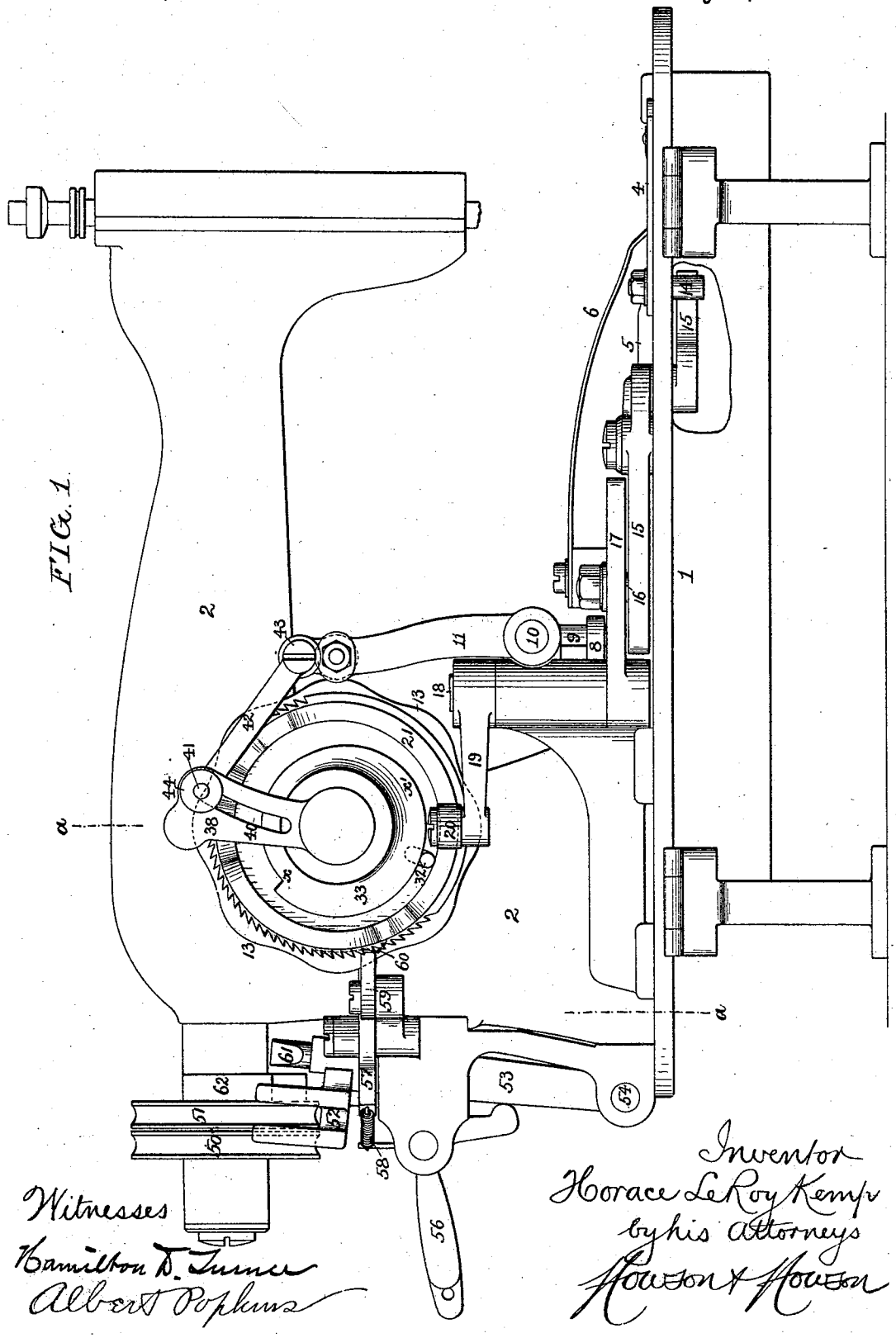
(No Model.) 4 Sheets—Sheet 1.

H. LE ROY KEMP.

SEWING MACHINE FOR BARRING AND TACKING.

No. 542,196. Patented July 2, 1895.

FIG. 1.



Witnesses
Hamilton D. Turner
Albert Popkins

Inventor
Horace LeRoy Kemp
by his Attorneys
Howson & Howson

(No Model.) 4 Sheets—Sheet 2.

H. LE ROY KEMP.

SEWING MACHINE FOR BARRING AND TACKING.

