

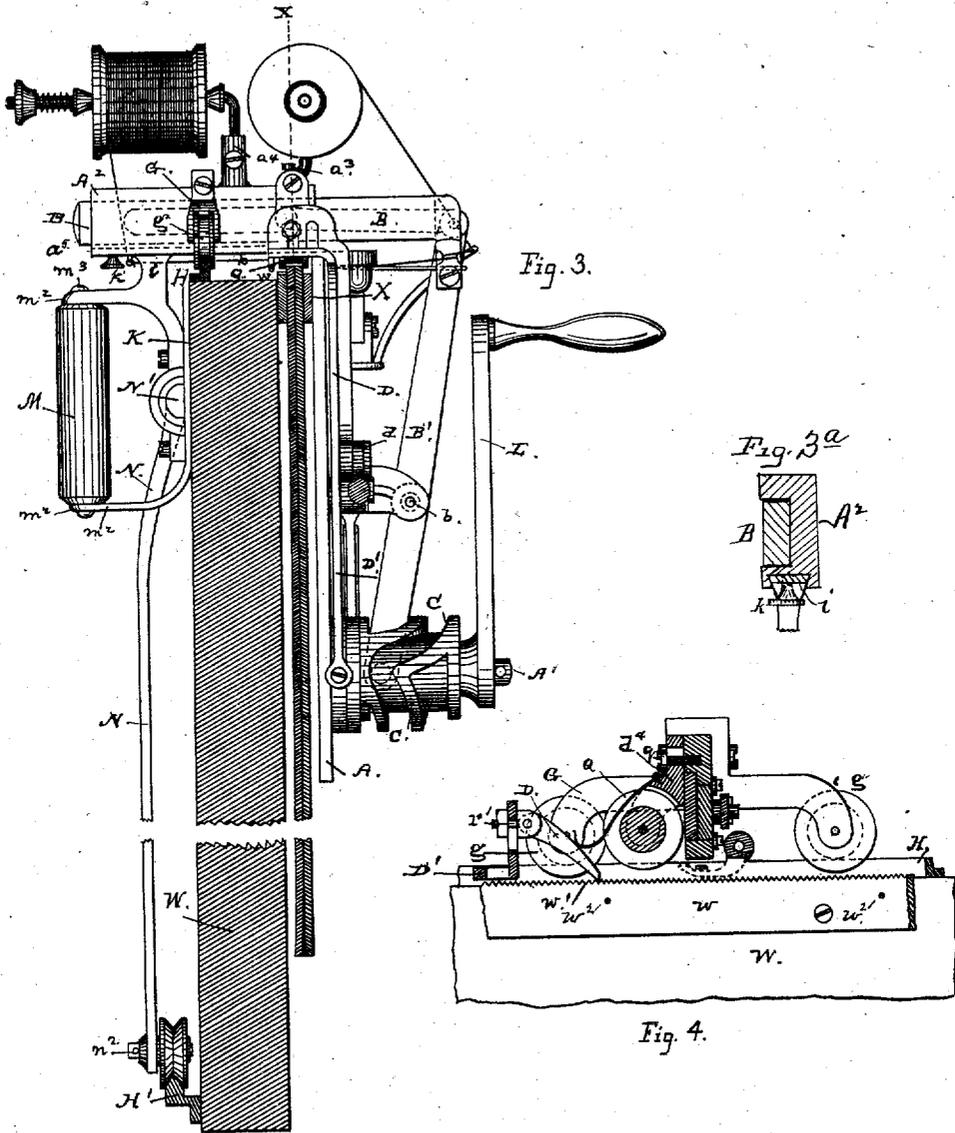
(No Model.)

3 Sheets—Sheet 2.

A. B. SMITH.
CARPET SEWING MACHINE.

No. 296,474.

Patented Apr. 8, 1884.



Witnesses..
 Geo. A. Dickson
 F. M. Downey

Inventor:
 Alphonse B. Smith.
 By his Atty.,
 Edward J. Selton

(No Model.)

