5 Sheets—Sheet 1.

C. E. LIPE.

Broom Sewing Machines.

No. 229,322. Patented June 29, 1880.

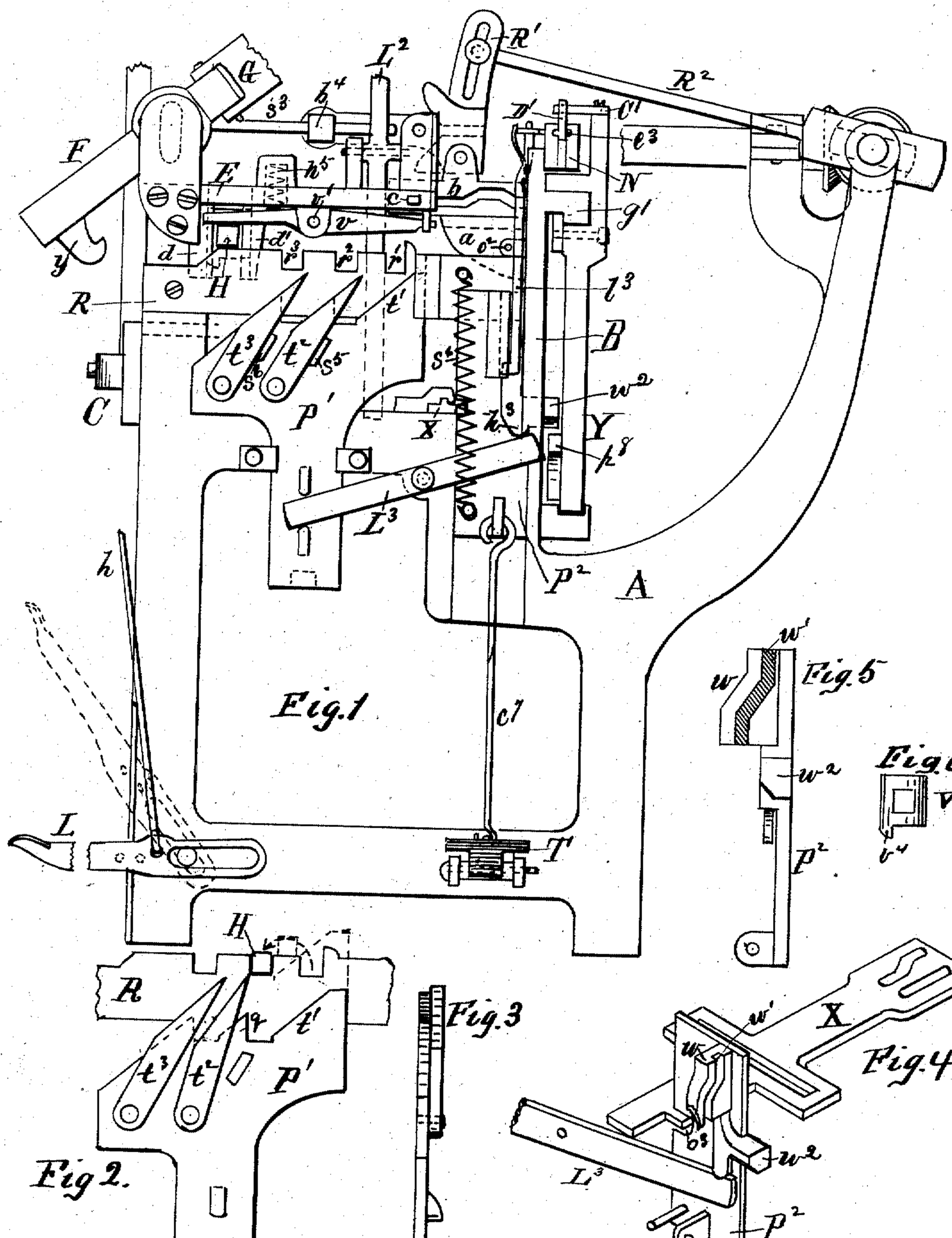

Fig. 1

Fig. 2.

Fig. 3

Fig. 5

Fig. 6

Fig. 4

Witnesses
G. W. Clark
Chas Wall

Inventor
Chas E Lipe

5 Sheets—Sheet 2.

C. E. LIPE.

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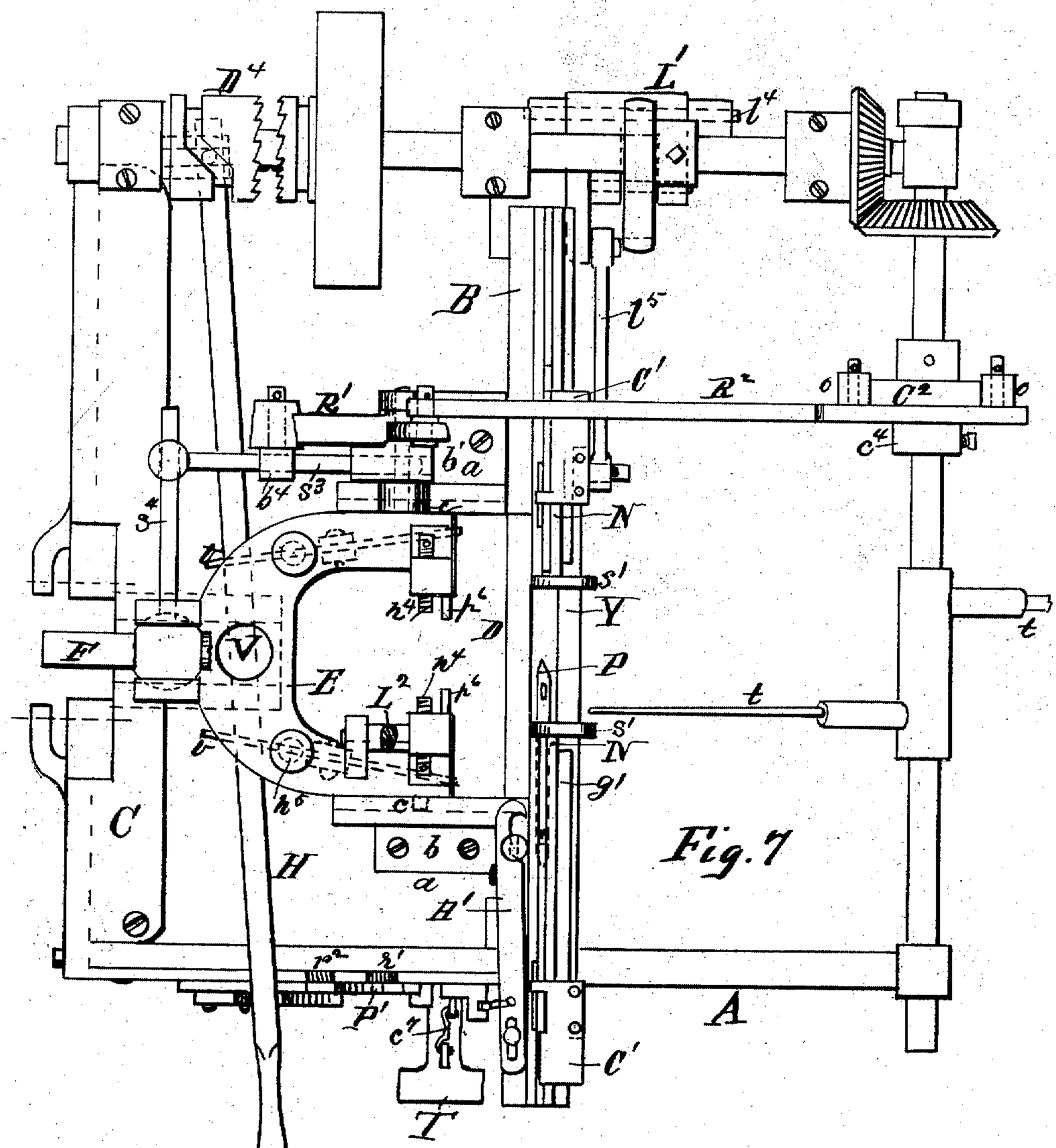

