No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(No Model.) (Application filed Feb. 16, 1901.) 6 Sheets—Sheet 1.

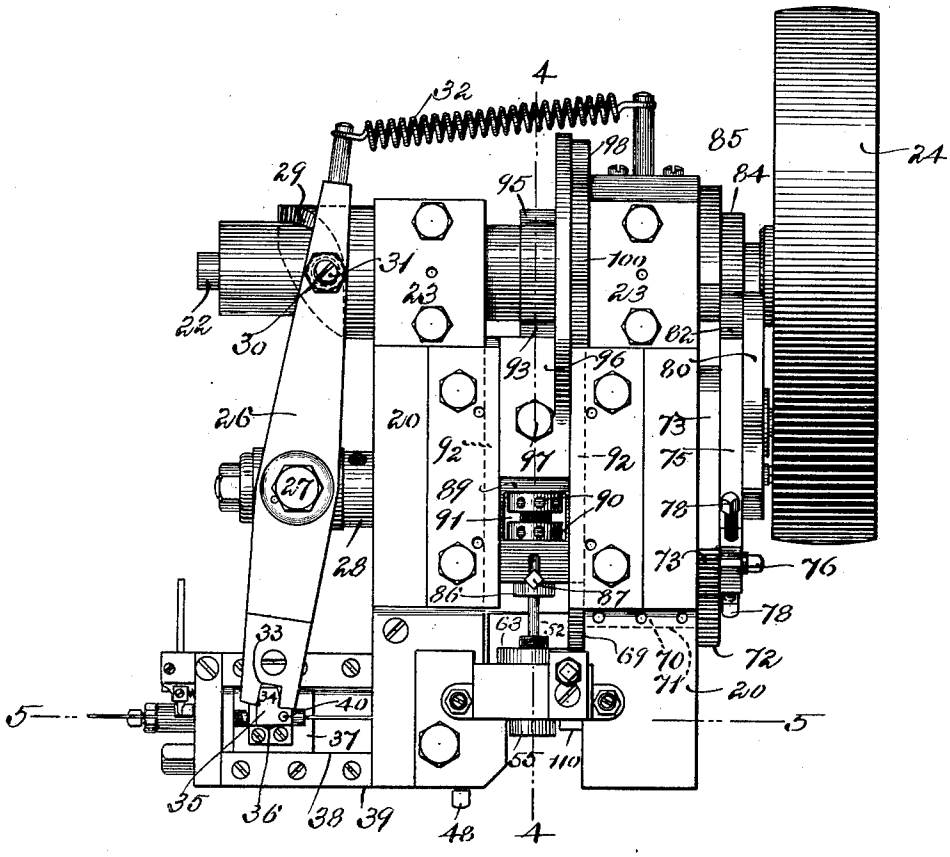


Fig. 1.

Witnesses:
Louis A. Jones.
F. Henry Marsh

Inventor:
Isaac H. Sisson
by his Attorney
Charles S. Gooding

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(Application filed Feb. 16, 1901.)

(No Model.) 6 Sheets—Sheet 2.

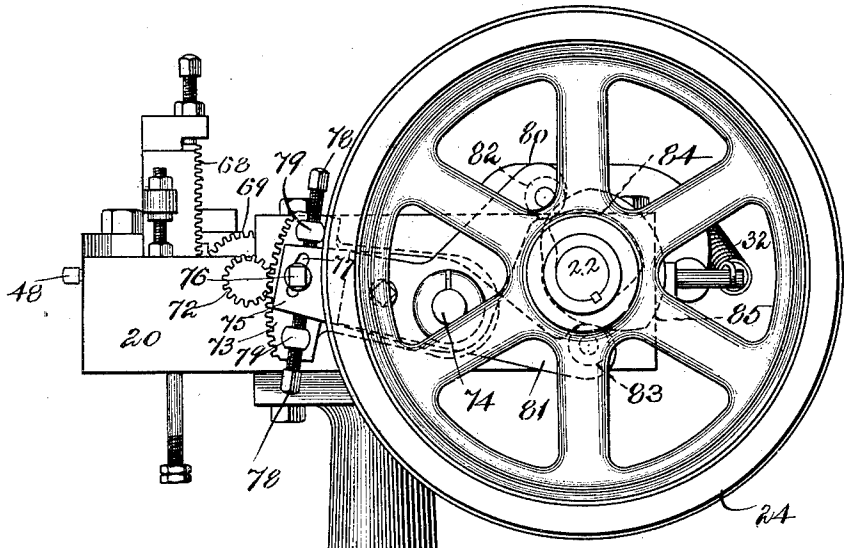
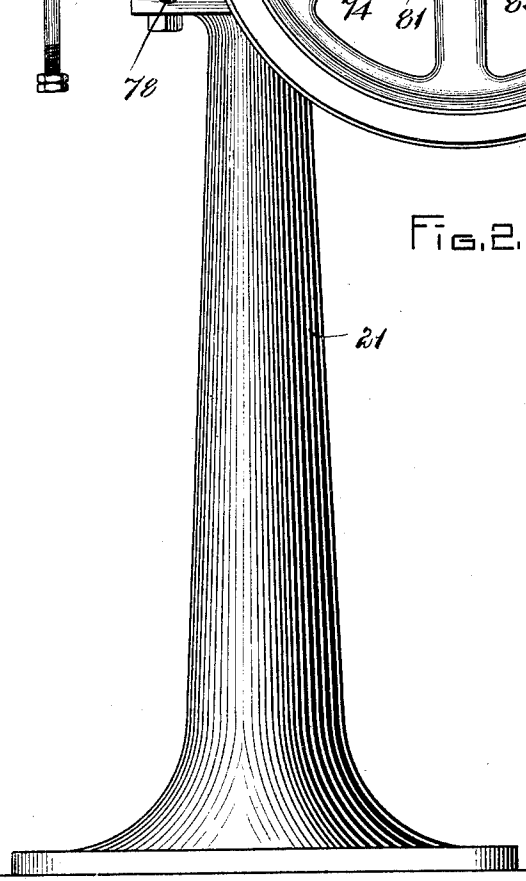


