(No Model.) 5 Sheets—Sheet 1.

J. MATHISON.

MACHINE FOR SEWING ON BUTTONS.

No. 336,881. Patented Feb. 23, 1886.

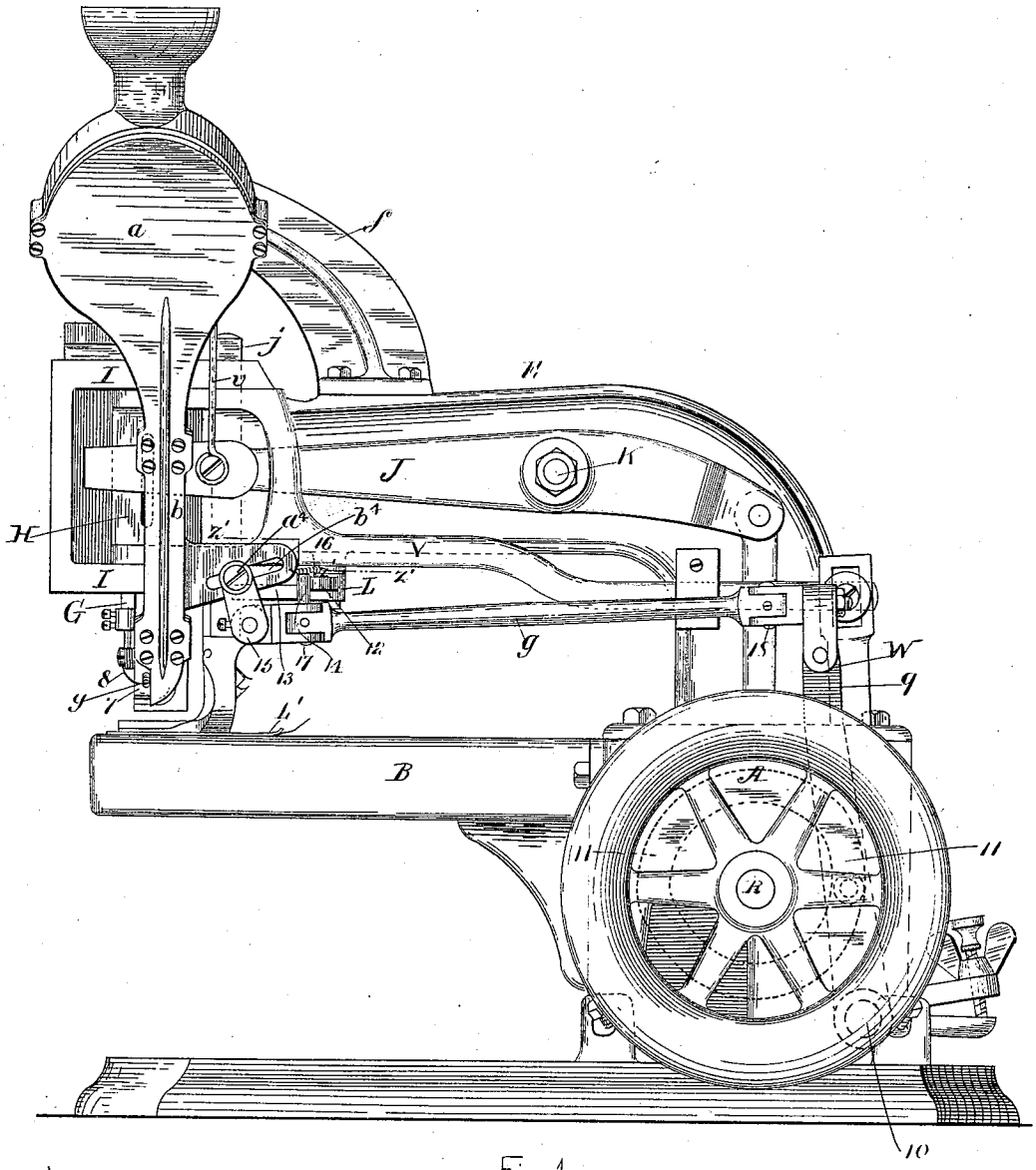


Fig. 1.

