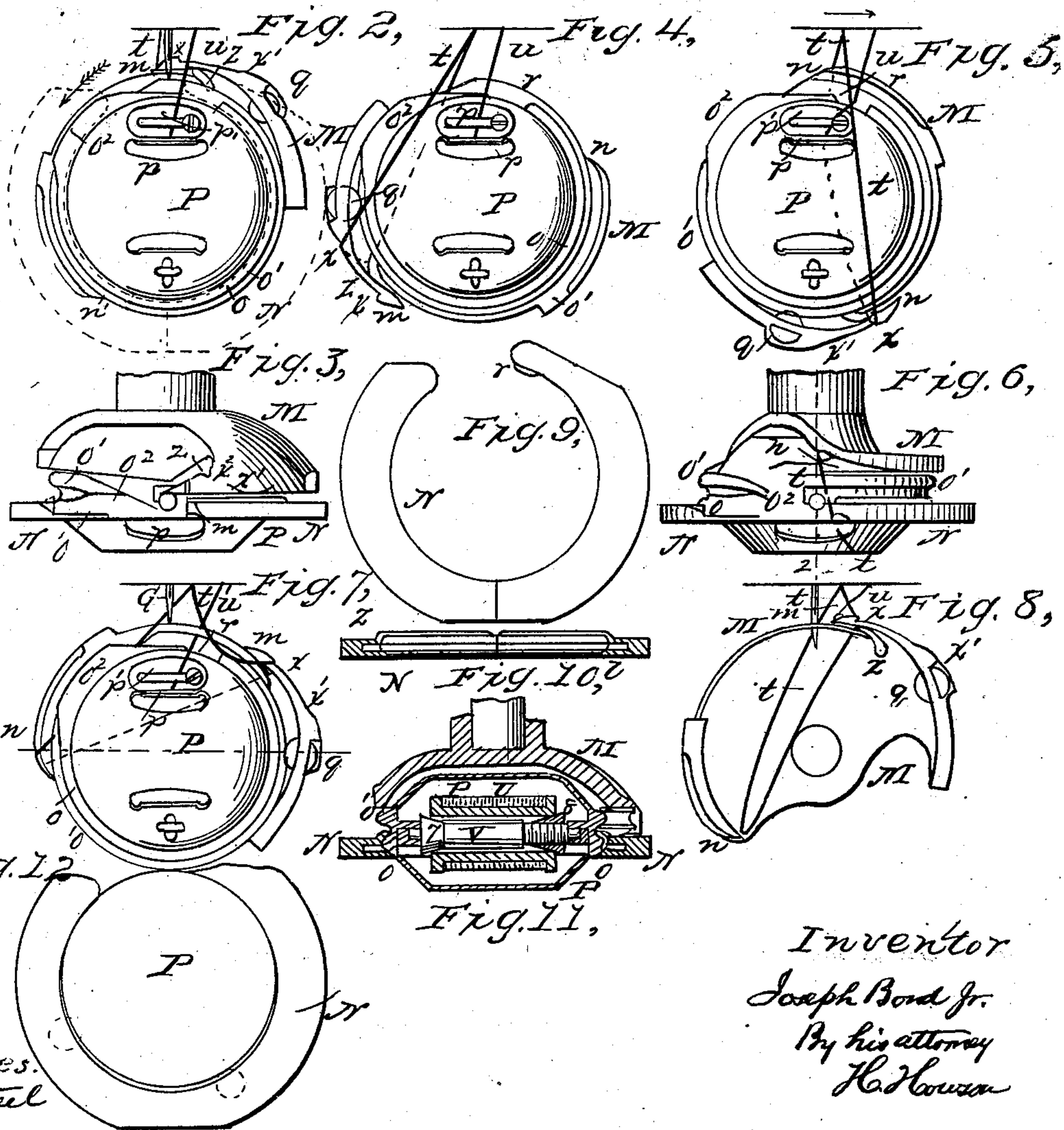
