, detached, in Figs. 16 and 17.) This tension device consists of a rounded block 105, which is secured to the under side of the cross-piece by bolts 106 or in any suitable manner.

107 denotes side pieces rigidly secured to said block, and 108 a cylindrical block pivoted eccentrically at the lower ends of the side pieces.

109 is an operating-plate rigidly secured to the trunnions of the cylindrical block. (See Figs. 16 and 17.) This plate is provided at its upper end with a curved slot 110. A thumb-screw 111 passes through this slot and engages the side pieces and block 105 to lock the cylindrical block in any position in which it may be placed.

112 is a finger-piece for convenience in adjustment. In adjusting this tension device to any style or thickness of band the thumb-screw 111 is loosened and the cylindrical block placed closely enough to block 105 so that the band-ribbon will pass through it with sufficient tension to keep it straight and free from wrinkles. The cylindrical block is then locked in position by tightening up the thumb-screw.

113 is a guide curved to correspond with the body of a hat, against which the outer side of the body rests when turning it in the operations of trimming.

As many staples may be used in attaching a band as may be required. It is of course well understood that ordinarily the bows are made separate from the bands and are attached in place after the band is secured, the ends of the bands not being brought quite together, so that in manufacturing large quantities considerable ribbon is saved by this means. In practice the free ends of the band are secured in place on the side of the hat by two staples each—one at each edge of the band—the first one being placed in line with the staples which have already been put in to secure the sweat. Spring-bolt 92 is then lifted, and latch 89 is swung around, so as to permit the hat to be moved far enough toward the right on the hat-support, as seen in Figs. 5 and 7, to permit another staple to be driven at the opposite edge of the band. The hat is then turned half-way around, the latch swung back to place, and another staple driven upon the opposite side close to the brim. In practice no other staples are ordinarily required to hold the band in place. More may be used, if preferred; but it is unnecessary. It will thus be seen that only one staple passing through the band is in view in the completed hat, and that this is completely hidden from view by the curve of the brim at the side. In practice, furthermore, the staples are made from japanned wire, so that they would be practically invisible, even if one or two of them were exposed.

In order that the operation of the entire machine may be clearly understood, I will briefly redescribe in their order the independent operations by which the functions of the machine are accomplished. Starting with the machine in its normal position, the operator lowers the hat-support by placing his foot upon the treadle. The sweat is first placed within the hat, and the latter is placed over the support, the end of the support extending into the crown of the hat, and the clinching-plate lying between the sweat and the covering-strip and body, so that when the staple is driven through the body and the covering-strip from the outer side it may be clinched without coming in contact with the hat itself. As soon as the operator removes his foot from the treadle the counter-weight raises the hat-support, and with it the hat, to its normal position. All of the different operations of feeding the wire forward, cutting it, forming the staple, and driving it are performed during a single upward and downward movement of the operating-lever. Suppose that the operator removes his hand from the operating-lever when it is in the position shown in dotted lines in Fig. 3, spring 82 will act to draw it to the position shown in Fig. 3, no result whatever being accomplished by said movement, the full-line position in Fig. 3 being the normal position of the lever. As soon as said lever is raised from this position it comes in contact with lever 33 upon the feed-slide, raising the latter, and thereby imparting movement to the feed-rollers by means of the feed-pawl, ratchet, gear, &c., and feeding into the machine the required amount of wire to form a single staple. The feeding movement continues until the upward movement of the feed-slide is stopped by the engagement of said slide with stump 40. As the upward movement of the operating-lever continues beyond this point, lever 33 is turned on its pivot; but the feed-slide remains stationary. An instant after the feed-slide has ceased to move the operating-lever engages the cutter-operating lever and forces down the cutter-slide and cutter, thereby severing the required length of wire to form a staple. The instant the downward movement of the operating-lever commences it acts upon the staple-former to form the staple between the dies. This movement occupies the first portion of the downward movement of the operating-lever. An instant after the disengagement of the operating-lever from the staple-former the operating-lever comes in contact with the block upon the staple-driver, forcing the latter downward and driving the staple out from between the dies and through the hat-body and the band or covering-strip. The cutter-block and cutting-die are so arranged relatively to each other as to cut the wire on a bevel, so that when a staple is formed the outer side of each arm will be longest, the bevels extending upward and inward. When the staple is driven through the hat, the beveled ends come in contact with the clinching-plate and are turned outward away from each other upon the inner side of the hat, where they are covered by the sweat. The hat is held in position upon the hat-support by a latch, which engages the edge of the sweat. The ribbon for the band is supplied in lengths, or, if preferred, in a continuous strip, a special tension device being provided to keep the ribbon straight and free from wrinkles. In attaching the band by staples the latch is turned out of the way to permit the hat to be moved longitudinally of the hat-support, so that staples may be inserted at the upper and lower edges of the band.

