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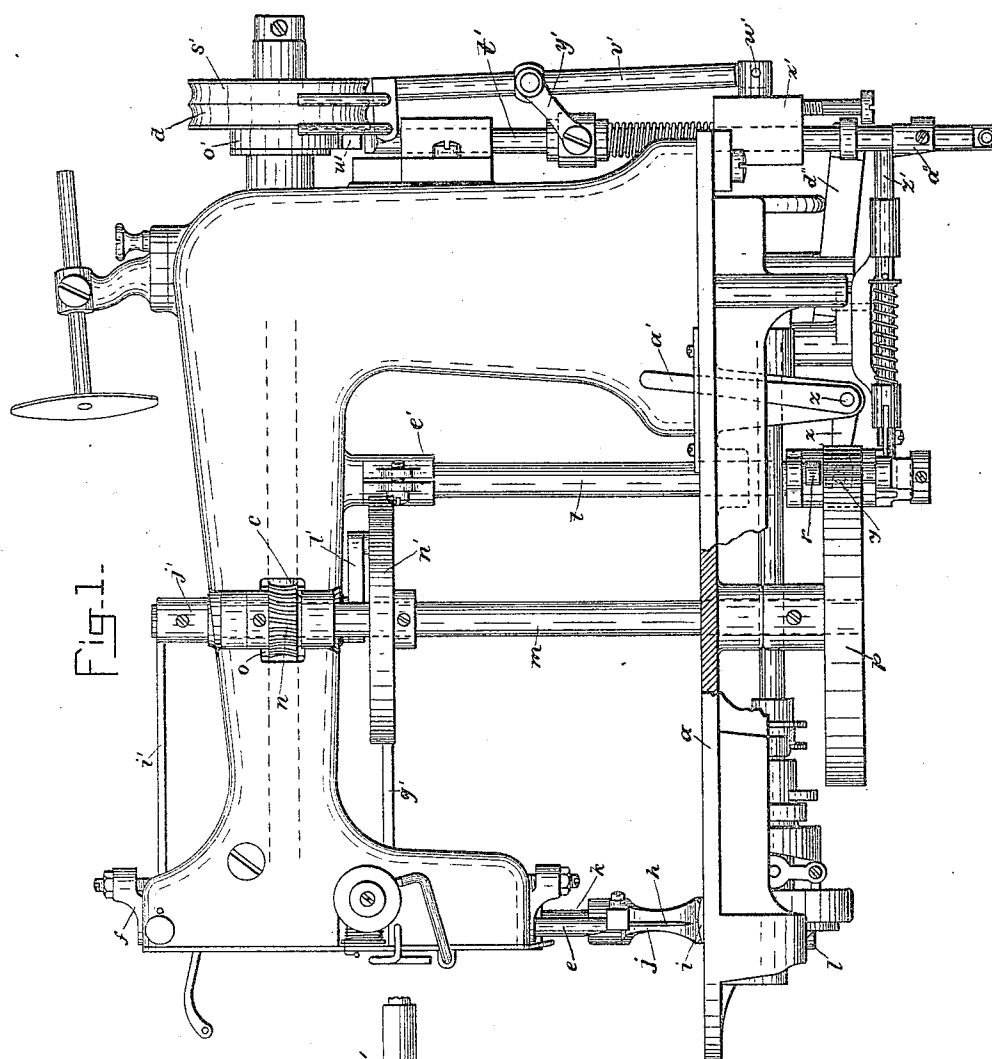
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G. S. HILL.

SEWING MACHINE FOR BARRING AND TACKING.

No. 529,491.

Patented Nov. 20, 1894.



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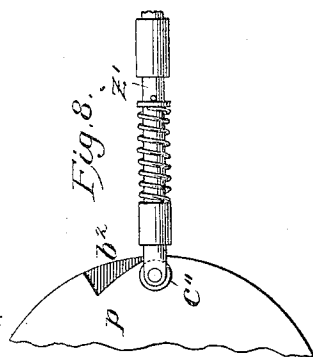


Fig. 8.

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(No Model.)

