

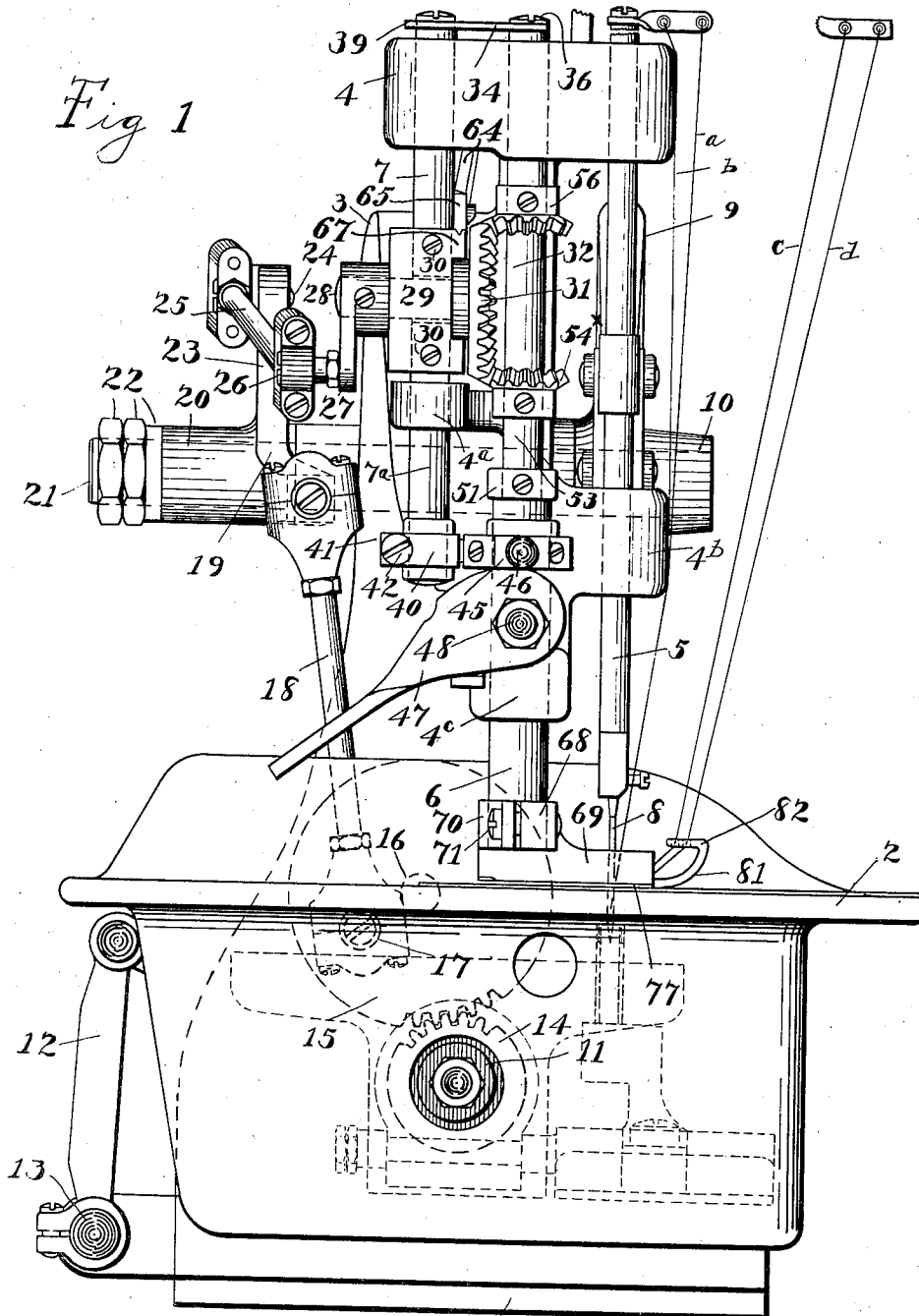
J. P. WEIS.
ORNAMENTAL STITCH MACHINE.
APPLICATION FILED JUNE 7, 1909.

1,058,820.

Patented Apr. 15, 1913.

4 SHEETS—SHEET 1.

Fig 1



WITNESSES:

M. Herkowitz
C. J. Stickley

1.

