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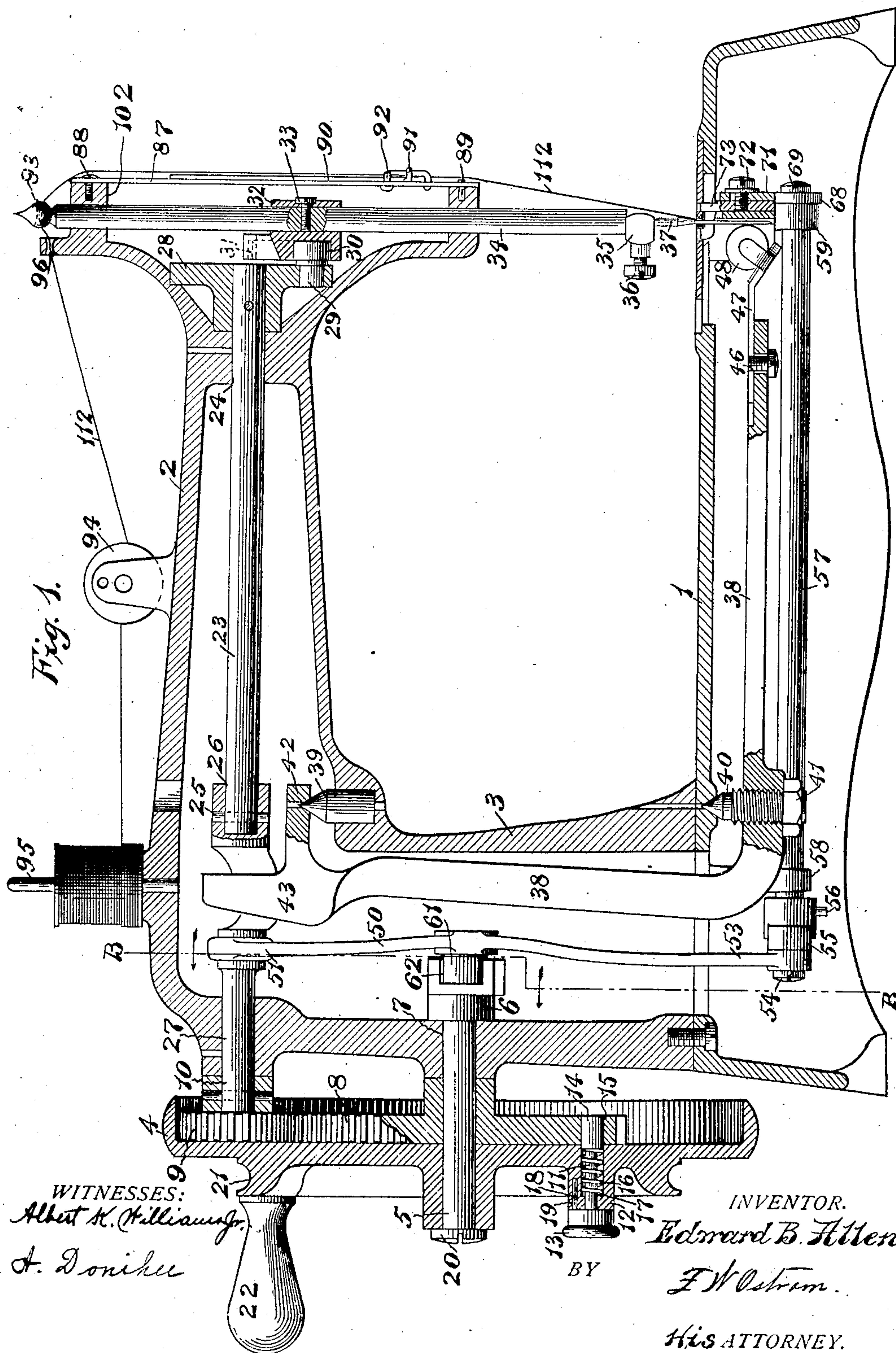
PATENTED MAR. 17, 1908.