No. 542,196. Patented July 2, 1895.

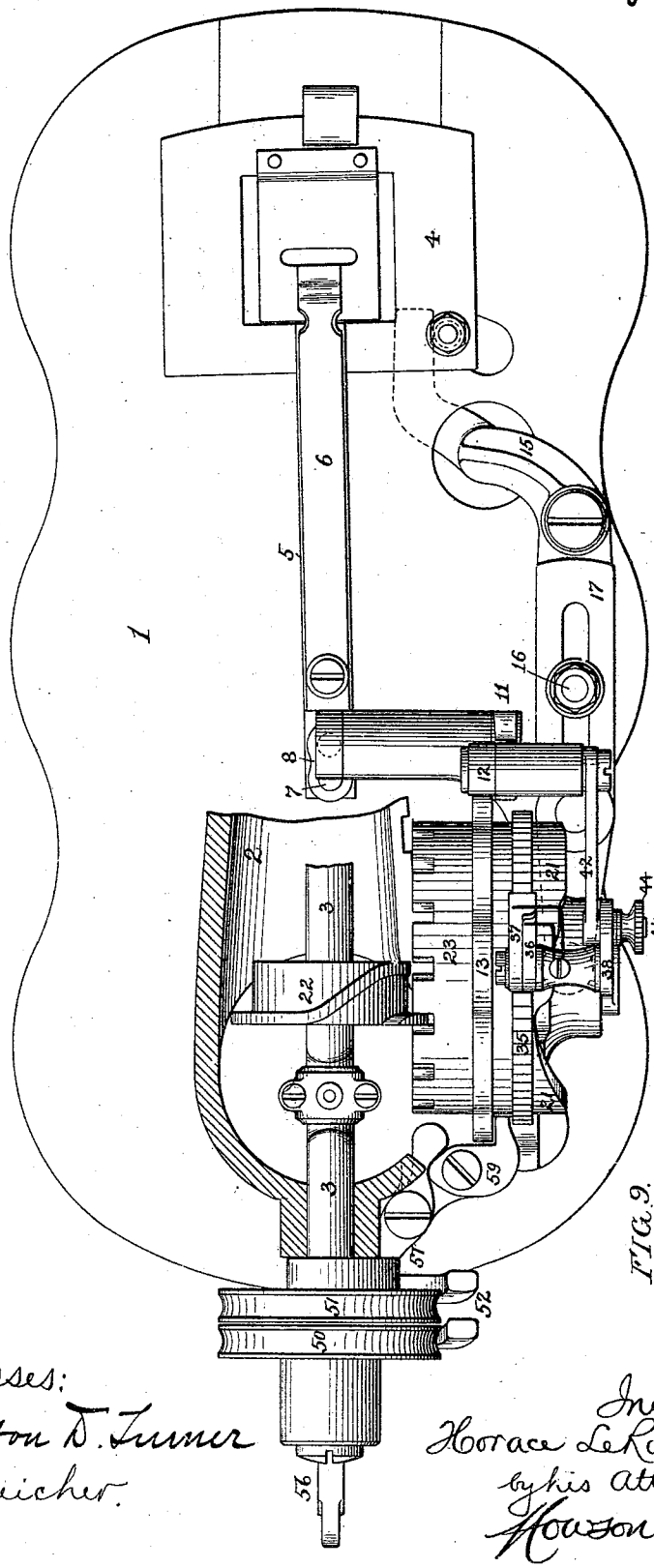


FIG. 2.

FIG. 11.

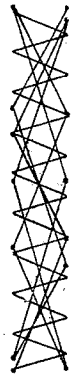


FIG. 10.

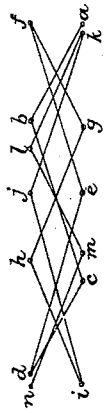


FIG. 9.

Witnesses:
Hamilton D. Turner
R. Schleicher.

Inventor
Horace LeRoy Kemp
by his Attorneys
Howson & Howson

(No Model.) 4 Sheets—Sheet 3.

H. LE ROY KEMP.

SEWING MACHINE FOR BARRING AND TACKING.

No. 542,196. Patented July 2, 1895.

FIG. 3.

