J. H. & J. B. URSBRUCK.

SHOE SEWING MACHINE.

APPLICATION FILED MAY 22, 1907.

944,751.

Patented Dec. 28, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

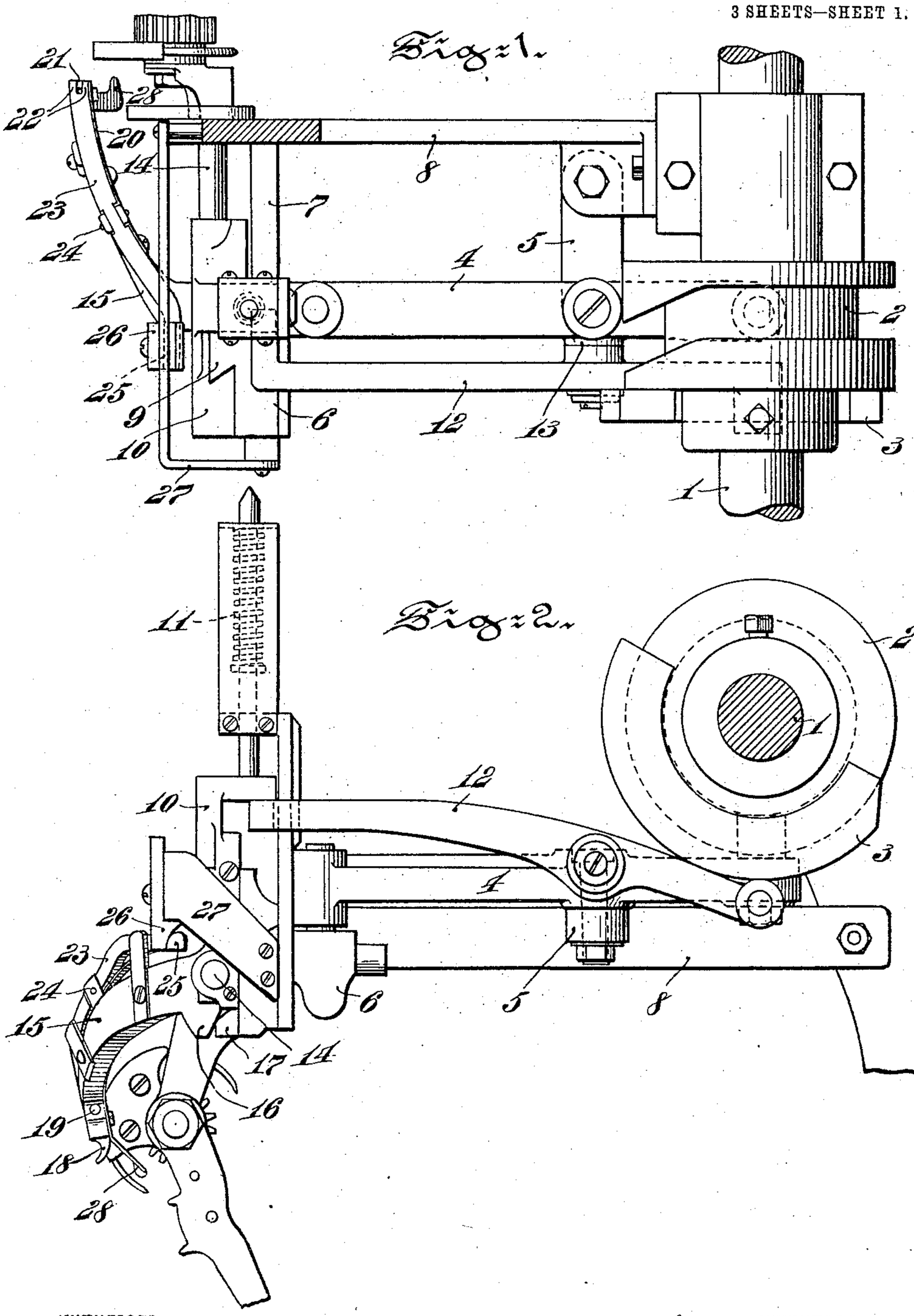

Fig. 2.

