(No Model.) 3 Sheets—Sheet 1.

F. AMES.

CARPET STRETCHER FOR CARPET SEWING APPARATUS.

No. 520,910. Patented June 5, 1894.

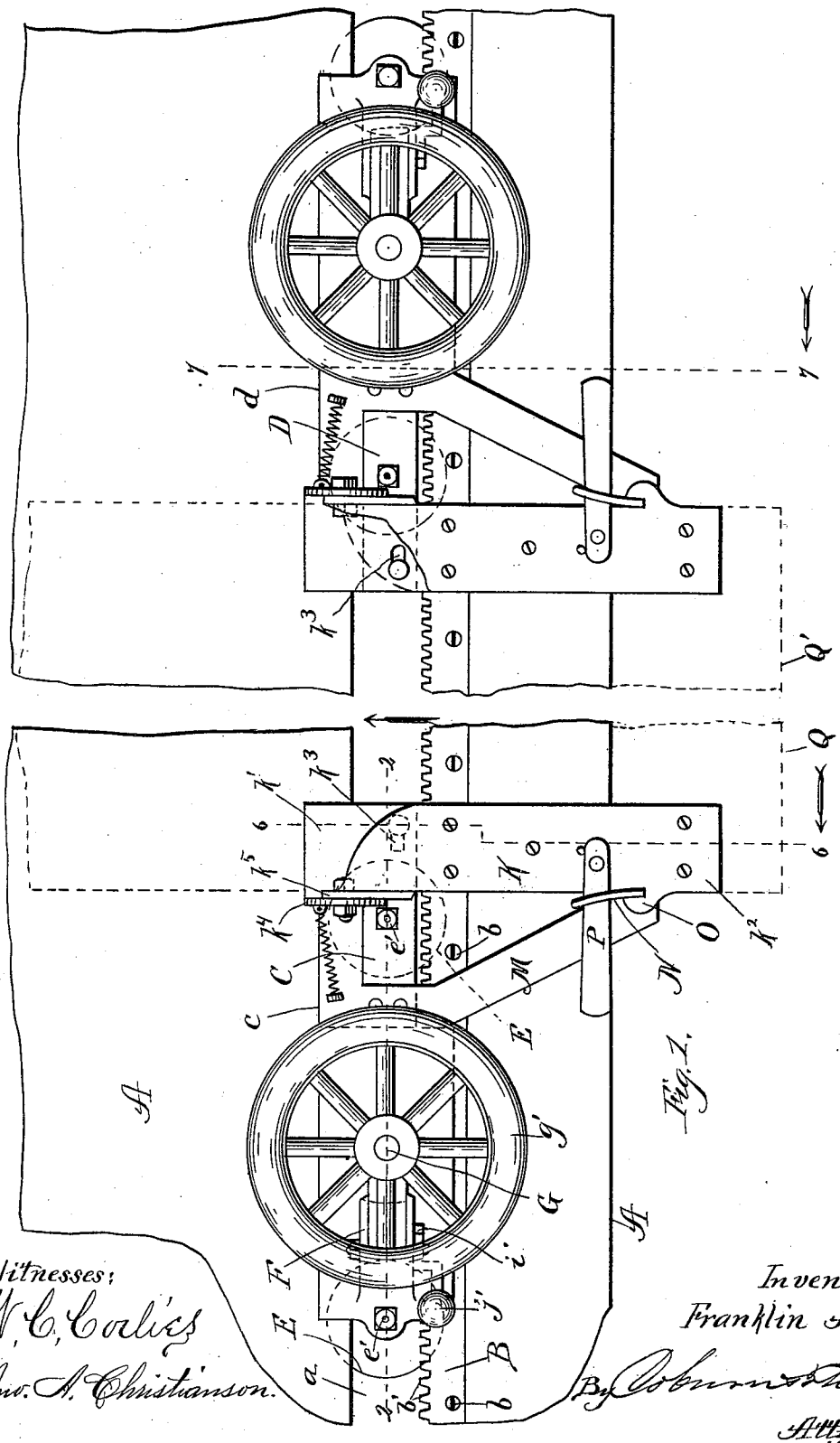

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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CARPET STRETCHER FOR CARPET SEWING APPARATUS.

No. 520,910. Patented June 5, 1894.