Fig. 2.



Witnesses:
Louis C. Jones.
R. Henry Marsh.

Inventor:
Isaac H. Sisson
by his Attorney
Miles N. Gooding.

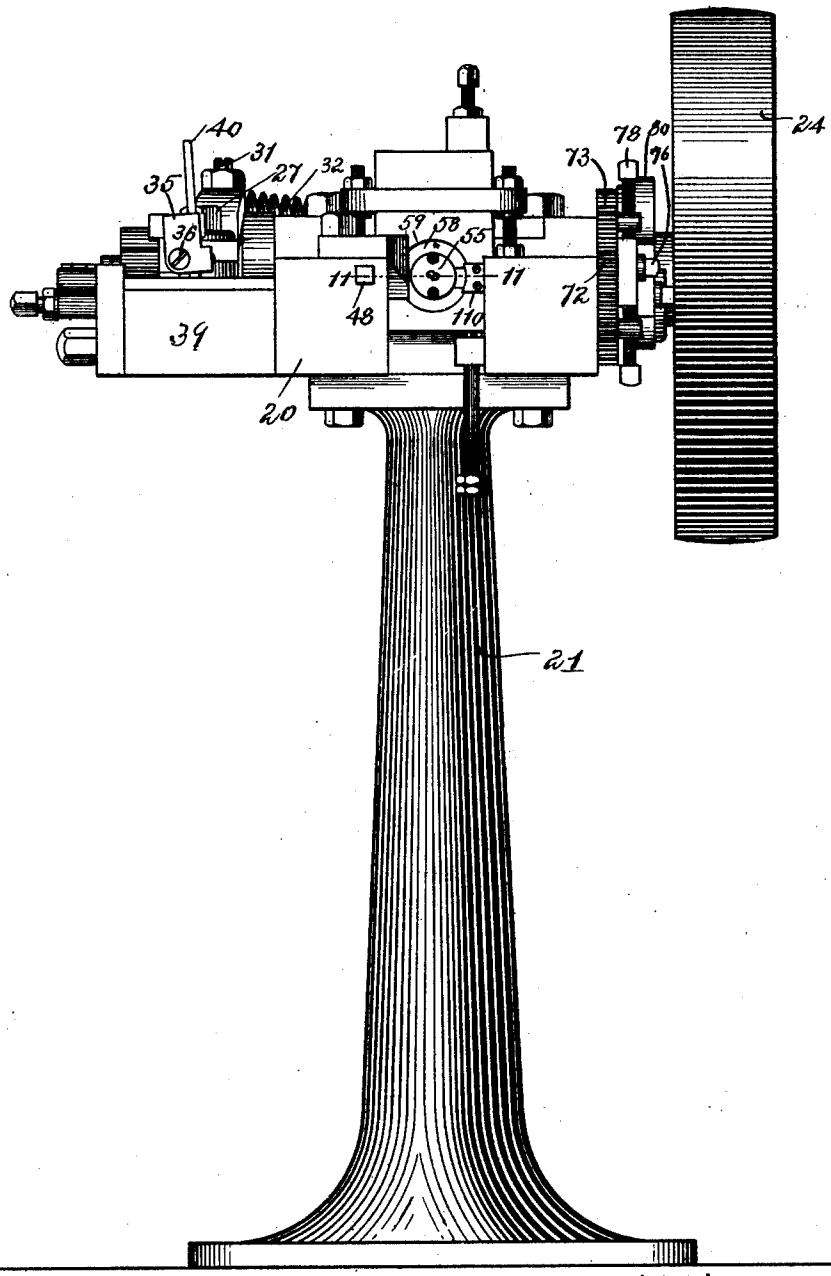
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No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(No Model.) (Application filed Feb. 16, 1901.) 6 Sheets—Sheet 3.



