3 Sheets—Sheet 1.

L. VARICAS.

Broom Sewing Machine.

No. 204,864. **Patented June 11, 1878.**

FIG. 1

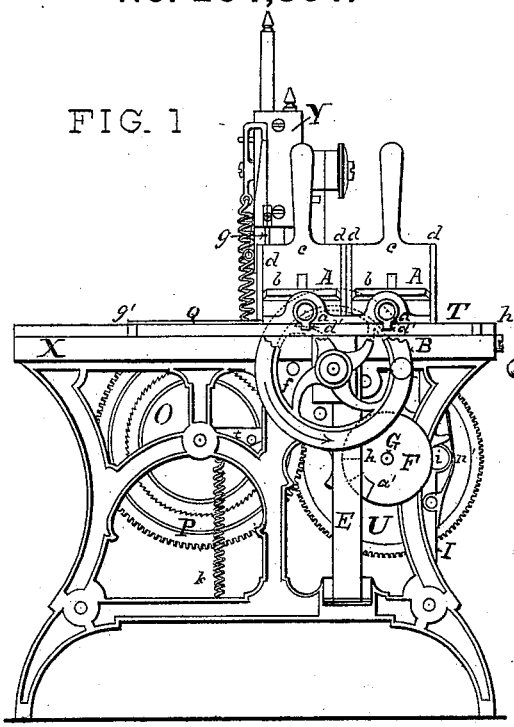


FIG. 2

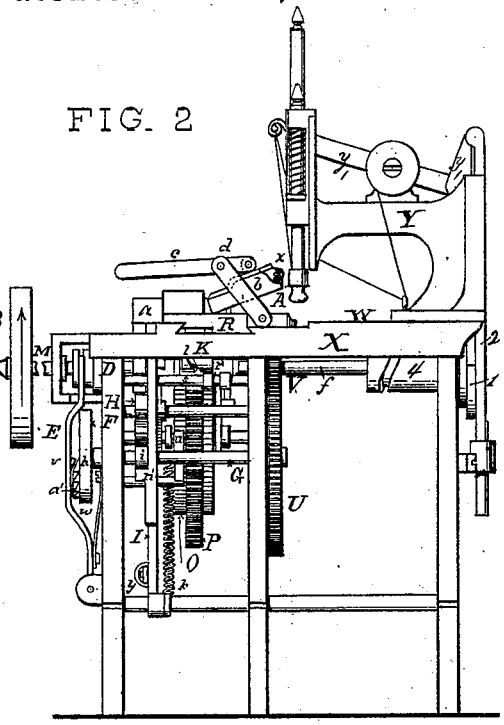


FIG. 3

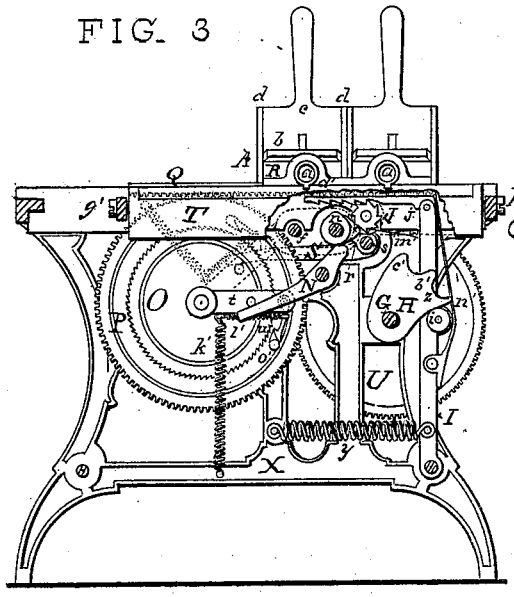
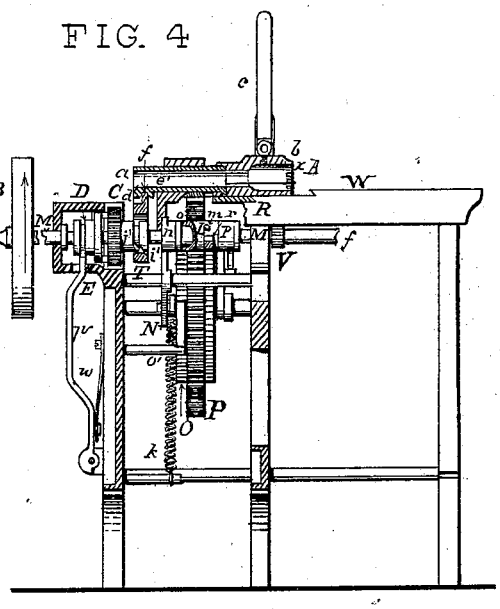


FIG. 4



WITNESSES

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INVENTOR

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Broom Sewing Machine.