Fig. 7

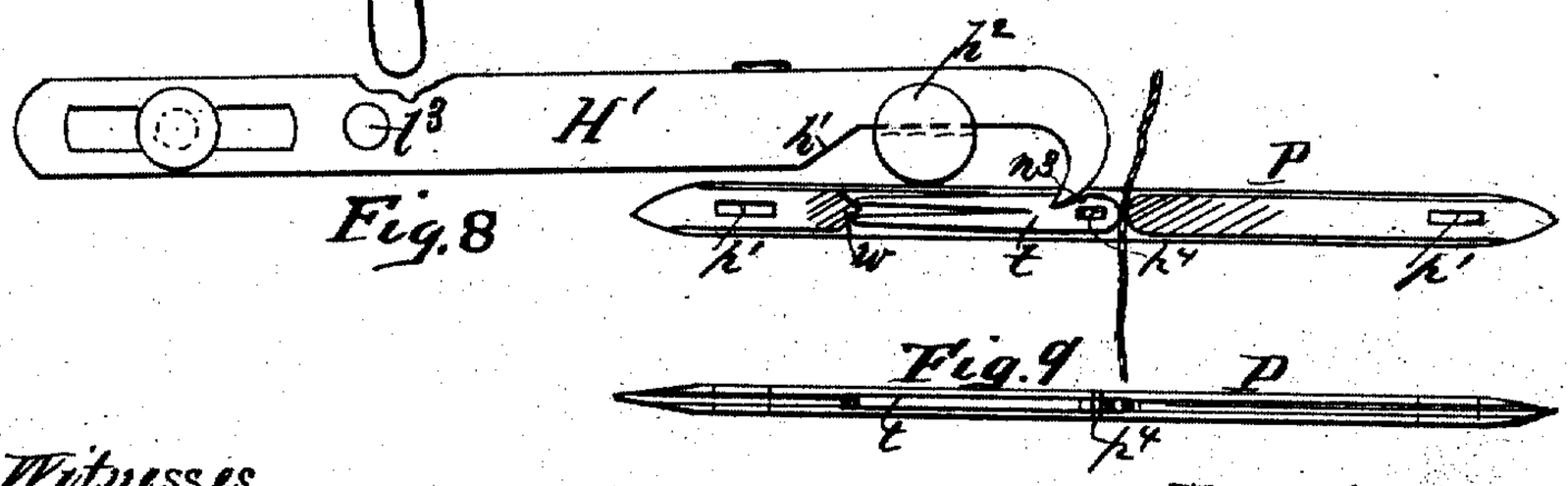

Fig. 8

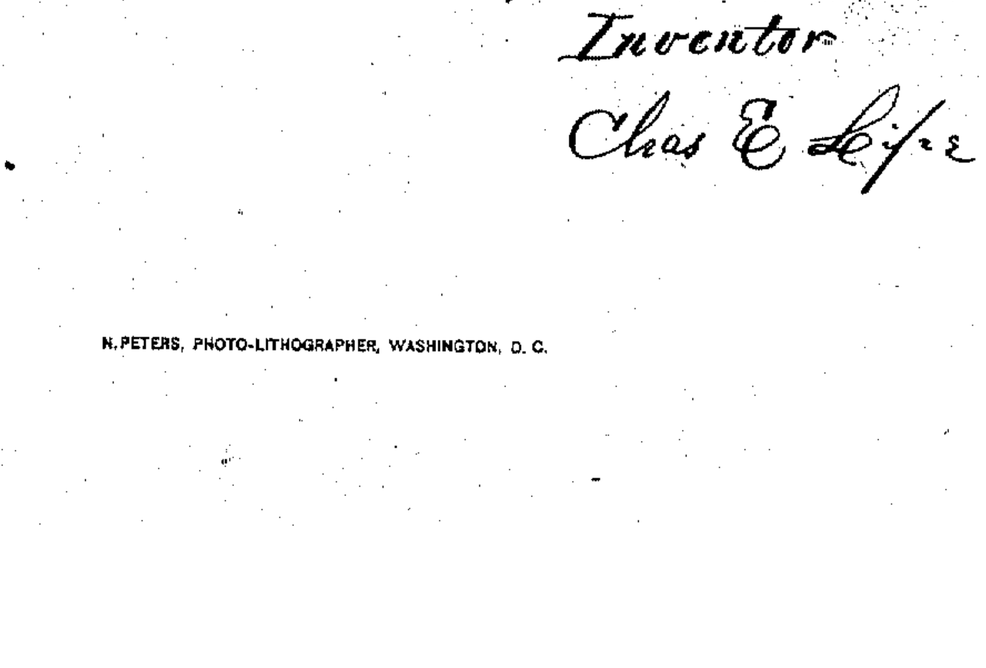

Fig. 9

Witnesses
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C. E. LIPE.

Broom Sewing Machines.

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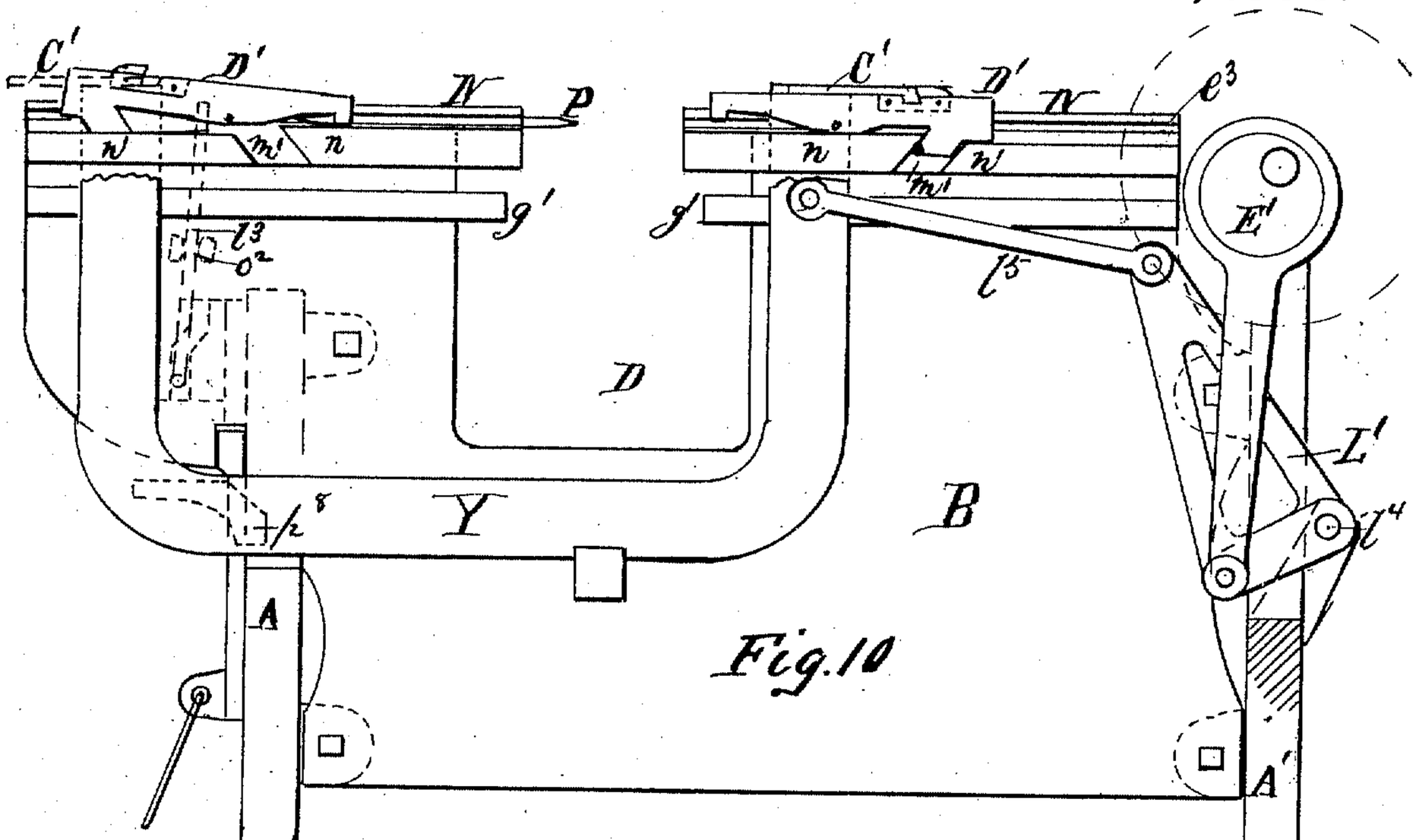

