(No Model.) 3 Sheets—Sheet 1.

J. M. MERROW.

CROCHETING OR OVERSEAMING MACHINE.

No. 413,761. Patented Oct. 29, 1889.

Fig. 1.

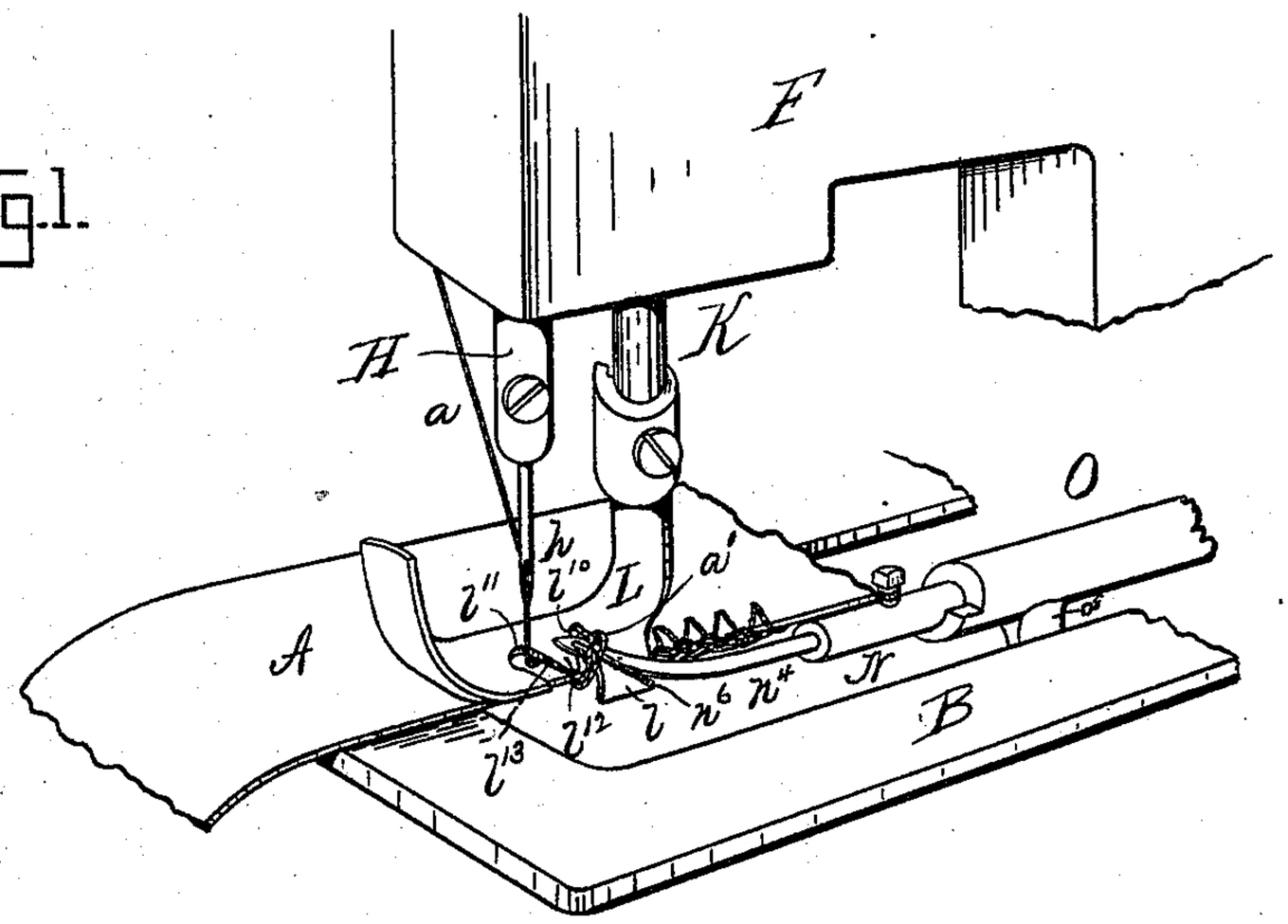


Fig. 2.

