(No Model.) 2 Sheets—Sheet 1.

C. F. HARLOW & E. E. BARTLETT.

SEWING MACHINE FOR BASTING.

No. 423,996. Patented Mar. 25, 1890.

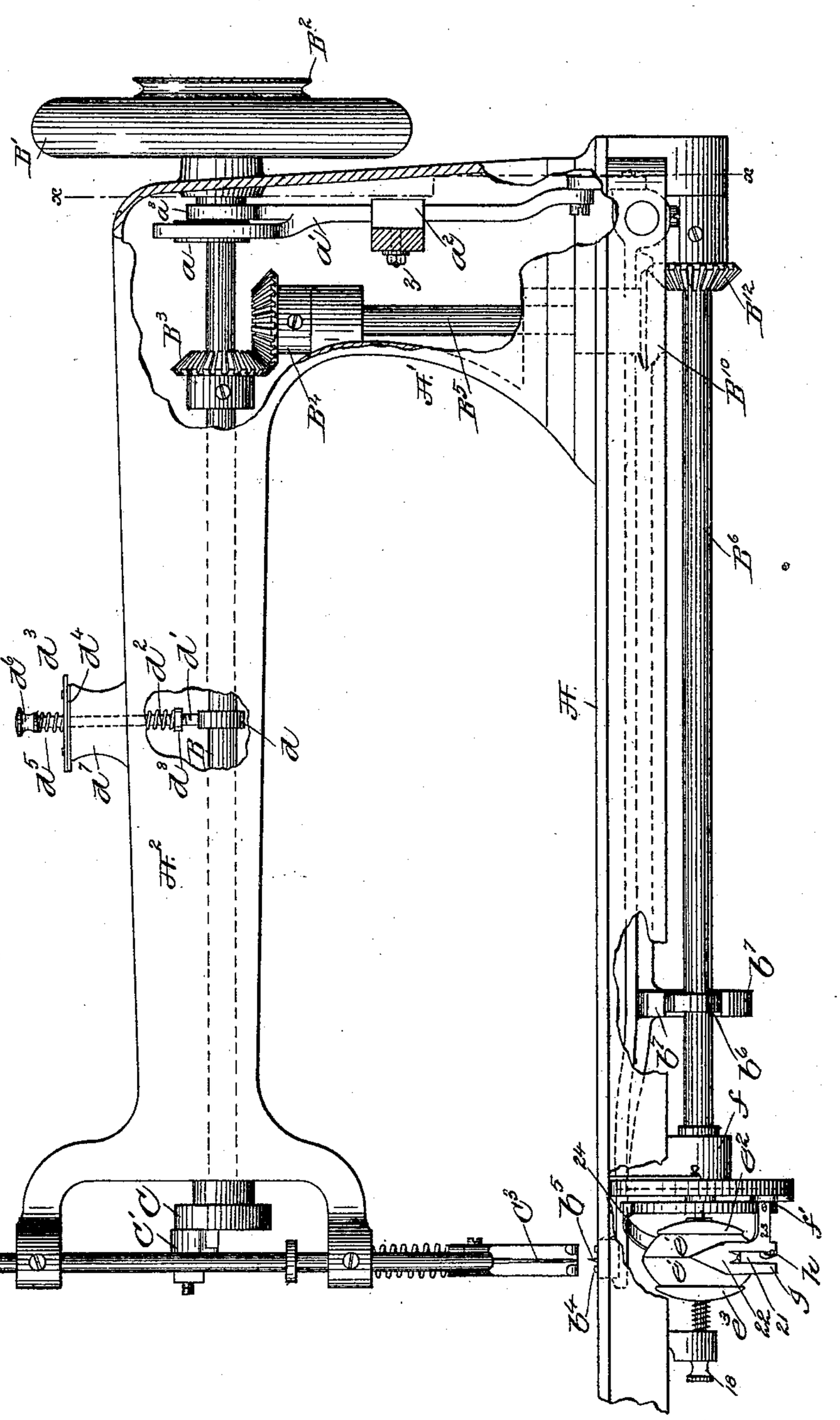

Fig. 1.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig: 2.