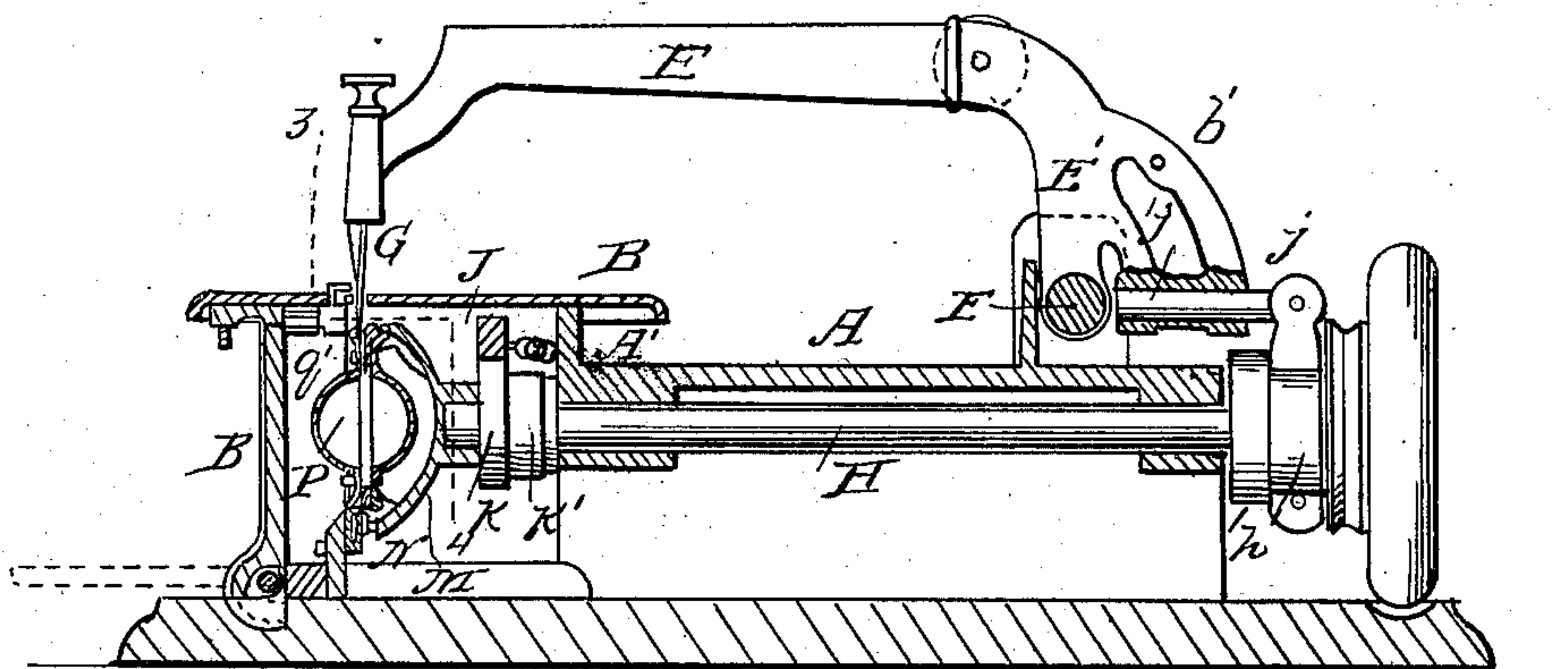