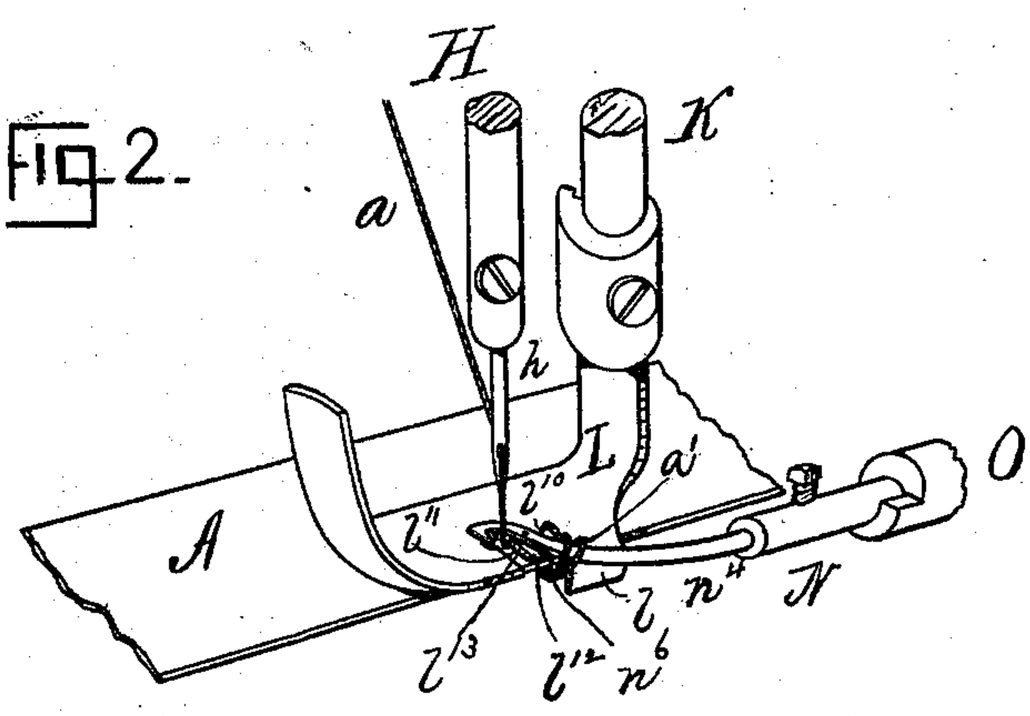
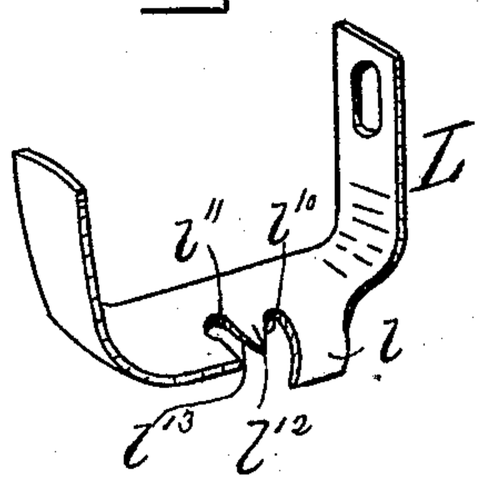


Fig. 3.



WITNESSES —

Frank K. Allen

William N Stedman

INVENTOR —

Joseph M Merrow

(No Model.) 3 Sheets—Sheet 2.

