

J. H. DRAEGER.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 245,359.

Patented Aug. 9, 1881.

Fig: 1.

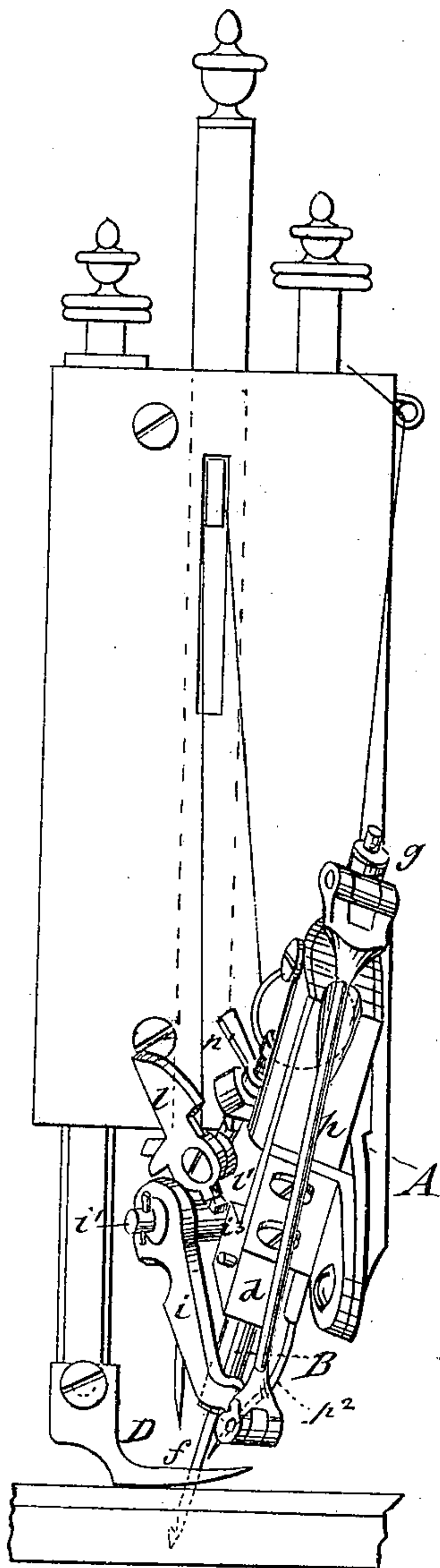


Fig: 2.

