

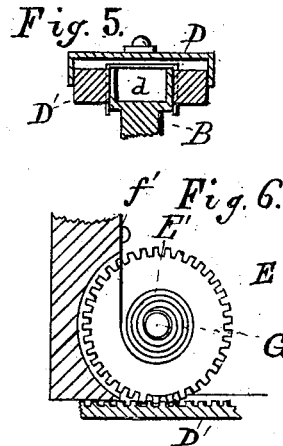
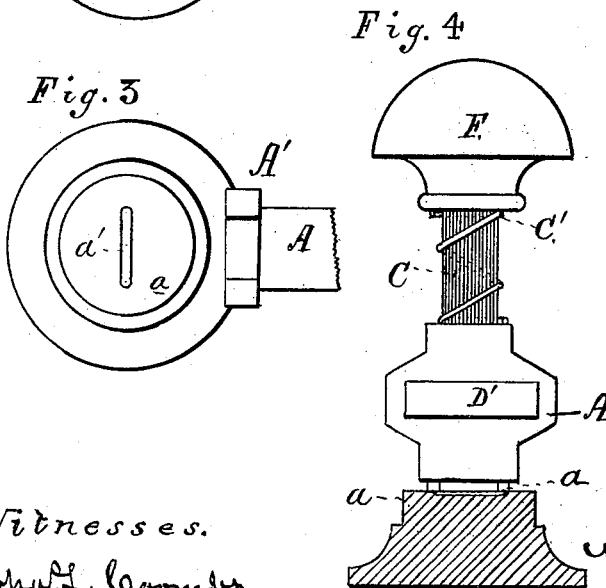
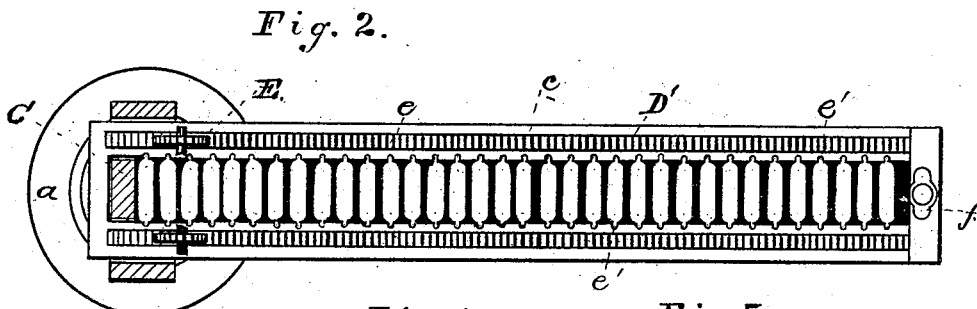
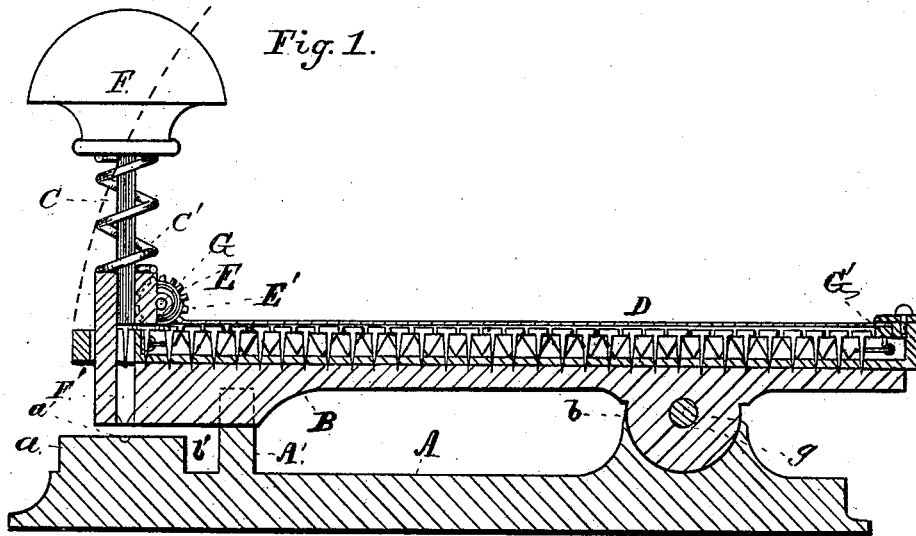
(No Model.)

