

B. GASTALDI.
SELF FEEDING STAPLING PLIERS.

APPLICATION FILED JUNE 24, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

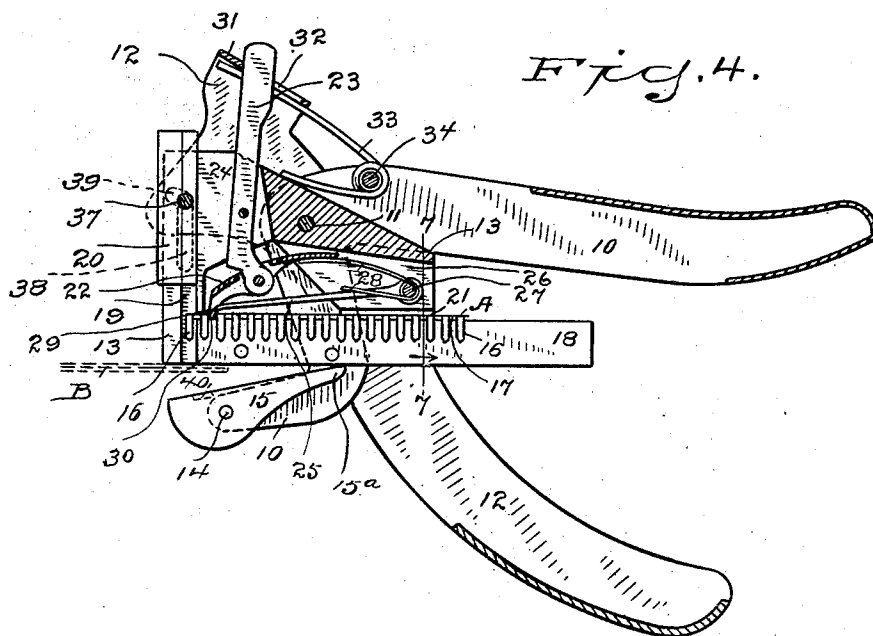


Fig. 4.

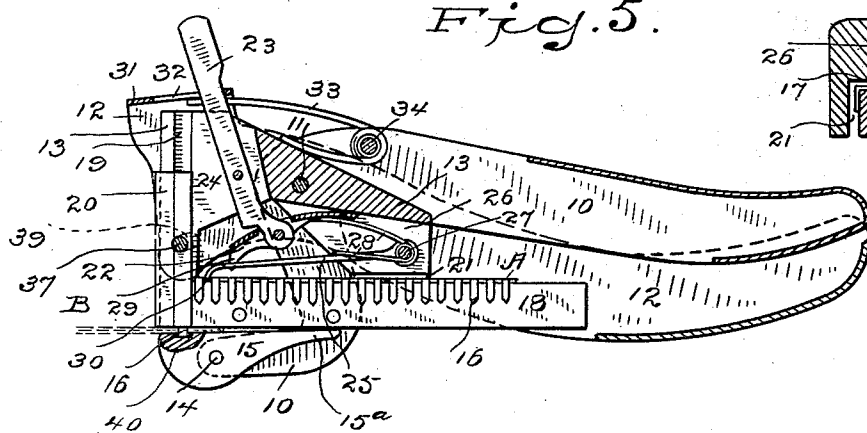


Fig. 5.

Fig. 7.

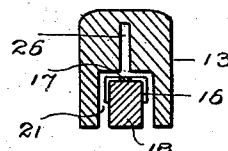
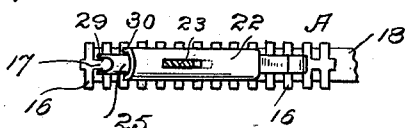


Fig. 6.



WITNESSES.

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SELF-FEEDING STAPLING-PLIERS.

SPECIFICATION forming part of Letters Patent No. 728,898, dated May 26, 1903.

Application filed June 24, 1902. Serial No. 112,971. (No model.)

To all whom it may concern:

Be it known that I, BERNARD GASTALDI, a citizen of the United States, residing at Norwalk, county of Fairfield, State of Connecticut, have invented a new and useful Self-Feeding Stapling-Pliers, of which the following is a specification.