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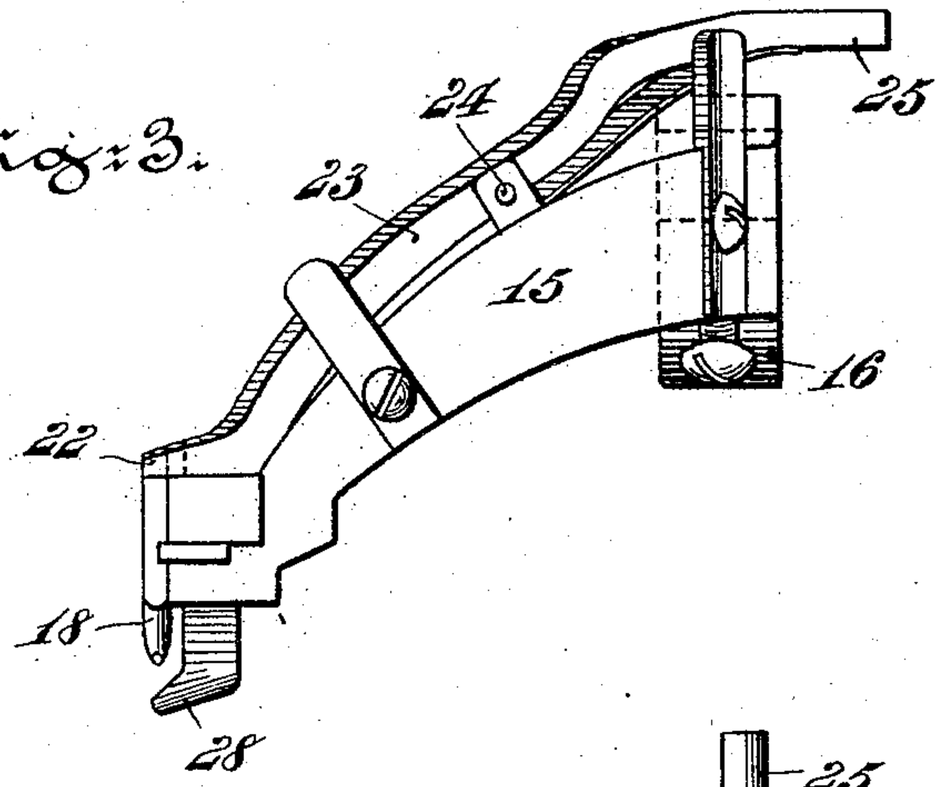
3 SHEETS—SHEET 2.

Fig. 3.