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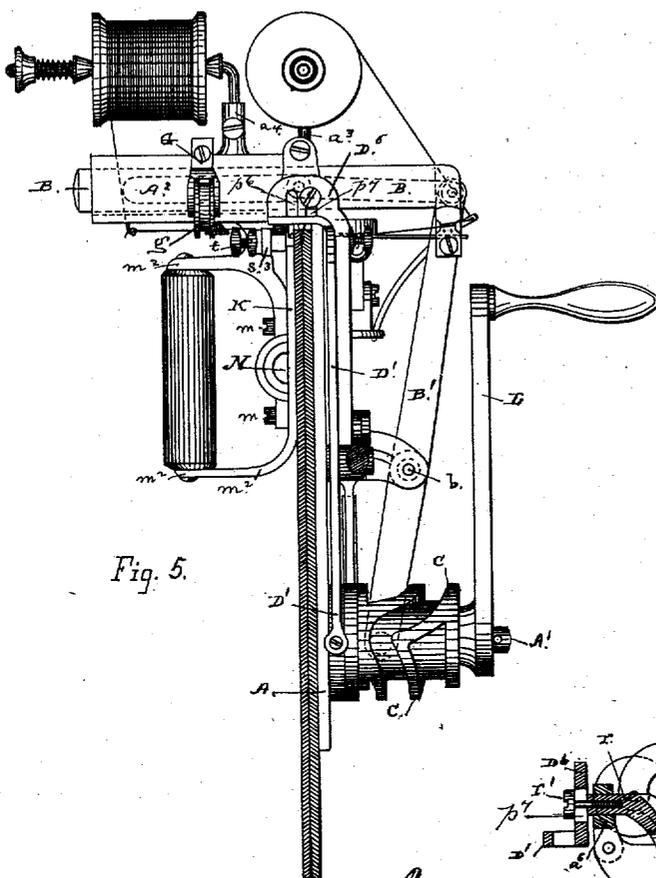


Fig. 5.

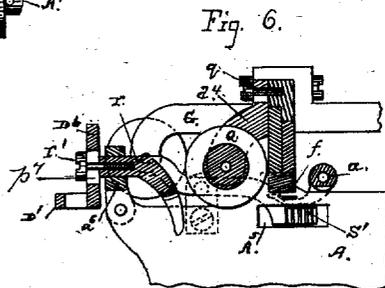


Fig. 6.

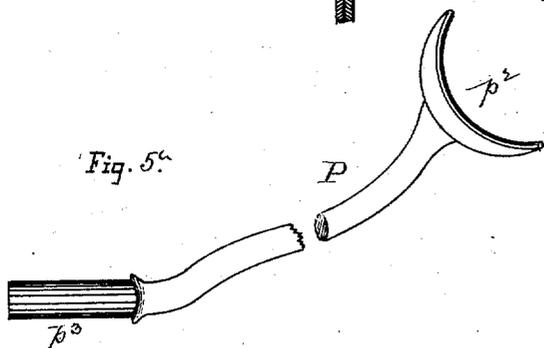


Fig. 5c.

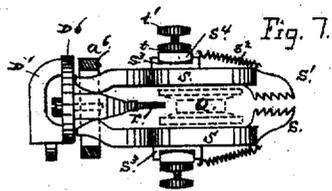


Fig. 7.

Witnesses:

Geo. A. Dickson

J. M. Downey

Inventor:

Alphonso B. Smith

By his atty.,

Wm. J. Downey

UNITED STATES PATENT OFFICE.

ALPHONSO BUDD SMITH, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO
SOLON PATTEE, OF SAME PLACE.

CARPET-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 296,474, dated April 8, 1884.

Application filed April 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSO BUDD SMITH, a citizen of the United States, residing at the city and county of San Francisco, State of California, have made and invented certain new and useful Improvements in Carpet-Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings.

