

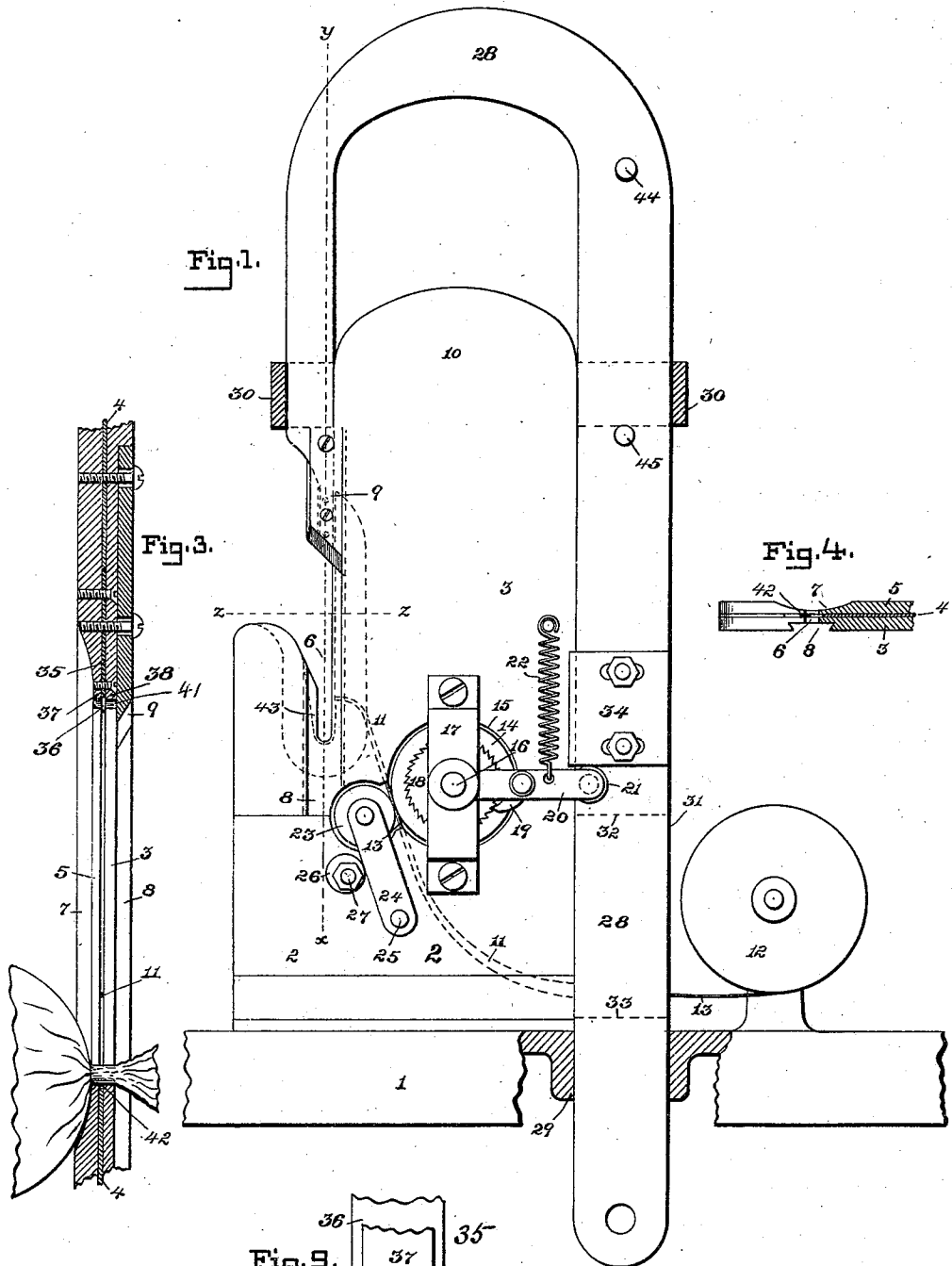
(No Model.)

2 Sheets—Sheet 1.

M. G. GILL.
BAG FASTENING MACHINE.

No. 557,378.

Patented Mar. 31, 1896.



Witnesses:

A. O. Babendreier.

H. Mac Carthy.

Inventor.

Martin Gill - Gill
by Price Stewart
his Attorneys.