J. BOND, Jr.
Sewing Machine.

No. 93,588.

Patented Aug. 10, 1869.

Fig. 1;



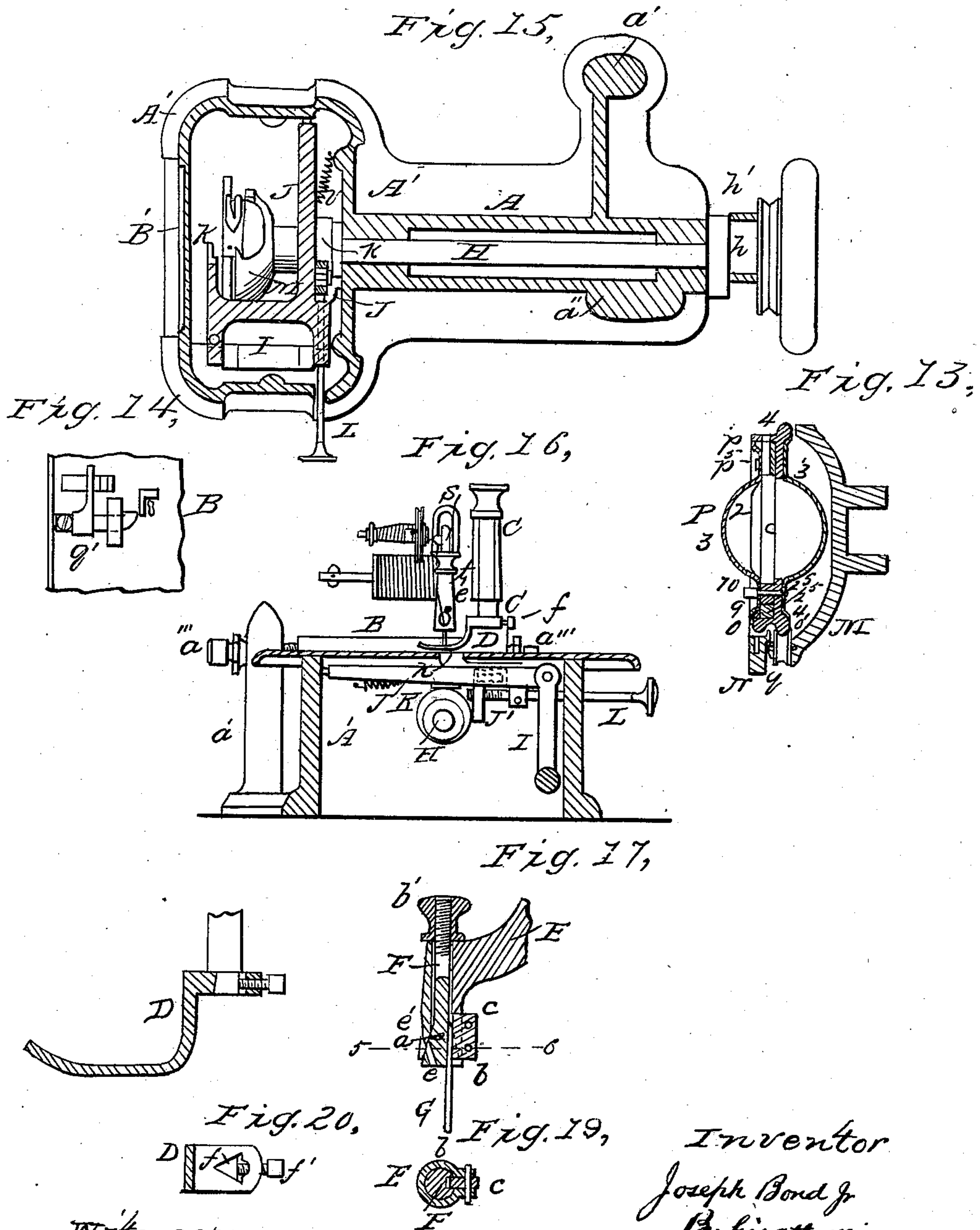
Witnesses.
Wm. Albert Steel
John Parker

Inventor
Joseph Bond Jr.
By his attorney
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United States Patent Office.

JOSEPH BOND, JR., OF NEWARK, NEW JERSEY.

Letters Patent No. 93,588, dated August 10, 1869.

IMPROVEMENT IN SEWING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSEPH BOND, Jr., of Newark, New Jersey, have invented certain Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists—

First, in the combination, with a rotating hook, of a spool-case, constructed substantially as described hereafter, retained by a stationary holder, and having such a motion imparted to it that it will be separated from contact with the holder whenever the loop of thread, carried, by the action of the revolving hook, round the spool-case, passes between the latter and the holder, the imparting of undue friction to the thread being thereby obviated.

Secondly, of a roller, or its equivalent, for imparting the within-described peculiar movement to the spool-case.

Thirdly, of a rib on the spool-case, so adapted to the said roller that the latter serves to maintain the spool-case in its place.

Fourthly, of a revolving hook, constructed in the peculiar manner fully described hereafter, for seizing the loop with certainty, and carrying it round the spool-case.

Fifthly, of peculiar machinery, described hereafter, for imparting a vibrating motion to the needle-arm from the driving-shaft.

Sixthly, of certain devices, fully described hereafter, for facilitating the removal and accurate replacing of the presser-foot.