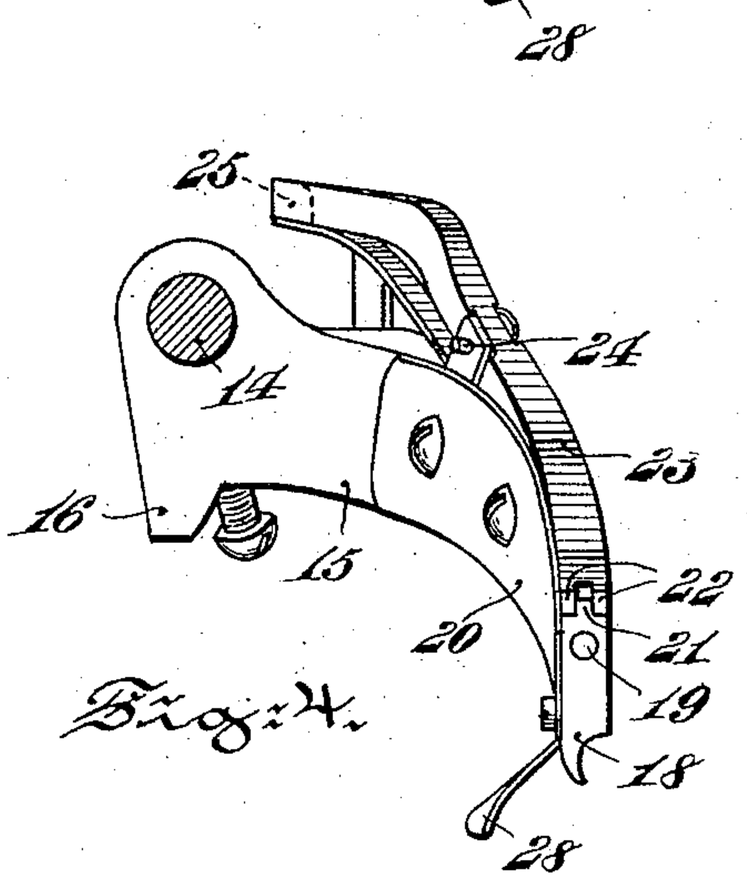


Fig. 4.

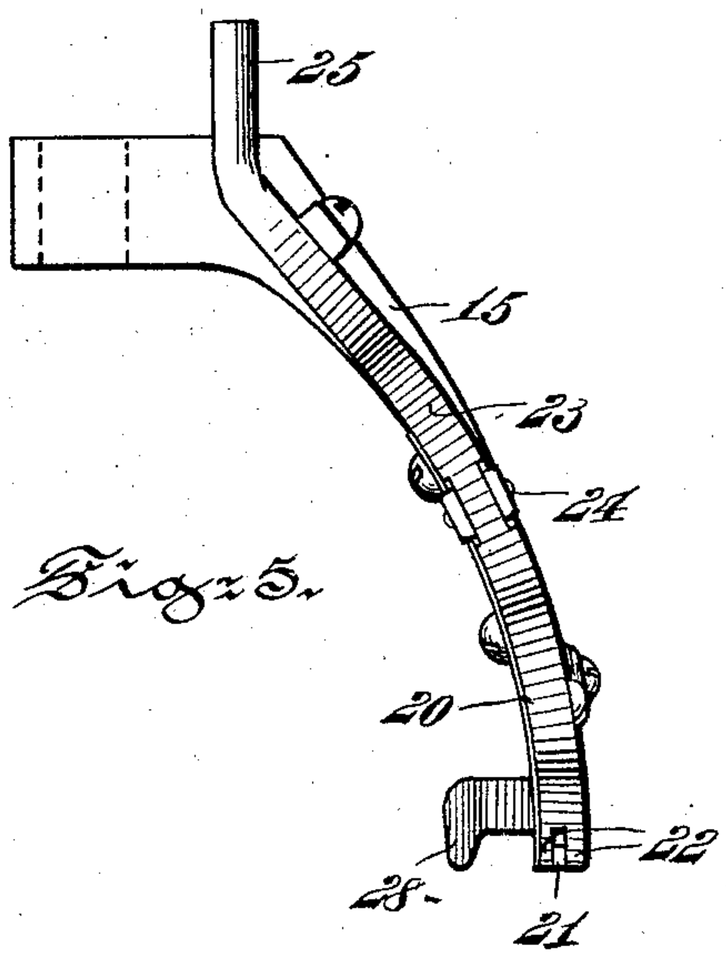
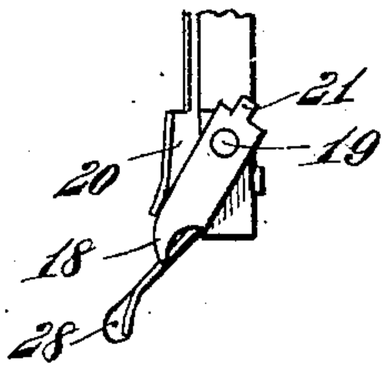


Fig. 5.

Fig. 6.



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3 SHEETS—SHEET 3.