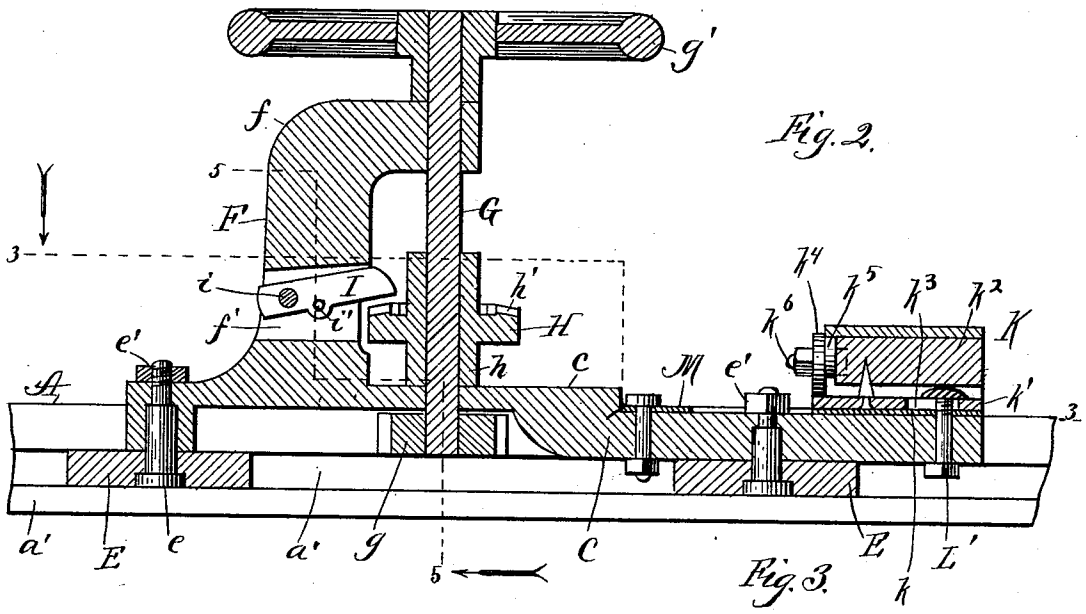

Fig. 2.

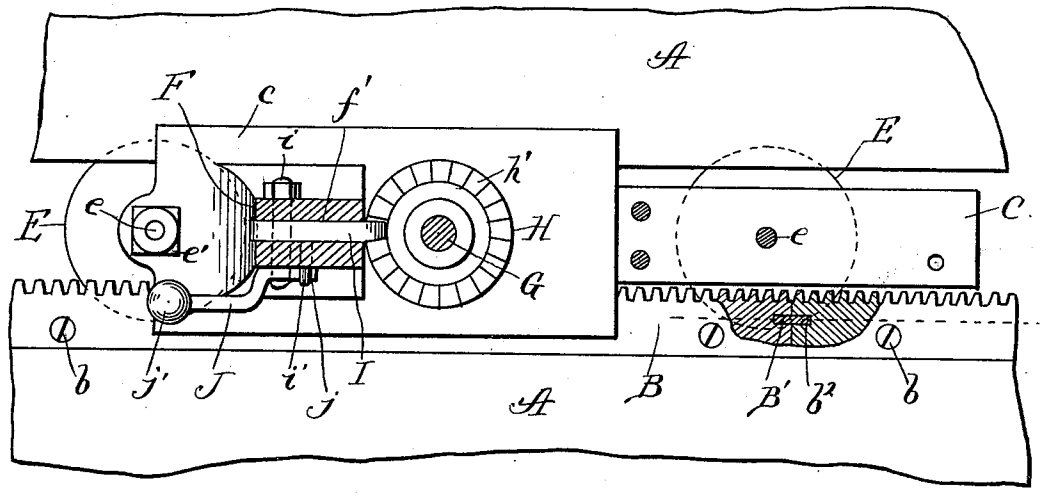

Fig. 3.