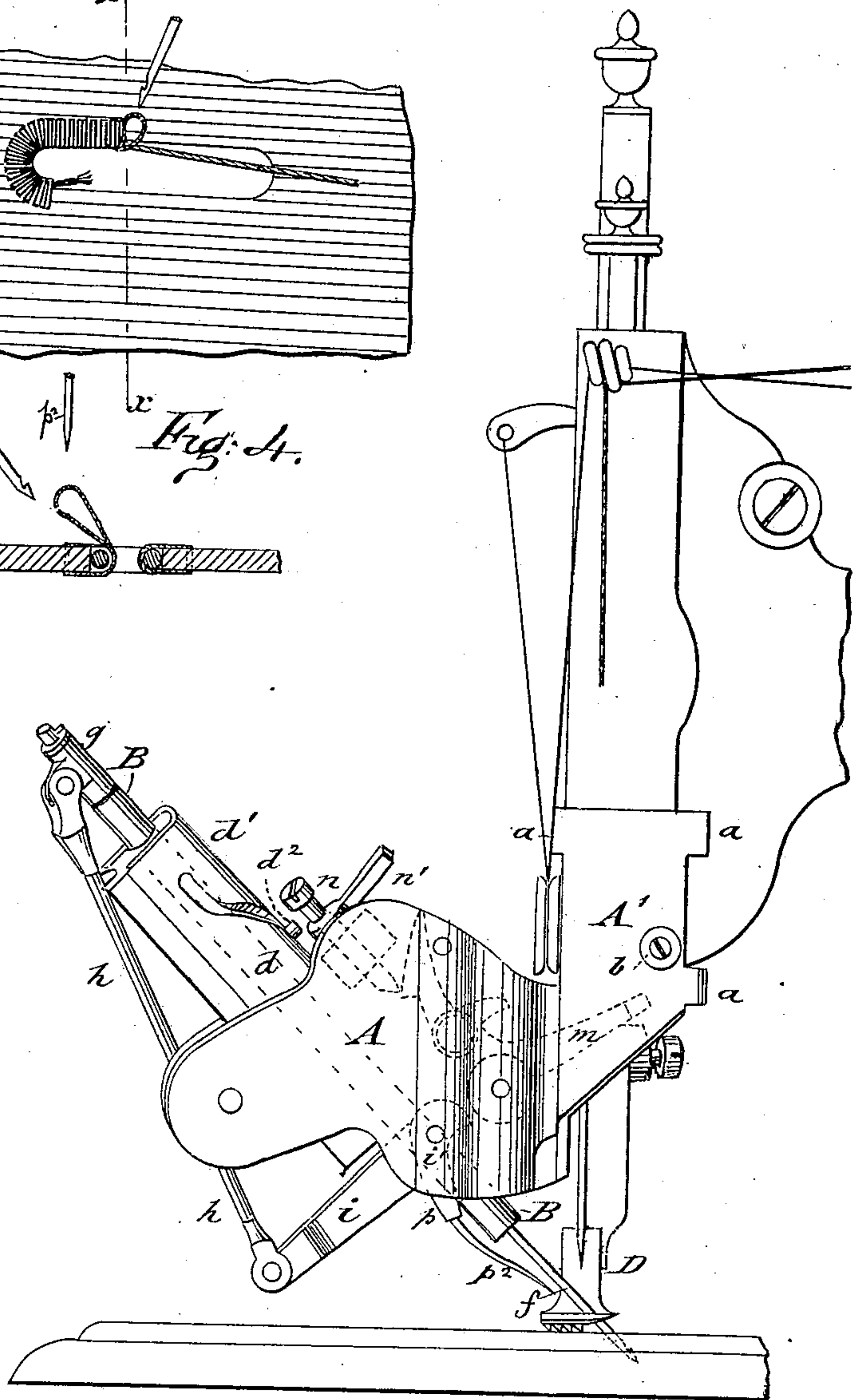


Fig: 3.

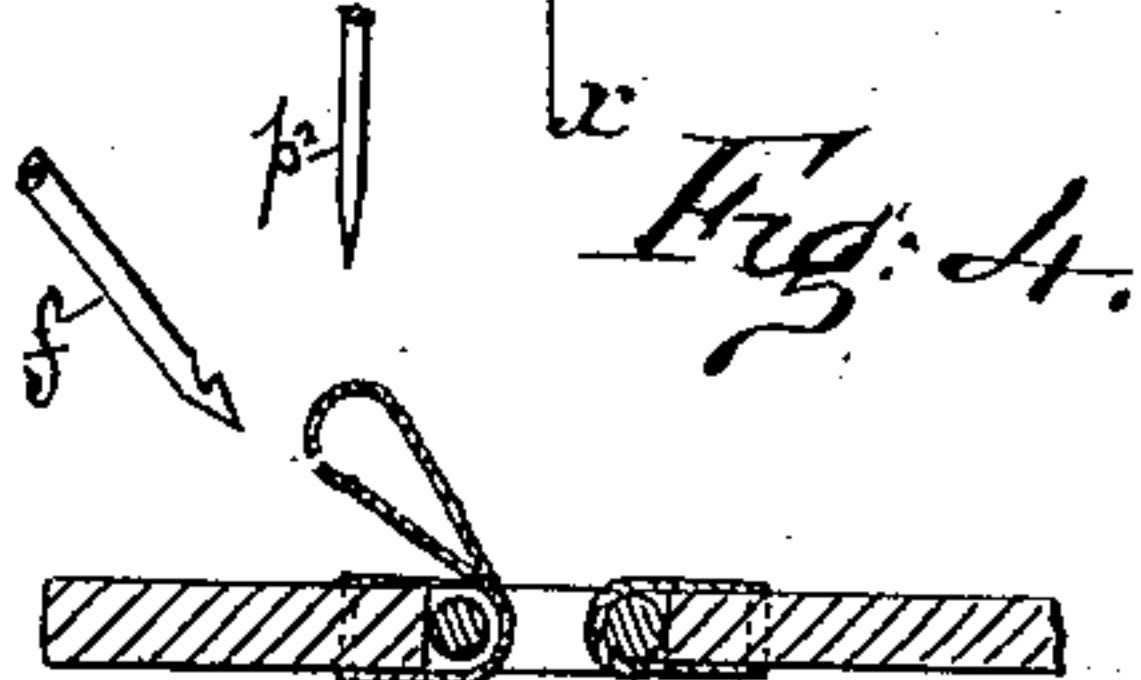
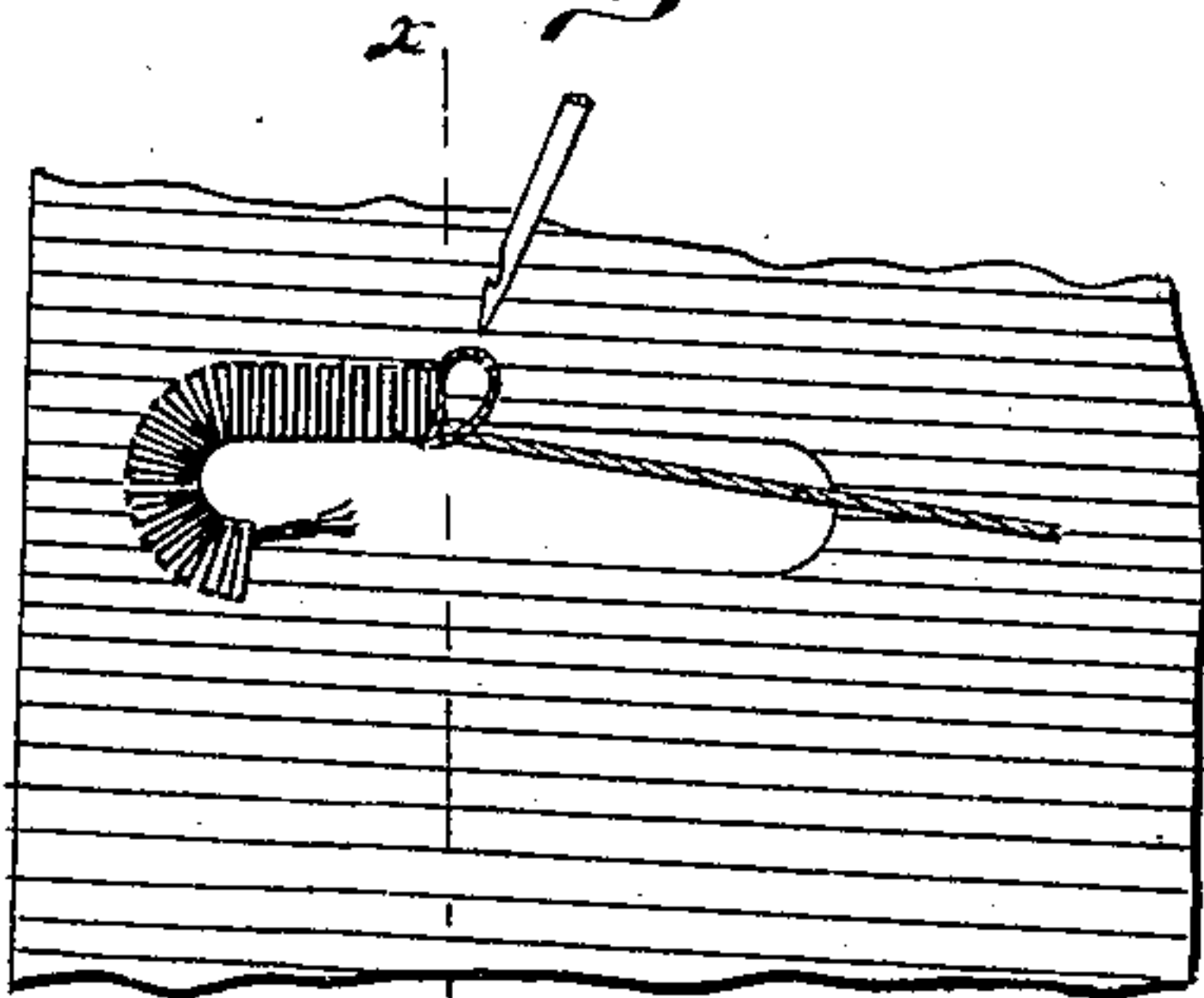