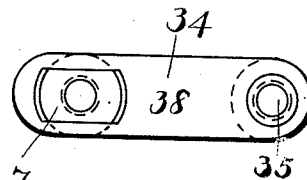
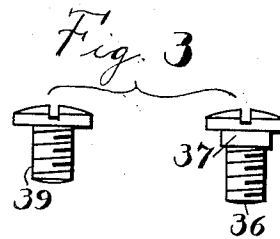
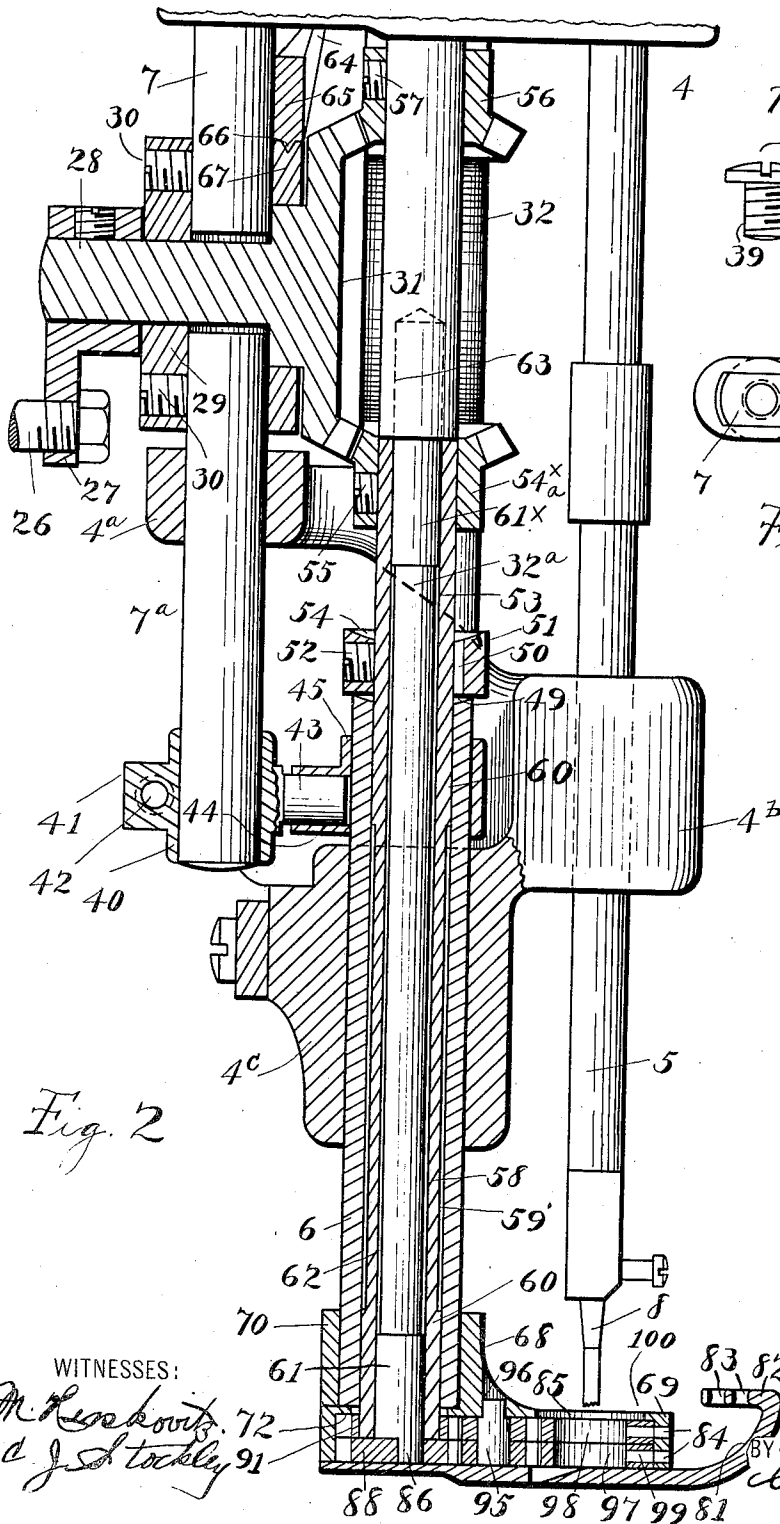
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4 SHEETS-SHEET 2.



WITNESSES:
M. R. L. L. L.
d. J. S. L. L.