Seventhly, of devices fully described hereafter, for facilitating the attachment of the needle to, and its removal from the needle-arm.

Eighthly, of a box forming a part of the frame of the machine, surrounding and enclosing the working-parts beneath the work-plate, and having at one side a hinged portion, so that ready access may be had to the said working-parts, while they are effectually protected from dust.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1, Sheet No. 1, is a sectional elevation of my improved sewing-machine;

Figures 2 to 11, inclusive, views (drawn to an enlarged scale) of the spool-case, spool-case holder, and revolving hooks, showing the manner in which the stitch is formed;

Figure 12, a diagram, illustrating part of my invention;

Figure 13, Sheet No. 2, a section on the line 1-2, fig. 6;

Figure 14, an inverted plan view of part of the work-plate;

Figure 15, a sectional plan view of the machine;

Figure 16, a transverse sectional elevation on the line 3-4, fig. 1;

Figures 17 and 18, detached sectional views of parts of the machine, drawn to an enlarged scale;

Figure 19, a section on the line 5-6, fig. 17; and

Figure 20, an inverted sectional plan view of fig. 18.

A is the frame of the machine, the front part of which is enlarged, so as to form an oblong box or case, A', and to the top of the latter is secured the work-plate B.

To an opening in the front of the box A' is fitted a door, B', which may be turned down to the position shown in dotted lines, fig. 1, when the interior of the box has to be exposed, and access has to be had to the mechanism within the box.

From the rear end of the frame projects the stationary arm C, fig. 16, in the front end of which slides a vertical rod, C', having at the lower end a triangular projection, *f*, (see figs. 18 and 20,) two sides of which are inclined, and are adapted to the inclined sides of a triangular recess, *g*, in a presser-foot, D, the said recess being of such a size that the projection *f* can be introduced readily into it.

Through the presser-foot passes a set-screw, *f'*, the end of which bears against the straight side of the projection *f*, and confines the foot thereto.

In projections *a'* and *a''*, at the rear end of the frame, are set-screws *a'''*, forming bearings for the vibrating needle-arm E.

Through the front end of this needle-arm passes a vertical rod, F, which is somewhat smaller than the hole through which it passes, and has, at the lower end, a conical enlargement, *a*, adapted to a conical seat in the arm, and in one side of this enlargement *a* is a recess, *b*, into which projects a plate, *c*, secured to the arm. On to the upper end of the rod F screws a nut, *b'*, and in the enlargement *a* is an inclined hole, *c*, which coincides with a similar hole, *c'*, in the arm.

The shank of a needle, G, which is introduced into the recess *b*, between the plate *c* and the rod F, is secured in this position by turning the nut *b'*, so as to elevate the rod, and cause its conical end to jam the stem of the needle against the plate *c*.

In suitable bearings within the frame A, turns the horizontal driving-shaft H, the front end of which projects into the box A', and near the rear end of this shaft is an eccentric, *h*, embraced by a strap, *h'*, to which is jointed a rod, *j*, fig. 1, the latter fitting snugly, but so as to slide to and fro freely in a longitudinal opening, *j'*, in a projecting portion of the needle-arm E.

To a rock-frame, I, within the box A', is jointed a feeding-frame, J, which has a serrated projection, *k*,

and bears on a cam, K, figs. 15 and 16; secured to the driving-shaft H; and at one side of the feed-frame is an adjustable plate, J', which bears against a cam, K', on the shaft H, and is controlled by a screw-rod, L, the knob or handle of which is on the outside of the box A', and in a convenient position to be handled by the operator.

A spring, r, secured to the box and to the feed-frame, maintains the plate J' in contact with the cam K'.

To the front end of the shaft H is secured the cup-shaped loop-carrier M, at the edge of which are two hooks *m* and *n*, fig. 8, the former having two shoulders x^1 .

The hook *m* is curved between the shoulders, and is bent inward, so that its end is nearest the centre of the carrier; and at the inner edge of the hook is a notch, x^2 , fig. 3.

The end of the hook *n* is curved, as shown in the drawing, and one side of the carrier, between the two hooks, may be cut away, while the edge of the opposite side is curved, from the hook *n* to a curved slot or opening, *z*, adjacent to the hook *m*, figs. 3 and 8.