Fig: 4.

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Fig. 5.

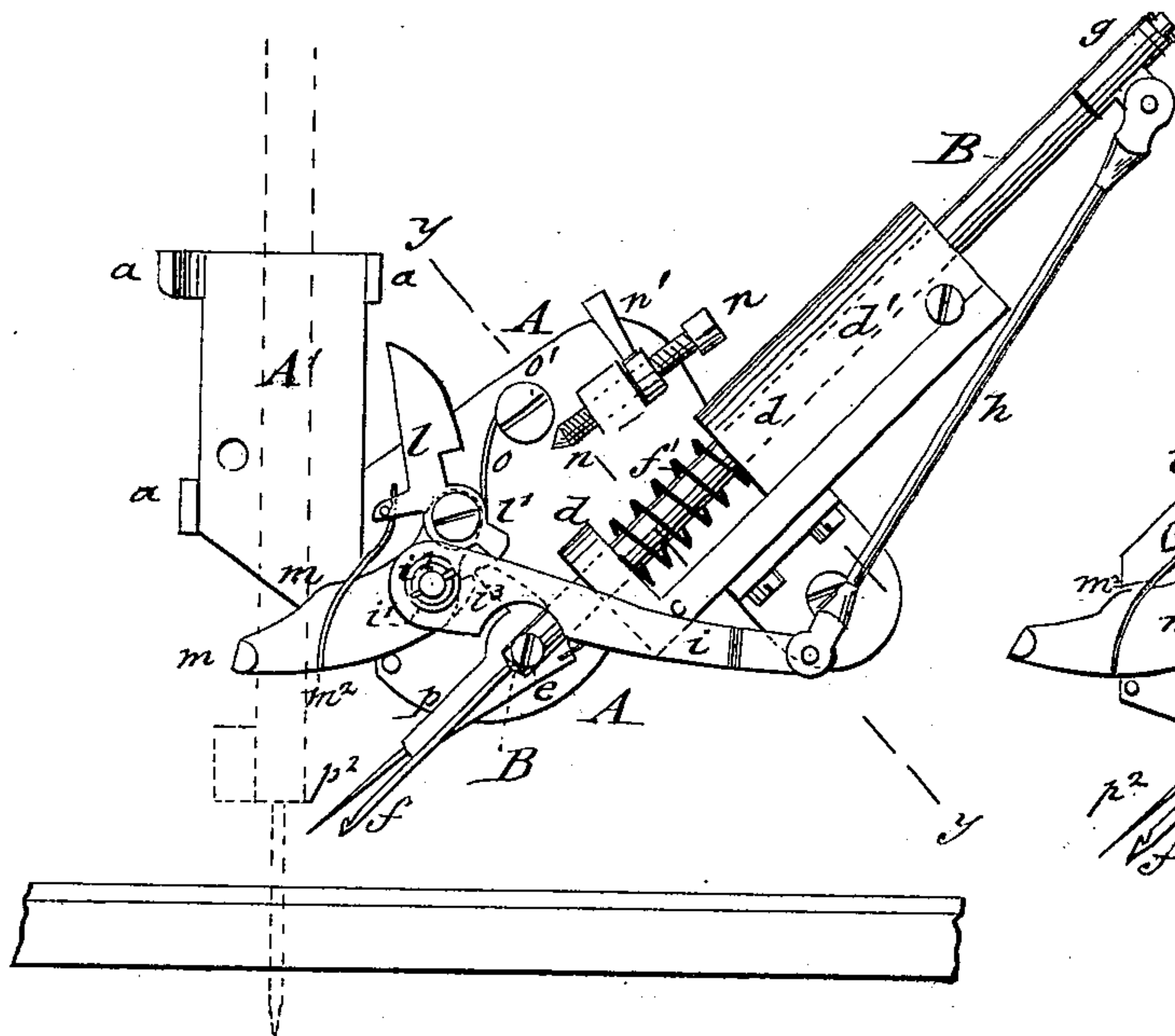


Fig. 6.

