A. H. MAYNARD.

PORTABLE STAPLING MACHINE.

APPLICATION FILED JAN. 26, 1914.

1,119,093.

Patented Dec. 1, 1914.

2 SHEETS—SHEET 1.

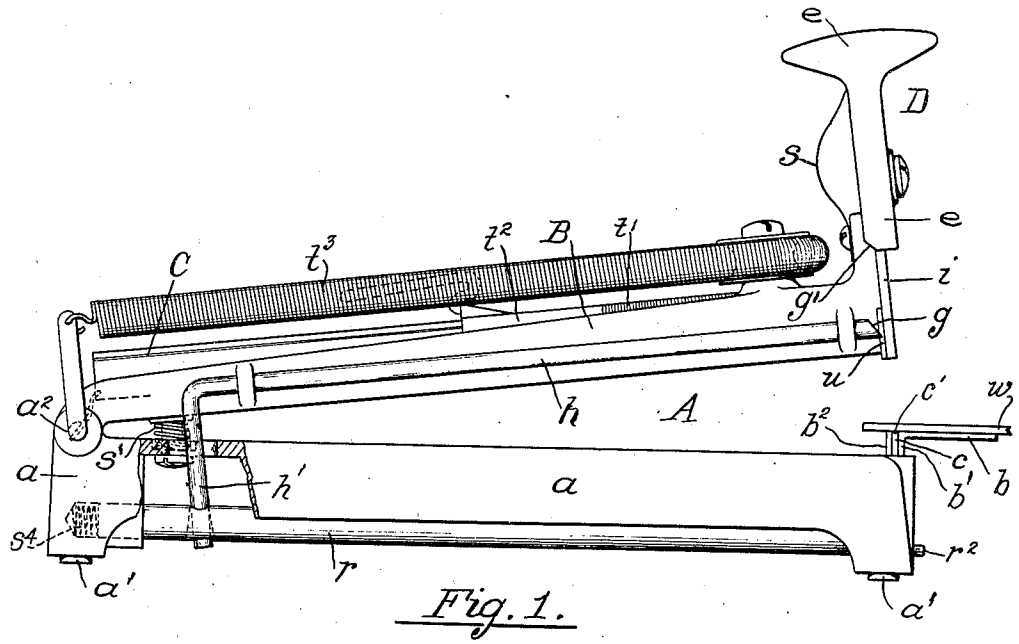


Fig. 1.

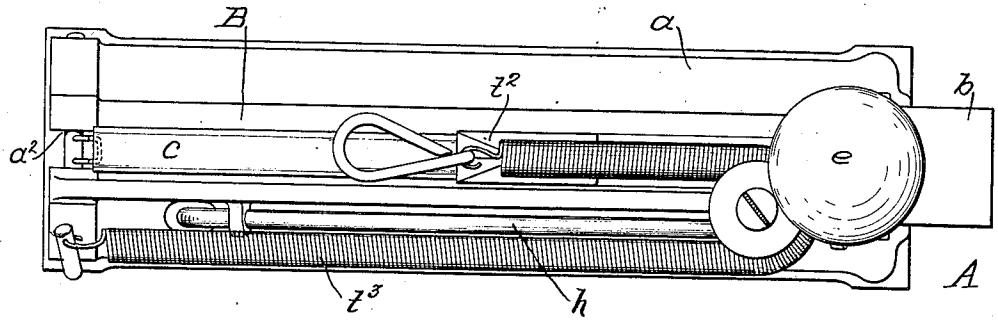


Fig. 2.

Witnesses.

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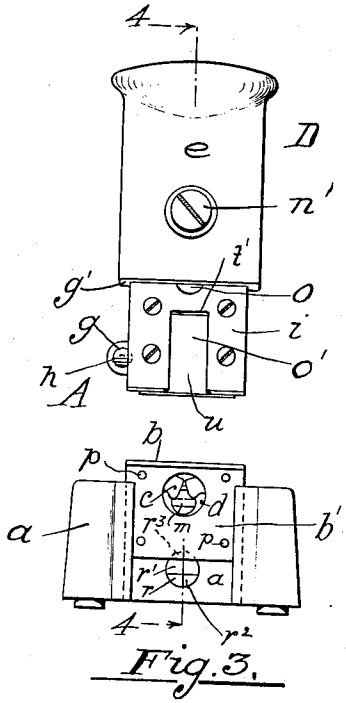


Fig. 3.