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FIG. 5

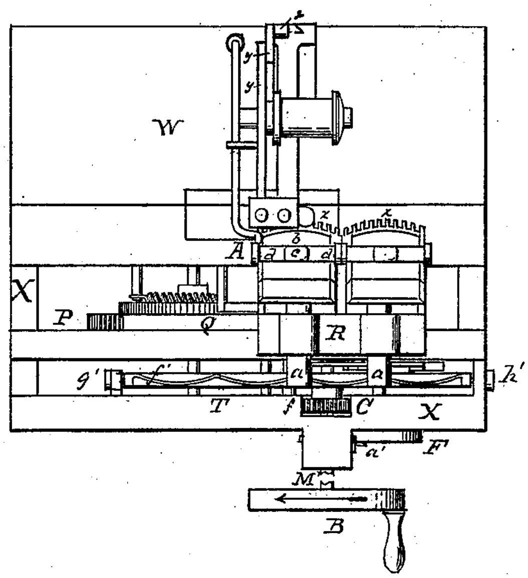


FIG. 7

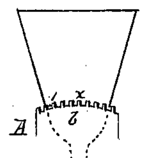


FIG. 8

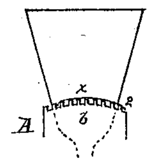


FIG. 9

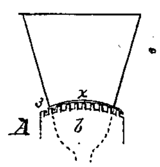


FIG. 6

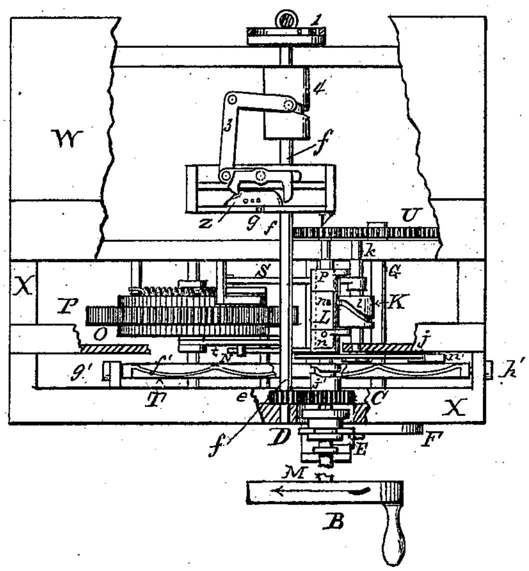
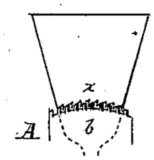


FIG. 10



WITNESSES

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Broom Sewing Machine.

No. 204,864. Patented June 11, 1878.

FIG. 11.

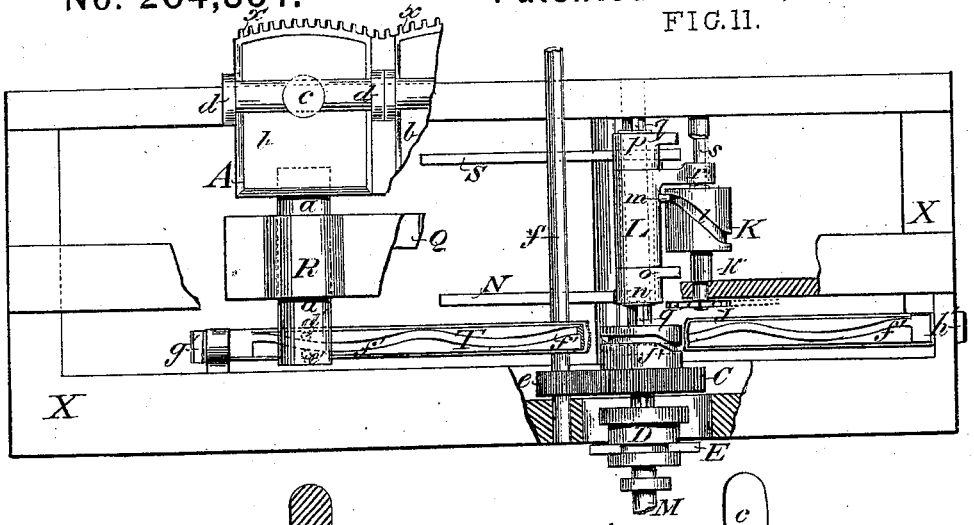


FIG. 12.