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Fig. 2.

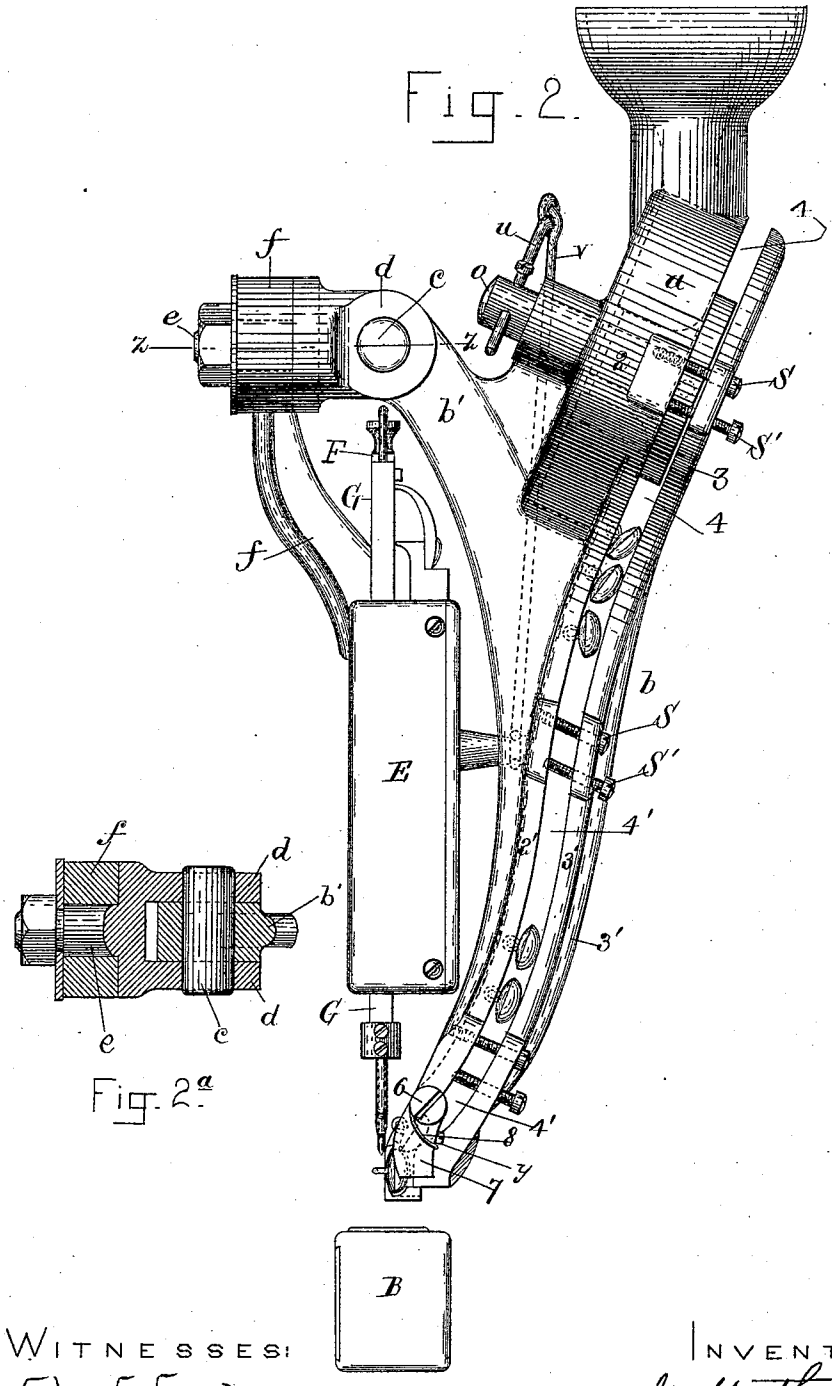


Fig. 2a.

