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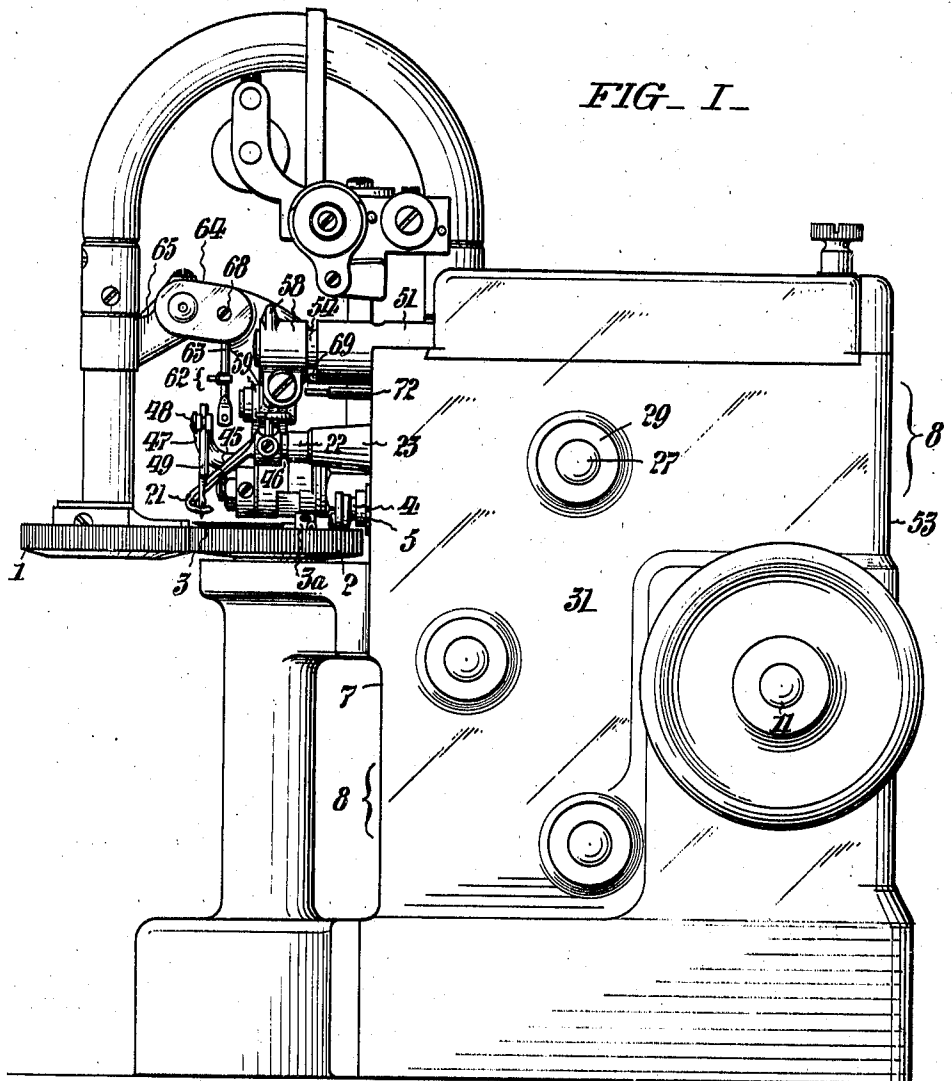
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2,156,536