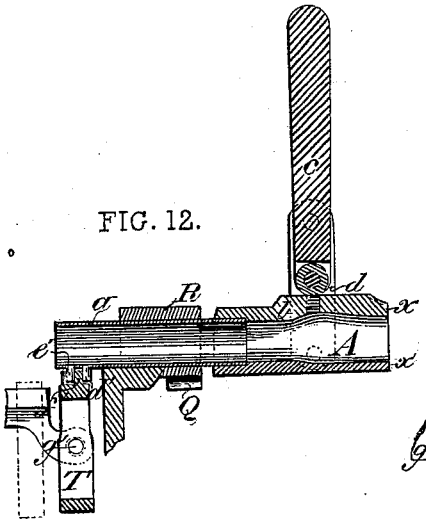


FIG. 13.

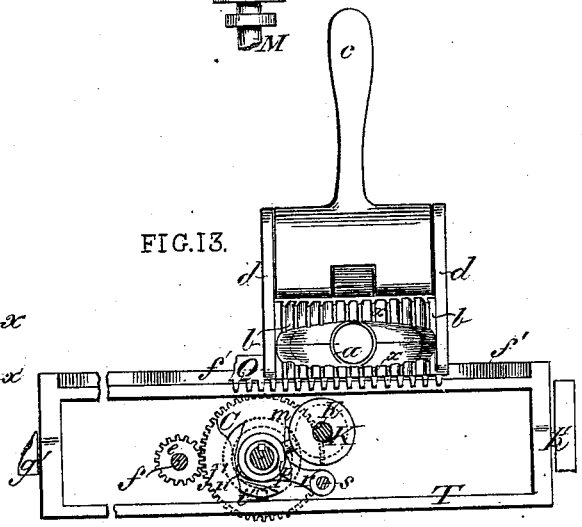
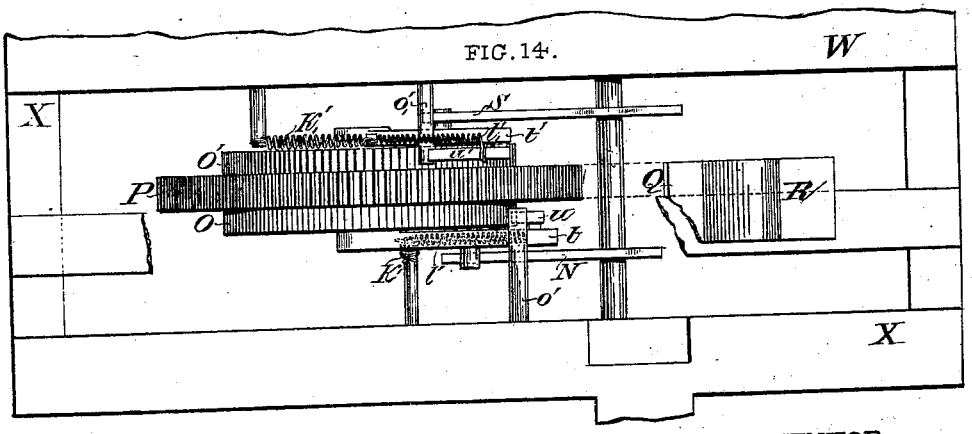


FIG. 14.



WITNESSES.

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UNITED STATES PATENT OFFICE.

LIONEL VARICAS, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN BROOM-SEWING MACHINES.

Specification forming part of Letters Patent No. **204,864**, dated June 11, 1878; application filed February 23, 1876.

To all whom it may concern:

Be it known that I, LIONEL VARICAS, of the city and county of San Francisco, State of California, have invented a Machine for Wrapping and Sewing Brooms, termed a "Broom-Sewing Machine," of which the following is a specification:

The first part of my invention refers to an arrangement of a rocking bar fitted with movable broom-clamps, whereby said broom-clamps are made to oscillate within carriages attached to a traveling rack-table, in such manner that as this table is moved backward or forward these clamps may be made to oscillate in a direction at right angles to that followed by the rack.

The second part of my invention refers to an arrangement of gearing on the driving-shaft for actuating the sewing mechanism, and also of a cam-grooved drum for actuating the rocking bar fitted with clamps for holding brooms, said clamps being thereby timed by this grooved drum to oscillate in accord with the movements of the sewing mechanism, whereby the requisite form of stitching may be effected.

The third part of my invention refers to a set of keys for the purpose of periodically actuating the rack-table with broom-carriages by the rack mechanism provided. These keys are attached to a sleeve that is made movable backward or forward on their common shaft, and controlled for that purpose by another sleeve actuated by a cam-grooved drum, said drum being operated by movements periodically imparted to it by a ratchet-wheel and toothed bar connected directly with the driving mechanism. By the proper adjustment or shifting of these keys, the rack mechanism is made by them to move the rack-table, with broom-carriages and broom-clamps, backward or forward by long or short movements, as may be required, for the several operations of wrapping and sewing or stitching with twine the brooms within these clamps.

