

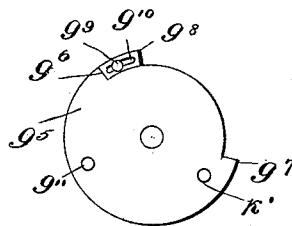
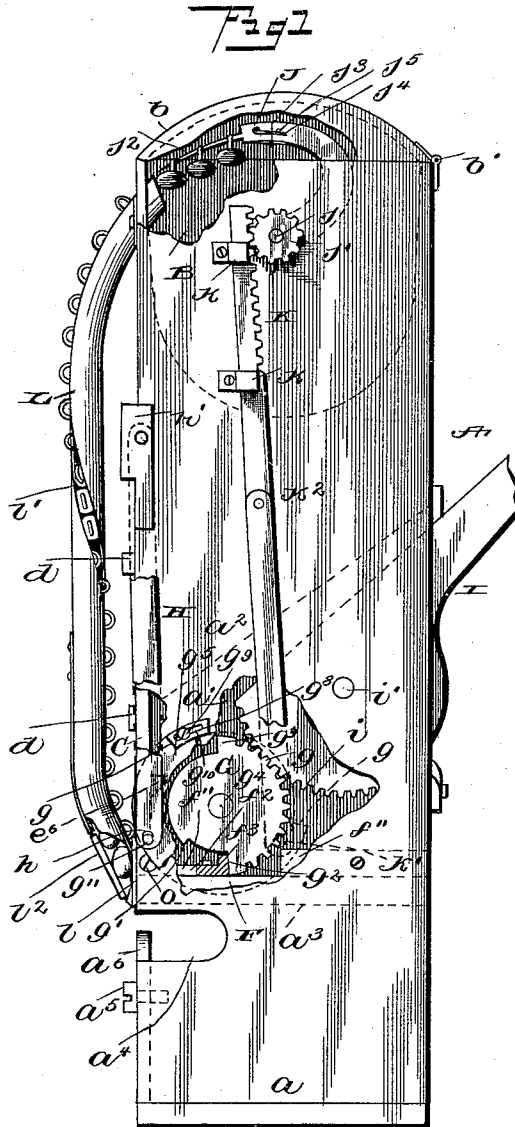
(No Model.)

2 Sheets—Sheet 1.

C. E. DENTON.
BUTTON SETTING MACHINE.

No. 479,704.

Patented July 26, 1892.



Witnesses

John D. Imrie
Wm. S. Hodges

Inventor

Charles E. Denton.

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Edward W. Whitaker

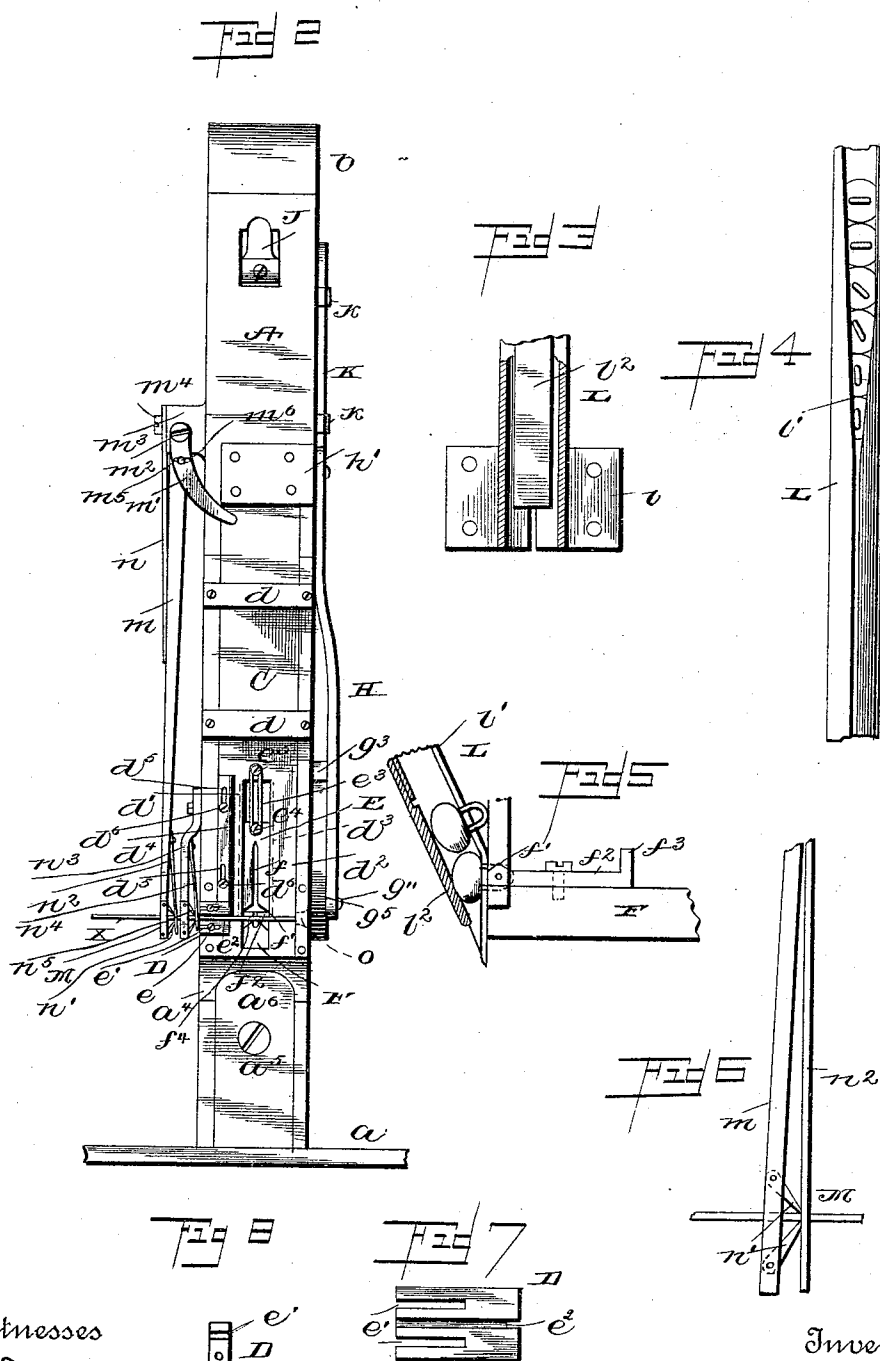
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UNITED STATES PATENT OFFICE.