Fig. 10

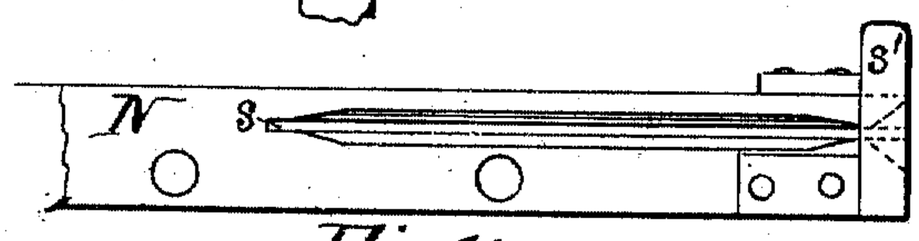

Fig. 11

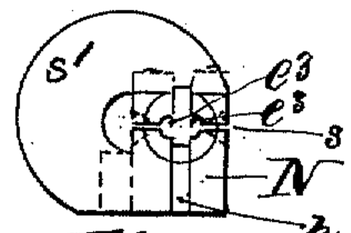

Fig. 12

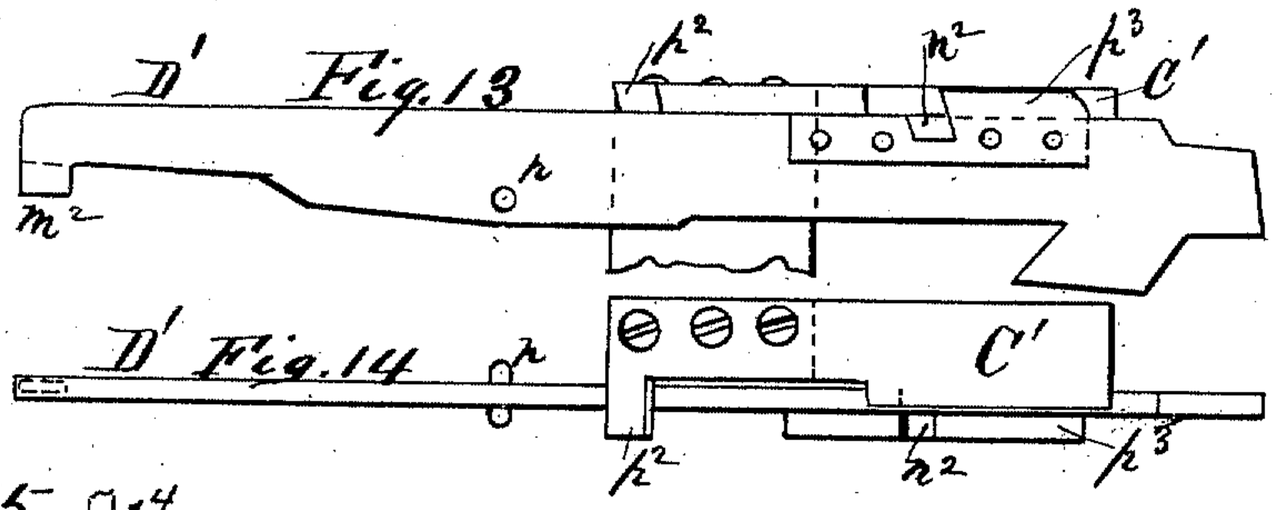

Fig. 13

Fig. 14

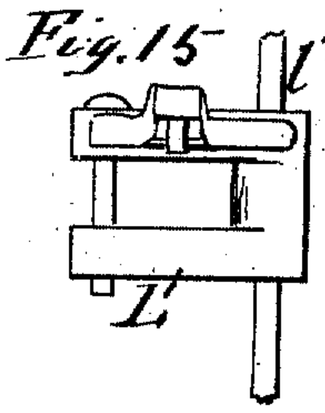

Fig. 15

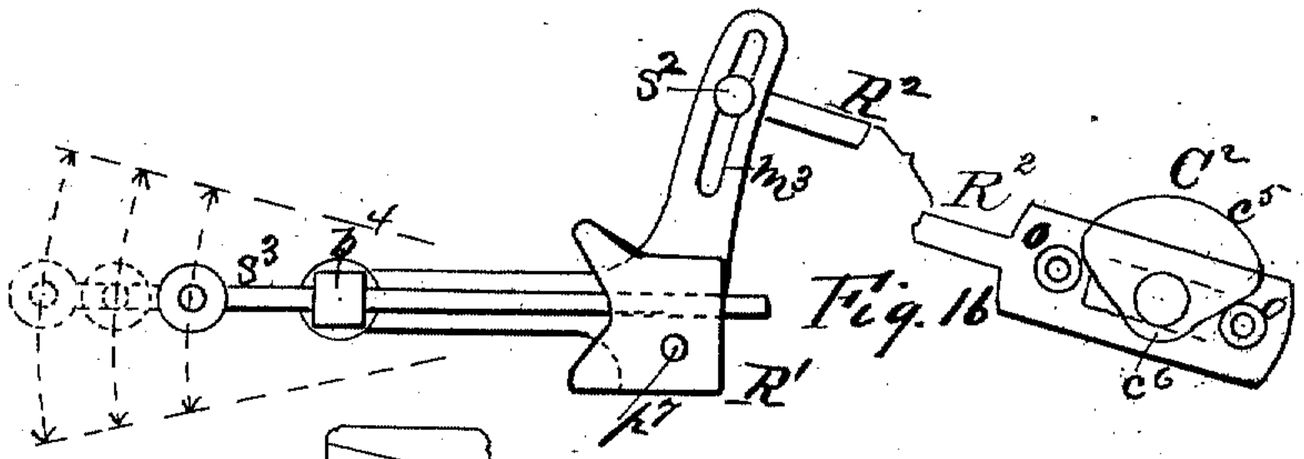

Fig. 16

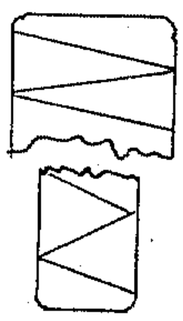

Fig. 17

Witnesses
G. M. Clark
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C. E. LIPE.

Broom Sewing Machines.

No. 229,322. Patented June 29, 1880.