The fourth part of my invention refers to the rocking bar, provided with curved ribs or cams, to which the sleeves of the broom-clamps are fitted, said clamps having their faces curved equally and in the same manner as each of these ribs or cams on the rocking bar, with the difference, however, that the clamp-faces are serrated or provided with teeth, and also curved in an opposite direction to those of the rocking-bar cams; the object of this part of my invention being, first, to cause the binding-twine from the sewing mechanism to assume a curved form on each broom held in its respective clamp, by being made to follow each such curved clamp-face as a guide; and, secondly, to admit of a double loop-stitch from the stationary sewing-head of the sewing mechanism, being stitched through each broom on both sides of this binding or wrapping twine, one stitch thus taken being made between any two of these teeth on one side of this binding or wrapping twine, and one without the teeth on the other side of this twine, but exactly opposite to the first stitch, the contrary or opposite curvatures of these ribs and clamp-faces being for the purpose of always bringing the curve-shaped twine wrapping into position under and between the sewing-needle and shuttle as operated from the stationary sewing-mechanism head.

The fifth part of my invention refers to a scalloped key, provided with horns and recesses, in combination with a movable bar, provided with springs, sheave-roller, and toothed bar, or their equivalents, whereby the ratchet-wheel aforementioned, that is employed for the purpose of operating and regulating the movements of the cam-grooved drum fitted to the keyed sleeve that actuates the rack with broom-clamp mechanism, may be revolved to a certain extent at certain defined intervals, the whole arrangement of the parts being so contrived that one key is only allowed to operate the rack mechanism at a time, and each key is made to follow in its order, viz., first, one key for causing the broom-clamps to move in one direction, so that a broom may receive its first wrapping; secondly, another key for reversing this movement for a second wrapping to this broom; and, thirdly, the key for short movements when the loop-stitching for securing this double wrapping is to be made.

The sixth part of my invention refers to an arrangement of a disk provided with projections, whereby a yoke, provided also with projections, is made during the revolution of this disk to operate at certain intervals a clutch,

so as to throw the sewing mechanism in and out of gear, when required.

The seventh part of my invention refers to an arrangement of pawls provided with springs, in combination with the ratchet-wheels attached to a spur-gear that actuates directly the rack-table with broom-carriages, and also to fixed shunts for these pawls, whereby each pawl may be made to act in turn for producing positive or negative long or short movements of the rack-table when such pawls are operated by levers actuated in turn by the shifting set of keys aforementioned, the long movements being for the purpose of allowing each broom to be double wrapped with ordinary broom-twine, and the short movements for the stitching to each broom of such double wrapping.

The eighth part of my invention refers to a table provided with broom-carriages, fitted with broom-clamps, so arranged as to be made to travel backward and forward on a stand or frame, fitted with a stationary head, having certain sewing or stitching mechanism attached thereto, whereby brooms placed in these clamps may be by this mechanism either wrapped or stitched, or both wrapped and stitched.

With reference to the drawings, Figure 1 is a longitudinal vertical elevation of the broom-sewing machine embodying my invention. Fig. 2 is an end or side elevation of the same. Fig. 3 is a longitudinal vertical section of Fig. 1, the front portion of the frame being removed. Fig. 4 is a vertical transverse section of Fig. 1. Fig. 5 is a plan of Fig. 1. Fig. 6 is a plan with a portion of the top covering removed. Fig. 7 shows the position of the broom in one of the clamps; also the point where the needle first pierces the broom in starting. Figs. 8, 9, and 10 show the progressive stages of the stitching, respectively. Fig. 11 is a view of part of the machine on an enlarged scale, for exhibiting plans of the broom-clamp and carriage or sleeve, rocking bar, keys *n o p*, sleeve for shifting these keys, with the lug forming part of this sleeve, levers directly engaged by the keys for actuating the rack mechanism, cam-grooved drum for engaging this sleeve, cam-grooved drum for engaging this rocking bar, and gearing directly operating the sewing mechanism. Figs. 12 and 13 are detail views, on an enlarged scale, of the broom-clamp and mechanism more immediately connected therewith. Fig. 14 is a plan, on an enlarged scale, of the rack-mechanism gear.

This machine is for the purpose of doing away with direct hand-labor in both processes of wrapping and sewing brooms, whereby the flattened shape given to brooms by clamps for that purpose is preserved.