SEWING MACHINE

Filed Feb. 26, 1938

5 Sheets-Sheet 1



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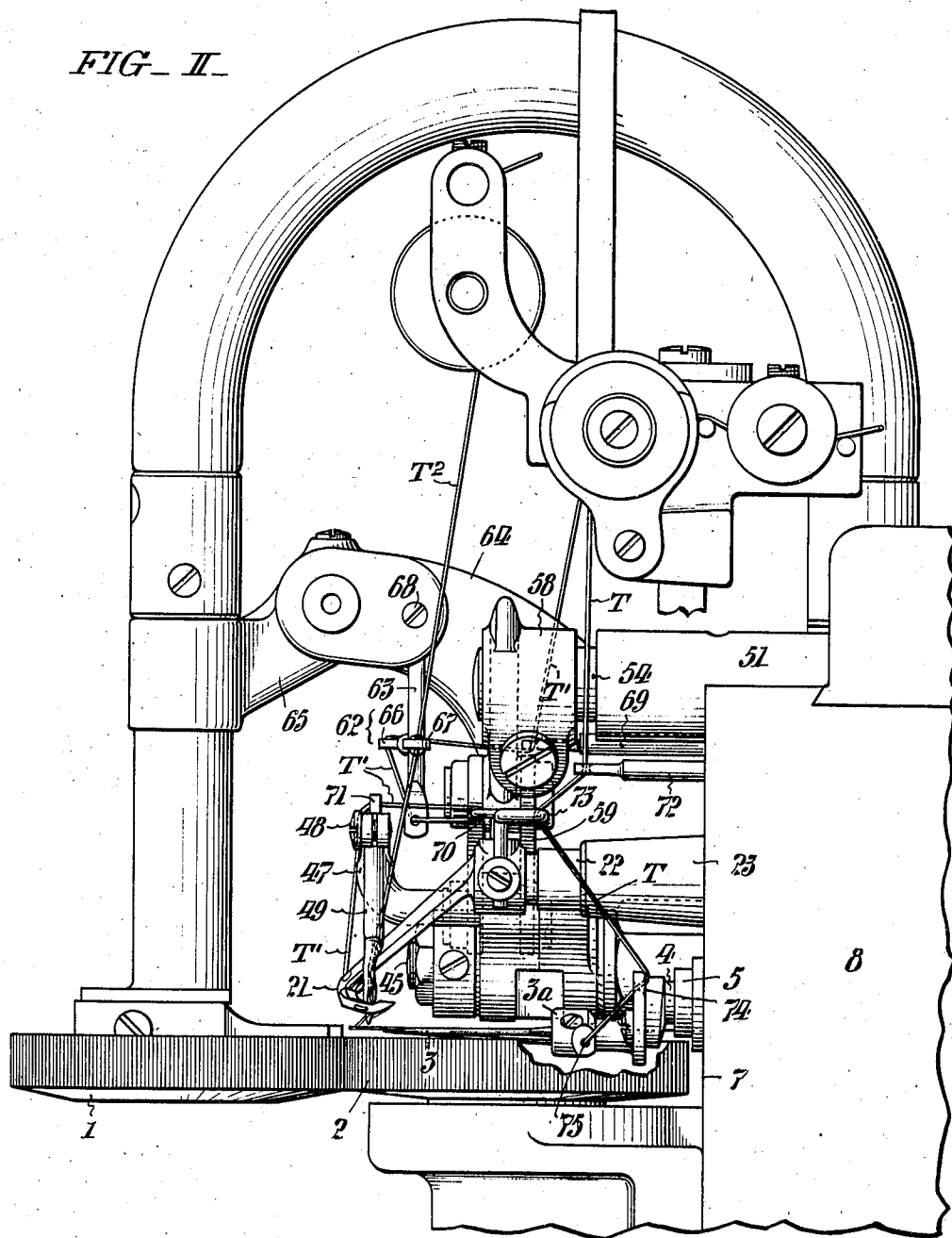
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FIG. II.