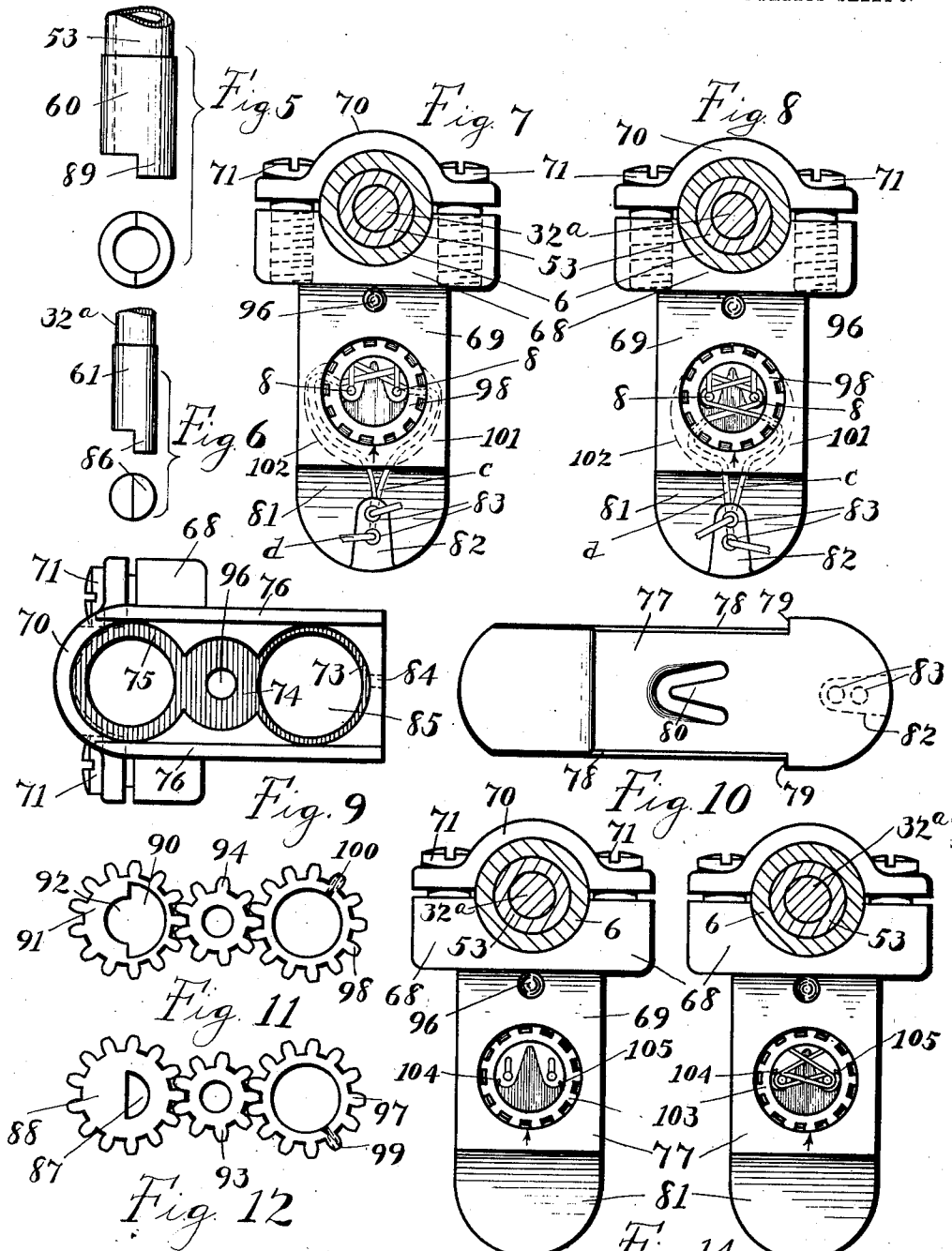
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4 SHEETS—SHEET 3.



WITNESSES:

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 C. J. Stoschley

Fig. 13

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4 SHEETS—SHEET 4.

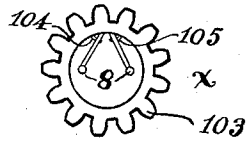


Fig. 15

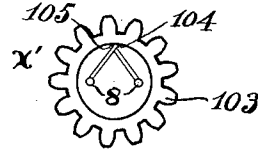
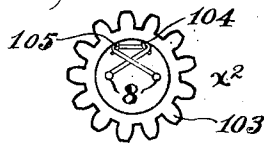