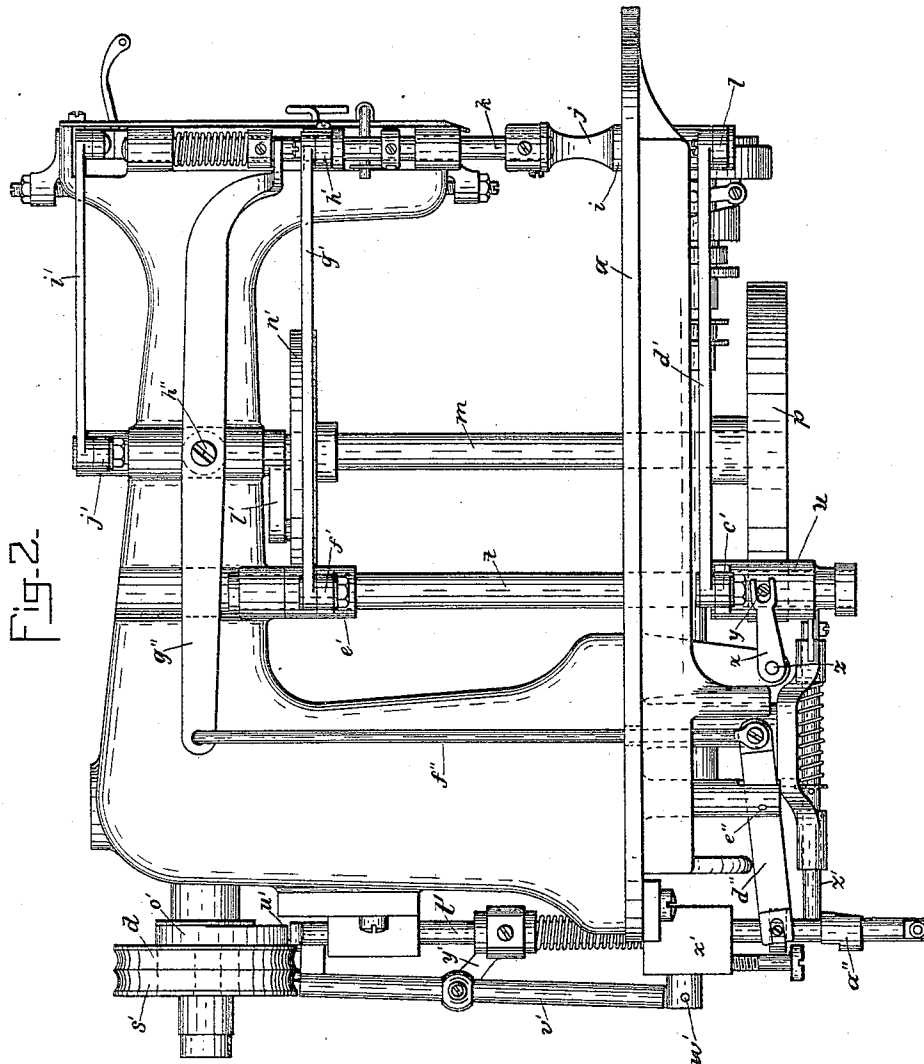
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SEWING MACHINE FOR BARRING AND TACKING.

No. 529,491.

Patented Nov. 20, 1894.



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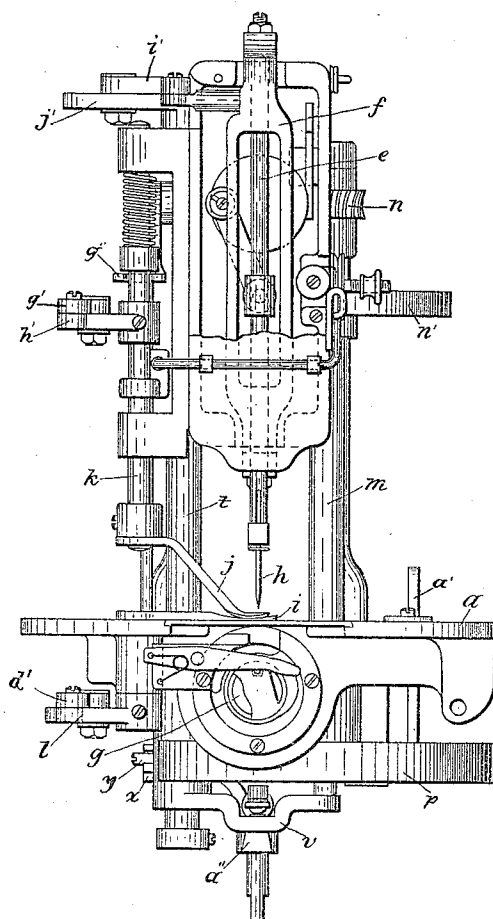
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Fig. 3.