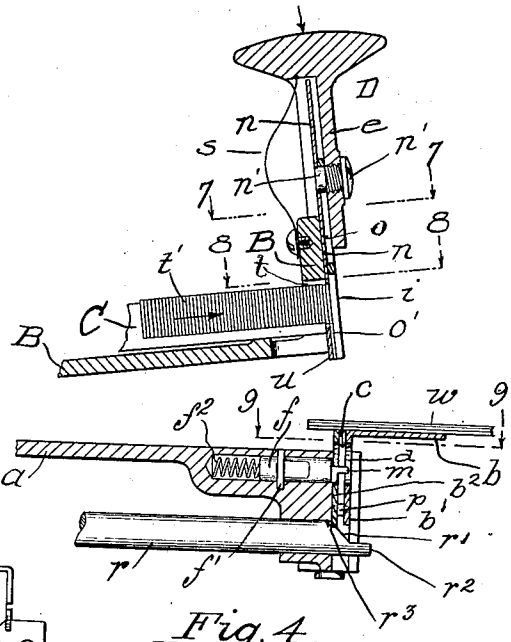


Fig. 4.

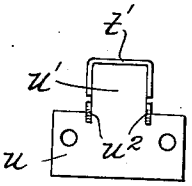


Fig. 10.

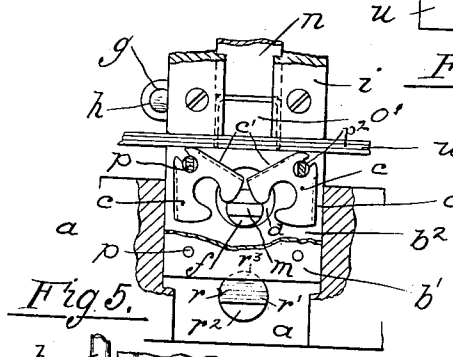


Fig. 5.

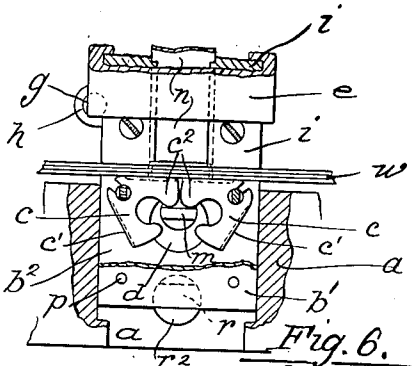


Fig. 6.

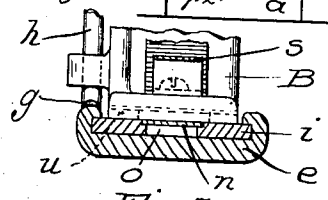


Fig. 7.

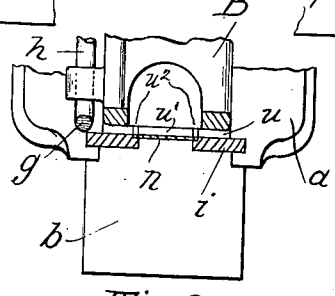


Fig. 8.

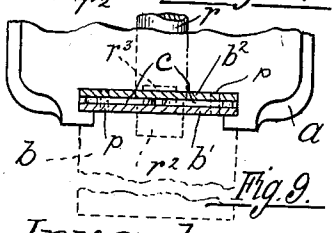


Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

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PORTABLE STAPLING-MACHINE.

1,119,093. Specification of Letters Patent. Patented Dec. 1, 1914.

Application filed January 26, 1914. Serial No. 814,337.

To all whom it may concern:

Be it known that I, ARTHUR H. MAYNARD, a citizen of the United States, residing at Chepiwanoxet, town of Warwick, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Portable Stapling-Machines, of which the following is a specification.

My invention relates to improvements in stapling machines, so-called, of the portable, manually operable type, and it consists in certain novel construction and combination of parts, hereinafter set forth and claimed.

Among the objects sought to be obtained is to provide a stapling-machine of simplified construction having the following advantages: The machine is practically automatic, in that in use the action of the several devices or instrumentalities thereof follow one another in a regular order or sequence; the machine is both easily and accurately operable, and comparatively inexpensive to produce; the staples are not liable to become clogged therein, resulting in imperfect work; the driving-plunger is reversible; the clenching dies are interchangeable as well as reversible; they are adapted to be readily removed from the die-holder and replaced therein, first simply pressing the anvil rearwardly, in fact upon pressing the face of the anvil endwise past the holder the dies and holder or frame may be easily removed bodily, and having the back stationary plate of the swinging arm arranged to automatically guide and deflect the staples singly into the channel-way in which the driving-plunger is mounted. The machine is arranged to accurately secure a plurality of sheets or folios together; and may be termed a desk-stapling machine.