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(No Model.)

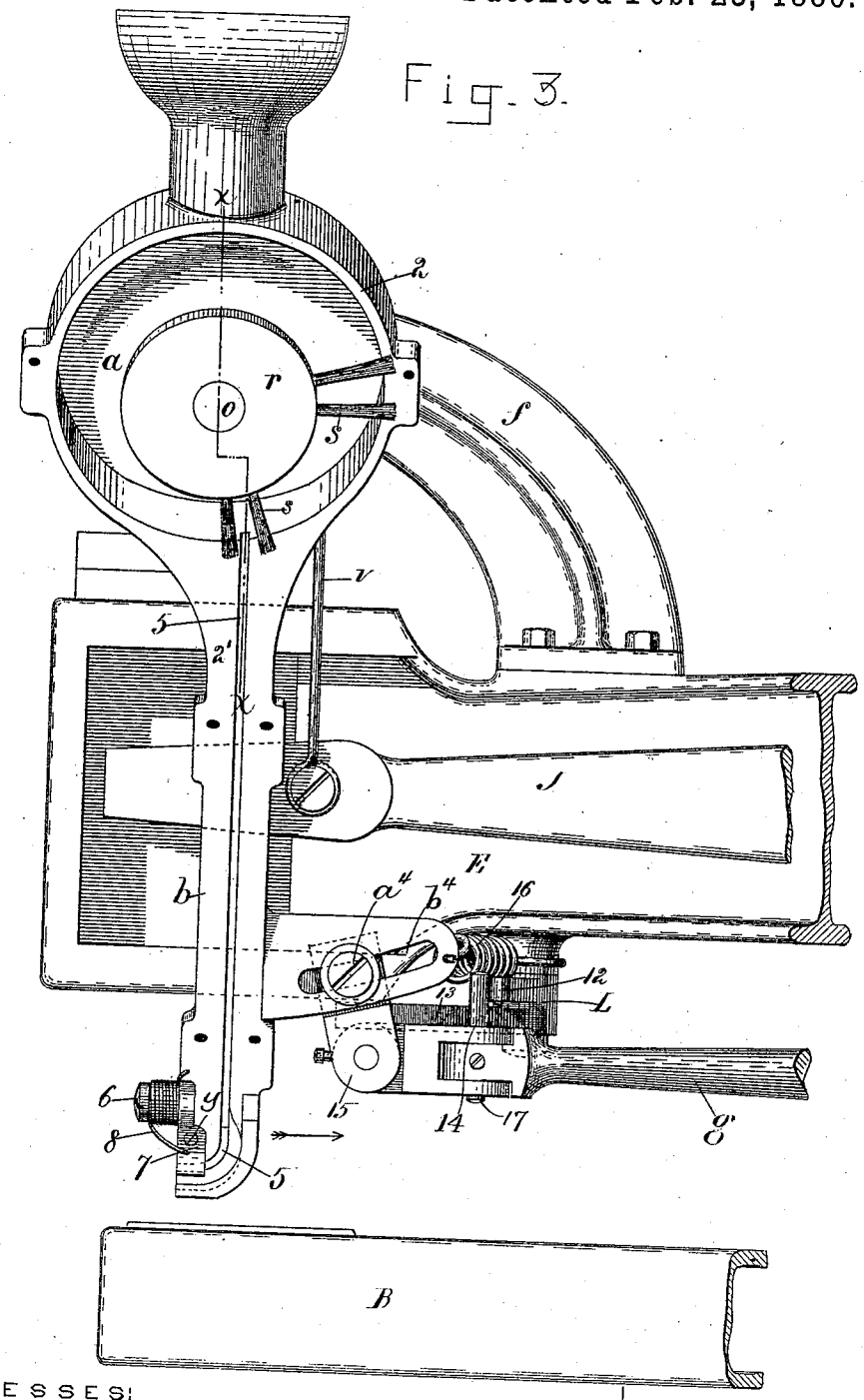
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Fig. 3.