E. B. ALLEN.

SEWING MACHINE.

APPLICATION FILED MAR. 12, 1907.

4 SHEETS—SHEET 1.



WITNESSES:

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Albert H. Williams, Jr.

A. Donihue

INVENTOR.

Edmund B. Allen

BY

F W Ostrom.

His ATTORNEY.

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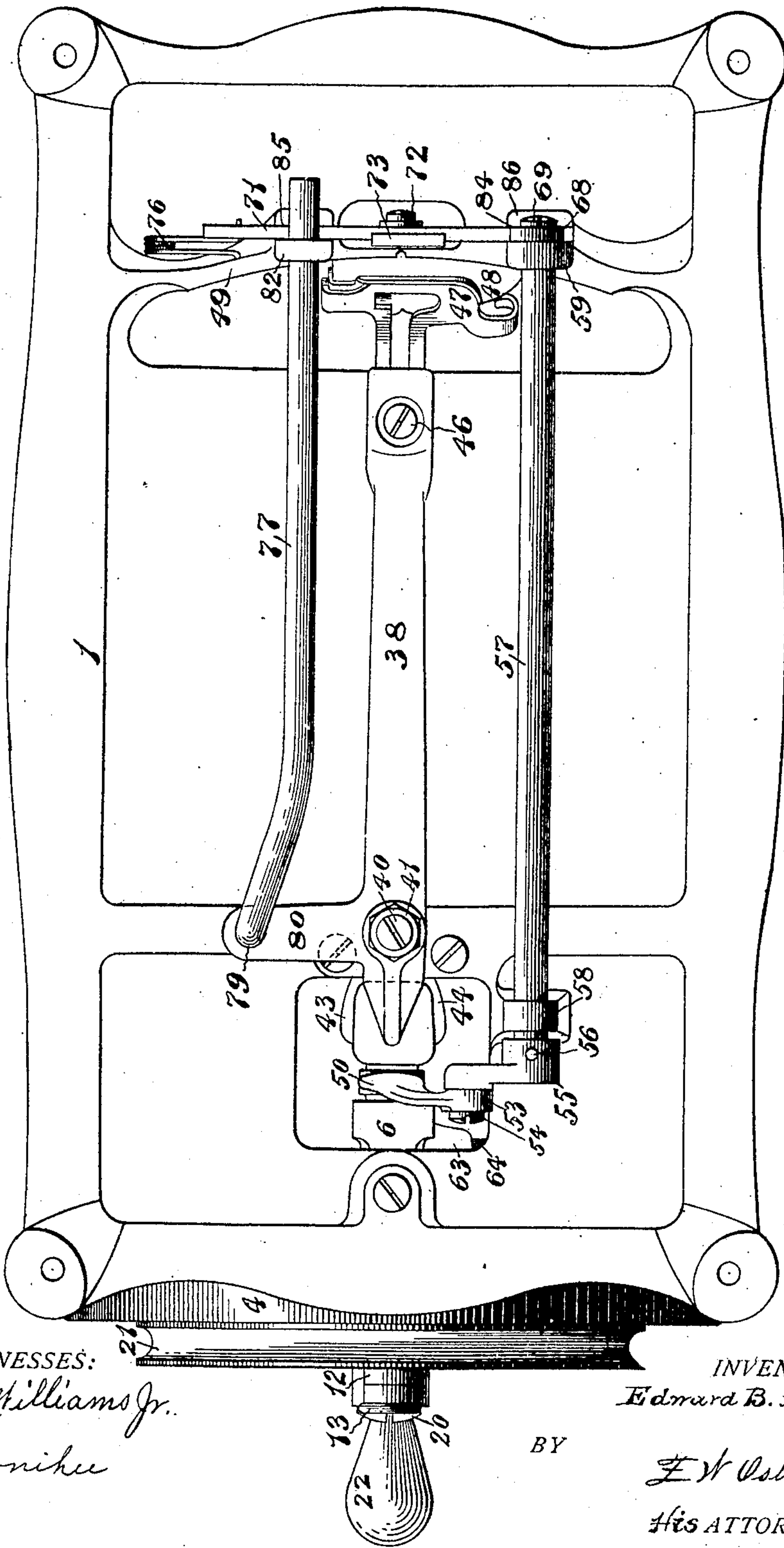
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4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:
A. H. Williams Jr.
A. D. Amick