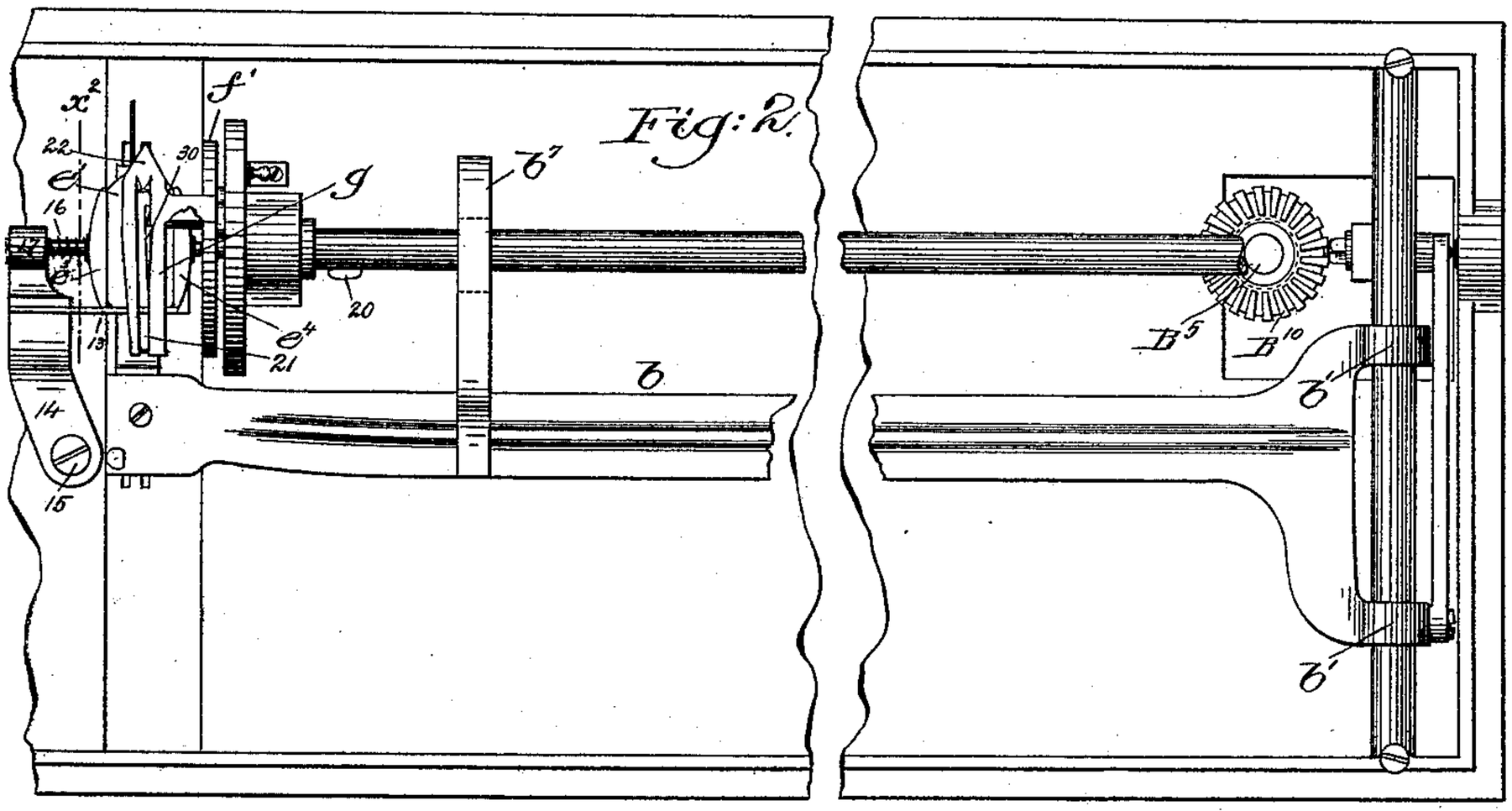


Fig: 3.