Fig. 16

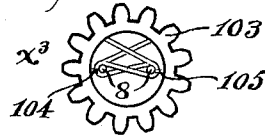


Fig. 17

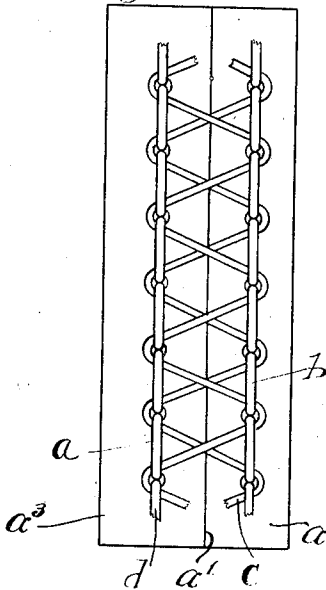


Fig. 18

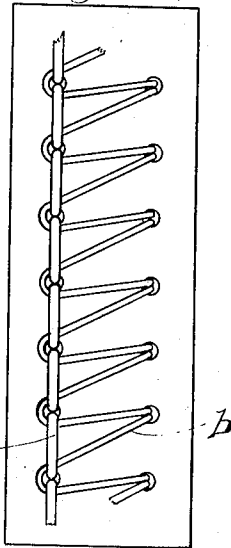
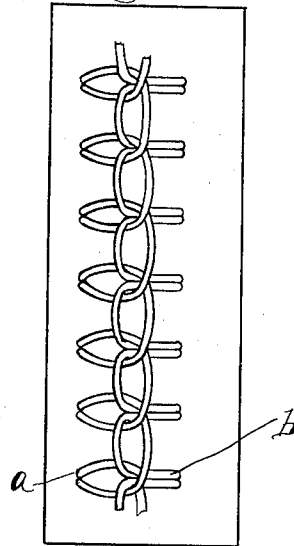


Fig. 19



WITNESSES:

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UNITED STATES PATENT OFFICE

JOHN P. WEIS, OF NYACK, NEW YORK.

ORNAMENTAL-STITCH MACHINE.

1,058,820.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed June 7, 1909. Serial No. 500,656.

To all whom it may concern:

Be it known that I, JOHN P. WEIS, a citizen of the United States, residing in Nyack, county of Rockland, and State of New York, have invented a new and useful Improvement in Ornamental-Stitch Machines, of which the following is a description.

This invention relates to sewing machines of the ornamental stitch class, and particularly to a machine of the character stated capable of producing, on the surface of the work, a variety of ornamental effects with a plurality of threads.

Among the objects of my invention may be noted the following: to provide a simple, cheap and compact construction whereby, in a machine of the type stated, quiet running and positiveness in action are produced; to provide a mechanism carried by the presser-foot of the machine for manipulating a plurality of threads and capable of being quickly detached for changing, substituting, or renewing the parts; to provide a train of mechanism, for actuating the thread-manipulating devices, so arranged as to produce a maximum of speed in the machine with a minimum of wear and vibration; and to provide certain novel, structural features, elements and combinations of elements which will simplify the machine and be capable of attachment to the well-known Metropolitan sewing machine.

With the above objects in view, and others which will be set forth during the course of this description, my invention consists in the parts, features, elements and combinations of elements and mechanisms as hereinafter described and claimed.

In order that my invention may be understood, I have provided drawings wherein:

Figure 1 is a front end elevation of a Metropolitan sewing machine having my invention applied thereto; Fig. 2 is a vertical section taken substantially centrally and longitudinally of the presser-foot and the mechanism thereabove shown in Fig. 1, certain of the parts being shown in elevation in order to clearly portray the same; Fig. 3 is a view showing in elevation the two screws employed for linking together the guide-bar and wing-shafts of the thread-manipulating devices; Fig. 4 is a top plan of the link referred to above; Fig. 5 is a

view showing in elevation and bottom plan the lower end of the tubular shaft for actuating one of the thread-manipulating devices; Fig. 6 is a view showing in elevation and bottom plan the lower end of another of the shafts for actuating another of the thread-manipulating devices; Fig. 7 is a top-plan view of the presser-foot showing the thread-manipulating devices in one position, the presser-bar and shafts being shown in section; Fig. 8 is a view similar to Fig. 7 showing the thread-manipulating devices in another position; Fig. 9 is a bottom-plan view of the presser-foot with its bottom slide-plate removed; Fig. 10 is a bottom-plan view of the bottom slide-plate of the presser-foot; Fig. 11 is a top-plan view of the top set of thread-manipulating devices and actuating-gears; Fig. 12 is a view, similar to Fig. 11, of the bottom set of thread-manipulating devices and actuating-gears; Fig. 13 is a view, similar to Fig. 7, showing another form of thread-manipulating devices in one position; Fig. 14 is a view, similar to Fig. 13, showing the thread-manipulating devices thereof in a different position; Fig. 15 is a view showing in top-plan one of the thread-manipulating devices in two different positions; Fig. 16 is a view showing in top-plan the thread-manipulating devices of Fig. 15 in two other positions; Fig. 17 is a top-plan of a stitch produced by two needle-threads and two thread manipulating devices; Fig. 18 is a top-plan of a stitch produced by two needle-threads and one thread-manipulating device; and Fig. 19 is a top plan view of a stitch made by two needle-threads and two thread-manipulating devices.