Witnesses:
Lyon A. Jones.
R. Henry Marsh.

Fig. 3.

Inventor:
Isaac H. Sisson.
by his Attorneys, Charles D. Gosling.

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No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(No Model.) (Application filed Feb. 16, 1901.) 6 Sheets—Sheet 4.

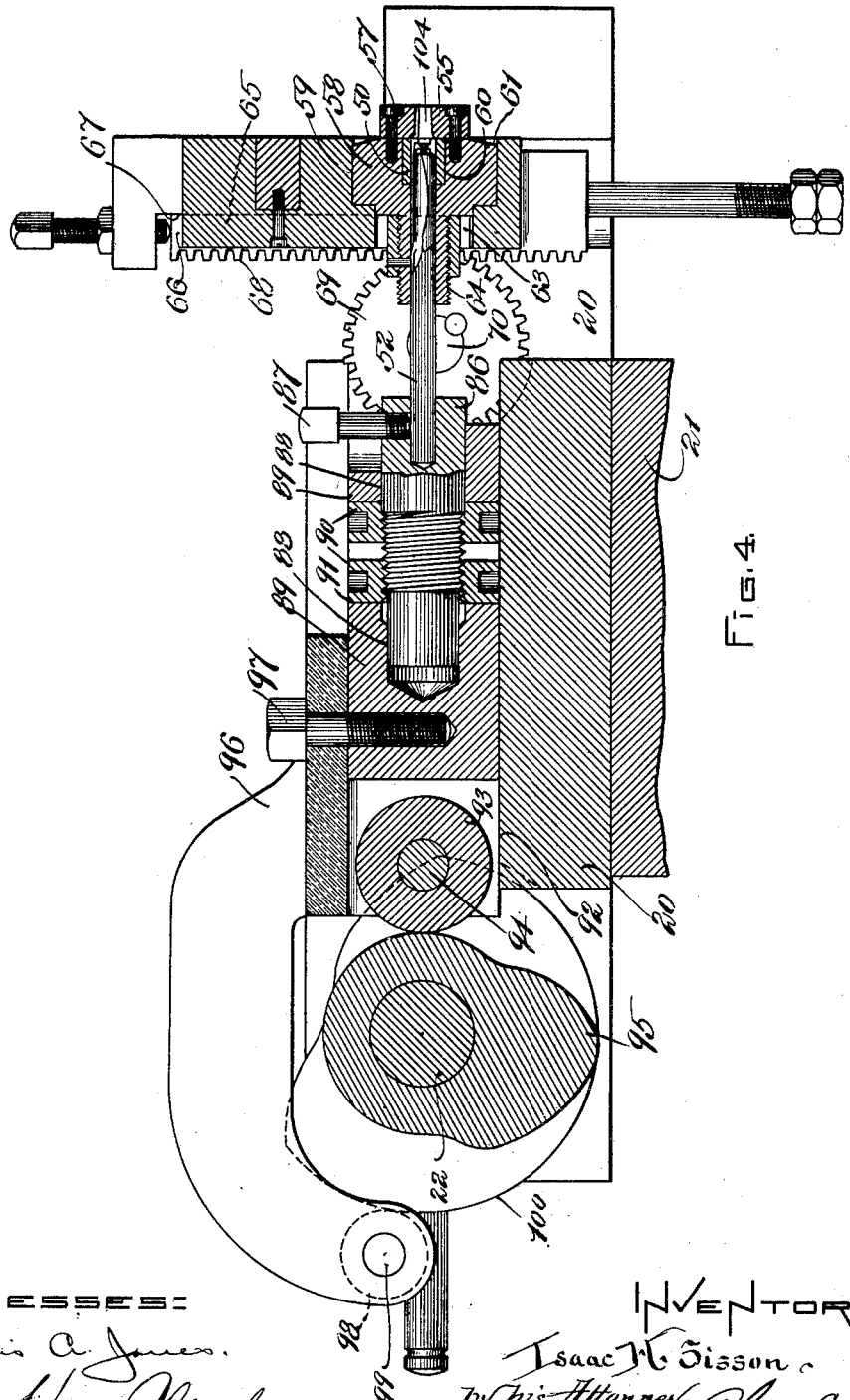


Fig. 4.

Witnesses:
Louis A. Jones.
R. Henry Marsh.

Inventor:
Isaac H. Sisson,
by his Attorney
Charles S. Goodwin

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(Application filed Feb. 16, 1901.)