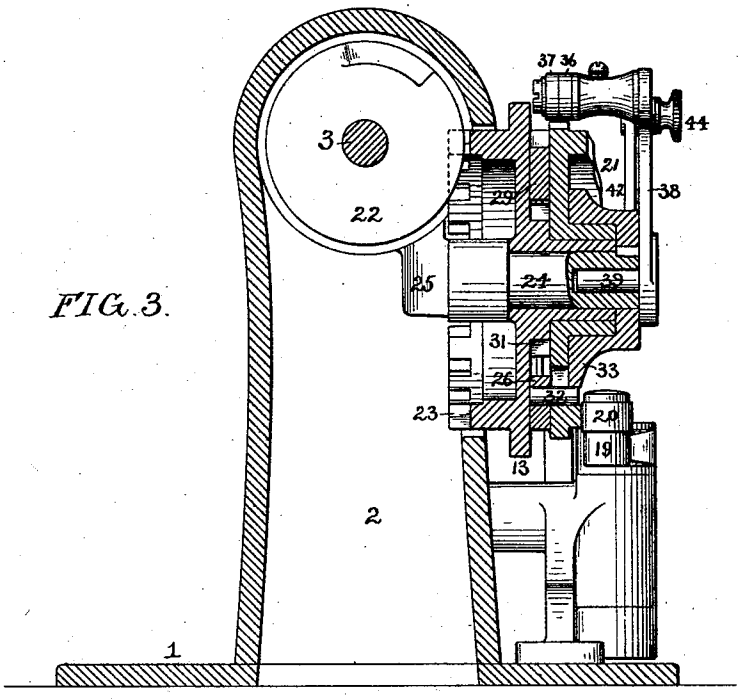


FIG. 4.

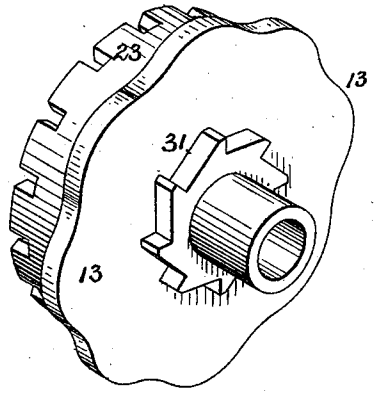
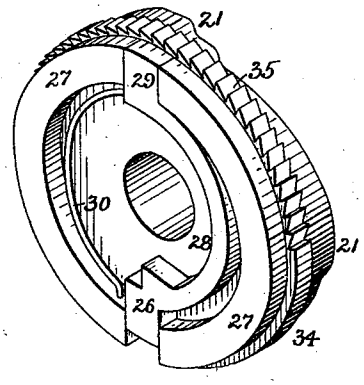


FIG. 5.



Witnesses:
Hamilton D. Turner
R. Schleicher.

Inventor
Horace LeRoy Kemp
by his Attorneys
Howson & Howson

(No Model.) 4 Sheets—Sheet 4.

H. LE ROY KEMP.

SEWING MACHINE FOR BARRING AND TACKING.

No. 542,196. Patented July 2, 1895.

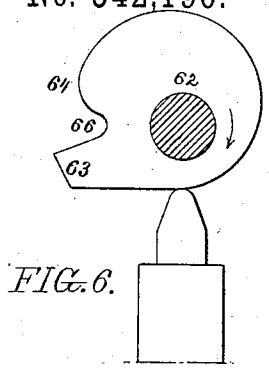


FIG. 6.

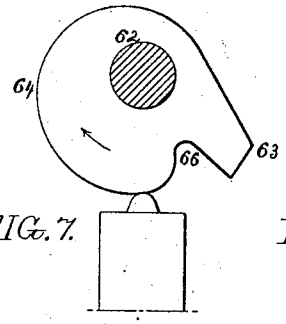


FIG. 7.

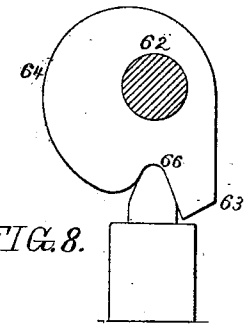


FIG. 8.

FIG. 12.

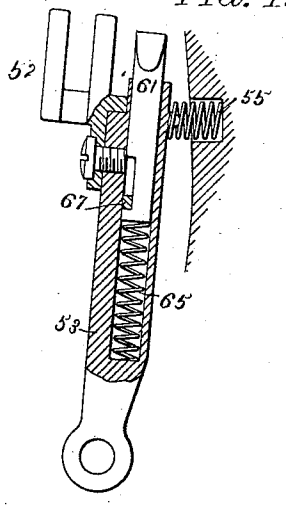


FIG. 14.

