

2 Sheets—Sheet 1.

No. 541,106.

Patented June 18, 1895.

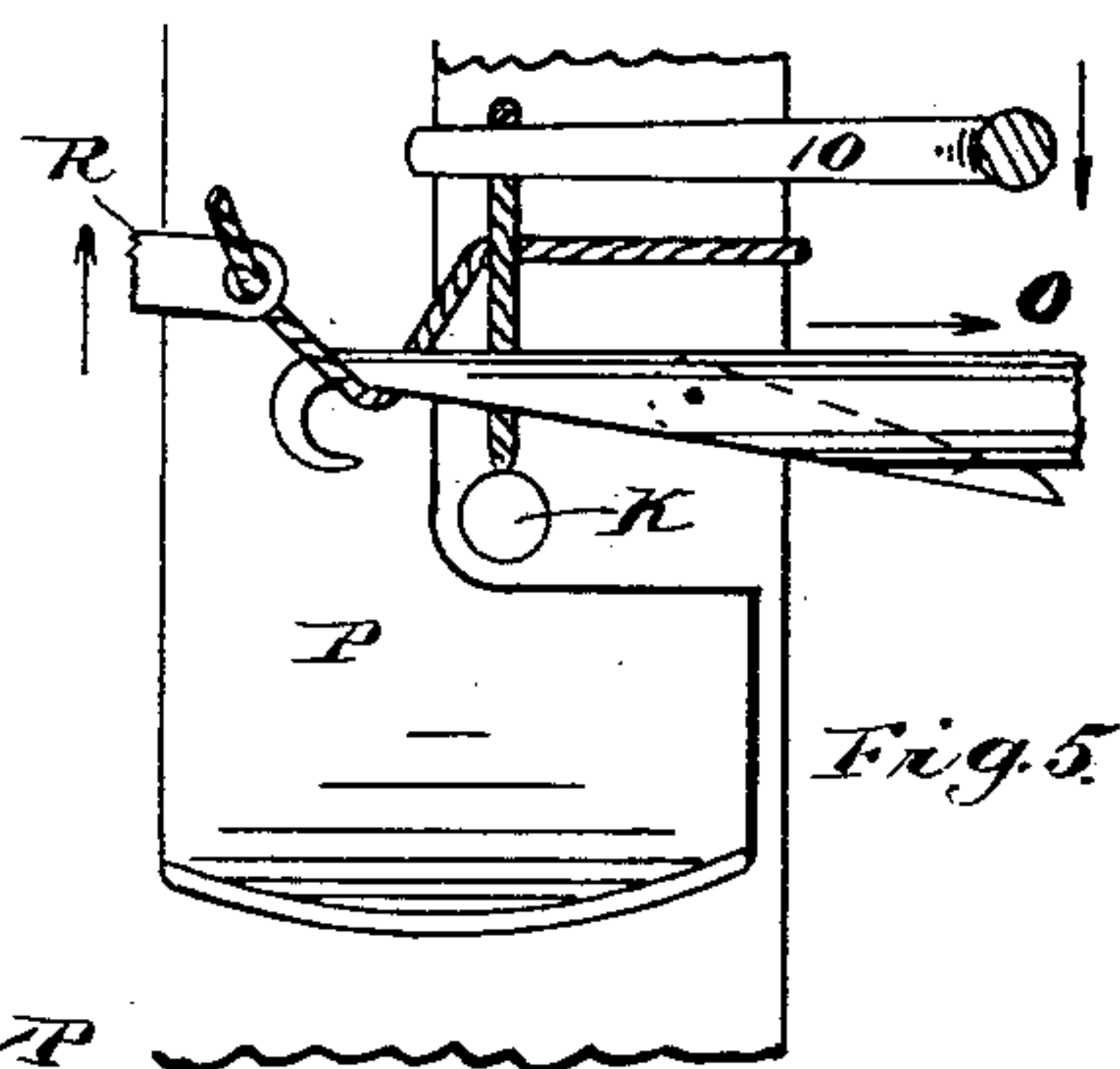
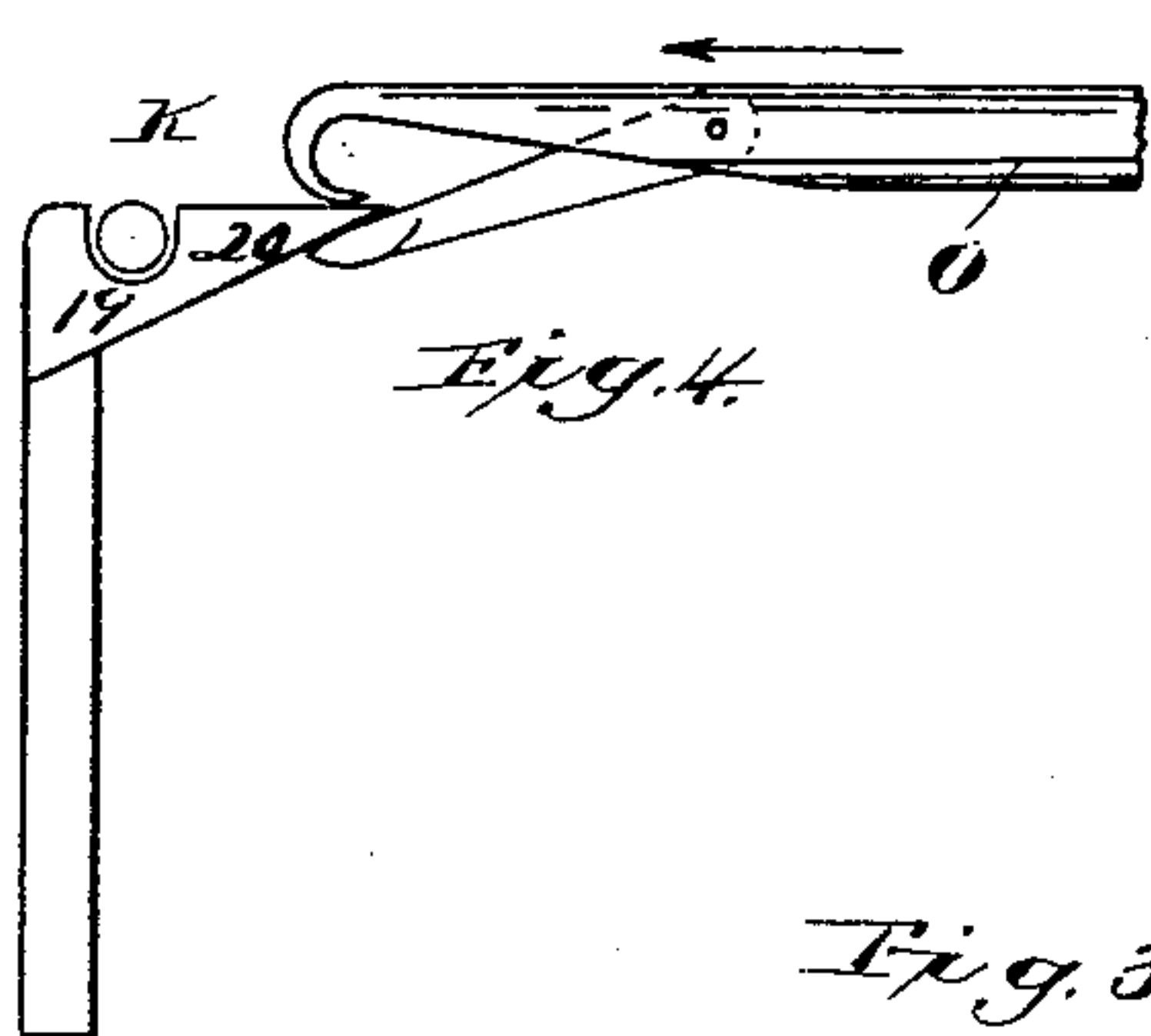