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Fig. 4.

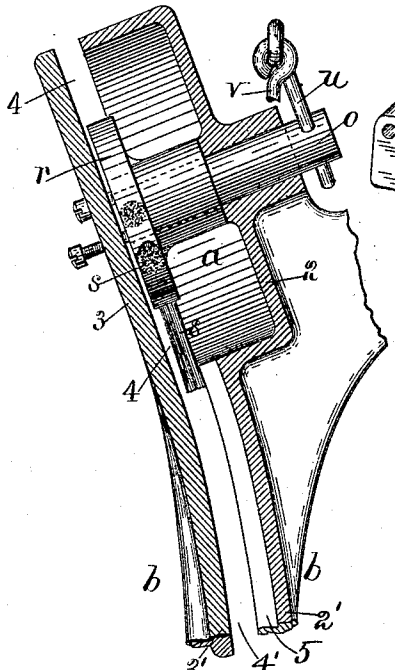
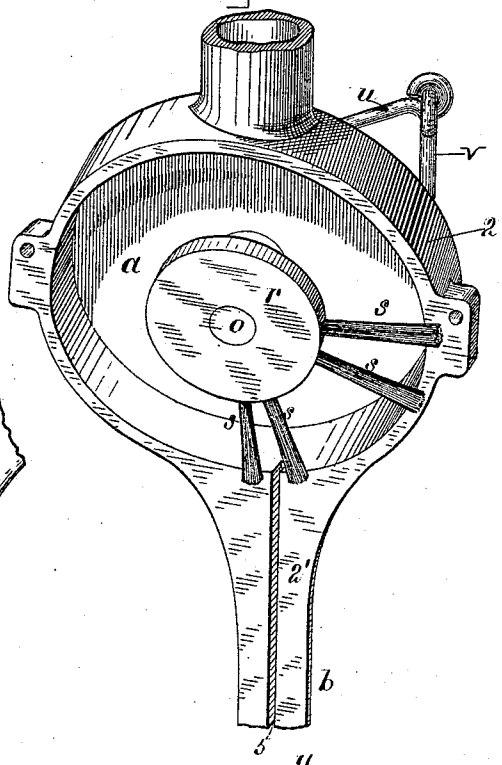


Fig. 5.



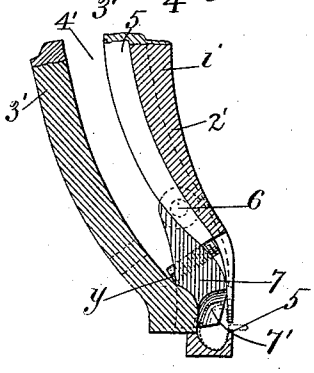


Fig. 7.

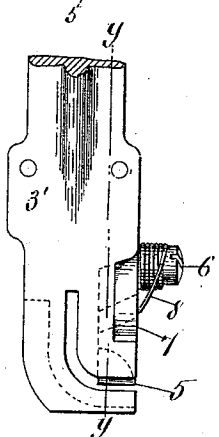


Fig. 6.

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Fig. 8.