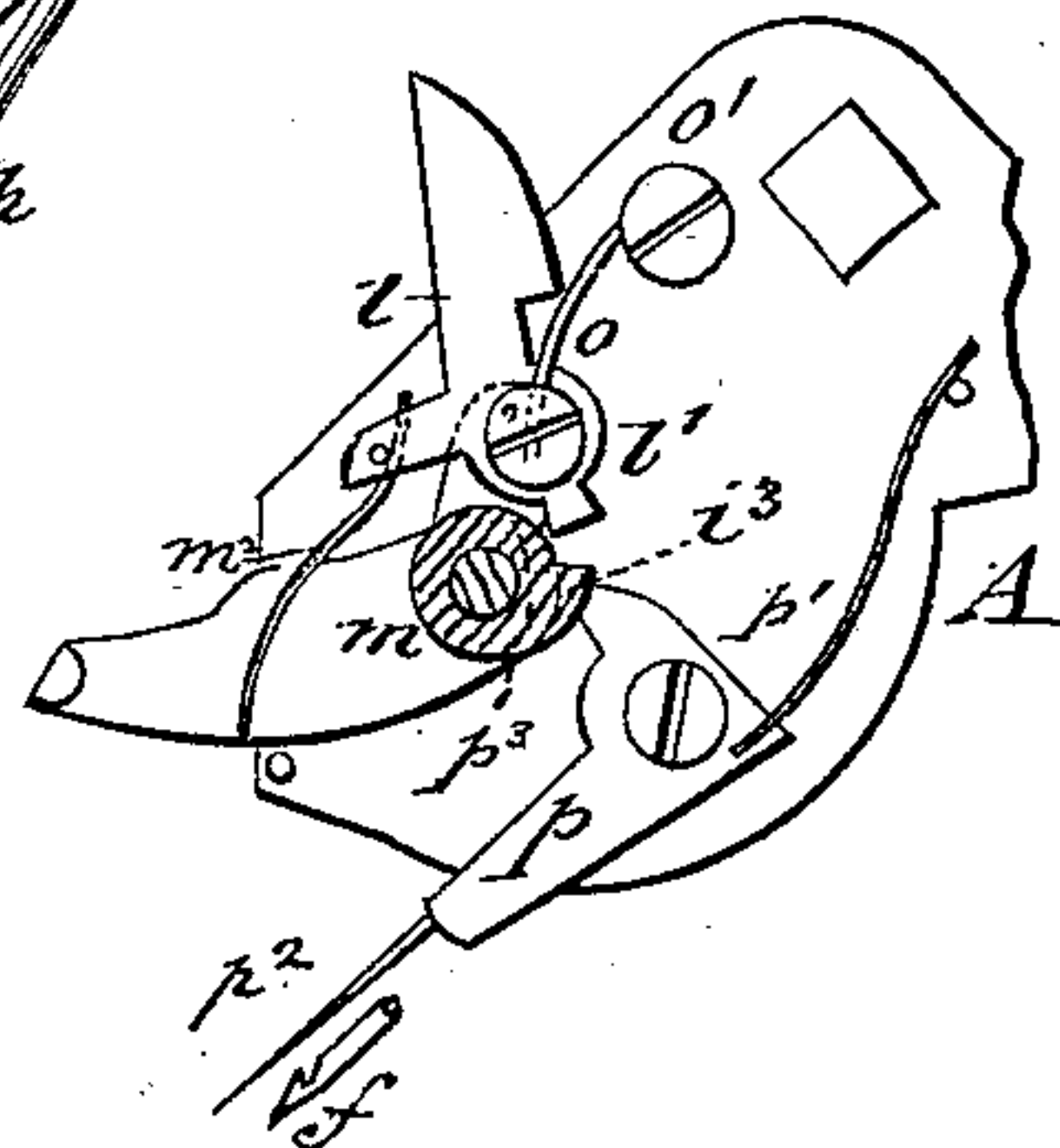


Fig. 7.