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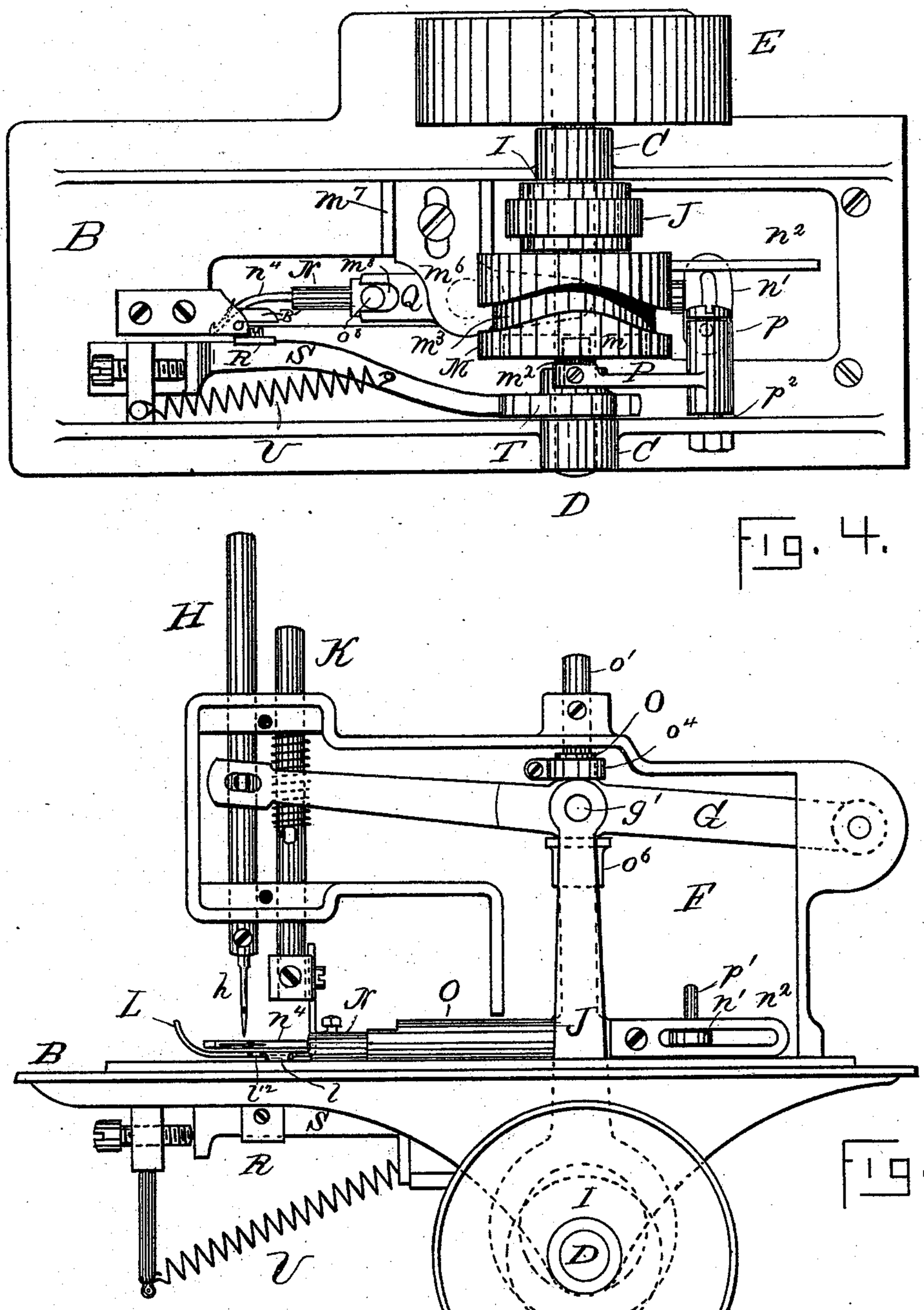

Fig. 4.

Fig. 5.

Witnesses

William H. Stedman

Lillie I. Young.

Inventor

Joseph M. Merrow

(No Model.) 3 Sheets—Sheet 3.

J. M. MERROW.

CROCHETING OR OVERSEAMING MACHINE.