INVENTOR.
Edward B. Allen

BY

F. W. Ostrom.
His ATTORNEY.

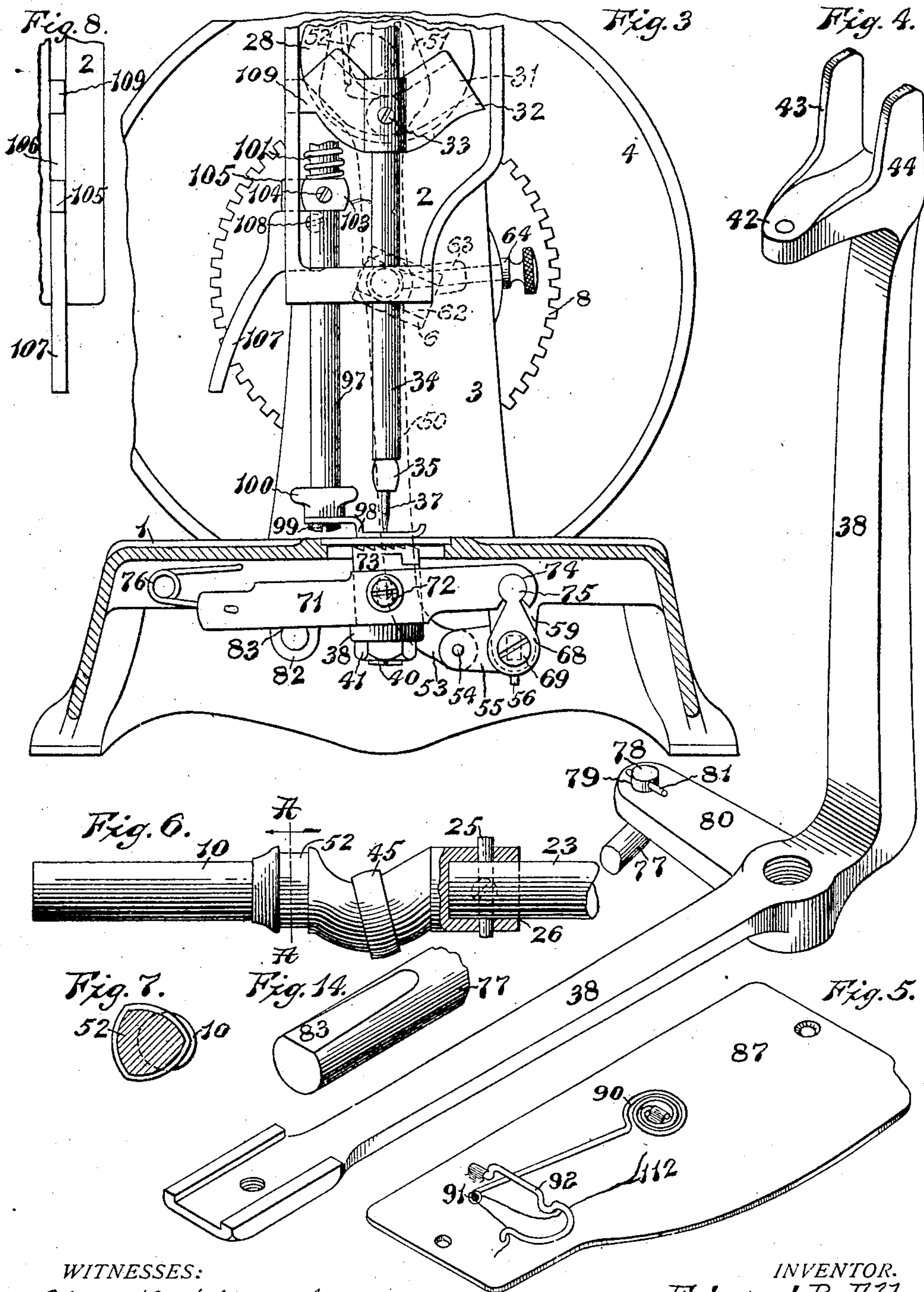
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WITNESSES:
Albert H. Williams
A. Donike