(No Model.) 6 Sheets—Sheet 5.

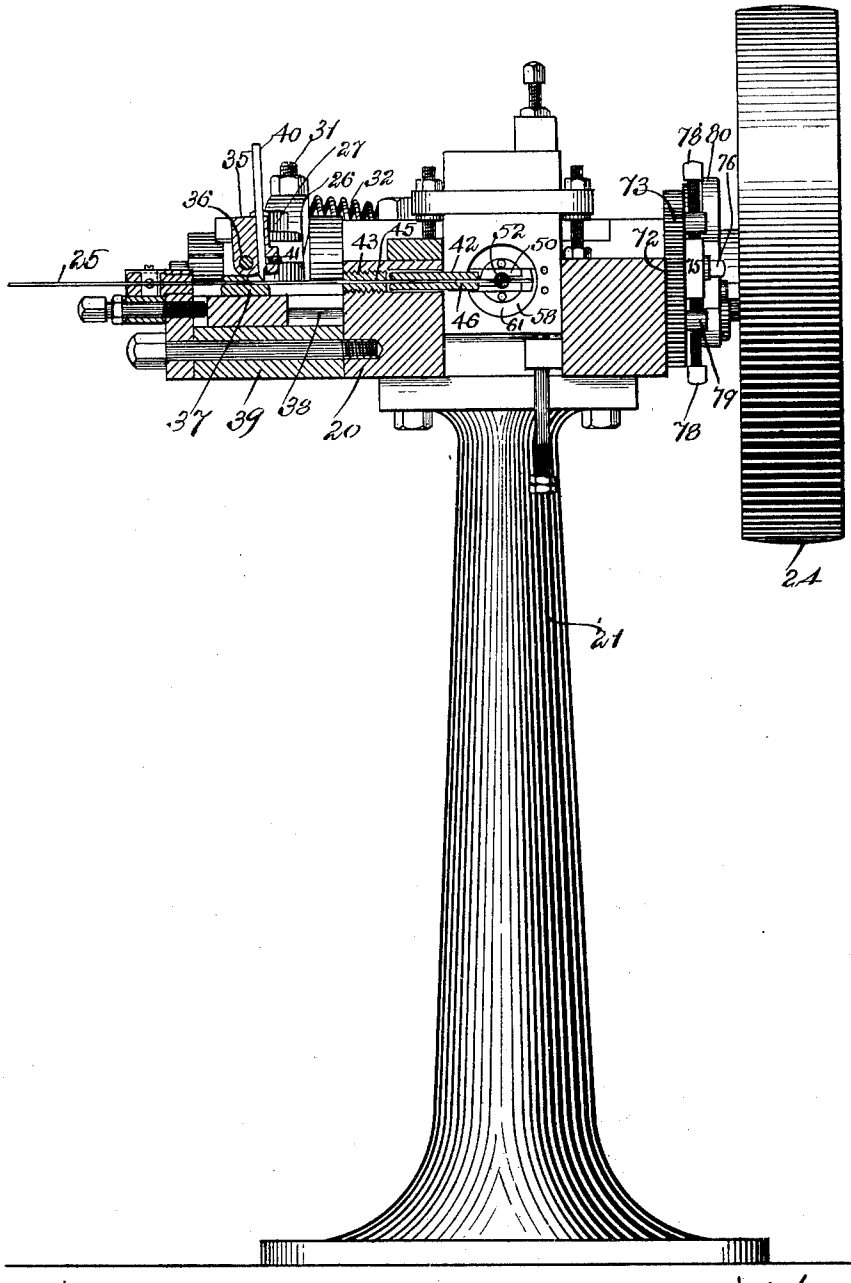


Fig. 5.

Witnesses:
Jesse A. Jones.
R. Perry Marsh.

Inventor:
Isaac H. Sisson,
by his Attorney,
Charles C. Gooding.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 679,433. Patented July 30, 1901.

I. H. SISSON.

MACHINE FOR MAKING WIRE BUTTON FASTENERS.

(No Model.) (Application filed Feb. 16, 1901.) 6 Sheets—Sheet 6.

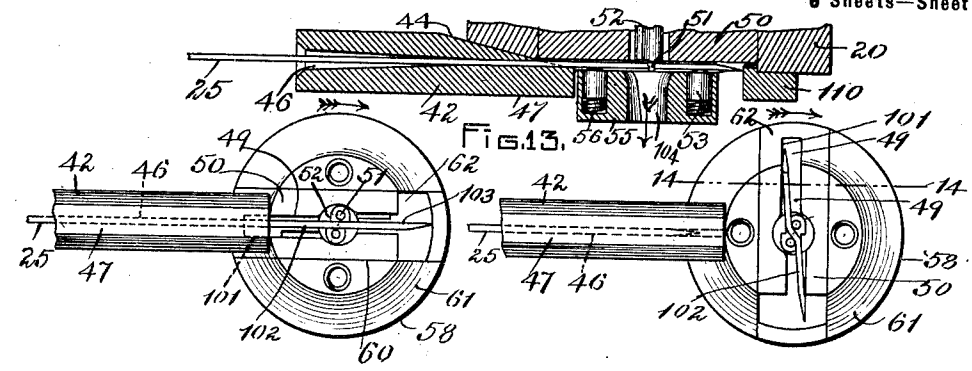


Fig. 13.