Fig: 4.

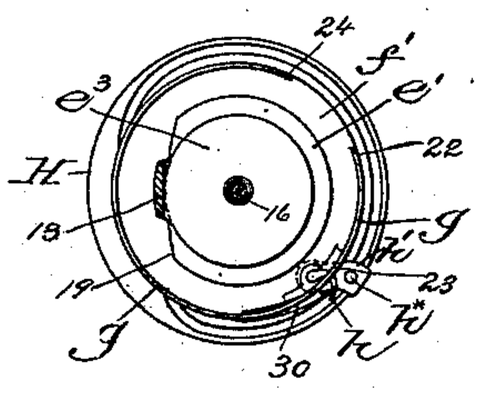
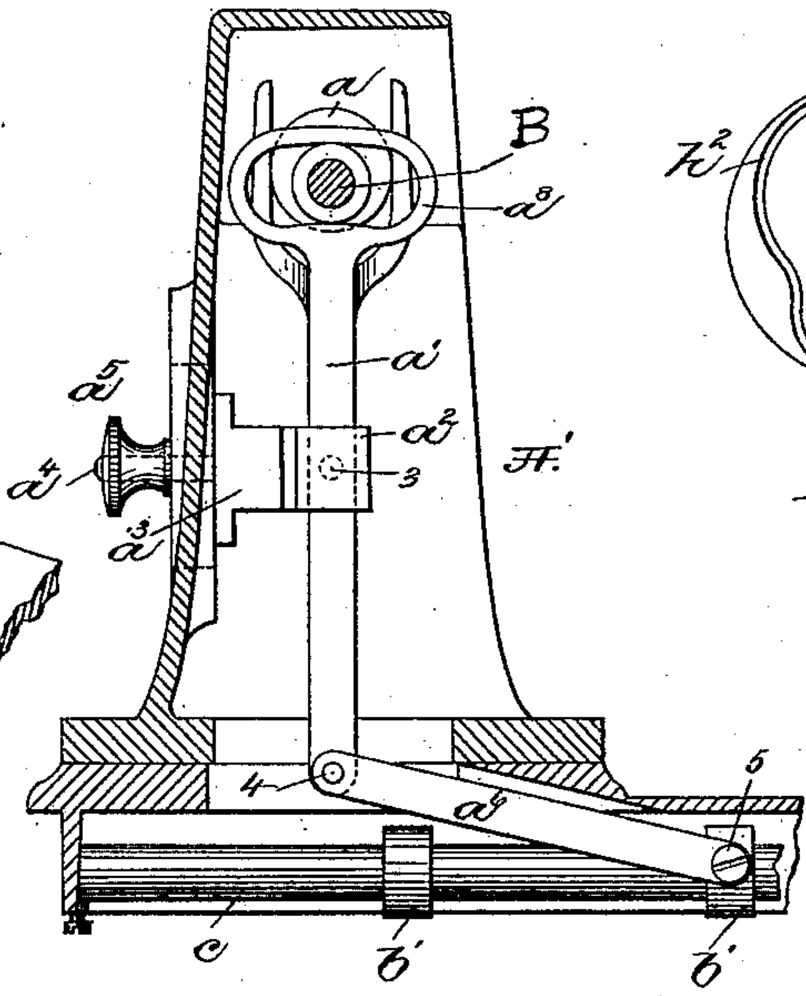


Fig: 5.



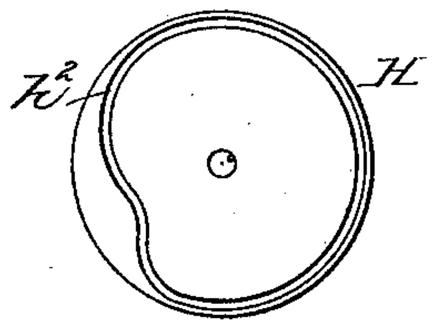


Fig: 7.

