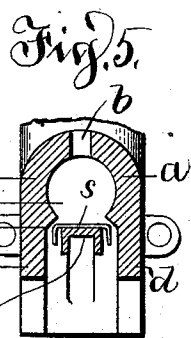
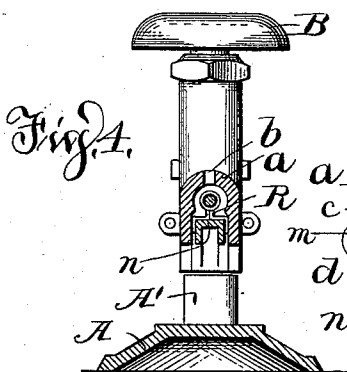
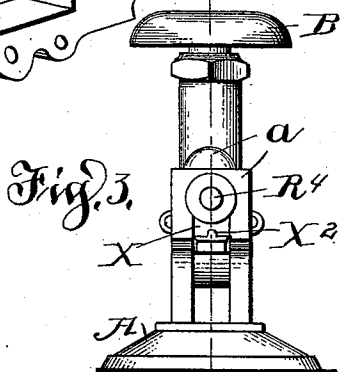
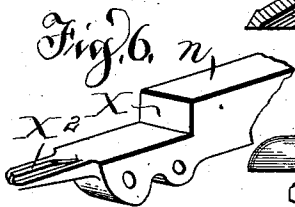
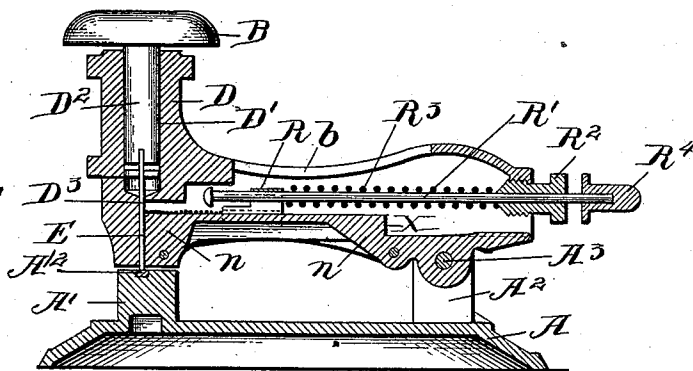


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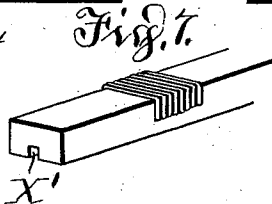
No. 532,136.

Patented Jan. 8, 1895.



Witnesses:

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Inventor.

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(No Model.)

2 Sheets—Sheet 2.

W. J. BROWN.
STAPLING MACHINE.

No. 532,136.

Patented Jan. 8, 1895.

Fig. 8.

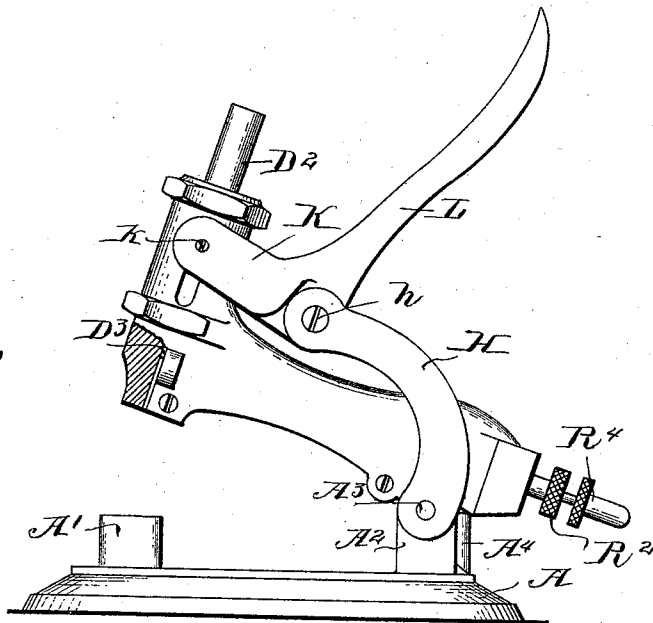
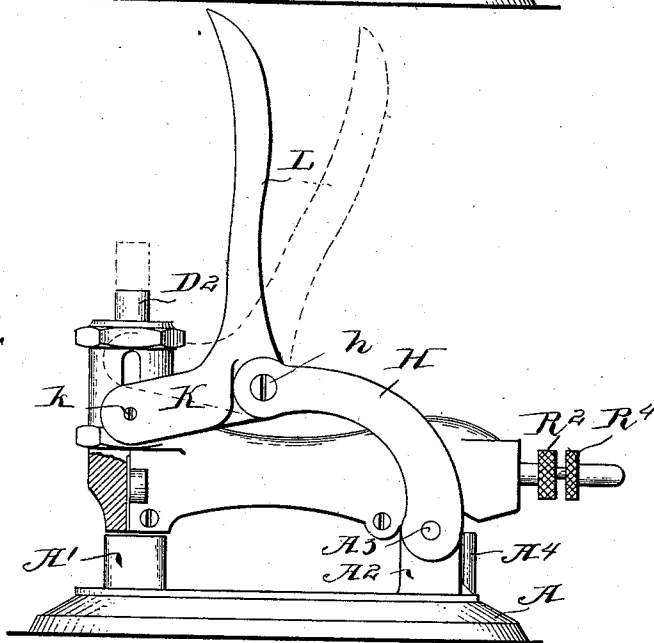