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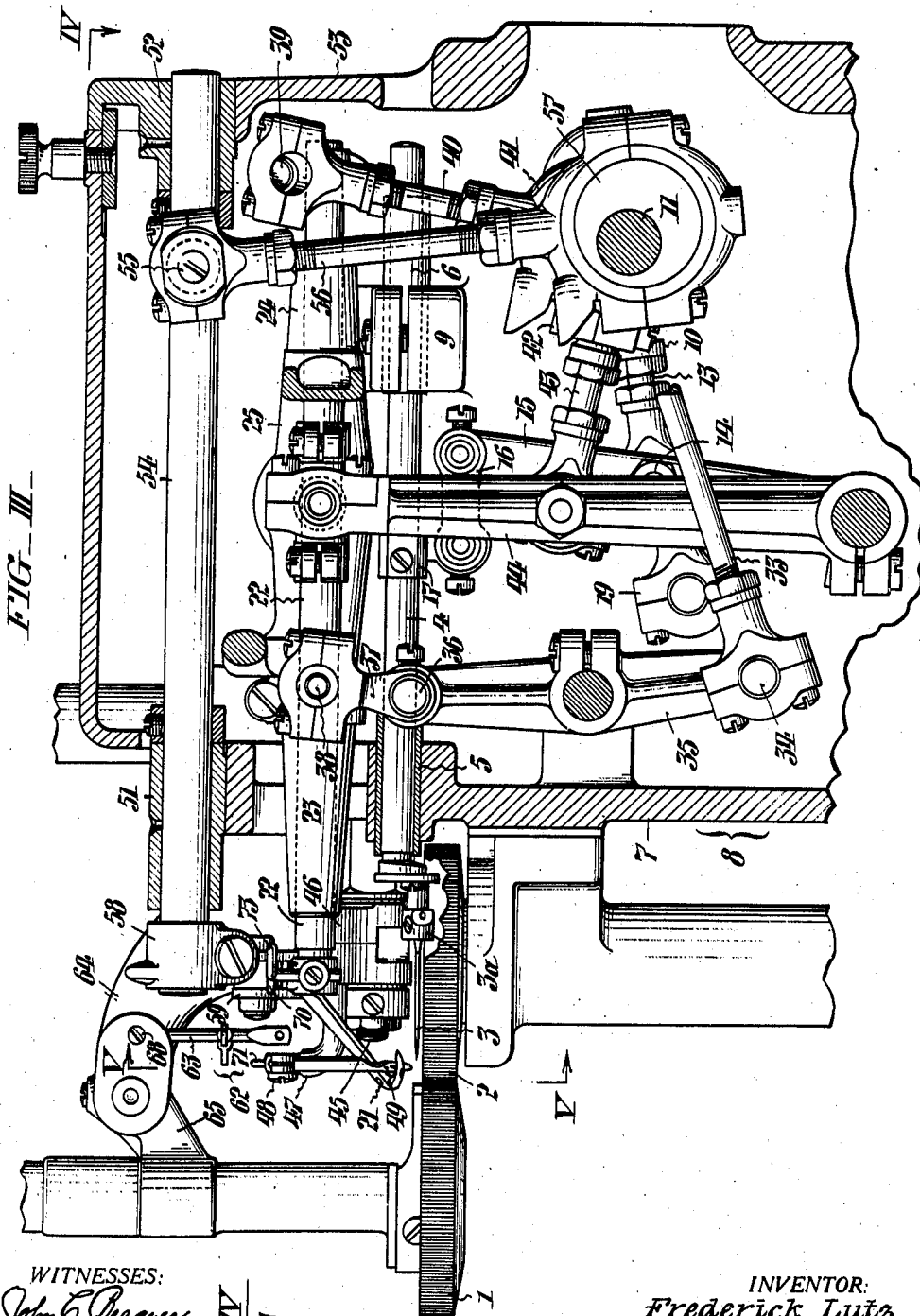
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SEWING MACHINE

