(No Model.) 3 Sheets—Sheet 1.

J. JENKINS.

SAFETY PIN MACHINE.

No. 345,144. Patented July 6, 1886.

Fig. 1.

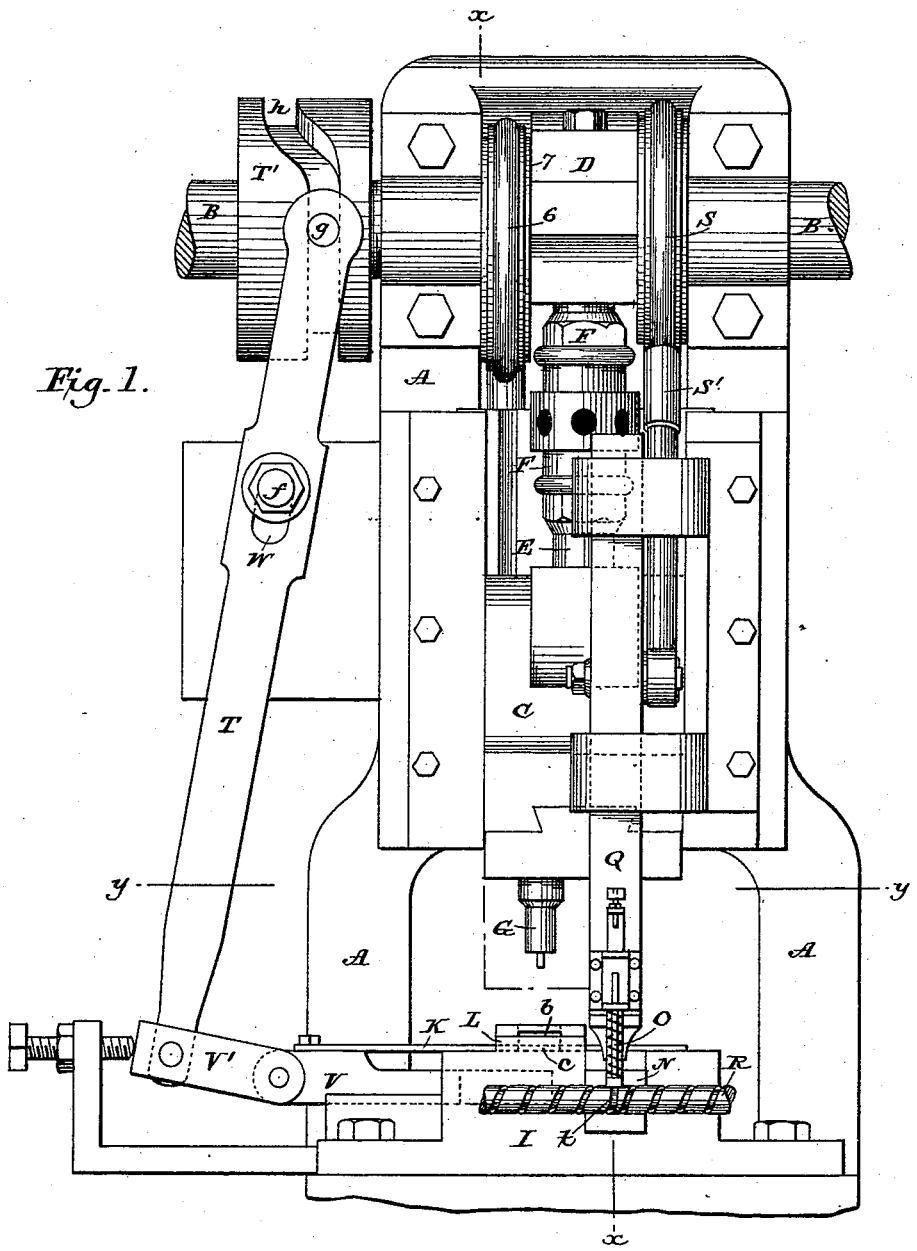

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Fig. 2.