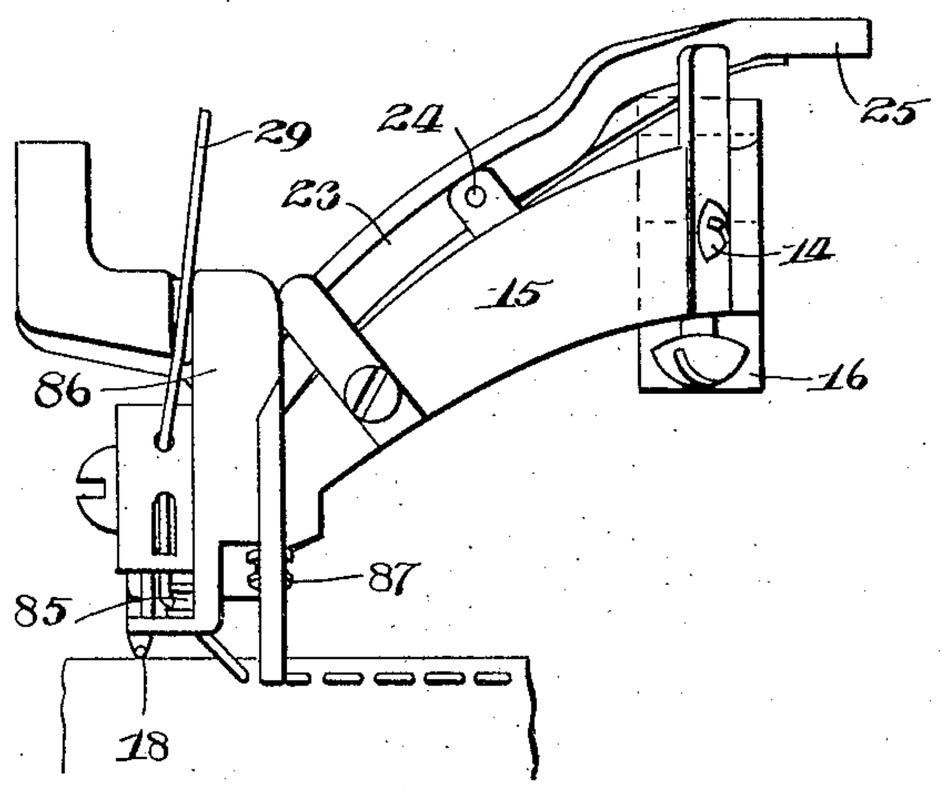

Fig. 7.