Hitherto it has been the custom to place each broom in its unfinished state separately into a vertically-fixed clamp provided with movable jaws, and to press such broom into hape by levers fitted to this clamp; then next to wrap it round by hand twice with broom-twine close to the lips of these jaws; and, finally, to stitch the broom with needle and twine, the needle being forced through the broom, so as to carry the stitching over the wrapping or binding twine, and to secure it in place in conjunction with the broom-corn, pressed into the required shape. In this last process of stitching brooms by hand the workman is obliged to place leather guards on his hands to enable him to pierce without injury to himself, and with sufficient force, the broom thus being sewed, thereby involving considerable labor and loss of time.

I propose by this machine to make such labor much lighter, and to save time in the manufacture of brooms generally, by adapting certain mechanism, to be hereinafter described, to these wrapping and stitching processes, whereby such mechanism may be under the control of a single crank or treadle, as in ordinary sewing-machines, or belt driven by power.

The following is a description of the several parts of this machine and its mode of operating: X X is a strong metallic frame, for holding the various pieces composing the machine. One side of this frame is fitted with a top plate, W, which serves as a kind of table, and a stationary sewing or stitching machine head, Y, to which the levers *y y*, for operating a needle *g* with spring, are arranged in somewhat similar manner to that in ordinary sewing-machines. The levers *y y* are engaged by a cam, 1, actuating a guide-rod, 2, fitted thereto. A shuttle, Z, beneath this plate is operated by a bent lever, 3, fitted to another cam-drum, 4. Both these cams, 1 4, are attached to a shaft, *f*, so that this shaft is made to actuate the sewing-mechanism portion of the apparatus.

Each broom to be wrapped and stitched has its handle inserted through a metallic tube or sleeve, *a*, so as to have the broom-corn within a shaping and holding clamp, A, to which this sleeve is attached, Figs. 2, 4, and 12. For this purpose the upper jaw *b* of the clamp is raised by means of a lever, *c*, attached to arms *d*. When the broom-corn of the broom has been properly adjusted, the lever *c* is forced up by hand, and the broom is then both pressed into its proper shape and firmly held for the wrapping and stitching operations. A broom being fixed in this manner within each clamp, the mechanism is next arranged with the various parts into proper starting positions, as shown in the several figures. A crank or driving wheel, B, is then turned in the direction indicated by the arrow. A spur-wheel, C, fitted to the crank-shaft M, actuates a pinion, *e*, which is keyed to the shaft *f* of the sewing-machine mechanism, which, being put in motion, causes the needle *g*, Fig. 1, to pierce the broom and form, with the shuttle-thread beneath, a double loop, such loop being thus taken one stitch or space from the edge, Fig. 7. When the

needle rises to a height sufficient to clear the broom the sewing mechanism ceases, by reason of the withdrawal of a sliding clutch, D, from contact with the spur C. This is effected by a yoke, E, actuated by an inclined projection, *h*, attached to a disk-wheel, F, which wheel is keyed to a shaft, G, Fig. 1. To this shaft G is also attached a scalloped key, H, which is regulated in its movements by the spur U, actuated by a pinion, V. This key H, by acting on a sheave, *i*, Fig. 3, is the means of throwing out a bar, I, and also at the same time of drawing a serrated or toothed bar, *j*, over, and thereby actuating a ratchet-wheel, J. The bar I is pivoted at one extremity to the frame of the machine. A spring, *m'*, arrests the momentum of the rachet-wheel J, and another spring, *n'*, causes a positive engagement of the toothed bar *j* with the ratchet-wheel. This wheel, being keyed to a shaft, *k*, on which is also fastened a cam-drum, K, Figs. 6 and 11, causes this cam-drum to revolve. This drum K is provided with a cam-shaped groove, *l*, into which groove is fitted a pin, *m*, that is attached to a sleeve, L, fitted onto the driving-shaft M. This sleeve L envelops the central portion of another sleeve, to which certain keys, *n o p*, are attached, and is itself withheld from revolving by a lug, *r*, Figs. 2, 6, 11, and 13, one end of which lug is provided with a ring, so as to admit of it sliding backward or forward on a bar, *s*, Figs. 6, 11, and 13. By the revolution, then, of this drum K the sleeve L is made to push or slide backward or forward an inner sleeve, to which these keys are in common attached, this inner sleeve being grooved to fit to a feather, *q*, provided on the shaft M, for the purpose of allowing of these keys being shifted to and fro, as may be required. By these means, in the first place the key *o* is brought forward, so as to fall over and actuate a lever, N, which, in turn, acting on an arm, *t*, fitted with a pawl, *u*, drives a ratchet-wheel, O, and, consequently, a spur-wheel, P, to which this ratchet is attached. The spur-wheel P is made to actuate a rack, Q, to which are attached two or more clamp-carriages, R R R. This key *o* is provided with a bit or spur, of sufficient length to cause the lever N to actuate the pawl *t u*, ratchet and spur wheels O P, respectively, and rack, with broom-carriages Q R R R, a distance for this rack equal to the full breadth of a broom, so that such broom may pass clear of the needle *g* by one stitch, such as the rack-table is made afterward to travel during the broom-stitching process.

