

G. W. PERKINS.

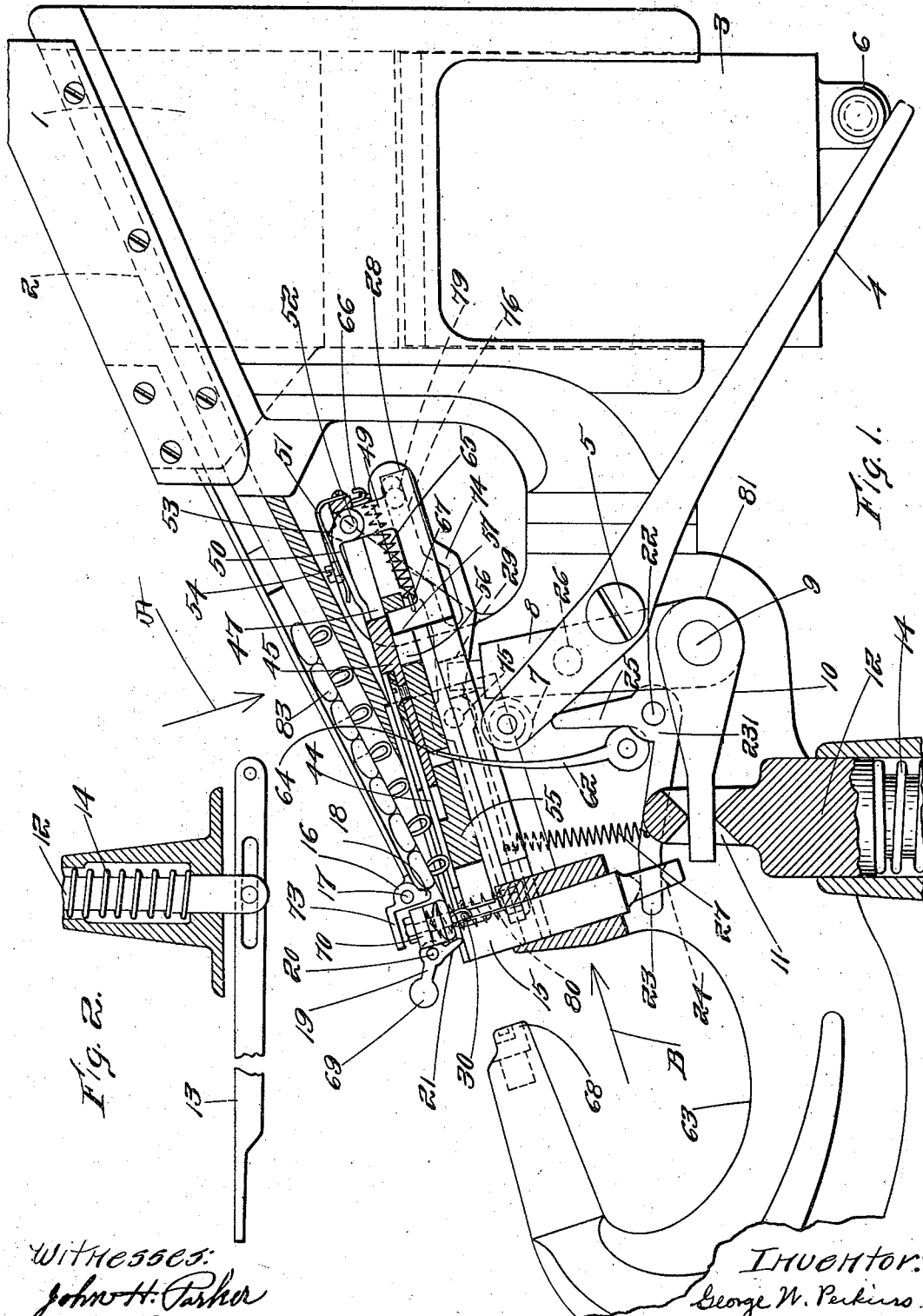
MACHINE FOR FASTENING BUTTONS ON SHOES AND OTHER ARTICLES.

APPLICATION FILED MAY 18, 1911.

1,043,862.

Patented Nov. 12, 1912.

4 SHEETS—SHEET 1.



Witnesses:
John H. Parker
R. Wallace.

INVENTOR:
George W. Perkins
by Macdonald, Calver, Copeland & Sibley
ATTORNEYS.