My invention has reference to sewing-machines of the class or kind now commonly known as "carpet-sewing machines," which are constructed for the special purpose of stitching carpets, sail-cloth, canvas, and other like coarse heavy material. By means of my improvements, as hereinafter described, I produce a machine having the capacity to work either directly upon the edges of the material supported for the purpose in a vertical position from points of suspension, at intervals, for the length of seam to be formed, and by adjustment made capable of operating upon a fixed track or guides along a bench or table, to the edges of which is clamped the material to be stitched. In the present application, however, while I show and describe both forms of machine and explain how the same machine may be equipped to perform the work in either position, with the substitution of certain parts in one for those used in the other, and the proper lateral adjustment of the frame, I claim only such features as are common to the machine in both adjustments, and those used thereupon when it is equipped to work upon a bench. The features peculiar to the machine when used directly on the edge of the material without any bench or supporting means have been made the subject-matter of a separate application for patent.

The objects sought to be attained are to provide a machine to work upon large heavy kinds of material that cannot be readily handled and stitched by ordinary machinery, and to work upon all grades of such material, from the heaviest to the lightest, and a machine that is particularly adapted to work to the best advantage on each kind of material.

To such end and purpose my improvements consist, first, in certain novel construction of frame or carriage, as hereinafter fully de-

scribed, whereby the working parts are disposed, supported, and balanced in the manner best calculated to produce even motion and regular feed, and whereby also the machine is rendered adaptable to travel and work directly upon the edges of the material, or to be operated upon a track or guide fixed on a bench or work-supporting table; secondly, in the combination, with such frame, of carrying and guiding rollers adjustable to enable the machine to work in both positions—*i. e.*, either upon the edges of material held vertically or upon the work-bench to which the edges of the material are held by clamps; thirdly, in certain novel construction of bench or table, guide-tracks for the machine, and a clamping and supporting device to confine and hold the work in position with respect to the movements of the machine; fourthly, in certain novel construction of feed mechanism for operating the machine upon the fixed work-bench to give it a progressive movement step by step; and, lastly, in the combination and arrangement, together and with the frame or carriage, of parts and mechanism for operating a horizontally-moving needle, an under-thread carrying and controlling mechanism, and thread-controlling devices comprising the stitch-forming mechanism.

The following description fully explains the nature of my said improvements and the manner in which I proceed to construct, apply, and combine the same to produce a sewing-machine of the kind described.

In the said drawings referred to, Figure 1 represents a front elevation of my said sewing-machine set up and in position for operating upon the work-supporting bench. Fig. 2 illustrates the operation of the work-clamping device by which the edges of material are held to the work-bench and presented to the traveling sewing mechanism. Fig. 3 is a side elevation of the machine, taken from the left-hand side of Fig. 1, the fixed bench and material being shown in cross-section. Fig. 3^a is a detail view, showing an enlarged section of the needle-arm and box, with the underneath groove and part that rides therein. Fig. 4 is a front view of the feed mechanism, consisting of a fixed rack upon the table and a vibrating finger or pawl upon the machine.

This view shows also the rollers of the carriage, and is a section taken through the line $x x$, Fig. 3. Fig. 5 is a side view showing the change and adjustment of parts for working directly upon the material, the parts in section representing the two thicknesses of material to be stitched together. Fig. 5^a is a steadying-bar to be used with the machine when adjusted for working directly upon the material. Figs. 6 and 7 are detail views of the feed mechanism that is employed in place of the mechanism, Fig. 4, when the machine is made to feed directly upon the material, Fig. 6 being a front view, partly in section, and Fig. 7 a plan or top view.

A is a flat plate of thin sheet or cast metal, and forming the principal carrying-plate for the mechanism that operates the needle, a looper, a , and feed device D. It carries a stud, A' , on which is mounted a groove-cam, C, to work the lever A' , which actuates the needle-bar B and a double-face cam, $c' c''$, of which one part operates a feeding-lever, D' , and the other part actuates the lever E of the looper or under-thread carrier. Upon the front of the plate also is a stud, b , whereon the needle-actuating lever B' is pivoted, and also at one side a bracket, d , for the feed-lever center, and at the other side a pivot, e , for the looper-lever.