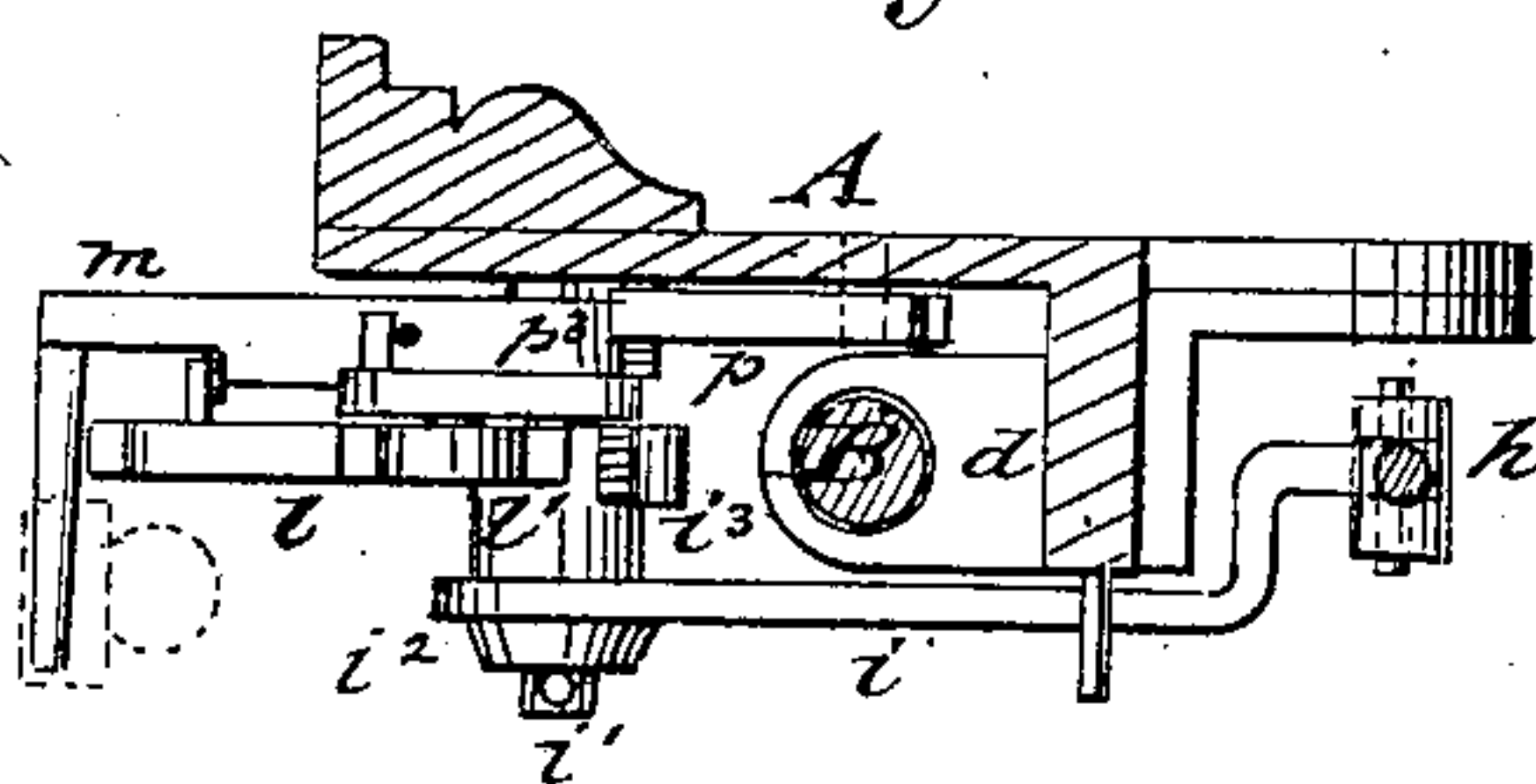


Fig. 8.