It will be apparent that the details of construction may be varied to an almost unlimited extent without departing from the principles of my invention.

I claim—

1. In a machine of the class described, the combination, with the feed-slide, the feed-lever engaged thereby, the feed-pawl carried by said lever, the feed-ratchet, and a bevel-gear moving with the feed-ratchet, of the feed-rollers, pinions moving with the feed-rollers and meshing with each other, and a bevel-pinion moving with one of said pinions, which is engaged by the bevel-gear, whereby the feed-rollers are moved forward to feed the wire at each reciprocation of the feed-slide.

2. The operating-lever, the feed-slide, the feed-lever engaged thereby, and a feed-pawl carried by said lever, in combination with a

feed-ratchet, a spring acting to hold the pawl in engagement therewith, a bevel-gear moving with said ratchet, guide 13, feed-rollers, pinions moving with said rollers and engaging each other, and a bevel-pinion moving with one of said pinions and engaged by the bevel-gear.

3. The combination, with the cutter-block having a cutting-edge beveled obliquely to the line of movement of the wire and a cutter-slide by which it is carried, of die 49, through which the wire passes, and which is provided with a beveled edge corresponding with the cutter-block, so that the wire is severed with a beveled cut, as and for the purpose set forth.

4. The combination, with the feed-rollers and the cutting-die having an opening to receive the wire, of the reciprocating cutter-block, also having an opening to receive the wire made largest at its outer end, said openings being in line when the cutter-block is at its raised position, and the opening in said plate being large enough at its outer end so that when said block is moved downward the wire will not be shifted in the feed-rollers.

5. The standard having bracket 42, and the cutter-slide and cutter-block, in combination with the operating-lever having pin 59, a cutter-operating lever which is pivoted to said bracket and connected to the cutter-slide, and is engaged by pin 59 at each upward movement of the operating-lever, whereby the cutter-slide is forced downward.

6. The standard having bracket 42, and the cutter-slide and cutter-block, in combination with operating-lever 5, having pin 59, and cutter-operating lever 43, pivoted to said bracket and connected to the cutter-slide, the outer end of said lever being engaged by the pin on the operating-lever to force the inner end downward and with it the cutter-slide and cutter-block to sever the wire.

7. The standard having bracket 42, and the cutter-slide and cutter-block, in combination with operating-lever 5, cutter-operating lever 43, pivoted to said bracket and connected to the cutter-slide, spring 45, connected to the outer end of lever 43 and acting to draw it downward, whereby the cutter-slide is raised, and a stop-screw 47, which is engaged by the inner end of lever 43 to limit the upward movement of the cutter-slide.

8. The combination, with the feeding mechanism, the feed-lever by which it is actuated, and the feed-slide to which said lever is connected, and which is provided with a lever 33, of the operating-lever adapted to engage lever 33, whereby the feed-slide is raised, and a spring 38, acting to return the feed-slide to its normal position.

9. The combination, with the standard having a stump 40, the feed-slide having a slot through which said stump passes, a lever 33, and a spring connected to said lever and to the top of said slide, of the operating-lever which engages lever 33 to raise the feed-slide until stopped by stump 40, the continued movement thereof acting to swing the lever 33 against the power of the spring.

10. The operating-lever, the standard having stump 40, and a feed-slide having a slot through which said stump passes and by which its npward movement is limited, in combination with a lever 33, pivoted to said slide, a spring 35, acting to hold said lever in its normal position, and a stop-pin 37, which checks lever 33 when returned to its normal position by the spring.

11. Standard 7, having stump 40, and the feed-slide having a slot through which said stump passes, a lever 33, pivoted to said slide, and a spring 35, connected to one end of said lever and to the top of the slide, in combination with the operating-lever, which is adapted to engage the opposite end of lever 33 to raise the feed-slide until stopped by stump 40, and to swing lever 33 against the power of the spring as the upward movement continues after the upward movement of the slide has been stopped.