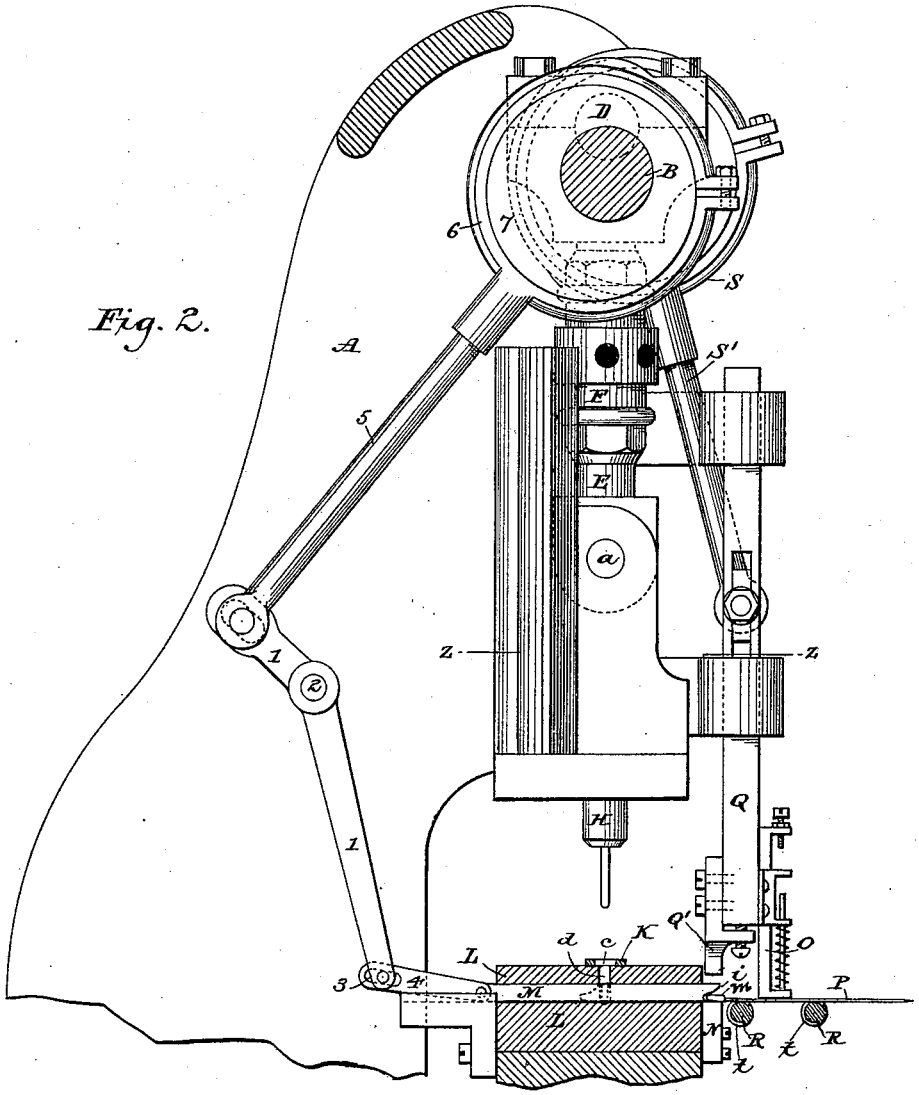

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Fig. 3.

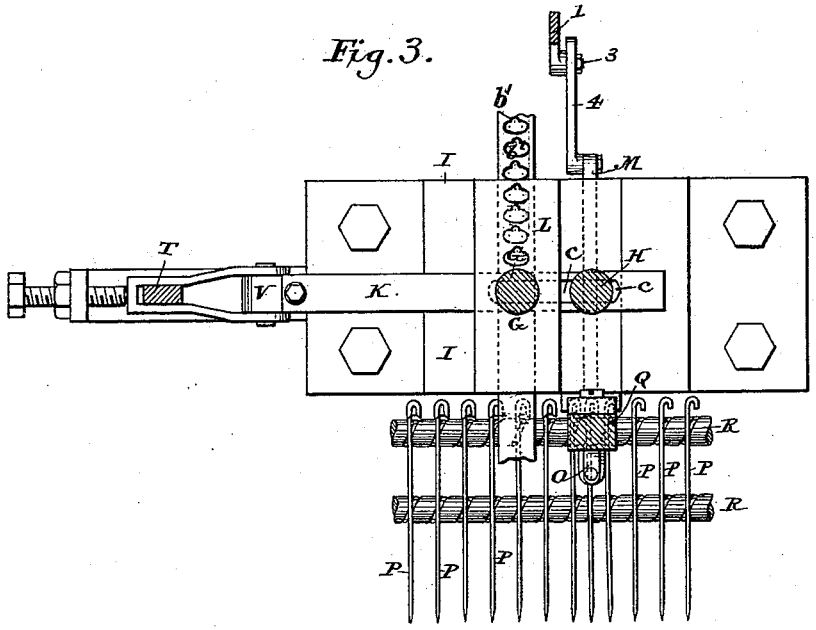
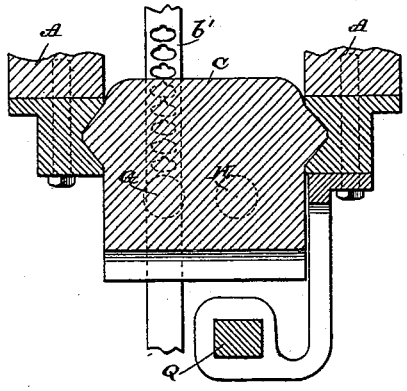