In the accompanying two sheets of drawings, Figure 1 is a front side elevation of my improved stapling machine in its normally inactive up-stroke position, a portion being in section. Fig. 2 is a corresponding top plan view. Fig. 3 is a corresponding front end view, viewed from the right of Fig. 1. Fig. 4 is a vertical central sectional view, taken substantially on line 4—4 of Fig. 3. Fig. 5 is a front end view, in enlarged scale, showing portions broken away; the staple-driving and work-holding means moving downward and in engagement with the work supported on the table. Fig. 6 is a similar view, showing the relation of the parts at the termination of the down-stroke. Fig. 7 is a horizontal section, taken on line 7—7 of Fig. 4, showing portions of the driving head. Fig. 8 is a corresponding section, taken on line 8—8 of Fig. 4. Fig. 9 is a horizontal section on line 9—9 of Fig. 4, showing the relation of the clenching-dies and holder to the front end of the base, and Fig. 10 is a front elevation of the relatively stationary staple positioning plate, the adjacent elements or parts being omitted.

I would state in advance that certain elements of the present machine that are embodied therein are represented in Thomas A. Briggs' U. S. Patents Nos. 836,662 and 850,290. I make no claim herewith to such patented features.

The following is a more detailed description of my improved manually operable stapling-machine, including the manner of its operation:

The improved stapling-machine as a whole is indicated by the letter A. It is provided with an elongated cast metal base or body part *a* having a plurality of non-metallic plugs a^1, of leather, felt, cork, or other analogous material, let into its bottom surface. The front end portion of the base has a work-supporting table movably fitted therein; the table proper comprises a flat, horizontal member *b* arranged above the upper face of the base; to the back edge of the table is secured a thin vertically movable, apertured front plate b^1 rigidly connected by pins *p* to a back plate b^2 having a similar form, minus the table; the two plates are parallel with each other and have a narrow space therebetween in which space the pair of clenching-dies *c* are pivotally mounted. The latter are reversible and interchangeably alike; they are oppositely arranged and mounted to swing on the upper pair of said pins *p;* the latter are flattened, as indicated at p^1, to receive the slotted openings p^2 of the dies to permit the removal of the latter; the upper edges c^1 of the dies are grooved longitudinally and register with the legs of the staples. As thus constructed and arranged the dies or clencher members *c*, when the machine is in the normal upstroke position, are also in the elevated position, the upper edges c^1 then converging downwardly at an angle toward the center of the machine, as clearly indicated in Fig. 5. The under or dia-

metrically opposed sides c^2 of the clenchers bear directly upon the anvil m of the anvil-bar f seated in the base a. The anvil-bar (shown in Fig. 4) is removable in case of renewal or repair, through the enlarged alining apertures d formed in the said plates b b^1 or clenching-die holder. A spring f^2 pressing against the inner end of the bar f serves, in coöperation with the fixed pin f^1, to maintain the proper relation of the parts. The dies c are freely movable on the pins p and engage the anvil m as before stated. In order to remove the dies and holder the anvil is pressed rearwardly until its front end is at the back of plate b^2, after which the dies and holder may be moved bodily upward from the base.

To the back end of the base a is hinged, at a^2 the upper jaw or arm B provided with staple-carrying and staple-driving devices, the said member B automatically swinging to its elevated or normal up-stroke position by means of a light expansion spring s^1. To the side of the arm B is mounted an endwise slidable push-rod h having its back end portion h^1 bent downward at an angle and extending freely through a slotted hole formed in the upper wall of the base and into a centrally arranged horizontal combined tripper and actuator-bar r, capable of limited endwise movement; the front end of said bar is beveled transversely and forms a cam face r^1 engageable with the clenching-die holder; the upper edge of the cam is also cut away to produce a flat seat r^3 (Fig. 4) arranged to temporarily support the work on the table b and holder while the legs of the staple are being forced downward through the work. See also Fig. 5. The lower part of the bar at the termination of the cam face r^1 extends therefrom in front and forms a stop r^2 for limiting the movement downward of the holder and its table when the staples are being clenched by the upwardly swinging dies c. See corresponding position Fig. 6.