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Fig. 7.

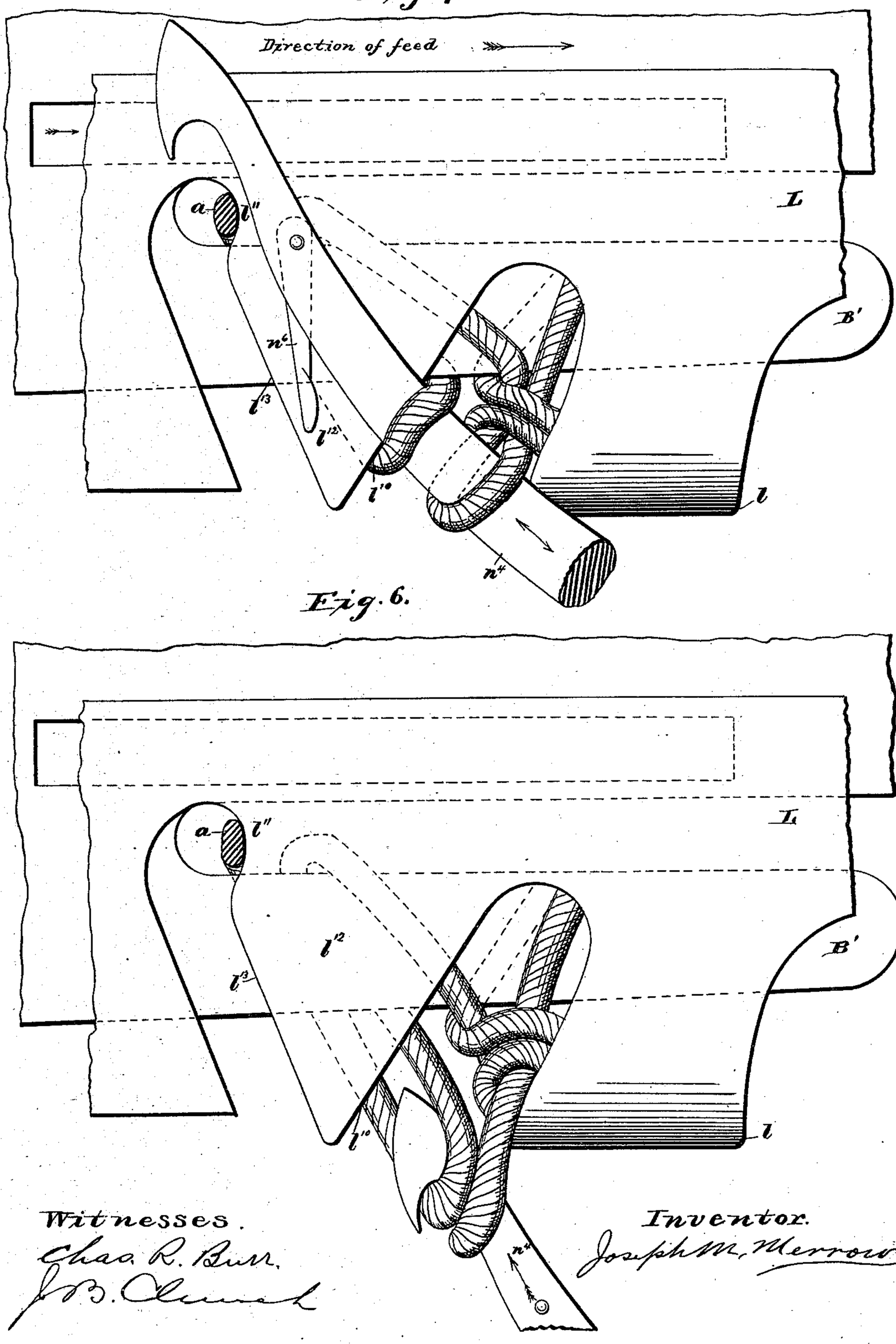

Fig. 6.