Fig. 6.

Fig. 7.

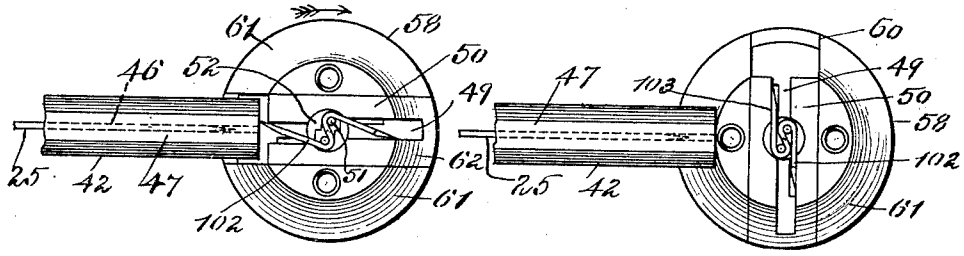


Fig. 8.

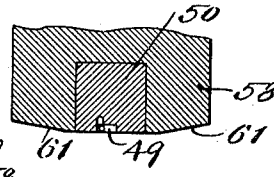


Fig. 9.

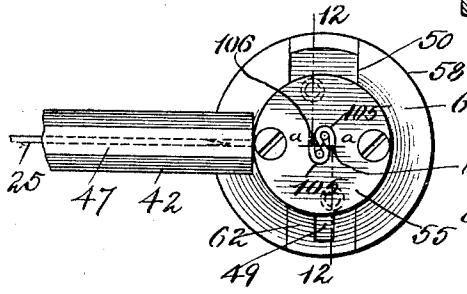


Fig. 14.

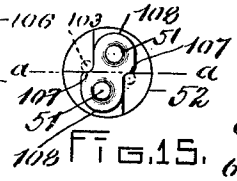


Fig. 10.

Fig. 15.

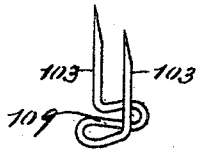


Fig. 16.

Fig. 11.

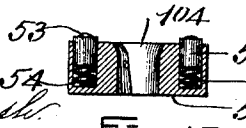


Fig. 12.

WITNESSES:

Louis A. Jones.

R. Henry Mandel.

INVENTOR:

Isaac H. Sisson

by his Attorney

Charles V. Gooding.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ISAAC H. SISSON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO ROBERT AMORY, OF BAR HARBOR, MAINE.

MACHINE FOR MAKING WIRE BUTTON-FASTENERS.

SPECIFICATION forming part of Letters Patent No. 679,433, dated July 30, 1901.

Application filed February 16, 1901. Serial No. 47,634. (No model.)

To all whom it may concern:

Be it known that I, ISAAC H. SISSON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Machines for Making Wire Button-Fasteners, of which the following is a specification.

The object of this invention is to produce a machine for making wire fasteners, said wire fasteners being adapted to fasten buttons to sheet material—such as clothing, boots and shoes, and the like—and consisting of a piece of wire having two substantially parallel points or prongs joined at their bases by a portion of the wire twisted or convoluted in a plane substantially at right angles to said prongs, said wire being preferably bent in the form of a letter **S** between the bases of said points or prongs.

The invention consists in certain improved mechanism for cutting the wire and for bending said wire in the shape of an **S** to form the head of a fastener and in certain other improved mechanism for bending the ends of the wire at right angles to said **S** portion and ejecting the finished fastener from the machine.

The invention further consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is a plan view of my improved machine for making wire button-fasteners. Fig. 2 is a right-hand side elevation of the same looking toward the left of Fig. 1. Fig. 3 is a front elevation of the machine. Fig. 4 is an enlarged longitudinal section taken on line 4 4, Fig. 1, looking toward the right of said figure with the balance-wheel removed. Fig. 5 is a vertical sectional front elevation on line 5 5, Fig. 1. Figs. 6, 7, 8, and 9 are detail enlarged front elevations of the rotatory wire-bender, reciprocatory former, and wire-guide, showing the said wire-bender in the different positions assumed in bending the wire to an **S** shape. Fig. 10 is a similar view with the rotatory prong-bending die affixed to said rotatory wire-bender. Fig. 11 is an enlarged central longitudinal section taken on line 11 11, Fig. 3, showing the rotatory parts as illustrated in Fig. 10 and the mechanism for rotating said parts. Fig. 12 is a section of the rotary bending-die, taken on line 12 12, Fig. 10. Fig. 13 is a section similar to Fig. 11, with the rotary former and die in the position shown in Fig. 6. Fig. 14 is a horizontal section taken on line 14 14, Fig. 7. Fig. 15 is an enlarged front or end elevation of the reciprocatory former, and Fig. 16 is an enlarged perspective view of the wire button-fastener formed by my improved machine.