Concentric with the carrier M, and in front of the same, is an annular stationary plate, N, severed at one point, as seen in fig. 9, and in the inner edge of this plate is a recess, *i*, containing felt, or other suitable packing, the said inner edge of the plate being made hollow, for the reception of an annular rounded rib, *o*, on the edge of a ring, 4, which forms part of a spool-case, P, fig. 13, the back and front plates 3-3' of the latter being bulged, so as to form a chamber for the reception of an ordinary spool, U, fig. 10, containing the lower thread *u*.

The back of the case is secured permanently to the ring 4, but the front is secured, at two points 5 5, to a detachable ring, 2, which fits within the ring 4, as shown in fig. 13, and in the opposite edges of which are recesses for the reception of the journals of a spindle, V, passing through the spool U, fig. 11, the latter being confined between a conical head, 7, and a conical nut, 8, on the said spindle. (See fig. 11.)

In the front plate 3 is a vertical slot, 9, for the passage of a button, the shank of which turns in the back-plate 3'; and at the outer end of this button is an enlargement, which, when turned at right angles to the slot 9, secures the plate in its place by bearing against the same at the opposite sides of the slot.

Near the upper edge of the plate 3 is an opening, *p*, above which is secured a spring-plate, *p'*.

On the edge of the ring 4, parallel to the rib *o*, is a larger rib, *o'*, against which bears a grooved roller, *q*, turning in the hook *m*; and in the rib *o* is a recess, *r*, for the reception of a projection, *r'*, on the annular plate N, which projection prevents the case from turning in the holder.

The two ribs *o* *o'* meet at a point in the edge of the spool-case, forming a sharp-edged projection, o^2 , figs. 5 and 6, for a purpose described hereafter.

The annular plate N is so adjusted that the hooks *m* and *n*, in their revolution, shall traverse near the edge of the spool-case, and at the rear of the spool-case holder, but not in contact therewith, the needle G, when it descends, passing into an opening in the upper edge of the case, in front of the path of the hook *m*. (See fig. 3.)

In a projection at the under side of the work-plate slides a bar, *q'*, figs. 1 and 14, the end of which, when it is at the limit of its inward motion, is adjacent to the path of the needle G, the opposite end of the bar projecting outward so far that it can be operated from the outside of the box A'.

The upper thread *t* is conducted from the spool to the front end of the arm E', is passed through the openings *e* *e'*, fig. 17, and through the eye of the needle G.

The under thread *u* is passed from the spool U within the case M, through the hole *p* in the front of the case, and beneath the spring *p'* the bar *q'*, fig. 14, is drawn outward, the fabric is placed upon the work-

plate, and the parts of the machine are adjusted to the positions shown in fig. 1, when the operation will be as follows:

As the needle begins to rise, a loop of the thread *t* will be formed at the rear side of the needle, and the hook *m* will project through this loop, and carry it forward in the direction of the arrow, fig. 2, one portion of the loop catching in the notch x^2 , behind the hook *m*, and against the shoulder x^1 .

As the loop is drawn by the hook across the edge of the spool-case, it will be distended by the projection o^2 , one portion passing across the back, and the other across the front side of the spool-case, until it reaches the position shown in fig. 5, when the fabric will be carried the length of one stitch in the direction of its arrow, by the above-described feed-mechanism, and the needle will penetrate the cloth.

Prior to the needle entering the opening in the spool-case, however, the hook *n* will catch that portion of the loop which extends across the back of the spool-case, figs. 5 and 6, and will carry it to the position shown in fig. 7. During this movement, the loop, owing to the curvature of the hook *m*, will slide on the latter from the shoulder x^1 to the shoulder *z*, the latter preventing the loop from slipping entirely from the hook. (Fig. 5.)

As the loop-carrier continues its revolution, and the hook *m* again approaches the needle, the loop will be gradually rolled (not drawn) off this hook by the action of the hook *n*, and by that of the needle, as in descending it draws the loop upward toward the fabric, until, on reaching the position shown in fig. 8, the loop will pass entirely off the hook *m*, and then off the hook *n*, when it occupies a position at the back of the spool-case, extending through the opening *z*, and will afterward, as the needle continues its descent, be drawn through the opening *z*, close to the under side of the fabric, drawing with it a portion of the thread *u*, with which it has thus been interlocked.