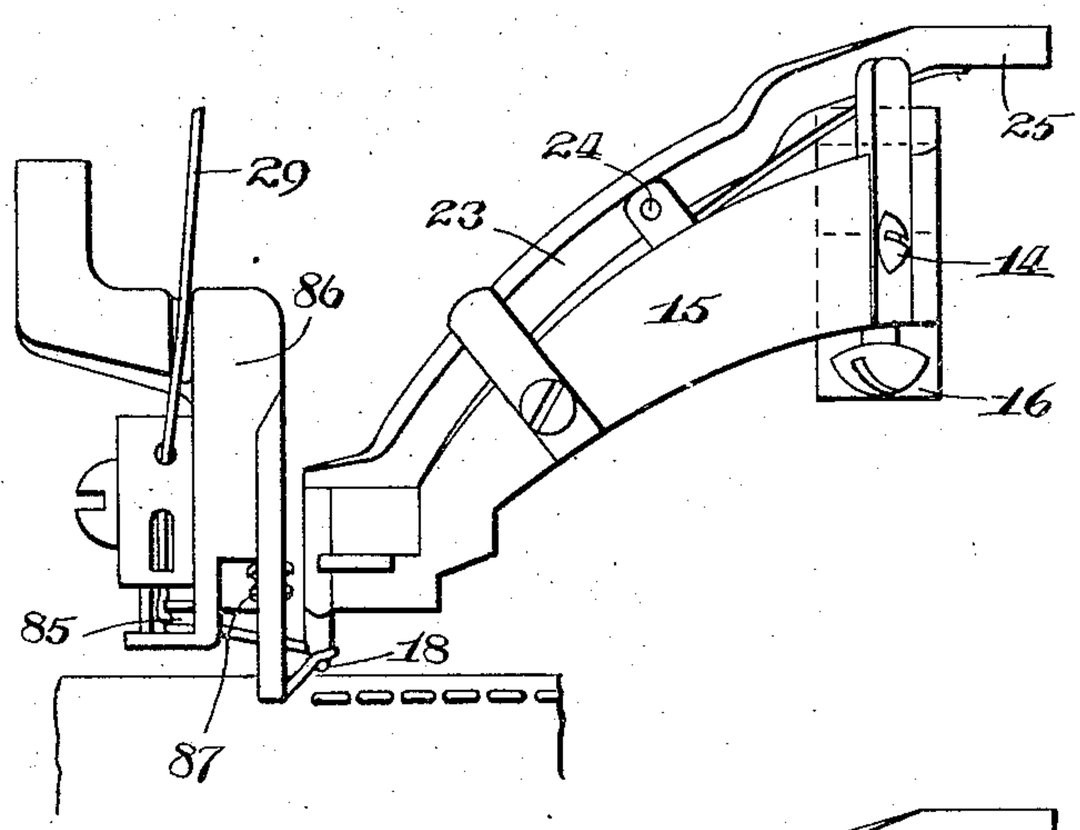

Fig. 8.