Like characters refer to like parts throughout the several views of the drawings.

In the drawings, 20 is the frame of the machine, supported upon a column 21. The main driving-shaft 22 rotates in capped bearings 23 and is rotated by the pulley balance-wheel 24.

The wire is fed into the machine by a lever 26, pivoted to a stud 27, fast to a stationary bracket 28, fast to the frame 20. The lever 26 is rocked upon its pivot by the open barrel-cam 29. A cam-roll 30 rotates upon a stud 31, fast to the lever 26, and is kept in contact with the cam 29 by a spring 32. In the forward end of the lever 26 is a notch 33, shaped like the space between two gear-teeth, which engages a lug 34 on a dog 35, pivoted to a slide 37 at 36. The slide 36 is guided in ways 38 on the bracket 39, fast to the frame 20. The cam 29 moves the forward end of the lever 26 to the right, Fig. 1, tips the dog 35 upon its pivot 36, and clamps said wire to said slide by a wire 40, adjustably fastened to said dog by a set-screw 41. The lever upon continuing its forward motion feeds the wire 25 forward through a guide 42, fast to the frame of the machine by a set-screw 48. The wire-guide 42 is adjustable longitudinally by means of an adjusting-screw 43, which is screw-threaded into the frame of the machine, Fig. 5, and bears against the left-hand end of said wire-guide.

The wire-guide 42 is cylindrical in cross-section, flatted off on one side at 47 and held in position by a set-screw 48, and is beveled off on the face 44 at an acute angle with the line of feed of the wire, (shown in plan view in Figs. 11 and 13,) thus forming a stationary cutter and wire-guide combined.

The wire 25 feeds through a hole 45 in the center of the adjusting-screw 43 and through a similar hole 46 in the stationary cutter 42, and thence along a slot 49, constituting a wire-passage across the front face of the rotary wire-bender 50, as shown in Fig. 6, and against a stop 110, Figs. 11 and 13. As the wire 25 is fed across the face of the rotary wire-bender 50 it passes betewen two forming pins or projections 51 upon the face of the reciprocatory former 52 and is held against the bottom or rear face of said wire-passage 49 by two spring guide-pins 53 53. The guide-pins 53 are rounded on the ends which bear against the wire 25 and are guided in holes 54 in the rotary prong-bending die 55, being held against said wire by spiral springs 56 in said holes. The rotary prong-bending die is fastened to the rotary holder 58 by screws 57 and rotates with it and with the rotary bender and cutter 50, fast also to said holder 58. The holder 58 rotates in a bearing 59 in the frame of the machine and is provided with a slot 60 to receive the cutter and bender 50. Said cutter and bender is held against lateral movement in the slot 60 by the bending-die 55 and is rounded upon the ends to form a continuation of the periphery of said holder 58, thus fitting the bearing 59 and being held by said bearing in position against longitudinal movement. The holder 58 and cutter 50 are beveled on the front face at 61 and 62, respectively, at the same angle as the bevel-face 44 of the stationary cutter 42 and bear against said bevel-face as they rotate.

The holder 58 is rotated by a pinion 63, screwed and pinned, Figs. 4 and 11, to a shank or hub 64, integral with the holder 58. The pinion 63 meshes with a vertically-reciprocatory rack 65 on the rack-bar 66, which slides in ways 67 in the frame of the machine. Another rack, 68, on said rack-bar 66 meshes with a gear 69, fast to a shaft 70, which turns in a bearing 71 in the frame 20 and has a pinion 72 fast to the other end thereof, which meshes with a segment-gear lever 73, pivoted to a stud 74, fast to the frame of the machine. The segment-gear lever 73 is adjustably fastened to a cam-lever 75 by a cap-screw 76. Said cap-screw is screw-threaded into the segment-gear lever 73 and passes through a slot 77 in the cam-lever 75. The relative location of the segment-gear lever 73 to the cam-lever 75 may be changed by loosening the cap-screw 76 and turning the adjusting-screws 78 in opposite directions. The screws 78 are screw-threaded in ears 79 on the lever 73, and one bears against the upper and the other against the lower edge of the lever 75, so that by turning said screws in the proper direction it is evident that the relative location of the said levers 73 and 75 to each other will be changed, and at the same time the position of the rotary holder 58, cutter and bender 50, and die 55 will be adjusted to a different position through the connecting-pinion 72, gear 69, and pinion 63. After adjusting the said parts to the desired position the lever 73 is locked to the lever 75 by tightening the cap-screw 76. The cam-lever 75 has two arms 80 and 81, each having a cam-roll 82 and 83, respectively. The cam-rolls 82 and 83 bear against the open cams 84 and 85, respectively, both of said cams being fast to the driving-shaft 22.