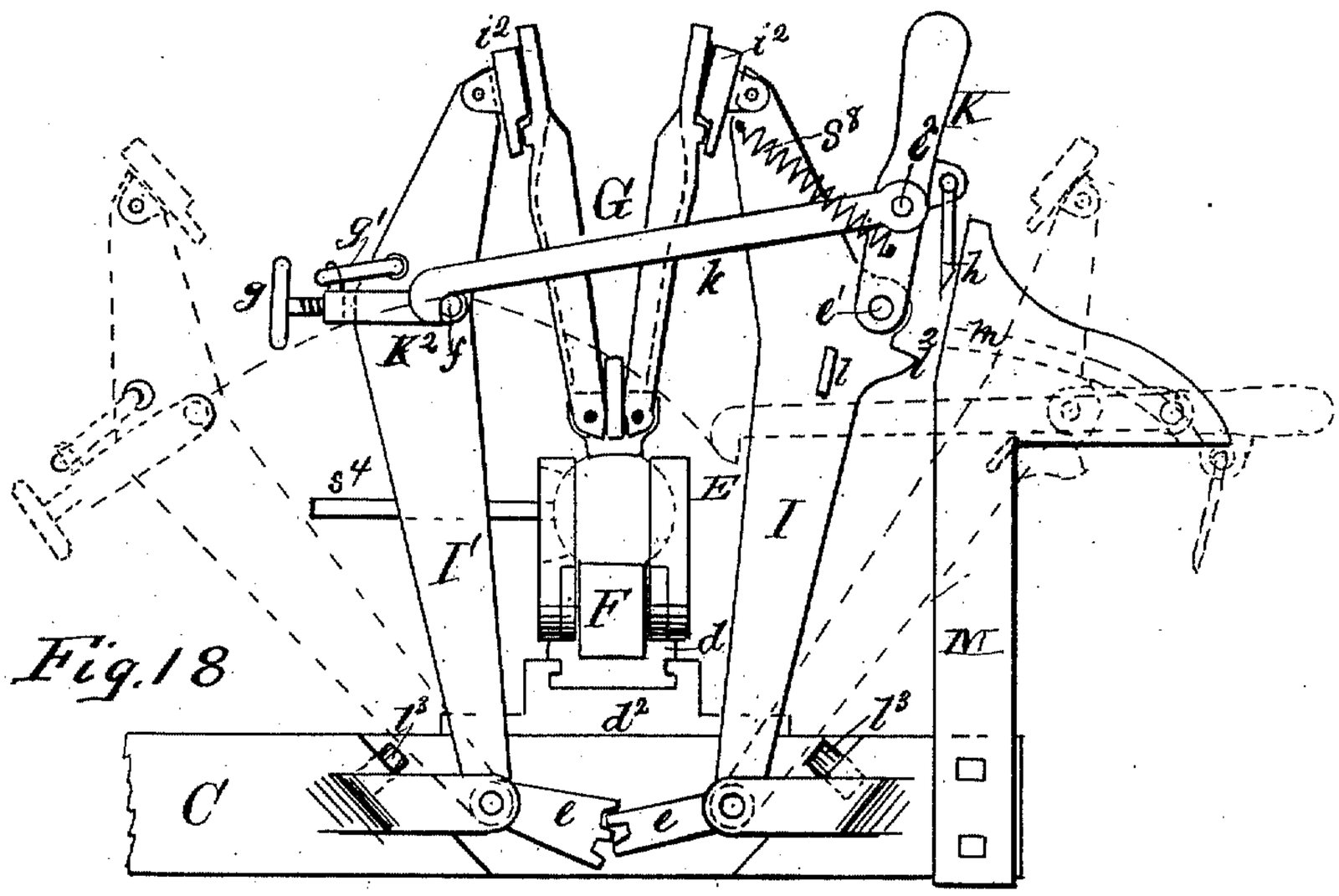

Fig. 18

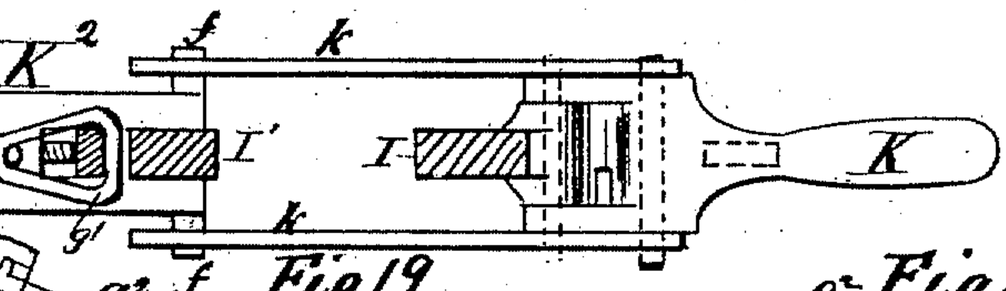

Fig. 19

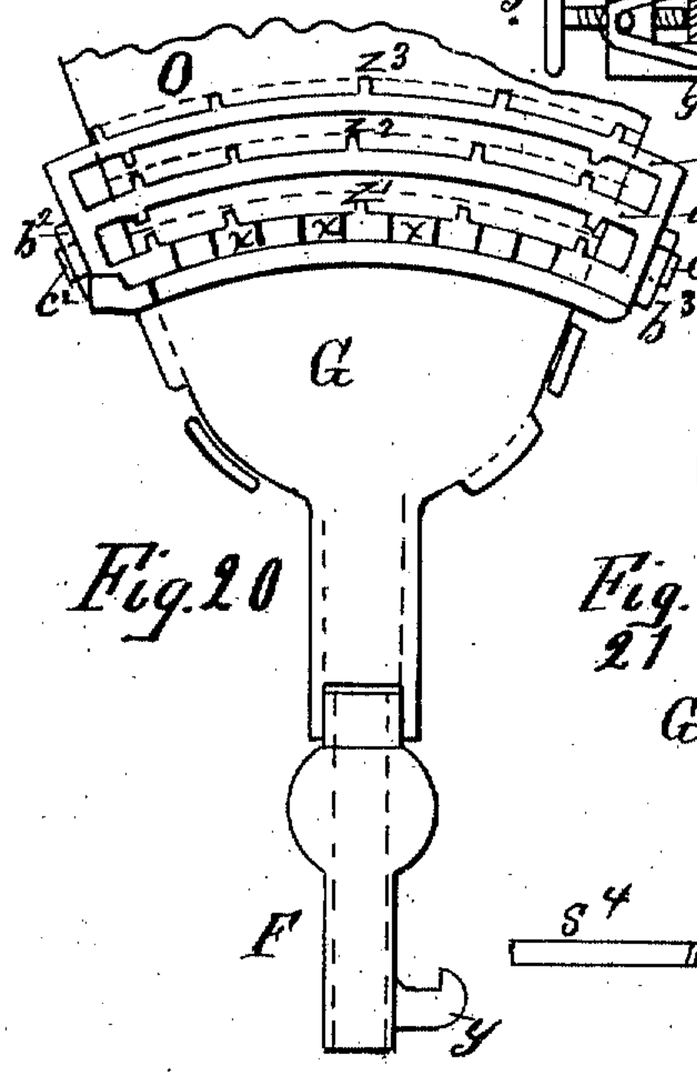

Fig. 20

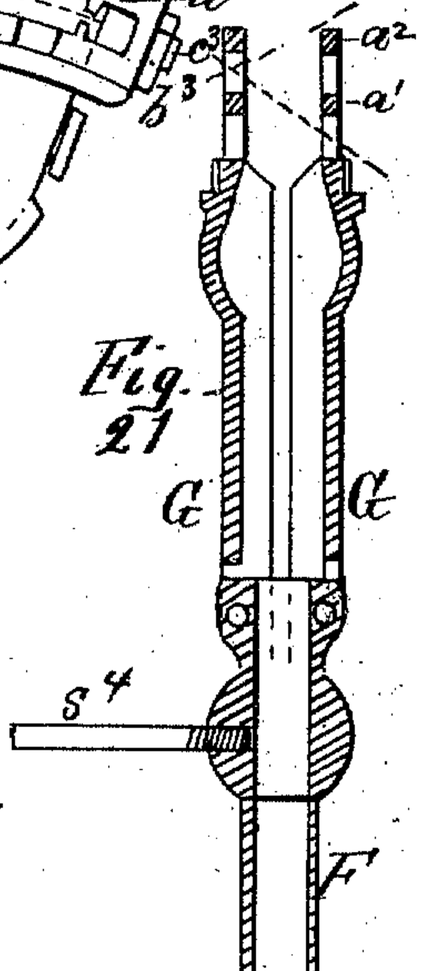

Fig. 21

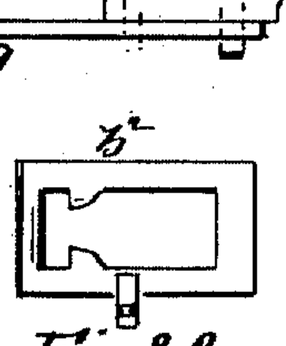

Fig. 22

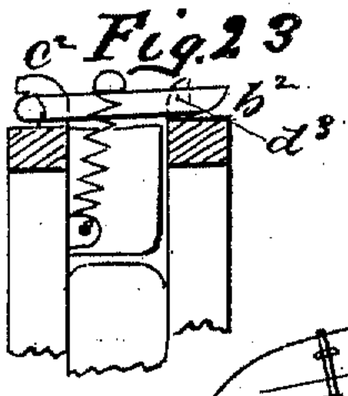

Fig. 23

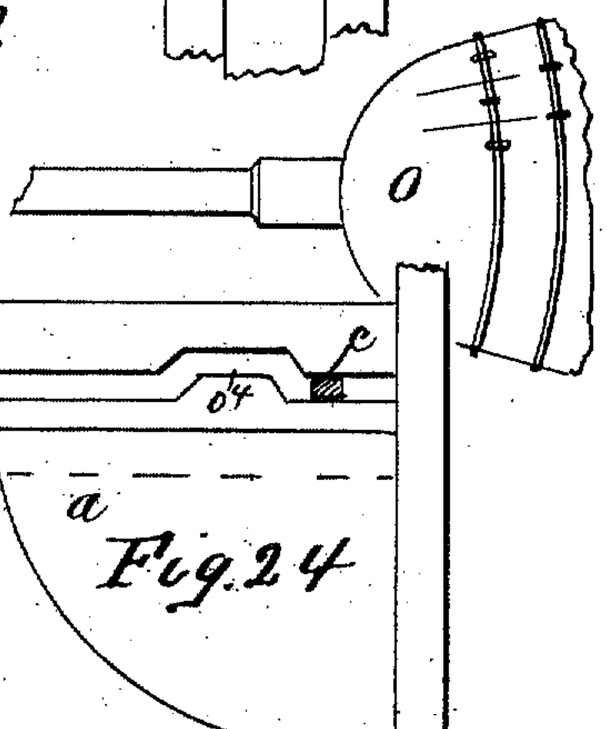

Fig. 24

Witnesses