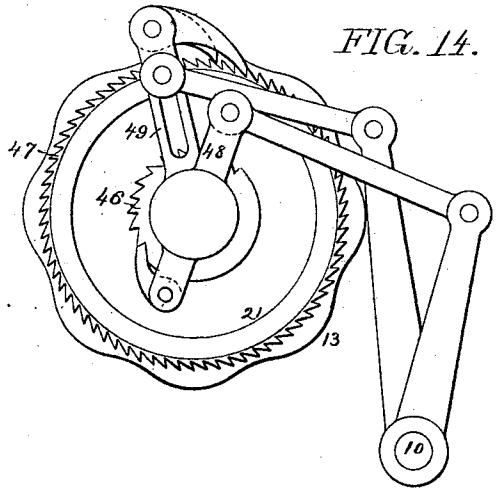


FIG. 13.

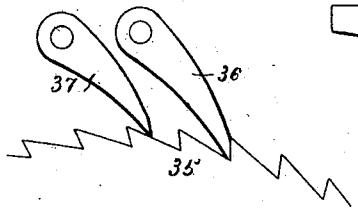
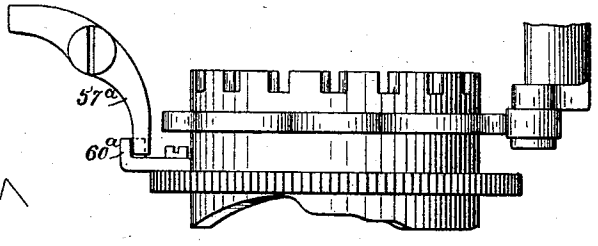


FIG. 15.



Witnesses:
Hamilton D. Turner
F. D. Goodwin

Inventor:
Horace LeRoy Kemp
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

HORACE LE ROY KEMP, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE PHILADELPHIA BARRING MACHINE COMPANY, OF SAME PLACE AND PHILADELPHIA, PENNSYLVANIA.

SEWING-MACHINE FOR BARRING AND TACKING.

SPECIFICATION forming part of Letters Patent No. 542,196, dated July 2, 1895.

Application filed May 25, 1893. Serial No. 475,439. (No model.)

To all whom it may concern:

Be it known that I, HORACE LE ROY KEMP, a citizen of the United States, and a resident of Camden, Camden county, New Jersey, have invented certain Improvements in Sewing-Machines for Barring and Tacking, of which the following is a specification.

My invention relates to machinery for forming a stiffening or strengthening bar at the end of a buttonhole, pocket-opening, or other slitted portion of different articles of apparel. Such bar is composed of a number of longitudinal thread courses forming a core and a number of short transverse stitches formed over said core and extending from end to end of the same.

One object of my invention is to form a long bar, and in order to effect this each thread course of the core is composed of a series of stitches, so distributed as to prevent undue weakening of the cloth or other material upon which the bar is formed and to cause the core-thread courses to lie closely upon the surface of said material.

A further object is to vary the number of cross-stitches formed over the core, so that the bar may be light or heavy, as desired, and a still further object is to provide simple and efficient means for positively stopping the machine when the formation of the bar has been completed. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of sufficient of a barring-machine to illustrate my invention, part of the needle-bar and part of the frame of the machine being broken away. Fig. 2 is a plan view partly in section and with immaterial parts broken away in order to illustrate those beneath. Fig. 3 is a transverse section on the line *a a*, Fig. 1. Figs. 4 and 5 are perspective views of parts of the machine to which my invention particularly relates. Figs. 6, 7, and 8 are views illustrating the operation of the stop-motion device. Figs. 9, 10, and 11 are views illustrating the character of the bar formed by the machine. Fig. 12 is a detached view of part of the stop-motion device. Fig. 13 is an enlarged view of another part of the machine, and Figs. 14 and 15 are diagrams illustrating modified construction of parts of the machine.

The machine is similar in its general characteristics to that forming the subject of my Letters Patent No. 466,607, dated January 5, 1891, the table or bed of the machine being represented at 1 and having an arm 2, in which are formed bearings for the driving-shaft 3.