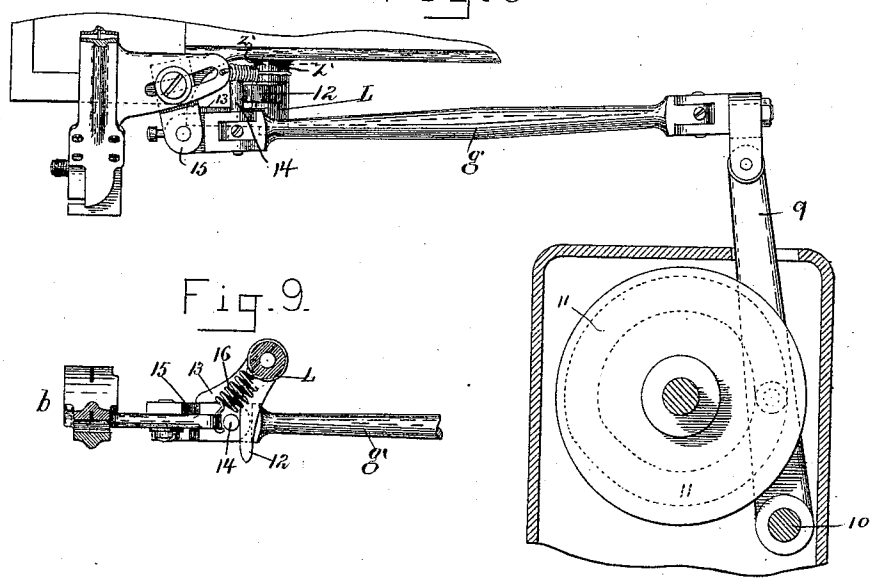


Fig. 9.

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UNITED STATES PATENT OFFICE.

JOSEPH MATHISON, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE STANDARD BUTTON FASTENING COMPANY, OF PORTLAND, MAINE.

MACHINE FOR SEWING ON BUTTONS.

SPECIFICATION forming part of Letters Patent No. 336,881, dated February 23, 1886.

Application filed September 24, 1885. Serial No. 178,085. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MATHISON, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Sewing on Buttons, of which the following is a specification.

This invention relates to button-fastening machines having a reservoir to hold a supply of buttons and provided with a raceway to guide the buttons to the point where they are taken by the needle, the reservoir and raceway being movable and provided with mechanism whereby the lower end of the raceway is moved alternately from and toward the needle, the movement of the raceway from the needle being effected while a loop of thread is held in the eye of the lower button in the raceway by the raised needle, so that said button is withdrawn from the raceway by the retreating movement of the raceway. The movement toward the needle effected while the needle is raised brings the eye of the lowest button in the raceway under the needle, so that the latter in descending passes through said eye preparatory to drawing up a loop of thread through it.

An example of this class of machines is shown in Letters Patent No. 268,369, granted to me November 28, 1882, the machine therein shown having a long raceway supported with the button-reservoir by a post at the rear portion of the machine, and pivoted to said post so as to be capable of oscillating thereon laterally, the post being reciprocated so as to impart positive longitudinal reciprocating movement to the raceway, said movement, in connection with certain auxiliary devices, causing the raceway to oscillate laterally, a compound movement being thus effected whereby the lower end of the raceway is caused to alternately approach and recede from the needle.

The present invention has for its object to provide a reservoir and raceway of less bulky construction capable of operating with less resistance and friction than that shown in my former patent, and having a shorter and more abruptly inclined raceway, so that the buttons will be less liable to become clogged while passing down to the delivering end.

To these ends my invention consists in a combined reservoir and raceway pivoted to the outer end of the neck or arm which supports the needle and presser-foot, so as to be capable of oscillating in a vertical plane, and the mechanism whereby said reservoir and raceway are oscillated on their pivot by the driving-shaft of the machine, the oscillating movement causing the lower end of the raceway to move alternately toward and from the needle.

The invention also consists in certain details, all of which I will now proceed to describe.

Of the accompanyings drawings, forming a part of this specification, Figure 1 represents a rear side elevation of a machine provided with my improvement. Fig. 2 represents an enlarged end elevation. Fig. 2ª represents a section on line *z z*, Fig. 2. Fig. 3 represents a side elevation of a part of the machine, a part of the reservoir and raceway being removed. Fig. 4 represents a section on line *x x*, Fig. 3. Fig. 5 represents a perspective view of a part of the reservoir; and Fig. 6 represents a side elevation of the lower portion of the raceway. Fig. 7 represents a section on line *y y*, Fig. 6. Fig. 8 represents a side elevation of a portion of the machine, showing the devices for oscillating the raceway. Fig. 9 represents a section on line *z' z'*, Fig. 8.

