

UNITED STATES PATENT OFFICE.

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STRING-FASTENER FOR PACKAGES.

1,027,656.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ELMER H. JOHNSON, citizen of the United States, residing at North Bennington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in String-Fasteners for Packages, of which the following is a specification.

My invention relates to mechanism for fastening string on packages, and the object is to provide a simple, effective and easily operated device whereby a small metallic clip may be clamped upon the overlapping ends of a cord or string to tie or bind the ends together and thus do away with the necessity of knotting the ends.

The invention comprehends to this end opposed jaw members one movable toward the other, means for feeding a wire or small metallic strip to the jaw members, means for crimping or folding the end of the wire or strip to form a V-shaped clip, and means for operating the jaws to clamp the clip upon a string and to cut the clip away from the body of the wire.

One form of my invention is shown in the accompanying drawings wherein:

Figure 1 is a side elevation of my package fastener with the jaws open. Fig. 2 is a like view but showing the jaws closed and the clip compressed. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a perspective detail view of the lever for folding the clip.

Referring to these figures 2 designates a standard having mounted upon it or formed integrally with it the outwardly projecting bracket 3. This bracket 3 is formed with a longitudinally extending slot or bore 4 which extends nearly the whole length of the bracket and opens at the outer end of the bracket. This bore is formed at opposite sides of its upper and lower portions with the longitudinally extending lateral enlargements or grooves 5 forming upper and lower oppositely disposed guides, for a purpose to be later described.

The forward end of the bracket is provided with the upwardly extending head 6 having a passage 7 near its upper end for the accommodation of the shank 8 of a movable jaw 9, the jaw extending downward from the shank and facing the outer face of the head 6. The shank 8 of the jaw 9 slides in the bearing formed in the head, and at its extremity is formed with a circular yoke

10. A contractile spring 11 surrounds the shank of the jaw and acts to force the jaw outward as shown in Fig. 1, which is its normal position when out of actual operation.

Mounted in suitable bearings extending upward from the upper face of the bracket 3 is a rotatable member which engages the yoke when operated to move the jaw inward against the force of the spring 11, and thereby crimp the binding or tying wire or strip. Preferably, this rotatable member has the form of an arm 12 which is mounted on a shaft 13 having the projecting arm 14 connected to a treadle 15 by means of a connecting rod 16. It will be seen that a depression of the treadle 15 will cause the jaw to be retracted and thus drawn against the outer face of the head 6 to compress the clip against the string, and that upon a release of the treadle 15 the spring 11 will cause the jaw to move outward and away from the head 6.

The strip from which the clips are formed is carried upon a reel 17 rotatably mounted in upwardly extending arms 18 preferably formed integrally with the bracket 3 and at the rear end of the bracket. The wire or strip of metal designated 19 is fed downward and passes beneath the rotatable sleeve or guiding pulley 20 mounted upon a transverse bolt 21. From thence the wire or strip passes into the bore 4 and extends longitudinally through the same to the front of the machine, that is, to a point immediately beneath the inner edge of the jaw 9.

For the purpose of feeding the wire intermittently forward a predetermined distance I provide the upper and lower feeding dogs 22 and 23 respectively. Each dog is toothed on its edge face opposite to the toothed edge face of the other dog as at 24, and each dog is formed with the laterally projecting guide flanges or shoulders 25. These are less in thickness than the depth of the grooves or slots 5. The guide flanges 25 are accommodated in these grooves and as the grooves are deeper than the guide flanges, the dogs have a play toward and from each other to grip or release the wire, strip or other metallic element to draw it from the reel.

In order to intermittently move the feeding dogs toward each other and to draw said dogs forward to feed the wire or strip I provide each dog with the links 26 which

are pivotally connected by a link 27 to one arm 28 of a bell crank lever which is mounted upon the upper face of the bracket 3. The forwardly projecting end 29 of the bell crank lever is engaged by a pin 30 which extends outward from the connecting rod 16 so that as the connecting rod is depressed by a depression of the treadle 15 the pin 30 will cause the rotation of the bell crank lever, the arm 28 of which will move rearward, thus moving rearward the links 26 and expanding the dogs so that they will slip from the wire or strip in their rearward movement. Upon a release of the treadle 15, however, the spring 11 will cause the jaw to open, thus raising the arm 29 of the bell crank lever drawing upon the links 27 and 26, causing the dogs 22 and 23 to bind upon the wire or strip and bite into the same, and of course causing the wire or strip to be fed forward with the forward movement of the dogs. It will thus be seen that upon each reciprocation of the treadle 15 the wire or strip will be fed forward a certain distance. This forward feed of the wire will occur as the jaw 9 opens or moves away from the face of the head 6.

In order to form my cord-fastening clip it is necessary that the projecting end of the wire or strip 19 shall be folded or crimped into a V-shape prior to its being cut off from the body of the wire. For this purpose I provide the crimping member 31 having the form of a lever pivoted intermediate its ends, one end of this lever being adapted to be engaged by the slide and to be depressed thereby, the other end of the lever having an angularly bent wire-engaging end, which as the rear end of the lever is engaged by the slide is moved upward and crimps or folds the projecting end of the wire between the head 6 and the inner face of the jaw 9, as shown in Fig. 1. After this crimping movement has taken place means are provided whereby the lever may drop to its normal position and out of the way so that the string of a bundle may be inserted within the folds of the V-shaped clip prior to the clip being clamped or closed.