The work-carrier consists of a plate 4, mounted upon or forming part of the outer end of an arm 5, which carries a clamp or presser-bar 6, said arm 5 having at the inner end a pin 7, which is connected by a link 8 to an arm 9 on a rock-shaft 10, said rock-shaft having another arm 11, which carries an antifriction-roller 12, acted upon by a cam 13 of such character as to impart short quick movements to the plate 4 in a direction crosswise of the length of the bar, the latter being formed in the position represented by the oblong slot in the work-plate 4, as shown in Fig. 2. Projecting from said plate 4 is a pin 14, which is acted upon by one arm of a lever 15, the other arm of said lever having a slot for the reception of a bolt 16, likewise adapted to a slot in an arm 17, which is secured to the lower end of a vertical rock-shaft 18, having at its upper end another arm 19, which carries an antifriction-roller 20, acted upon by a cam 21, which serves to impart movement to the plate 4 in the direction of the length of the bar.

It will be understood that suitable springs acting on the arm 5, as in my said patented machine, serve to keep the rollers 12 and 20 constantly in contact with their respective cams. I may say, however, that it is wholly immaterial to my invention what form of work-carrier is employed or what the particular construction of the transmitting mechanism whereby the cams 13 and 21 are caused to effect the desired movements of said work-carrier, as these may be similar to those of other known forms of machine, my invention, so far as regards the mechanism for operating the work-carrier, being devoted to a special operation of the two cams 13 and 21, so that the cam 21 will move faster at one part of its

rotation than at another. The means illustrated in Figs. 1 to 5 for effecting this object are as follows: On the shaft 3 is a worm 22, which engages with a worm-wheel 23, secured to or forming part of the cam-disk 13, said disk turning upon a spindle or stud 24, which projects outward from an arm 25, forming part of the arm 2 of the machine. To the reduced outer end of the hub of the cam 13 is adapted the hub of the cam 21, so that the latter is free to turn independently of the cam 13, except when clutched thereto by means of a sliding-pawl 26, which is guided in a slot in a flange 27 at the back of the cam 21 and is connected by a curved arm 28 to a tongue 29, guided in another slot in said flange 27, so that said pawl 26 is compelled to move in a radial line, a spring 30 being connected at one end to the flange 27 and at the other end to the tongue 29, so as to tend to move the pawl 26 inward and cause it to engage with a ratchet-wheel 31, formed on or secured to the face of the cam-disk 13, the construction of these parts being clearly illustrated in Figs. 4 and 5.

A pin 32 projects from the pawl 26 through a slot in the disk of the cam 21, and this pin is under control of a fixed cam 33, which is keyed or otherwise secured to the outer projecting end of the stud 24, as shown in Fig. 3, so that as said cam 21 is rotated the pin 32, under the action of the cam 33, will be moved outward, so as to withdraw the pawl 26 from engagement with the ratchet-wheel 31, or will be permitted to move inward, so as to again effect such engagement.

On the peripheral portion of the cam 21 is formed a flange 34, which is toothed throughout a portion of its extent, so as to form a rack 35, and with this rack engages a pair of pawls 36 and 37 hung to a pin at the outer end of an arm 38, which has a spindle 39 free to turn in a central opening formed in the outer end of the stud 24.

The pawls are so set in respect to the teeth of the rack 35 that when one pawl is in engagement with a tooth the other will lap over one-half of a tooth, as shown in Fig. 13, so that a movement of the rack to the extent of half a tooth is permitted, or by employing a greater number of pawls or a friction clutching device the extent of fractional movement of the rack can be still further reduced.

The arm 38 has a slot 40, to which is adapted a bolt 41, carried by an arm 42, which is hung to a pin 43, projecting from the upper end of the arm 11, the bolt 41 being adjustable in the slot 40 and being capable of being secured in position after adjustment by means of a thumb-nut 44, applied to the outer end of the bolt, so that a varying extent of vibration can be imparted to the arm 38.

When the bar is first started, the pin 32 of the pawl 26 occupies a position at the point x of the cam 33, and said pawl is consequently in engagement with the ratchet-wheel 31, so that the two cams 13 and 21 will rotate in unison as long as this engagement of the pawl 26 and ratchet 31 continues. By the time the pin 32 reaches the point x' of the cam 33, however, the pawl 26 will have been withdrawn from engagement with the ratchet-wheel 31 and the cam 21 will be free to move independently of the cam 13, such movement being effected by the engagement of the pawls 36 and 37 with the teeth of the rack 35, it being understood that during the time that the cams 13 and 21 were clutched together the pawls 36 and 87 traveled upon the plain surface of the flange 34, and hence had no effect upon said cam 21.