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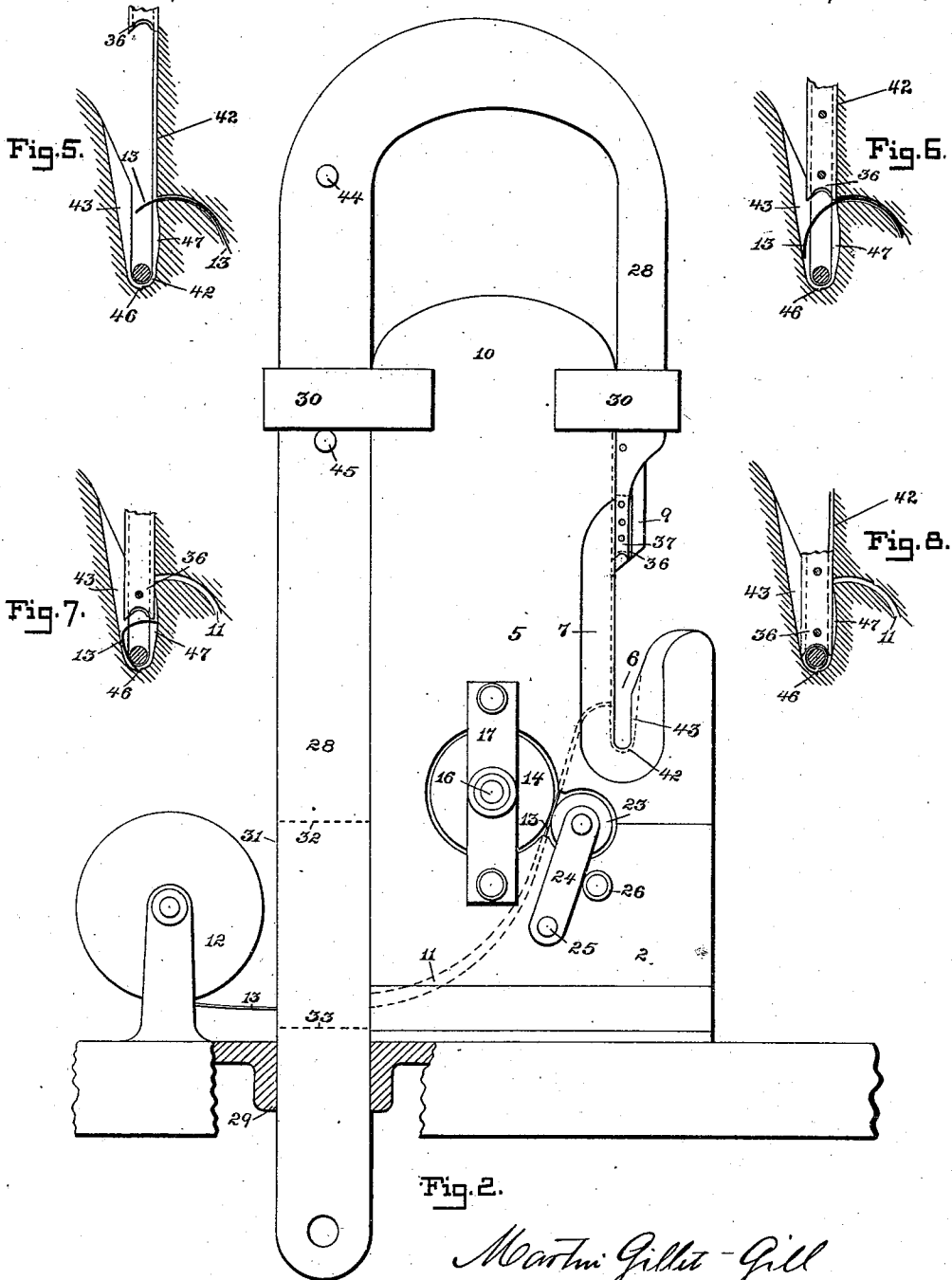


Fig. 2.

Martin Gill - Gill

Inventor.

by Price Stewart

his Attorney.

Witnesses:

A. O. Balendrier.

H. Mac Carthy.

UNITED STATES PATENT OFFICE.

MARTIN G. GILL, OF BALTIMORE, MARYLAND.

BAG-FASTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 557,378, dated March 31, 1896.