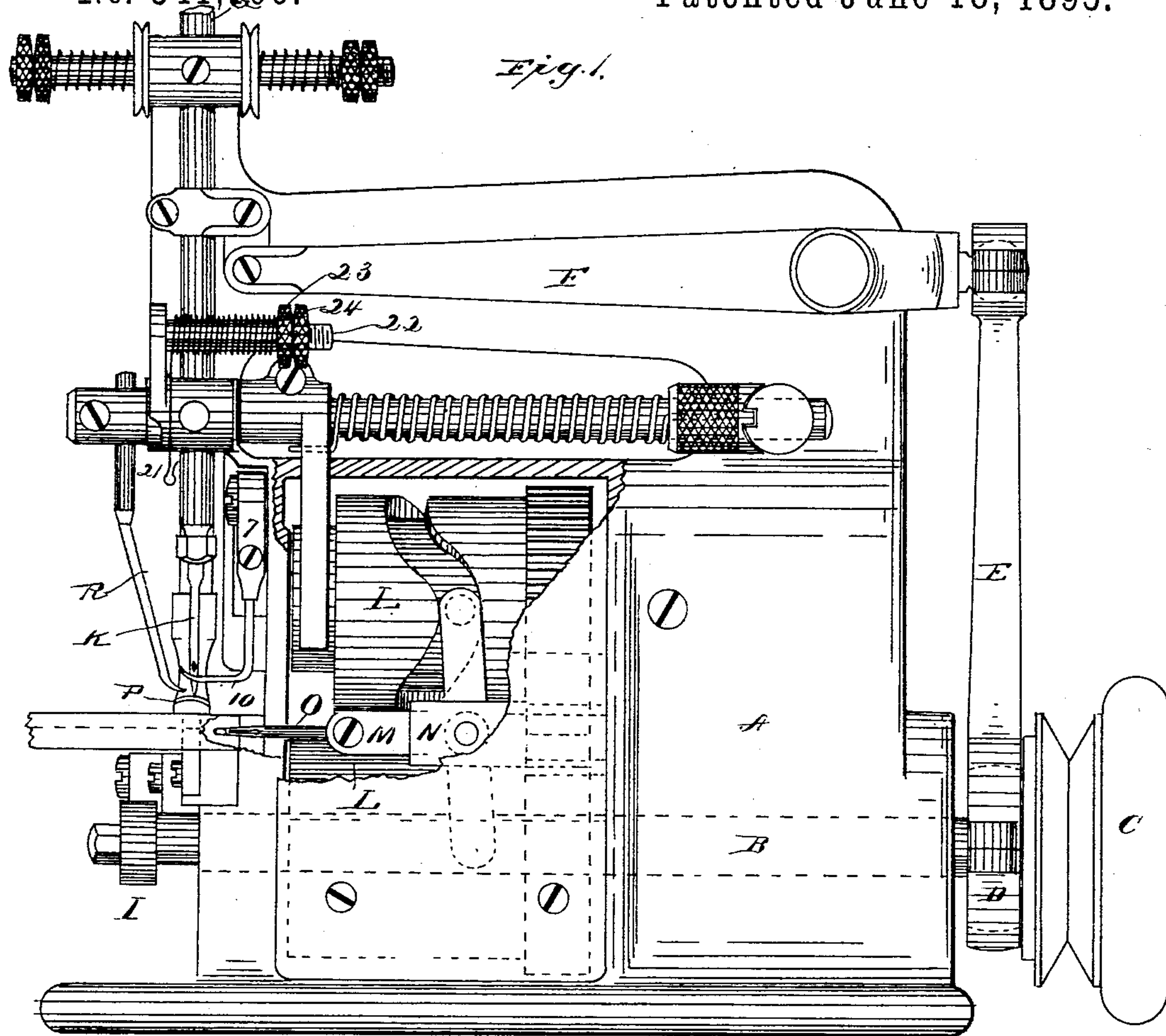