A^2 is a box having a groove, a^2 , to receive and guide the needle-bar. This box, fixed across the top of the plate A, is secured to it at the point f , and in a horizontal position transversely to the face of the plate. Upon this box are sockets $a^3 a^4$ for the spool-spindles, and there is secured to it a frame, G, carrying traction-rollers or flanged wheels $g g$, that are points of support for the frame upon the track H of the work-holding bench.

In the bottom of the rear end of the box A^2 , or the end back of the plate A, a dovetail slot or way, a^5 , is cut to receive the dovetail end piece, i , at the top of a plate, K. A thumb-screw, k , is let through this sliding block i to work from the under side against the bottom of the slot a^5 for locking the sliding block in place at any point. The plate K, of which this slide i is a part, is about the same width of surface, but considerably shorter than the principal plate A of the carriage, as its office is to give not only a steadying-surface to slide upon the back of the work-bench, as in the adjustment, Fig. 3, or against the surface of the material, as in Fig. 5, but also to give a point of attachment for the guiding-handle M and a steadying-bar, N. The metal parts of the handle M are fixed to the back of the plate K by screws $m m$, and have two lateral extensions, $m^2 m^2$, with a rod, m^3 , passing through the handle-roller M from one extension to the other. A half-round socket, N' , is provided on the back of the plate to receive the upper bent end of steadying-bar N. This bar holds a vertical position, and is made of sufficient length to extend below the bottom of the plate A. A short stud, n^2 , fixed on its lower end, holds

a V-shaped groove-roller to travel on a supplementary rail, H' , secured to the side of the bench W. This bar, roller, and secondary track serve to maintain the upright position of the machine upon the track H and to counteract the sway or lateral vibration of the plate A, produced by working the crank L. This construction of steadying-bar is only applicable, however, to the machine when adjusted for and used with the work-bench, as illustrated in Figs. 1 and 3 of the drawings.

In the adjustment of the machine to travel directly upon the edge of the material to be stitched, I provide a steadying-bar, P, Fig. 5^a, having an end, p^1 , to fit the socket N, and a crutch-piece, p^2 , to be placed under the arms of the operator as additional means for steadying the carriage, and leaving the two hands of the operator free to work the crank L and grasp the handle M. This bar P, when used, will extend backward nearly horizontal and in line with the direction of travel, and will be long enough to reach the armpit when the crank and handle of the machine are grasped in the hands. This gives the operator the use of both hands to guide the machine and rotate the crank. Now, as thus constructed, the carriage is capable of running and working as well upon a fixed work-bench as upon and over the edge of the carpet or material when suspended vertically in the manner now employed in carpet-sewing machines that are constructed to travel directly on the edge of the work. Its ready adjustment renders it adaptable for heavy work or for light material that is not sufficiently heavy and stiff to properly support the machine and afford surface for the engagement of the stitch-forming mechanism.

The construction of work-bench is shown in Figs. 1, 2, and 3 of the drawings. It is a stout plank, W, set on edge, and may be as long as the seam to be stitched and as high as will suit the convenience of the operator. Along the back part of the top or upper edge is fixed a rail, H, and against the front face a narrow plate, w , in position as nearly as possible parallel with the rail, and with its upper edge, w' , practically horizontal and projecting slightly above the top of the plank. This projecting edge w' is notched for the feeding-pawl to work against, and in the face of the plate are fixed a row of projecting pins, w^2 , at short distances apart and long enough to take the whole thickness of material. The two thicknesses of material are impaled on these points, and a clamping-bar, X, of wood or metal, in sections of convenient length, is employed to hold and confine the top edge of the material against the fixed plate w . Clamps Y, having a fixed jaw, y , and a movable jaw, y' , (shown in Figs. 2 and 1,) secure the clamping-bar X in place during progress of the work. These clamps are readily detachable, so that as the machine advances they can be removed and shifted from in front of the carriage as each one is reached in turn. The top edge of the plate w on the bench is raised sufficiently

above the top of the plank W to afford a bearing for the jaw y of the clamp, and the body Y is bent or curved to carry it over clear of the edge of the material and bring the pressure of the two jaws into line. The outer bent end of the clamp Y has a screw-threaded socket, y^2 , to receive the thumb-screw y^1 , that constitutes the movable jaw. This construction of the clamp and its application are clearly shown in Figs. 1 and 2 of the drawings.