Application filed March 22, 1894. Serial No. 504,608. (No model.)

To all whom it may concern:

Be it known that I, MARTIN G. GILL, a citizen of the United States, and a resident of the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Fastening-Machines, of which the following is a specification.

My invention relates to a machine for tying securely the necks of paper bags. The machine may be used for tying bags of other materials or for tying any other article than a paper bag which requires to be securely tied in the manner in which the neck of a bag is tied.

I employ my invention for the purpose of tying the necks of bags in which tea is packed. The bags are filled with tea and the open end drawn together and twisted. It is then placed in the machine and tied by clamping a wire staple around the neck of the bag and the projecting end of the bag cut off, so as to make a secure and permanent fastening and a compact finish to the end of the bag. The machine with which I accomplish this result is shown in the figures of the accompanying drawings and will be hereinafter described.

In the drawings, Figure 1 represents a side elevation of the machine from the side on which the knife for cutting off the projecting end of the bag-neck is located. Fig. 2 represents a side elevation of the same machine from the opposite side. Fig. 3 is a vertical section through the line xy of Fig. 1, showing the bag in position to be tied. Fig. 4 is a horizontal section through the line zz , Fig. 1, showing a top view of the seat for the neck of the bag and a section of the structure of the body portion of the machine. Fig. 5 represents the machine as it begins to feed the wire into place for tying with the front plate of cutter and machine removed. Fig. 6 represents the position of the parts when the requisite length of wire has been fed into the tying-slot and the knife is about to cut it off. (Same section as Fig. 5.) Fig. 7 represents the parts in the position after the wire has been cut off and as it is being bent into a staple for tying. (Same section as Fig. 5.) Fig. 8 shows the parts in the clenching position, where the staple surrounds the neck of the bag and is being clenched on its seat. (Same section as Fig. 5.) Fig. 9 is an en-

larged side elevation of the wire cutter and clencher.

Referring to Fig. 1, 1 is the bed of the machine, on which there is mounted a vertical plate 2, which is shown in section in Fig. 4. It consists of two plates of iron with an intermediate plate of steel.

3 is one of the plates of iron upon which we are looking in Fig. 1.

4 is the intervening steel plate, and 5 is the rear plate. (Shown in full view in Fig. 2.) These plates are cut so as to form the receiving-slot 6 for the neck of the bag on the front of the machine and are recessed, as shown in Fig. 4, plate 5 having concave recess 7, so as to fit the convex surface of the neck of the bag, as shown in Fig. 3, and plate 3 having a dovetailed countersink 8 cut into it to form a guide for the bag-cutting knife 9. The upper portion of the plate 2 (marked 10) forms the guide for the reciprocating cutters.

11 is a channel-way and guide for the binding-wire.

12 is a reel upon which the wire is wound. 13 is the wire entering the channel-way 11 and passing through the feeding mechanism and into the tying-throat 6 through the end of the channel-way 11. The feeding mechanism for the wire is located in holes in the plate 2. The main feed-wheel 14 is mounted in a hole 15 in the plate 2 upon a shaft 16, which is secured in bracket-bearings 17 17. On the same shaft 16 is a ratchet-wheel 18, with which a pawl 19 engages. Said pawl is mounted on a pawl-lever 20, one end of which is pivoted upon the shaft 16. The other end is provided with a roller 21. The pawl-lever is maintained at the point of highest elevation by the spring 22.

23 is the pressure-roll by which the wire is kept against the feed-wheel 14. This pressure-roll is mounted in the ends of the swinging arms 24 24, which are pivoted to the plate 2 at 25.

26 26 are eccentric disks mounted upon bolt 27 and adapted for fixing the pressure with which the pressure-roll 23 will bear upon the feed-wheel 14, thus causing the wire to feed positively.

28 is the reciprocating carrier for the cutters and clencher. It is mounted in a slide 29 in the bed 1 and guide 30 secured to the

upper end 10 of the plate 2, through which it reciprocates. Power is applied to the lower end of this reciprocating cutter by means of a treadle or other similar device, and it is maintained in its position of highest elevation by a spring mechanism. (Not shown in the drawings, but which is applied to the treadle or the connecting-rod.) This reciprocating carrier is constructed in the same way as the plate 2. (Shown in section in Fig. 4.) The carrier is shown in section in Fig. 3. It consists of two plates of iron or other metal on either side of an intermediate plate, preferably of steel. This structure is not essential to the machine, but is a preferred form of manufacture. The steel plate might be omitted from the body of the carrier and only inserted at its extremity, where it is needed for the cutters and clencher.