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5 Sheets-Sheet 3



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SEWING MACHINE

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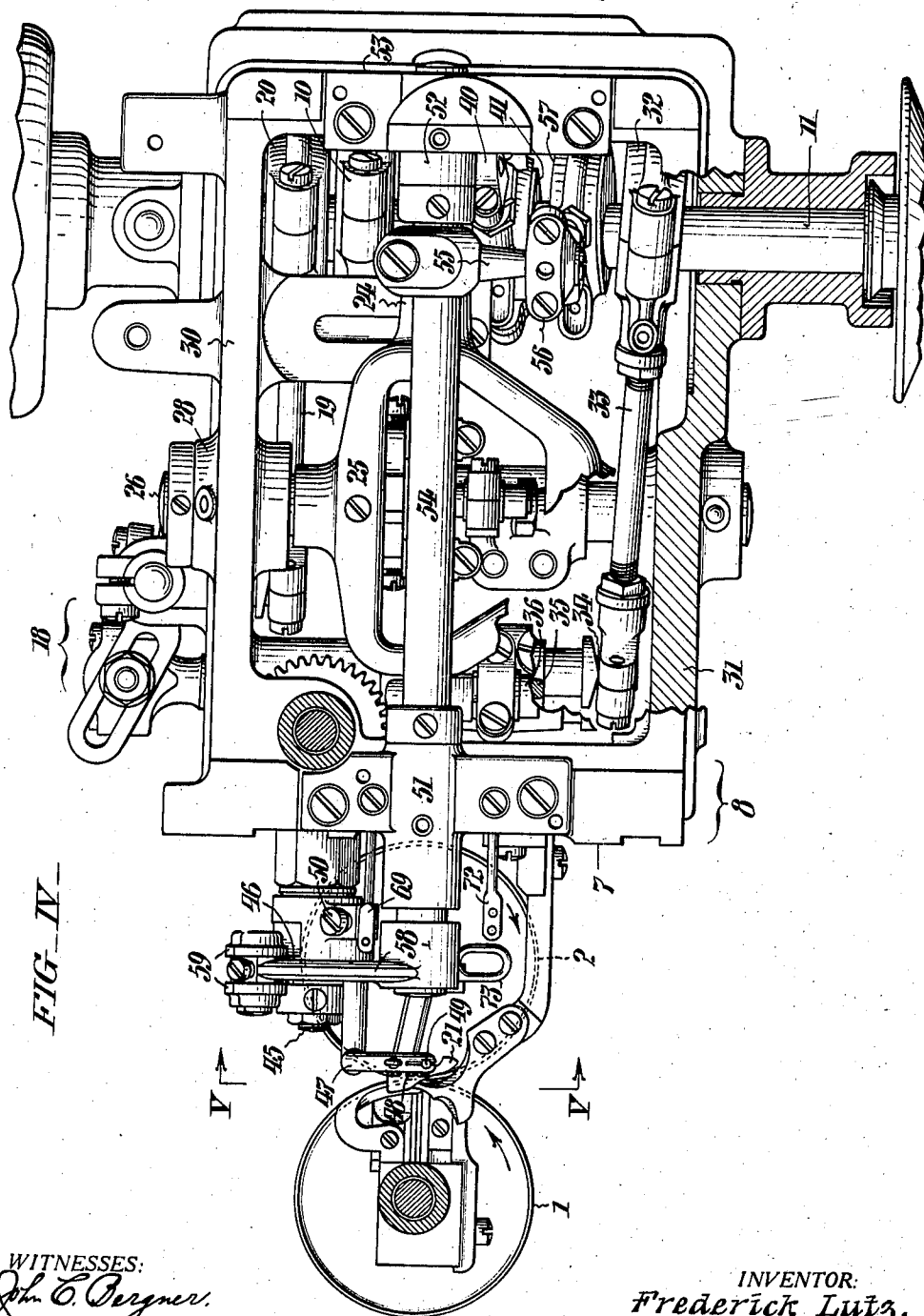