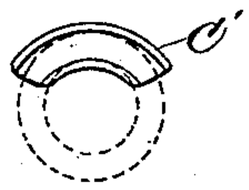


Fig: 6.

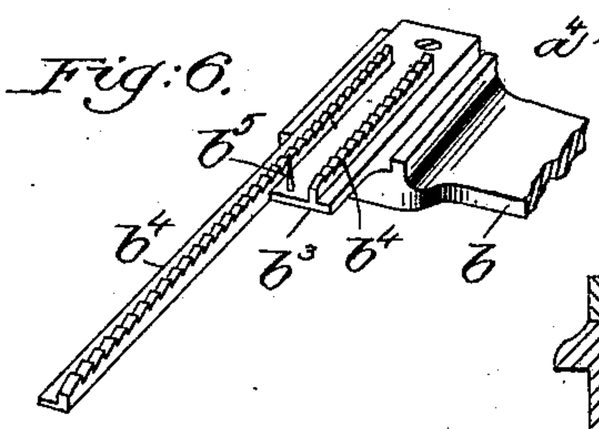


Fig: 9.

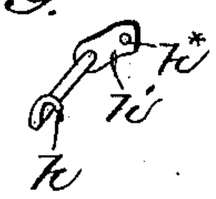
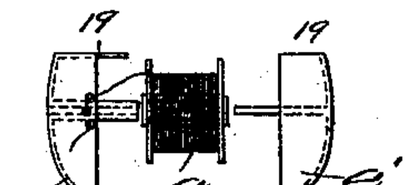


Fig: 8.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES F. HARLOW, OF BOSTON, AND EDWIN E. BARTLETT, OF HYDE PARK, MASSACHUSETTS, ASSIGNORS TO THE ADDAX BASTING MACHINE COMPANY, OF PORTLAND, MAINE.

SEWING-MACHINE FOR BASTING.

SPECIFICATION forming part of Letters Patent No. 423,996, dated March 25, 1890.

Application filed May 24, 1887. Serial No. 239,192. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. HARLOW, of Boston, county of Suffolk, and State of Massachusetts, and EDWIN E. BARTLETT, of Hyde Park, county of Norfolk, and State of Massachusetts, have invented an Improvement in Basting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve the construction of basting-machines wherein a very long stitch is made, the especial features of my invention relating to the feed-operating mechanism, to means for controlling the needle-thread in the formation of the stitch, and to the stitch-forming devices or mechanism located below the bed-plate.

In this our invention the needle-thread is passed through a clamping-tension located between the spool and the needle, the said tension being operated automatically, and as herein shown, by a cam on a needle-bar-operating shaft. The thread-clamping tension is operated to release the thread as the feed commences to move forward with the material, the thread being left loose and free to render through the eye of the needle until the feed completes its stroke, the point of the needle being just out of the goods when the feed starts, the needle-bar completing its ascent and starting to descend as or just before the feed completes its forward stroke. The feed-bar, besides its usual serrations, has a prong to penetrate into or substantially through the material to be basted together, or it might be stitched together, and the time of the rise and fall of the feed is such with relation to the descent of the needle that the needle begins to descend as or just before the penetrating-prong of the feed-bar retires from below the fabric, the said penetrating-point on the feed-bar preventing the material from what is called "fore-edging," or preventing one piece or ply of the garment being moved at a different speed from the other, so as to displace one part or ply with relation to the other and leave uneven edges.

In a basting-machine wherein the stitch has to be very long provision has to be made to permit the needle to remain out of the material for the longest possible space of time in the formation of each stitch, and to do this we have provided the needle-bar cross-head with arc-shaped groove, whereby the speed of the needle-bar at its upstroke is retarded sufficiently to enable the long feed to take place and the penetrating-point of the feed-bar to be withdrawn from the material before the point of the needle reaches the material, the penetrating-point remaining in the material for a longer or shorter time, according to the length of the stitch, the curve in the cross-head being of sufficient radius to provide for a stitch of the maximum length. The serrated feed-surface is attached to the front end of a long lever pivoted at the rear of the machine and made to slide a greater or less distance horizontally to determine the length of the stitch, the said lever between its ends having an arm, herein shown as forked, which arm is acted upon to lift the feed-bar by a cam or eccentric upon the under shaft of the machine.