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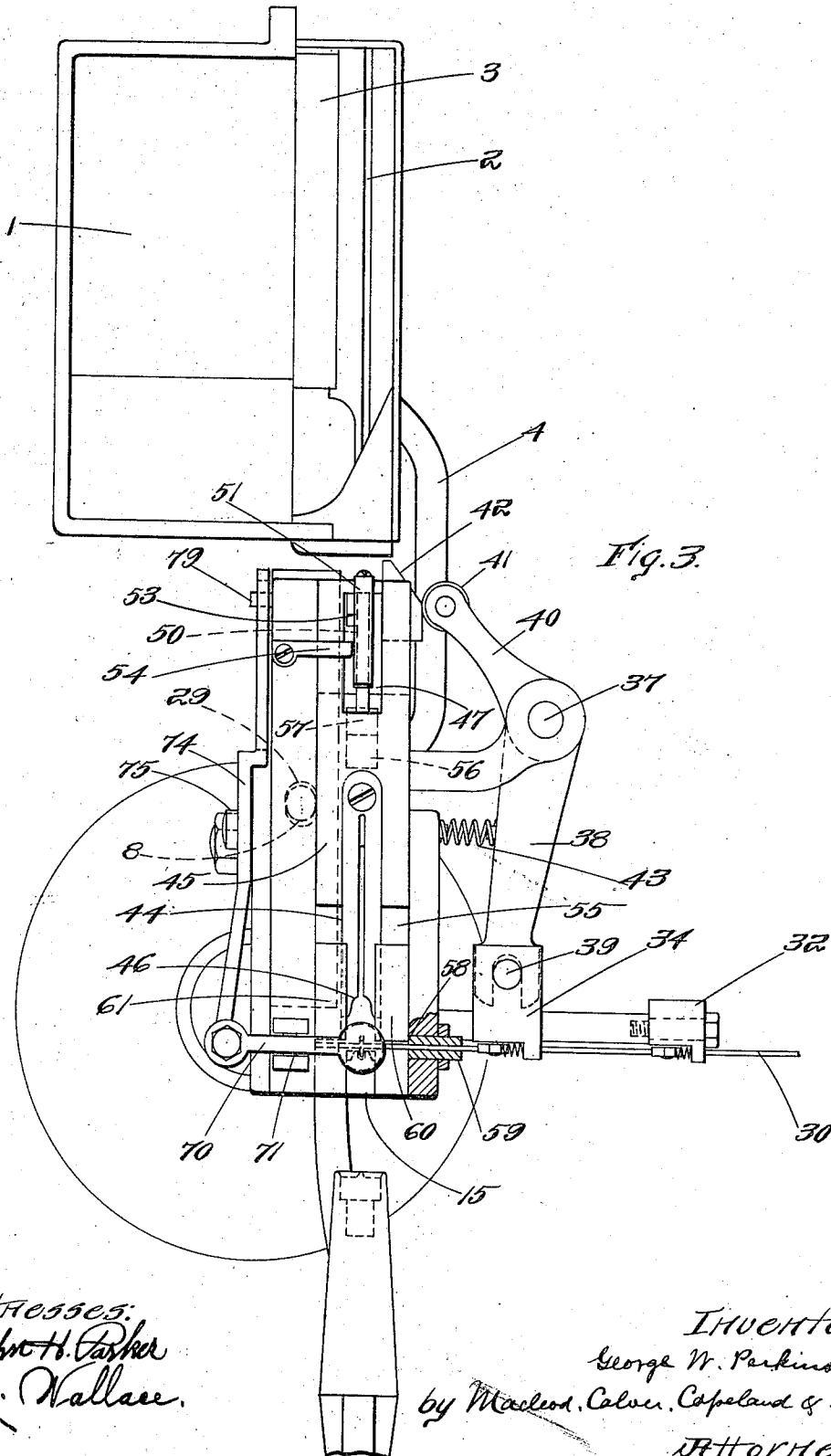


Fig. 3.