INVENTOR.
Edmond B. Allen
BY *F. W. Ostrom*
His ATTORNEY.

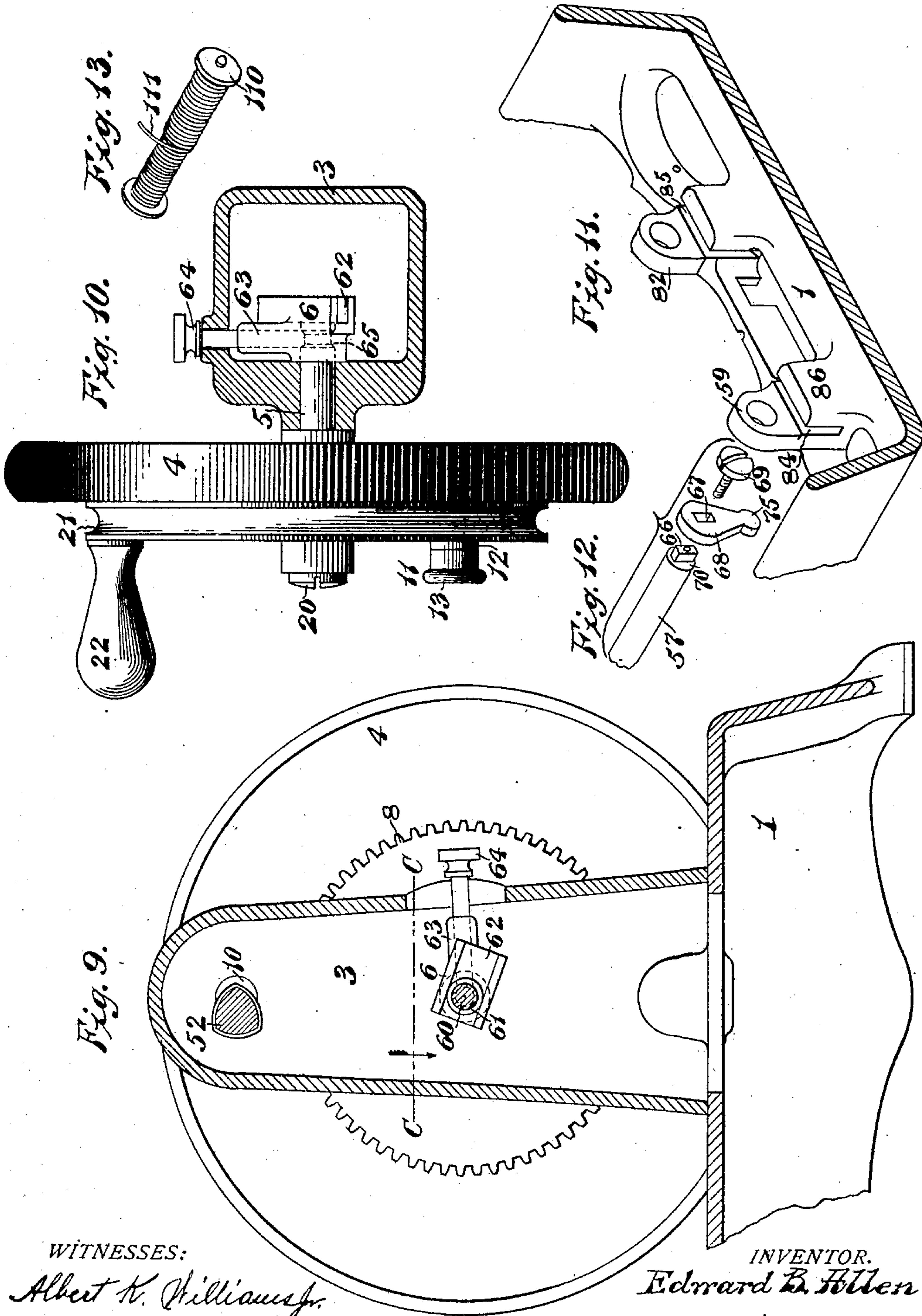
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Albert K. Williams, Jr.
A. Donihue.