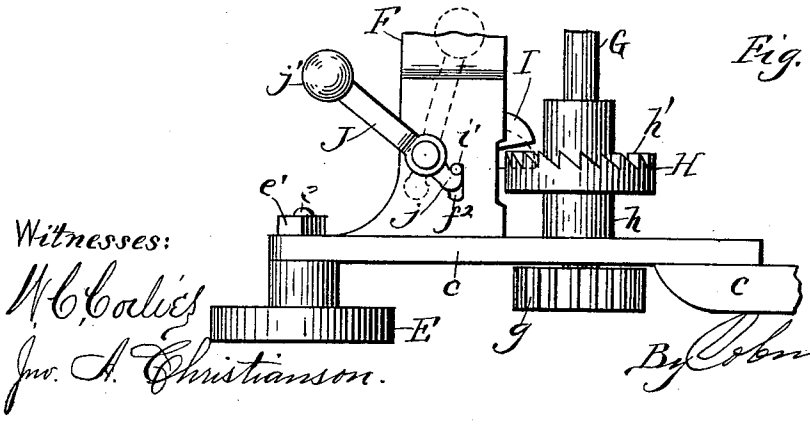

Fig. 4.

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(No Model.) 3 Sheets—Sheet 3.

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CARPET STRETCHER FOR CARPET SEWING APPARATUS.

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Fig. 5.

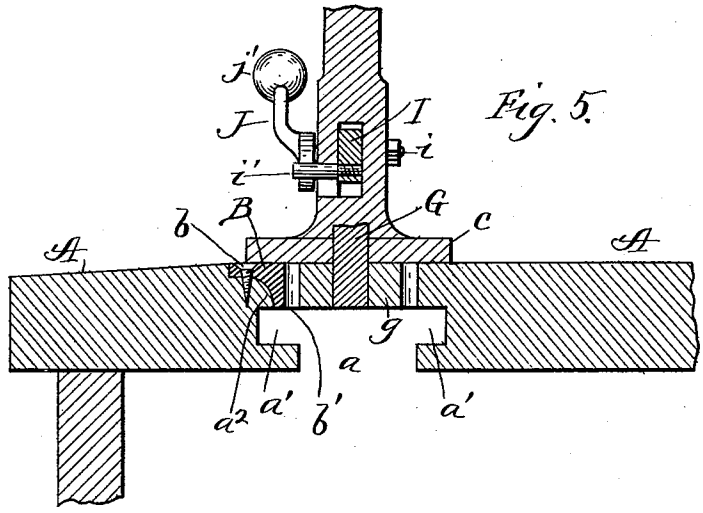


Fig. 6.

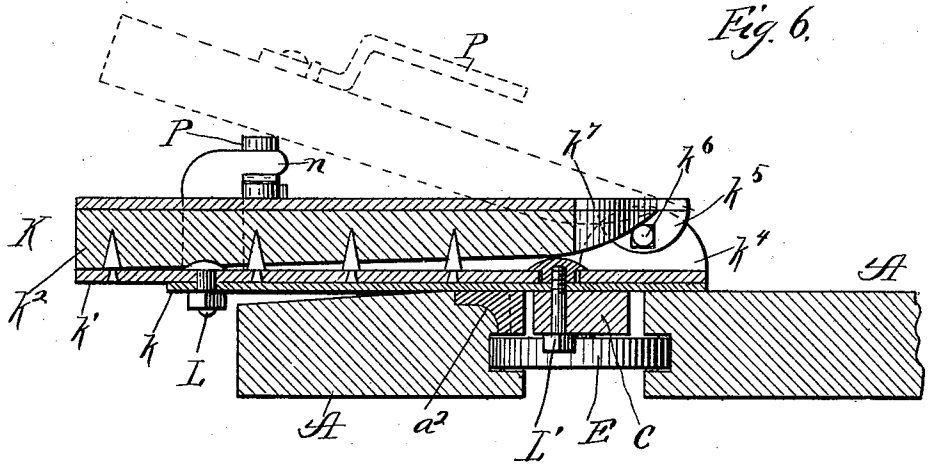
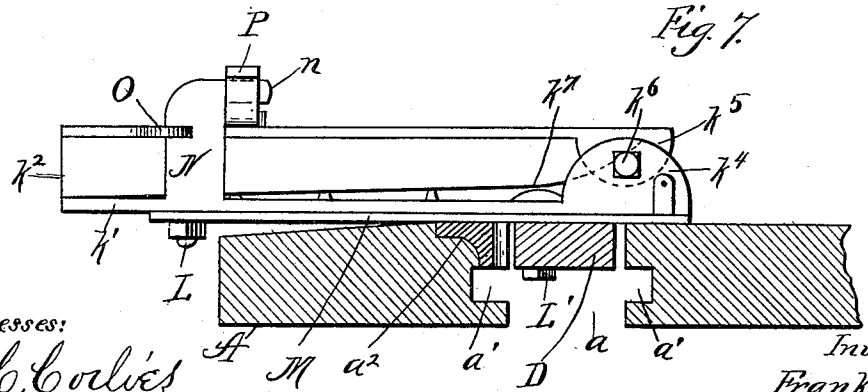