My invention has for its object to provide pliers adapted to carry formed staples in strips and to cut off, drive, and clench a staple during each closing movement of the lever-handles and to feed the staple-strip forward so as to place a staple in position to be cut off and driven during each opening movement of the lever-handles, my novel self-feeding pliers being adapted to take the place of the various more or less complicated machines and other devices for driving and clenching staples in any of the various uses to which said machines and devices have been applied, as in securing papers together, binding pamphlets, fastening belts, &c.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, forming part of this specification, in which like characters of reference indicate the same parts, Figure 1 is a side elevation of my novel stapling-pliers in the normal position—that is, in position to receive the work to be operated upon between the jaws; Fig. 2, a plan view corresponding therewith; Fig. 3, a front elevation; Fig. 4, a longitudinal section also corresponding with Fig. 1; Fig. 5, a longitudinal section showing the lever-handles and jaws in the closed position, as in clenching a staple; Fig. 6, a detail view illustrating the construction and operation of the feeding and locking pawls, and Fig. 7 is a detail sectional view on the line 7 7 in Fig. 4.

10 and 12 denote the lever-handles, 11 the pivot, 13 the jaw-block, and 15 the rocking jaw. The jaw-block in addition to serving as one of the jaws—the upper jaw, as illustrated in the drawings—might also be termed

the “body” of the implement, as it carries all of the working parts, the pivot 11, upon which the lever-handles oscillate, passing through the jaw-block, as clearly shown in Figs. 4 and 5. The rocking jaw is pivoted to the short arm of lever-handle 10, as at 14.

A denotes the staple-strip in common use, the same consisting of a series of U-shaped staples 16, connected by a web 17.

18 denotes the strip-carrier, which is rigidly secured in the jaw-block. The forward end of the strip-carrier terminates at a vertical groove 19, which receives the staple-driver 20, as will be more fully explained. The rear end of the strip-carrier extends backward more or less from the jaw-block, as clearly shown in the drawings, it being simply required that the strip-carrier be made long enough to give sufficient support to as long a strip of staples as can be received between the long arms of the lever-handles, said lever-handles being shown as blanked out and formed from sheet metal and so shaped as to receive a staple-strip between them the full length of their long arms.

21 denotes a longitudinal recess in the jaw-block partly surrounding the strip-carrier, which receives the staple-strip freely.

The staple-strip is fed forward by means of a feed-pawl 22, pivoted at the lower end of a lever 23, which is itself pivoted in a vertical slot 24 in jaw-block 13. The operative end of the feed-pawl straddles a locking-pawl 25, the rear end of which lies in a slot 26 in the jaw-block and is pivoted on a pin 27, which also carries a double-acting spring 28. One arm of spring 28 bears upon the locking-pawl, acting to hold it normally in engagement with the staple-strip to prevent it from moving backward, the other arm engaging the rear end of the feed-pawl back of its pivotal point and acting to hold the forward end of said feed-pawl in operative position. It will be noted in Fig. 6 that the locking-pawl is provided with teeth 29, which straddle the connecting-web 17 of the staple-strip and drop between the staples 16, as clearly shown in Figs. 4 and 5. The feed-pawl straddles the locking-pawl and is provided with teeth 30,

which are adapted to ride over a staple during each backward movement, then to drop back of the staple over which they have passed, and to carry the strip forward when the forward movement takes place.

31 denotes a cross-piece at the jaw end of lever-handle 12, having a slot 32, through which feed-pawl lever 23 passes, as clearly shown in Figs. 4 and 5.

33 denotes a handle-spring, shown as carried by a pin 34 in lever-handle 10, one arm of which bears upon jaw-block 13, the other arm bearing upon the under side of cross-piece 31 of lever-handle 12, the action of said spring being to throw the jaws to the open position, as in Figs. 1 and 4.

The staple-driver, which also serves as a cutting-off tool, is adapted to be moved vertically in a groove 19 in the jaw-block by means of lever-handle 12, a pin 37, rigidly secured in the staple-driver, passing through vertical slots 38 in opposite sides of the jaw-block and engaging oblique slots 39 in said lever-handle.