In order to effect this movement and subsequent movements of the rack-table, the rack mechanism described has the arm *t*, provided with a spring, *k'*, which spring is attached at one end to the machine-frame X X, and is for the purpose of bringing this arm *t* back to its primary position on its being released from the lever N, while a spring, *l'*, causes a positive engagement of the pawl *u* of this arm *t* with the ratchet-teeth of the ratchet-wheel O. When the arm *t* takes its primary position, the pawl *u* is run onto a lug or bolt attached to the frame, which acts as a shunt, *o'*. This arrangement of ratchet-wheel, pawl, actuating-lever, springs, and shunt O *t u* N *k' l' o'*, respectively, is duplicated on the other side of the spur-gear P, for producing a reverse or opposite movement of the rack-table, when required. This is effected by having the spur-gear P and attached ratchet-wheels fitted loosely to their common shaft, while the shunts *o' o'* throw out of gear their respective pawls alternately—that is to say, while one is operating the other is thrown off onto its shunt; and also, only one of the keys *n o p* is shifted into position at a time for engaging one of the actuating-levers to these pawls. The rack-table having now been shifted a distance sufficient to pass a broom its full breadth and a stitch-space under the sewing-needle *g*, and the inclined projection *h*, Fig. 1, having also at the same time passed the projection *v* of the yoke E, Fig. 4, allows this yoke to be pulled back to its original position by means of a spring, *w*, thereby impelling the clutch D to an impingement with the loose spur-wheel C, and by this means again throwing the sewing-machine mechanism into gear. At this stage the needle *g* is a second time brought down, and a second loop formed with the shuttle-twine, thus completing the first wrapping, Fig. 8. As soon as this loop has been made, the sheave *i*, by following the contour of the scalloped key H, by means of the pressure of the spring *y*, is made to enter the first scallop *z*, Fig. 3. The tooth-bar *j* then slides over the ratchet-wheel J for another movement. A second inclined-plane projection, *a'*, now impinges on the projection *v*, and the sewing mechanism is again thrown out of gear. By the continuous movement of the key H the sheave *i* is made to traverse the second horn *b'*; and by means of the toothed bar *j* and mechanism already described, the key *p*, Figs. 6 and 11, is now brought into position, and its spur falls onto a lever, S, which lever actuates the ratchet mechanism on the reverse side of the spur-gear P. (See Figs. 6 and 14.) By the action of this key on this lever S the rack-table Q is moved backward, and the broom is made again to traverse its full breadth under the needle *g*, and one stitch-space clear, the needle taking up the slack of the second double loop. About this time the inclined plane *a'* is made to pass clear of the projection *v*, the sewing mechanism is again started, and a third double loop formed outside of the broom, thus completing the double or second wrapping. The third horn *c'* of the scalloped key H now comes into play, and, acting on the toothed bar and ratchet mechanism described, causes the cam-grooved drum K to shift the keys *n o p* into the original position occupied by them before starting,

Figs. 6 and 11. The scalloped key having now passed the sheave *i*, the sewing mechanism remains in gear; and as the keys *n o p* have been shifted so as to bring the short-spurred key *n* into position for actuating the lever N by short movements, the stitching will now be commenced and continued uninterruptedly until the broom now being first operated upon is stitched, Fig. 10, or at least until one row of stitching has been completed, by which time the scalloped key will have made a revolution, and again be in its original position for the succeeding broom.

The sleeves *a* attached to the broom-clamp carriages R are each provided with pins *d' e'*, which are made to engage a raised rib or cam, or series of cams, *f'*, fixed onto a bar, T. This bar T, by being pivoted to the frame at each end *g'* and *h'*, is made capable of being moved or rocked backward and forward on these pivot-points. At the lower branch or frame part of this rocking bar a pin, *i'*, is so attached as to fit into and be actuated by a cam-shaped groove of the revolving cam-drum *j'*, which cam-drum is attached to the main or driving shaft M.

This rocking bar is for the purpose of giving the clamp-carriages movements at right angles to those given to them by the rack Q, thus causing the needle to pierce the broom alternately on each side of the binding-twine. Each of these clamp-carriages A has its lower face end, and also the corresponding face end of the cover *b*, curved, such curvatures being the same as each of those of the ribs or cams *f'* of the bar T, but made in an opposite direction.