Fig. 5.

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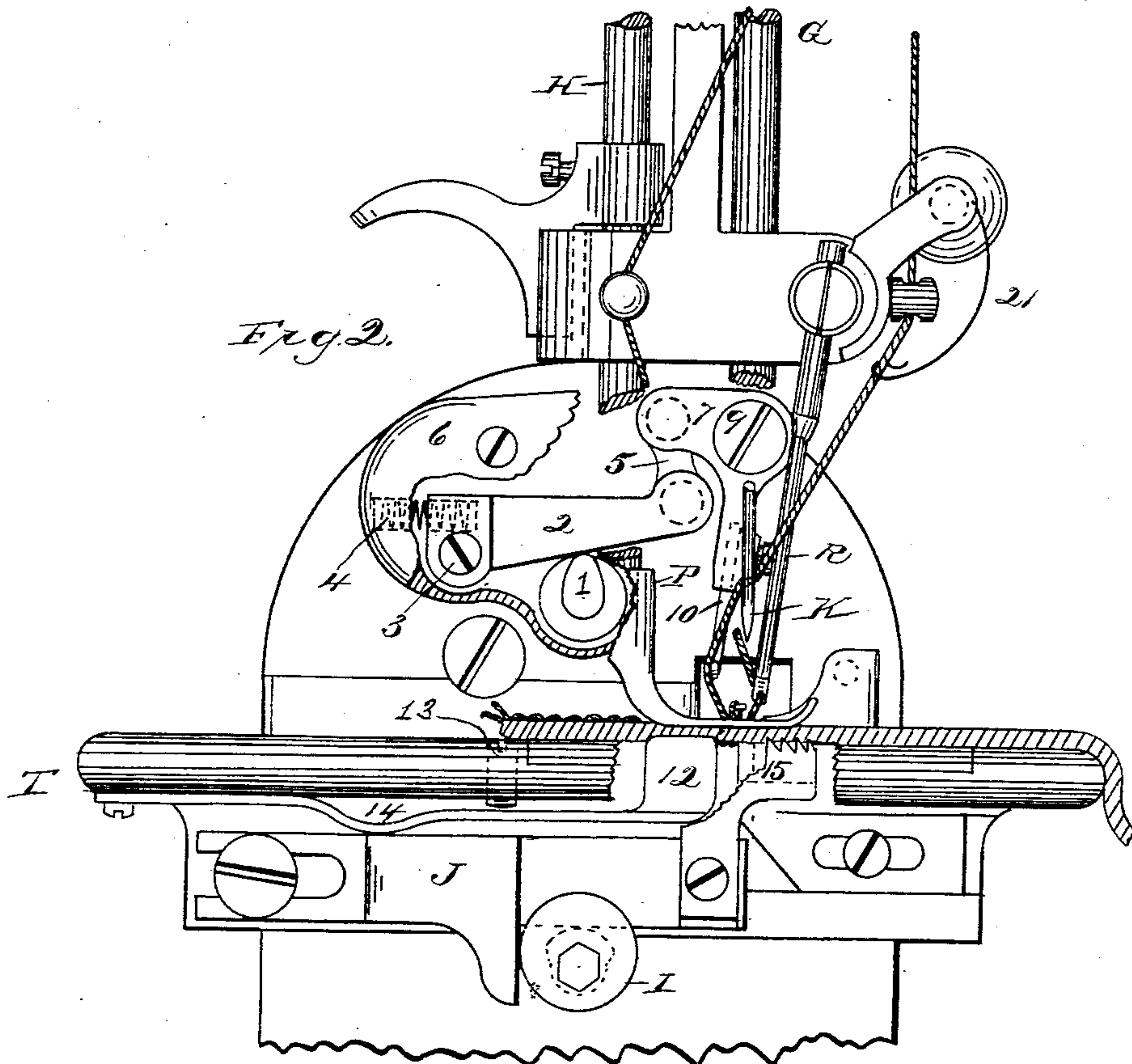
(No Model.)

2 Sheets—Sheet 2.

J. M. MERROW & J. T. COLLINS.
SEWING MACHINE.

No. 541,106.

Patented June 18, 1895.



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UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF MANSFIELD, AND JOHN T. COLLINS, OF HARTFORD,
CONNECTICUT; SAID COLLINS ASSIGNOR TO SAID MERROW.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,106, dated June 18, 1895.

Application filed February 2, 1894. Serial No. 498,862. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH M. MERROW, of Merrow, town of Mansfield, county of Tolland, and JOHN T. COLLINS, of the city and county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Crocheting or Overseaming Machines; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

The invention relates to improvements in that class of crocheting or overseaming machines in which two threads are employed, the one held by a thread carrier and the other by an eye pointed needle, the latter reciprocating through the fabric, said threads being joined and interlooped by means of a looper or latched needle reciprocating above and below the fabric, and around the edge thereof; and it has for its principal object the production of a machine competent to form a welt edge finish of the kind patented to Joseph M. Merrow, August 9, 1892, No. 480,335.

The general style or class of machines to which the present invention relates is illustrated by what is known as the Merrow high speed crotchet machine of Patent No. 497,587 and the improvements, changes and modifications which characterize and constitute the present invention can well be explained by comparison with the said patented machine.