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM J. BROWN, OF PHILADELPHIA, PENNSYLVANIA.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,136, dated January 8, 1895.

Application filed January 25, 1894. Serial No. 497,987. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. BROWN, a citizen of the United States, and a resident of the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machines for Inserting and Clinching Metallic Staples, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to that class of machines for inserting and clinching metallic staples, sometimes called self-feeding machines, in which a series of such staples are maintained in position, suspended crown upward, upon a mandrel or bar, contained within the hollow interior of the machine which is provided with suitable devices to cause them to be automatically fed forward upon such staple bar to the delivery and driving mechanism when and as required. My present improvements in such machines are adapted equally as well for use in small desk tools, in which the driver is actuated by a hand impact knob, as for larger machines operated by power or by a hand lever.

My invention consists primarily in the combination with the essential elements for the purpose, of such a self-feeding staple-driving tool, viz., one in which the staples are delivered to the throat or delivery channel of the machine from a fixed mandrel or bar upon which they are supported, crown upward, and so guided—of a staple magazine having interior walls so shaped and arranged relatively to the mandrel inclosed therein that the staples shall be guided on said mandrel and between said walls, solely by their two crown corners, *i. e.*, the two points of junction between the crown and the dependent legs.

My invention also consists in minor details of construction of the machine as will be hereinafter specifically mentioned.

In the accompanying drawings illustrating my invention, Figure 1 is a side elevation of the completed tool provided with a hand impact knob actuating the driver blade. Fig. 2 is a vertical section thereof taken longitudinally through the machine on the line 3—4 of Fig. 3. Fig. 3 is a front end view, with the lower plate inclosing the staple channel, removed. Fig. 4 is a vertical sectional

view through the line 1—2 of Fig. 1. Fig. 5 is an enlarged view of the central portion of Fig. 4. Fig. 6 is an elevation of the staple bar or mandrel. Fig. 7 is an elevation of the staple holder, with a string of staples thereon, and adapted to be used to deliver staples to the staple bar or mandrel of the machine. Fig. 8 is a side elevation of the machine of Fig. 1, with a pivoted lever arm actuating the staple driver, in lieu of the impact knob for that purpose, and operating also to lift and depress the staple driving member of the device. Fig. 9 is a like view intended in connection with Fig. 8 to illustrate the movements of the lever arm.

In all such self feeding staple driving machines, a mandrel or staple bar, whether stationary or removable, must necessarily be employed, as upon this bar the staples are placed or arranged "in train" crown upward ready to be pushed or fed forward thereon and therefrom singly and in succession to the throat or staple channel of the machine by means of a pusher rod or follower actuated by a spring or other appropriate means; and it is equally essential to the successful operation of such a machine that the staples on the bar or mandrel should be guided while being so fed or pushed forward thereon, as otherwise the pressure at the rear of the train of staples causes them to crowd both laterally and vertically on and over each other, the result being either to clog the delivery on the bar or to crowd two staples at the same time across the mouth or entrance of the throat or channel and so stop the operation of the machine. Various expedients have been attempted to obviate this almost universal defect in such machines, some of which operate to guide the staples by the crown alone, (to prevent vertical movement which causes the crowns to overlap,) others by the legs alone, (to prevent lateral movement which causes the legs of contiguous staples to overlap,) others by the crown and one of the legs, (which prevents lateral movement in one direction only) and still others by all three sides of the staple; but the result has been that too much frictional contact is produced by these methods, impeding the movement of the staple, and sometimes increasing the very evil sought to be remedied. My present invention obvi-