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C. E. LIPE.

Broom Sewing Machines.

No. 229,322. Patented June 29, 1880.

Fig. 25.

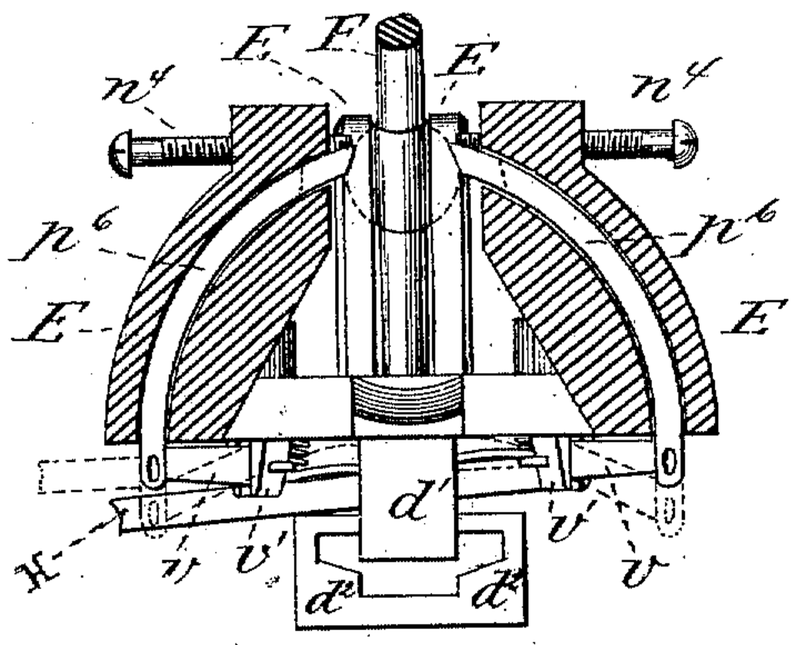
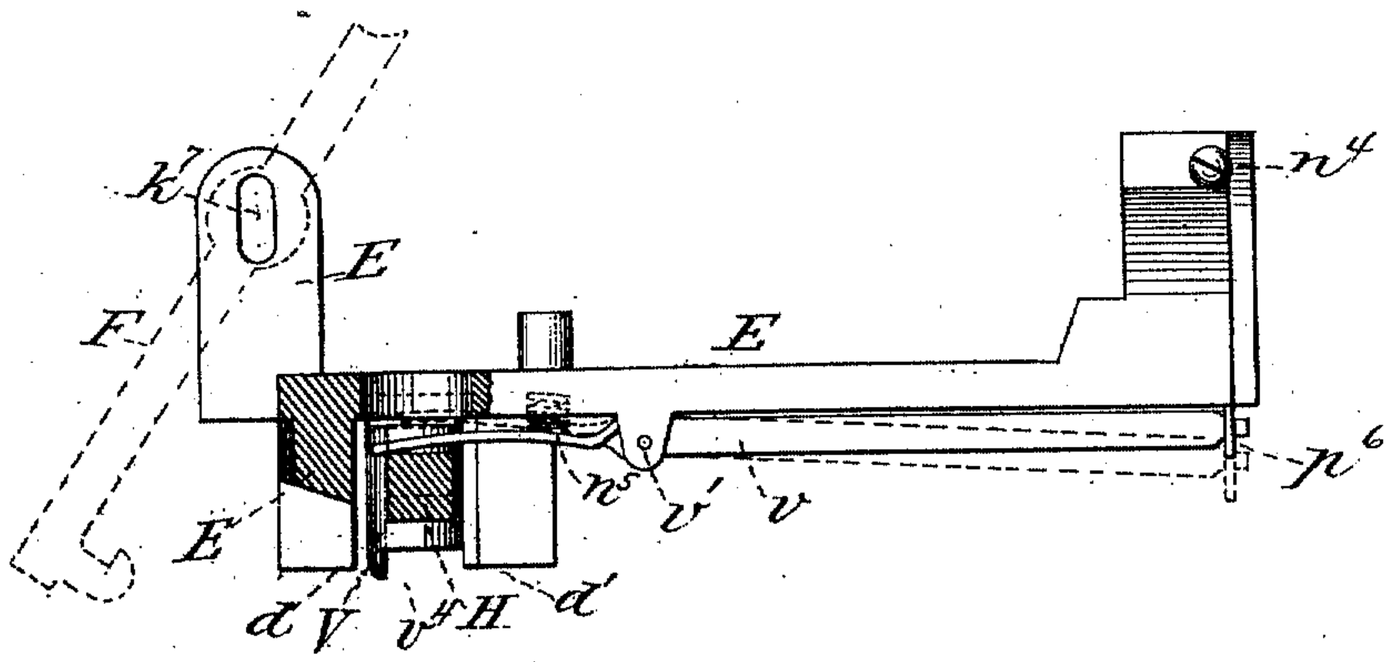


Fig. 26.



Witnesses:

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Chas Crall

Inventor:

Chas E Lipe

UNITED STATES PATENT OFFICE.

CHARLES E. LIPE, OF SYRACUSE, NEW YORK.

