No. 705,062. Patented July 22, 1902.

Z. T. FRENCH & W. C. MEYER.

FEEDING MECHANISM FOR SHOE SEWING MACHINES.

(Application filed Nov. 23, 1899.)

(No Model.) 2 Sheets—Sheet 1.

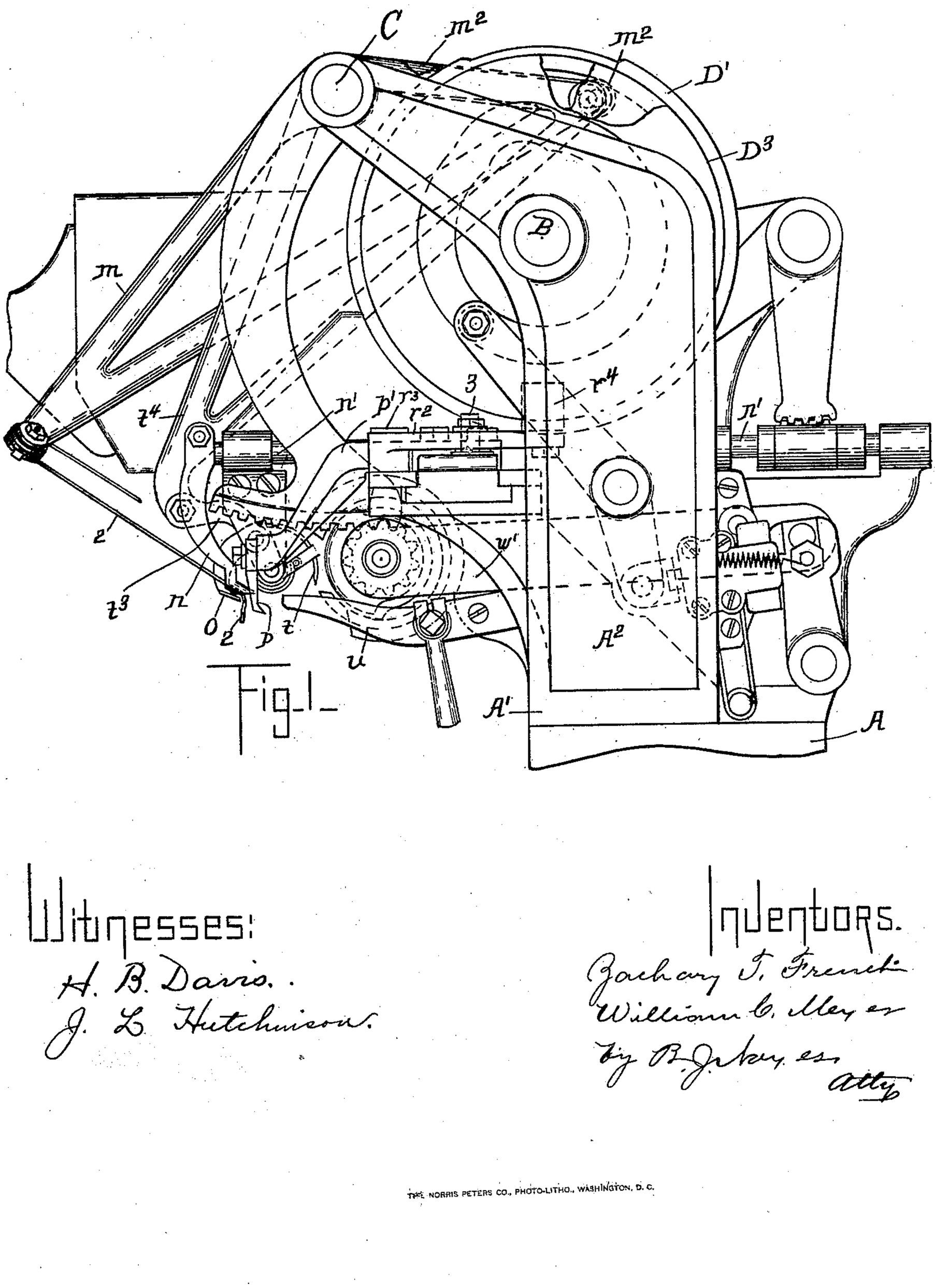

Fig. 1.