The reciprocatory former 52 is fastened to a cylindrical holder 86 by a set-screw 87. The holder 86 is fitted to enter a hole 88 in the slide 89 and is screw-threaded to receive two adjusting set-nuts 90, which bear against opposite sides of a slot 91 in said slide 89. The slide 89 is guided in ways 92 on the frame 20 and has a cam-roll 93 thereon, which turns on a stud 94 fast thereto, and bears against an open-face cam 95, fast to the driving-shaft 22. A bracket 96 (fast to said slide 89 by a cap-screw 97) on a stud 99 fast thereto, carries a cam-roll 98, which bears against a cam 100. The cams 95 and 100 impart a reciprocating motion to the slide 89 and the former 52 for the purpose hereinafter set forth.

The operation of the machine as a whole is as follows: Assuming the end of the wire to be pointed, as in Fig. 6, said wire 25 is fed from a reel into the machine by means of the lever 26, the dog 35 and the wire 40 clamping said wire to the slide 37 in the forward movement thereof, as hereinbefore described. The wire is fed through the hole 45 in the adjusting-screw 43 and through the hole 46 in the wire-guide and stationary cutter 42 into the slot or wire-passage 49 in the wire-bender 50 and across the face of the former 52, between the former-pins 51, to the position shown in Figs. 6 and 13, with the end of said wire against the stop 110. The holder 58 and wire-bender 50 are next rotated by the pinion 63 and connecting mechanism, hereinbefore described, through three-quarters of one rotation in the direction of the arrow, as illustrated in Figs. 7, 8, and 9. As the rotary cutter and bender 50 starts to rotate in the direction of the arrow, Fig. 6, the cutting edge 101 on said cutter and bender severs the portion of wire 102 from the main portion of the wire 25 and severs it on the acute angle that the face 44 makes with the line of feed of the wire 25, against which it cuts as a stationary cutter. As the bender 50 continues its rotary movement to the position shown in Fig. 7, or one-quarter of a rotation, the wire begins to be bent around the two former-pins 51 51, said pins remaining stationary during a three-fourths rotation of the bender 50. The rotary bender 50 is shown in Fig. 8 as having made one-half of a rotation and the wire as being bent still farther around the pins 51. In Fig. 9 the bender 50 has rotated, with the holder 58, through three-fourths of a rotation, and the wire 102 is now bent in the form of an **S**, with the portions 103 103 which are to be bent at right angles to the plane in which the **S** portion or head 109 of the fas-

tener lies and form the prongs of said fastener lying in the same plane as the S portion. The reciprocatory former 52 next moves forward in the direction of the arrow, Fig. 13, forcing the wire 102 through the hole 104 in the rotary prong-bending die 55. The hole 104 is made of substantially the same shape as the S portion of the fastener—namely, of two semicircular curves 105 105, located upon opposite sides of a median line *a a* and joined together by two straight lines 106 106 on opposite sides of the same center line and at a distance therefrom equal to the diameter of the wire. The walls of the hole 104 are rounded off and tapered upon the rear side of the die 55 in order to bend the prongs as described without danger of cutting or breaking the wire. The forward end of the reciprocatory former 52 is of the same outline in cross-section as the hole 104, except that the straight lines 107, joining the semicircular curves 108, are exactly on the median line *a a*, so that as the head 109 of the fastener is forced through the hole 104 the prongs 103 are bent backward at right angles to said head, occupying the position shown in Fig. 11 and also in the dotted circles, Fig. 15, and lying adjacent to the straight walls 107 107 of the former 52, thus completing the fastener with an S head 109 and with two prongs 103 at right angles to said head. The former 52 continues its forward motion after bending the prongs at right angles to the head until the fastener is pushed through the hole 104 in the rotary prong-bending die 55 and out into a receptacle provided therefor.

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

1. In a machine for making wire fasteners, a former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, and mechanism to feed a wire into and lengthwise of said slot.

2. In a machine for making wire fasteners, a rotary wire-bender, a slot extending across the face thereof at right angles to the axis of rotation of said wire-bender, mechanism to feed a wire into and lengthwise of said slot, and a spring-pin arranged to bear against said wire and assist in guiding the same.