The needle then begins to ascend, another loop is formed at the rear side of the same, and this loop is caught by the hook *m* and carried by the latter round the spool-case, and interlocked with the thread *u*, as before.

As the carrier revolves, the roller *q*, which is adjacent to that portion of the hook *m* round which the loop passes, and by which it is held, will continually bear against the spool-case, and will force the latter away from contact with the adjacent edge of the plate N, so that the thread can pass freely and without any friction between the case and the plate, while the opposite edge of the spool-case is brought to bear firmly against the opposite edge of the plate, the spool-case and the plate N being thus always separated at that point where the thread is being carried between them, or, in other words, the roller maintains an open unobstructed channel, or crescent-shaped space for the thread, which channel or space travels always with the loop, and closes after the same. (Fig. 12.)

The roller is grooved, and adapted to the rib *o'*, so that in addition to maintaining this open channel, the roller keeps the spool-case in its proper lateral position, and maintains the rib *o* central with the recess *i*, so that it cannot bear against either edge of this recess, and close the opening through which the loop of thread passes.

By pushing inward the bar *q'*, the end of the latter will be brought in the way of the loop, which will be retained in such a position that the needle, on its downward movement, will pass through this loop, while the needle-thread below this loop (now round the needle,) is caught by the hook, a stitch somewhat similar to a chain-stitch, but consisting of two threads, being thus produced.

By breaking off the under thread within the spool-case, and by maintaining the parts in the position just described, an ordinary chain-stitch will be produced.

Among other advantages possessed by the above-described machine, may be enumerated the following:

The loop, owing to the peculiar movement imparted to the spool-case, is passed round the latter, and between it and the holder, with little or no friction on the thread.

The rib o^2 , on the spool-case, insures the opening of the loop, so that the latter shall invariably pass to both sides of the spool-case.

Owing to the peculiar construction of the hooks m and n , the loop must pass freely from the same at the proper time.

The spool-case is so constructed that an ordinary spool of thread can be readily introduced and withdrawn.

The rattling of the spool-case is effectually prevented by the felt contained within the recess in the holder.

The required vibrating motion is imparted from the driving-shaft to the needle-arm, with little friction or strain on the connecting-devices.

The extent of the feed may be readily regulated, without detaching any portion of the machine, by turning the rod L so as to adjust the plate J' on the feed-frame.

The character of the stitch may be changed without stopping the machine, or attaching or detaching any of the parts, and without using any supplementary devices.

The presser-foot may be adjusted accurately to its place after removal.

The needle, by turning the nut b' , may be readily secured in its proper position to the needle-arm, and may be quickly detached.

Ready access may be had to the spool-case, and the surrounding parts, by opening the door B' .

I claim as my invention, and desire to secure by Letters Patent—

1. A spool-case, constructed substantially as described, and retained by, and having the within-de-

scribed motion imparted to it, in a stationary spool-case holder, in combination with a rotating hook, for seizing the loop of needle-thread and carrying it round the said spool-case.

2. The combination of the said revolving hook with a roller, q , or any equivalent device, for imparting the within-described motion to the spool-case, and thereby maintaining between the latter and the spool-case holder an unobstructed opening for the free passage of the thread.

3. The rib o^1 , on the spool-case, adapted to the groove in the periphery of the roller q , as and for the purpose herein set forth.

4. The hook m , in its shoulders x and x^1 , and notch x^2 , the whole being constructed and arranged for operating on the loop, substantially as described.

5. The eccentric on the shaft H , the strap k , and rod j , arranged to slide in the said needle-arm, all combined and operating substantially as set forth.

6. The foot D , with its slot and set-screw, in combination with the presser-bar C , and its dovetailed triangular projection f fitted loosely to the slot, as and for the purpose described.

7. The combination of the recessed conical end of the bolt F , and the plate C , adapted to the end of the needle-arm E , and arranged for the reception and removal of the needle, substantially as set forth.

8. The box forming a part of the frame of the machine, enclosing the working-parts below the work-plate, and having at one side a hinged portion, B' , as set forth.

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

JOSEPH BOND, JR.

Witnesses:

H. HOWSON,

W. J. R. DELANY.