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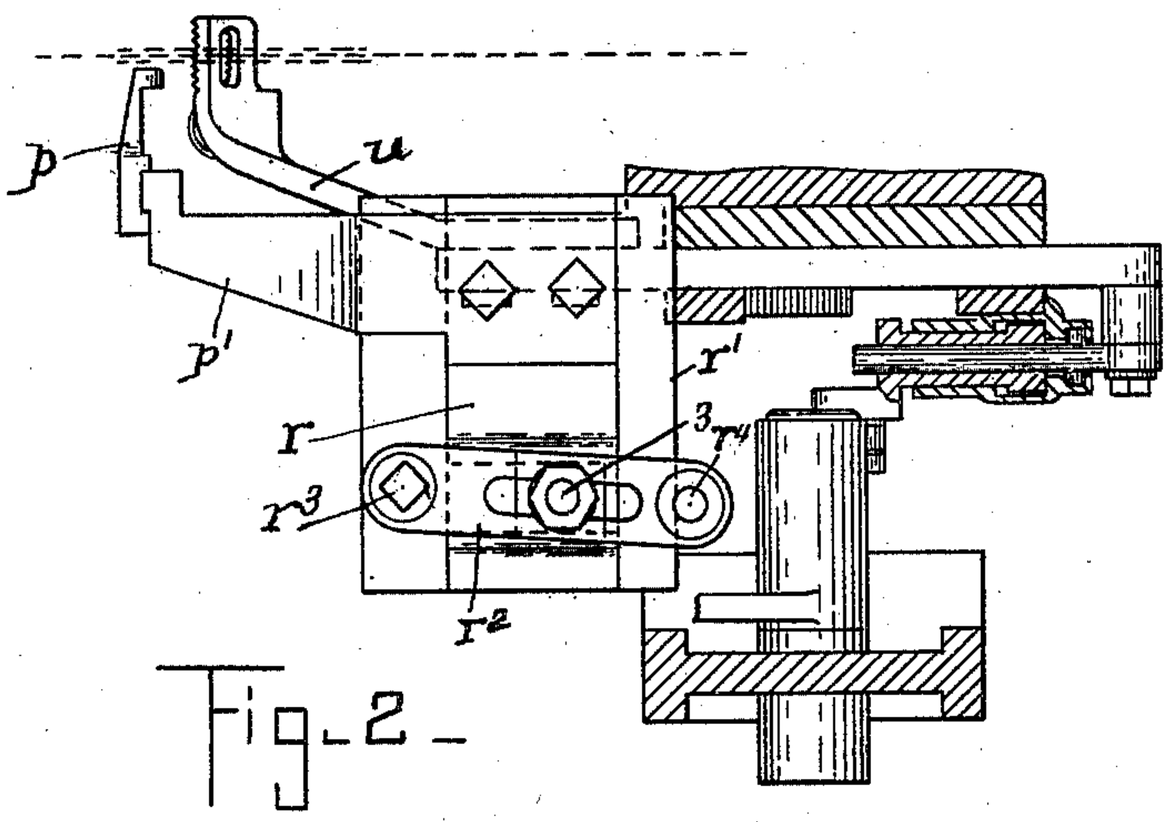

Fig. 2.

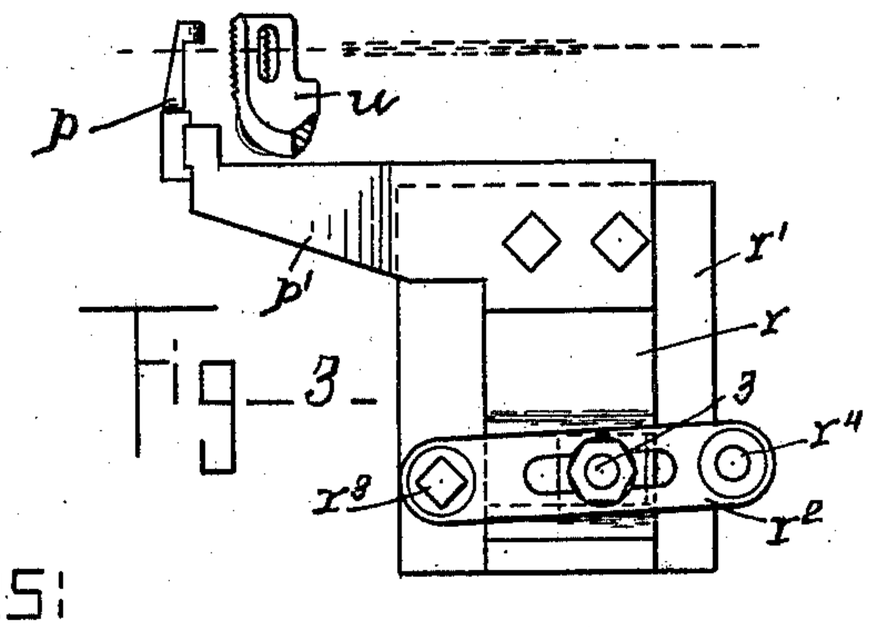

Fig. 3.