In the patented machine referred to the looper or latched needle reciprocates above and below the fabric and around the edge thereof, to grasp the needle thread, and with it the supplemental thread, above the fabric, pass around the edge of the fabric, again grasp the needle thread below the fabric, and then rising again above the fabric, grasp the needle and supplemental threads and draw loops thereof through the previously formed loops, *i. e.*, the upper loop of needle thread, the supplemental thread and the under loop of needle thread, this cycle of operations being repeated for each complete stitch, the fabric being fed or advanced in the intervals between successive stitches. The product is a line of stitches embracing the edge of the

fabric composed of needle thread, the loops thereof being interlooped at the edge, and a line of stitches formed from the supplemental thread enchained through the interlooped ends of the needle thread stitches.

According to the present invention, while the needle and looper are given the same general movements and operate in a manner quite similar to the foregoing in so far as the engagement of the needle-thread below the fabric and engagement of the supplemental thread above the fabric are concerned, it differs in this, that the looper does not engage and draw a loop of the needle-thread above the fabric, the stitches being composed of loops drawn alternately from the needle and supplemental threads, each loop of the supplemental thread being drawn through a loop of needle thread from below the fabric, and a previous loop of the supplemental thread. In order to accomplish this result, means are provided for diverting the needle thread so that it will be held out of the way of the looper, when the latter reciprocates above the fabric to grasp the supplemental thread and draw a loop thereof through the previously formed loops of the needle and supplemental threads.

The invention also embraces means for controlling or regulating the edge of the fabric during the feeding and stitch forming operations, to prevent stretching or pouting the margin of the fabric.

The machines heretofore placed upon the market for overseaming the edges of fabrics, when employed to produce a finish upon soft, elastic or stretchy goods, operate to stretch or lengthen the edge and produce an objectionable fullness, or, in other words, during the overseaming operation, the edge of the fabric is lengthened or pouted to such a degree as to be unsightly, rendering the goods so finished less salable than when the edges are finished without this stretching or pouting.

In the accompanying drawings, Figure 1 is a front elevation of a machine embodying our improvements, a portion of the casing being broken away to disclose the interior. Fig. 2 is an end view of a portion of the machine containing the improvements. Fig. 3 is a top plan view of the work-plate. Fig. 4 is a de-

tail illustrating the needle-guard and latch-opener. Fig. 5 is a detail view of a portion of the stitch-forming mechanism.

Similar letters and numerals of reference in the several figures indicate the same parts.

As before stated, the machine illustrated is in its general features similar to that of Patent No. 497,587, although applicable to the machines of the same type, that is, having the eye pointed needle for carrying a thread through the fabric and a looper or latched needle reciprocating above, below and around the edge of the fabric.

Referring to the machine shown in the drawings, A is the frame; B, the main shaft; C, the hand wheel; D, the eccentric; E, the connecting rod; F, the needle-lever; G, the needle bar; H, the presser foot spindle; I, the feed cam; J, the feed-dog carrier; K, the needle; L and L', the upper and lower latch-needle operating cams; M, the latch-needle carrier; N, the sliding support for said carrier; O, the looper or latch-needle; P, the presser-foot; Q, the finger-plate, and R the supplemental thread carrier. All these parts are common to crochet machines now in use and their operation is well understood by those familiar with the art.

Upon the end of the shaft carrying the upper latch-needle operating cam L is mounted a cam 1 against which bears a lever 2, pivoted to the frame, as at 3, and maintained in contact with said cam by a spring 4, the latter interposed between the lever and the cap or cover 6. Pivotally attached to the frame, as by stud or screw 9, is the diverter carrier 7, the latter being connected to the lever 2 through a link 5 and to said carrier is attached the thread diverter 10, the latter being preferably arranged for adjustment as by being secured in a socket by means of a clamp or screw which permits of both vertical and lateral adjustments.

The thread diverter is of such form and dimensions that its outer or free portion will move across the path of the needle, that is to say, it will have motion laterally of the needle and between the latter and the fabric or work plate when the needle is elevated, so as to engage the needle thread and thrust or draw it to one side and out of the way of the latched needle as the latter advances above the fabric to grasp the supplemental thread supported by its carrier R. Thus by the simple addition of the thread diverter 10 the machine is converted from one adapted to produce the stitch of the Merrow patent, No. 394,783, into one suitable for the production of the stitch of the Merrow patent, No. 480,335.