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INVENTOR:
George W. Perkins
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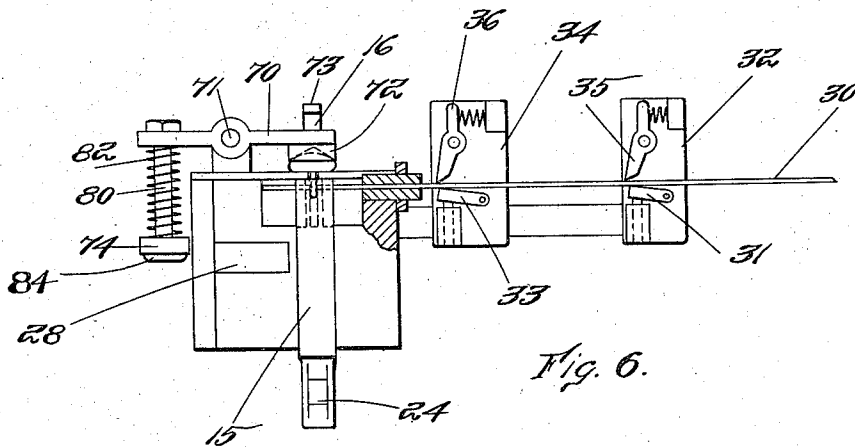
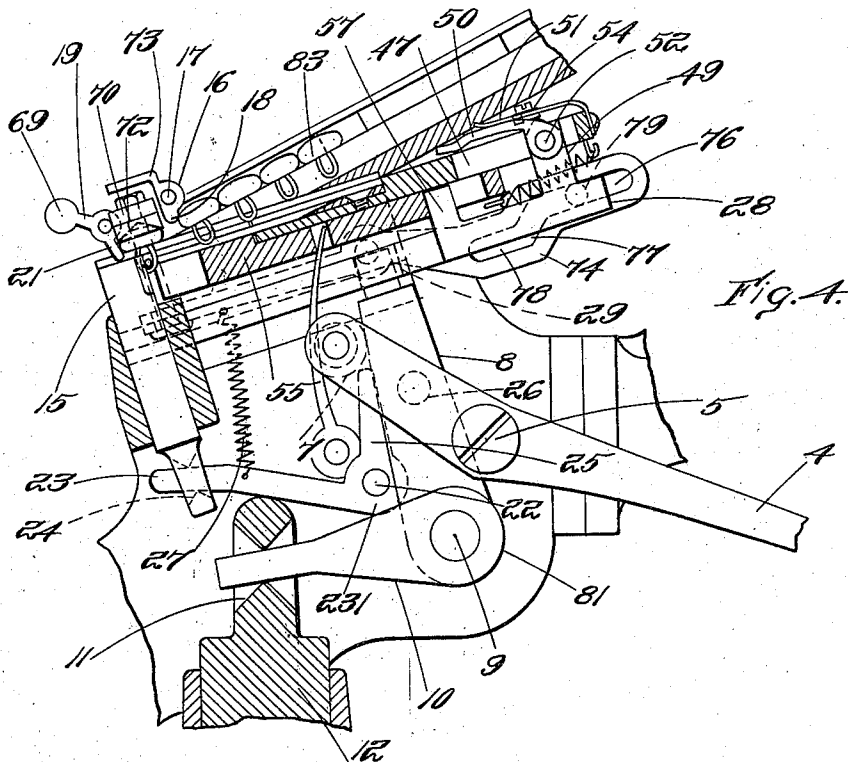
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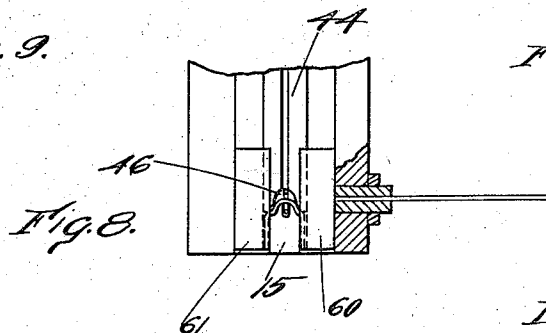
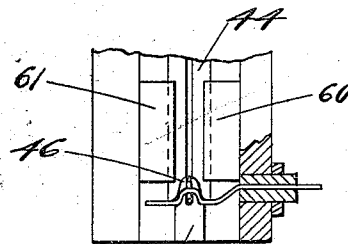
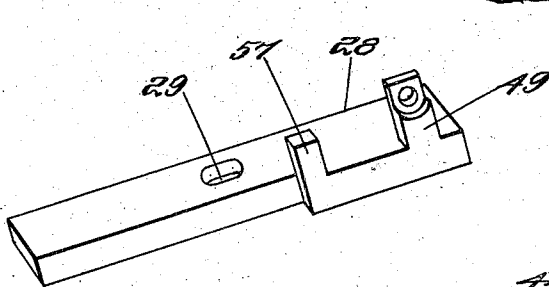
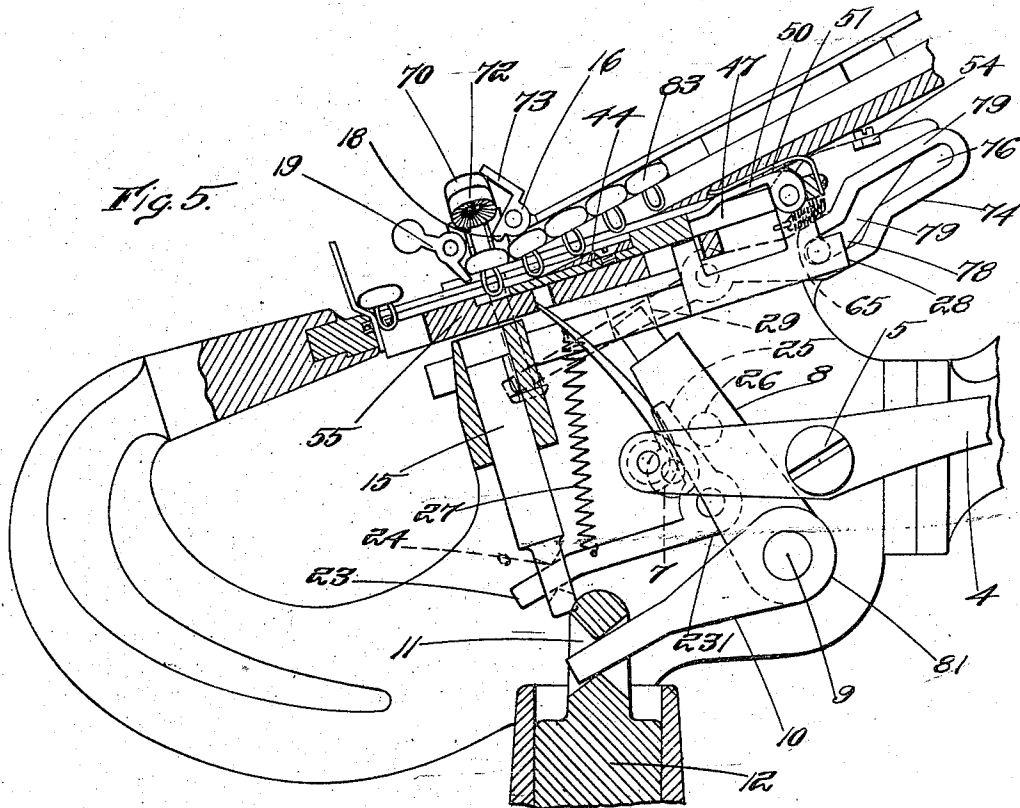
Inventor:
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4 SHEETS—SHEET 4.



WITNESSES:
John H. Parker
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UNITED STATES PATENT OFFICE.

GEORGE W. PERKINS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HEATON PENINSULAR BUTTON FASTENER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

MACHINE FOR FASTENING BUTTONS ON SHOES AND OTHER ARTICLES.

1,043,862.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed May 18, 1911. Serial No. 627,974.

To all whom it may concern:

Be it known that I, GEORGE W. PERKINS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improvement in Machines for Fastening Buttons on Shoes and other Articles, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a machine for making metallic fasteners and fastening buttons therewith to shoes and other articles.

The invention is especially intended for application to foot power machines or to other machines in which the operation of making a single fastener and attaching a single button therewith is performed at each operation of the machine and the machine stops at the end of each operation and is started each time at the will of the operator as is usual in hand or foot power machines.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features will be pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a side elevation partly in section and partly broken away of a machine embodying the invention. Fig. 2 is a side elevation partly in section and partly broken away of the treadle on a smaller scale than Fig. 1. Fig. 3 is a top view of the machine looking in the direction of the arrow A shown in Fig. 1, the raceway and certain other parts being stripped away. Fig. 4 is a side elevation partly in section of a portion of the parts shown in Fig. 1, showing the parts in the position after the former has moved down to form the loop in the fastener. Fig. 5 is a side elevation partly in section of a portion of the machine, showing the parts at the end of the down stroke of the former and slide, the fastener being set in the material. Fig. 6 is a view looking in the direction of the arrow B shown in Fig. 1. Fig. 7 is a view showing the former and slide and wire after the loop has been formed. Fig. 8 is a view similar to Fig. 7 after the slide has descended and cut the wire and formed

the legs. Fig. 9 is a detail view of the carrier.