The progressive movement of the carriage after each stitch as the needle leaves the material is effected by the backward movement of the feed-lever D' and by the engagement of the end of its pawl or finger D with the top w' of the notched plate w on the bench. The lever D' is operated by the face-cam c' , and being pivoted at d the forward throw of its lower end moves its upper end backward; but the engagement of the feeding-finger D with a notch in the plate w has the effect to hold this end of the lever at rest and make it a point of leverage, and the whole machine is moved forward upon the track as the cam throws out the lower end of the lever. A spring, f^2 , holds the lever to work against the cam; but by using a groove-cam in place of this face-cam the spring will not be required.

To regulate the length of stitch, a contact-plate, D², is fixed to the inner side of the lever, so that its lower end can be set out away from the end of the lever a greater or less distance. One end of this tongue is fixed at d^1 to the lever, and the lower end rests against a set-screw, D³, working through the end of the feed-screw from the front, and thus the throw of the feed-lever is diminished by setting this tongue to meet the cam. The fulcrum of the feed-lever is an eccentric, e^2 , set in bearings in the bracket d on the edge of the plate, and a handle, D⁵, is fixed to or forms a continuation of the eccentric to the front, by means of which the center of the lever can be thrown in or out. This construction (clearly shown in Fig. 1) affords a means for throwing the feed-pawl into and out of operation.

In adjusting the machine to run and feed directly on the edge of the material, a pair of nipper-jaws, S, having corrugated grasping ends S', are substituted for the feed-pawl, and the machine is then moved along step by step through the alternate action of these nippers against opposite sides of the material confined between the two plates. This feed consists of dogs S', with notched or serrated inner faces loosely pivoted to the ends of two curved bars, S, that are held in position by two small brackets, S⁴, one fixed to each plate A K, with sufficient room between the outside face of the plate and the inside of the brackets to take in the bar S. A seat, S³, for the bracket is fixed to the outer side of the bar S, and the inner face of the bracket is convex or rounded, so that the bars may rock upon them as fulcra. These bars S fit in the space on each side of the flanged roller Q and just outside of the plates A K. Their front ends are inserted in the loop a^6 on the

top of the plate A through which the pawl works. In place of the feed-pawl used in the other form, a beak, r , with wedge-shape sides, is fixed by a screw, r^1 , to the end of the feed-lever. Two slots, p^6 p^7 , are provided in this end or head D⁶, one to receive the screw of the feed-pawl and the other for the binding-screw of the beak r . The necessity of these two slots arises from the difference in the center of the machine, that is found to be changed as the plate K is moved toward the plate A in setting the two plates to the thickness of the material, for in this adjustment the thickness of the bench and of the clamping-bar are taken from the space within the frame; but only one of the plates is moved.

In the two plates A K, just below the needle-hole, are slots A³ for the feed-points S'.

Fig. 6 shows the position of the roller Q, the feed-bar S, and the wedge-shape beak r , the segment of plate shown being the inside face and the section being taken on a line running longitudinally through the center. The roller Q has a deep groove, with tapering faces on the inner side of its flanges, and it is set to run upon the edges of the material, and acts both as a guide and as a presser, to bring the two thicknesses of material closely together in advance of the part where the needle penetrates. It is adjustable in a vertical direction, its bracket d^4 being fixed to the front of the needle-arm box A² by a screw, g , taking through a slot.