CHARLES E. DENTON, OF ATTICA, KANSAS, ASSIGNOR TO IDA M. DENTON, OF SAME PLACE.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,704, dated July 26, 1892.

Application filed October 10, 1891. Serial No. 408,324. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DENTON, a citizen of the United States, residing at Attica, in the county of Harper and State of Kansas, have invented certain new and useful Improvements in Button-Stapling 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.

This invention relates to button-stapling machines, and has for its object the production of a machine of this class which comprises advantages in point of strength and durability, and is composed of a minimum number of parts, and which shall be neat in appearance, positive in its operation, and free from all complicated mechanism.

The invention comprises novel features of construction, embracing a new and improved form of button-feed tube or chute and connection between the clincher bar or block and the cutting and bending bar or plate.

The invention further comprises an improved wire-feeding device, which is automatically operated at each formation of a staple.

The invention also comprises the detail construction, combination, and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my improved stapling-machine, parts being broken away. Fig. 2 is a front view thereof with the feed-supply tube or chute removed. Fig. 3 is a detail view showing the lower end of the feed-supply tube. Fig. 4 is a view of a portion of the latter. Fig. 5 is a detail view with parts in dotted lines, showing a button in place, with the wire projected through its shank. Fig. 6 is a slightly-enlarged detail view of a portion of the wire-feeding attachment. Fig. 7 is a view of the stationary knife. Fig. 8 is an end view of a modification. Fig. 9 is a detail.

Referring to the drawings, A designates a vertically-disposed frame or support, which is made, preferably, from one piece of metal,

and from its lower end projects a horizontal plate *a*, through which screws are passed for securing the same upon a stand or table. (Not shown.) In this frame is formed a chamber *a'*, having an upper inclined top or wall *a²* and a lower horizontal bottom *a³*. An inwardly-extending opening *a⁴* is formed in the front portion of this frame, immediately beneath the horizontal bottom *a³*, and in a vertical groove in the front end or wall is rigidly secured by a screw *a⁵* a clinching-die *a⁶*, the upper end of which projects up into opening *a⁴*. The upper end of this frame is hollowed out to form a button hopper or receptacle B, and the latter is provided with a curved lid or cover *b*, pivotally connected at *b'* to the upper end of the rear wall of the frame.

C is the cutting and bending bar or plate, capable of moving vertically in a groove in the front wall of frame A, said bar or plate being held therein by cross-bars *d*, secured to the front edges of said frame. From the lower end of this bar or plate project two parallel arms *d'* *d²*, in the inner opposite edges of which are grooves or recesses *d³*. To the arm *d'* is secured a knife *d⁴*, the same being of right-angular formation and provided with slots *d⁵*, through which screws *d⁶* are passed for holding said knife in place. By this construction the knife can be adjusted to compensate for wear occasioned by sharpening.