In detail the clip-bending element consists of a lever which is angularly bent as shown in Fig. 4, the lever being pivoted at the junction of the two angular portions of the lever as at 32. The short end of the lever which extends toward the jaw 9 is formed with the inwardly extending terminal end 33 which is of such length that it will extend into the space between the outer face of the head 6 and the inner face of the jaw 9, as shown in Fig. 1. The rear portion of the lever extends downward and rearward and is wider than the forward portion of the lever. The rear end of the lever is preferably beveled and the inside

edge is formed with the transversely extending slot or notch 34. Mounted on the slide 22 rearward of the forward end of the slide is the laterally projecting pin 35 which may project out through a slot formed in the bracket 3, which pin is adapted to engage the broad rear end of the lever 31 to depress this rear end. It is essential that after the pin has depressed the rear end of the lever to a certain extent that the pin shall be released from the lever, and it is for this purpose that I have provided the slot 34. When the pin reaches the slot 34 the spring 36 will act to draw down the forward end of the lever and throw up the rear end, thus releasing the lever from its engagement with the pin and permitting the spring 36 to return to its normal position wherein the terminal end 33 is disposed at the mouth of the bore 4.

Means must be provided for cutting off the clip after it is formed, and for this purpose I form the lower end of the jaw 9 with the inwardly projecting cutting edge 37 which co-acts with a slight transverse groove or recess 38 formed in the lower end of the face of the head 6. Thus when the jaw is retracted under the impulse of the treadle 15 the cutting edge 37 will cut off the proper length of wire or strip 19.

The operation of my invention will be obvious from what has gone before.

Assuming that a clip has already been formed upon the extremity of the wire 19 with the parts in the position shown in Fig. 1, it will be plain that a depression of the treadle 15 will cause a retraction of the jaw 9. The bundle is wrapped with string and the overlapping or crossed ends of string are brought up between the jaw and the face of the head. The treadle is then depressed, the jaw 9 moved inward, compressing the clip upon the two ends of string and firmly binding them together, at the same time cutting the clip off the strip 19. As soon as pressure on the treadle 15 is released the spring 11 will cause the jaw to open and at the same time that the jaw opens a new length of wire will be fed forward and will be engaged by the bent terminal end 33 of the lever 31 and bent into a V-form, as previously described.

The lever 31 is actuated as follows: As the feeding dogs move forward from the position shown in Fig. 2, the pin 35 engages the rear end of the lever and rides over the same, thus depressing this rear end of the lever. There will be a very quick depression of the end of the lever causing a quick bending of the wire clip until the pin 35 reaches the slot 34, whereupon the spring 36 returns the lever to its normal position as shown in Fig. 1. Upon an inward movement of the jaw 9 the pin 35 will move beneath the arm 31 of the lever raising it to

the position shown in Fig. 2 so that the terminal end 33 moves into the recess 39. After the pin has passed in the rearward movement of the dogs the lever returns to its original position. It will be seen that the dogs have a sufficient movement before the pin 35 engages the end of the lever to feed forward a definite length of wire, and that then, after this length of wire has been fed forward, the bending or folding lever acts as above described.

It will be seen that my invention does away with the necessity of tying the overlapping ends of the cord used in wrapping bundles or packages, and that this clamping action takes place with practically one motion of the parts.

The invention is simple, easily operated, and while I have shown it as being operated by a treadle, it is obvious that it might be easily formed to operate by hand if desired.

While I have shown what I believe to be the best form of my invention I do not wish to be limited to this as it is obvious that many changes might be made without departing from the spirit thereof.

What I claim is:

1. A twine fastener for bundles including jaws, one movable toward the other, manually actuated means for reciprocating said jaws, a device for intermittently feeding a metallic strip toward the jaws, means actuated by the feeding device for folding the strip between the jaws, and means for cutting off the folded end of the strip.

2. A twine fastener for bundles including jaws, one movable toward the other, a device for intermittently feeding a length of metallic strip toward the jaws, means actuated by the feeding means for crimping the strip between the jaws, manually operated means for reciprocating the movable jaw toward the fixed jaw to clamp the clip upon a twine, and means for cutting the clip from the metallic strip.

3. A twine fastener for bundles including a fixed head, a jaw movable toward and from said head, manually operated means for moving the jaw toward the head, means for moving the jaw away from the head when released by the manually operated means, a longitudinally movable strip-gripping device, means actuated upon an outward movement of the jaw for moving the gripping device toward the jaw and causing it to grip a metallic strip and feed it forward, and means also actuated upon an opening movement of the gripping device for folding the projecting end of the strip between the head and the inner face of the jaw.