BROOM-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 229,322, dated June 29, 1880.

Application filed February 1, 1879.

To all whom it may concern:

Be it known that I, CHARLES E. LIPE, of Syracuse, in the county of Onondaga and State of New York, have invented certain new and valuable Improvements in Broom-Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The object of these improvements is the further development and perfecting of the principles and functions contained in my broom-sewing machine for which Letters Patent were granted by the United States, April 3, 1877, and numbered 189,240, and the addition of such improvements as continued experiment and research have proved to be of practical value in bringing the art of sewing brooms by machinery to a high state of perfection.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine. Fig. 7 is a top view of the same. Fig. 10 is a front view of the needle-operating devices. Fig. 18 represents the vising mechanism from the rear of the machine, this mechanism not being shown in the main views, Figs. 1, 7, and 10. Figs. 20 and 21 are views of the broom-holding jaws. The remaining views are details of the different parts.

The general arrangement of the frame, main shaft, driving-pulley, take-up mechanism, gear-shipper, broom-carriage, and yoke remain substantially the same as described in my former patent.

The principal improvements consist in improved needle-operating devices, improved broom-holding vise whereby the operation of banding the broom is facilitated, improved broom-rocking devices, improved broom-shifting devices for changing the position of the broom from one band to another, improved needle-tension and tension-opening devices, an improved vise for pressing the broom preparatory to banding, automatic means for rocking the broom at a greater angle on the outside or upper bands, the object of which will be hereinafter explained, and automatic means for locating the stitches of each band between those of contiguous bands.

In my improved machine I connect the frame-standards A A′ with an upright head-plate, B, Fig. 10, which rises to the proper height and supports the sewing devices; also, in the rear with the vise-plate C, which supports the vising mechanism.

Brackets *a a*, Figs. 1, 7, and 24, extend rearward from the head-plate B, on each side of the gap or opening D, Figs. 7 and 10, which form supports for the castings *b b′*, the inner faces of which are grooved to form a track for the pins *c c* on each side of the broom-carriage E, Fig. 7.

From the rear end of carriage E depend lugs *d d′*, the lug *d* being broader than *d′*, and fitted to slide in a guideway, d^2, Fig. 18, bolted to the vise-plate C. The broom-carriage is thus adapted to travel back and forth between the vising and sewing mechanisms, as required.

The spindle F, to which are pivoted the broom-jaws G G′, Figs. 20 and 21, is held in a ball-and-socket joint rising from the rear end of carriage E.

When the carriage is thrown back to the rear by means of the lever H, which controls its position along its path, the broom-jaws and spindle may be thrown up to a vertical position between the vise-closing levers I I′. These levers are pivoted to the plate C, Fig. 18, in an offset, as shown in Figs. 7 and 18, and geared together with the gear-segments *e e*, which constrain them to open and close symmetrically from the broom, said segments meeting at the back of the offset in plate C, so as not to interfere with the movements of the broom-handle in vising.

A bifurcated toggle-lever, K, straddles and is pivoted to the lever I at *e′*, and straining-hooks *k k*, Fig. 19, are pivoted to K at e^2, their hook ends extending over, one on each side of the jaws G G, to the lever I′.

A slide, K^2, shaped like the letter U, provided with projecting pins *f f*, is fitted to slide in a recess cut across the body of I′, directly opposite the pivot *e′*, being held in adjustment by the set-screw and hand-wheel *g* and prevented from falling back by the spring *g′*. The pins *f f* are in line with the hooks *k k*, which, when hooked over, as shown in Fig. 18, connect the closing-levers.

The upper ends of levers I I′ are provided with pivoted pads i^2 i^2, which adapt themselves to the surface of the broom-jaws against which they are forced in pressing the broom. The broom to be sewed being placed in position in the open jaws, Fig. 18, the lever K is depressed, thereby closing the jaws between the levers I I′.

The principle of the toggle-joint arrangement herewith employed is too well known to require any further explanation.

As the pressing of a broom to its required shape requires considerable force, the lever K is connected, by means of a rod or chain, *h*, with a foot-treadle, L, (shown in Fig. 1,) which enables the operator to bring his weight to his assistance in straining the jaws to a close.

The set-screw *g* is intended to regulate pressure and adjust the distance between the levers I I′ for different thicknesses of brooms. When the toggle-lever K has been brought down to a horizontal position, or a little farther, the hooks *k k* strike projections *l l* on lever I, and the further depression of the toggle-lever causes the hooks to fulcrum on *l l* and raise the hook ends above contact with the pins *f f* and instantly release connection between the vise-levers. At this point the toggle-lever is brought to a stop by striking the lug l^2 on the lever I, and the weight on treadle L starts the vise-levers instantly to fall back to the dotted position indicated in Fig. 18, striking rubber buffers l^3 l^3 set in the oblique faces of the offset in plate C.

To take care of the toggle and hooks while falling back a guard, M, is bolted to the plate C, which rises up outside the path of the vise-lever, the upper end being elongated, as shown, and provided on its inner face with a curved groove, *m*. The mouth of said groove stands directly in front of the pivot e^2 when the toggle-lever strikes its stop l^2. As the vise-levers fall back after their release the pivot-pin e^2, which projects a short distance, enters the groove *m*, the contour of which is of such shape as to guide the toggle-lever down to the dotted position, the hooks following and resting on the lugs *l l*.

Fig. 19 shows a top view of the toggle and its connections, with the vise-levers broken away.

The broom-jaws complete (shown in elevation and section, Figs. 20 and 21) are an entirely new departure from the jaws hitherto in use, either in hand or machine sewing. They are pivoted to the broom-spindle, as shown, and up to the line of the lower band are essentially the same as described in my former patent.

In all other methods now in use, where the broom is clamped and not moved until the sewing is completed, when it is desired to sew more than one band to the broom supplementary clamps are swung up, after the first band has been put on, to hold in position a second band, and a similar pair over the second band to support the third, and so on. A practical method of adapting this principle to machine-sewing was shown and explained in my former patent. The objection to this method is that it is slow and cumbersome where several bands are required to be sewed on the broom. To remedy this objection I construct my jaws as follows: The upper edge of the jaw proper is extended outward a short distance from each side of the broom, and then upward parallel with its edges. Connecting these two extended portions, at intervals equal to the required distance between the bands, are arranged a series of bars, a' a^2 a^3, which I shall term "band-supporters." These bars and also the jaw proper are provided with short lugs Z' Z^2 Z^3, distributed along the upper edges thereof, to hold the band about midway between the bars, so that in stitching the needle may pass on either side of said band free from interference with the bars. A pair of clasps, b^2 b^3, are hooked on curved lugs c^2 c^3 on one jaw and slide up and spring over short projections d^3 d^4 on the opposite jaw when said jaws are closed in the vise, thus holding the broom secure for the operation of banding and sewing. The broom being pressed, the bands may be wound around the broom through the openings between the band-supporters, singly for one band or continuously for more than one, by passing the twine diagonally upward through the broom from one opening to another, as shown in dotted lines in Fig. 21, there being sufficient space between the edge of the broom O and the extension of the jaws to pass through a needle, which is generally used to lace the binding-twine around.

The band-supporters, in addition to holding the band, perform another very important office, which is that of pressing and holding the splints of the broom on both sides of the binding-twine while being sewed. Where there is no pressure above the band the body of the broom, being of an elastic nature, presses out above the top of the jaw, and the band being sewed down in that condition, when the broom is released it will swell out and become loose and pliable, thus vitiating to a certain extent the object of the sewing, which is to bind the broom firm and durable.

I have thus described an entirely new principle in vising, banding, and sewing brooms, which is that of vising for all the bands at once, placing all the bands at one operation and stitching them all to the broom without removing or disturbing any portion of the clamping devices, and another new principle, which is the result of the first—namely, that of clamping the broom on both sides of the band while being stitched. I have also described a practical combination of parts for utilizing this principle and producing the results named. The drawings represent this improved jaw for sewing the bands on curved lines. The same principle can be applied to jaws adapted for straight bands without departing from the spirit of the invention.