INVENTOR.
Edward B. Allen
BY *F. W. Ostrom.*
His ATTORNEY.

UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE.

No. 882,484.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed March 12, 1907. Serial No 362,071.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to improvements in sewing machines and has to do more particularly with that class of machines commercially termed "Family sewing machines," and has for its object to effect a machine of superior utility in comparison with its commercial cost; and to this end I have provided certain changes in construction hereinafter described for accomplishing this purpose.

Referring to the drawings, Figure 1 is a sectional view in central elevation of the bed-plate and overhanging arm of my improved machine, looking from the rear side thereof, together with certain parts of the stitch-forming, cloth-feeding and driving mechanisms, said parts being shown mainly in full lines, certain portions being broken away or shown in section to better illustrate their action relatively to each other. Fig. 2 is a bottom plan view of the sewing machine bed-plate and parts connected therewith. Fig. 3 is a front end elevation of the sewing machine, the bed-plate shown in section substantially in line with the feed-dog carrying bar, the upper portion of the head overhanging arm being broken away and the arm face-plate removed. Fig. 4 is a detail perspective view of the shuttle actuating lever. Fig. 5 is a perspective view of the arm face-plate. Fig. 6 is a view of the driving cam shaft, together with a portion of the attached needle-bar driving shaft. Fig. 7 is a view in section on the line A—A, Fig. 6. Fig. 8 is a rear side elevation of that portion of the head of the overhanging arm containing the guide-slot and followers for preventing axial movement of the needle-bar and presser-bar. Fig. 9 is a view in section on the line B—B, Fig. 1, the feed-actuating lever being omitted. Fig. 10 is a plan view of the stitch regulating mechanism, the arm standard being shown in section on line C—C, Fig. 9. Fig. 11 is a perspective view illustrating that portion of the underside of the sewing ma-

chine bed-plate provided with the front bearing for the feed rock-shaft, the feed lift-rod and the guide-ways for the feed-bar. Fig. 12 is a perspective view of the front end of the feed rock-shaft and the feed-bar lever, together with the feed-bar lever attaching screw. Fig. 13 is a perspective view of the bobbin carried by the shuttle, showing the manner of applying the under thread. Fig. 14 is a perspective view showing, on an enlarged scale, a portion of the forward end of the feed-bar lifting rod.

1 is the bed-plate of the sewing machine, 2 the overhanging arm, and 3 its standard.

4 is the hand wheel or driving pulley mounted to rotate upon the shaft 5 of the stitch-regulating lever 6, said shaft being adjustably mounted in a bearing 7 located in the rear portion of the arm standard 3.

8 is a spur wheel, shown partially in section and partially in full lines, mounted to turn on the shaft 5, the teeth of said wheel meshing with the teeth of the pinion 9 secured upon the end of the cam-shaft 10.

11 is a locking bolt slidably mounted in a suitable bearing formed in a boss 12 made integral with the driving pulley, said bolt being provided at its outer end with a flanged head 13 and at its opposite end with an enlarged portion 14, which latter is adapted to enter a hole 15 formed in the spur wheel 8, where it is held against accidental displacement by a spring 16, one end of which latter rests against an inner wall 17 formed in the boss 12, its opposite end acting upon the inner end of the enlarged portion 14, and 18 is a pin secured in the flanged head 13 and adapted to enter a hole 19 formed in the boss 12.