Witnesses.
Chas. R. Burr.
J. B. Clunk

Inventor.
Joseph M. Merrow

UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF MERROW, CONNECTICUT.

CROCHETING OR OVERSEAMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,761, dated October 29, 1889.

Application filed October 15, 1887. Serial No. 252,416. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, a citizen of the United States, residing at Merrow, in the county of Tolland and State of Connecticut, have invented new and useful Improvements in Crocheting or Overseaming Machines, of which the following is a specification.

This invention relates generally to that class of overseaming-machines in which a latched looper or hook is employed to co-operate with a reciprocating needle in forming an overseamed finish upon fabrics; and the said invention consists in the form, construction, and arrangement of certain guiding or detaining fingers, shoulders, or projections co-operating with the looping mechanism and needle to properly place or hold the thread and loops during the operation of the machine, as hereinafter more fully described and pointed out.

In the accompanying drawings, wherein the application of my invention is illustrated, Figures 1 and 2 are perspective views of a portion of an overseaming-machine, showing the looper in different positions. Fig. 3 is a perspective view of a presser-foot. Fig. 4 is a bottom view, and Fig. 5 a side view, of an overseaming-machine. Figs. 6 and 7 are diagrammatic views illustrating, on an enlarged scale, the action of the parts to which my improvements relate.

Similar letters of reference represent similar parts through the illustrations.

The overseaming-machine shown herein to illustrate the manner of applying and using my present improvements is substantially identical in form, construction, and arrangement of its parts with that forming the subject of my prior application filed January 18, 1886, Serial No. 188,912, and the same is not claimed herein, but is included merely to illustrate a type of the class of machines to which my improvements are applicable.

With this understanding, I will proceed first to briefly describe the structure of this typical overseaming-machine, in order that its general mode of operation may be understood, and will then refer to the features of my improvement.

B represents the bed of the machine, including the work-plate. B′ is the finger or plate around which the loops are formed. F is the case which forms a support for the needle-bar H and presser-foot bar K, the presser-foot L being detachably secured to the bar K and the needle *h* to the lower end of bar H. The crochet-hook bar N, supported and guided in a sleeve O, carries a crochet-hook n^4, the latter being furnished with a latch n^6. These parts, together with a feeding mechanism, constitute in effect the operating parts of the machine, suitable driving or actuating mechanism being supplied for reciprocating the needle *h* vertically, for holding the presser-foot down on the fabric A, for giving the proper motion to the feeding devices, and for carrying the crochet-hook n^4 around the edge of the fabric and reciprocating it alternately above and below the latter to grasp the needle-thread *a* alternately on opposite sides of the fabric and draw and interloop the thread along the edge thereof.

A mechanism such as hereinafter referred to for actuating the crochet-hook after the manner indicated is illustrated in Figs. 4 and 5, wherein E represents a hand-wheel suitable to receive motion from any convenient source, and secured to shaft D, the latter journaled at C on the bed-plate B.

M is a cam-cylinder, to which is secured an eccentric I, both being fastened to the shaft D. The eccentric-rod J is loosely connected at its lower end with the eccentric I and at its upper end with the needle-lever G upon a stud g', projecting from the side of said lever near the longitudinal center thereof. The needle-lever G is pivoted at its rear end in the case of the machine, its front end being loosely connected to the needle-spindle H in a manner common in sewing-machines. The looper-bar N is provided at its rear end with a slotted head n'.