3 Sheets—Sheet 1.

M. TOULMIN.  
PAPER FASTENING MACHINE.

No. 267,283.

Patented Nov. 7, 1882.



Witnesses.  
Chas. L. Coombs  
Chas. D. Davis

Inventor.  
Morton Toulmin  
By H. Aubrey Toulmin  
his Attorney.

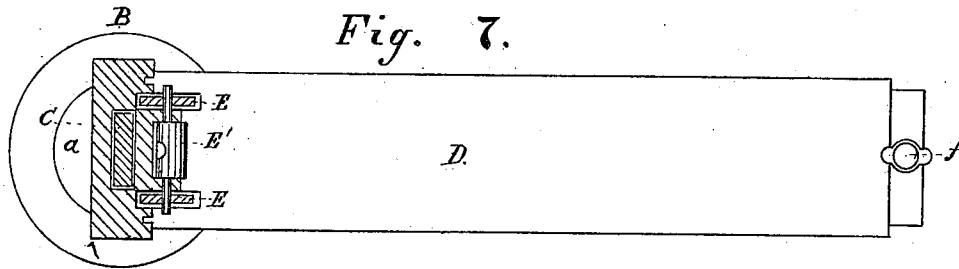
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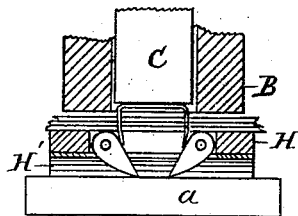
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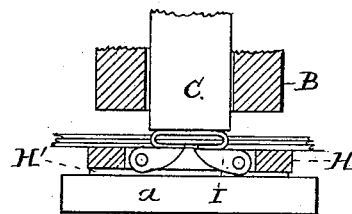
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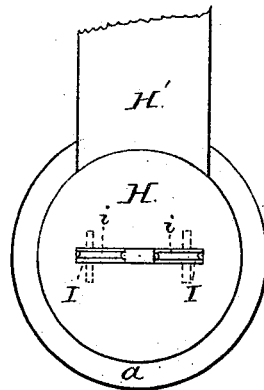
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



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(No Model.)

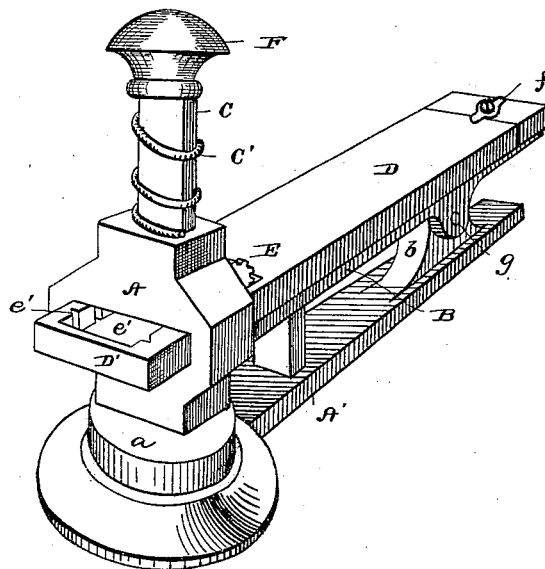
3 Sheets—Sheet 3.

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*Fig. 11.*



*Witnesses.*

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*Inventor,*

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# UNITED STATES PATENT OFFICE.

MORTON TOULMIN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## PAPER-FASTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 267,283, dated November 7, 1882.

Application filed April 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, MORTON TOULMIN, a citizen of the United States of America, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Paper-Fastening Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in paper-fastening devices, and it has for its object to provide a cheap and simple machine for the purpose of uniting or fastening papers together; and it consists of certain means whereby a quantity of the fastenings may be stored up ready for a continuous feed; of means for automatically supplying them to a forcing or driving plunger; of a forcing piston or plunger; and, finally, of mechanism for clinching the fastenings after their passage through the paper or material being connected or united together, all of which will be hereinafter more fully pointed out and described.