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANKLIN AMES, OF CHICAGO, ILLINOIS.

CARPET-STRETCHER FOR CARPET-SEWING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 520,910, dated June 5, 1894.

Application filed May 22, 1893. Serial No. 475,080. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN AMES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carpet-Stretchers for Carpet-Sewing Apparatus, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of the table on which the carpet is laid for sewing, with my improved stretching mechanism applied thereto, the table being broken away at the ends, back and middle; Fig. 2, a section of the same taken on the line 2. 2 of Fig. 1; Fig. 3, a plan section taken on the line 3. 3 of Fig. 2; Fig. 4, a detail side elevation of the actuating device for the movable stretcher-clamps; Fig. 5, a detail section taken on the broken line 5. 5 of Fig. 2; Fig. 6, a detail section taken on the line 6. 6 of Fig. 1; and Fig. 7, a detail section taken on the line 7. 7 of Fig. 1.

In the drawings Fig. 1 is upon a scale by itself; all the remaining figures are upon another and enlarged scale.

My invention relates to apparatus for sewing carpets, in which the carpet lengths are stretched upon and secured to a long table, and the edges then sewed together by a sewing machine mounted on a movable carrier which travels along at the side of the table. An apparatus of this general type is shown in my prior patent, No. 454,404, dated June 16, 1891.

The present invention relates to the clamping device in which the ends of the carpet are secured, and the means by which these clamps are moved on the table to stretch the carpet, and secured in any position to which they may be adjusted.

The invention may be regarded as an improvement upon my said prior patent, No. 454,404, and subsequent Letters Patent, No. 464,212, issued to me December 1, 1891.

I will now describe in detail the construction and operation of so much of a carpet sewing apparatus as is necessary to an understanding of the construction and operation of my present invention, and will then designate more specifically in claims the improvements which I believe to be new and wish to secure by Letters Patent.

As the present improvements relate only to the mechanism whereby the carpet is made ready for sewing by a machine traveling along by the edges of the carpet widths, the said machine, its traveling support and track for the latter, are not here shown and will not be described, as they do not constitute any part of this invention; and they may be of the general type shown in my said patent, No. 454,404, or any other suitable construction and organization.

In the drawings, A represents the table upon which the widths of the carpet are laid and stretched and to which they are secured with the edges, which are to be stitched together, beyond the front edge of the table in proper position for the operation of the sewing machine. This table is provided with a slot, a, running the entire length thereof, but arranged much nearer the front than the back of the table. The walls of this slot are provided with shallow grooves, a', cut horizontally inward, as seen in Figs. 5 and 7. Above this groove on one side of the slot the wall is also cut away to provide for the attachment of a rack bar, B. This rack-bar is, in cross section, of the shape shown in Fig. 5, from which it will be seen that the bar is cut out at its rear lower corner so as to form a kind of concave recess or groove running the entire length of the bar. This is to provide for the easy and secure fastening of the bar to the table, which is effected by cutting the edge of the slot wall so as to present a convex surface, a^2, adapted to a close fit of the rack thereon, as seen in Fig. 5, and the latter is secured to the table by screws, b, passing through the upper face thereof into the table, as seen in the said figure. The bar is provided with ordinary rack teeth, b'. For convenience this rack bar is made in sections which are rigidly held in position by dowel pins, B', set in companion grooves, b^2, cut vertically in the abutting ends of these sections. With this mode of securing the sectional rack bar to the table, I am able to fix and hold the bar in perfect rigid position and alignment, a result quite necessary to the proper sewing of the carpet, as the alignment of the carpet edges is determined by this rack, which will appear from the description hereinafter given. The edge of the table at the slot is cut away sufficiently

to bring the outer plane of the teeth on the rack flush with the uncut portion of the wall below, as seen in Fig. 6.