The driving-head D is slidably mounted for independent vertical movement on the front end of the member B and is also movable bodily with it. The driving-head and clenching-means are in alinement, the driving-head being connected to the swinging member B by means of a bent retracting spring s whose tension exceeds that of said spring s^1. The driving-head consists of the manually operable handle or pusher e, a work engaging or clamping plunger i having upper and lower slotted opening o, o^1 therein; a thin steel blade n, constituting the staple driving-plunger proper, is attached centrally to the handle member e by a screw n^1 tapped into its front wall and extending through the opening o of the work clamping plunger i and fits a hole therefor in the driving plunger n. See Fig. 4.

The front end of the upper arm B has an opening t therein in register or alinement with the end of a previously charged staple-holder or hollow core C in or on which a column of wire-staples t^1 arranged to be fed or discharged singly therefrom are closely packed sidewise; the holder is detachably connected to the member B. The forward end of the core engages the central back portion u^1 of the relatively stationary plate u secured to the arm; Fig. 10 represents the front face of the plate, minus the core; said Fig. 10 also shows a staple normally positioned on the central tongue part u^1 by the action of the spring-like connection t^3 and follower t^2. It will be apparent that as the staple slides from the tongue u^1 into the guideway of the driving plunger to be engaged by driver n the action of the uniformly pressing connection t^3 causes the next succeeding staple to slide from the core to replace the former staple; the last-fed staple, however, is prevented from immediately entering the guideway owing to the presence of the then depressed driver n. The said container or core C is substantially like the staple-magazine disclosed in said Patent No. 836,662, hereinbefore referred to.

It is assumed that the machine is stopped in its idle or up-stroke position, the several members thereof having been properly assembled, that is the staple-charged container or core C is detachably connected to the machine, and further assuming that a wire-staple t^1 has been released from the interposed relatively stationary staple positioning plate u, communicating with the column of staples, into the guide-way of the driving-plunger n, the plunger being at the end of its upward stroke and above the head of the staple. Meanwhile the uniformly pressing resilient connection t^3 causes the follower t^2 thereof to press the staples slidably along the core, thus insuring that the said plate u is kept charged with a staple at all times.

Now, upon placing the sheets or work w upon the flat table b, the latter including the clenching-dies c c, then being in the normally locked upward position, substantially as shown in Figs. 1, 3, and 4, the operation may be described as follows: Upon pressing downward somewhat sharply upon the slidable handle or post e of the driving-head D the initial action causes the arm B to swing downwardly against the tension of springs s^1 s; the back of the thin, steel driving plunger n meanwhile impinging against the face of the back plate u, thereby holding the staples stationary in temporary check until the return up-stroke; the continued downward movement of the arm B causes the lower end of the work-engaging plunger i (fixed to the arm) to forcibly engage the proximate or upper surface of the work, while at the same time a further downward

movement of the driving-head forces the legs of the staple into and practically through the work (see Fig. 5; the member *e* being omitted); at this instant the cam surface g^1 formed on the lower end of member *e* (see Fig. 1) engages the corresponding surface *g* of the push-rod *h* and forces the latter endwise rearwardly, thereby retracting the actuator-bar *r* and withdrawing its supporting shoulder r^3 from the vertically guided holder carrying the clenching-dies. The continued movement of the parts in making the downward stroke retracts the bar *r* to its limit, while at the same time the descending plunger *i* causes the dies, *c*, mounted in the correspondingly moving apertured holder b^1 b^2, to forcibly engage the stationary anvil *m*, thereby turning them on the respective pivots *p*, and clenching the legs of the staple against the underside of the work *w*, the die-holder then being supported by the extension or abutment r^2 of the bar *r*; the corresponding parts then appearing substantially as represented in Fig. 6, thus completing the operation.

Upon the return or up-stroke, the downward pressure then being released from the handle *e* of the driving-head D, the spring s^1 causes the arm B to swing upwardly to its limit, said action at the same time disengaging the cam surfaces g^1 and *g* from each other, thereby releasing or unlocking the rod *h*, at which instant the pressure of the confined spring s^4 forces the actuator-bar *r* endwise toward the front of the machine and causes its beveled end r^1 to elevate the clenching-die holder to its normal limit or until seated on the shouldered portion r^3, the relative position of the parts then appearing substantially as represented in Fig. 4. At the instant the lower end of the upwardly moving driver *n* passes the head of the staple t^1 positioned on the back plate *u*, the continuous forward pressure on the column of staples causes the staple to slide from the plate into the guideway of the driving plunger *n*, the two parallel narrow grooves u^2, beveled from the back of the plate downward toward the front, also serving to engage the legs of the staple and further insuring its proper entrance into the guideway.