It will be noted (see Figs. 4 and 5) that the rocking jaw is so pivoted to lever-handle 10 as to adapt it to readily assume a position in use substantially parallel with the lower side of jaw-block 13, which serves as the upper jaw, and it is free to assume this parallel position at all times whether the number of sheets to be stapled be two or any greater number within the capacity of the device. The front end of the rocking jaw is made heaviest to insure the jaw dropping to the open position by gravity, and the rear end is extended, as at 15^a, said extension engaging the under side of the strip-carrier and preventing said rocking jaw from tilting forward, but permitting it to so incline as to facilitate the insertion of the work between it and the under side of the jaw-block 13. The work to be operated upon is indicated by dotted lines in Figs. 4 and 5 and is designated as B.

The operation is as follows: The documents or other articles to be fastened together are placed between the rocking jaw and the underside of the jaw-block, and the first closing movement of the lever-handles causes the material to be grasped and held between said jaw and block. Continued movement of the lever-handles in the same direction causes a staple to be cut off from the strip, driven through the work, and clenched by the single movement of closing the lever-handles together, spring 33 acting to throw the lever-handles to the open position the instant pressure is relieved, the movement also feeding the staple-strip forward and placing another staple in position to be cut off and driven. Suppose the implement to be in the normal or open position, as in Figs. 1 and 4, and that the lever-handles are moved toward the closed position, as in Fig. 5. The rocking jaw and the jaw-block will first close upon the

work, gripping it firmly between them, the rocking jaw shifting more or less upon its pivot as the jaws close together. When the material is inserted, in order that the staple shall be driven at a point sufficiently far in from the edge of the sheets of the work the material will be in practice moved to a point that will carry the inner edge or edges thereof well beyond or inside of the vertical plane of the pivot 14 of the rocking jaw. Therefore when the sheets are grasped or pinched the upper surface of the rocking jaw, the said sheets, and the under side of the jaw-block 13 will all be parallel. As soon as the thickness of the work stops the closing movement of the jaws continued movement of the lever-handles in the same direction causes the staple-driver to be carried downward in vertical groove 19 by pin 37, which is itself moved downward by lever-handle 12. It will be noted in Fig. 4 that the staple-driver lies normally a slight distance above staple-carrier 18. In the downward movement of the staple-driver the staple 16, (see Fig. 4,) which has been fed into position to be cut off and driven, is sheared off by the joint action of the staple-driver and the inner end of the staple-carrier. Continued downward movement of the staple-driver forces the severed staple through the work and clenches it upon the under side, as clearly shown in Fig. 5, the rocking jaw being provided with a recess 40, which when the jaws are forced tightly together, the staple having been previously driven through the work, acts as an anvil to clench the arms of the staple inward in the usual manner, Fig. 5 showing the clenched staple in edge view. Owing to the fact that the rocking jaw is free to present an upper surface parallel with the under surface of the jaw-block 13, so that it lies flat against the under surface of the work or sheets regardless of the thickness of the latter, the anvil portion of said working jaw will necessarily be in a plane at a right angle to the arms of the staple that is driven and will therefore properly clench them. Obviously if the work was thick and the anvil-jaw were to remain at an inclination such as indicated in Fig. 4 the arms of the staple or the whole of the staple would be turned laterally without proper clenching. It will be noted in Fig. 4 that lever 23, which carries the feed-pawl, is lying at the extreme forward end of slot 32. As the lever-handles move toward the closed position lever 23 will move toward the rear end of slot 32 and presently will engage the rear end of said slot. Continued closing movement of the lever-handles through the engagement of lever 23 with the rear end of slot 32 will act to swing the upper end of said lever forward from the relatively vertical position, as in Fig. 4, toward the position shown in Fig. 5, the effect of which is necessarily to carry the feed-pawl backward, dragging it over one of the staples,