D is the stationary knife, which is rigidly secured by screws *e* to the front edges of frame A, said screws being passed through slots *e'* in said knife to permit of the adjustment of the latter. A groove or recess *e²*, extending longitudinally through said knife, serves as a guide for the wire X. In lieu of this groove a hole will serve the same purpose.

E is the clincher bar or block, whose vertical side edges fit within the grooves or recesses *d³* of bar or plate C, and to this bar or block is rigidly secured an oblong link *e³*, the same being held by a screw *e⁴*, and at its upper end said link is loosely retained by a screw *e⁵*, projecting from bar or plate C. Thus the clincher bar or block is capable of moving upward with the cutting and bending bar or plate, and also has an additional independent movement, so as to permit of its depression below the cutting and bending bar or plate

in the final clinching of the staple. In the lower half of this bar or block E is a vertical slot f , and in its extreme edge is an inclined groove or recess f' . The upper end of bar or block E is thickened to form an inwardly-extending flange e^6 .

Within the chamber a' , resting on the horizontal bottom thereof, is a staple-former or mandrel F, the same consisting of an oblong bar fitted snugly between the walls of said chamber and having a plate f^2 secured to its upper portion, from the inner end of which plate projects a lip or shoulder f^3 . A rigid plate f'' , held by screws within chamber a' , serves as a guide for the mandrel, the latter moving beneath said plate. In the forward ends of mandrel F and its plates f^2 are formed coincident slots f^4 , in which the button-staples are designed to fit. The extreme upper outer edge of this mandrel is also beveled or inclined to conform with the lower end of the clincher bar or block E.

G is a wheel having teeth g extending over about one half of its periphery, and said wheel is provided with shoulders g' g^2 , designed to engage lip or shoulder f^3 of the mandrel to effect the back-and-forward movement of the latter. This wheel has a third shoulder g^3 , designed to engage flange e^6 of the clincher bar or block to force the latter down upon die a^6 after the staple is cut and formed and the mandrel is withdrawn. This wheel is mounted on a shaft g^4 , having its bearings in the sides of frame A, and upon one end of said shaft is keyed a crank-wheel g^5 , having a segment of its periphery cut away to form two corresponding shoulders g^6 g^7 . These shoulders are designed to alternately engage a stop-block g^8 , adjustably secured to the side of frame A by a set-screw g^9 , extended through a longitudinal slot g^{10} thereof. This block serves to regulate the limit of each stroke, and for this purpose is rendered adjustable. From wheel g^5 projects a pin g^{11} , extended into a slot h in the lower end of a pitman H. This pitman at its upper end is pivotally connected to an enlargement h' of the bending bar or plate C. With the teeth of wheel G engages the toothed cam end i of an operating-lever I, whose shaft i' is projected through the sides of the frame.

J is a curved picker-arm rigidly secured to a shaft j , passed transversely through the button-hopper B, and upon one end of this shaft is a pinion j' . The picker-arm is composed of two parts, the outer part having a finger j^2 for engaging the button-shanks and is pivotally and yieldingly connected at j^3 to the inner part, so as to relieve too great pressure on the finger during its backward movement. A spring j^4 , secured to the outer part and engaging a stud j^5 of the inner part, accomplishes this purpose. A rack-bar K, held by keeper-plates k to side of frame A, engages pinion j' , and at its lower end said rack-bar is pivotally connected by a pin k' to wheel g^3 , so as to impart motion to shaft j . This rack-bar is pref-

erably made in two parts held together by a screw k^2 to enable adjustment thereof, so that the exact relative position of the picker-arm can be secured.

L is the button-feed chute or tube, the upper end of which is projected through a hole or opening in the front wall of the hopper B, while its lower end is secured to frame A by screws passed through a plate l , projecting therefrom, said plate completely concealing the stationary knife D and serving to hold the wire in the groove or recess e^2 . The connection of the upper end of the tube or chute is similar to that just described. In this tube or chute is an approximately spirally-arranged slot or opening l' , which decreases in width from its upper to its lower end. At the upper end of the tube or chute this slot faces outward and is widest at this point, and the same gradually winds toward one side of the chute and ends facing inward toward the clinching bar or block, the lower end of said slot being coincident with that formed in said bar or block. By making the slot l' of gradually-decreasing width the button-shanks, no matter how they extended therethrough when first dropped into the chute by the picker-arm J, are gradually brought around, so as to be properly presented to the clincher bar or block and in position to receive the wire. A portion of the lower front wall of this tube or chute is removed, and a flat spring l^2 , secured to said tube or chute, projects thereover, so as to bear against the lowermost button and hold the same in proper position. The end of spring l^2 is slightly thickened to properly hold the lower two buttons.