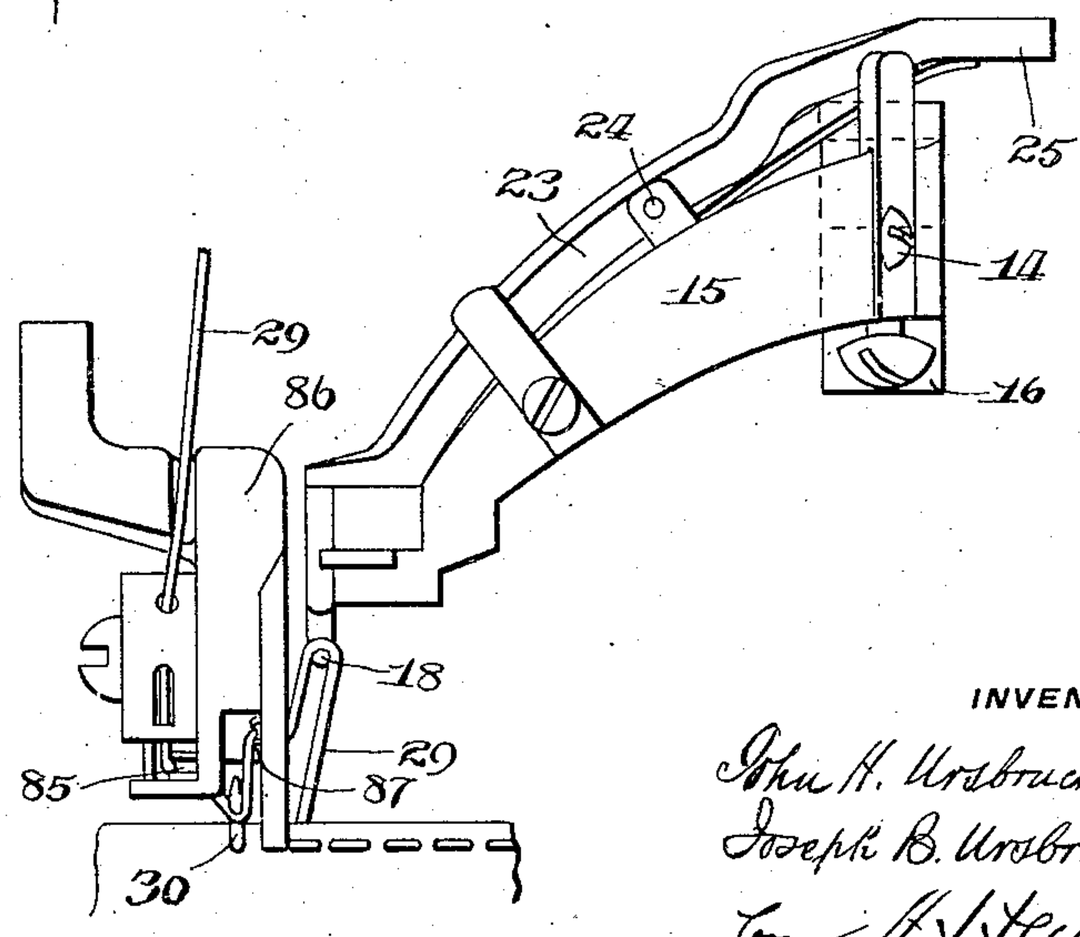

Fig. 9.

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JOHN H. URSBRUCK AND JOSEPH B. URSBRUCK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS OF ONE-FOURTH TO JOHN A. HUNTER AND ONE-FOURTH TO MARY A. HUNTER, OF PHILADELPHIA, PENNSYLVANIA.

SHOE-SEWING MACHINE.

944,751. Specification of Letters Patent. **Patented Dec. 28, 1909.**

Application filed May 22, 1907. Serial No. 375,099.

To all whom it may concern:

Be it known that we, JOHN H. URSBRUCK and JOSEPH B. URSBRUCK, citizens of the United States, residing in the city of Philadelphia, State of Pennsylvania, have jointly invented certain new and useful Improvements in Shoe-Sewing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates generally to boot and shoe sewing machines and particularly to the machine described in Letters Patent heretofore granted to us No. 715,323 dated December 9, 1902, and is designed to simplify and improve the loop-forming mechanism of said machine by the substitution of a new looper device, the machine not being otherwise changed. In our former machine this was accomplished by the means shown in Figures 10 to 15 inclusive, of the drawings of that patent, Figs. 13, 14 and 15 showing the looper, and Figs. 10, 11 and 12 illustrating the means coacting with the looper. By our present improvements the functions of both these elements are accomplished by the single element hereinafter described and constituting the chief novel feature of the present invention.

In the accompanying drawings Fig. 1 is a plan view of the improved form of loop-forming mechanism of our present invention, such parts only of the old machine being shown as are necessary to show the relation of the present invention thereto. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged side elevational view of the hook-carrying arm detached. Fig. 4 is a front elevation of the same. Fig. 5 is a top plan view of the same, and Fig. 6 is a fragmentary view showing the hook in released position for casting off the loop at the proper time. Figs. 7, 8 and 9 are diagrammatic views illustrating the operation of the new elements, in the thread-applying device, for insuring the proper application of the thread to the needle, and the delivery of the loop of thread therefrom.

The machine shown and described in our former patent No. 715,323 to which our present looper mechanism is applied, is not otherwise altered than as hereinafter stated, and need not be described again save in connection with the vibrating carrier and its oppositely-disposed curved awl and needle, shown in Figs. 5 and 6 of the drawings of said patent, and the co-acting thread-applying and stitch-pulling arm 86 shown in Fig. 4 of said drawings. In said former machine, the needle-thread was drawn taut across the grooved face of the thread-applying and pulling arm 86, in order to insure certainty in the application of the thread to the barbed end of the needle, by means of a pair of fingers 100 and 101; the former had a movement across the end of arm 86 and the latter had a movement alongside of said arm; the finger 100 engaged with the thread between end of arm 86 and the work and drew it laterally into position to be engaged by finger 101 which caught the loop and drew it up alongside of arm 86 which pulled it. This operation, by these two parts referred to, we now perform by the mechanism hereinafter described, in substitution therefor and in lieu of looper finger 101 and finger hook 100 with its carrying arm 107 shown in Figs. 10, 11 and 12 of said patent, the single element so substituted performing the functions of both the elements for which it is thus substituted.