Referring to the drawings, the numeral 1 indicates the bed-plate of my machine, 2 the cloth-plate thereof, 3 the overhanging-arm, which at its forward end, supports the head-bearings 4^a, 4^b and 4^c, through which the needle-bar 5 reciprocates, and in which the presser-bar 6 and guide-bar 7 operate. The needle-bar, at its lower end, has two needles 8 clamped thereto in usual manner and arranged side-by-side transversely of the feed, and said needle-bar is actuated by the needle-lever 9, having its journal bearing on the end of shaft 10, extending transversely of the overhanging-arm 3, as usual.

The driving-shaft of the machine is, as usual, journaled in bearings extending vertically from the bed-plate and the forward end of said shaft is provided with the feed-actuating eccentric mechanism, generally indicated by 11, now well known as a part of the Metropolitan sewing machine, said eccentric, in usual manner, actuating the feed-rocker 12, journaled at 13 on the bed-plate of the machine. Near its rear end, the driving-shaft is provided with the pinion 14, shown in dotted lines, Fig. 1, which meshes with the gear 15, likewise shown in Fig. 1, journaled upon a short shaft or stud 16, in the lower portion of the overhanging-arm of the machine. These two gears 14 and 15 are made removable in any usual manner so that others of different size, or ratio, may be substituted, this being necessary under certain circumstances and for the purpose of producing certain ornamental effects, as will be presently explained. The gear 15 carries the crank-pin 17, to which is connected the pitman 18, the upper end of which is likewise connected to the forwardly-extending arm 19 of a bell-crank lever journaled by its extended bearing 20 upon the portion 21 of the shaft 10, upon which the needle-lever 9 is journaled, said shaft being prolonged for the purpose. Said bell-crank lever is held upon the shaft-portion 21 by the washer and locking and jam nuts 22; and the upwardly-extending arm 23 of said lever carries the ball-stud 24, to which is connected the rear end of the pitman 25, the forward end of which is jointed to the ball-stud crank-pin 26, carried by the crank-arm 27, secured to the short shaft 28, journaled in the block 29, secured by means of screws 30 to the top and bottom guide-bar sections 7 and 7^a.

The forward end of the short shaft 28 is provided with a bevel-gear 31. The upper end of the top section 7 of the guide-bar extends slightly above the top bearing 4 of the machine-head as does also the top portion of the top section 32 of one of the shafts which operates the thread-manipulating devices, the bottom section 32^a of said shaft being supported as presently described. The top section 32, of said shaft and the top section 7, of guide-bar are coupled by the link 34, see Fig. 4, one end of which is provided with the apertures 35, through which extends the body of the screw 36, the upper end of which is enlarged at 37, so that the link may swivel thereon, the said screw being tapped into the upper end of the said top section 32 of the shaft. At its other end, the link is provided with the elongated flat-sided, curved-ended slot 38 for the reception of the similarly-formed upper end of the top section 7 of the guide-bar, into which is tapped the screw 39. By thus connecting the shaft and bar sections 7 and 32, the guide-bar sec-

tion is prevented from having any axial movement, while the shaft section 32 is permitted to have rotary oscillating movement, as presently described. The lower section 7^a of the guide-bar, at its lower end, has clamped thereto the split collar 40, the arms 41 of which are clamped together by the screw 42, this collar having the laterally-projecting pin 43, extending into the tubular socket 44 of the collar 45 clamped upon the upper end of the presser-bar 6, which, as clearly shown in Fig. 2, is tubular.

The collar 45 is provided with the laterally-projecting pin 46, with which cooperates the cam-head of the lifting-lever 47, journaled upon the stud 48, carried by the bearing portion 4^c of the machine-head.

At its upper end, the presser-bar 6 is dished at 49, to provide a receptacle for oil, which may reach the same through the aperture 50 of the collar 51, clamped by means of the screw 52 upon the lower tubular shaft 53. The upper surface of the collar 51 is likewise dished at 54 for the reception and retention of oil, the latter running down through the aperture 50 into the dished end 49 of the presser-bar, the latter and the tubular shaft 53 being thus lubricated and the oil being prevented from flying or over-running. The tubular shaft 53, at its upper end, is provided with the bevel-pinion 54^x, clamped thereto by means of the screw 55, and which meshes with the bevel-gear 31, the latter, in like manner, meshing with the bevel-gear 56, clamped by means of the screw 57 to the upper end below the bearing 4 of the top shaft-section 32. Thus, the two-part shaft 32—32^a and the tubular shaft 53 are caused to oscillate for the purpose presently described. The shaft 53, from about midway its length to near its bottom, is reduced in size as at 58, thus providing the oil-space 59 between it and the presser-bar and thus also providing the separated bearing-portions 60, at top and bottom, so as to journal within the tubular presser-bar.