31 is a slot formed through the reciprocating carrier between the dotted lines 32 33. Through this slot the wire passes, and it is provided for the purpose of allowing the wire to feed through the center of the carrier 28 and the plate 2 without being disturbed by the reciprocation of the carrier 28.

34 is a plate bolted on the side of the reciprocating cutter, against the under side of which the roller of the pawl-lever 21 bears. With the reciprocation of the cutter-frame 28 it will be seen that the pawl-lever 20 will be reciprocated and the wire-feed caused to push forward a desired length of wire. As the pawl-lever 20 descends, pressed down by the plate 34, the roller 21 will be withdrawn from beneath the plate and will bear against the side of the plate as it continues to descend, thus stopping the wire-feed. This arrangement permits the cutter-carrier to cause the wire-feed to supply a requisite length of wire and then continue its stroke without feeding. On the extremity of the reciprocating carrier 28 are two cutters—the wire cutter and clencher and the knife for cutting off the end of the bag.

The wire cutter and clencher is shown in Figs. 2, 5, 6, 7, 8, and 9, and in section in Fig. 3. The cutter and clencher is marked 35, and an enlarged view is shown in Fig. 9. It consists of three parts—an intermediate steel which forms a cutter and clencher 36 and two exterior plates 37 and 38, of metal. The steel plate 36 projects beyond the exterior plates 37 and 38 and enters guides (viewing Fig. 5) on both sides of the clenching-throat 6, the plates 37 and 38 entering and fitting the throat 6. The guide in the edge of the plate 10 extends up to its top, and in this guide one side of the clencher always travels.

39 is a recess in the end of the plate 36, and 40 and 41 are recesses in the ends of the plates 37 and 38, respectively. The extremities of the plate 36 project slightly below the extremities of the plates 37 and 38. One of these extremities, 36^a, is square on the end and forms the wire-cutter, as shown in Fig. 9. The recesses 40 and 41 in the ends of the plates 37 and 38 are not concentric with the

recess 39 in the end of plate 36, but of longer radius, so that when the plates are secured together in the position shown in Fig. 9 a semicircular channel or recess will be formed in the end of the cutter and clencher, which will be deepest in its center and disappears at its ends. In this channel the staple will rest and be given form. The bottom of the throat 6 in the plate 2 is formed in the same manner as the end of the cutter and clencher 35—that is to say, the steel plate which is intermediate between the two iron ones, as shown in Fig. 4, is cut away into a larger curve than the curve in the adjacent iron plates. It therefore forms a semicircular groove between the two iron plates at the bottom of the throat 6. In this groove, (marked 42,) Fig. 5, on the side next the plate 10, fits and travels the projecting edge of the plate 36. At a point below where the channel 11 enters the throat 6 the intermediate plate 4 is cut away a little, so as to deepen the guide-groove at that point and give it a concave surface, (marked 47.) This is designed for the purpose of giving the staple, after having been cut off, more freedom in its downward course. On the left-hand side of the throat 6 (viewing Fig. 5) the plate 4 is cut away still more, so as to make a deeper recess on that side, which is marked 43. The recess 43 is designed as a guide for the reciprocating knife and clencher, and also for the purpose of allowing a proper length of wire to feed from the channel 11 into recess 43 unobstructed in its course and not be bent out of the shape in which it comes from that channel. It is important that the curve given to it by the channel should be preserved in order that it may bend in the proper way when struck by the clencher.

9 is the knife designed for cutting off the end of the bag. It is bolted to the end of the reciprocating-cutter carrier and travels in the guide-groove 9, which is dovetailed and countersunk into the plate 3, the countersunk groove 8 being on the other side of the throat 6; but one side of which, as is seen by Fig. 1, is extended above the throat as high as the upper position of the knife. The recess 7, which is concave in form, as is shown in Fig. 3, serves to permit the neck of the bag to be tied as close to the body of the bag as is desirable.