ates these defects in that respect, is exceedingly simple, and very effective, and consists in constructing or providing the magazine which contains the staple mandrel or bar and
 5 which also connects at its forward end with the delivery throat or staple channel of the machine with such form of interior walls so arranged relatively to the contained mandrel that the channel or passage way of the staple
 10 will present only two points of possible contact with the staple, viz., by the two crown corners of the latter formed by the junction of the crown with the two dependent legs. Hence there is no side pressure on the staple-
 15 legs nor any top pressure on the crown, and the staple is fully maintained in position on the bar on its forward passage to the throat at the minimum of possible frictional contact. This primary feature of my present
 20 machine is separately shown in Fig. 5, in which a, a , are the walls of the magazine, which presents first a hollow interior c of any suitable shape, to allow of the passage of the pusher rod or follower R (see Fig. 2) and hav-
 25 ing a top slot b , if desired, to enable the operator to see when the mandrel is full or empty of staples. Lower vertical walls d, d each terminate at the top in an inwardly inclined face or wall m, m . The stationary mandrel n
 30 (see Figs. 2 and 6) is arranged within this magazine in such relative position to the walls thereof, that there will be a full and free passage way between each of its vertical sides and the vertical walls d, d of the magazine
 35 for the passage of the legs of the staple, and the top rectangular corners of the mandrel will maintain the crown corners of the staples immediately opposite to and facing the inwardly inclined walls m, m of the magazine
 40 and in such close proximity thereto that a sufficient space only will be formed for the passage of the staple but without contact therewith except by a lateral or vertical movement of the staple, either of which is possible
 45 only to an exceedingly limited extent, (and that without possible contact except by the two points of the crown corners which is not sufficient to cause interruption of forward movement by friction) because the overhang-
 50 ing inclined faces m, m of the magazine walls lying opposite to the corners of the mandrel and placed as nearly as possible at right angles to a diagonal line drawn from the top and bottom opposite corners respectively of the
 55 mandrel or bar, will present possible contact surfaces for the crown corners only of the staples if the latter manifest any tendency to move out of place on the mandrel, and thus prevent, by this relative position of the parts,
 60 any undue lateral movement of the staples (and hence will not permit the legs of the contiguous staples to overlap each other) or any undue vertical movement of the staples (and hence will not permit the crowding and
 65 overlapping of the crowns of contiguous staples); and in consequence, no matter what is the strength or force of the rear pressure ex-

erted by the pusher, the staples will be fed forward regularly and evenly; and this construction of staple guide will also permit the
 70 use of a stronger and more certain feed than has heretofore been possible in such machines. In Fig. 5 of the drawings these inwardly inclined guiding walls m, m , are shown as flat
 75 surfaces, but it is obvious that they may be inclined inwardly on a curved line, whether convexly inward or concavely outward, or otherwise shaped, as well as flat or plane, their functions being the same, provided they
 80 are so arranged relatively to the staple bar as to present possible contact surfaces for the crown corners only of the staples mounted or suspended "in train" crown upward thereon. It is obvious that this feature of my invention
 85 is applicable to all self-feeding staple driving machines, in which a mandrel or feeding bar is employed to hold a row of staples in train. I have shown it embodied in a small tool, one
 90 form of which (see Figs. 1 and 2) is adapted to desk use, and in which the driver is actuated by a hand impact knob; and in the other form of machine (see Figs. 8 and 9) in which the pivoted feeding and driving member of the device, with the contained driver, is actuated by a lever arm.

95 The machine shown in the drawings, contains a base or supporting stand A with a trunnion A^2 to which the staple feeding and driving member of the device is pivoted at A^3 , and at its forward end is a block A' the
 100 face of which is dish shaped as at A^{13} , or given any other known form usual for the purpose of bending up by contact and clinching the legs of staples, or may be supplied with any appropriate form of mechanical
 105 clinchers. The magazine may be made integral with the throat or staple channel and with the staple driver guide of the machine. It is so shown in the drawings, in which the casting of the magazine a terminates at its
 110 forward end in a vertical projection D (see Fig. 2) which is recessed of the shape and size of the driver shank D^2 to which is fitted the driver blade D^3 which is adapted in size to, and reciprocates vertically in, the throat
 115 or staple channel E which is formed by channeling the face of the magazine arm a , (or of a separate piece secured to the magazine arm a if not made integral therewith,) and this staple channel communicates directly with
 120 the passage way formed between the interior vertical walls of the magazine and its contained mandrel or staple bar. In the desk tool a hand impact knob B is secured to the driver shank, and in both forms of tool, the
 125 driver guide is slotted at D to receive a pin D^5 secured to the shank of the driver to limit the extent of reciprocation of the latter. The throat or staple channel is closed or covered by a plate D^6 fastened by a set screw D^7 to
 130 the magazine frame, and can thus be readily removed if repairs are needed to the interior of the machine.