Extending longitudinally within the tubular shaft-section 53 is the solid shaft-section 32^a, the ends of which are provided with the enlarged bearing portions 61 and 61^x, the intermediate portion being reduced, so as to provide the oil space 62, the said shaft thus having a journal-bearing within the tubular shaft 53. The upper end 63 of the upper bearing-portion 61^x of the shaft-section 32^a is extended, as shown by the dotted lines, into the lower end of the upper shaft-section 32, the connection being made by sweating them together so that the movement imparted to the shaft-section 32, will be imparted to the lower shaft-section 32^a. This mode of constructing the inner solid shaft, though not absolutely essential, has been found more practical and to facilitate

the manufacture of the shaft and assembling of the mechanism. The presser-bar, with all its supported parts just described, is under a normal downward pressure through the medium of the usual presser-bar spring 64, the forward end 65 of which is twisted and provided with a V-shaped rib 66, which enters a correspondingly formed groove in the portion 67 of the block 29. Thus, the block 29, the guide-bars 7—7^a, the presser-bar 6, the two concentric-shafts 32—32^a and 53, together with the gearing 31, 54^{*} and 56, are all compactly arranged so as to operate substantially as one, in so far as lifting and depressing the same are concerned; but, obviously, the gear 31 has its rotary reciprocating motion within the block 29, and likewise the concentric shafts are oscillated, the outer one within the presser-bar and the inner one within and upon the shaft 53, in a direction opposite the latter.

The lower end of the presser-bar 6 has secured thereto the shank 68 of the presser-foot 69, the securing means being the socket-plate 70, which partially embraces the presser-bar and has a screw 71, see Fig. 7, passing through each end thereof and tapped into the shank 68, thus firmly clamping the foot in place upon the bar, the latter being entered in the socket into engagement with the ledge 72, which determines the position of the foot on said bar. As shown in Figs. 9 and 10, the presser-foot is hollow and provided with gear-seats 73, 74 and 75 in alinement. The bottoms of the two side-walls 76 of the foot are provided with a dovetail groove into which is slid the bottom-plate 77, the edges of which are beveled at 78 to correspond with the grooves in the walls 76 of the foot, said bottom-plate being slid into position until the shoulders 79 engage the front end of the foot. The connection between the foot and bottom-plate is frictional merely and has been found amply sufficient to securely hold the parts together. The bottom-plate of the foot is provided with the rearwardly extending tongue 80, over which the loops are formed and beside which the needles reciprocate, as is well understood, this plate also being formed with the forwardly-extending and upwardly-bent toe 81, see Fig. 7, provided with the overhang 82, having the thread-guiding apertures 83 therethrough. Likewise, the front wall of the presser-foot is provided with the thread-guiding apertures 84, see Fig. 2, which permit the entry of the threads to the thread-manipulating devices presently described. The top of the presser-foot is provided with the circular opening 85, through which the needles reciprocate and also through which the operation of the thread-manipulating devices can be observed. The lower end 61, see Fig. 6,

of the solid portion 32^a of the center shaft, 65 is provided with a semi-circular extension making a plano-convex projection or key 86, which enters the similarly-formed aperture 87 of the gear 88; which is set in the bottom of the heel of the presser-foot and there held by the said key 86.

The lower end 60 of the tubular shaft 53, see Fig. 5, is provided with a semi-circular extension providing the arc-shaped key 89, which enters a correspondingly formed aperture 90 of the gear 91, which is set in the heel of the presser-foot above the gear 88, the gear 91 being also provided with the semi-circular extension 92 of the aperture 90 to permit the passage of the lower end 61 of the shaft 32^a, the said gear 91 being thus capable of oscillating independently of said shaft 32^a under drive from the tubular shaft 53. The gear 88 meshes with the gear 93 and the gear 91 meshes with the gear 94, the latter being arranged above the gear 93 and both being centered by, and free to turn upon, or with, the pin 95, journaled in, or secured to, the foot 69, by its reduced end extending into the bearing provided by an aperture 96 in the foot, adjacent the shank 68. The gear 93 meshes with the gear 97 and the gear 94 meshes with the gear 98, the latter set arranged above the former set in the forward end of the presser-foot, as shown in Fig. 2. The gears 98, 94 and 91 being set, respectively, in the seats 73, 74 and 75 of the presser-foot.

The gear 97 is provided with the thread-guiding aperture 99 extending longitudinally through one of its teeth and the gear 98 is provided with the thread aperture 100 extending longitudinally through one of its teeth, and the surface of each of these gears is provided with an arrow, the head of which extends toward the front of the foot for the purpose of indicating the presence of the said apertures 99 and 100 and also for the purpose of bringing the said apertures into registry with each other and with the arrow, which points in the opposite direction, on the top surface of the foot, see Fig. 7, for the initial line up in setting the gears. It will thus be seen that the gear 88 is held to and driven by the solid shaft-section 32^a, which latter passes through the gear 91, which latter, in turn, is held to and driven by the tubular shaft 53, these two gears, respectively, driving their trains of gears 94—98 and 93—97. The presser-foot, in addition to having the thread leading-in slots 84 in its front wall, is also provided with the thread-guiding grooves 101 and 102, extending in opposite directions around substantially half the circumference of the thread-manipulating gears 97 and 98, as shown by dotted lines in the plan views of Figs. 7 and 8, the said grooves being

provided by removing the material of the foot.