The operation of the device is as follows: The reel 12 is charged with wire which is passed through the slot 31 in the reciprocating-cutter carrier, thence through the channel 11, through the feed-rolls 14 and 23, and up to the extremity of the channel 11. A bag is then placed in the throat 6, the neck having been twisted, as shown in Fig. 3, and power is applied by means of the treadle or otherwise to the lower end of the reciprocating carrier 28. The downward motion of this carrier will carry with it the pawl-lever 20, pressed down by the plate 34, bearing upon the roll 21, will turn the ratchet-wheel 18, and

feed forward the wire 13 to an extent measured by the motion of the lever 20, caused by the plate 34. 44 and 45 are pins passed through carrier 28 and which limit its motion by coming in contact with the upper and lower sides of the guide 30. As the carrier 28 descends, the wire will begin to feed through the channel 11, as shown in Fig. 5, and as the cutter continues the wire will continue to feed until the projecting portion occupies the position shown in Fig. 6, when the edge of the intermediate cutter-plate 36 will come in contact with the wire at the mouth of the channel 11. The wire, as will be seen by Fig. 6, is in a curved shape, which permits it to pass across the throat 6 and enter the recess 43 without being bent. The wire-feed will, as above described, stop at this point, and the cutter will continue its motion without feeding the wire. As the cutter continues to descend it will cut the wire off at the mouth of the throat 11 and force downward both of the ends of the piece severed until the left-hand end of the staple strikes the bottom of the throat 6, at which point there is a small notch 46, which will form a stop for its further motion. The other end will then be bent down, as shown in Fig. 7, its extremity traveling in the recess 47 until it reaches the bottom thereof, when it will be almost in the position shown in Fig. 8, and the remaining operation of the stroke of the clencher will force it into the circular form shown in Fig. 8. The staple will then lie in the groove in the bottom of the throat 6 and in the bottom of the clencher 35 and will be held in its position by the projecting edges of the plates 3 and 5 and the plates 37 and 38. The knife 9 meanwhile being rigidly secured to the cutter and clencher 35 and traveling ahead of it will sever the end of the bag before the staple is clenched around the neck of the bag, so that when the clenching is finally done the neck of the bag is free of the projecting portion.

I do not desire to confine myself to the peculiar form of construction shown in this apparatus, as it may be varied in many ways to accomplish the same result, the spirit of my invention being the forming of a staple from wire and clenching it around the neck of a bag to form a permanent fastening with a single operation.

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

1. In a fastening-machine the combination of a throat provided with suitable guide-grooves for the fastening material, mechanism

for feeding a fastening material thereto, and a reciprocating cutter and clencher for the fastening material adapted to enter the throat and cooperate with the guides thereof to sever a section of the fastening material, form it into suitable shape and clench it into the throat, substantially as described.

2. In a fastening device the combination of a throat and a reciprocating cutter and clencher adapted to enter the grooves of the throat, and a feeding mechanism operated by the same mechanism which reciprocates the forming device to feed a requisite length of fastening material to the throat as the forming device descends, the cutter severing the fastening material when a requisite length has been fed to the throat, substantially as described.

3. In a fastening-machine the combination of a throat having a seat for the thing to be fastened and grooves for forming the fastening material at either side thereof, mechanism for feeding a fastening material to the throat, and a reciprocating cutter and forming device cooperating with the throat and the grooves thereof to sever a requisite length of fastening material and form it around the object to be tied.

4. In a fastening-machine the combination of a throat adapted to receive the object to be fastened and provided with grooves in the throat suitable for forming a staple, a feeding mechanism for feeding a continuous strip of fastening material to the throat, a reciprocating cutter for severing the fastening material when a requisite length has been fed to the throat, and a clencher provided with suitable grooves and guides adapted to cooperate with the grooves of the throat to form the section of fastening material into a staple and clench it around the object to be tied.

5. In a staple-tying device the combination of a throat provided with a central groove adapted to receive a section of wire and having a seat for the thing to be tied, a reciprocating clencher cooperating with the central groove of the seat to force a section of wire thereinto and clench it around the thing to be tied, and a cutter reciprocating beyond the seat and adapted to sever the projecting end of the thing being tied.

Signed at Baltimore, in the State of Maryland, this 15th day of March, A. D. 1894.

MARTIN G. GILL.

Witnesses:

JOHN L. HEBB,
P. H. ROCHE.