Those skilled in the art to which this invention has relation will readily understand the same, by reference to the annexed drawings, forming a part of this specification, on which like letters refer to corresponding parts, and in which—

Figure 1 is a longitudinal vertical sectional view through my device at or about the center thereof. Fig. 2 is a view partly in section and partly in plan elevation, the forward end or head of the oscillating arm being in horizontal section in a plane just above the staple-carriage and the latter in plan, the cover or top plate being removed; Fig. 3, a plan view of the clinching-anvil and guiding-standard, the base-piece being broken off; Fig. 4, a front elevation, the anvil being in vertical section; Fig. 5, a vertical cross-section through the oscillating arm, the feeding-carriage, and the cover or cap thereof; Fig. 6, a vertical longitudinal section through a portion of the head of the oscillating arm, feeding-carriage, and feed-wheel shaft; Fig. 7, a like view to that shown in Fig. 2, the machine being in plan and section; Fig. 8, a vertical sectional view of a

portion of the head of the oscillating arm and a modification of my clinching device, showing the staples partially inserted through the several layers of paper, and the guiding and turning pawls in position to bend or fold the projecting points of the staples or fastenings; Fig. 9, a similar view, the plunger in this instance being entirely down, and the operation or act of clinching the fastenings completed; Fig. 10, a like view to Fig. 3, being a plan of the anvil and clinching-pawls, and the bed-piece broken off; and Fig. 11, a perspective view of my improved device, showing the same complete and ready for operation.

The letter H designates the base or bed piece of my device, which is constructed of metal, preferably cast, and which is provided with an anvil, *a*, at one end thereof, a bifurcated guiding-standard, *A'*, for a purpose hereinafter named, and an extension near the other end. This extension is suitably pivoted, hinged, or otherwise flexibly connected, an oscillating arm, *B*, having a longitudinal groove or way, *d*, the object of which will presently appear, and which sustains a staple-feeding carriage, *D'*. This carriage consists of a rectangular or other conveniently-shaped frame, *D'*, having an opening, *G*, the inner walls of which are oppositely notched or vertically grooved, as shown at *e'*, into which grooves are adapted to fit the staples or fastenings used for securing the papers together. This feeding-casing laterally embraces the arm *B*, as shown in Fig. 5, and has a cross-bar, *G'*, at its rearend, which acts as a support, the said bar resting upon the upper faces of the arm *B*. The forward end of this carriage is guided and supported by being passed through a suitable opening in the vertical extension of the arm *B*. One or both sides of the upper surface of this carriage are formed into or have attached to them racks or toothed portions *e*, which serve, in conjunction with suitable pinions or cogs engaging therewith, to give the carriage the proper forward travel for the purpose of feeding the staples to the forcing mechanism. The fastenings are supplied to the carriage by inserting them into the vertical grooves *e'* above mentioned, the under sides of their body portions being supported by contact with the upper face or top part of the arm *B*, as shown in Fig. 5. The letter *D* designates a top or cover, made

of metal or other suitable material, which fits snugly over the carriage, excluding dust, &c., from being collected in the teeth of the racks *e* and hides them and the fastenings from view, the said lid or cover being retained in place by a button, *f*, or other suitable device attached to the arm B.

To the vertical extension of the arm B or other convenient part of said arm is journaled a cross-shaft, G, which is provided with pinions E E, adapted to gear or engage with the racks *e* and impart to them a forward movement by virtue of the rotary motion they receive through the medium of the recoil force of the spring E' exerted upon the said shaft G, to which one end is rigidly secured, the other or free end being fixed or connected to the arm B, at *f*'.

In some instances I may dispense with the racks and pinions and use only the cross-shaft, (which would then be firmly held in its journals to prevent rotation,) and the spiral spring, the latter being connected to and wound around the shaft in such manner that its contraction or recoil force would act to operate the carriage, the free end of the spring being distended and attached to the latter at any suitable point thereof.

I may also, in some instances, dispense altogether with the spring and shaft, pinions and racks above alluded to, and employ a helical spring, as seen in Fig. 1 of the drawings, the same being located in a channel formed therefor, as well as for the purpose of reducing weight in the upper surface of the arm B, its respective ends having connection with the carriage and arm, respectively.

The letter F' indicates a vertical passage or aperture in the forward end of the arm B, within whose vertical plane is a clinching-groove, *a'*, formed in the upper surface of the anvil, *a*. The lower terminus of this passage is provided with inclined staple-guides *b'*, whose faces converge downwardly, and which are located one in each angle or corner of said passage, their lateral dimension being approximately equal to the thickness of the staple-points, or the distance between the ends of the body of the staples and the vertical faces of the points thereof, the lateral space between the guides being always slightly more than the length of the staple-bodies, in order to permit the unobstructed descent of the latter through the passage F' during the act of fastening a staple.