O is a right-angle guide, through which passes the vertical spindle o', the latter secured to the frame of the machine. Upon the upper end of the guide O and above the needle-lever G is a clamp-collar o^4, while below said needle-lever is a collar or flange o^6. The collar o^6 and clamp-collar o^4 form a loose

joint or connection with lever G. Secured to the rear portion of the lower end of guide O is a slotted guide n^2, through which passes one end of the slotted head n' of the looper N, said bar N being passed through the lower horizontal portion of guide O and provided with a latched looper n^4. The front part of the lower portion of guide O is provided with a downwardly-projecting stud o^8, passing into the slotted end m^8 of a lever Q, the latter being pivoted upon stud m^6, adjustably secured to block m^7. At the rear end of lever Q is a stud projecting into the groove m^3 of cam-cylinder M. P is an angular lever provided at its lower end with a stud m^2, projected into the groove m of cam-cylinder M. The opposite end of lever P is formed into a pin p', which projects through the slotted head n' of the looper-bar N, said lever being pivoted upon a stud p^2, secured to the bed of the machine.

The presser-foot is held down to the work in a manner common in sewing-machines.

The operation of the described overseaming-machine is as follows: The shaft D, cam M, and eccentric I are rotated simultaneously by the application of power to the wheel E, and the connecting-rod J operates upon the lever G to reciprocate the needle as well as the guide O, in which the bar N, carrying this looper n^4, is supported. The cam-groove m^3 reciprocates either end of the lever Q by means of the stud projecting into said groove, thereby imparting a lateral reciprocatory motion to the guide O and looper-bar N. The longitudinal reciprocatory motion of the looper-bar N is produced by means of the stud m^2 of lever P projecting into the irregular groove m in the side of the cam-cylinder M, said lever P being reciprocated at either end as the cam-cylinder is rotated. Any suitable means may be employed for feeding the fabric.

As the operation of machines of this class is well known and understood in the arts, a detailed explanation is not deemed necessary to a full understanding of my present invention relating to auxiliary or supplemental features. It is sufficient for the purposes of this case to state that the thread is carried through the fabric by the needle, while the looper being reciprocated around the edge of the fabric is operated so as to grasp the needle-thread alternately above and below the fabric, first drawing a loop from beneath and around a finger or plate and advancing through the loops thus formed to grasp the thread on the upper or opposite side of the fabric, which operations are repeated and the threads enchained along the edge by causing the looper of crochet-hook to draw each third loop through the two preceding loops, as more fully described in my application, Serial No. 188,912, and in my patent, No. 195,520, dated September 25, 1877.

Having thus fully set forth the characteristics of the type of overseaming-machines to which my invention relates, and having specifically described one example of said type, I will now proceed to explain my improvements.

It is found in practice, and especially when operating upon certain classes of goods, that there is sometimes developed a tendency on the part of the looper as it is moved around the edge of the fabric or around the finger with a loop on the hook to catch the thread or throw the loop around on the latch side. As the thread is held under tension it is drawn into the throat of the hook as the latter is drawn toward the edge of the fabric, and when the hook is carried around the edge, unless some means are provided for deflecting the upper strand of the loop, it will sometimes be caught on the end of the hook or deflected toward or onto the latch, so that as the hook is advanced over the fabric on the opposite side to grasp the needle-thread and form another loop the previously-formed loop will be cast off or misplaced or the thread split or broken. This action is much more liable to occur when operating with yarn than with silk or thread. Again, it is essential to the perfect formation of the stitches that the loops carried by the hook or looper should be held back on the latter as it is advanced to again grasp the thread in order that the latch shall at the proper time be passed through the loops to enable the next loops to be drawn through them. It is to overcome these and other defects relating to the action of the crochet hook or looper, when used in the manner and for the purposes described, and not as affecting the action of other parts of the mechanism, that my present improvements have been made, said improvements comprehending the application and adaptation of certain fingers, shoulders, or abutments so arranged and combined with the needle and looper as to engage the thread at proper intervals, and, in addition, to hold or deflect it into proper positions without otherwise interfering with or changing the normal operation of the machine.