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4 Sheets—Sheet 4.

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SEWING MACHINE FOR BARRING AND TACKING.

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Fig. 4-

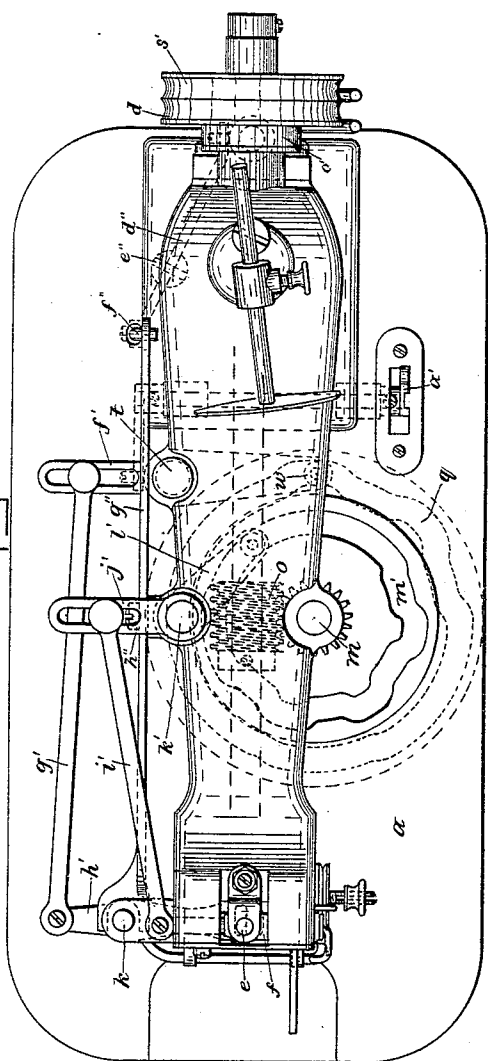


Fig. 6-

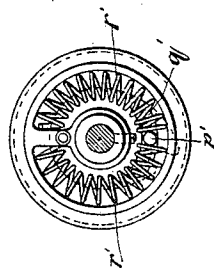


Fig. 7-

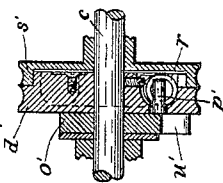
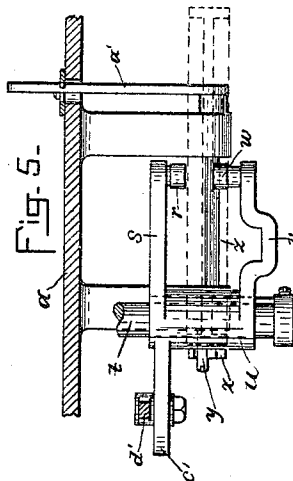


Fig. 5-



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UNITED STATES PATENT OFFICE.

GEORGE S. HILL, OF BRADFORD, ASSIGNOR OF ONE-HALF TO JAMES H. MURRAY, OF HAVERHILL, MASSACHUSETTS.

SEWING-MACHINE FOR BARRING AND TACKING.

SPECIFICATION forming part of Letters Patent No. 529,491, dated November 20, 1894.

Application filed February 27, 1894. Serial No. 501,700. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. HILL, of Bradford, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines for Barring and Tacking, of which the following is a specification.

This invention has relation to that kind of sewing machines which are designed to secure particular points of an article, as the ends of button-holes of boots and shoes or other articles of apparel, the corners of pockets, &c., with bar or tacking stitches.

It is the object of the invention to provide a machine for the purposes mentioned which shall be simple in construction, and certain and efficient in its operation.

The invention consists of a reorganized barring and tacking machine, as a whole, and in certain improved parts and combination of parts in the said machine, all as I will now proceed to describe and claim.