Referring now to the drawings,—1 represents the hopper in which the buttons are held in bulk and 2 the hopper stand race-way into which the buttons are delivered by an elevator 3 which is actuated by a lever 4 fulcrumed at 5, one end of which engages a roll 6 projecting from the lower end of the elevator, the other end of the said lever carrying a roll 7 which is engaged by the arm 8 of the bell crank lever 81 fulcrumed on a shaft 9, the other arm 10 of said bell crank lever engaging with the slot 11 in the treadle rod 12 operated by a foot treadle 13. By depressing the treadle the elevator is raised and when the foot is released from the treadle the weight of the elevator will carry it down again. A spring 14 tends to hold the treadle rod in its elevated position when the foot is released from the treadle.

The buttons 83 pass from the hopper stand race-way 2 down into the race-way proper as shown in the drawings ready to be fed to position over the arbor 15 to be threaded by the wire from which the fastener is formed.

Means are provided whereby only one button at a time is admitted to the lower end of the race-way where the placer positions the button on the arbor for the wire to be threaded through the eye of the button. Said means consists of a dog 16 pivoted at 17 in the upper side of the race-way and having a tooth 18 which extends down into the race-way to hold in check the buttons back of it in the race-way until the button below it has passed out. A dog 19 pivoted at 20 has a tooth 21 which extends down in front of the button on the arbor while it is being threaded and having the loop and legs formed. The means for actuating the dogs 16 and 19 will be hereinafter explained.

A bell crank lever 231, fulcrumed at 22 to the frame of the machine has one arm 23 which passes loosely through a slot 24 in the lower end of the arbor 15, the other arm 25 of said bell crank lever being adapted to be engaged by a pin 26 projecting from the side of the arm 8 of the bell crank lever 81 whereby the downward movement

of the treadle will depress the arbor 15 and when the treadle rod 12 moves up again the spring 27 will raise the arbor again into its operative position. One end of said spring is connected with the arm 23 of the bell crank 231 and the other end of the spring is connected to the frame of the machine.

An irregular shape slide piece 28 which is termed the carrier has a straight sliding movement in ways in the frame of the machine and is formed with a slot 29 which is engaged by one end of the arm 8 of the bell crank lever 81 whereby the movement of said bell crank gives a reciprocating movement to the carrier. Said carrier actuates the wire feed, the loop forming mechanism and the leg forming mechanism and the cutter, the cutter being a part of the slide which forms the legs. The wire is fed on the upstroke of the treadle rod; the loop forming, wire cutting, leg forming and the setting of the fastener is performed on the depression of the treadle.

The wire feed mechanism is as follows:—

The wire 30 passes over a rest 31 on the side of the stationary block 32 thence over a rest 33 on the movable block 34, said stationary block having a dog 35 which prevents backward movement of the wire and the movable block 34 having a dog 36 which grips the wire to feed it when the block moves forward and which yields to allow the block to slide backward without moving the wire backward. A bell crank lever pivoted at 37 has one arm 38 formed with a forked lower end which engages a pin 39 projecting from the movable block 34 so that the rocking of said bell crank lever will give a straight reciprocating movement to the wire feed block 34. The arm 40 of said bell crank has a roll 41 which engages with a cam faced block 42 carried by the carrier 28, the sloping cam face of said block 42 being so formed that on the upward stroke of the carrier the bell crank will be turned so as to feed the wire forward; on the down stroke of the carrier a spring 43 will turn the bell crank in the opposite direction keeping the roller 41 always in engagement with the cam block 42.

The means for forming the loop consists of a reciprocable member 44 which is termed the former, said former having a holder portion 45 attached thereto and constituting a part of the former, the lower end of the former 44 being formed with an arched slot 46 to give the loop formation to the wire when it bends the wire over the arbor. In the upper part of the former holder 45 is a slot 47.

The parts 44 and 45 are shown as two separate parts fastened together. They are so made for convenience of assembling, but when assembled they act as virtually one piece and it is obvious that they might be

integral and when the holder is referred to it simply means that portion of the former which is designated by the numeral 45 whether it be a separate piece or integral with the former 44.

An arm 49 projects from the side of the carrier up into the slot 47. A pawl 50 is pivoted to the upper end of said arm 49, the lower end of said pawl 50 being adapted to engage with the shoulder on the former holder 45 at the lower end of the slot 47 when the arm 49 is at the upper end of the slot and being normally held in such engaging position by a spring 51. When in this position the downward movement of the carrier 28 which is effected by the depression of the treadle will carry the former holder and the former downward bending the wire over the arbor and forming the loop. Said pawl is hinged on a pin 52. The pawl 50 has a tooth 53 which when the former holder and pawl have moved down a certain distance sufficient to form the loop will engage a tripping device 54 which will turn the pawl 50 so as to raise the forward end of the pawl out of engagement with the wall of the slot in the former holder as shown in Fig. 4 so that the carrier may continue its downward movement without moving the former until the arm 49 reaches the lower end of the slot 47.