Although by no means necessary or essential to the successful use and application of my improvements, I prefer for various reasons—such as simplicity, economy, and uniformity—to locate or form the guiding, detaining, or deflecting shoulders or surfaces upon the presser-foot, and to this end have illustrated my invention as applied to the presser-foot L, which latter also embodies certain features claimed in my prior application, Serial No. 188,912—to wit, the knocking-over lip l and the needle-thread-retaining shoulder or stop l^{11}—with which some of the present improvements are designed to co-operate. This presser-foot L is cut away or formed with an opening on the side toward the looper for the passage of the needle and to permit the thread to be drawn down upon the fabric as the crochet-hook draws the loops from above toward or around the edge. This side or wall l^{11} beyond the needle (looking in

the direction toward which the fabric is fed) forms a stop to receive, hold, or retain the needle-thread in position when the needle is carried above the fabric. In rear of the needle-opening, and on the side toward which the fabric is fed, the presser-foot is extended laterally in a direction toward the edge of the fabric and toward the crochet-hook, forming a wall or guide l^{13}, in front of which the thread is carried as the hook draws a loop from above the fabric, and at or near the outer edge of this wall or lateral extension of the presser-foot is formed a shoulder or surface l^{10}, for a purpose to be described, preferably produced by cutting a notch in the presser-foot with the front wall inclined inward and forward, resulting in the production of a finger or projection l^{12} on the side of the presser-foot and extending laterally with respect to the feed motion and pointing toward the looper. In the present instance this finger or lateral projection forms an embodiment of my present improvements as adapted for application to a presser-foot. The outer end of this finger, or that part corresponding to the outer end of the shoulder l^{10}, is so located and arranged relatively to the path traversed by the crochet-hook in its course upward and forward toward the needle to grasp the thread above the fabric that it will project across said path or line of direction, so as to present a surface to receive or engage the threads of the loops carried by the crochet-hook, as clearly shown in Figs. 6 and 7. The angle or general direction given the shoulder l^{10} is dependent upon or determined by the direction of travel of the crochet-hook in its course over or above said shoulder. The outer end of the finger l^{12} is projected across the line of travel of the crochet-hook as it is moved around the edge and advances to grasp the needle-thread above the fabric; but it does not interfere with the action of the hook in drawing the loops from the top, for if the thread is drawn over the end of the finger it will be shed off onto the fabric. It is when the loops are drawn from beneath and around or against the finger or shoulder that it performs its office as guide or stop for the loops in the manner described.

Preferably the shoulder l^{10} is extended to such length and the angle is made such as to have a tendency to somewhat deflect the loop or loops carried upward and forward by the crochet-hook, as shown in Fig. 6, in order the more securely to hold said loop or loops upon the crochet-hook and prevent them from being crowded off, slipping from, or being dropped by said crochet-hook; but the primary function of the shoulder l^{10} is to retain or hold back the loop or loops on the crochet-hook, (see Fig. 7,) and thus afford ample opportunity for the latch to be carried through or beyond the loop or loops, while the stop or wall l^{11} is made to contribute to the operation by holding the needle-thread a in such position as that it will be grasped by the crochet-hook without liability of the latch being carried beyond the needle-thread, for if this were to occur the latch might be closed by the needle-thread before the latter is grasped by the hook. It will then be seen that the office of the stop or wall l^{11} is to control the position of the needle-thread relatively to the direction and extent of movement of the crochet-hook above the fabric and while the needle is elevated, and that the shoulder l^{10} performs two distinct functions or combines two different qualities—viz., to retain or hold the loops in position while the crochet-hook continues to move forward above the fabric and to deflect the loops in the direction of the feed movement and away from the latch side and hold them on the crochet-hook so that they will not be easily crowded off or dropped.

As hereinbefore stated, I have for convenience of description and illustration shown the stop l^{11} and shoulder l^{10} located upon and made integral with the presser-foot, this being for general use a most convenient arrangement.

In further explanation of the action let it be assumed that the operation of overseaming has been started, the needle having been actuated to carry the thread several times through the fabric or below the finger and the looper at each reciprocation having taken a loop of said thread from above and from below the finger or finger and fabric and interlooped said thread at the edge, a single feed movement taking place each time the needle was elevated above the fabric.