Reference is to be had to the annexed drawings and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings—Figure 1 is a front elevation of a machine constructed in accordance with my invention, parts being shown as broken away the better to show the structure. Fig. 2 is a rear elevation of the machine. Fig. 3 is a front end view of the same. Fig. 4 is a top view showing some of the essential features which would naturally be obscured, in dotted lines. Fig. 5 is a detail view, in sectional side elevation, designed to show the manner of shifting parts for the purpose of securing variation in the cross or tacking stitching. Fig. 6 is a side view and Fig. 7 is a central sectional view of the driving and loose pulleys and contrivance for stopping the same. Fig. 8 is a detail view showing the cam-pieces (*b''*) (*c''*).

In the drawings—*a* is the bed of the machine.

b is the overhanging arm in which is journaled the needle shaft, *c*, operated by a belt (not shown) running over the pulley, *d*, on the said shaft.

e is the needle-bar supported in a swinging

frame, *f*, so as that it may be vibrated in the usual way to form the well-known zigzag or side-to-side stitch. The needle-bar is reciprocated in the usual way by the needle-shaft.

g is a rotating shuttle which is operated and equipped in such manner as to form with the reciprocating needle, *h*, a sewing mechanism, all as is well understood by sewing-machine artisans.

The parts so far described, as has already been intimated, are not of my invention, and may be of the form shown or any other suited to the purpose.

The work-holder consists of the base-plate, *i*, and the presser-foot, *j*, connected with the vertically movable spring-pressed presser-bar, *k*, said bar being also capable of a rocking motion in its bearings. The rear end of the base-plate, *i*, is secured to a vertical pivot stud to the lower end of which a crank arm *l* (see Fig. 3) is connected, so that as the said pivot stud is rocked the forward free end of the base-plate may be shifted from side to side.

In the use of the improved machine the work will be clamped between the two members comprising the work-holder, and upon starting the machine the work-holder will first be shifted from side to side for a considerable distance, coincident with the reciprocating movements of the needle, to effect the making of long bar stitches, and then said work-holder is moved intermittently from end to end of the bar stitches, so that the needle, in its vibrations, may sew diagonally across from side to side of the bar stitches.

m is a vertical shaft sustained in suitable bearings so that it may be rotated, and connected with the same at the proper point is a worm wheel, *n*, which is engaged and driven by a worm, *o*, shown by dotted lines in Fig. 4.

On the lower end of the shaft *m* there is affixed a disk, *p*, provided on its upper face with a cam groove or path cam, *q*, (see dotted lines in Fig. 4,) into which an anti-friction roller, *r*, on the free end of an arm, *s*, is adapted to extend. The opposite end of the said arm is affixed to a vertical shaft, *t*, by means of a collar or sleeve, *u*, splined upon the shaft. With the said collar, *u*, there is connected another arm, *v*, the free end of which extends

below the disk, *p*, and is provided with an anti-friction roller, *w*, similar to roller, *r*, which is adapted to be extended into a cam groove or path cam formed in the lower face of the said disk, which latter cam groove may differ in form from the cam groove *q*. The forked end of an arm, *x*, engages a pin, *y*, on the sleeve *u*. (See Fig. 1.) The opposite end of the arm, *x*, is secured to a fulcrum pin, *z*, with which a lever, *a'*, is also connected, said lever extending up through a slot, *b'*, in the bed of the machine. (See Fig. 4.) It will now be seen that by the movement of the lever, *a'*, the anti-friction rolls of either the arms *s* or *v* may be engaged with the cam grooves of the disk, *p*, and that as the latter is rotated, the said cam grooves will by their form cause the rocking of the said shaft *t*. Extending out from the collar or sleeve, *u*, is a slotted arm, *c'*, with which is adjustably connected one end of a link rod, *d'*, (see Fig. 2,) the opposite end being connected with the free end of the arm *l*. With the shaft, *t*, there is connected by a pinch-collar, *e'*, one end of a slotted arm, *f'*, with which there is adjustably connected one end of a link-rod *g'*, the other end of which is pivotally connected with the outer end of a crank arm, *h'*, secured to the presser-bar, *k*, (see Fig. 4,) so that when the shaft, *t*, is rocked, the presser-bar, *k*, will be correspondingly rocked, and the pivot stud of the base-plate, *i*, will likewise be moved, shifting or moving the members of the cloth-holder in unison.