FIG. IV

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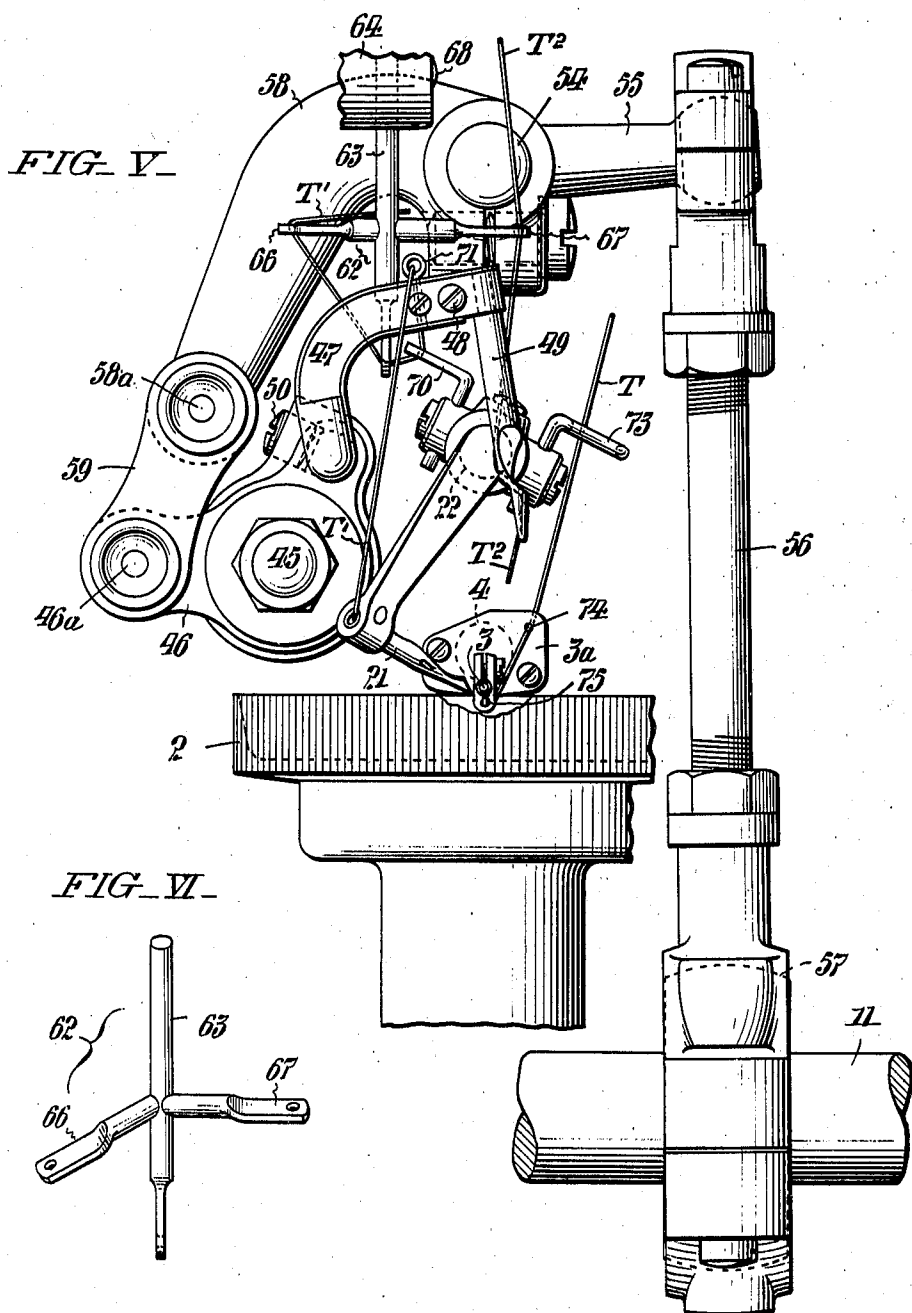
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SEWING MACHINE

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,156,536

SEWING MACHINE

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6 Claims. (Cl. 112—16)

This invention relates to sewing machines. More particularly, it has reference to over-edge sewing machines of the type wherein a pair of tangentially-opposing feed wheels or cups revolving about vertical axes intermittently advance the material which is to be sewed, and wherein a thread-carrying looper and a horizontally-reciprocating thread-carrying needle actuated from a driving shaft within a closed housing cooperate to form a two thread seam.

The chief aim of my invention is to enable production by sewing machines of the kind specifically referred to, of three thread seams without necessitating any alterations whatever in their original construction or in their normal mode of operation. This desideratum I attain as hereinafter more fully disclosed, through provision of a compact and inexpensive auxiliary mechanism including an auxiliary thread manipulating instrumentality to cooperate with the needle and the usual looper, and simple interposed connections whereby this auxiliary instrumentality is actuated from the drive shaft of the machine.