Staples for such self-feeding machines are

usually provided commercially and put up on sticks, some of which are made according to a form patented to me and shown in Fig. 7, *i. e.*, with a longitudinal slot x' on the under face of the stick. The machine is fed or charged by inserting the stick of staples (Fig. 7) in the open end of the magazine, against the rear face x of the mandrel, and pushing the staples off the former on to the latter, by the pusher R or by other appropriate means.

The staple bar or mandrel I prefer to provide with a rib x^2 , so that if the operator uses the form of stick shown in Fig. 7 the rib x^2 of the mandrel will pass into the slot x' of the stick and hold the latter steady while charging the machine and thus prevent any staples being spilled in the magazine. The bar or mandrel being charged, the staples are automatically fed forward one by one as the driver D³ in its reciprocation opens and closes the throat or channel E, by means of pressure caused by a follower or pusher R fitting on and embracing the mandrel, and which follower is actuated by a rod R' mounted on a hollow screw nut R² screwed into the end of the magazine frame, terminating in an exterior knob R⁴, the rod being embraced by a spiral spring R³ to supply the force.

In the form of larger machine, shown in Figs. 8 and 9, there is provided a double jointed lever, consisting of the arm H pivoted to the trunnion A² at A³, and at h to the other arm K of the lever, which is pivoted at k to the shank D² of the driver and is provided with a hand piece L. This double lever performs two distinct functions in its reciprocation in both directions. Its normal position is shown in Fig. 9. Its first completed movement as shown by the dotted lines in Fig. 9, has for its sole object to lift the staple feeding and driving member of the machine from contact with the anvil or clinching block and thus allow the papers to be placed thereon. The second movement of the lever, as shown in Fig. 8, operates only to raise the driver blade, which thus uncovers the staple channel, allowing a staple to be shot forward into the same ready to be driven on the return and downward movement of the driver. The return movement of the lever is continuous in action but double in effect, and exactly the reverse of the upward movement, that is, it first returns the lower face of the staple channel in the staple driving member to its normal position and brings it into contact with the clinching anvil or the papers laid thereon; and not until that is fully accomplished, is the continued movement of the lever arm effectual to act on the driver blade to bring it down on the crown of the staple in the throat or channel and drive it through the underlying papers. The limit of upward movement of the staple feeding and driving member may be controlled by the post or projection A⁴ or by any analogous means.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a self-feeding staple-driving machine, the combination with a feeding bar or mandrel upon which staples in train, are mounted or suspended, crown upward, and with mechanism to propel the same forward thereon, of guiding devices therefor, presenting possible contact surfaces for each of the crown corners only of the staples arranged in train upon the contained feeding bar; substantially as described.

2. In a self-feeding machine for driving metallic staples, the combination with a feeding bar upon which staples in train are mounted or suspended, crown upward, and with mechanism to propel the same forward thereon under pressure, and mechanism to deliver the same singly and in succession to the driving and clinching devices, of guiding devices presenting substantially flat contact surfaces contiguous to each of the crown-corners of the staples and arranged at an angle to both the top and vertical sides of the feeding bar; substantially as and for the purpose set forth.

3. The combination, in a self feeding staple-driving machine, of a frame constructed with a vertical recess forming a driver guide, a second recess below but in the same plane therewith forming a staple channel or throat, a staple magazine communicating directly with said throat or channel and provided with a longitudinal recess to admit the passage of staple propelling mechanism, a follower adapted thereto, a staple supporting and feeding bar mounted within the magazine, and staple guiding devices formed by interior walls of the latter, consisting of two vertical and parallel walls terminating at top in two inwardly inclined walls; the whole forming a feeding, guiding and driving member, and a supporting base or stand upon which the same is mounted; substantially as described.

4. The combination with the supporting stand or base provided at its forward end with clinching mechanism, and a staple feeding and driving member pivotally mounted on said supporting stand at its rear end, and consisting essentially of automatic staple feeding devices and a channel into which the staples are ejected, controlled by a driver blade reciprocating therein, of the double jointed lever arm actuating said member and its contained driver blade consisting of the connecting arm H pivotally mounted at one end to the supporting base, the straight lever K provided with actuating handle L, said lever K being pivotally secured at one end to the driver blade and at the other end pivotally mounted on the opposite free end of the lever connecting arm H, the same being constructed and operating substantially as and for the purpose described.

5. In a self-feeding staple driving machine, provided with a staple feeding magazine, a mandrel or staple bar contained therein, pro-

vided at its rear end with a rib, in combination with a removable stick adapted to hold a row of staples and having a longitudinal slot on its under face into which said rib of the
5 stationary mandrel is adapted to enter; substantially as and for the purpose described.

In testimony whereof I have hereunto af-

fixed my signature this 24th day of January,
A. D. 1894.

WILLIAM J. BROWN.

Witnesses:

H. T. FENTON,
W. S. ASHBEY.