The object of these contrary forms of curvature of rocking-bar rib *f'* and clamp-faces is to constantly allow of a broom-clamp receding a distance equal to the advance of its curved face from a straight line, thereby always bringing the double binding of wrapping-twine into position under the stationary needle-head Y of the sewing mechanism; also, to allow of the curved-face end of the clamp, with cover, serving as a guide to the twine taken by both needle and shuttle from the stitches made at each end of the broom, to give the proper curved shape or form to this double wrapping or binding described.

These curved faces of both clamp and clamp-cover are also indented, serrated, or provided with teeth *x*. These teeth are to allow of the needle, when piercing the broom placed within its clamp-carriage, first entering on that side of the wrapping nearer the broom-handle or socket, and consequently between these teeth *x* and close to the line of this wrapping, Figs. 8, 9, and 10, and next at the second stitch on the other side of this wrapping, and so on continuously, by reason of the forward and backward movements imparted to these clamp-carriages at certain intervals.

These intervals are regulated, in order that the stitching that secures this wrapping shall be of a double binding or encompassing loop and zigzag form, and depend also on the following parts of the general mechanism.

The spur-gear C, being fitted to the shaft M, is arranged so as to engage a pinion, *e*. This pinion is made to actuate the sewing mechanism through the shaft *f*, to which it is attached, in such manner that for each revolution of the spur C a certain number of revolutions of the pinion *e* is effected, and consequently a certain number of stitches are sewed through or onto the broom during that same interval.

The movements, however, of the rocking bar are so regulated by the inclined directions given to the cam-groove of the drum *j'* that, after a stitch has been made through the broom first on one side of the wrapping-twine, and the needle has risen clear of the broom, the sudden incline of a portion of this cam-groove causes the rocking bar T *i'* to draw the broom-carriage clamps quickly backward in a direction at right angles to the length of the rack-table or breadth of the broom.

Another stitch is then immediately afterward made by the needle and shuttle on the other side of the wrapping-band of twine, thus making a double stitching and enveloping loop to this double wrapping-band; and as the sewing-mechanism head is stationary while the broom being thus sewed has been drawn backward at right angles to its breadth, such binding-loop to the double wrapping-band will be also at right angles to it.

On the needle *g* again rising clear of the broom, the cam-drum *j'* being continually in motion, its cam-groove will gradually draw the rocking bar back again to its primary position during the time that the needle *g* is raised above the broom; but during this movement the key, with short spur *n*, is brought into position at the requisite time during its revolution, so as to fall onto the lever N, and such lever, on being thus actuated, will, by the rack mechanism described, shift the rack-table, with brooms, a space equal to the distance between each loop-stitch required on the broom.

At about the completion of the revolution of the cam-drum *j'* the needle again commences to descend, and will pierce the broom in the same relative position as at starting, preparatory to making another enveloping-loop. Consequently both needle *g* and shuttle Z, on commencing to form the next stitch, will have carried their connecting-threads across the double wrapping-band, thus giving the finished stitching a double enveloping-loop and zigzag stitching appearance, as shown in Fig. 10.

A broom-sewing machine such as described may be provided with two or more broom-clamp carriages, the limit to the number of such clamps being defined simply by convenience with regard to the size of the machine and the strength of the rocking bar T. One with a dozen such broom-clamps would be an ordinary machine for factory use.

When the rack-table has progressed to the end

of its travel in one direction, and has passed all the broom-clamps holding brooms under the needle, so that each broom may have received a double wrapping of twine and stitching of the same, it is necessary that another line of wrapping and stitching should then be made on each broom, as a majority of the brooms hand-sewed have two lines of wrapping and stitching, for properly preserving the broom-corn in shape.

In order to effect this, each broom-clamp is loosened sufficiently to enable the workman to adjust each broom by its handle to the requisite position for such second double line of wrapping and stitching. The clamps are then again fastened down, and the mechanism of the machine adjusted so that it may wrap and stitch on the return or backward movement of the rack-table. This is arranged by shifting the keys *n o p*, so that instead of allowing the lever that actuates the rack-table in a positive direction to be employed, that key only will be brought into play that engages the lever that reverses the direction of the rack-table, thus forming a backward wrapping on the last broom. The next shifting by the ratchet-wheel J will produce a positive movement of the rack-table. A forward wrapping of the broom and another shifting of the keys by the action of this ratchet-wheel and mechanism connected therewith will cause a backward stitching of this broom, to be followed by a backward wrapping of the next broom in order, and so on till the rack-table with brooms has been brought back again to its original starting position.