Figure 1 in side elevation, partially broken out, represents a sewing-machine for basting, it embodying our invention; Fig. 2, a partial under side view of Fig. 1, parts being broken out to save space on the drawings; Fig. 3 is a section of Fig. 1 in the line x, looking toward the left. Fig. 4 is a view of the loop-spreader and looper, bobbin-case, and bobbin-holder to the right of the dotted line x^2 as it would appear if the bed-plate were right side up rather than inverted, as in Fig. 2. Fig. 5 is a face view of the cam for oscillating the looper. Fig. 6 is an enlarged detail of the feed-bar. Fig. 7 is an inner side view of the needle-bar cross-head. Fig. 8 is a detail showing the bobbin-case separated, with the bobbin in line with the two halves thereof, and Fig. 9 shows the looper and rock-shaft detached.

The bed-plate A is surmounted by a stand-

ard A′, having a long overhanging arm A^2, all constituting the frame-work and of usual construction.

The main or needle-bar-operating shaft B, provided with usual balance-wheel B′ and belt-pulley B^2, has a beveled gear B^3, which engages a beveled gear B^4 on a vertical shaft B^5, which, by other beveled gears B^{10} B^{12}, rotate the shaft B^6, to the forward end of which is secured the loop-spreader *g* and looper *h*, to be described. The shaft B at its front end is provided with a disk C, having a roller or other stud, which enters an arc-shaped groove in the needle-bar cross-head C′, (see Fig. 7,) bolted or attached in usual manner to the needle-bar, the rotation of the said stud with the crank-pin causing the needle-bar C^2, having at its lower end the needle C^3, to be reciprocated vertically in such time as to properly co-operate with the stitch-forming devices located below the bed-plate. The groove in the cross-head C′ is made as an arc of a circle of greater radius than that in which the roller-stud moves, in order that the needle may move as slowly as possible when in the upper part of its movement—as, for instance, when the disk C and cross-head C′ are in the relative positions shown in Figs. 1 and 7 the needle is stationary, the circular path of the roller-stud and the arc of the groove at that time being substantially concentric, thus giving the feeding-bar as much time as possible in which to move the material, it being necessary to retain the needle-bar in nearly its highest position as long as possible to accommodate for a long stroke of the feed-bar, as when basting is being done.