The mechanism for cutting the wire and forming the legs is as follows:—A sliding member 55 which is termed the slide is formed with a groove or slot in its upper face within which the former slides and is formed also with a slot 56 into which extends an arm 57 from the carrier 28. The slot 56 is longer than the width of the arm 57 so that the carrier may move some distance without moving the slide 55. In the uppermost position of the carrier, as shown in Fig. 1 the arm 57 is at the upper end of the slot 56 and the length of the slot is such that before the arm 57 engages with the lower end of the slot the pawl 50 will have been tripped after the loop is formed so that now the slide 55 will begin to move while the former 44 remains stationary clamping the loop of the fastener to the eye upon the arbor. The lower end of the slide 55 is hardened and the edge 58 thereof forms a sheering edge which engages with the wire just after it passes through a hardened bushing 59 in the frame and severs the wire. On account of the groove in the slide 55 in which the former 44 slides there are formed the two leg portions 60, 61, which straddle the arbor and engage the opposite end portions of the severed blank bending them down as the slide moves downward and forming the legs of the fastener. By the time the slide has descended far enough to form the legs of the fastener the bell crank 81 will have moved far enough

for the pin 26 projecting from the bell crank 81 to engage the arm 25 of the bell crank 231 and thereby to have pulled the arbor 15 down out of the path of the former so that the former may be moved farther downward.

A spring 62 is fastened at its lower end to a portion of the frame 63 and its upper end engages in a slot 64 in the slide 55.

10 This spring is under its greatest tension when the slide is in its uppermost position and tends at all times to press the slide downward. When the slide has reached the end of that portion of its movement which 15 forms the legs of the fastener the arm 57 of the carrier being then in engagement with the lower end of the slot 56 the tension of the spring 62 will give an accelerated movement to the slide faster than the carrier so 20 that although the carrier continues its downward movement the slide 55 will move faster than the carrier until the upper end of the slot 56 engages with the arm 57.

A spring 65 is made fast at one end to 25 the upper end of the former holder as for instance by a hook 66 secured to the former holder and its other end is made fast to a fixed portion of the frame as by a hook 67 or other suitable means, said spring being 30 in expanded form under tension when the former is in its uppermost position and tending to pull the former downward. During the time that the former is making the first portion of its descent to form the loop 35 of the fastener and while the pawl 50 is engaged in the lower end of the slot 47 the spring 65 will contract somewhat but not sufficiently fully to destroy its tension. After pawl 50 is tripped and after the legs 40 are formed and the arbor is withdrawn from the lower end of the former so that the former will then be free to yield to the pull of the spring 65 the former will be given an accelerated movement due to the 45 spring faster than the carrier and the arm 49 of the carrier will come into the upper end of the slot 47 as when it started its downward movement and the spring 51 which rests on the top of the pawl 50 will 50 turn the pawl 50 down so that its lower end will again engage with the lower end of the slot 47 which position allows the former to be again moved by the carrier. Now the slides will be moved by the spring 62 in unison with the movement of the former by 5 the carrier until the slide comes into engagement with the material on the anvil to which the button is to be attached. After the slide has reached the end of its movement the 10 former will continue to be moved by the carrier.

The downward movement of the slide occasioned by the spring 62 will have carried the button and attached fastener down against the material on the die 68 the dog

19 yielding to the pressure of the button carried down by the slide so that the dog will turn on its fulcrum until the tooth 21 is turned out of the path of the button. As soon as the button passes out from under the upturned dog, the weight 69 on the outer 70 end of the dog will by gravity turn the dog again so as to bring the tooth 21 down into position to stop the next succeeding button.

After the slide has brought the button and attached fastener into engagement with the 75 material on the die 68 the slide clamps the fabric to the die and also holds the fastener in position to receive the impact of the former which will be brought down immediately afterward by the carrier, the former thus serving as a driver to force the legs of the fastener through the fabric and clench them.

After the wire has been threaded through 85 the eye of the button and the loop and legs have been formed and the button with the attached fastener is ready to be moved down to the fabric on the anvil the dog 16 may be turned so that the next following button 90 may be free to move into position for the next threading movement of the wire as soon as the advance button with the attached fastener has moved out of the way. Mechanism for thus actuating the dog 16 is 95 as follows:

A lever 70 which is termed the button 100 placer is fulcrumed at 71 and extends in a direction transverse of the raceway. One arm of said lever overhangs the raceway and on the underside of said overhanging arm there is a cupped out portion 72 which fits over the head of the button. The dog 16 has an arm 73 which overhangs the upper 105 side of that end of the lever which has the cupped out portion 72 so that when the lever 70 is turned on its fulcrum in a direction to tip up that arm which extends beneath the overhanging arm 73 it will engage the said arm 73 and turn the dog 16 back 110 on its pivot as shown in Fig. 5 turning up the tooth 18 so as to release the button above it and allow said button to slide down into position beneath the placer.

The means for thus actuating the placer 115 lever 70 is as follows:—A lever 74 is fulcrumed intermediate its ends as at 75 and is formed with an elongated slot having a straight portion 76 extending parallel with the path of movement of the carrier, an off-set portion 77 at an angle with the portion 76 and terminating in a straight portion 78 120 which is also parallel with the path of movement of the carrier. A pin 79 projects from the side of the carrier and engages with said slot. A rod 80 is made fast at its upper 125 end to the arm of the placer lever 70 on the opposite side of the fulcrum from the placer recess 72, the lower end of said rod 80 passing loosely through a hole in the lever 74 130

near the lower end of said lever 74. Said rod 80 is formed with a head 84 on its lower end forming a stop to prevent the disengagement of the rod 80 from the lever 74.