12. The standard having bracket 42 and stump 40, the cutter-slide, the cutter-operating lever pivoted thereto, and the feed-slide having lever 33 and spring 35 to return it to its normal position, in combination with operating-lever 5, having pin 59, said lever being adapted to engage lever 33 to raise the feed-slide until stopped by the stump, after which said lever is oscillated against the power of the spring, and lever 43 is engaged by pin 59 to actuate the cutter-slide, substantially as described.

13. The combination, with the standard having bracket 42 and the cutter-operating lever pivoted thereto, of feed-slide 8, cutter-slide 9, pivoted to the inner end of lever 43, operating-lever 5, and springs 45 and 38, whereby the slides are returned to their normal position after each actuation.

14. The combination, with the standard having bracket 42 and cutter-operating lever 43 pivoted thereto, of feed-slide 8, cutter-slide 9, connected to lever 43, the feed-lever connected to the feed-slide, and operating-lever 5, as and for the purpose set forth.

15. The bed-plate, the standard having block 7^a at its base and slot 64 in the bed-plate and block, in combination with dies 48 and 49, having grooves in their faces and openings through which the wire is passed, and an oscillating staple-former having a portion 63 adapted to be swung upward between the dies to form a staple in said groove.

16. The bed-plate and the standard having slot 64, in combination with dies 48 and 49, opening for the wire through said dies, and bevels 49^a below said openings, and an oscillating staple-former having a portion 63, which swings upward to form the staples between said dies.

17. The combination, with the bed-plate and standard having slot 64, and the operating-lever having a lug 71, of a pivoted sta-

ple-former having a portion 63, which swings in said slot, and portion 77, which is engaged by said lug to throw portion 63 upward to form a staple between the dies.

18. The combination, with the dies, of an oscillating staple-former having a portion 63, adapted to pass between the dies, and means—for example, an operating-lever having a lug—engaging said staple-former, whereby the latter is oscillated to form a staple.

19. The combination, with the dies, of an oscillating staple-former having a portion 63, adapted to pass between the dies, and a slide 66, adapted to engage the wire, as and for the purpose set forth.

20. The combination, with the dies, of the oscillating staple-former having a slide 66, adapted to engage the wire, and a spring whereby said slide is forced forward into operative position.

21. The combination, with the dies having openings to receive the wire, of a pivoted staple-former having a portion 63, adapted to pass between said dies, and slide 66, having a groove to engage the wire, and a spring acting to throw said slide forward when portion 63 is swung downward.

22. The combination, with the operating-lever having a lug 71 and the dies, of a staple-former having a portion 63, adapted to pass between the dies, a dog 72, having a stop engaging said former and an operative portion 77, and a spring 74, adapted to hold said stop in engagement with the former, whereby when the operating-lever is pressed downward lug 71 will engage the operative portion to throw portion 63 upward to form a staple, and when said lever is raised the dog will yield to allow the lug to slip by.

23. The combination, with the operating-lever and the dies, of the oscillating staple-former having a dog 72, a spring 74, to hold said dog in operative position, and a spring 75, which holds the staple-former in position.

24. The operating-lever having lug 71, in combination with a staple-former 61, having a dog 72, a spring 74, to hold said dog in position, and a spring 75, acting to hold the staple-former in position, so that when said lug engages the dog from above the staple-former is oscillated against the power of spring 75 to form a staple, and when said dog engages said lug from below the dog will yield against the power of spring 74 to allow the lug to slip by.

25. In a machine of the class described, an oscillating staple-former having a slide 66, to engage the wire, a spring 70, to hold said slide in operative position, and a spring-controlled dog 72, as and for the purpose set forth.

26. The combination, with the staple-former, of dog 72, having stop 73, spring 74, for holding said dog in position, slide 66, and spring 70, for holding said slide in position.

27. The combination, with staple-former 61, having pins 69, of slide 66, having flanges engaging said pins, and spring 70, whereby the slide is held in operative position.

28. The combination, with the dies having openings to receive the wire, feeding mechanism, substantially as described, for feeding the wire forward, and cutting mechanism, substantially as described, for severing the wire, of an oscillating staple-former adapted to pass between said dies to form a staple after the wire has been severed.

29. The combination, with die 48, die 49, having a beveled cutting-edge, said dies having openings to receive the wire, feeding mechanism, substantially as described, for feeding the wire forward, and a reciprocating cutter-slide having an opening to receive the wire, and a cutting-edge corresponding with the edge of die 49, whereby the wire is severed, of an oscillating staple-former adapted to pass between said dies to form a staple after the wire has been severed.