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOEL JENKINS, OF MONTCLAIR, NEW JERSEY.

SAFETY-PIN MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,144, dated July 6, 1886.

Application filed May 7, 1886. Serial No. 201,464. (No model.)

To all whom it may concern:

Be it known that I, JOEL JENKINS, of Montclair, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Safety-Pin Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification, in which—

Figure 1 is a front elevation, partly in section, of my heading-machine for safety-pins; Fig. 2, an irregular vertical section in line *x x* of Fig. 1; Fig. 3, a transverse section in line *y y*, and Fig. 4 a similar section in line *z z* of Fig. 2.

My invention relates to that class of machines for heading safety-pins in which the wire blank for the pin is carried automatically into register with mechanism by which a shield or head is fitted upon its bent end and clamped and secured thereon by a suitable punch or squeezer, the headed blank being thereupon carried forward to the mechanism for bending and coiling it. The object thereof is to simplify the construction of such a machine and perfect its operation.

In the accompanying drawings, A A represent standards in the frame of the machine, and B a shaft supported in suitable bearings on the upper ends of the standards. This shaft is driven by a prime motor geared thereto in any customary manner.

C is a reciprocating block mounted to slide up and down vertically in suitable ways between the standards A A, and which is actuated by a crank, D, on the shaft B. The crank D is connected to the block by a coupling-rod, E, pivoted to the block at *a*, (see Fig. 2,) and is made adjustable in its length by a right-and-left screw-coupling, F.

A cutting-punch G, and a forming-punch, H, are secured side by side a short distance apart (see Fig. 3) to the bottom of the vertically-reciprocating block C, to project therefrom in a common vertical plane passing through the longitudinal axis of the shaft B.

A cutting-die, L, is mounted upon the top of the bed-plate I, (see Fig. 3,) immediately under the cutting-punch G, and a shallow rectangular aperture, *b*, slightly wider than the face of the punch, is formed through the die at a right angle with the axis of the shaft B. This aperture is adapted to receive a thin strip of sheet metal, *b'*, (see dotted lines, Fig. 4,) constituting the stock out of which the blanks for the pin heads or shields are to be cut by the punch G. The strip is fed forward at each stroke of the punch by mechanism such as is commonly employed for the purpose, and which it is not necessary herein to describe. The punch G, dropping through the die L upon the strip *b'*, will cut out a blank therefrom, and the blank when cut out will drop into a recess, *c*, upon a transversely-moving plate or slide, K, (see Fig. 3,) which is made to reciprocate upon the top of the bed-plate I, at a right angle to the strip under the die L and the punches G and H, a transverse aperture being cut in the bottom of the die L (see Fig. 1) to allow it to pass through the same. The length of the reciprocating movement imparted to this slide K is such as to carry the rear end of the recess *c*, which receives the blank from the cutting-punch G, forward under the forming-punch H at each rotation of the main shaft. The recess in the slide is so cut out and fashioned in connection with a die, *d*, formed in the bed-plate I immediately under the punch H, (see Fig. 2,) as that when the punch H descends upon the blank it will force it down out of the recess *c*, through the die *d* into a recess in the bed-plate I beneath it, and in forcing it down will bend it into the shape required in a shield or head for the safety-pin. This process of forming the shield or head is well known to the art, and requires, therefore, no further description. The recess *e*, in which the head is formed, is intersected by a transverse aperture formed at a right angle with the slide K, and which extends entirely through the bed-plate I. Within this aperture a bar, M, is fitted, and so adjusted as that when the rear end of the recess *c* in the slide K is in position to receive the blank from the cutting-punch G the front end of the bar M shall just clear the bottom of the opening *d*, so that the shield or head *m*, which has been deposited vertically therein, may drop into position in front of said bar. The front end of the feed-bar M is furnished with an upper projection or finger, *i*, which, when the feed-bar moves forward, will strike the upper open end of the shield *m*,

standing vertically in the opening as it has dropped from the forming-punch, (see Fig. 2,) and will push it over, so that the shield will be carried forward by the bar, with its open end to the front, in position to pass upon the bent end of the pin-blank P, upon which it is to be secured.