The operation of the machine is rendered more certain and satisfactory by the addition to the needle guard 19 which is located beneath the work plate and protects the needle when down, of a projection or edge 20 co-operating with the looper to engage and open or throw back the latch, as the looper advances to grasp the needle thread beneath the fabric

as shown in Fig. 4. A spring 21 is also applied to the upper or needle thread. It is supported on a stud 22 and has its inner end attached to a nut 23 held, after adjustment, by a jam-nut 24.

The means devised for preventing the stretching or pulling of the edge of the fabric during the stitching operation, consists of a friction plate or fabric edge controller arranged to co-operate with the presser-foot or other suitable resisting surface in rear of the feed-dog, when the feeding takes place. During the upward motion of the feed-dog as it rises to grasp the fabric it presses the latter against the under surface of the presser-foot, and in so doing elevates the presser-foot slightly or tends to do so, thereby and to that extent reducing the hold of the presser foot on the surrounding portion of the fabric. The fabric edge controller is arranged to assist in retaining and guiding the fabric during the feeding movement, and to prevent the edge of the fabric being unduly drawn or stretched by the pull of the threads extending to the needle and looper.

In the present instance the edge controller is in the form of a narrow blade 12 whose spring shank is secured at the end to the under side of the work-plate and is provided with a curved portion 14 for engaging the upper surface of the feed dog carrier J. A set screw 13 serves to limit the upward motion of the edge controller, and the latter stands normally in the plane of or below the upper surface of the work plate, being elevated, as the feed dog is raised, by its contact with the feed-carrier. The feed-dog 34 is preferably provided with two toothed surfaces 15, 16, which are caused to project through and travel in openings formed in the needle plate S, and the longer toothed-surface 15 is arranged to one side and extends forward and back of the needle, while the shorter one, 16, is located nearly in front of the needle.

The blade 12 of the edge controller in its vertical reciprocations travels through a slot in the needle plate in rear of the needle.

It is deemed advisable that the forward upper corner of the blade 12 should be rounded or beveled to prevent it from catching the fibers or threads of the fabric or unduly detain the latter.

The operation of the machine is as follows: Assuming the needle K is provided with its thread, the supplemental thread has been passed through its carrier, the fabric placed under the presser foot, and that one or more stitches have been taken and the machine stopped with the needle elevated above the fabric, at this stage the latched needle will carry a loop of the supplemental thread and a loop of needle-thread drawn from below the fabric, while the needle thread extends from the point of last insertion to the eye of the needle. The cycle of operations required to form a stitch involves a movement of the thread diverter 10, to engage the needle thread

between the fabric and the needle to deflect it, accompanied by a forward movement of the looper above the fabric. As the looper advances, the two loops it carries are pushed back over the point of the latch, and, passing the needle thread, the supplemental thread is grasped within the hook, and, as the needle descends, the loop of supplemental thread is drawn in front of and over the needle thread. While the needle is elevated a feed movement has taken place so that the needle descends in front of the supplemental thread forming a loop over the two limbs of the loop last grasped by the looper, and the latter, during its retrograde motion, draws the loop of supplemental thread through the two loops before held on the looper. The needle having descended through the fabric and the looper moving around the edge advances beneath the fabric, its latch if closed striking the latch-opener to uncover the hook, which latter takes a loop from the side of the needle and, bearing both loops returns to first position, the needle in the meantime having been withdrawn from the fabric. It will be seen that during these operations a loop of the supplemental thread has been laid in the loop of the needle thread extending from one point of penetration to the next, that said loop has been drawn through the two loops held by the looper, (the one of supplemental thread and the other of needle-thread drawn from the under side of the fabric,) and that the supplemental thread loop and another needle thread loop from beneath the fabric have been laid on the looper, preparatory to the completion of the next stitch by drawing another loop of supplemental thread therethrough. This cycle of operations is repeated for each stitch formed. At the same time that the feed dog is elevated, to advance the fabric while the needle is elevated, the edge controller is also raised and operates to press the fabric against the presser-foot to such an extent as to somewhat obstruct the edge of the fabric and prevent it from being fed as rapidly or as far as the feed-surfaces would otherwise carry it, the principal strain, in feeding, being thus borne by the fabric at some distance from the edge rather than by the edge itself, and at the same time ample feeding movement is secured at the edge. Moreover the edge controller assists in preserving the line of feed-movement of the fabric and prevents it from being pulled and unduly stretched by the strain of the threads.