The shaft B has fast upon it a cam or eccentric *a*, which is embraced by the upper forked end 10 of a feed-regulating lever *a*′, the said lever having as its fulcrum a block a^2, pivoted at 3 upon the block a^3, herein shown as provided with a threaded screw extended from a slot in the upright A′, where it receives a thumb-nut a^5, the said block a^3 being made vertically adjustable, in order to raise or lower the fulcrum a^2 and give to the lower end of the lever *a*′ a greater or less stroke, according to the length of feed desired. The lower end of the lever *a*′ is jointed at 4 to a link a^6, which in turn is pivoted at 5 to one of the ears *b*′ of the feed-lever *b*, made as a long bar, the said ears surrounding loosely a guide-rod *c*, so that the ears of the lever *b* are free to slide upon the guide-rod *c*. The forward end of the lever *b* has connected to it in suitable manner, by screws or otherwise, the feeding-plate b^3, it having in addition to its toothed surfaces b^4 a prong, as b^5, said prong being of sufficient length to penetrate into or preferably substantially through the main part of the substance of the material which is being stitched, the said prong by entering the material causing it to be fed uniformly and preventing what is called "fore-edging," as before explained. Providing the feed-plate with a prong such as described to penetrate the material requires a somewhat different timing of the needle—that is, the speed of the needle must be such that the said feed-prong will be entirely withdrawn from the material before the point of the needle in its descent touches the material. The shaft B^6 is provided with a cam or eccentric b^6, which is embraced above and below by the forked end (see Fig. 1) of an arm b^7, extended laterally from the lever *b*, the said cam acting to raise and lower the feed-bar and plate positively. The upper end of the feed-regulating lever *a*′ is provided with a guide-loop a^8, having an elongated slot of a width substantially equal to the diameter of the hub of the cam or eccentric *a*, (see Fig. 3,) the said hub acting as a holder and guide to prevent any vertical movement of the feed-regulating lever *a*′, as will be understood, yet permitting the said lever to be vibrated freely by the cam or eccentric *a*. The thread to be used will be taken from a suitable cap, spool, or bobbin (not shown) and passed between the two plates d^3 d^4 of the clamping-tension device, the plate d^4 resting upon a block d^7, rising from the arm A^2. These two plates are provided with a hole, through which is extended a rod *d*′, to which is attached a nut d^8 and a thumb-nut d^6, the said rod between the top of the arm A^2 and the nut d^8 being surrounded by a spiral spring d^2, which normally keeps the lower end of the rod *d*′ against the cam or eccentric *d*, fast on the shaft B. A spiral spring d^5 is placed upon the upper end of the rod above the loose tension-plate d^3 and between it and the thumb-nut d^6, the rotation of the thumb-nut causing the spiral spring d^5 to exert more or less pressure upon the plate d^3, and consequently exert more or less tension upon the needle-thread passing between it and the under plate d^4, the tension exerted by the nut d^6 and spring d^5 being the maximum tension required to be exerted upon the thread for forming the stitch; but, as stated, it is necessary when the long feed is taking place that the thread be relieved entirely from tension, so at such time the cam *d* upon the shaft B meets the lower end of the rod *d*′ and lifts the said rod high enough to relieve the force of the spring d^5 upon the tension-plate d^3, lifting the said plate so that it bears upon the thread with a tension due only to its weight and that of the spring d^5, which leaves the thread practically free from tension. The thread, free from tension above described, is passed through an eye in a hollow stud d^{10} at the upper end of the needle-bar, and thence down through the eye of the needle, and when the cam *d* acts to release the tension upon the needle-thread, the feed-bar being then moved forward and the needle lifted, the needle-thread renders freely through the eye of the needle and the tension

device. The under or second thread employed in the formation of the stitch is contained upon a bobbin *e*, (see Fig. 8,) which in practice is inclosed by a bobbin-case composed of two saucer-like or frusto-conical disks or plates *e' e'*, held by a bobbin-holder, consisting, essentially, of two plates e^2 e^3, the one e^2 being connected to or forming part of a bar 13, secured to a bobbin-holder-carrying arm 14, pivoted at 15 to the under side of the bed-plate. (See Fig. 2.) The plate e^3 has a shank, which is extended through a spiral spring 16, and thence through a lug 17, forming part of the arm 14, the said shank being screw-threaded to receive upon it (see Fig. 1) a thumb-nut 18, the spring permitting the plate e^3 to yield more or less, as required, for the passage of the loop of needle-thread about the bobbin-case. The bobbin-case, at its rear side, (see Figs. 4 and 8,) is slabbed or cut off, as at 19, to bear against the bar 13 and prevent the rotation of the bobbin-case. The front end of the shaft B^6 is bored to receive in it the shank *f* of a disk *f'*, forming part of the mechanism for manipulating the loop of needle-thread, the said shank being held in place by means of a thumb-nut 20, so as to rotate with the shaft B^6.

The loop-spreader is composed of a substantially semicircular plate *g*, slotted, as at 21, and having a V-shaped heel 22. The loop-spreader (see Fig. 1) has an arm 23, which is screwed or otherwise attached to the edge of the disk *f'*, the rear end of the spreader being connected to the disk at the point marked 24.