In connection with auxiliary looping means having the above attributes, it is a further aim of my invention to preclude entanglement of the three threads enroute respectively from different sources of supply to the needle, the usual looper and the auxiliary looper. This objective I also realize as hereinafter more fully disclosed, through provision of a cruciform guide with eyes in its extremities for directing the looper threads to keep them effectively separated from each other and from the needle thread.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings wherein Fig. I is a view in side elevation of a cup feed sewing machine conveniently embodying the auxiliary mechanism of my invention.

Fig. II is a fragmentary view corresponding to Fig. I but drawn to a larger scale.

Fig. III is a fragmentary view showing the machine in longitudinal section.

Fig. IV is a fragmentary view partly in plan and partly in section taken as indicated by the arrows IV—IV in Fig. III.

Fig. V is a detail view looking as indicated by the arrows V—V in Figs. III and IV, and drawn to a still larger scale; and

Fig. VI is a perspective view of a thread guide means which constitutes a part of the attachment.

The over-edge sewing machine chosen for con-

venience of illustrating my invention herein is generally of well known construction in that it has a pair of cooperating circumferentially-corrugated wheels or cups 1 and 2 between which the material (not shown) to be sewed is passed for penetration by a needle 3 fast in a head 3a at the outer end of a horizontal bar 4. As shown, the needle bar 4 is confined to axial movement in guide sleeves 5 and 6 whereof the first mentioned is set into the front wall 7 of the hollow machine housing 8, and the last mentioned set into a clamp bracket 9 interiorly of the said housing. The needle bar 4 is actuated from an eccentric 10 on the main or drive shaft 11 of the machine through a strap rod 13 pivotally connected at 14 to an upright rocker arm 15 which is coupled, by means of a short horizontal link 16, with a collar 17 on said bar. The feed wheels or cups 1 and 2 are intermittently rotated synchronously in the directions indicated by the arrows in Fig. IV by suitable means which is in part shown at 18 and which is actuated, through a link rod 19 from another eccentric 20 on the main shaft 11. The mechanism 18 is of well known construction and need not therefore be further referred to herein. Arranged to cooperate with the needle 3 is a thread-carrying looper 21 which is secured to the outer end of a horizontal shaft 22 supported for endwise sliding movement above the needle bar 4 in bearings 23 and 24 of a yoke 25 which has transverse trunnions 26, 27 (Figs. I and IV) journaled respectively in bosses 28, 29 on the opposite side walls 30, 31 of the housing 8. The yoke 25 is oscillated by means including another eccentric 32 (Fig. IV) on the main shaft 11, whereof the strap rod 33 is pivotally connected at 34 (Fig. III) to the lower end of a medially-fulcrumed upright lever 35 within the housing 8, while the other end of said lever is pivotally connected at 36 to a link 37 which is in turn connected to a lateral ball-ended arm 38 on said yoke. To the inner end of the looper shaft 22 beyond the bearing 24 of the yoke 25 is secured a crank arm 39 (Fig. III) with a ball end engaged in the socket head of the strap rod 40 of still another eccentric 41 on the main shaft 11, whereby rocking movement is imparted to the looper shaft to induce loop taking and shedding movements to the looper. Endwise movements are induced in the looper shaft 22 from still another eccentric 42 on the main shaft 11 through a link rod 43 and a rocker arm 44 (see Fig. III). By virtue of the connections just described, the looper 21 receives its sidewise and up and down

oscillatory movements as required to form, in cooperation with the needle 3, a two-thread over-edge seam in a well known manner.