If, for any purpose, it is desired to disconnect the operative hitch-up between the driving pulley 4 and spur wheel 8, the operator simply withdraws the enlarged portion 14 of the bolt 11 from the hole 15, when a slight turn of the flanged head 13, carrying the bolt 11, will cause the free end of the pin 18 to rest upon the upper surface of the boss 12.

20 is a screw threaded into the shaft 5 for holding the driving pulley 4 and spur wheel 8 against accidental displacement relatively to the pinion 9.

21 is a belt-groove for the convenient application of a belt in case it is desired to

operate the machine by other than hand power through the manipulation of the handle 22.

23 is the needle-bar driving shaft, the forward end of which is mounted to rotate in a bearing 24 formed in the overhanging arm, its opposite end being secured by a pin 25 in a suitable seat 26 formed in the end of the cam-shaft 10, which latter is mounted to rotate in a bearing 27 formed in the arm standard 3.

28 is a flange secured upon the end of the needle-bar driving shaft 23, which flange is provided with a stud 29 carrying a roller 30 which enters a cam groove 31 formed in a needle-bar bracket 32, said bracket being secured by a screw 33 to the needle-bar 34; thus, through the rotation of the shaft 23, the action of the roller 30 in the cam groove 31 effects vertical movements of the needle-bar in opposite directions to form stitches.

35 is the needle clamp, 36 the needle clamp screw and 37 the needle.

38 is the shuttle-actuating lever mounted to oscillate on the pintles 39 and 40, the pintle 40 being threaded into the lever 38 and provided with a check-nut 41, and the pintle 39 coacting with a lug 42 formed integral with said shuttle-actuating lever 38. The upper end of the vertical portion of the lever 38 is provided with oppositely extending portions 43 and 44 which embrace a shuttle-actuating crank 45 formed integral with the cam shaft 10, said crank comprising an oval portion formed at an angle to the axis of said shaft, the rotation of which latter, through the action of the shuttle-actuating crank 45 on the extended portions 43 and 44 of the shuttle-actuating lever 38, causes said lever to be oscillated on the pintles 39 and 40.

To the forward end of the horizontal portion of the lever 38 is adjustably secured, by a screw 46, a shuttle carrier 47 carrying the shuttle 48, which latter is oscillated in the arc of a circle corresponding to the arc 49 formed in the bed-plate 1.

From the foregoing it will be understood that the rotation of the shuttle-actuating crank 45, through the shuttle-actuating lever 38, transmits vibratory movements to the shuttle 48; and that the action of the roller 30 in the cam groove 31 gives to the needle-bar its vertical movements in opposite directions; and that the timing of the vertical movements of said needle-bar, relatively to the vibratory movements of said shuttle, is determined by the position of the roller 30 relatively to the position of the shuttle-actuating crank 45 about the axis of the shaft 23.

50 is a feed-actuating lever provided with a bifurcated end 51 which coacts with a feed-cam 52 formed eccentric to and integral with the cam-shaft 10. The lower end 53 of said lever 50 is connected by a pivot screw 54 to

a crank 55, which latter is in turn secured, by a pin 56, to a feed rock-shaft 57 mounted in bearings 58 and 59 formed on the bed-plate 1. The feed-actuating lever 50 is provided with a stud 60 carrying a roller 61 which enters a groove 62 formed in the stitch-regulating lever 6. The stitch-regulating lever 6 is provided with a lug 63 into which is threaded an adjusting screw 64, the threaded end of which enters a groove 65 formed in the shaft 5, against which shaft the screw 64 is tightened to hold the stitch-regulating lever 6 in its adjusted position.