The pin-blanks P P (see Fig. 3) are brought forward in succession, with their bent ends over and upon the anvil N, by means of the two parallel spirally-grooved conveying-shafts R R, rotating in a horizontal plane in front of the anvil and at a right angle to the line of movement of the feed-bar M.

The pin-blanks P P are laid transversely upon the shafts R R at a right angle to their axes, to rest in the spiral groove in each, and are carried forward by the rotation of the shafts until brought upon the anvil. At this point the spiral groove upon each shaft is carried at a right angle to the length of the shaft (see at *t*, Figs. 1 and 2) around so much of the circumference thereof as may in the rotation of the shaft be required to detain the blank resting in the groove long enough at said point to permit a shield to be placed upon the end of the blank and made fast thereon.

So soon as the pin-blank P enters the transverse length *t* of the spiral groove, a spring-actuated yielding presser-foot, O, carried by a vertically-reciprocating bar, Q, is made to drop upon the blank to hold it fast, (see Fig. 2,) while a punch, Q′, carried upon the same bar Q so as to play directly over the anvil N, descends upon the shield previously pushed out upon the end of the pin-blank and clamps it firmly upon the same.

The movement of the bar Q and clamping-punch Q′ is obtained at proper intervals and in proper relation to the movement of the feed-bar M by means of an eccentric wheel, S, upon the shaft B, the strap of said eccentric being connected to the bar Q by a pivoted coupling-rod, S′, as illustrated in Fig. 2.

The slide K is attached at its outer end to a heavy parallel bar, V, (see Fig. 1,) playing in a recess in the bed-plate I, and which serves to steady its movements. The slide and bar are actuated by means of a lever, T, pivoted to the frame at *f*, (see Fig. 1,) to vibrate in a vertical plane parallel with the shaft B. The upper end of this lever is provided with a lateral pin, *g*, adapted to engage a cam-groove, *h*, cut in the periphery of a wheel, T′, fixed on the shaft B, so that the rotation of the wheel shall cause the lever to vibrate to and fro upon its pivot *f* during a portion of the revolution of the wheel and remain still during the remainder thereof. The lower end of the lever T is connected to the bar V by means of a coupling rod or link, V′, pivoted to the one and the other. The pivot-pin *f*, upon which the lever swings, passes through a longitudinal slot, *w*, in the lever, so as to permit of an adjustment of the lever, notwithstanding its attachment to the bar V.

The feed-bar M is actuated by means of a bent lever, 1, (see Fig. 2,) pivoted to the frame of the machine at 2, and whose longer dependent arm is pivoted by a slotted connection at 3 to a link, 4, pivoted in turn to the outer end of the bar M. The upper shorter end of the lever 1 is connected by a rod, 5, to the strap 6 of an eccentric, 7, on the shaft B, so that the rotation of the shaft will operate to rock the lever 1, and thereby produce a reciprocating movement of the feed-bar M.

A cutting-punch may be formed to encircle the forming-punch H in manner well known to the art, so that the latter shall descend within and through the former upon the blank cut out by it and force said blank into and through the forming-die in manner as has heretofore been commonly done in machines for cutting and shaping blanks of sheet metal. In such case the strip *b* of metal stock is fed directly over the opening or forming die *d*, under the punch H, and the slide K is entirely dispensed with, the operation of cutting out the blank and forcing it into and through the die *d* being performed without the necessity of a transference of the blank after it has been severed from the strip *b;* or the blank shields or heads for the pins may, instead of being formed in the machine by means of the cutting and forming punches G and H, attached thereto in manner as described, be formed in a separate machine and delivered to the opening *c* through a feed-tube, to be then carried forward in manner as described by the horizontal feed-bar M to the anvil and pin-blank.

I contemplate the use, as an equivalent for the conveying-shafts R R, of an endless carrier-belt or of a rotating carrier-wheel, such as are already known and in use in safety-pin machines for delivering intermittently a pin-blank upon the anvil M, and which, after allowing the blank to rest upon the anvil long enough to receive the shield or head, will carry it forward therefrom to be replaced by another blank.