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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR SHOE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 705,062, dated July 22, 1902.

Application filed November 23, 1899. Serial No. 737,985. (No model.)

To all whom it may concern:

Be it known that we, ZACHARY TAYLOR FRENCH and WILLIAM C. MEYER, of 443 Albany street, Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Feeding Mechanism for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to sewing-machines, and has for its object to improve and simplify the construction of the feeding mechanism employed for feeding the work along.

The invention is herein shown as applied to a welt-sewing machine—such, for instance, as shown and described in our application for Letters Patent No. 655,165—yet it may be applied to other sewing-machines and used advantageously.

The feeding mechanism consists, essentially, of a feeding-finger, which may or may not be adapted to enter the channel of the sole, and a back gage, which coöperates with said feeding-finger to hold the work at certain times during the stitching operation, and said feeding-finger is located on the same side of the work as the needle-thread take-up and is so disposed relatively to said take-up that as said take-up rises to set the stitch the pull upon the needle-thread will be resisted by said feeding-finger, which results in holding the work firmly pressed into engagement with said feeding-finger during such movement of the take-up, and while the work is thus held pressed into engagement with the feeding-finger by the take-up said feeding-finger is moved to feed along the work. The back gage is moved rearward while the work is thus held by the action of the take-up and while the work is being fed along and is then moved forward into engagement with the work at the proper time to coöperate with the feeding-finger in holding the work while the take-up descends. The feeding-finger is located very close to the path of movement of the needle—just as close as possible—and it is moved back and forth across said path of movement of the needle when feeding the work along, and such location of the feeding-finger places the point of resistance of the needle-thread substantially in line with the pull of the needle-thread, which obviates tilting the work when the needle-thread take-up rises and pulls the needle-thread taut and draws the work firmly into engagement with the feeding-finger. By utilizing the take-up to hold the work pressed firmly into engagement with the feeding-finger while said feeding-finger is being operated to feed along the work we find that in many instances and for some classes of work a feeding-awl, which is usually employed as a coöperative part of the feeding mechanism, may be omitted.

Figure 1 shows in side elevation a sewing-machine embodying our present invention. Fig. 2 is a plan view of the back gage and means for operating it and the feeding-finger and means for operating it back and forth across the path of movement of the needle, which latter is represented by dotted lines, the feeding-finger being shown at the right-hand side of the needle at the beginning of its lateral or feeding movement. Fig. 3 is a plan view of the feeding-finger and means for operating it back and forth across the path of movement of the needle, showing the feeding-finger at the left-hand side of the needle or at the end of its lateral or feeding stroke.

The sewing-machine which we have herein shown for the sake of illustrating this invention is the welt-sewing machine of our application No. 655,165.

The main frame comprises, essentially, the upright or column A, surmounted by a table A′, having erected thereon several vertical uprights A^2, which are constructed and arranged to afford bearings for the main shaft B, which has secured to it the several operating-cams, and said uprights also afford bearings for the rod or bar C and for other operating parts of the machine.

m represents the take-up for the needle-thread 2, it being herein shown as an arm having at its forward extremity a roll over which the thread 2 passes, said arm projecting from a hub which is mounted on the bar C and adapted to oscillate thereon as required, and an arm m^2 projects rearward from said hub, having at its rear extremity a stud, with or without a roll thereon, which enters a cam-groove formed or provided in one side or face

of a cam wheel or disk D′, which is secured to the main shaft B, said groove being shown in the right-hand side or face of said disk D′. The needle-thread 2 passes from the take-up *m* through the eye of the looper *n*, which is secured to the forward end of a horizontal shaft *n*′, having its bearings in the framework. The horizontal shaft *n*′ extends rearward to the rear side of the machine, and means are provided for oscillating said shaft on its axis and also for moving it back and forth longitudinally, (which is not deemed necessary to herein describe in detail,) whereby the looper *n* is operated to carry the thread around the needle.

o represents the thread-finger, which is provided for the purpose of carrying the needle-thread rearwardly from the looper *n*.

p represents the feeding-finger, which is herein shown as adapted to enter the channel of the sole, and said feeding-finger is secured to an arm *p*′, which extends upward and is bolted or otherwise secured to a feed-slide *r*, supported in a guideway *r*′, formed in the framework, said slide *r* being adapted to move back and forth in the direction of the feed of the work. The feed-slide *r* has a vertical stud 3 projecting from its upper side or face, which enters a slot formed in an arm r^2, pivoted at r^3 to the front side of said guideway or slide-support *r*′, and a stud r^4 projects upward from the rear extremity of said arm r^2, which enters a peripheral groove formed or provided in a cam wheel or disk D^3, which is secured to the main shaft B of the machine. As the arm r^2 is swung to and fro on its pivot r^3 by said cam-wheel D^3 the feed-slide *r* will be moved back and forth in the guideway *r*′ provided for it, carrying with it the feeding-finger *p*.