This structure enables two independent threads to be manipulated during the running of the machine, in addition to the needle-threads, said independent threads being made to cross each other and be in turn crossed and stitched down by the respective needle-threads, as shown, for example, in Figs. 7, 8 and 17, to produce a line of ornamental stitching on the surface of the fabric, or for seam-covering purposes, if so desired. An alternative construction, which omits the use of the independent threads, but by means of which the needle-threads may be manipulated and crossed from side-to-side of the line of stitching,—one or both of said threads,—is indicated in Figs. 13 and 14, wherein, instead of using gears such as 97 and 98 with thread-guiding apertures, gears may be substituted provided,—the top one 103,—with a pin or hook 104 and the lower one with a similar pin or hook 105. In this instance, the bottom plate 77 of the foot is modified to the extent of omitting the overhang 82, since the same is not required except for the purpose of guiding independent threads.

From the foregoing detailed description, it will be apparent that, during the operation of the machine, the needle-bar will be reciprocated in usual way carrying its two needles, each of which is provided with a thread indicated by a and b , with which will coöperate, as is usual in the Metropolitan sewing machine, a single thread-carrying looper. The fabric is fed through the machine by any usual feeding mechanism, a part of which is indicated at 11, 12 and 14, as is also usual in the Metropolitan sewing machine. The rotation of the driving-shaft will actuate the pinion 14, which, in turn, will actuate the gear 15, thus rotating the crank 17 and reciprocating the pitman 18, which will rock the bell-crank lever on the journal 21, the upper arm of which lever will reciprocate the pitman 25, thus imparting, through the crank-arm 27, a rotary oscillating movement to the gear 31. At its top, this gear coöperates with the pinion 56, fixed to the shaft-section 32, thus imparting to the solid shaft-section 32^a a rotary reciprocating movement, which is imparted to the gear 88, and from it through the gear 93 to the gear 97. Likewise, the gear 31 meshes with the pinion 54^x, fixed upon the tubular shaft 53 and imparts thereto a rotary oscillation, but the movements of which are the reverse of the movements imparted to said shaft 32—32^a. The rotary oscillating movement of the tubular shaft 53 is imparted to the gear 91, which, in turn, actuates the gear

94, which drives the gear 98. The result of these operations is that the top gear 98 is moved in one direction simultaneously with the movement of the bottom gear 97 in the opposite direction, thus carrying the respective threads c and d in opposite directions part way around the opposite needles, and also carrying said threads across the line of feed and compelling the lines of stitching, formed by the two needles and looper, to stitch down a strand of the threads c and d for every feed movement, in accordance with the stitch or seam shown in Fig. 17. This stitch is produced by the two-to-one gearing 14—15 of Fig. 1, and the thread-guiding or manipulating gears 97—98 of Figs. 11 and 12, a feed-movement taking place for each reciprocation of the needles and for every movement of the manipulating gears, said gears being moved in opposite directions and, consequently, causing their threads to cross each other and be caught, by the needle threads, on opposite sides of the line of seam. This stitch may be used for ornamental purposes only, or may be used to overseam and connect the edges of two pieces of fabric, as shown in Fig. 17, wherein the line a^1 indicates the abutted edges of two pieces of fabric a^2 and a^3 . If, however, the two hooks 105, shown in Figs. 13 and 14, are employed in place of the apertures 99 and 100 in the thread-manipulating gears, the said hooks will engage the needle-threads and carry them from side-to-side, or from one line of stitching to the other, resulting in the seam or ornamental stitch shown in Fig. 19. If, however, but one line of gear, such as shown in Fig. 12, be employed and the gear 97 be provided with a hook, as shown in Figs. 13 and 14, said hook will manipulate one of the needle-threads so as to cross it from side-to-side of the line of seam and carry said needle-thread into the line of stitch of the other needle-thread, thus producing the ornamental stitch or seam shown in Fig. 18.