A pair of needle-guideways, N N, Fig. 10,

are secured to the upper edge of the head-plate B, facing the opening D, their inner ends being sufficiently far apart to allow for the free movement of the broom between them. These guideways are built up as follows: Two bars of steel having longitudinal grooves e^3 e^3, Fig. 12, along their inner faces are joined together, with thin strips n n' between them, the strip n being wider than n' and reaching nearly to the groove e^3. Their inner ends are cut obliquely, as shown, leaving one oblique slot, m', near the center of guideway. The grooves e^3 e^3 form a guide through which the needle P is translated from one guideway to the other to and fro through the broom. Needle-drivers D′ D′, (shown in detail, Figs. 13 and 14,) operated by the driving-yoke Y, are adapted to move in the space above the strips n n', alternately seizing and releasing the needle in a somewhat similar manner to the needle-carriers described in former patent, the essential difference being that in this case the needle has a stationary support to hold it in line, while in the former it has a movable one.

The drivers are provided with a small pin, p, which runs along the middle groove, e^3. The outer end of each driver is formed into a hook with oblique faces to correspond with and fill the slot m'. The inner end carries a spur, m^2, which enters the perforation p' near the end of each driver of the needle. In the upper edge, toward the rear, is a notch, n^2. The upper end of the yoke is capped with a plate, C′, from the inner end of which projects a pin, p^2, which is adapted to rest in the notch n^2 when thus engaged. The hooked end of the driver moves along the top of the strip n', the spur m^2 being in engagement with the needle.

As the needle passes the broom and enters the opposite guideway the driver on that side catches the needle, while the other releases it by the hook coming in contact with the point of strip n, which draws said hook down in the slot m', dropping the notch n^2 from the pin p^2 and lifting the spur m^2 out of engagement with the needle, the driver vibrating upon the pivot p. As the driver comes to rest its upper edge becomes horizontal, the pin p^2 and rear end of cap C′ riding over the top, and preventing it from accidental misplacement until the return of the needle.

The return of the cap and catching of the needle are effected as follows: To prevent the pin p^2 from riding past the notch n^2 a narrow plate, p^3, is riveted to the driver on the back side, the notch being cut through both; but the rear part of this plate rises above the edge of the driver, against which the pin strikes, and, carrying the driver with it, pushes the hook up the inclined face of the slot and reengages the needle by the spur m^2, as before. The yoke is gibbed to move along guides g' g', which may be cast upon the head-plate.

The advantage of this construction over that described in former patent is that it reduces the weight of the intermittent parts or needle-drivers, which may be made from a single thin strip of steel, allowing greater speed with less concussion, and in giving the needle a permanent support near the broom, thus insuring little or no deviation in its course through the broom.

The mouths of the guideways are funnel-shaped, as shown in dotted lines in Fig. 11, to still further insure the entrance of the needle. To prevent the thread from becoming entangled in the guideways a slot, s, is cut through into the needle-groove, Figs. 11 and 12, back as far as the thread may be drawn by the needle, thus allowing the thread to work freely away from the needle on its return to the broom. As this slot s somewhat weakens the end of the guideway, a stay or support, s', is riveted to the several portions thereof to keep them in their normal position. This stay is cut away around the slot, so as not to obstruct the movements of the thread. The needle is also threaded through this slot.

Figs. 8 and 9 represent the improved needle and device for opening the tension.

The tension-spring t is made from a flat piece of steel. One end is bifurcated, as shown, forming two spring-points, which, when inserted in a mortise made in the needle to receive it, impinge against the wedge-shaped divide w. A short slot in the other end, sliding on the pin p^4, guides it centrally with the needle. This end is rounded, as is also this end of mortise in the needle, and between the two the thread is drawn. The spring-points opened by the wedge tend to close and ride down to the point, thus pressing the other end up against the thread with sufficient force to create the necessary tension to draw up the stitches on the broom. To open this tension to thread the needle a thin strip of steel, H′, slotted at one end to serve as a guide and made into a hook at the other, is arranged on top of the head-plate, Fig. 7, the hook end being adapted to pass through the slot s of guidway and engage with a notch, n^3, in one side of the tension. When not in use it is thrown forward until the inclined edge h' rides up on the guide-pin h^2, which draws the hook away from the tension out of the way while sewing. This hook is controlled by a lever, l^3, Figs. 1 and 10, and will be explained farther on.

Reciprocating motion is given to the yoke Y by means of the eccentric E′, the customary strap, and an intermediate bell-crank rocking-lever, L, a top view of which is shown in Fig. 15. This lever is fulcrumed at l^4. The eccentric-strap is connected with the short end thereof, and the long end with the yoke through the link l^5. This arrangement gives a long movement to the yoke with a medium-sized eccentric, being compact and admirably adapted to its office. The broom being pressed and banded, the operator steps around from the rear of the machine, raises the lever H, which releases the hook-catch on the extreme end of the spindle and allows the jaws to swing down with the contained broom, and throws the car-

riage forward, the lever H then resting in the front notch, r', of the notch-plate R. The needle being threaded, the machine is thrown into gear with the lever L^2 and the first band is sewed to the broom.

The lever L^2, the gear-shipper connections, tripping pawl and lug on vise for automatically stopping the machine, the curved feed-pawls p^6 p^6, thrust-pins n^4 n^4, ratchets $x\,x\,x$ on jaws, and take-up arms t t remain essentially the same in construction and operation as described in my former patent, and will not be described here.

The broom-rocking device is radically different, and will now be described.

A bell-crank lever, R′, technically termed the "broom-rocker," Figs. 1, 7, and 16, is pivoted to a casting, which may be a part of the front track, p'. Its vertical arm m^3 is slotted, in which is secured at any desired point a stud, s^2. A rod, R^2, connects this stud with a cam, C^2, secured to the take-up shaft. The enlarged head of rod R^2 is slotted, as shown, to slide over the shaft, and is held up to the side of the cam by the collar c^4, Fig. 7. From the cam side of said head project two studs, upon which turn the rollers o o, adapted to run against the face of the cam, which is of such shape that it will exactly fill the space between said rollers at all points of its revolution. It is also of such shape as to give an intermittent motion to the rod R^2 and rocker, they remaining stationary while the concentric portions c^5 c^6 pass the rollers.

The horizontal arm of the broom-rocker has a swiveled bearing, b^4, at its outer end, through which passes a round sliding rod, s^3, one end passing through the base of the rocker near its pivot p^7. The outer end of s^3 is loosely connected to a stem, s^4, which projects from the center of the ball on spindle F, working through a vertical slot in the cupped bearing. The elevation and depression of the stem s^4 with the arm s^3 give the required rocking motion to the broom, the angle or slant being regulated by adjusting the stud s^2 along the arm m^3.

Now, it will be noticed that as the upper bands are sewed the carriage is receded back from the sewing mechanism, and in consequence thereof the sliding arm s^3 is lengthened, thus causing it to vibrate a greater distance and rock the broom farther. Now, as the stitches are laid on lines radiating from the ball-joint center, the farther out they are on the broom the farther they will be apart. This requires the needle to pass through at a greater angle; also, the broom being thinner out on the brush than near the shoulder, this requirement is still further augmented.

Fig. 17 shows the relative thickness of broom and variation of stitching at the points in question. This rocking device contains the principle which automatically produces the desired result—namely, that of rocking the broom farther as the stitching is carried up the broom.

In Fig. 16 the dotted positions of the sliding arm s^3 show the increased movement as the arm lengthens.

As the stem s^4 proceeds from the center of the ball-joint, its relation to the broom-rocker is not changed by the vertical motion of the broom-vise. The rocking and vertical motions of the broom are therefore entirely independent of each other in their functions and results obtained.