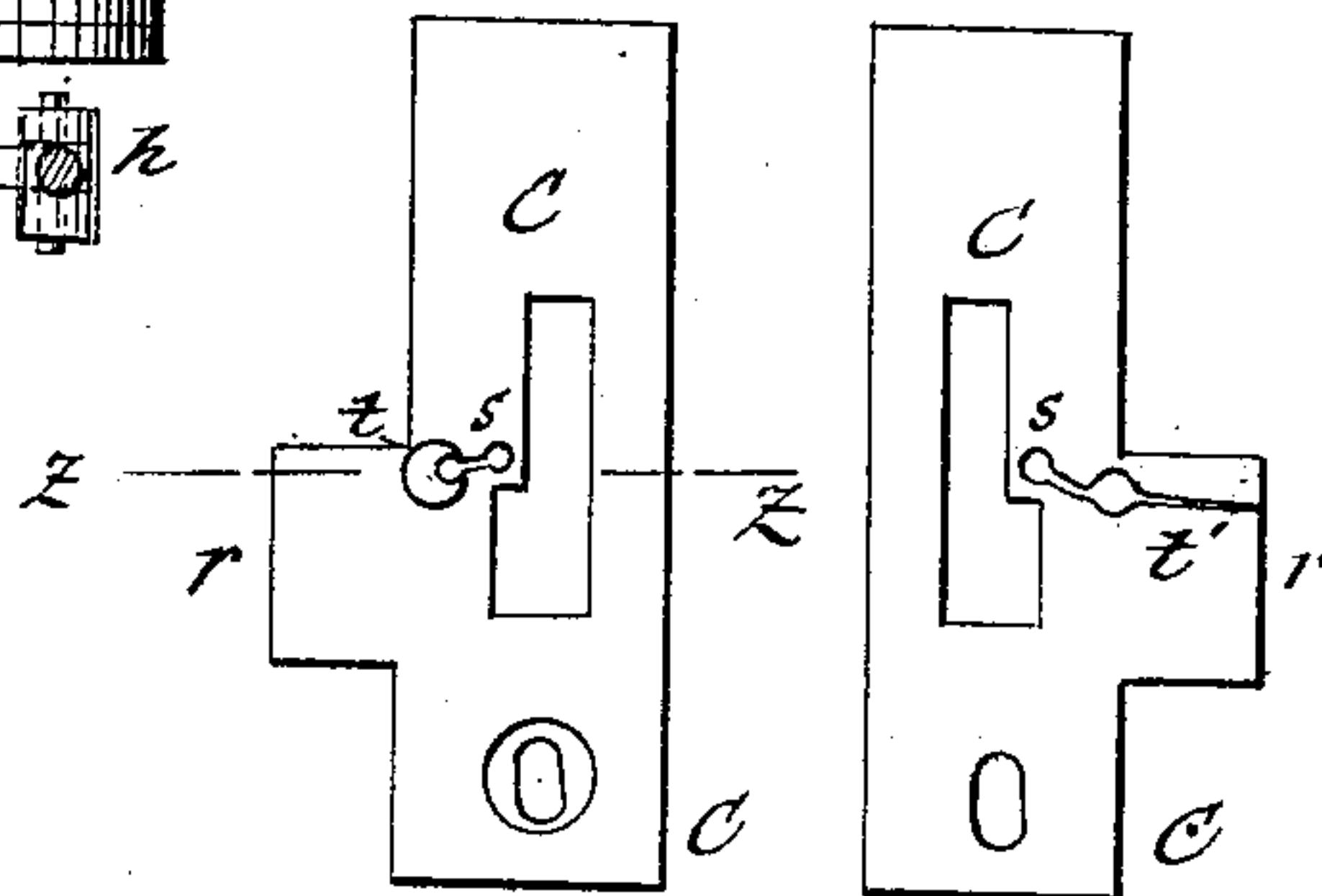
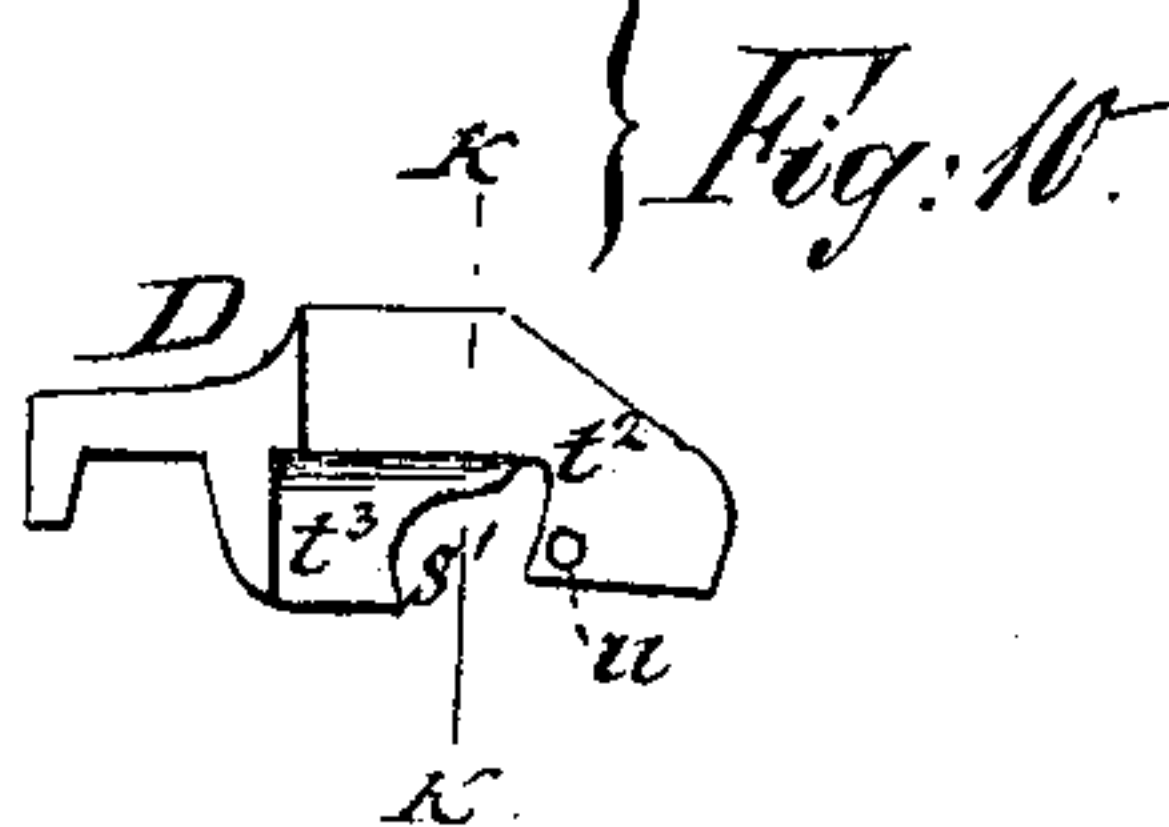
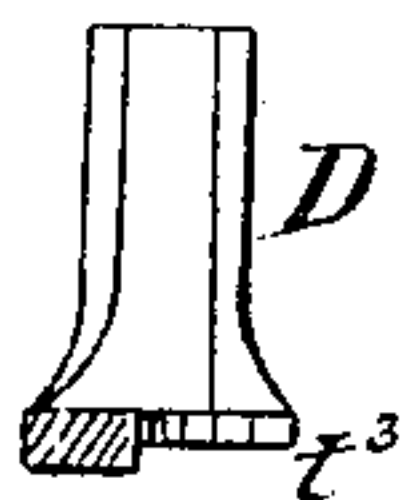


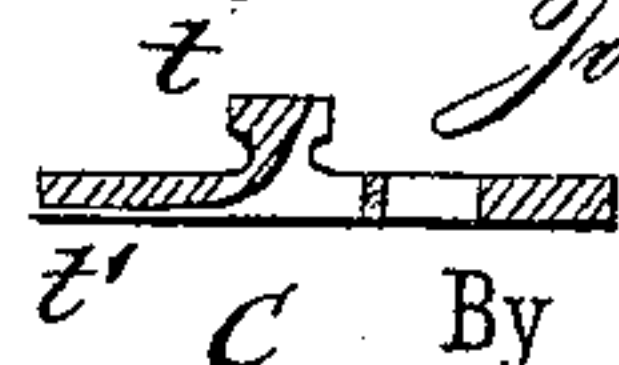
Fig. 11.