5 The spring 82 holds the lever 74 in yielding contact with the head 84. During the first portion of the downward movement of the carrier 28 the pin 79 travels through the straight portion 76 of the slot and while
10 traveling through this portion the lever 74 will remain unmoved. When the pin 79 travels through the offset portion 77 of the slot it will turn the lever on its fulcrum and turn down the end which is connected with
15 the rod 80. A spring 82 surrounding the rod 80 is seated upon the lever 74, its upper end bearing against the placer lever 70. The tension of this spring is sufficient so that unless there is some unusual opposition
20 when the lever 74 is tipped as just described it will carry down the rod 80 thereby pulling down that end of the placer lever with which the rod 80 is connected and tip up the other end until it engages the overhang-
25 ing arm 73 of the dog 16, turning the dog 16 into the position shown in Fig. 5 to release the button just behind so as to admit the button under the placer when the button already under the placer passes out. After
30 the pin 79 has passed out of the offset portion 77 of the slot and enters the straight portion 78 of the slot it will travel down to the end of the slot without further movement of the lever 74 but will retain the lever
35 74 in its tilted position. When the carrier returns on its back stroke and the pin 79 travels back through the offset portion 77 of the slot the lever 74 will be turned back into its normal position thereby bringing the
40 placer lever 70 back into its normal position and allowing the dog 16 to also swing back which it will do by gravity owing to its being hung off the center of gravity.

When all the parts have reached the end
45 of the down stroke they will remain in this position until the pressure upon the treadle is released. When the pressure upon the treadle is released, the spring 14 will carry up the treadle rod 12 thereby turning the
50 bell crank lever 81 and moving the carrier back to its uppermost position and in so doing will carry back the former and slide to their uppermost positions. When the pin 26 on the arm 8 of the bell crank 81 with-
55 draws from engagement with the bell crank arm 25 the spring 27 will turn the bell crank 231 so as to lift the arbor again into operative position for the next operation.

During the upward stroke of the carrier
60 the cam block 42 as previously described, will turn the bell crank 38 on its fulcrum causing the forward feed of the wire through the eye of the button which has just been positioned beneath the placer. The
65 parts are now in position so that when the

treadle is again depressed the former and slide will move down as previously described to perform another series of operations.

What I claim is:

1. A button fastening machine having an arbor, a slidable former adapted to form a loop of a wire fastener by bending a wire over the arbor and then to dwell in clamp-
70 ing position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former having an elongated slot, a slidable carrier having an arm carry-
75 ing a pawl which normally engages with said elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, and a trip so located as to trip the pawl
80 when the former has moved far enough to form the loop.

2. A button fastening machine having an arbor, a slidable former adapted to form a loop of a wire fastener by bending a wire over the arbor and then to dwell in clamp-
90 ing position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having
95 an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier
100 and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein
105 without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in the slide engaging with the end of said slot to actuate the slide to form the legs.

3. A button fastening machine having an arbor, a slidable former adapted to form a loop of a wire fastener by bending a wire over said arbor and then to dwell in clamp-
110 ing position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having
115 an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip
120 the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving
125 to form the loop, the said arm after traveling the length of the slot in the slide en-

gaging with the end of the slot in the slide to actuate the slide to form the legs, means for actuating the carrier, and means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide.

4. A button fastening machine having an arbor, a slidable former adapted to form a loop of a wire fastener by bending a wire over the arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in the slide engaging with the end of said slot in the slide to actuate the slide to form the legs, means for actuating the carrier, means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide, means whereby the former is given a more rapid movement than the carrier after the pawl is tripped to free the former from the carrier and after the arbor is out of the path of the former until the former has gained enough distance for the pawl to reengage the slot in the former, and means for causing the pawl to reengage with the slot in the former and lock the former to the carrier so that the former and carrier will then move together.

5. A button fastening machine having means for threading a wire through a button, an arbor, a slidable former adapted to form a loop of a wire fastener by bending the wire over said arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in

the slide engaging with the end of the slot in the slide to actuate the slide to form the legs, means for actuating the carrier, means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide, means whereby the former is given a more rapid movement than the carrier after the pawl is tripped to free the former from the carrier and after the arbor is out of the path of the former until the former has gained enough distance for the pawl to reengage the slot in the former, means for causing the pawl to reengage with the slot in the former and lock the former to the carrier so that the former and carrier will then move together, an anvil, and means whereby the slide is moved to carry the fastener to the material on the anvil and to clamp the material to the anvil.

6. A button fastening machine having means for threading a wire through a button, an arbor, a slidable former adapted to form a loop of a wire fastener by bending the wire over said arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in the slide engaging with the end of the slot in the slide to actuate the slide to form the legs, means for actuating the carrier, means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide, means whereby the former is given a more rapid movement than the carrier after the pawl is tripped to free the former from the carrier and after the arbor is out of the path of the former until the former has gained enough distance for the pawl to reengage the slot in the former, means for causing the pawl to reengage with the slot in the former and lock the former to the carrier so that the former and carrier will then move together, an anvil, and means whereby the slide is moved to carry the fastener to the material on the anvil and clamp the material to the anvil, the carrier actuating the former to continue its movement and force the fastener through the material upon the anvil.

7. A button fastening machine having an arbor, a slidable former adapted to form a loop of a wire fastener by bending a wire over said arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each being formed with an elongated slot, the slidable carrier having projections which respectively engage the slots in said former and slide, the said slots being of sufficient length to permit a certain range of movement of said projections respectively without moving the former or slide, said carrier actuating the former when one of the projections is in engagement with the end of the slot in the former and actuating the slide when the other projection is in engagement with the end of the slot in the slide, said slots and projections being so located with relation to each other that the former will form the loop while the slide is at rest and the slide will form the legs while the former is at rest.

8. A button fastening machine having an arbor, means for threading a wire for a fastener through a button, a slidable former adapted to form a loop of a wire fastener by bending the wire over the arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each having an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in the slide engaging with the end of the slot in the slide to actuate the slide to form the legs, means for actuating the carrier, means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide, means whereby the former is given a more rapid movement than the carrier after the pawl is tripped to free the former from the carrier and after the arbor is out of the path of the former until the former has gained enough distance for the pawl to reengage the slot in the former, means for causing the pawl to reengage with the slot in the former and lock the former to the carrier so that the former and carrier will then move together, an anvil, a button race-way, a placer lever which engages the lowermost button

and holds it in position during the forming and attaching of the fastener to the button, and means actuated by the same mechanism which actuates the carrier to release the placer lever so timed as to release the placer lever after the fastener is formed and attached to the button.