It may be observed that for the sake of clearness the action of the parts have been described as occurring in a step-by-step manner. In fact, however, the action of the several instrumentalities or devices are effected by a single, quick, downward movement, the result being effected in the order or sequence substantially as stated.

I claim as my invention:

1. In a stapling-machine of the general character described, the combination of a relatively stationary base element, an anvil member positioned in said base, a guided work supporting table, clenching-dies operably engageable with said anvil, a normally locked frame or holder having the dies mounted therein for turning movement, an angularly movable main operating arm hinged to said base, a clamping member fixed to the arm, a staple driver, means mounted in the arm for feeding the staples and positioning them singly in the path of said driver and a manually actuated self-retracting pusher member having the staple driver secured thereto, the arrangement being such that the act of depressing the pusher member releases the die holder and causes the driver to force the legs of the positioned staple downward through the work and in coöperation with the clenching-dies to bend the said legs to engage with the under surface of the work.

2. In a portable self-contained automatic stapling-machine, the combination with a stationary base, an endwise movable actuator-bar mounted in the base and having its forward end portion constituting a support, a normally stationary anvil member also positioned in the base, a die holder vertically slidable in ways formed in said base, said holder arranged to be locked in position by means of the actuator-bar, and a pair of oppositely facing clenching-dies pivotally mounted in the holder and engageable with the anvil, of an upper arm or jaw member hinged to said base, a spring-pressed driving-head slidably mounted on the free end of the arm, staple-feeding means carried by said arm arranged to feed and position the staples singly in the driving-head, and means controlled by the said driving-head for retracting the actuator-bar from the die-holder, the arrangement being such that, after driving the legs of the staple through the work, a further depression of the driving-head will cause the dies engaging the stationary anvil to swing and fully clench the legs of the said staple to the underside of the supported work or material.

3. In a stapling-machine, a base member, a spring-pressed upper arm member hinged to the base member, the said members constituting the main frame or body part of the machine, the said arm being provided with instrumentalities for feeding, positioning and inserting the staples, the combination therewith of a die-holder movable in said base member, a pair of clenching-dies pivoted in the holder and capable of independent movement therein while the holder is in action, an anvil positioned in said base and means actuated and controlled by the arm for causing the clenching of the prongs of the positioned staple by the conjoint action of the said anvil, die holder and dies.

4. In a stapling-machine, the combination of instrumentalities arranged to feed and position staples singly therein, a vertically slidable transversely apertured holder

or frame, a pair of clenching-dies pivotally mounted in said holder, a normally stationary anvil member having its outer portion extending through the said aperture formed in the holder and being in operative engagement with the dies, and a slidably mounted manually controlled driving head for inserting the staples through the work and causing the dies, in coöperation with the anvil, to clench the staple prongs.

5. In a stapling-machine, the combination of a base, an anvil positioned in the base, its longitudinal axis being substantially parallel with the upper face of the base, a vertically guided movable die-holder mounted in the front end of the base, said holder having a table or support secured at an angle therewith and bodily movable with it, a pair of clenching-dies pivotally mounted in said holder, said dies being in engagement with the anvil, means for elevating the holder and its attached members and locking them in the elevated position, and means for releasing or unlocking the holder and returning it to the lower position.

6. In a stapling-machine, the combination of a base, an operating arm hinged to the base, a spring-retracted driving-head slidable on the outer end of the operating arm, a thin staple-positioning plate secured to the face of said arm, a reservoir adapted to hold a column of closely packed staples carried by the arm, said positioning plate registering with the reservoir and adapted to receive the staples singly thereon, a driving plunger secured to the driving-head, a clamping plunger secured to the front end of said operating arm, the last-named plunger provided with a staple-receiving groove or channel in which the driving-plunger is movably mounted and arranged to engage the head of the staple and force the latter downward from the channel, and means for deflecting the staple from the positioning plate into said channel or path preparatory to being acted upon by the driving plunger.

7. In a stapling-machine, the combination of a movable arm, a spring-pressed depressible driving-head capable of independent movement and vertically slidable on the arm, a relatively stationary staple-positioning plate, having an inverted T-shape, provided with a central tongue portion arranged to receive and support a staple thereon and having an inclined groove formed at the base of each of the tongue's vertical edges constructed to deflect the staple therefrom, and a spring-pressed staple-carrying core or magazine detachably connected to said arm, the front end of the core being in register with the said tongue portion of the positioning-plate.

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

ARTHUR H. MAYNARD.

Witnesses:
GEORGE A. LOOMIS,
GEO. H. REMINGTON,