In the operation of my improved heading-machine the blanks P P for the pins are fed forward in the customary manner by the rotating shafts R R or other equivalent device, so as to carry their bent ends over the anvil N, and each blank is momentarily arrested upon the anvil. At this moment the reciprocating bar Q desends and the presser-foot O is brought to bear upon the blank P to hold it firm. As the presser-foot yields by reason of the compression of its spring, the clamping-punch Q′ descends toward the anvil to clamp and secure upon the blank a head or shield, *m*, meantime fitted upon the bent end of the blank, by the movement toward it of the feed-bar M, the shield having been tipped over by the finger *i* from its vertical position at the bottom of the opening *d* in the bed-plate into a horizontal position with its open end forward to pass over and upon the bent end of

the blank P when carried to it by said movement of the feed-bar. As the feed-bar M moves to and from the anvil N, the clamping and forming punches G and H are elevated, and so soon as the feed-bar has moved back of the die-opening *d* the punches descend and the one, G, cuts a blank from the strip *b*, and the other, H, forces the blank left beneath it through the opening *d* into position to be engaged and fed forward at the next movement of the feed-bar M. During each movement of the feed-bar the slide K moves from the cutting to the forming punch and back again, thereby carrying the blank cut from the strip *b* by the former into position under the latter. In this manner a shield or head is formed and is carried and placed upon each blank brought to and arrested upon the anvil, and is then clamped and secured upon the blank before the latter is started forward and removed from the anvil.

I claim as my invention—

1. The combination, in a safety-pin machine, with an anvil-block and mechanism, substantially as described, for conveying a wire blank to and from said anvil, of a reciprocating feed-bar moving back and forth in an aperture extending in a plane coincident with the length of the blank through the bed-plate of the machine between the anvil and a recess formed in the bed-plate for the reception of a pin head or shield, whereby, in the movements of the machine, the pin head or shield placed in said recess is transferred by the feed-bar to the anvil and fitted upon the blank resting thereon, substantially in the manner and for the purpose herein set forth.

2. The combination, in a safety-pin machine, with an anvil-block, mechanism, substantially as described, for conveying a pin-blank to and from said anvil, and a reciprocating clamping-punch descending over the anvil, of a yielding presser-foot attached to the punch to descend in front of the anvil and rest upon the pin-blank when it is detained over the anvil, substantially in the manner and for the purpose herein set forth.

3. The combination, in a safety-pin machine, with an anvil-block, and mechanism, substantially as described, for conveying a wire blank to and from said block, and a reciprocating feed-bar moving back and forth in an aperture extending in a plane coincident with the length of the blank through the bed-plate of the machine between the anvil and a recess formed in the bed-plate for the reception of a detached head or shield, of a forming-punch reciprocating into and out of the opening or die over the receiving-recess which is traversed by the slide, whereby a blank placed under the forming-punch is forced by it into the receiving-recess to be thence carried to the anvil, all substantially in the manner and for the purpose herein set forth.

4. The combination, in a safety-pin machine, with an anvil-block, and mechanism, substantially as described, for conveying a wire blank to and from said block, and a reciprocating feed bar moving back and forth in an aperture extending in a plane coincident with the length of the blank through the bed-plate of the machine between the anvil and a recess formed in the bed-plate for the reception of a detached pin head or shield, of a slide moving immediately over said receiving-recess, a cutting-punch reciprocating to and from the bed-plate to cut at each move a head-blank from a strip fed forward in an extended recess above the slide, and a forming-punch reciprocating into and out of the opening over the receiving-recess which is traversed by the slide, whereby the blank cut out by the cutting-punch is carried under the forming-punch and is forced by it into the receiving-recess to be thence carried to the anvil, all substantially in the manner and for the purpose herein set forth.

5. The combination, in a safety-pin machine, of the rotating shaft B and the eccentrics and cam-wheels thereon, the reciprocating bar Q, actuated by the eccentric S, and the presser-foot O and clamping-punch Q′, carried by said bar, the reciprocating block C, actuated by the eccentric D, and the cutting and forming punches G and H, carried by said block, the slide K and its lever T, actuated by a cam-groove, *h*, in the wheel T′, and the feed-bar M and its lever 1, actuated by the eccentric 7, all substantially in the manner and for the purpose herein set forth.

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

JOEL JENKINS.

Witnesses:
WM. S. GUERINEAU,
S. A. STAVERS.