9. A button fastening machine having an arbor, means for threading a wire for a fastener through the eye of a button, a slidable former adapted to form a loop of a wire fastener by bending the wire over the arbor and then to dwell in clamping position, a slide which moves independently of the former to form legs on the fastener while the fastener is clamped by the former, said former and slide each being formed with an elongated slot, a slidable carrier having an arm carrying a pawl which normally engages with the elongated slot in said former and locks the former to the carrier so that the former moves with the carrier and forms the loop, a trip so located as to trip the pawl when the former has moved far enough to form the loop, said carrier having an arm which engages with the elongated slot in the slide and moves therein without moving the slide while the former is moving to form the loop, the said arm after traveling the length of the slot in the slide engaging with the end of the slot in the slide to actuate the slide to form the legs of the fastener, means for actuating the carrier, means whereby the carrier actuating mechanism actuates the arbor to move the arbor out of the path of the former and slide, means whereby the former is given a more rapid movement than the carrier after the pawl is tripped to free the former from the carrier and after the arbor is out of the path of the former until the former has gained enough distance for the pawl to reengage the slot in the former, means for causing the pawl to reengage with the slot in the former and lock the former to the carrier so that the former and carrier will then move together, a button raceway, a placer which engages the lowermost button and holds it in position during the forming and attaching of the fastener to the button, means actuated by the same mechanism which actuates the carrier to release the placer so timed as to release the placer after the fastener is formed and attached to the button, a dog which holds in check the line of buttons behind the lowermost button during the formation of the fastener, and means actuated by the placer upon its release to release the next succeeding button behind the lowermost from its check and admit it to the placer when the button already beneath the placer is released.

10. A button fastening machine having an arbor, a slotted slidable former which bends a wire over the arbor to form a loop of a

fastener, a slotted slide independent of the former which bends the ends of the wire to form legs on the fastener, a reciprocable carrier having projections which respectively engage with the slots in the former and slide, said slots being elongated to allow a limited movement of said carrier with relation to the former or the slide, a lever fulcrumed intermediate its ends and having one arm connected with said carrier, driving mechanism connected with said lever, whereby the carrier is actuated, a lever connected with said arbor, and means actuated by said driving mechanism after the carrier has actuated the loop-forming and leg-forming mechanism to withdraw the arbor from the path of the former and slide.

11. A button fastening machine having an arbor, a slotted slidable former which bends a wire over the arbor to form a loop of a fastener, a slotted slide independent of the former which bends the ends of the wire to form legs on the fastener, a reciprocable carrier having projections which respectively engage with the slots in the former and slide, said slots being elongated to allow a limited movement of said carrier with relation to the former or the slide, a lever fulcrumed intermediate its ends and having one arm connected with said carrier, driving mechanism connected with said lever whereby the carrier is actuated, a lever connected with said arbor, means actuated by said driving mechanism after the carrier has actuated the loop-forming and leg-forming mechanism to withdraw the arbor from the path of the former and slide, and means controlled by the said driving mechanism to return the carrier, former, slide and arbor to their initial positions and to feed the wire through the eye of a button.

12. A button fastening machine having means for threading a wire through the eye of a button, an arbor over which the wire is bent to form a loop and legs on a fastener, a slidable former which bends the wire over the arbor to form the loop, cutting mechanism for cutting a length of wire for the fastener, a slide separate from the former which bends the ends of the wire to form the legs, a slidable carrier which actuates the said loop-former and leg-forming slide, means to actuate the carrier, and means actuated by the said mechanism that actuates the carrier to withdraw the arbor from the fastener out of the path of the former and slide so arranged that the arbor will be withdrawn after the loop and legs are formed.

13. A button fastening machine having an arbor, a reciprocable former which is adapted to bend a wire over the arbor to form a loop of a fastener, an independently movable slide which is adapted to bend the projecting ends of the wire to form legs on the fastener, a reciprocable carrier which is

adapted to actuate said former and slide, said carrier having two arms, said former being formed with an elongated slot with which one of the arms of the carrier engages, a pawl pivoted to said arm which is adapted to engage with said slot in the former whereby when so engaged the movement of the carrier will actuate the former, and a trip device which disengages the pawl after a partial movement of the carrier during which movement the former forms the loop of the fastener, said slide being formed with an elongated slot with which the other arm of said carrier engages, said slot in the slide being of sufficient length whereby during that portion of the movement of the carrier which actuates the former to form the loop the said second arm of the carrier will travel in the slot of the slide without actuating the same and being so arranged that after said pawl is tripped said carrier will actuate the said slide to form the legs of the fastener.

14. A button fastening machine having an arbor, a reciprocable former which is adapted to bend a wire over the arbor to form a loop of a fastener, an independently movable slide which is adapted to bend the projecting ends of the wire to form legs on the fastener, a reciprocable carrier which is adapted to actuate said former and slide, said carrier being formed with two projecting arms, said former being formed with an elongated slot with which one of the arms of the carrier engages, a pawl pivoted to said arm which is adapted to engage with said slot in the former whereby when so engaged the movement of the carrier will actuate the former, a trip device which disengages the pawl after a partial movement of the carrier during which movement the former forms the loop of the fastener, said slide being formed with an elongated slot with which the other arm of said carrier engages, said slot in the slide being of sufficient length whereby during that portion of the movement of the carrier which actuates the former to form the loop the said second arm of the carrier will travel in the slot of the slide without actuating the same and being so arranged that after said pawl is tripped said carrier will actuate the said slide to form the legs of the fastener, a reciprocable driving rod, a bell crank lever having one arm which is loosely connected with said driving rod and another arm which is loosely connected with said carrier whereby the movement of said driving rod on one direction will give to said carrier a straight line movement in one direction to actuate the former and slide, a bell crank having one arm loosely connected with said arbor, and a projection on the said carrier actuating bell crank which engages the arbor-actuating bell crank to withdraw the arbor from the fastener after the carrier actuating

bell crank has moved a sufficient distance to form the loop and legs of the fastener.