Referring now to the drawings showing our improved looper mechanism and so much of the actuating mechanism of the machine as operates it, 1 indicates the main driving shaft, 2 and 3 are cams mounted thereon for imparting the requisite horizontal and vertical movements to the loop-forming device, and 4 is a lever to transmit motion from cam 2. This lever is pivoted intermediate its ends to a link 5 to compensate for the straight line movement which it imparts to member 6 to which it is pivotally secured at its outer end. Member 6 is mounted to slide horizontally on a bar 7 rigidly secured to the machine frame through a bracket 8. A block 10 is adapted to slide in a dovetail groove 9 in member 6, and is normally forced downward by tension of spring 11, and contrawise is raised, at proper time, by a lever 12 pivoted intermediate its ends to an extended part 13 of said bracket 8, and said lever 12 is actuated by cam 3 on the main shaft. A rod or spindle 14 is also mounted in said block 10, and said rod carries the hook-carrying arm 15, the mount-

ing being such as to permit a swinging movement of it about the axis of the rod 14; this swinging movement being effected by lugs 16 and 17. Lug 16 is formed on said arm 15 adjacent its axis of support, and contacts with lug 17 at the limit of the downward movement of block 10. This hook-carrying arm 15 is provided at its outer end with a loop-forming hook 18, by means of a pivotal connection 19, and said hook is maintained in normal position by a leaf spring 20. Means to lock the hook member 18 in normal position, at the requisite time, in the cycle of movements of the machine, and means to release it at appropriate times, consist of a projection 21 on the upper end of hook 18, said projection being straddled by a bifurcated end 22 of a lever 23 pivoted at 24 to said hook-carrying arm 15. The other end of lever 23 has an extension 25 adapted, when arm 15 is moved about its axis of support, to encounter the under cam surface of a member 26 carried by a bracket 27 which is secured at one of its ends to said bracket 8 and at the other end to a horizontal slide-bar 7. To the outer end of hook-carrying arm 15 is fixedly secured a guide finger 28 adjacent the loop-forming hook 18, and its function is to secure the proper engagement of said hook with the thread.

The operation is as follows: The needle thread is drawn taut across the grooved face of the thread-applying arm as before (see Fig. 4 of our former patent 715,323, and lines 68 to 132 of page 2 of the printed specification) in our improved device herein shown and described, but now by the pivotally-mounted loop-forming hook 18 when in normal and locked position; and in the engagement of said looper hook 18 with the thread it is led by the guide finger 28, and then it has imparted to it, through the novel actuating mechanism before described, the requisite movements stated whereby it delivers the thread to the needle, as fast as the needle requires it, and draws therefrom a loop of thread with which the shuttle, carrying the under thread, engages. This mode of operation of the new parts is further illustrated by the diagrammatic views, Figs. 7, 8 and 9, wherein they are shown in connection with the thread-applying and stitch-pulling arm 86 of our former patent. The thread 29 is drawn across and through the grooves of member 86, and over its guide-wheel 85, as before. The member 15 carrying the hooked arm 18 pivotally mounted thereon, has a forward and backward and a rising and falling motion imparted to it, by substantially the same means described in our former patent to operate the thread-applying finger 101 of that device. The first or normal position, at rest, of the new member 15, hook arm 18, and their adjunctive parts which move with them, relatively to the thread-applying member 86, is at the side thereof, in relatively elevated position, as shown at left of Fig. 9. The machine being threaded up and motion imparted by the main shaft, the first movements of the member 15 imparted to it by the adjunctive actuating elements described, are to lower the hook-member 18 and throw it across the rear face of member 86 as shown in Fig. 7, to clear the loop, and also put it in the downward position hereinafter stated in reference to Fig. 8, where it will catch the thread. At that time the feed operation is taking place but the needle is at rest. Then the member 15 recedes, the hook 18 catching the thread and pulling it sidewise, horizontally, as shown in Fig. 8. As previously stated an auxiliary thread-guiding finger 28 (see Figs. 3 to 6) may be applied to more perfectly insure the hook 18 engaging the thread, in the last described movement; but as its said function is not absolutely necessary and does not affect the movements and functions of hook 18 and member 15 it is omitted, for clearness, from Figs. 7, 8 and 9 so as to show the mode of operation of the latter with certainty. The parts being in the position shown in Fig. 8, the thread-applying member 86 then backs, so to speak, carrying the loop of thread into the path of the needle, the hook 18 still engaging the thread as before stated, to hold it taut and insuring the performance of the needle-threading function of the member 86. After the needle 30 has thus caught the thread, delivered to the point of the needle by the member 86, the latter returns to normal position (these movements of that member being as in our former patent); and the hook 18, by reason of the rising movement of member 15 is lifted to the position shown in Fig. 9, carrying the thread over the additional guide-wheel 87, and then, having imparted to it the before-described movement, through tripping of the lever 23 effected when its extension end 25 is brought into contact with cam-member 26 (see Figs. 1 and 2), the member 15 recedes and drops the loop off its hook 18. This completes the stitch, but, as in our former patent, the member 86 is not only a thread-applying arm (or loop-former) applying thread to the needle, but it is a stitch-pulling arm, this function taking place after the hook 18 of new member 15 has dropped the formed loop, as just described; and it may also be added that, as before, this stitch-pulling function of member 86 occurs after the usual "take-up" of the machine has pulled the loop as tight as it, alone, will pull it; all these functions of member 86 being effected by the movements and mechanism as described on printed page 2 lines 61 to 100 of our said former patent.