30. The dies having grooved faces and openings to receive the wire, one of said dies having a cutting-edge at its back, in combination with the cutter-slide and cutter-block and an oscillating staple-former, whereby the wire that has been severed is bent in said groove to form a staple.

31. The combination, with the dies having openings to receive the wire and bevels 49^a below said openings, of the oscillating staple-former, whereby staples are formed between said dies, and the staple-driver, whereby they are expelled.

32. The combination, with the feeding and cutting mechanism and the oscillating staple-former, of dies having grooved faces, openings to receive the wire when fed forward, and bevels 49^a below said openings, so that the formed staples may be expelled without engagement with said openings.

33. The combination, with the oscillating staple-former and the staple-driver having a block 79, of the operating-lever, which engages said block to drive the staple, and spring 82, which returns the staple-driver to its normal position when the operating-lever is raised.

34. In a machine of the class described, the combination, with the dies, an oscillating staple-former, whereby staples are formed between the dies, and a staple-driver, of a hat-support and a clinching-plate adapted to pass under a hat-body, whereby the ends of the staples are clinched when driven downward.

35. The hat-support, the clinching-plate carried thereby, and a latch 89, whereby the hat is held in place, in combination with the wire feeding and cutting mechanism, substantially as described and shown, the dies, an oscillating staple-former which forms the staples between the dies, and the staple-driver, whereby the staples may be driven through a hat-body and the ends turned by the clinching-plate.

36. The combination, with the standard having block 7^b, the feeding and cutting mechanism, substantially as described, the oscillating staple-former, and the staple-driver, of operating-lever 5, by which said parts are car-

ried, the upward movement of which is limited by block 7^b.

37. The combination, with the standard, feeding and cutting mechanism, substantially as described and shown, the oscillating staple-former, and the staple-driver, of operating-lever 5, the hat-support having a clinching-plate, and stop-screw 3^a in the bed-plate, whereby the downward movement of the operating-lever is determined, so that the staple cannot be driven through the hat-body.

38. The combination, with guard-plate 6, having slot 81, the standard, and the operating-lever, of the staple-driver, block 79, by which it is carried, and a lug on said block engaging the slot in the guard-plate, whereby the upward movement of the staple-driver is determined.

39. In a machine of the class described, the hat-support having a go-between or clinching-plate, and mechanism, substantially as described and shown, to raise and lower said hat-support in removing and replacing hats.

40. The combination, with the hat-support and the bed-plate, of wire feeding and cutting mechanism, substantially as described and shown, the oscillating staple-former, the staple-driver, and a guide 113 upon the bed-plate, whereby the hat is held in position as it is turned on the hat-support.

41. The combination, with the cross-piece, the bed-plate, feeding and cutting mechanism, substantially as described and shown, the oscillating staple-former, and staple-driver, of the hat-support, block 105 upon the cross-piece, and an eccentrically-pivoted adjustable block 108, whereby the tension of the hat-band may be regulated.

42. In a machine of the class described, the combination, with the hat-support and the clinching-plate adapted to pass on the inner side of a hat-body, of a swinging latch 89, having an adjustable block to engage the reed of the sweat, substantially as described.

43. In a machine of the class described, a hat-support having a clinching-plate, substantially as described and shown, in combination with a swinging latch having at its forward end an adjustable block with a groove to receive the sweat, and a spring-bolt 92, whereby the latch is locked in operative position.

44. The hat-support having clinching-plate 87, incline 93, terminating in an opening, and stop 94, in combination with swinging latch 89, having a spring-bolt adapted to ride up the incline and engage the opening, and an adjustable block adapted to engage the sweat.

45. The combination, with the hat-support and rods 95, by which it is carried, of a cross-piece between said rods, a treadle-rod connected to said cross-piece, and a treadle having a counter-weight to hold it at its normal position.

46. The combination, with the cross-piece and rounded block 105, secured thereto, of eccentrically-pivoted block 108, side pieces by which it is carried, operating-plate 109, and a thumb-screw to lock the block in operative position, whereby the band is kept straight and free from wrinkles.

47. The combination, with the cross-piece and block 105, secured thereto, of side pieces secured to said block, block 108, eccentrically pivoted to said side pieces, an operating-plate having a curved slot, and a set-screw passing through said slots and engaging block 105, whereby the tension of the band may be adjusted.

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

GEORGE E. BRUSH.

Witnesses:
JABEZ AMSBURY,
JOSEPH E. PLATT.