The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents the supporting-frame, having the narrow elongated work-supporting arm B, which contains the thread-carrier and tension devices.

E represents the neck or arm supporting the needle-bar F and presser-bar *j*, and also supporting the cast-off bar.

The operation of said bars as well as that of all the parts of the machine, excepting the button raceway and reservoir, are fully described in my former patent, and in a pending application, Serial No. 178,084, filed by me herewith, to which reference is made for a fuller description.

a represents the button-reservoir, and *b* the raceway rigidly attached thereto. The reservoir is composed of a body, 2, and a back plate, 3, separated by a slot or space, 4, around the margin of the reservoir. The raceway has an arm, *b'*, which is pivoted at *c*, Fig. 2, to

ears *d d* on a stud, *e*, which is journaled in an arm, *f*, rigidly attached to the neck or arm E of the machine, the pivot *c* and stud *e* being at right angles with each other, so that the raceway is capable of oscillating toward and from and parallel with the arm E, the described connection of the raceway to the arm constituting a double joint. The raceway extends downwardly from the reservoir, and is composed of two parallel side pieces, 2′ 3′, separated by a slot, 4′, adapted to receive the heads of the buttons. The side piece, 2′, is provided with a slot or groove, 5, adapted to receive the eyes of the buttons, said groove being cut through the piece 2′ at the lower end of the raceway to permit the eyes of the buttons to project from the raceway, and curved so as to cause the eye of each button to stand horizontally when it reaches the lower end of the raceway, the eye being thus adapted to receive the descending needle, as hereinafter described.

To the side 2′ of the raceway is pivoted at 6 a gate, 7, which is forced by a spring, 8, against a rigid part of the raceway, and thus caused to stand across and partially obstruct the lower end of the slot 4′, and thus prevent the buttons from passing out from the slot unless drawn out by a force sufficient to displace the gate, as hereinafter described. The gate 7 is a solid or inelastic block of metal, which swings in a plane at right angles to the line in which the buttons move in passing out from the raceway. Consequently it is not liable to be displaced by the ordinary pressure of the buttons against it caused by the jar or vibrations of the machine, a greater force being required to displace it than could originate within the reservoir or raceway, or be caused by the jar of the machine. The gate has a cavity or socket, 7′, Fig. 7, in that end that constitutes the button-stop. Said cavity is formed to fit accurately against the sides of the button-heads, and insures the stoppage of the lower button at the precise point required to cause the eye thereof to receive the descending needle. It is obviously a matter of much importance that the lower button be accurately located with reference to the needle. The gate has a screw, *y*, which projects through its inner side and constitutes an adjustable stop bearing against the piece 2′ of the raceway, and limiting the extent to which the gate is moved by its spring toward the part 2′, and thus determining the initial position of the cavity 7′ and enabling it to be adjusted to the thickness of the heads of the buttons. There is sometimes a slight difference between the sizes of the heads of different lots of buttons, and as the gate 7 should stand so that the wall of the cavity 7′ in its normal position will receive the head of the lower button and hold it well forward, so that the eye will project properly from the slot 5, the importance of the means of adjusting the initial position of the gate 7 will be obvious.

The back plates, 3 and 3′, of the button-reservoir and raceway are formed in a single piece, which is secured to the bodies 2 and 2′, (which are also in a single piece) by screws S S passing through the plates 3 3′ into tapped orifices in the parts 2 and 2′. Screws S′ S′, working in tapped orifices in the parts 3 3′ and bearing at their inner ends against the parts 2 2′ without entering said parts, co-operate with the screws S S in holding the parts 3 3′ at any desired distance from the parts 2 2′, so that the width of the slots 4 4′ may be varied to correspond to variations in the sizes of different lots of heads.