In Figs. 1 and 7 the parts are shown in their relative positions assumed as the hook n^4 is rising and moving toward the needle-thread, the needle being in its elevated position, with the thread passing down through the fabric or needle-opening and encircling the crochet-hook. The motion of the machine being continued effects the advance of the hook toward the needle-thread and the feeding of the fabric preparatory to the descent of the needle. As the crochet-hook n^4 continues its motion toward the needle-thread (see Fig. 2) the loop or loops carried by said hook are brought against the shoulder l^{10}, (which stands more or less across the path traversed by the hook, see Fig. 7,) and said shoulder operates to detain or hold back and at the same time deflect or divert them somewhat during the forward movement of the hook, so that the latch will be carried through the loop or loops and the latter will be held back as the hook advances and grasps the needle-thread, which latter in the meantime has been prevented from becoming displaced and is held in proper position to be engaged by the hook by the stop or wall l^{11}, between which and the needle the thread is extended and the hook is reciprocated.

Although I have, for convenience of illustration, referred to the wall or stop l^{10} as standing across or below the line of motion

of the crochet-hook toward the needle-thread, so as to be always in position to engage the loop on the hook as the latter is moved up around the edge and advanced to grasp the needle-thread, it is obvious that substantially the same action will take place if the loops are deflected or carried back of said stop or shoulder as by the action of the feeding mechanism, so as to bring the loop behind the shoulder prior to the advance of the hook above the shoulder and toward the needle-thread, as thereby the plane of movement of the loop, when carried forward on the hook, would be intersected by the shoulder.

Having thus described my invention, what I claim as new is—

1. In a machine such as described, the combination, with the needle and looper and means for reciprocating them, and a finger or plate around which loops may be formed by the needle and looper, of a shoulder, as at l^{10}, occupying a position above said finger or plate and between the latter and the path traversed by the looper around the edge of the fabric, substantially as described.

2. In a machine substantially such as described, the combination, with a reciprocating needle and a reciprocating crochet-hook, and means for controlling the movements of said needle and hook, of a thread stop or guide in proximity to the needle for controlling the position of the needle-thread, and a retaining shoulder or guide, as at l^{10}, for the loops carried by the hook, said last-named shoulder or guide occupying a position between the plane of motion of the needle and the path traversed by the crochet-hook around the edge of the fabric, substantially as described.

3. In a machine such as described, the combination, with a crochet-hook and a needle, and means for operating the same, of a finger or plate around which loops may be formed, and a finger or projection, as at l^{12}, provided with a retaining shoulder or guide for the needle-thread and a shoulder or guide engaging the loops carried by the crochet-hook, said last-named finger or projection being supported to occupy a position between the finger or plate around which the loops are formed and the path traversed by the crochet-hook, substantially as and for the purpose described.

4. In a crocheting or overseaming machine, the combination, with a needle and looper and means for actuating the same, and a finger around which loops may be formed, of a presser-foot provided with a lateral extension forming a finger or projection for engaging the loop carried by the looper when advancing toward the needle-thread, substantially as described.

5. In a machine substantially such as described, a reciprocating needle and a crochet-hook reciprocating above and below the fabric in planes transverse to the needle, in combination with a presser-foot provided with a finger or projection for engaging the loops, and a guide or stop, such as l^{11}, for engaging the needle-thread, substantially as described.

6. In a crocheting or overseaming machine, the combination, with a reciprocating needle and crochet-hook, and a finger or plate around which loops may be formed, of a second or loop-engaging finger, as at l^{12}, overlapping the first-named finger or plate and located beneath but in proximity to the path traversed by the crochet-hook above the fabric, substantially as and for the purpose specified.

JOSEPH M. MERROW.

Witnesses:
FRANK H. ALLEN,
WILLIAM H. STEDMAN.