The vibrating needle-frame is connected by means of a link-rod, *i'*, with a slotted arm, *j'*, of a lever secured to a fulcrum stud, *k'*. The other arm, *l'*, of said lever is provided at its free end with an anti-friction roll, *l'*, which extends into a cam groove or path cam, *m'*, formed in the upper face of a disk, *n'*, secured to the shaft, *m*, just below the overhanging arm of the machine, so that as the disk, *l'*, is rotated, the needle-frame *f* will be vibrated in accordance with the form of the cam groove, *m'*, in the disk, *n'*.

As before stated the pulley *d* is secured to the shaft, *c*, and a hub, *o'*, loose upon the shaft, *c*, is connected with the pulley, *d*, by means of a pin, *p'*, extending into a slot, *q'*, (see Fig. 6,) between the ends of cushioning springs, *r'*, arranged in recesses in the side of the pulley *d*. The pulley, *s'*, is arranged alongside of the pulley, *d*, and constructed so as to run loose on the shaft *c*.

t' is a vertical upwardly spring-pressed rod adapted when released to have its upper end enter a notch, *u'*, in the hub, *o'*.

v' is a belt shifter, pivoted at its lower end at *w'* upon a lug extending from a collar, *x'*, on the rod *t'*. The belt shifter is also connected about midway of its length with the rod, *t'*, by means of a link, *y'*, so that by moving the rod, *t'*, up and down the fork of the belt shifter will be moved from side to side shifting the belt from the fast to the loose pulley, and back.

z' is a horizontally arranged rod, spring-pressed toward the rod (*t'*) and its outer end adapted to snap above a catch-collar (*a''*) on the rod (*t'*), and at its inner end extending under the disk (*p*), see Fig. 8, where a wiper or cam-piece (*b''*) is arranged to engage a cam-piece or wheel (*c''*) on the inner end of the rod (*z'*), as said disk (*p*) is revolved and move the said rod (*z'*) longitudinally against the tension of its spring and release it from the catch-collar (*a''*), allowing the rod (*t'*) to be moved upward by the tension of its spring operating the belt shifter to move the belt from the fast to the loose pulley and engaging the upper end of the rod (*t'*) with the notch (*u'*) of the hub (*o'*), and stopping the machine.

d'' is a lever fulcrumed at *e''*, and loosely connected at its outer end with the rod, *t'*, and pivotally connected at its other end with the lower end of a link-rod, *f''*, which link-rod, at its upper end, is pivotally connected with the rear end of a lever, *g''*, fulcrumed at *h''* and loosely connected at its forward end with the presser-bar, so as to raise it against the stress of its spring.

The operation of the machine, as a whole, will now be readily understood. The machine being at rest, the presser-foot will be raised and goods to be operated upon may be placed in position in the work-holder, and the rod, *t'*, drawn down by means of a treadle attached thereto, or in any other suitable way. This operation will effect the release of the upper end of the rod, *t'*, from the hub, *o'*, of the pulley, *d*, allowing the said pulley to be set in motion when the belt is shifted as it will be by the belt-shifter, *v'*, from the loose pulley, *s'*, to the pulley, *d*, as has been before explained. With the pulling down of the rod, *t'*, the lever, *d''*, will be operated, and through the medium of the link-rod, *f''*, and lever, *g''*, the presser-foot, *j*, will be allowed to press upon the goods in the work-holder by means of a spring operating on the presser-bar, in the usual way. After the rod, *t'*, shall have been drawn down to its fullest extent the spring-pressed and horizontally arranged rod, *z'*, will be moved rearwardly so as to catch upon the top of the collar, *a''*, on the rod, *t'*, and so hold the said rod *t'*, down.

It will have been understood that before the machine shall have been started, as stated, the lever, *a'*, will have been operated so as to engage the roller or stud, *r*, of the lever, *s*, or the roller, *w*, of the lever, *v*, with the cam groove of the disk, *p*, in accordance with the particular stitch that it may be desired to make in tacking down the bar stitches.