The raceway and reservoir are oscillated on the stud *e* by means of a lever, 9, pivoted at 10 to the frame of the machine, a cam-groove, 11, in a disk on the driving-shaft R, receiving a roller on said lever, and a connecting-rod, *g*, connecting the lever 9 with an ear, 15, attached to the raceway. The rotation of said cam causes the lever 9 to oscillate, and communicates a like oscillating movement to the raceway through the rod *g*. The movements thus imparted to the raceway would be parallel with the length of the arm E, but for a two-armed lever, L, Figs. 8 and 9, pivoted to the under side of the neck or arm E of the machine and adapted to oscillate horizontally. The arm 12 of said lever is struck by a pin, 14, on the connecting-rod *g* when said rod and the raceway are moving in the direction indicated by the arrow in Fig. 3. The lever L is thus turned on its pivot, so that its other arm, 13, presses outwardly on the ear 15, to which the connecting-rod *g* is pivoted, and thus causes the raceway to swing outwardly from the presser-foot while it is moving backwardly. A spring, 16, connecting an arm on the raceway with the neck or arm E, normally draws the raceway inwardly toward said arm, so that when the raceway is swung forward the spring draws it inwardly to its proper position beside the needle. The connecting-rod *g* is pivoted at 17 and 18, so that it conforms to the movements of the raceway caused by the two-armed lever L and spring 16. The ear 15, to which the connecting-rod *g* is pivoted, is adjustably secured to the raceway *b* by means of a bolt, *a*⁴, and an arm attached rigidly to said raceway, and having a slot, *b*⁴, receiving said bolt. Said slot enables the ear 15 to be secured at various distances from the raceway, and thus enables the initial position of the raceway, or that which it occupies when presenting the eye of the button to the descending needle, to be adjusted as circumstances may require.

The space between the attached buttons on the work is determined by the position of the needle when it enters the work preparatory to feeding it, and the needle is capable of adjustment so as to enter the work at a greater or less distance from the outer end of the work-supporting arm, as described in my other application.

The adjustable connection between the raceway and the connecting-rod *g* enables the race-

way to be adjusted to correspond with any adjustment of the needle-bar.

Other devices may be employed for adjusting the initial position of the raceway. For example, the connecting-rod *g* may be made capable of being lengthened or shortened.

The needle and cast-off bars are mounted in a horizontal movable carrier in the arm E, said carrier being moved horizontally while in the work to cause the needle to move or feed the work, as described in my pending application above referred to.

The oscillating movements of the raceway produced by the above-described mechanism, are timed as follows: The lower end of the raceway is held in position to present the eye of the lower button to the descending needle prior to the formation of the first stitch. After the needle has drawn up a loop or thread through the eye of the button, and has moved forward and passed down outside of the eye of the button and through the loop thus drawn up, the raceway is moved, by the devices above described, backwardly and outwardly before the depressed needle makes its work-feeding movement, as described in my other application, the loop drawn through the eye of the last button being thus caused to pull said button past the yielding spring-gate 7 and out of the raceway. While the needle is making the feed movement the raceway remains in the position to which it was last moved, and returns to its original position after the button has been completely attached, and while the needle is raised preparatory to its descent through the eye of the next button.

It will be observed that the location of the reservoir at the outer end of the arm E enables a much shorter and lighter raceway to be employed than heretofore, the descent of the raceway being very abrupt—in fact, almost vertical—so that the buttons move more positively downward than in a raceway having a more gentle inclination.

The described connection of the raceway to the arm E by means of the two pivots constituting a double joint enables the raceway to oscillate freely in any desired direction.

The machine is considerably simplified and made to operate more easily than heretofore, so far as the raceway and its movements are concerned.

The button-agitator in the reservoir is composed of a hub, *r*, mounted on a stud, *o*, and tufts of bristles *s*, radiating from the hub. The agitator is oscillated by a connection with the oscillating lever J, which operates the needle-bar, as described in my former patent, said connection being composed of an arm, *u*, secured to the stud *o* of the agitator, and a connecting-rod, *v*, pivoted to the outer end of said arm and to the lever J, as shown in Figs. 1, 3, 4, and 5.