3. In a machine for making wire fasteners, a former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary stop, and mechanism to feed a wire into and lengthwise of said slot against said stop.

4. In a machine for making wire fasteners, a former, a wire bender and cutter, mechanism to rotate said wire bender and cutter around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary cutter and wire-guide, and mechanism to feed a wire through said wire-guide and lengthwise of said slot.

5. In a machine for making wire fasteners, a former, a rotary wire bender and cutter, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary cutter and wire-guide, and mechanism to feed a wire through said wire-guide and lengthwise of said slot, the cutting edge of said stationary and of said rotary cutter being formed at an acute angle with the line of feed of said wire.

6. In a machine for making wire fasteners, a former of curvilinear outline in cross-section, said curvilinear outline consisting of two semicircular arcs 108, 108, located upon opposite sides of a median line and joined together by two straight sides 107, 107, and a projection in the center of each of said semicircular arcs extending outwardly from the end face of said former.

7. In a machine for making wire fasteners, a former, mechanism for imparting a reciprocatory motion to said former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, and mechanism to feed a wire into and lengthwise of said slot.

8. In a machine for making wire fasteners, a former, mechanism for imparting a reciprocatory motion to said former, a rotary wire-bender, a slot extending across the face thereof at right angles to the axis of rotation of said wire-bender, mechanism to feed a wire into and lengthwise of said slot, and a spring-pin arranged to bear against said wire and assist in guiding the same.

9. In a machine for making wire fasteners, a former, mechanism for imparting a reciprocatory motion to said former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary stop, and mechanism to feed a wire into and lengthwise of said slot against said stop.

10. In a machine for making wire fasteners, a former, mechanism for imparting a reciprocatory motion to said former, a wire bender and cutter, mechanism to rotate said wire bender and cutter around said former as a center, a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary cutter and wire-guide, and mechanism to feed a wire through said wire-guide and lengthwise of said slot.

11. In a machine for making wire fasteners, a former, mechanism for imparting a reciprocatory motion to said former, a rotary wire bender and cutter, mechanism to rotate said wire-bender around said former as a center,

a slot extending across the face of said wire-bender at right angles to the axis of rotation of said bender, a stationary cutter and wire-guide, and mechanism to feed a wire through said wire-guide and lengthwise of said slot, the cutting edge of said stationary and of said rotary cutter being formed at an acute angle with the line of feed of said wire.

12. In a machine for making wire fasteners, a former, two projections upon the face of said former, located upon opposite sides of a median line, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a wire-passage in said wire-bender, extending across said wire-bender and at right angles to the axis of rotation thereof, and mechanism to feed a wire lengthwise of said wire-passage and between said projections.

13. In a machine for making wire fasteners, a former, two projections upon the face of said former, located upon opposite sides of a median line, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a slot extending across the face of said wire-bender, and mechanism to feed a wire lengthwise of said slot and between said projections.

14. In a machine for making wire fasteners, a former, two projections upon the face of said former located upon opposite sides of a median line; a rotary wire bender and cutter, a slot extending across the face thereof at right angles to the axis of rotation of said wire-bender, a stationary cutter and wire-guide, and mechanism to feed a wire through said wire-guide lengthwise of said slot and between the projections upon said former.

15. In a machine for making wire fasteners, a prong-bending die, said die consisting of a piece of metal with a hole extending through from one face to the other thereof, said hole having a curvilinear outline consisting of two semicircular arcs 105, 105, located upon opposite sides of a median line and joined together by straight sides 106, 106.

16. In a machine for making wire fasteners, a former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a prong-bending die, and mechanism to impart a reciprocating motion to said former in a direction parallel to the axis of rotation of said wire-bender.

17. In a machine for making wire fasteners, a former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a prong-bending die, arranged to rotate with said wire-bender, and mechanism to impart a reciprocating motion to said former in a direction parallel to the axis of rotation of said wire-bender.

18. In a machine for making wire fasteners, a former, a wire-bender, mechanism to rotate said wire-bender around said former as a center, a prong-bending die, fast to said wire-bender and concentric with said former, and mechanism to impart a reciprocating motion to said former in a direction parallel to the axis of rotation of said wire-bender.

19. In a machine for making wire fasteners, a former, two projections upon the face of said former, located upon opposite sides of a median line, a rotary wire bender and cutter, a slot extending across the face thereof at right angles to the axis of rotation of said wire-bender, a stationary cutter and wire-guide, mechanism to feed a wire through said wire-guide, lengthwise of said slot and between the projections upon said bender; a prong-bending die fast to said wire-bender, and concentric with said former; mechanism to rotate said wire bender and cutter, and mechanism to impart a reciprocating motion to said former.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ISAAC H. SISSON.

Witnesses:
ISAAC L. GOFF,
GEO. A. TARBELL.