Two metal bars, C and D, are constructed to nicely fit the upper portion of the slot in the table above the side grooves therein. These bars are nicely fitted to the slot so as to have no lateral play, but, at the same time, are free to be moved back and forth therein. The sliding bars carry the carpet clamps, which will be hereinafter described, so that the proper adjustment of the bars in the slot of the table will stretch the carpet breadths preparatory to sewing, and the carpet will be secured in this condition ready for sewing by temporarily fastening the slides in the position to which they may be adjusted. Now, the devices, by means of which the slides are moved back and forth in the table slot, and the fastening devices by which they are secured at any point of adjustment therein, are identical on each slide; hence, a description of these devices as applied to one of the slides will be sufficient for present purposes, and, therefore, only one set of said devices will be here described in detail. Each of the sliding bars is provided with a pair of metal rollers or wheels, E, which are adapted to nicely fit the side grooves in the slot, as seen in Fig. 6, and are arranged on the under side of the bars, being secured thereto by pivot pins, *e*, passing up through the bars and secured by nuts, *e'*, on their upper ends. This provides for the easy adjustment of the slides, even with a close fitting to the slot. The ends of these sliding bars, on which the clamps are mounted, will be called the front ends, and the others the rear ends thereof. The rear end of each slide is elevated slightly, so that its under side will be flush with the upper surface of the front or bed portion thereof and with the surface of the table, and is extended outward a little over the table on each side of the slot, presenting a kind of flat bed or platform, *c* and *d*, on the respective slides, as seen in Figs. 1 and 3. An upright standard, F, rises from this platform near the rear end of each slide, being preferably cast in one piece with the latter, though it may be made separately if desired and properly secured to the slide. This standard at its upper end is bent inward at right angles to form a short horizontal projection, *f*, slightly overhanging the platform. An upright shaft, G, is mounted in this overhanging projection and the platform below, as seen in Fig. 2. A gear pinion, *g*, is fixed on the lower end of this shaft just below the platform, and so obviously will be in the same plane as the rack, B, at one side of the slot in the table. This pinion is intended to engage with the teeth of the said fixed rack, and, obviously, for this purpose, the shaft, to which it is attached, must be set a little to one side of the center of the slot in the table, so that the diameter of the pinion will extend from the plain wall of the slot on one side to the bottom of the notches between the rack teeth on the other. This is the arrangement of these parts shown in Fig. 5 of the drawings, as will appear by measurement. A hand wheel, *g'*, or any other suitable device, is secured to the upper end of the pinion shaft above the bearing in the standard; this wheel is for the purpose of turning the shaft, and a crank or any other suitable device for this purpose may be substituted therefor. Obviously the gear pinion may be rotated by means of the hand wheel on its shaft, and as the pinion engages with the fixed rack, this rotation will move the slide in one direction or the other along the slot of the table. The respective ends of the carpet breadths being connected to the respective slides by means of the clamps on their front ends, the carpet will be stretched by thus moving the slides in opposite directions. When the carpet is thus stretched to be made ready for sewing, it is necessary to set the slides in their respective positions in order to retain the carpet in this condition during the operation of the sewing machine. This may be effected by various means, but I provide a special device for this purpose which has a peculiar action that makes it desirable. A ratchet wheel, H, is fixed on the shaft, G, by means of an elongated hub, *h*, arranged between the two bearings of the shaft. This ratchet wheel or disk is horizontal, and upon its upper face is provided with ordinary ratchet teeth, *h'*. A slot, *f'*, is cut through the standard, F, from front to rear thereof, and above the opposite ratchet wheel. A dog or pawl, I, is pivoted in this slot by means of a pivot pin, *i*, running through the standard and pawl, as seen in Fig. 3. The pawl is a short straight bar arranged horizontally in the slot, and with its inner end projecting far enough at the front of the standard to engage with the ratchet teeth when dropped down thereon. It is evident that, when the pawl thus engages with the ratchet, the shaft, G, to which the latter is fixed, will be securely held against turning back under the strain of the stretched carpet, the ratchet teeth being shaped so that they cannot move past the pawl in this direction, though they may be free to move in the opposite direction. In order to facilitate the engagement of the pawl with the ratchet by gravity action, the pivot pin is arranged near its rear end, so that, left free, the pawl will drop into the ratchet without assistance. In front of its pivot, the pawl is provided with a pin, *i'*, which projects out at one side thereof and extends through a vertical slot, f^2, in the standard, as seen in Figs. 4 and 5. A weighted lever, J, is hung upon the pivot of the pawl on the side of the standard, at which the pin, *i'*, projects, and is, of course, in rear of this pin. The inner end of this lever is very short and formed into a shallow hook, *j*, which is adapted to take under the pin, *i'*, as seen in Fig. 5. The outer end of this lever is much longer and is provided with a weight, *j'*, which obviously has the effect to hold the lever up