The feeding-finger *p* is bent or formed to project or extend into proximity to the path of the needle *t* and is designed to be moved back and forth across the path of movement of said needle *t* when operated, as shown in Figs. 2 and 3, wherein it will be seen in Fig. 2 that the point of the feeding-finger is at the right-hand side of the path of movement of the needle *t*, and in Fig. 3 it is shown at the left-hand side of the path of movement of the needle, these two positions being the two extremities of the feeding stroke of the feeding-finger.

The curved hooked needle *t* is secured to a needle-segment, which is loosely connected by a short link t^3 with an arm t^4, projecting from a hub mounted on the bar C, said arm t^4 having a rear extension, which is provided with a stud which enters a cam-groove formed or provided in one side or face of a cam wheel or disk which is secured to the main shaft B.

The back gage *u*, which may be made as a welt-guide, if desired, is adapted to be moved back and forth or toward and from the work to coöperate with the feeding-finger *p* in holding the work, it being designed to engage the work and hold it from retrograde movement when the feeding-finger *p* is returning to its normal position or starting-point after having fed along the work and also to coöperate with the feeding-finger in holding the work in fixed position while the take-up is descending. The back gage *u* is attached to a longitudinally-sliding bar supported by any suitable means provided for the purpose, and means are provided for moving said back gage rearwardly a predetermined distance, which it is not deemed necessary to herein describe in detail, as such mechanism forms no part of our present invention, being shown in our application above referred to and in our application, Serial No. 8,196, filed March 10, 1900.

The shuttle, which may be of any usual or suitable construction, is set concentrically in a shuttle-carrier *w*′.

While the take-up *m* is rising to set the stitch and is drawing the needle-thread taut, the work is pulled by the needle-thread toward the feeding-finger *p*, and the operator is thus assisted in holding the work, and during such time the back gage *u* recedes to disengage the work for the feeding operation. While the work is thus firmly held pressed against the feeding-finger by the action of the take-up, the feeding-finger is operated to feed along the work. Immediately afterward the back gage *u* is moved forward into engagement with the work, so as to retard any retrograde movement of the work, and the feeding-finger then moves a short distance in a direction toward the right preparatory to again feeding the work along.

While it is preferable for many reasons to operate the feeding device at the time specified, yet we do not desire to limit ourselves to thus operating the feeding device, as it may be operated to feed along the work at any time while the work is firmly held pressed into engagement with it by the action of the take-up pulling hard upon the needle-thread in a direction toward the feeding-finger.

We claim—

1. In a sewing-machine, the combination of stitch-forming mechanism including a curved needle movable about an axis, a feeding-finger and means for moving it back and forth crosswise the path of movement of said needle from a point at one side of to a point at the other side of said needle, when the needle is in a remote position, substantially as described.

2. In a sewing-machine, the combination of stitch-forming mechanism including a curved needle movable about an axis, a feeding-finger and means for moving it back and forth crosswise the path of movement of said needle from a point at one side of to a point at the other side of said needle, when said needle is in a remote position, a back gage, and means for moving said back gage toward and from said feeding-finger, substantially as described.

3. In a sewing-machine, the combination of stitch-forming mechanism including a curved

needle movable about an axis, a feeding-finger adapted to enter the channel of the sole and means for moving said feeding-finger back and forth across the path of movement of said needle from a point at one side of to a point at the other side of said needle, when said needle is in a remote position, substantially as described.

4. In a sewing-machine, stitch-forming mechanism, a feeding-finger against which the work is held pressed by the action of the needle-thread take-up and means for moving it across the path of movement of the needle while the work is so held, substantially as described.

5. In a sewing-machine, stitch-forming mechanism, a feeding-finger, means for moving it back and forth across the path of movement of the needle, a needle-thread take-up operating while drawing the needle-thread taut to hold the work in engagement with said feeding-finger while said feeding-finger operates to feed along the work, a back gage cooperating with said feeding-finger, and means for moving said back gage toward and from said feeding-finger, disengaging the work while said feeding-finger operates to feed the work along, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ZACHARY TAYLOR FRENCH.
WILLIAM C. MEYER.

Witnesses:
B. J. NOYES,
J. L. HUTCHINSON.