4. A twine fastener for bundles including a fixed head, a reciprocating jaw movable toward and from said head, manually actuated means for moving the jaw toward the

head, means for opening the jaw when released by the manually actuated means, a longitudinally movable strip-gripping device, means operatively connected to the movable jaw for causing a forward movement of the gripping device and causing it to grip a metallic strip and feed it forward upon an opening movement of the jaw, and means actuated upon the forward movement of the gripping device for folding the projecting end of the strip between the head and the inner face of the jaw.

5. A twine fastener for bundles including a fixed head, a jaw movable toward and from said head, manually operated means for moving the jaw toward the head, means for opening the jaw, a horizontally movable strip-gripping device comprising opposed dogs, means for moving the dogs toward each other to grip a metallic strip and toward the jaw upon an opening movement of the jaw, and a strip-bending lever having a terminal end adapted to fold the projecting end of the strip and actuated by the forward movement of the strip-gripping device.

6. A twine fastener for bundles including a fixed head, a jaw movable toward and from said head, a spring acting to hold the jaw in its open position, manually operated means for moving the jaw toward the head, a reel adapted to support a metallic strip, longitudinally movable strip-gripping devices comprising opposed dogs between which said strip passes, means for causing the dogs to engage with the strip and move forward upon an opening movement of the jaw, a lever having a laterally bent terminal end movable into a position between the jaw and head, and means carried by the strip-gripping device for operating said lever upon a forward movement of the gripping device.

7. A twine fastener for bundles including a fixed head, a jaw movable toward and from said head, a spring acting to hold the jaw open, manually operated means for moving the jaw toward the head, a reel adapted to carry a metallic strip, longitudinally movable opposed dogs having toothed adjacent faces between which the strip passes, means for moving said dogs rearward as the movable jaw moves toward the head, and for moving the dogs forward and in gripping engagement with the strip as the jaw moves outward, and means actuated by the dogs during the last portion of their forward movement for bending the projecting end of the strip between the fixed jaw and the movable jaw.

8. A twine fastener for bundles including a fixed head, a jaw movable toward and from said head, manually actuated means for moving the jaw toward the head, a spring resisting the movement of the jaw, a

reel adjusted to carry a metallic strip, opposed longitudinally movable parallel dogs having their adjacent faces toothed, said strip passing between said dogs and being engaged thereby, guides in which said dogs move, means operated by the jaw-moving means for operating said dogs to feed the strip, and means operated by the dogs during the last portion of their feeding movement for bending the strip between the movable jaw and the fixed head.

9. A twine fastener for bundles including jaws, one movable toward the other, a reel for carrying a metallic strip, means for feeding a length of the metallic strip into position beneath said jaws when the jaws are open, a lever having an angular terminal end disposed beneath the jaws, means for moving said terminal end upward to fold the end of the strip; and manually operated means for closing said jaws.

10. A twine fastener for bundles including opposed jaws, one movable toward the other, a reel for carrying a metallic strip, means for intermittently feeding the metallic strip carried on the reel toward the jaws, a lever having an angular end disposed beneath the jaws, and means actuated by the intermittent feeding means for depressing the inner end of the lever and elevating the angular forward end into the space between the jaws and thereby fold the projected end of said strip.

11. A twine fastener for bundles including a base, a bracket mounted on the base and having a longitudinally extending bore, oppositely disposed upper and lower dogs mounted in the bore and having their adjacent faces toothed, a head formed at the extremity of the bracket, a movable jaw mounted in the head and having a yoke at its rear end, a spring acting to hold the jaw open, an eccentric engaging with the yoke, a treadle for operating the eccentric, and means operatively connected to the treadle for moving the dogs rearward simultaneously with the closing movement of the jaws and moving said dog forward toward the jaws as the jaws are opened.

12. A twine fastener for bundles including a base, a bracket extending out from the base and having a longitudinal bore open at the end, an upwardly extending head formed on the end of the bracket, a jaw having a shank passing through said head and having sliding engagement therewith, the extremity of the shank being formed with a yoke, a spring acting to hold said jaw open, an eccentric mounted on the bracket engaging with the yoke, a treadle, a connecting rod between the treadle and eccentric, opposed strip engaging dogs mounted in guides in the central bore of the bracket and provided with teeth on their adjacent faces, a strip containing reel, converging links pivoted to the dogs, a bell crank lever mounted upon the bracket, one arm of which is connected to said links and the other arm to the treadle-connecting rod, an angular lever pivoted to the forward end of the bracket, the forward extremity of the lever being angularly bent to one side and adapted to extend up between the jaw and the head when the lever is moved, the rear portion of the lever being formed with a transverse notch, a pin mounted on one of said dogs adapted to engage with the lever upon a forward movement of the dogs, to depress the lever and being adapted to pass through the notch in the lever at the proper point in its advance, and a spring for lowering the forward end of the lever.

13. A twine fastener for bundles including opposed clip compressing jaws, one movable toward the other, manually actuated means for reciprocating said jaws, automatically actuated means for feeding a length of material into place against the ends of the jaws as the jaws open, and clip bending means reciprocating into and out of position between the jaws for initially bending the length of material between the jaws.

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

ELMER H. JOHNSON. [L. s.]

Witnesses:

W. M. MARSHALL,
L. F. MOORE.