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Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHANN H. DRAEGER, OF KIRCHWÄRDER, ASSIGNOR TO GEORGE NEIDLINGER, OF HAMBURG, GERMANY.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 245,359, dated August 9, 1881.

Application filed February 19, 1880. Patented in Germany September 21, 1879, and in England October 1, 1879.

To all whom it may concern:

Be it known that I, JOHANN HEINRICH DRAEGER, of Kirchwärder, State of Hamburg, German Empire, have invented Improvements in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

This invention has reference to an improved button-hole attachment for sewing-machines, the same being mainly adapted for use with the Singer sewing-machine, and applicable thereto without necessitating any change in the construction of the essential parts of the same. The attachment may, however, also be applied, with slight modifications, to sewing-machines of other systems, it serving to facilitate the sewing of button-holes in a considerable degree.

The invention consists, mainly, in a button-hole attachment for a sewing-machine wherein certain novel devices, hereinafter explained, are employed for giving a rectilinear reciprocating motion, and also axillary motion, to a needle-bar bearing a hooked needle, in combination with which is a vibrating casting-off needle, the said parts being operated in such manner that the hook takes hold of the shuttle-thread and draws the same in a loop over a face-cord of the button-hole, while the casting-off needle throws off the shuttle-thread after it is secured by the needle-thread of the machine.

The invention also consists of a presser-foot having an enlarged recess for the free play of the hooked needle, an eye for the face-cord, and a cut-away portion at the under side, as will be more fully explained hereinafter.

In the accompanying drawings, illustrating my invention, Figure 1 represents an end view, and Fig. 2 a side elevation, of my improved button-hole attachment, shown as attached to the head of a sewing-machine. Figs. 3 and 4 represent a top view and a vertical transverse section on line *x x*, Fig. 3, of a button-hole, showing the stitch made by the attachment. Fig. 5 is a rear elevation of the attachment, detached from the sewing-machine. Fig. 6 is a detail view of the working mechanism of the hooked needle and throwing-off needle. Fig. 7 is a transverse section of the same on line *y*

y, Fig. 5. Fig. 8 represents top and bottom views of the needle-plate; Fig. 9, a vertical transverse section of the same on line *z z*, Fig. 8. Fig. 10 represents top and bottom views of the presser-foot; and Fig. 11 a vertical transverse section of the same on line *k k*, Fig. 10.

Similar letters of reference indicate corresponding parts.

The working parts of the button-hole attachment are supported in an inclined position relative to the table of the sewing-machine on a frame, A, which is attached to the head of the sewing-machine by an extension-plate, A', having three clasp-pieces, *a a*, and by a clamp-screw and washer, *b*, as shown in Figs. 2 and 5.

On the frame A are guide-bearings *d d* for the inclined needle-bar B, which carries at its lower end, by means of a socket and clamp-screw, *e*, a hook-shaped needle, *f*. The upper bearing *d* of the needle-bar is enclosed by a fixed sleeve, *d'*, having a spirally-curved slot, through which a guide-pin, *d''*, of the inclined needle-bar B projects, said guide-pin and curved slot serving to impart to the needle-bar an axially-turning motion through a quadrant of a circle, simultaneously with the up-and-down motion of the same.

Below the guide-pin *d''* is placed around the needle-bar a spiral spring, *f'*, the lower end of which rests on the lower guide-bearing *d* of the needle-bar, and the upper end against the pin *d''*, so as to impart to the needle-bar a movement in upward direction.

The needle-bar B is inclosed at its uppermost end by a sleeve, *g*, which is connected by a pivoted connecting-rod, *h*, with the lower end of a lever, *i*. This lever *i* turns on a pivot-pin, *i'*, which is attached by a screw-nut, *i''*, to the supporting-frame A. The hub of the lever *i* is provided back of the lever with a cam-shaped projection, *i'''*, against which is pressed at each upward motion of the needle-bar of the machine the projection *l'* of a spring-pawl, *l*. The spring-pawl *l* is pivoted to the shorter arm of a fulcrumed elbow-lever, *m*, the longer arm of which forms, by a projection at its outer end, the connection with the clamp-screw of the needle-bar of the machine, so that at each upward motion of the needle-bar the elbow-lever

is carried upward, and thereby the spring-pawl and lever downward, they imparting at the same time to the needle-bar of the attachment a downward motion, it being turned simultaneously axially by the guide pin and slot, so as to take up the shuttle-thread by the hook-shaped end of the needle of the attachment. The elbow-lever m is fulcrumed to the same pivot-pin as the lever i , while a small spring, m^2 , which presses on the pawl l , serves to keep the projection l' of the same continually in contact with the cam i^3 on the hub of the lever i until the pawl is released therefrom, after which the inclined needle-bar is quickly returned into the former raised position by its spring. The return of the needle-bar B is produced by the contact of the pawl l , when the lever i and the inclined needle-bar B are at their lowermost position, with an adjustable screw-stop, n , which holds the pawl back and admits the return of the needle-bar. The stop-screw n is retained in its position by a nut adjusted by a lever, n' . A spring, o , which is bent into spiral shape back of the screw-head o' , bears with its free lower end against the elbow-lever m , and forces the same down to keep up the connection with the needle-bar of the machine, so that the elbow-lever follows the up-and-down motion of the same.