into engagement with the said pin, thereby forcing it to the upper end of its slot and lifting the pawl from engagement with the ratchet, as seen in Fig. 4. If left in this position the pawl will, of course, be held out of engagement with the ratchet, and the shaft with its gear pinion will be free to rotate. Upon throwing the weighted lever over in the opposite direction, as shown in dotted lines in Fig. 4, the pawl will, of course, be freed from the influence of the weight, and by force of gravity will at once drop into engagement with the ratchet, and will remain in this engagement until lifted again by the action of the weighted lever on the pin, caused by throwing the lever back again into the position shown in full lines in Fig. 4.

A clamp, K, is secured to the front end of each of the sliding bars, and, of course, these clamps will then stand opposite to each other, as seen in Fig. 1. These clamps are substantially the same in construction as shown and described in my said patent, No. 464,212; but they are considerably shorter and contain some desirable improvements. These clamps are composed of three strips, k, k' and k^2, which are similar to the three strips of the clamp shown in my said patent, and similarly connected. The lower strip, k, is secured to the front end of the sliding carrier, the second strip, k', is the lower tooth bar of the clamp and is connected to the front end of the strip, k, by means of a pivot pin, L, and at its other end by a bolt and nut, L', fitting a transverse slot, k^3, in the toothed strip. The strip, k^2, is the upper bar of the clamp and adapted to engage with the teeth on the lower strip to clamp the carpet ends between them. This upper bar is hinged to the lower at the outer or rear ends thereof, as in my said patent; but this hinge is differently constructed. In the said patent the hinged ends of the bars come in contact with each other, and it is inconvenient with this construction to insert the ends of the carpet breadths in the clamp, as they must be brought around the hinge and then set in at the front of the clamp. This construction I have improved by providing a space between these ends of the two clamp bars sufficiently large to permit the carpeting to be slipped in laterally between the jointed ends of the bars when the upper one is lifted. For this purpose the lower bar is provided with an upright lug, k^4, at its rear edge, as seen in Figs. 2 and 7. The upper bar, k^2, is provided with a similar lug, k^5, depending from its rear edge and somewhat smaller than the former. These two lugs are hinged together by a pivot pin, k^6, as seen in Figs. 6 and 7. The ends of the clamp bars are plain and straight, and the hinge lugs being both located at the rear edges of these bars and the wood body of the upper bar being beveled at its rear end, as at k^7 in Fig. 7, there will be left a free space under the ends of the bars, in front of the said lugs, when the upper one is lifted, as seen in Fig. 6, which provides a sufficiently wide opening to permit the ends of the carpeting to be carried in laterally between the bars and over the teeth on the lower one, when they are secured between the bars by bringing down the upper upon the lower as usual. I have also found it necessary to stiffen the front projecting ends of the clamps, so that they will have greater rigidity and will not be displaced under the strain of the carpet, which would tend to derange the proper alignment of the stretched edges thereof. This is effected by means of a brace, M, extending from the lower bar, k, in an inclined direction backward and outward to the slide which carries the clamp, and is fastened to the upper side of the said slide, as seen in Fig. 1. This brace may be in one piece with the bar, or separate therefrom, but fastened to it in any suitable way.