In the form of the machine adapted to move on a fixed track on the bar that is fixed to the back of the needle-arm box at G will be seen flanged rollers g g , that carry the machine along in the fixed track H; but in the adjustment of the machine now being described, and as shown in Figs. 5, 6, and 7, these rollers are inoperative. The machine then travels on, and is entirely supported by the roller Q and a smaller roller, Q', at the rear end of the machine. This rear roller is carried in an ear or extension, p , at the top rear corner of the principal plate A. In the machine as adapted to run directly on the edge of the material being stitched, the position of these two rollers Q Q' is thus directly upon the edge of the said material, and the feed-points S' S' work through the slots A³ from the outside and engage with the surface of the material as the outer ends of the feed-bars S are pressed outward. This movement of the bars takes place at every backward throw of the upper end of the feed-lever, at which time the wedge r is pressed in between the bars, the brackets S⁴ acting as fulcrum-points. At the reverse motion of the feed-lever the wedge withdraws and the small springs S² throw out the feed-points. The smaller end of the wedge is curved downwardly to enter the slit between the two thicknesses of material being stitched. Its office is to turn in the threads and ragged edges or nap in advance of the needle and feed.

In this manner my improved machine is constructed and rendered adjustable for light

and heavy work, to operate either upon a fixed track and work-supporting bench, or to work directly upon the edges of the material suspended vertically, the change from one to the other being accomplished by simply shifting the sliding plate K of the frame and substituting the wedge and upper feed for the pawl D, or vice versa. In the first-described adjustment the machine is advanced step by step through the operation of the feeding-pawl against the fixed track or notched bar on the work-bench; and in the operation of the nipper feed the points of the upper feed-bars constitute jaws that grasp the thicknesses of material between them at backward throw of the feed-lever, and thus form for a time a fixed point of leverage for the feed-lever, from which progression of the whole machine over the edge of the material results. Combined with these parts are the required thread-controlling mechanism and the needle and looper operating mechanism for forming stitches. The particular construction of these, however, forms no part of my present invention, as their application and the mode of obtaining the required movements for the other mechanism will be comprehended by any mechanic.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a carpet-sewing machine, the combination, with the stitch forming and feeding mechanisms, of the two plates A and K, which support said mechanisms, one of said plates being provided at the top with an arm extending across over the other plate, and the other plate being secured adjustably to the said arm, whereby the plates may be adjusted toward or from each other, substantially as set forth.

2. The combination of the box A², the fixed depending plate A, having stud A' and brackets b d, and the actuating mechanism connected therewith, and rear plate, K, having the guide-handle, and adapted to slide laterally toward and from the fixed plate, and a binding-screw,

substantially as hereinbefore described, for the purpose set forth.

3. The combination of the frame adapted to travel astride of the edges of material to be stitched together, carrying wheels g g, a work-supporting bench, W, having fixed track, the clamps w X, and the steady-bar, with traction-wheel and the guide-rail on the back of the work-bench, substantially as hereinbefore described, for the purpose set forth.

4. In a carpet-sewing machine, the combination of the traveling frame adapted to carry all the stitch-forming mechanism, and to rest astride of and move over the edges of material to be stitched, a work-supporting bench having a guide-track for the frame, and a clamping device to hold the material in a vertical position, a fixed rack placed in relation to the guide-track, as described, and a pawl or vibrating finger, D, and operating mechanism attached to the said traveling frame, the movements of which in one direction cause the finger to engage with the rack and propel the frame forward, and in the other direction to pass over the rack without engaging, substantially as hereinbefore described.

5. The combination, with the adjustable traveling frame having a horizontally reciprocating and vibrating looper, of the fixed lever D', having the head D⁶, provided with the two slots, and interchangeable feeding devices to be secured in the slots, substantially as set forth.

6. The combination of the stationary bench W, track H, notched plate w, clamp-bar X, and movable clamps Y, substantially as hereinbefore described.

7. The combination of the stationary bench W, track H, notched plate w, clamp-bar X, movable clamps Y, and lower guide-rail, H', carrying-frame, and steadying-bar N, with its roller, substantially as described.

ALPHONSO BUDD SMITH. [L. S.]

Witnesses:

EDWARD E. OSBORNE,
E. PATTEN.