The auxiliary mechanism which I have devised to enable production upon a standard over-edge sewing machine characterized as above, of a three-thread over-edge seam, is as follows: Mounted for oscillation about a horizontal stud 45 threaded into the front wall 7 of the housing 8 above the needle bar 4 and to one side of the vertical plane of the latter is a short rocker arm 46 with a lug projecting upwardly from its fulcrum hub. As shown the lug of the rocker arm 45 has a bore parallel with the hub axis wherein is lodged and secured the laterally-projecting shank of a curved holder 47 in the free split end of which is secured in pendant relation by means of a clamp screw 48, an auxiliary thread manipulating element in the form of a thread-carrying loop 49. By swinging the holder 47 about the axis of its shank, the auxiliary loop 49 may be angularly adjusted in respect to the fulcrum axis 45 of the rocker arm 46 so as to cooperate properly with the needle 3 and main loop 21. By tightening the set screw shown at 50, the holder may be secured to prevent accidental displacement of said loop in its adjusted position. Journaled in supplemental bearings 51 and 52 mounted centrally of the tops of the front and rear walls 7 and 53 of the housing 8 is a ball arm 55, which, through a strap rod 56 is connected to a supplemental eccentric 57 on the main shaft 11. To the front end of the rock shaft 54 exteriorly of the housing beyond the bearing 51 is clamped a rearwardly and downwardly-extending arm 58, which, by means of a short vertical link 59 (Fig. V), is coupled with the rocker arm 46 of the auxiliary loop 49. Accordingly during each rotation of the main shaft 11, the auxiliary loop 49 is oscillated on stud 45 to perform its looping operation while confined by the latter to swing in a single vertical plane. The timing of the auxiliary loop 49 is such that it is caused to move down and enter the loop of the main loop just as the latter has moved to the right of the plane of tangency of the feed cups 1 and 2 as shown in Fig. II, and at the same time to present its own loop for punctuation by the needle 3 as the latter advances on its next forward stroke. Due to the proportioning of the rocker arm 46, the arm 58 and the connecting link 59 and due to the relative allocation of the stud 45 and the actuating shaft 54 in Fig. V, it will be noted that the auxiliary thread manipulating element or loop 49 will remain substantially quiescent in its elevated position as the axis 58a approaches a dead center position between the axis 46a and the axis of the shaft 54. This construction restricts the oscillation of the auxiliary loop to a relatively small swing with minimization of its momentum during high speed operation of the sewing machine, but moreover favors greater compactness of the mechanism.

In order to properly direct the loop threads T¹, T² and prevent their entanglement with each other or with the needle thread T, I further provided, in accordance with my invention, a cruciform guide 62 which is separately illustrated in perspective in Fig. VI. As shown in Figs. II and III the main stem 63 of the guide 62 fits

upward into a vertical hole bored in the fixed bracket projection 64 of the machine on which the arm 65 supporting the movable feed wheel or cup 1 is pivoted. The cruciform guide 62 is thus vertically and rotatably adjustable in the bracket projection 64 with its lateral extremities 66 and 67 over-reaching the loopers 21 and 49, a set screw shown at 68 being provided for securing it after adjustment. Enroute from a source of supply (not shown), the thread T¹ first passes through a guide 69 at the front of the housing 8, then through an eye at the end of the extremity 66 of the cruciform guide 62, then through an eye at the lower end of the main stem 63 of the guide 62, then through a guide 70 attached to one side of the hub of the carrier arm of the main looper 21, then through a guide 71 in the holder 47 of the auxiliary looper 49, and finally to said main looper. Enroute from another source of supply (not shown) the auxiliary looper thread T² first passes through an eye in the other lateral extremity 67 of the cruciform guide 62 and thence downward directly to the receiving eye of the auxiliary looper 49. The needle thread T, enroute from still another source of supply (not shown) first passes through a fixed guide 72 at the front end of the housing 8, then through a guide 73 at the opposite side of the hub of the carrier for the main looper 21, and then through eyes 74 and 75 in the clamp head 3a on the needle bar 4, and finally to the needle 3.

A two thread seam can be produced by the machine notwithstanding the presence of the attachment simply by omitting the additional looper thread T² in which the element 49 will function simply as a spreader to enlarge the looper loop for easier punctuation by the needle 3. Or, if desired, a fishtail spreader of a well known type may be substituted in the holder in place of the auxiliary looper 49 for attainment of the same result.

Having thus described my invention, I claim:

1. An auxiliary thread-manipulating attachment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a looper to cooperate with the needle, and a drive shaft journaled in the housing from which the needle bar and the looper derive their movements, said attachment including an auxiliary thread-manipulating element to cooperate with the looper, an auxiliary actuating shaft for the thread-manipulating element, means for journaling the auxiliary shaft on the housing above and in parallel relation to the needle bar, and means whereby the auxiliary shaft is operated from the drive shaft of the machine.