I claim as my invention—

1. In a broom-sewing machine, the combination of the rack-table Q, fitted with carriages R R R and geared to the spur-gear P, with attached ratchets O O′, the pawls *u t w′ t′*, with springs for engaging these ratchets, the fixed shunts *o′ o′*, the movable clamps A, provided with curved serrated faces *x x*, covers *b*, and tightening-levers *c d*, sleeves *a a*, provided with pins *d′ e′*, fitted to the ribs of the rocking bar T *f′ f′*, the levers N S, keys *n o p*, sleeve with lug and pin L *r m*, and sliding bar *s*, cam-grooved drum *j′* fitted to the key-shaft, cam-grooved drum K with ratchet-wheel J attached to the shaft *k*, the scalloped key H *b′ c z*, provided with sheave *i*, springs, and toothed bar *j* I, the disk F, provided with projections *h a′*, and the yoke E, provided with projections *v* and springs, and the clutch D, for operating the loose gear C, fitted to the sewing-mechanism gear *e f*, all arranged as herein set forth.

2. In a broom-sewing machine, the combination of the rocking bar T *i′ f′*, fitted by sleeves *a d′ e′* to the movable broom-clamps A A and to the traveling rack Q, provided with with fixed sleeve casings or carriages R R, substantially as and for the purposes herein set forth and specified.

3. In combination with the sewing-mechanism gear C *e f*, the rocking bar T *f′ i′*, fitted with holding-clamps A *a* A *a* described, and to the cam-grooved drum *j′*, attached to the driving-shaft M, substantially as and for the purposes herein set forth and specified.

4. The broom-clamp A, provided with cover *b*, curved serrated faces *x*, levers *c d*, and broom-handle sleeve *a*, all constructed and arranged as shown, substantially as and for the purposes herein set forth and specified.

5. The keyed movable sleeve *n o p* described, fitted to the feathered shaft M *q* and to the outer sleeve L, provided with pin *m* and lug *r*, with sliding bar *s*, all arranged as shown, in combination with the direct-acting cam-grooved drum K, and the mechanism, or its equivalent, for operating the traveling rack Q, with broom-carriages R R R, consisting of the levers S N, pawls *u t w′ t′*, springs *k′ l′ k′ l′*, with ratchet-wheels and spur-gear O O′ P′, respectively, substantially as and for the purposes herein set forth and specified.

6. The rocking bar T *i′*, provided with curved ribs or cams *f′ f′ f′*, fitted to the movable clamps A *a* A *a*, said clamps being provided with toothed or serrated faces *x x*, curved in an opposite direction to that of these ribs *f′ f′ f′*, all combined as shown and described, substantially as and for the purposes herein set forth and specified.

7. The scalloped key H *b′ c z* described, fitted with bar I, provided with sheave *i*, springs *m′ y*, and toothed rack *j*, in combination with the shaft *k*, provided with ratchet-wheel J, and grooved cam-drum K *l*, that actuates the keyed sleeves L *n o p*, all arranged as herein set forth, whereby, by these keys *n o p* being timed by this scalloped key in their action on the levers operating the rack mechanism, said keys may be made to regulate long and short forward and backward movements of the broom carriages and clamps, as required.

8. The disk F, provided with projections *h a′*, in combination with the yoke E, fitted with springs *w*, and provided with the projection *v*, and the clutch D, for impingement on the loose gear C, all arranged as shown, substantially as and for the purposes herein set forth and specified.

9. The shunts *o′ o′*, attached to the broom-sewing-machine frame X X, in combination with the pawls *u t w′ t′*, and ratchet-wheels O O′, with spur-gear P, geared to the rack-table Q, provided with broom-carriages R R, substantially as and for the purposes herein set forth and specified.

10. The pawls *u t w′ t′*, fitted with springs *k′ l′ k′ l′* in the manner described, in combination with the ratchet and spur wheel gear O O′ P, respectively, geared to the rack-table Q, fitted with broom-carriages R R, substantially as and for the purposes herein set forth and specified.

11. The traveling rack-table Q, provided with fixed carriages R R and movable broom-clamps A *a*, in combination with the needle and shuttle mechanism fitted to the stationary

sewing-machine head Y, substantially as and for the purposes herein set forth and specified.

12. In a machine for sewing brooms, the combination, substantially as specified, of the following elements, viz: first, a sewing-machine operating intermittingly; second, a broom-clamp mounted to laterally reciprocate on a traversing feed-carriage; third, mechanism for traversing the feed-carriage and laterally reciprocating the broom-clamp at proper times and in unison with the movements of the needle to first wrap and then stitch the broom.

LIONEL VARICAS.

Witnesses:

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