With the machine thus set in motion the first operation will be to shift the work-holder backward and forward to the utmost limits of its movement so as to form what has been described as the "bar-stitches," and this shifting of the work-holder will be accomplished by the cam groove, *q*, or a corresponding groove on the under side of the disk, *p*, as has

already been explained, and after the required number of bar-stitches shall have been made, the cam groove *g* will be so formed as to bring the work-holder to a substantial rest, or so that its future movements will be of a step-by-step order from one end of the bar stitches to the other. While the bar stitches were being made the frame in which the needle-bar operates will have been held substantially stationary so that the needle will have been operated in substantially the same vertical plane. This control of the needle-bar will be accomplished, as has already been shown, by the plain form of the cam groove, *m'*, in the disk, *n'*. After the completion of the bar stitches just mentioned the work-holder will be moved step-by-step, as before explained, and the frame in which the needle-bar operates will be vibrated by reason of the form of the cam groove in the disk, *n'*, so as to sew across from side-to-side of the bar stitches, and tack the same down from one end to the other.

Just here it may be explained that in some classes of work it may be desirable to have the tacking stitches or shifting made from side to side of the bar stitches of regular form from one end of the bar stitches to the other, while in other classes of work it may be desirable to tack down the ends of the bar stitches by two or three more close cross stitches skipping by stitches of considerable length from one end of the bar to the other; and this is why provision is made in my machine for employing either the groove on the upper face of the disk, *p*, or a groove of different form on the lower face thereof, with means for employing either one or the other in the movements and control of the work-holder. After the barring and tacking shall have been completed, a cam or wiper on the lower face of the disk, *p*, will engage the inner end of the rod, *z'*, and release said rod from the catch-collar, *d''*, allowing the rod, *t'*, to be pressed upward by the spring controlling the same when released, and engage the notch, *u'*, of the hub, *o'*, and at the same time effect the shifting of the belt from the fast to the loose pulley, stopping the machine. The loose connection of the hub, *o'*, with the pulley, *d*, and the springs between said connection and pulley provide a means for cushioning the operation of the stopping devices so as to avoid shock to the machine, and possible breakage. With the raising of the rod, *t'*, it will be understood that the presser-foot will be raised against the tension of the presser-bar spring through the medium of the levers, *d'' g''*, and connecting link, *f''*.

It is to be noted that by a single operation of the rod, *t'*, I am enabled to release the stopping means, shift the belt from the loose to the fast pulley to set the machine in motion, and at the same time operate the presser-foot so as to clamp the goods to be operated upon therein. This I consider an important feature of the invention.

Another point to be noted is the fact that the work-holder is operated to form the bar stitches while the needle operates in substantially the same plane, while in effecting the tacking or cross stitching the work-holder is simply moved step-by-step from one extremity of its movements to the other, and the needle-bar and needle are vibrated.

No claim is made herein to the belt shipping and stopping devices these forming the subject matter of another application filed by me, August 24, 1894, Serial No. 521,170.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A barring and tacking machine comprising in its construction a sewing mechanism, a work holder, a path cam, and connections between the latter and the work holder for first moving the work holder so as to produce long bar stitches, and then moving it step by step from one of the extreme limits of its movements to the other, a vibratory needle, a path cam and connections between the same and the vibratory needle for holding the latter against vibratory movement while the bar stitches are being made, and vibrating it during the last mentioned movement of the work holder, substantially as and for the purpose described.

2. A barring and tacking machine comprising in its construction a sewing mechanism, a work holder, a double path cam and connections between the latter and the work holder for first moving the work, so as to produce long bar stitches and then moving it step by step from one of the extreme limits of its movements to the other, a vibratory needle, a path cam and connections between the same and the vibratory needle for holding the latter against vibratory movement while the bar stitches are being made and vibrating it during the last mentioned movement of the work holder, connections between the work holder and the said double path cam, a lever and intermediate mechanism for operating said connections, whereby either path in said cam may be used for moving the work holder, substantially as and for the purpose described.

3. In a sewing machine for barring and tacking in combination, a main shaft, a vibratory needle, a work holder and complementary stitch forming mechanism, a vertical shaft connected to said main shaft, two wheels *p* and *n'*, fast upon said vertical shaft, and provided with path cams, lever connections between the cam and the wheel *p* and the work holder for first moving the work holder so as to produce long bar stitches and then moving it step by step from one of the extreme limits of its movements to the other, and lever connections between the cam in the wheel *n'*, and the vibratory needle for

holding the latter against vibratory movement while the bar stitches are being made, and vibrating it during the last mentioned movement of the work holder, substantially
5 as and for the purposes described.

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

two subscribing witnesses, this 15th day of February, A. D. 1894.

GEORGE S. HILL.

Witnesses:

ARTHUR W. CROSSLEY,
A. D. HARRISON.