When a band is sewed and the machine stopped, the broom is shifted to the next band and dropped to its starting-point by the following devices: A shifting-plate, P′, provided with inclined shifting-faces t' t^2 t^3, directly under corresponding notches in plate R, Figs. 1, 2, and 3, is arranged in front of the notch-plate R, to slide under suitable guides on the frame, and is connected, by the lever L^3, to another sliding plate, P^2, which in turn is connected, by a link or chain, c^7, to a treadle, T. By depressing said treadle with the foot the shifter-plate P′ is raised, thereby causing the incline t' to strike the lever H, which rested in the notch r', and raise it out of said notch. As soon as it is free from the notch the further elevation of P′ causes H to slide along the incline t' and over against the stop q, directly over the notch r^2. The incline t' is a part of the plate P′. The subsequent ones, t^2 t^3, are pivoted thereto at their lower ends, so that as lever H strikes them from the back they will yield, and, when the plate P′ is dropped to its normal position, fall back under H against stops s^5 s^6, ready at the next elevation to shift the lever H to the next notch. As the plate P′ drops H falls into the notch over which it has been pushed.

A pair of pawl-levers, v v, Figs. 1, 25, and 26, are pivoted to the under side of carriage E at v' v', their front ends engaging with the pawls p^6, the rear ends passing under springs n^5 n^5 inserted in recesses in the carriage, and over the lever H. The springs n^5 n^5, operating against the rear arms of levers v v, keep the pawls p^6 in engagement with the ratchets on the broom-jaws when sewing; but when the shifting takes place and H is elevated the rear ends of the pawl-levers are raised, thereby withdrawing the pawls and allowing the broom to drop down to the starting-point.

The slide P^2 has a projection, w, near its top, having on one face a zigzag groove, w'. In this groove the bent end of the tension-hook lever l^3 travels. This lever, fulcrumed to the head-plate at o^2, pulls back the tension already described as the groove w' in the descent moves its lower end.

Another projection, w^2, of the plate P^2 reaches through the head-plate, Fig. 1, over the path of an inclined stop-piece, p^8, Fig. 10, cast on the back of the yoke. In order to avoid breaking the needle by the falling of the broom, and also to insure the hooking to the tension, the yoke must stop at the extreme end of its travel in this direction. At or near this point it is

thrown out of gear; but should it pass this point the beveled face of w^2 on its descent, striking the incline of p^5, brings back the yoke to the end.

To prevent the treadle and shifter from being operated while the machine is running, also to prevent the machine from being thrown into gear while the shifter is operating, the slide P^2 and gear-shipper slide X are combined, as shown in Fig. 4. A notch, o^3, is cut in the edge of plate P^2, through which slides the edge of the shipper-slide X. When in gear, X is pushed through the notch o^3, and the plate P^2 remains locked. When thrown forward and out of gear the end of slide X passes out of notch o^3 and allows P^2 to be moved, which in turn locks the slide X.

The working of the treadle T produces simultaneously the following results: It retains the yoke in threading position, opens the tension, withdraws the pawls, drops the broom, (which pulls the free end of the thread from the needle ready for another thread,) and shifts the broom to the next band. A coiled spring, s^6, draws back the slide P^2, when the treadle is released.

The connection of the lever L^3 and slide P^2 is effected simply by the lever resting under a lug, h^3, the weight of P′ always keeping it in contact.

When the last band has been sewed the carriage is moved to the rear and the broom swung back to the vertical, the catch-hook y on the spindle catching under a similar hook, v^4, Fig. 6, on the under side of a sleeve, V, which slides vertically between the two lugs $d\,d'$ on the carriage, and through which passes the lever H. This sleeve securely holds the broom-jaws in position for vising and banding, and forms a pivot between the lever and carriage.

To release the broom, the pressing-levers I I′ are thrown up. The hooks $k\,k$, being guided by the groove, follow the path of the dotted line until their curved ends strike the pins $f\,f$ on the opposite lever and the pin e^2 is freed from the groove m. The coiled spring s^8 then throws the toggle-lever up, engaging the hooks, when, by pressing the jaws and releasing the spring-clasps b^2, the broom may be taken out and another inserted.

It will be noticed that the track in the front carriage-guides has a rise or offset, o^4, Fig. 24, near the forward end. While sewing the first band the guide-pins $c\,c$ of the carriage rest in the lower portion, as shown. When moved back for the next band these pins ride up on the raised portion. This rise is of sufficient height to lift the carriage and feed-pawls a distance of half a stitch, which causes the stitches on this band to alternate with those on the first band, as shown in the broom O, Fig. 24. For the third band the pins $c\,c$ will ride down on the lower portion on the other side of the rise, putting in the stitches on the line of the first band.

If it is desired, another rise may be made for another band, and so on for as many bands as may be desired. The lines of stitches on the finished broom will thus have a zigzag appearance, and the broom will be firmer and more durable than would otherwise be the case.

A cam, D^4, Fig. 7, is secured to the driving-shaft, one side of which may be formed into a clutch to engage with the clutch on the driving-pulley. In this cam is a groove cut so as to give a short intermittent vibratory motion to the lever H, there being a pin on the under side thereof to work in said groove. This causes the needle to emerge from and enter the broom on opposite sides of the band, as explained in my former patent.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a broom-vise with pressing-levers arranged to automatically release the pressure at a certain point and retire, leaving the vise free for the operator, substantially as described.

2. In a broom-sewing machine, a pair of vise-closing levers provided with toothed segments at their pivot ends to cause said levers to open and close simultaneously, for the purpose set forth.

3. A pair of vise-closing levers carrying hook-connections, in combination with a stationary guide, whereby said guide carries the hook-connections to automatic engagement when the levers are moved into position for clamping.

4. A broom-vise having lateral openings for the bands.

5. A broom-vise having supporting-bars with intervening openings.

6. A broom-vise having lateral openings for the bands, provided with projecting spurs for holding the bands in position.

7. In a broom-sewing machine, the combination of a broom-carriage with feed-pawls and pawl-operating levers $v\,v$.

8. The combination of the feed-pawls and pawl-operating levers $v\,v$ and controlling-lever H, substantially as and for the purpose set forth.

9. The combination of a sliding broom-carriage with an undulating track for alternating the stitches on different bands.

10. In a broom-sewing machine, the combination of a broom vise or holder with a broom-rocker which automatically varies the rocking angle at each band.

11. In a broom-sewing machine, a broom-rocker provided with an extensible rocker-arm.

12. The combination of a rocking broom-vise with a broom-rocker provided with an extensible arm, an operating-cam, and connections.

13. In a broom-sewing machine, a movable broom-carriage, a broom-vise, controlling-lever, and shifting-plate, in combination.

14. In a broom-sewing machine, a broom-shifter plate provided with shifting devices having the nature of inclined planes.

15. In a broom-sewing machine, a shifting-

plate and broom-carriage, in combination with a gear-shipping slide in such a manner that the shifter cannot move while the machine is in gear and the machine cannot be moved into gear while the shifter is operating.

16. In a broom-sewing machine, a hooked broom-spindle, in combination with a catch and shifting-lever.

17. In a broom-sewing machine, the combination of a stationary needle-guideway with a needle.

18. The combination of a stationary needle-guideway with a needle and an elementary needle-driver.

19. The combination of a connecting-yoke, a pair of elementary needle-drivers, a pair of stationary needle-guideways, and needle.

20. In a broom-sewing machine, a stationary needle-guideway provided with a thread-slot, substantially as and for the purpose set forth.

21. In a broom-sewing machine, the combination of a driving-shaft, carrying an eccentric or its equivalent, with needle-driving mechanism and an intermediate rocking lever.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES E. LIPE.

Witnesses:
JAMES S. THORN,
PATRICK HOGAN.