M is the wire-feeding device, the same consisting of an arm m , through which the wire is passed, and a curved arm m' , pivotally secured at m^2 to a stud m^3 , held by a screw m^4 to the side of frame A, a slot m^5 being formed in the latter arm, through which a screw m^6 is passed to hold arm m to arm m' . By adjusting this screw the extent of movement of the arm m can be regulated. A plate-spring n , secured to stud m^3 and bearing against arm m , serves to force the latter toward frame A. To arm m are pivotally connected two short arms n' , forming jaws for biting upon the wire. A plate-spring n^2 , secured to arm m and having the wire extended through an aperture therein, constantly bears against the outer ends of these jaws n' . An arm n^3 is rigidly secured to frame A, and through it and a plate-spring n^4 , attached to said arm, the wire is also passed, two pivoted jaws n^5 being also connected to this arm n^3 . These latter jaws serve to hold the wire while the arm m is being operated to gain a fresh bite on the wire and prevent the rearward movement of the latter. The curved arm m' projects into the path of movement of the enlargement h' of bar or plate C, whereby when the latter is lowered the arm m is forced outward, and its jaws n' , biting on the wire, will effect the feeding forward thereof when the bar or plate

C in its upward movement permits arms *m* and *m'* to assume their normal position under the action of plate-spring *n* and the wire to be moved forward. The extreme end of the wire, after being projected across the mandrel and through the shank of the positioned button, strikes against a screw *o*, inserted through the side of frame A to prevent wear of the latter.

The operation of my improved stapling-machine is apparent from the foregoing and is substantially similar to that described in my allowed application for patent, Serial No. 384,708, filed March 12, 1891, but differs therefrom in that the wire is not kinked before being cut to form a staple, it being found that sufficient kink is formed in the bending of the wire on the mandrel. The latter is withdrawn after the staple is formed by one of the shoulders of the wheel G striking against the lip thereof, and the staple is finally clinched on the clinching-die by the shoulder *g*³ of said wheel bearing upon flange *e*⁶ of the clincher bar or block, forcing the latter down onto said die. It is obvious that, like the machine described in said allowed application for patent, foot or hand power can be used for effecting the operation of the parts.

The advantages of my present invention are many. The machine is very compact and greatly strengthened. Instead of having a button-hopper secured to the frame it is formed within the latter, and by extending the length of said frame the clinching-die is secured directly thereto, and hence is strong and durable. The wire-feeding device being automatic in its action, the feeding of the wire is sure and accurate. The mechanism employed for operating the mandrel is entirely within the frame and out of the way of the material to which buttons are being fastened. The cutting and bending bar or plate and also the mandrel are so set in the frame of the machine that its strength and durability are greatly increased.

I claim as my invention—

1. The herein-described improved button-stapling machine, comprising the frame having a chamber, the movable bar or mandrel seated on the bottom of said chamber, the cutting and bending bar or plate, the clincher bar or block movable therewith and having an inwardly-extended flange, the operating-shaft, the toothed wheel secured thereon having shoulders on its periphery designed to engage said bar or mandrel and effect the back-and-forward movement thereof, and a third shoulder, also on its periphery, to engage said flange, the pitman operated by said shaft and connected to said cutting and bending bar or plate, means for operating said wheel, the supply tube or chute, and the clinching-die secured to said frame, substantially as set forth.

2. In a button-stapling machine, the cutting and bending bar or plate having parallel arms, the clincher bar or block loosely secured between said arms, and the link rigidly secured

to said bar or block and loosely connected to said bar or plate, in combination with the mandrel with which said clincher bar or block is brought into contact and means for operating said parts, substantially as set forth.

3. In a button-stapling machine, the combination, with the frame, of the button-hopper having a picker-arm movable therein, the bar for imparting motion to said picker-arm, the cutting and bending bar or plate, the crank-wheel having two shoulders, the adjustable stop-block designed to be engaged by said shoulders, and means for cutting and bending and clinching a wire staple, and the pitman connected to said cutting and bending bar or plate and to said crank-wheel, substantially as set forth.

4. The combination, with the frame, of the bar or mandrel, the operating-shaft having a wheel thereon designed to operate said bar or mandrel, the crank-wheel secured on said shaft and having two shoulders on its periphery, the adjustable stop-block designed to be engaged by said shoulders, the cutting and bending bar or plate, the pitman connected thereto and to said crank-wheel, the clincher bar or block movable with said cutting and bending bar or plate, the button hopper and chute, the picker-arm, and the bar for imparting motion to said picker-arm and connected to said crank-wheel, substantially as set forth.