The letter C indicates a plunger or piston, of metal or any suitable material, which snugly fits into said passage F', and which is adapted to slide freely therein. The upper end of this plunger is provided with a knob or handle, F, for the purpose of forcing it down, and about it is placed a helical spring, C', located between the knob and the head of the arm B, the function of which spring is to raise the plunger to its normal position.

In the figures of the drawings numbered 8 9 10, as above described, is shown a modifica-

tion of my improved clinching mechanism. The letters A, B, C, and *a* therein shown designate respectively a portion of the base-piece of my machine, the oscillating arm, the vertical plunger, and the anvil. The letter H' indicates a flat spring, secured to the base A, and extending forwardly over and above the anvil *a*, to which is attached or forming a part of which is a disk, H. This latter is slotted, as indicated in Fig. 10, to receive two pawls, I, pivoted therein. These pawls are grooved on their respective upper faces or edges to receive and prevent lateral displacement of the points of the staples during the act of clinching them.

The operation of my invention will be readily understood from the following explanation thereof, when taken in connection with the above description. The staple-feeding carriage being loaded, as hereinbefore stated, the action of the spring E, through the medium of the pinions and racks, causes it to travel forward until one of the staples is suspended in the passage F'. The paper to be fastened together is then laid upon the anvil *a* in proper position, when the oscillating arm B is let down upon it, the bifurcated standard A' serving to receive the said arm and guide and hold it in the desired position, and preventing it from any lateral displacement which might occur by reason of any looseness in the pivot-joint *b g*. The hand is applied to the knob F, by which the plunger *c* is forced down through the passage F, forcing before it the staple, suspended as above mentioned. The points of the staple enter the flaring space between the guiding-lugs *b'*, and are thus directed against the paper in a vertical or nearly vertical position, (according to the position of the arm B,) through which they pass, and come in contact with the groove *a'*, whose inclined bottom throws them together, whence they are finally bent up tightly against the paper and thus complete the fastening.

When I use my clinching modification shown in Figs. 8, 9, 10 substantially the same operation as that above described takes place, with the exception that in the latter case the staples, instead of entering the grooves *a'*, enter the grooves in the pawls I, and are thus clinched, when the spring H is overcome by the mediate pressure of the plunger C, and disk H brought firmly down upon the anvil *a*, and the pawls I made to assume a horizontal position, as seen in Fig. 9.

When the hand is removed from the knob the helical spring elevates the plunger above the horizontal plane of the staples, and the recoil of the spiral and its appurtenances advances another staple in the passage F', ready for a second operation, and so on after each descent and operation of the plunger.

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

1. In a paper-fastening machine, the combination of a bed-piece provided with a clinch-

ing-anvil with an oscillating arm flexibly connected thereto, having a traveling staple-carriage, constructed substantially as described and shown, and means for automatically operating the same, and mechanism for forcing the staples to and through the paper, substantially as described, and herein set forth.

2. In a paper-fastening machine, the combination of a bed-piece provided with a clinching-anvil and guiding-standard with an oscillating arm flexibly connected thereto, having a staple-carriage adapted to slide thereon and to receive and hold separately a quantity of staples, means for automatically operating said carriage, and a staple-passage and forcing-plunger fitting therein, substantially as and for the purposes described.

3. In a paper-fastening machine, the combination of a bed-piece provided with a clinching-anvil and a guiding-standard with an oscillating arm flexibly connected thereto, having a staple-carriage adapted to slide thereon and to receive and hold a quantity of staples, and provided with a rack or racks engaging pinions journaled to said arm, a spring for operating them, and a staple-passage and plunger, substantially as and for the purposes set forth.

4. In a paper-fastening machine, the combination of a bed-piece provided with a clinching-anvil and guiding-standard with an oscillating arm flexibly connected thereto, having a staple-passage, a forcing-plunger fitting therein, a pinion or pinions, and a spring for operating the same journaled thereto, and a traveling carriage adapted to slide thereon and to receive and hold separately a quantity of staples, and provided with a rack or racks engaging said pinions, substantially as and for the purpose described.

5. In a paper-fastening machine, the staple-carriage, consisting of a frame having suitably-spaced grooves or notches for holding the staples separately, whereby a quantity may be fed into the machine at a time and each staple delivered to the clinching mechanism without affecting the others, substantially as herein specified.

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

MORTON TOULMIN.

Witnesses:

J. J. MCCARTHY,  
EDWIN L. YEWELL.