A fastening device for securing the two clamp bars together is provided in the shape of a stud, N, rising from the rear edge of the lower bar, k', near the junction of the brace. The upper end of this stud is bent inward toward the table to provide a projecting toe, n, as seen in Fig. 7, which is preferably bent backward a little also, as seen in Fig. 1. The rear edge of the upper bar, k^2, is provided with a hook, O, adapted to engage with the stud, N, when this upper bar is brought down into position upon the lower, as seen in Figs. 1 and 7, thereby always bringing both members of the clamp into perfect alignment with each other when closed. In order to fasten the clamp bars together, a short arm, P, is pivoted at one end to the top of the upper bar, and when the latter is swung down into closed position this arm is swung around underneath the projecting toe of the standard on the lower clamp bar, thereby fastening the two together, as seen in Figs. 1 and 7.

In operation, the sliding bars are slipped into the slot in the table and brought as near together as may be required for the lengths of the carpet breadths which are to be sewed together, the pawl levers being in position shown in full lines in Fig. 4, whereby the pawls are held from engagements with the ratchet on the pinion shafts. The upper clamp bar is swung up as seen in dotted lines in Fig. 6, and the carpet ends are then slipped in laterally between the bars, a free space for this purpose being provided when the upper bar is lifted, as seen in Fig. 6; the upper bar is then brought down upon the lower, and the two parts of the clamp fastened together as described. The respective clamps are then drawn in opposite directions by means of the actuating devices on each, as described above, the pawl levers being thrown over into the position seen in dotted lines in Fig. 4. The carpet will thus be properly stretched and when the required strain is reached the pawls remain in the ratchets and the sliding clamp supports are securely fastened in the position to which they have been adjusted, when the carpet is ready for sewing. The sewing be-

ing completed, the strain upon the carpet is, of course, at once removed by throwing over the pawl levers to lift the former from the ratchets, and the carpet breadths are then removed from the clamps and new breadths inserted for the repetition of the operation. The weighted pawl lever insures the constant disengagement of the pawls from the ratchets during the adjustment of the slides, so that, once thrown out of engagement, the pawls will so remain until the levers are again thrown to permit them to drop into the ratchets; and once this engagement is made, it will continue until the levers are thrown back into their former position. The engagement and disengagement of the pawls and ratchets are thus determined by the position of the said levers, and there can be no mistake or interference with the movement by accidental engagement of these two devices. It is obvious that both clamp carriers being adjustable, they may be moved away from each other in opposite directions carrying with them the respective ends, Q, Q′, of the carpeting thus quickly stretching the latter, and are almost instantaneously locked in the required position of adjustment when reached; it is further to be noted that, owing to the adjustability of each carrier, the carpet can be arranged anywhere along the length of the table to suit the lengths of the breadths; and if these are short, two or more sets may be laid on the table at the same time. The peculiar form of the rack-bars provides for the insertion of the fastening screws on the upper surface which corresponds to the top of the table, thus facilitating the fastening of the rack in place. This feature of construction also provides for the ready detachment of these strips without injury to the table, which result is facilitated by the construction of the rack bar in sections; the dowel pins are easily removed so that, if a section is broken or otherwise injured, it can be removed by taking out the dowel pins at each end and fastening screws at the top of this section only and replacing it by another. The stud, M, and the hook on the back edge of the upper clamp bar are always in the same relation to each other and to the lower clamp bar on which this stud is fixed. The result is that these devices compel the swinging member of the clamp to drop upon the lower member always in the same relative position, so that the ends of the carpet are always clamped accurately, which is necessary to secure an accurate adjustment for sewing the edges together.

In some details of construction, modifications may be made in the mechanism described above and shown in the drawings, and mechanical substitutes applied in some instances; these changes, which may be made without materially modifying the operation of the mechanism, I contemplate in the application of my invention to practical use under varying conditions.

Having thus described my invention, what I believe to be new, and desire to secure by Letters Patent, is—

1. In an apparatus for sewing carpets, a table, A, on which the carpet is laid, provided with a slot running lengthwise thereof, in combination with a rack bar fastened to the table at one side of the slot, sliding clamp carriers fitted to said slot and movable therein, and a gear pinion on each carrier arranged to engage with the rack, and means for rotating said pinion to adjust the sliding carriers on the table, substantially as described.

2. In an apparatus for sewing carpets, a table, A, on which the carpet is laid, having a longitudinal slot, *a*, in combination with a rack bar, B, shaped in cross section as specified, whereby a horizontal flange or projection is provided at the back edge of the bar, fastening screws, *b*, inserted on the upper side of the table through the horizontal projection of the bar to secure the latter to the table, and movable clamp carriers fitted to said slot and provided with gears engaging said rack, substantially as described.