5. The combination, with the frame, of the bar or mandrel having an upwardly-projecting lip, the operating-shaft having a toothed wheel provided with three shoulders, two of which are designed to engage said lip, the crank-wheel secured on said shaft having two shoulders, the stop-block having a slot therein, the set-screw projected therethrough, the cutting and bending bar or plate, the pitman connected thereto and to said crank-wheel, the clincher bar or block movable with said cutting and bending bar or plate and having a flange with which one of the shoulders of said toothed wheel is designed to engage, the button hopper and chute, the picker-arm having its shaft provided with a pinion, the rack-bar engaging said pinion and pivoted at its lower end to said crank-wheel, and the operating-lever having a toothed cam end engaging said toothed wheel, substantially as set forth.

6. The herein-described improved stapling-machine, comprising the frame having a button hopper or receptacle in its upper end and a lower chamber, a shaft extended through said hopper and having a picker-arm, a pinion secured on one end of said shaft, the button-feed tube or chute leading from said hopper and projected through an opening in said frame, the bar or mandrel seated on the bottom of said lower chamber and having a slot in its forward end and an upwardly-projecting lip, an operating-shaft, a toothed wheel secured thereon having shoulders designed to engage said lip, the cutting and bending bar or plate, the clincher bar or block carried thereby and designed to be engaged by

said toothed wheel, whereby it is given an additional final movement, the wheel on said shaft, the pitman connected to said wheel and to said cutting and bending bar or plate, the
 5 operating-lever having a toothed cam end engaging said toothed wheel, and the rack-bar engaging said pinion and connected to said wheel, substantially as set forth.

7. In a button-stapling machine having a
 10 hopper or receptacle, a rotary shaft projected through said hopper and having a picker-arm secured thereto and composed of two parts pivotally and yieldingly connected together, and means for operating said shaft, substan-
 15 tially as and for the purpose stated.

8. In a button-stapling machine, the combination, with the frame, the button-hopper, the cutting and bending bar or plate, and the clincher bar or block having a slot therein, of
 20 the tube or chute extended at its upper end into said hopper and having an opening therein facing outward and gradually winding around to the opposite or inner side of said tube or chute at the lower end thereof, said
 25 opening being widest at its upper end and gradually decreasing in width to its lower end opposite the slot in said clincher bar or block, said tube or chute also having an outer slot in its lower end, and the plate-spring attached
 30 to said tube or chute and extended over said latter slot, substantially as set forth.

9. In a button-stapling machine having a cutting and bending bar or plate, the wire-feeding device herein described, comprising
 35 a spring-pressed movable arm, through which the wire is passed, two pivoted jaws engaging said wire, and the plate-spring secured to said arm and bearing against the outer ends of said jaws, the wire being also passed through said
 40 plate-spring, said arm being operated at each depression of said cutting and bending bar or plate, substantially as set forth.

10. In a button-stapling machine, the combination, with the frame and the cutting and

bending bar or plate having an upper projection, of the curved arm pivotally connected to a stud of said frame and extended into the path of said projection, the spring-pressed arm adjustably connected to said curved arm and through which the wire is passed, the piv-
 50 oted jaws engaging said wire, and the spring secured to said spring-pressed arm and bearing against said jaws, substantially as set forth.

11. In a button-stapling machine having a
 55 cutting and bending bar or plate, a rigid wire-holding arm having pivoted jaws engaging and holding a wire as against retraction, a plate-spring bearing against the inner ends of said jaws and through which the wire is
 60 passed, and a spring-pressed wire-feeding arm also having pivoted jaws engaging and feeding said wire forward, substantially as set forth.

12. In a button-stapling machine, the combination, with the frame and the cutting and bending bar or plate having an upper projection, of the curved arm pivotally connected to a stud of said frame and extended into the
 70 path of said projection, the arm connected to said curved arm, the plate-spring extended from said stud and bearing against said arm, the pivoted jaws carried by said latter arm and between which the wire is passed, the plate-spring secured to said arm and bearing
 75 against the ends of said jaws, the rigid arm attached to said frame and having pivoted jaws engaging and holding said wire as against retraction, and a plate-spring secured to said rigid arm and bearing against the pivoted
 80 jaws thereof, substantially as set forth.

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

CHARLES E. DENTON.

Witnesses:

CAROLUS E. VOORHES,

THOMAS L. DAY.