the parts being so proportioned that the feed-pawl cannot possibly pass but one staple. As soon as the feed-pawl has passed a staple in the backward movement the action of spring 28 upon the rear end thereof will cause the teeth 30 to drop down behind the staple it has passed. To remove the work with the clenched staple therein, the operator simply relieves the pressure upon the lever-handles, which permits spring 33 to return the lever-handles and staple-driver to their normal positions. The instant the lever-handles commence to move from the clenching position, as in Fig. 5, toward the normal or receiving position, as in Fig. 4, lever 23 will commence to move toward the forward end of slot 32, and the instant said lever is in engagement with the forward end of said slot said lever will be swung from the oblique position (shown in Fig. 5) toward the relatively vertical position (shown in Fig. 4) and must necessarily in moving to this position move the feed-pawl, which is pivoted to the lower end thereof, forward, carrying the staple-strip forward and leaving another staple 16 in position to be cut off and driven at the next downward movement of the staple-driver, as indicated in Fig. 4. The operation of pawl 25, which I have termed the "locking-pawl," is simply as a holdback. As the staple-strip is moved forward the locking-pawl will be slightly raised against the power of spring 28 and will drag over the surface of one of the staples. The instant a staple has passed the locking-pawl, however, the spring will force the pawl downward back of the staple that has passed, thus rendering any backward movement of the staple-strip impossible. It will be noted that the sole movement in use is to close the lever-handles together, this closing movement acting to cut off, drive, and clench a staple. The opening movement of the lever-handles—that is, the return to the normal position—is effected by a spring and takes place the instant the operator relieves the closing pressure, this opening movement of the lever-handles by spring-power acting also to feed the staple-strip forward automatically and place another staple in position to be cut off, driven, and clenched. This operation may be continuously repeated until the staple-strip is used up, it being obvious, as in other machines of this class, that the last staple of the strip will be wasted. As soon as a staple-strip is used up the operator simply slides another staple-strip into operative position over strip-carrier 18 from the rear.

Having thus described my invention, I claim—

1. Stapling-pliers comprising lever-handles, a jaw-block to which they are pivoted, a rocking anvil-jaw carried by one of the lever-handles and coacting with the jaw-block, said rocking jaw being so pivoted as to present its

upper surface parallel with the under surface of the jaw-block at all times, means for supporting a staple-strip, means carried by the jaw-block for cutting off and driving a staple during each closing movement of the lever-handles and means for feeding the staple-strip forward during each opening movement of the lever-handles.

2. In stapling-pliers the combination with lever-handles, a jaw-block to which they are pivoted, a staple-driver actuated by the closing movement of the lever-handles and a strip-carrier, of a feed-pawl adapted to engage a staple-strip upon the carrier, a lever to which the feed-pawl is pivoted and which is actuated by one of the lever-handles, a locking-pawl to prevent backward movement of the staple-strip and a spring acting to retain said feed-pawl and said locking-pawl in operative position.

3. In stapling-pliers the combination with lever-handles, a jaw-block to which they are pivoted, a staple cutter and driver actuated by the closing movement of the lever-handles and a strip-carrier, of an anvil-jaw below said jaw-block, a feed-pawl adapted to engage a staple-strip upon the carrier, a lever 23 to which the feed-pawl is pivoted and which engages one of the lever-handles and a spring acting to throw the lever-handles to the open position and, through the engagement of lever 23 with one of the lever-handles, to feed the staple-strip forward.

4. In stapling-pliers the combination with lever-handles 10 and 12, said handle 12 having a cross-piece with a slot 32, a jaw-block to which said lever-handles are pivoted and a staple-driver in the jaw-block actuated by lever-handle 12, of a lever 23 pivoted in the jaw-block and extending through said slot, a feed-pawl pivoted to the lower end of said lever and a spring acting to retain said pawl in operative position.

5. In stapling-pliers the combination with lever-handles, a jaw-block to which they are pivoted and a rocking jaw pivoted to one of the handles and coacting with the jaw-block, said rocking jaw being so pivoted as to present its upper surface parallel with the under surface of the jaw-block at all times, of a strip-carrier and a staple-driver carried by the jaw-block, said staple-driver being actuated by one of the lever-handles, and staple-strip-feeding mechanism actuated by the opening movement of the lever-handles.

6. Stapling-pliers comprising lever-handles, a freely-rocking anvil-jaw carried by one of the levers, a jaw-block movable toward and from the anvil-jaw and having a staple cutter and driver and staple-strip-feeding mechanism, and means carried by the other lever-handle for actuating the staple-driver, the parts being relatively arranged whereby during a single closing movement of the handles the work will be first grasped between the an-

vil-jaw and jaw-block and a staple then cut
off and forced through the work and clenched,
said anvil-jaw being pivotally connected with
its carrying-lever, and projecting forward and
5 back of its pivot whereby its upper surface
may be presented parallel with the under sur-
face of the jaw-block at all times.

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

BERNARD GASTALDI.

Witnesses:

A. M. WOOSTER,
S. W. ATHERTON.