The object of using the ratchet-wheel and sliding pawl as the clutching device, in place of a clutch member movable in line with the axis of the stud 24, is because the pawl is more readily operated and occupies less room, although, in its broadest form, my invention is not specifically limited to this special form of clutch.

That portion of the cam 21 which acts upon the antifriction-roller 20 of the arm 19 of the transmitting mechanism during the time that the two cams are clutched together is so shaped as to impart a series of comparatively quick vibrations to the work-carrying plate in the direction the length of the bar, while that portion of said cam 21 which acts during the time that the cam is being operated independently is such as to move the plate more slowly from one end of the bar to the other.

The formation of the cam 21 in respect to that of the cam 13, moreover, is such that the core of the bar is composed of a succession of short stitches, each of less length than the length of the bar, and these stitches are so distributed as to separate to a considerable extent the openings formed by the needle in making said stitches, so as to prevent undue weakening of the leather, cloth, or other fabric upon which the bar is being formed. The formation of the long core, moreover, by means of a series of short stitches insures the lying of the threads which constitute the core close to the surface of the material, and thus insures the formation of a firm, compact bar possessing the maximum of strength.

The course of the successive stitches constituting the core of the bar is represented in the enlarged diagram Fig. 9, in which the successive letters of the alphabet represent the successive points of descent of the needle. After the last descent, represented by the letter n, the slow movement of the work-holder in the direction of the length of the bar and the short quick movements in a direction at right angles thereto, for the formation of the short cross-stitches begins, and the number of these cross-stitches formed between the opposite ends of the bar is dependent upon the speed at which the cam 21 is rotated after it is released from the cam 13, and this is readily regulated by shifting the pin 41 in the slot 40 of the arm 38, the difference in the character of the bar caused by such

adjustment being indicated, respectively, in Figs. 10 and 11.

Although it is preferable to impart the quick movement to the cam 21 by clutching the same to the cam 13, said cam 21 may, if desired, be operated entirely independently of the cam 13, one method of accomplishing this result being represented in Fig. 14. In this case the cam 21 has two ratchet-wheels 46 and 47, the former of less diameter than the latter, and there are two arms 48 and 49, the former carrying a pawl for operating the ratchet-wheel 46 and the arm 49 carrying pawls for operating the ratchet-wheel 47. The arms 48 and 49 are independently actuated by arms on the rock-shaft 10, and the arm 49 has an adjustable connection by means of which its throw may be regulated, so as to vary the speed of rotation of the cam when the latter is being operated by said arm 49. In this case the arm 33 may be dispensed with, the pawl of the cam 48 traveling upon a blank portion of its rack when the other pawls are in action. In carrying out this part of my invention it will be evident, also, that a peripheral cam or other equivalent construction can be substituted for the side cam 21, the latter form being adopted simply because it tends to simplify the transmitting device.

In a machine of the character to which my invention relates it is desirable to positively stop the machine when the formation of the bar has been completed, and in order to effect this result I employ the mechanism shown in Figs. 1 and 2 and in Figs. 6, 7, 8, and 12, which I will now proceed to describe. The shaft 3 of the machine has two belt-pulleys 50 and 51, the former being loose on the shaft and the pulley 51 being secured to said shaft, and the driving-belt is guided by a belt-shifting fork 52 which is carried by the upper end of an arm 53, pivoted at 54 to the frame of the machine, and acted upon near the upper end by a spring 55, Fig. 12, which tends to move the shifting-fork outward, so as to throw the belt onto the loose pulley. In starting the machine, however, the arm 53 and the belt-guiding fork are moved inward by means of a lever 56, and the arm 53 is held in this position by means of a catch-lever 57, which is drawn into engagement with the arm 53 by means of a spring 58, so as to properly guide the driving-belt onto the fast pulley 51. The lever 57 is acted upon by another lever 59, which, on the completion of the bar, is moved by means of a cam 60 on the flange 27 of the cam 21, so as to withdraw the lever 57 from engagement with the arm 53 and thus permit the latter to be moved outward by the spring 55, so as to carry the driving-belt onto the loose pulley. As the momentum of the machine, however, might cause the same to run for two or three turns after the shifting of the belt, it becomes necessary to positively stop the shaft 3 as soon as the belt has been shifted from the fast to the loose pulley, and this I accomplish by the engagement of a spring-plunger 61 on the arm 53 with a shouldered disk 62, carried by the shaft 3, and in order that the spring-plunger may also act as a brake to cause the slowing down of the machine before the motion of the same is positively arrested I construct the disk 62 in the form of a cam, the lowest point 66 of which is immediately in the rear of the stop-shoulder 63, this being the only point at which the plunger 61 can be moved in underneath the disk. From this point to the point 64, therefore, the plunger bears upon the cam-surface of the disk and is gradually forced downward against the action of its spring 65, so as to exercise the desired braking or retarding effect upon the disk before finally entering the recess 66 and coming into contact with the stop-shoulder 63. The portion 64 of the disk 62 is slightly less in height than the stop-shoulder 63, and the plunger 61 is prevented, by a stop 67, from descending beyond the point to which it is pushed by said portion 64 of the cam, so that there is no possibility of the plunger missing the stop-shoulder 63 and permitting another turn of the shaft.