The looper *h* (shown separately in Fig. 9) consists of a curved finger attached to and forming part of a rock-shaft having suitable bearings in or near the arm 23 referred to, the inner end of the said rock-shaft having a short arm *h'*, provided with a stud $h^\times$, which enters a cam-groove h^2 of the stationary looper-operating cam-plate H, the said cam-groove h^2 being of such shape that the looper-shaft will be rocked as the disk *f'* is rotated, to thus cause the looper to enter and retreat from the loop of needle-thread.

Referring to Figs. 4 and 5, it will be noticed that the cam-groove h^2 is of such shape that the point of the looper will enter the loop of needle-thread quickly and hold the said loop until the looper arrives beyond the lower center of the cam H, when the cam-groove h^2 recedes to quickly withdraw the looper *h* from the loop of needle-thread that it may be cast off about the bobbin-case to be taken up to complete the stitch, the slack in the loop so cast off being taken up by the action of the looper in the loop of needle-thread next to be entered by it. The slot 21 in the spreader enables the needle C^3, which is necessarily quite long, to descend far enough to properly make and present the loop of its thread to be entered by the point of the looper *h*. The wall at one side of the slot 21 referred to has a needle-guard 30, which is so located with relation to the looper as to act against one side of the needle and insure that the latter be held in just the proper vertical position to enable its loop to be entered by the point of the looper. As the looper *h* in engagement with the loop of needle-thread draws the said loop, the two sides of the loop are made to pass to opposite sides of the tapering heel 22 of the spreader, the said heel acting to expand the loop and pass it upon the bobbin-case.

Patent of the United States No. 349,844 shows a looper and spreader somewhat like the one herein shown.

We claim—

1. The rotating shaft B, provided with a cam or eccentric, the feed-lever *b*, having a feed-plate, and a guide-rod *c* for the said feed-lever, located below the bed-plate, and on which the rear end of the said feed-lever slides in the direction of the feed, combined with the feed-regulating lever *a'*, having an adjustable fulcrum and a forked end to embrace the said cam or eccentric, and with a link, as a^6, and means to adjust the fulcrum of the lever *a'*, substantially as described.

2. The rotating needle-bar-operating shaft, the cam or eccentric thereon, the feed-lever *b*, having a feeding-plate, a guide-rod for the said lever, a feed-regulating lever *a'*, having a forked end to embrace the said cam or eccentric, and a loop to embrace the said shaft to prevent vertical movement of the lever *a'*, combined with a link to connect the said lever with the feed-lever *b'*, and with an adjustable fulcrum for the lever *a'*, to operate substantially as described.

3. The rotating needle-bar-actuating shaft B, a disk thereon, a crank-pin connected thereto, the needle-bar and its attached cross-head having an arc-shaped groove with its ends downwardly turned to stop the movement of the needle in its upper position, combined with a feed-plate having a penetrating-prong b^5, and with means for actuating the said feed-plate while the needle is stationary, substantially as described.

4. The needle-bar, its attached cross-head having an arc-shaped groove, the needle-bar-actuating shaft B, its disk and crank-pin, the feed-bar, its attached feed-plate, the guide-rod *c*, upon which the feed-bars slide, the link a^6, and the feed-regulating lever actuated by a cam or eccentric on the said shaft B, combined with an intermittent clamping-tension mechanism, substantially as described, to release the tension on the needle-thread while the feed is operating to move the material, substantially as described.

5. The needle-bar-operating shaft B, provided with a cam or eccentric *a*, the needle-bar to carry an eye-pointed needle and actuated by the said shaft, the shaft B^6, an intermediate shaft, and gearing to rotate the shaft B^6 from the shaft B, the cam or eccentric b^6, the guide-rod, the feed-lever *b*, having ears to

slide upon the guide-rod, and having a forked arm to embrace the said eccentric, combined with the feed-regulating lever a', the link a^6, and with means, substantially as described, located below the bed-plate, to engage the loop of needle-thread and pass it about a bobbin-holder having a bobbin containing an under thread, the combination being and operating substantially as described.

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

CHARLES F. HARLOW.
EDWIN E. BARTLETT.

Witnesses:
G. W. GREGORY,
C. M. CONE.