Figs. 15 and 16 are intended to illustrate the manner in which the two needle-threads a and b are engaged and interlooped by the hooks 104 and 105, carried by the gears of Figs. 13 and 14. The successive positions of said hooks are shown in the several positions of thread manipulation designated as w , w^1 , w^2 and w^3 in Figs. 15 and 16. In these figures position w is the beginning of the cycle of stitch-formation, and in the first position the needles have descended, the needle-loops have been caught by the looper, as usual, the needles have risen, a feed-movement has taken place, which carries the two needle-threads forward in the line of feed, and the hooks 104 and 105 have engaged the respective needle-threads, thus carried forward

preparatory to carrying them around to position α^1 . While the needles are finishing their upward movement and are descending a second time, the hooks carry the needle-threads from position α^1 to, and past, position α^2 into position α^3 , where the needles pass through the loops thus produced, said loops being held by the needle-thread as the next stitch is formed. This operation will produce the stitch of Fig. 19, the gears 14 and 15 being proportioned as 1 to 1.

The stitch of Fig. 18 is produced by two needles and complementary stitch-forming mechanism, and a single hook for manipulating one of the needle-threads, the ratio between the gears 14—15 being 1 to 1. By inclosing the thread-manipulating devices and their actuating gears in the hollow presser-foot and providing the latter with a removable bottom, the said gears and devices may be removed at any time for any purpose, as for example, for substituting one device for another, for repairing, or cleaning, and by making the bottom removable, other forms may be substituted for the one shown.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An ornamental stitch machine having, in combination, stitch-forming mechanism including a plurality of needles and complementary means for forming the stitch; and means for manipulating ornamental threads comprising a plurality of concentric devices for carrying the threads transversely of the line of stitch, means for actuating said device including a shaft supported in the head of the machine, means for oscillating the shaft including a gear and a bell-crank lever, means for connecting the gear and lever for actuating the latter, and means connecting the lever and shaft for actuating the latter.

2. An ornamental stitch machine having, in combination, stitch-forming mechanism; a presser-foot; a device supported by the presser-foot for carrying an ornamental thread transversely of the line of seam; and means for actuating said device comprising a driving-shaft arranged below the work-plate of the machine, a bell-crank lever arranged above the said work-plate, means connecting the shaft and lever for actuating the latter, a rotary reciprocating shaft arranged at an angle to the driving-shaft, means for connecting the lever with the second named shaft for actuating the latter, and means connecting the second named shaft with the said device for actuating the latter.

3. An ornamental stitch machine having, in combination, stitch-forming mechanism; a device for carrying a thread transversely of the line of seam; a presser-foot mechanism

including a presser-bar; means for supporting said device on the presser-foot mechanism; means for actuating said device including a rotary driving-shaft and a shaft extending concentrically with the presser-bar of the presser-foot mechanism; and means between the two shafts for transforming the rotary motion of the driving-shaft into rotary reciprocating motion in the other shaft, including differential gearing.

4. An ornamental stitch machine having, in combination, a stitch-forming mechanism; a presser-bar carrying a presser-foot; a thread-manipulating device, the thread-manipulating device being supported by the presser-foot; means for actuating said device comprising a shaft concentric with the presser-bar; rotary oscillating gear for actuating said shaft; and differential gearing connecting said shaft with said device.

5. An ornamental stitch machine having, in combination, stitch-forming mechanism; presser-foot mechanism; a thread-manipulating device; the presser-foot mechanism including a hollow presser-foot and a hollow presser-bar; and means for actuating the said device including a driven shaft carried by the hollow presser-bar, gearing carried in the hollow presser-foot cooperating with said shaft, and means for actuating the driven shaft.

6. An ornamental stitch machine comprising a stitch-forming mechanism; presser-foot mechanism; and a thread-manipulating device; the presser-foot mechanism including a hollow presser-foot; means for actuating the said device including differential gearing supported within the hollow presser-foot; a shaft concentric with the presser-bar for driving said gearing; and means for giving the said shaft rotary reciprocating movements.

7. An ornamental stitch machine having, in combination, stitch-forming mechanism; presser-foot mechanism; and a thread-manipulating device; the presser-foot mechanism including a hollow presser-foot having a removable bottom; and means for actuating the said device including gear supported in said hollow presser-foot and held in place by said removable presser-foot bottom, whereby the gear for the said device and also the latter may be quickly removed for any purpose.

8. An ornamental stitch machine having, in combination, stitch-forming mechanism; a plurality of thread-manipulating devices comprising a plurality of superposed gears, a plurality of concentric shafts, and means connecting said shafts, respectively, with the superposed gears, and connections between said gears and the said devices.

9. An ornamental stitch machine having, in combination, stitch-forming mechanism

and thread-manipulating devices; means for actuating said thread-manipulating devices comprising a plurality of concentric shafts; gears carried by the several shafts; and a
5 single driving-gear coöperating with the gears on said shafts to impart motion thereto simultaneously in opposite directions.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN P. WEIS.

Witnesses:

OSCAR DEVOE,
A. BENDER.