3. In an apparatus for sewing carpets, a table, A, upon which the carpet is laid, having a longitudinal slot, *a*, in combination with a rack-bar, B, composed of sections having vertical slots at their respective ends and provided with a horizontal projection extending back over the table, the dowel pins, B′, and fastening screws, *b*, substantially as described.

4. In an apparatus for sewing carpets, the table, A, on which the carpet is laid, having a longitudinal slot, *a*, provided with side grooves, *a′*, in combination with a rack-bar, B, secured to the table at one side of the slot, sliding clamp carriers, C and D, fitted to said slot, anti-friction rollers, E, mounted on the carriers and adapted to run in the side grooves, *a′*, gear pinions, *g*, mounted on said carriers and engaging with the rack, and means for rotating said gears to adjust the carriers lengthwise, substantially as described.

5. In an apparatus for sewing carpets, a table, A, on which the carpet is laid, provided with a longitudinal slot, *a*, in combination with a rack bar, B, secured at one side of the slot, a clamp carrier fitted to the slot and movable lengthwise therein, a shaft, G, mounted on said carrier and provided with a pinion, *g*, engaging with the rack, and mechanism for locking said shaft against rotation as required, substantially as described.

6. In an apparatus for sewing carpets, a sewing table, A, provided with a longitudinal slot, *a*, in combination with a rack, B, applied thereto, a clamp carrier fitted to the slot and adapted to slide therein, a shaft, G, mounted on said carrier and provided with a pinion, *g*, engaging the rack, a ratchet, H, fixed to the shaft, a pawl, I, adapted to engage automatically with the ratchet, and a device for lifting said pawl and retaining it

in disengagement from the ratchet, substantially as described.

7. In an apparatus for sewing carpets, a sewing table, A, having a longitudinal slot, in combination with a rack applied thereto, a clamp carrier mounted and movable in the slot, the shaft, G, mounted on said carrier and provided with pinion, g, engaging with the rack, the ratchet, H, fixed on the shaft, pivoted pawl, I, adapted to drop automatically into engagement with the ratchet and provided with a side projecting pin, i', and the weighted lever, J, adapted to engage by its short arm with said pin, substantially as described.

8. In an apparatus for sewing carpets, a table, A, having longitudinal slot, a, in combination with the rack-bar, B, a clamp carrier fitted to and sliding in said slot, a standard, F, on said carrier provided with slot, f', extending through the standard from front to rear, and side slot, f^2, in one of the walls thereof, the shaft, G, mounted on the carrier and provided with pinion, g, engaging with the rack, ratchet, H, fixed on said shaft, pawl, I, pivoted in the through slot of the standard back of its center and provided with a pin, i', extending out through the side slot, f^2, a weighted lever, J, pivoted to the side of the standard and having a shallow hook, j, on its short arm adapted to engage with the pin, i', substantially as described.

9. In an apparatus for sewing carpets, the lower clamp bar, k', provided at its outer end with upright lug, k^4, at its rear edge, in combination with the upper clamp bar, k^2, provided with lug, k^5, depending from its rear edge, a pivot pin, k^6, securing said lugs together, and a bevel face, k^7, at the hinge end of the body of the upper clamp bar, substantially as described.

10. In a carpet clamp for carpet sewing apparatus, the lower clamp bar, k', provided with upright stud, N, at the rear edge of its free end, in combination with the upper clamp bar, k^2, hinged to the former and provided with a hook, O, at the rear edge of its free end, adapted to engage with the stud, N, when closed down on the lower bar, substantially as described.

11. In a clamp for carpet sewing apparatus, the lower bar, k', provided with upright stud, N, having a projecting toe, n, in combination with the upper bar, k^2, hinged at one end to the former, and a lever, P, pivoted to the upper bar and adapted to be turned in underneath the toe of the stud to fasten the clamp bars together, substantially as described.

12. In a clamp for carpet sewing apparatus, a movable carrier, in combination with the bar, k, fastened to the carrier, a brace, M, extending from the front end of the said bar back to the carrier, and the hinged clamping bars, k', k^2, secured to the bar, k, substantially as described.

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