In order to simplify the construction, I propose, in some cases, to provide the cam-disk 21 with a hooked arm 60^a, as shown in Fig. 15, which cam can act directly upon a trip-lever 57^a, in order to withdraw the same from engagement with the arm 53, or other means for releasing the stop-motion may be adopted within the scope of my invention so long as said devices are actuated by or from the cam 21, the cam 13 being unavailable for this purpose, because it makes more than one turn in the formation of each bar.

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

1. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening mechanism whereby one of said cams is caused to move the work carrier in the direction of the length of the bar, and the other is caused to move said carrier in a direction crosswise of the bar, and differential driving mechanism for operating the cam which imparts to the work carrier movement in the direction of the length of the bar, substantially as specified.

2. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening mechanism whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other cam is caused to impart movement to said carrier in a direction crosswise of the bar, differential driving devices whereby the cam which imparts movement to the work carrier in the direction of the length of the bar is caused to move faster at one part of its rotation than at another, and means for regulating the speed of the slow movement, substantially as specified.

3. The combination in a sewing machine for

barring, of a work carrier, a pair of cams, intervening devices whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other cam is caused to impart movement to said carrier in a direction crosswise of the bar, means for rotating the crosswise-movement cam, a clutch for connecting the two cams, means for operating said clutch, and means for operating the cam which imparts movement to the work carrier in the direction of the length of the bar when said cam is released from the crosswise-movement cam, substantially as specified.

4. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening devices whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other cam is caused to impart movement to said carrier in a direction crosswise of the bar, means for driving the said crosswise-movement cam, a clutching element carried by said cam, a sliding pawl carried by the other cam, a cam for operating said pawl, and mechanism for driving the cam which imparts movement to the work carrier in the direction of the length of the bar, when it is released from the crosswise-movement cam, substantially as specified.

5. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening devices whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other is caused to impart movement to said carrier in a direction crosswise of the bar, a driving shaft having fast and loose pulleys and a shouldered stop disk, an arm carrying a belt guide and a stop for engaging with said shouldered disk, a retaining lever for said arm, means for operating the work carrier cams, and a device for tripping the retainer lever when the bar has been completed, substantially as specified.

6. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening devices whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other is caused to impart movement to said carrier in a direction crosswise of the bar, a driving shaft having fast and loose pulleys and a cam disk with stop shoulder, an arm having a belt guide and a spring plunger for bearing upon said cam disk and engaging with said stop shoulder, a retainer lever for said arm, means for operating the work carrier cams, and devices for tripping said retainer lever, substantially as specified.

7. The combination in a sewing machine for barring, of a work carrier, a pair of cams, intervening devices whereby one of said cams is caused to impart movement to the work carrier in the direction of the length of the bar, and the other cam is caused to impart movement to said work carrier in a direction crosswise of the bar, a driving shaft having fast and loose pulleys and a cam disk with stop shoulder projecting beyond the highest point of the cam, an arm having a belt guide and a spring plunger bearing upon said cam disk and engaging with said stop shoulder, a stop for preventing further depression of said plunger than that caused by the action of the cam disk, a retainer lever for said arm, means for tripping said lever, and mechanism for operating the work carrier cams, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE LE ROY KEMP.

Winesses:

H. F. REARDON,

FRANK EDMUND BECHTOLD.