Having thus described our invention, we

claim as new and desire to secure by Letters Patent:—

1. In a sewing machine of the class recited, comprising a vibrating carrier, its needle, a vibrating arm for applying thread to the needle, with means for actuating said elements, the combination therewith of mechanism for drawing the thread across said thread-applying arm, comprising an arm carrying a loop-drawing hook, a member on which said arm is pivotally mounted, means to impart the desired series of movements to said member, means for holding said loop-drawing hook in locked position, and means for releasing it therefrom to shed the loop in the formation of the stitch; substantially as set forth.

2. In a shoe sewing machine comprising a vibrating carrier, its needle, a vibrating arm for applying thread to the needle, with means for actuating said elements, the combination therewith of a loop-drawing hook, an arm carrying it, a member on which said arm is pivotally mounted, means to impart the desired movements to said member whereby the thread is drawn by said hook across said thread-applying arm, a lever pivoted on said member with means on its end to lock said pivoted hook-carrying arm in fixed position, cam mechanism operating to trip the lever and release the hook and withdraw it from the loop, substantially as set forth.

3. In a shoe sewing machine the combination with a vibrating needle carrier, its needle, a vibrating thread-applying arm delivering thread to the needle, of means to draw the thread across the face of said arm in loop formation, comprising a pivoted hook arm, a member on which it is mounted, means to impart the desired series of movement to said member, means to lock and release said arm during the formation of the loop, and actuating devices driven from the main shaft operating to impart said movements to said arm-releasing mechanism.

4. In a shoe sewing machine comprising a vibrating needle carrier, its needle, a vibrating arm for applying thread to the needle, and means for actuating said elements, the combination therewith of mechanism for initially drawing the thread across said thread-applying arm, holding the loop during its engagement by the needle, and then releasing the loop to said thread-applying arm operating as a stitch tightener, said mechanism comprising a carrying member 15, means to impart the desired series of movements thereto, a hooked arm 18 pivotally mounted on said member, a lever 23 also pivotally mounted thereon, and provided with means detachably engaging the end of said hooked arm, with means to trip said lever and release the engagement of the hook with the loop for the completion of the stitch formation; substantially as described.

In testimony whereof, we have hereunto affixed our signatures this 11th day of May A. D. 1907.

JOHN H. URSBRUCK.
JOSEPH B. URSBRUCK.

Witnesses:
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JAMES DUNLAP.