I do not limit myself to the application of the described improvements in the button reservoir and raceway to a machine otherwise of the construction shown in my former patent, or my other application, but reserve the right to modify the construction and operation of the machine, or to apply the improved reservoir and raceway to other button-fastening machines on which it is capable of use whether said machines use thread or metallic fastenings. Neither do I limit myself to the pivoting of the reservoir and raceway to a fixed support directly over the loop-forming mechanism, as the pivotal connection may be located at any other suitable point, and may be of such nature as to permit the raceway to swing in but a single plane instead of having the compound movement described.

I claim—

1. In a button-fastening machine, the combination of a work-support button-fastening mechanism, substantially as described, a fixed arm above the work-support, a button reservoir and raceway, a joint or pivotal connection between said fixed arm and the reservoir and raceway over the fastening mechanism, and mechanism, substantially as described, whereby said reservoir and raceway are oscillated, as set forth.

2. In a button-fastening machine, the combination of a work-support button-fastening mechanism, substantially as described, a fixed arm above the work-support, a button reservoir and raceway connected to said arm by a double joint comprising two pivots at right angles to each other, the reservoir and raceway being adapted to oscillate on either or both pivots, and mechanism, substantially as described, whereby said reservoir and raceway are oscillated, as set forth.

3. The combination of the reservoir and raceway connected to a fixed support by a double joint, the jointed connecting-rod secured to said raceway, means, substantially as described, for reciprocating said rod and thus oscillating the raceway, and the two-armed lever pivoted to a fixed support, one arm of said lever bearing against a projection on the connecting-rod, and the other on an attachment to the raceway, as set forth.

4. The reservoir and raceway composed of the body 2 and side piece, 2′, formed in one piece, said side piece having a button-eye-guiding slot, 5, and the back plate, 3, and side piece, 3′, formed in one piece and separated from the body 2 and side piece, 2′, by a continuous slot or opening, 4 4′, as set forth.

5. The combination of the raceway connected by a double joint to a fixed support, the loop-forming mechanism, the work-support, the two-armed lever L, the spring 16, and the jointed connecting-rod, and means for reciprocating it, one arm of said lever bearing against an attachment on the rod, and the other against an attachment on the raceway, as set forth.

6. The raceway having the button head and eye guiding slots combined with the rigid or inelastic gate 7, pivoted to the raceway and provided with a spring, 8, whereby it is pressed against a rigid part of the raceway and caused

to stand normally across the lower end of the button-head-guiding slot, and with a socket, 7′, formed to fit a button-head, the arrangement being such that the heads of the buttons pass into the socket 7′ and are positively held thereby in position to receive the needle, as set forth.

7. The combination of the raceway having the button head and eye guiding slots, the rigid or inelastic gate pivoted to the raceway and provided with the socket 7′, and with the spring 8, which normally holds the gate with its socket in position to receive the button-heads as they pass down said slot, and the adjustable screw or rigid stop *y*, which limits the closing movement of the gate and thereby enables the socket to receive buttons of different sizes without interfering with the opening movement of the gate, as set forth.

8. The raceway and reservoir composed of the separate front and back parts combined with the screws, whereby said parts are connected, and the bearing-screws, whereby the width of the button-guiding space between said parts may be raised, as set forth.

9. The combination of the reservoir and raceway mounted to oscillate as described, a connecting-rod pivotally secured to said raceway, mechanism whereby said rod is reciprocated and the raceway thereby oscillated, and means, substantially as described, whereby the distance between the raceway and the end of the connecting-rod that is connected to the operating mechanism of said rod may be varied, as set forth.

10. The combination of the reservoir and raceway mounted to oscillate as described, and provided with the slotted arm, the connecting-rod adjustably secured to said slotted arm, and means, substantially as described, for operating said connecting-rod, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of September, 1885.

JOSEPH MATHISON.

Witnesses:
C. F. BROWN,
H. BROWN.