15. A button fastening machine having an arbor, a reciprocable former which is adapted to bend a wire over the arbor to form a loop of a fastener, an independently movable slide which is adapted to bend the projecting ends of the wire to form legs on the fastener, a reciprocable carrier which is adapted to actuate said former and slide, said carrier having two arms, said former being formed with an elongated slot with which one of the arms of the carrier engages, a pawl pivoted to said arm which is adapted to engage with said slot in the former whereby when so engaged the movement of the carrier will actuate the former, a trip device which disengages the pawl after a partial movement of the carrier during which movement the former forms the loop of the fastener, said slide being formed with an elongated slot with which the other arm of said carrier engages, said slot in the slide being of sufficient length whereby during that portion of the movement of the carrier which actuates the former to form the loop the said second arm of the carrier will travel in the slot of the slide without actuating the same and being so arranged that after said pawl is tripped said carrier will actuate the said slide to form the legs of the fastener, means for withdrawing the arbor after the loop and legs are formed, a spring which actuates the former to continue its movement with relation to the carrier after the arbor is withdrawn from the fastener, and means for causing said pawl to reengage the slot in the former after the former has moved a certain distance with relation to the carrier.

16. A button fastening machine having an arbor over which a fastener is formed, means for feeding a continuous wire from which a fastener is to be formed over the arbor, a reciprocable former which bends the wire over the arbor to form a loop, a reciprocable slide independent of the former which forms legs on the fastener, a cutter which severs a blank for the fastener from the continuous wire, a reciprocable carrier which in its movement in one direction actuates the former to form the loop of the fastener, actuates the slide to form the legs of the fastener, and actuates the cutter to sever the blank, means whereby the return movement of the carrier actuates the wire feed, means for reciprocating the carrier, a button raceway, and means for feeding buttons to the raceway actuated by the same mechanism that actuates the carrier.

17. A button fastening machine having an arbor over which the fastener is formed, means for feeding a continuous wire from which a fastener is to be formed over the arbor and through the eye of a button, a

reciprocable former which bends the wire over the arbor to form a loop, a reciprocable slide independent of the former which forms legs on the fastener, a cutter which severs a blank for the fastener from the continuous wire, a reciprocable carrier which in its movement in one direction actuates the former to form the loop of the fastener, actuates the slide to form the legs of the fastener, and actuates the cutter to sever the blank, means whereby the return movement of the carrier actuates the wire feed, means for reciprocating the carrier, a button raceway, a pivoted placer lever which engages the button while the fastener is being threaded and formed, a pivoted detent which holds back the line of buttons behind the lowermost button, and means actuated by the carrier to release the placer lever from the button with attached fastener and thereby to also trip the detent from the next following button.

18. A button fastening machine having an arbor, a reciprocable former which is adapted to bend a wire over the arbor to form a loop of a fastener, a movable slide which is adapted to bend the ends of the wire to form legs on the fastener, a reciprocable carrier which is adapted to actuate said former and slide, connections between said carrier and said former and slide whereby said carrier has a limited range of movement without moving the former and a limited range of movement without moving the slide, and means for reciprocating the carrier.

19. A button fastening machine having an arbor, a reciprocable former which is adapted to bend a wire over the arbor to form a loop of a fastener, a movable slide which is adapted to bend the ends of the wire to form legs on the fastener, a reciprocable carrier which is adapted to actuate said former and slide, connections between said carrier and said former and slide whereby said carrier has a limited range of movement without moving the former and a limited range of movement without moving the slide, and means for reciprocating the carrier, said connections being so constructed and arranged that during a portion of the movement of the carrier the slide will move while the former is at rest.

20. A button fastening machine having an arbor, a slotted slidable former which bends a wire to form a loop of a fastener, a slotted slide independent of the former which bends the wire to form legs on the fastener, and a reciprocable carrier which engages with the slots in the former and slide, said slots being elongated to allow a limited movement of said carrier with relation to the former and an independent limited movement with relation to the slide.

21. A button fastening machine having an arbor, a button raceway, a placer lever which

engages the lowermost button and holds it in position during the forming and attaching of the fastener to the button, means for threading a wire through the eye of the button, a movable mechanism adapted to bend the wire over the arbor to form the fastener, a movable carrier adapted to move the fastener forming mechanism, mechanism for actuating the said carrier, and means actuated by the same mechanism which actuates the carrier for releasing the placer lever so timed as to release the placer lever after the fastener is formed and attached to the button.

22. A button fastening machine having an arbor, a button raceway, a placer lever which engages the lowermost button and holds it in position during the forming and attaching of the fastener to the button, means for threading a wire through the eye of the button, a movable mechanism adapted to bend the wire over the arbor to form the fastener,

a movable carrier adapted to move the fastener forming mechanism, mechanism for actuating the said carrier, means actuated by the same mechanism which actuates the carrier for releasing the placer lever so timed as to release the placer lever after the fastener is formed and attached to the button, a dog which holds in check the line of buttons behind the lowermost button during the formation of the fastener, and means actuated by the placer upon its release to release the next succeeding button behind the lowermost from its check for admitting it to the placer when the button already beneath the placer is released.

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

GEORGE W. PERKINS.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."