The motion of the edge controller is substantially vertical and except when the feeding motion is being actually performed it is out of the way and the fabric can be directed or guided as usual.

The principal object had in view in giving motion to the edge-controller in the manner described is to facilitate the removal of the goods by withdrawing the obstruction when its functions are suspended, that is, when the feeding is not being performed.

Having thus described our invention, what we claim as new is—

1. In a machine such as described the combination with a needle and looper, the latter reciprocating transversely of the plane of reciprocation of the needle, of a thread diverter movable across the plane of reciprocation of the needle means to cause said thread diverter to engage and hold the needle thread out of range of the looper during the retrograde movement of the latter, and actuating devices including means controlling said diverter, whereby the looper is permitted to make a complete movement or reciprocation without engaging the needle thread substantially as described.

2. In a crocheting or overseaming machine such as described the combination with the vertically reciprocating needle, the latch-needle reciprocating horizontally alternately above and beneath the work support, and a supplemental thread guide above the work support of a thread diverter movable laterally of the needle and means whereby said thread diverter is caused to engage the thread carried thereby and hold it out of range of the latch-needle as the latter reciprocates above the work support and engages and draws a loop of the supplemental thread, whereby the latched needle is operated to engage the needle thread on one side of the fabric and the supplemental thread on the opposite side of the fabric, substantially as described.

3. In a crocheting or overseaming machine such as described, the combination of the vertically reciprocating needle, the horizontally reciprocating latch-needle, the oscillating supplemental thread carrier, the oscillating thread diverter movable across the path of the needle in rear of the latch-needle and means whereby said thread diverter is caused to withdraw the needle-thread from the latch needle as the latter is retracted, while carrying the supplemental thread, substantially as described.

4. In combination with the needle and the looper or latch-needle and their operating mechanism the pivoted carrier, the needle-thread diverter adjustably secured to the pivoted carrier, the latter operated from a cam through a lever and link connection; substantially as described.

5. In a crocheting or overseaming machine, such as described, the combination with the thread carrying needle and the latch-needle, of the needle guard located below the work plate and provided with the latch opener engaging the latch on the latch-needle when the latter is advanced to grasp the needle thread below the work plate; substantially as described.

6. In an overseaming machine wherein the stitches are drawn laterally of the line of feed motion over and around the edge of the fabric, the combination with the stitch-forming mechanism, its needle, presser foot and feed

dog, of a fabric edge controller located in rear of the needle and comprising a narrow bearing surface or blade fixed against motion in the direction of the feed and cooperating
5 with the rear under face of the presser foot, said edge controlling blade operating to clamp the fabric near the edge in rear of the needle and to retard the edge of the fabric under the presser foot while engaged by the feed-
10 dog, and also to resist lateral displacement of the fabric as the stitches are drawn and laid by the stitch forming mechanism; substantially as described.

7. In an overseaming machine the combination with stitch forming mechanism adapted
15 to form stitches around the edge of the fabric and including a presser foot and feed dog for holding and advancing the fabric, a fabric edge controller comprising a narrow blade
20 located in rear of the needle and movable vertically toward the presser foot but held from movement in the direction of the feed motion, said edge controller operating upon the edge of the fabric beneath the presser
25 foot in rear of the needle to retard the advance of the edge of the fabric and prevent stretching the latter while the stitches are

drawn around the edge; substantially as described.

8. In a crocheting or overseaming machine, 30 the combination with the stitch forming mechanism and presser foot, of the feed-dog provided with two feeding sections of different lengths, the shorter one 16 located in front
35 of the needle and the longer one 15, to one side and extending in front and rear of the needle, and the edge controller 12 located in rear of the needle beneath the presser foot; substantially as described.

9. The combination with stitch forming and 40 feeding mechanisms, a feed controller comprising a narrow projecting spring supported surface between which and an opposing surface the fabric is clamped with a yielding
45 pressure at a point in rear of the needle and feeding devices said narrow projecting surface being held against horizontal motion in the direction of the feed-motion when the latter takes place, substantially as described.

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