2. An auxiliary thread-manipulating attachment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a thread-carrying looper to cooperate with the needle, and a drive shaft journaled in the housing from which the needle bar and the looper derive their movements, said attachment including an auxiliary thread-manipulating element to cooperate with the looper, a horizontal stud with means for securing it to the housing whereon the thread-manipulating element is pivoted, an auxiliary actuating shaft for the element, means for jour-

nalng the auxiliary shaft on the housing above and in parallel relation to the needle bar, means operatively connecting the thread-manipulating element with the auxiliary shaft, and means whereby the auxiliary shaft is operated from the drive shaft of the machine.

3. An auxiliary thread-manipulating attachment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a thread-carrying looper to cooperate with the needle, a horizontal shaft carrying the looper, and a drive shaft journaled in the housing from which the needle bar is actuated and from which endwise and oscillatory movements are imparted to the looper shaft, said attachment including an auxiliary thread-manipulating element, a horizontal stud with means for securing it to the housing whereon the thread-manipulating element is confined to pivotal movement in a single vertical plane at right angles to the needle bar, an auxiliary shaft with means for journaling it on the housing above and in parallel relation to the needle bar, means operatively connecting the thread-manipulating element with the auxiliary shaft, and means whereby the auxiliary shaft is oscillated from the drive shaft of the machine.

4. An auxiliary thread-manipulating attachment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a thread-carrying looper to cooperate with the needle, and a drive shaft journaled in the housing from which the needle bar and the looper derive their movements, said attachment including an auxiliary shaft with means whereby it is journaled on the housing above and substantially in the same vertical plane with the needle bar, a horizontal stud with means for securing it to the housing to one side of the vertical plane of the needle bar at an elevation between the latter and the auxiliary shaft, a rocker with a lateral arm pivoted on the stud and carrying an auxiliary thread-manipulating element to cooperate with the looper, a link connecting the rocker arm with a pendant actuating arm on the auxiliary shaft, said link being in substantial alignment with said actuating arm when the auxiliary element is in its highest position, and means whereby the auxiliary shaft is oscillated from the drive shaft of the machine.

5. An auxiliary thread-manipulating attach-

ment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a looper to cooperate with the needle, and a drive shaft journaled in the housing from which the needle bar and the looper derive their movements, said attachment including an auxiliary thread-carrying looper to cooperate with the first mentioned looper, an auxiliary looper-actuating shaft with means for journaling it on the housing above and in parallel relation to the needle bar, means whereby the auxiliary looper-actuating shaft is operated from the drive shaft of the machine, and a guide fixable on the machine frame and having spaced eyes to directionally control the threads for the usual and auxiliary loopers and to keep said threads separated from each other and from the thread for the needle.

6. An auxiliary thread-manipulating attachment for over-edge sewing machines of the type having a housing, a pair of tangentially-arranged feed wheels rotative about vertical axes exteriorly of the housing, a horizontal needle bar confined to endwise reciprocation, a thread-carrying looper to cooperate with the needle, and a drive shaft journaled in the housing from which the needle bar and the looper derive their movements, said attachment including an auxiliary shaft with means whereby it is journaled on the housing above and substantially in the same vertical plane with the needle bar, a horizontal stud with means for securing it to the housing to one side of the vertical plane of the needle bar at an elevation between the latter and the auxiliary shaft, a rocker with a lateral arm pivoted on the stud and carrying an auxiliary thread-manipulating element to cooperate with the looper, a link connecting the rocker arm with a pendant actuating arm on the auxiliary shaft, said link being in substantial alignment with said actuating arm when the auxiliary element is in its highest position, means whereby the auxiliary shaft is oscillated from the drive shaft of the machine, and a cruciform guide fixable upright in pendant relation to a portion of the machine frame overhanging the feed wheels, said guide having an eye at the bottom of its main stem and an eye at the end of one of its lateral arms for directing the thread for the usual looper, and an eye in the end of its other lateral arm for guiding a thread directly from above into the eye of the auxiliary looper.

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