The hub of the elbow-lever m is also provided with a recessed cam, p^3 , which acts upon an angular lever, p , that is fulcrumed to the main frame A back of the needle-bar. Upon the upper end of the lever p presses a spring, p' , while the lower socket-shaped end of the lever carries the curved throwing-off needle p^2 . During the downward motion of the needle-bar one arm of the angular lever p is thrown by its spring into a recess of the cam of the elbow-lever m , and thereby moved away from the hook-shaped needle, the throwing-off needle being retained in position away from the hooked needle until the latter has engaged the shuttle-thread, which is carried up with the hooked needle in the shape of a loop. When the machine-needle has passed through the loop the cam of the elbow-lever m , in following the machine-needle bar, presses on the end of the angular lever p and carries the throwing-off needle toward and beyond the looping-needle, so as to throw off the loop, as shown in Figs. 3 and 4.

The throat-plate C is of the same shape as that usually employed in Singer machines. It is provided to the right of the shuttle-race with an extension, r , and sidewise of the hole s , for the regular needle of the machine, with a second hole, through which the hook-shaped needle of the attachment descends for engaging the shuttle-thread. The second hole has an annular button-shaped projection, t , along which the edge of the button-hole is guided. Through the projection t is bored a hole at the same inclination as that of the hook-shaped needle, said hole communicating with a tapering extension-groove, t' , at the under side of

the throat-plate. The hole for the hook-shaped needle is connected by a slit with that of the needle of the machine.

The guide-button t may, instead of being affixed to the throat-plate, be made movable in a correspondingly-shaped hole of the same, in which it moves up and down in the same manner as the feed. The guide-button is pressed downward by a spring at the under side of the machine, so that the said button is kept flush with the throat-plate, but lifted by a projection of the shuttle-carrier whenever the hook-shaped needle descends into the shuttle-race. The fabric is guided in its forward motion along the raised button. This modification is not shown in the drawings, but it is for some fabrics preferable to the fixed guide-button.

The presser-foot D has a recess, s' , for the machine-needle, and a second recess, t^2 , for the hook-shaped needle. In the front part of the pressure-foot is arranged a perforation, u , through which passes a heavy thread or cord, which is supplied from a second spool, supported on the main arm of the machine sidewise of the spool of the needle-thread. This cord forms the facing of the edge of the button-hole, and serves to give to the same greater strength. It is covered entirely by the successively laid on loops of the shuttle-thread, the loops being secured to the fabric by the needle-thread. The under side of the presser-foot is cut away at t^3 , at the side toward the button-hole, as shown in Figs. 10 and 11, so as to facilitate the easier forward feeding and turning of the partly-finished portion of the button-hole.

The attachment operates as follows: The hook-shaped needle passes close to the edge of the button-hole downward through the guide-button of the throat-plate into the race of the shuttle, where it takes up the shuttle-thread and lays the same, in returning, over the edge of the button-hole, and in position for the machine-needle, which passes through the loop on descending. The throwing-off needle clears the thread from the hook-shaped needle so that the shuttle can draw, after the needle-thread has interlocked with the shuttle-thread, the latter tightly across the face-cord and edge of the button-hole. When the machine is required for common sewing the button-hole attachment is removed by loosening its clamping-screw.

As before mentioned, the attachment, in its general features, may with but slight modifications be used for other systems of sewing-machines, it performing its functions in a reliable and regular manner.

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

1. The needle-bar B, provided with a sleeve, g , and a helical spring, in combination with the rod h , the lever i , having part i^3 , the lever m , pawl l , and stop n , constructed and arranged substantially as described.

2. In a button-hole attachment for sewing-machines, the actuating elbow-lever m , having a spring-pawl, l , a transmitting-lever, i , having a hub formed with a cam, i^3 , in combination with the needle-bar B, connected thereto, and acted on by a spring and by a pin, d^2 , playing in a slot in sleeve d' , substantially as described.

3. In a button-hole attachment for sewing-machines, the actuating-lever m , having a spring-pawl, l , with projection l' , in combination with a connecting-rod, h , needle-bar B, a transmitting-lever, i , and a releasing-stop, n , substantially as described.

4. In a button-hole attachment for sewing-machines, the actuating-lever m , having recessed cam p^3 and an angular spring-acted lever, p , carrying the throwing-off needle p^2 , in combination with connecting-rod b , sleeve g , and a needle-bar, B, which turns about its axis and also moves endwise, substantially as described.

5. In a button-hole attachment for sewing-machines, the pressure-foot D, provided with recesses s' and t^2 , perforation u , and cut-away

portion t^3 , in combination with the hooked needle f and casting-off needle p^2 , substantially as described.

6. The frame A, bearing a hooked needle and a casting-off needle, in combination with the spirally-slotted sleeve d' , pin d^2 , and spring f' on needle-bar B, rod h , lever m , having a cam, i^3 , and with bearing-pawl l and the adjustable stop n , substantially as described.

7. In a button-hole attachment for sewing-machines described, the throwing-off needle p^2 , having a lever, p , which is pivoted to the main frame and acted on by a cam on the hub of lever i , and a spring, p' , in combination with a rectilinearly-reciprocating and axially-turning hooked needle-bar, provided with pin d^2 , and the sleeve d' , having a curved slot, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN HEINRICH DRAEGER.

Witnesses:

JOHANN CARL HEINRICH SONNTAG,
WILHELM RICHARD WENDEL.