From the foregoing it will be understood that the feed-actuating lever 50 is rocked upon the pivot screw 54 by the action of the feed-cam 52 and that the degree of rocking movement given the crank 55 and, consequently, the rock-shaft 57 to which said crank is attached, depends upon the angle of adjustment of the groove 62 relatively to a straight line connecting the longitudinal center of the screw 54 with the axis of the cam shaft 10, which adjustment is effected by adjusting screw 64 bodily about the axis of shaft 5. On the forward end of the feed rock-shaft 57 is formed a reduced portion 66 which fits into an opening 67 of corresponding shape formed in a feed-bar lever 68, the latter being held, by a screw 69, against the shoulder 70 of the feed rock-shaft 57.

71 is a feed-bar to which is secured, by a screw 72, the feed-dog 73, one end of said feed-bar being provided with a circular opening 74 into which is fitted a circular portion 75 formed integral with the feed-bar lever 68, the opposite end of said feed-bar being acted upon by a spring 76 to resiliently hold said bar in its lowest position.

77 is a feed-bar lift-rod, the end 78 of which is formed at right angles to the main portion and journaled in a bearing 79 formed in an arm 80 and held against displacement by a pin 81, the arm 80 being formed integral with the shuttle-actuating lever 38. The free end of the feed-bar lift-rod 77 is mounted in a bearing 82 and provided with an inclined surface 83 which coacts with the lower edge of the feed-bar 71.

As the rod 77 is moved in the direction of its length, by the vibratory movements of the arm 80, the inclined surface 83, in connection with the movements of the feed-bar lever 68 and the control of the spring 76, effects the commonly termed four motion feed of the feed-dog 73. The feed-bar 71 is mounted in guide-ways 84, 85, formed in lugs 82 and 86 which project downwardly from the bed-plate 1.

87 is the arm face-plate secured, by screw 88 and pin 89, to the face of the head of the overhanging arm.

90 is a spring wire thread-controller, one end of which is secured to the face-plate, its

opposite end being provided with an eye 91 through which the needle-thread 112 is passed to the needle.

92 is a wire bracket, attached to the face-plate 87, which acts as a guard for the free end of the thread-controller and coacts with the latter to control the slack of the needle-thread during certain periods in the stitch formation. The upper end of the needle-bar is provided with a hole 93 through which the needle-thread passes, said bar, through its vertical movements, thus acting as a take-up to tighten the stitch.

94 is the commonly employed needle-thread tension device, 95 the spool-wire, and 96 a hole, formed in a lug extending upwardly from the head of the overhanging arm, through which the needle-thread is passed to the thread hole 93 in the needle-bar.

97 is a presser-bar provided with the usual cloth-presser 98, which latter is secured by screw 99 and nut 100 to the lower end of said bar, the upper portion of said bar being provided with the usual presser-bar spring 101, one end of which rests against the inner wall 102 formed in the head of the overhanging arm, the opposite end bearing against a collar 103 secured by a screw 104 to said presser-bar. The collar 103 is provided with a lug 105 which enters a groove 106 formed in the rear side of the head of the overhanging arm.

107 is the presser-bar lifter lever pivoted by a screw 108 to the head of the overhanging arm. To prevent axial movement of the needle-bar, the needle-bar bracket 32 is provided with a lug 109 which tracks in the groove 106.

110 is the shuttle bobbin provided with the under thread 111 which is interlocked with the needle-thread 112 in the usual manner to form stitches.

What I claim is:—

1. In a sewing machine, a needle-bar, an eye pointed needle carried by said bar, a shuttle-carrier, a shuttle, a bobbin carried by said shuttle, a feed-bar provided with a feed-dog, a two-part rotary shaft comprising a needle-carrying bar actuating shaft and a cam shaft, the latter having formed integral with it a feed-cam and a shuttle-actuating crank, and connections for operatively connecting said two-part shaft with the needle-bar, shuttle-carrier and feed-bar, the connection for operatively connecting said shaft with the shuttle-carrier being bifurcated to engage said shuttle-actuating crank, the engaging walls of said bifurcated portion consisting of plane surfaces formed integral with the lever.

2. In a sewing machine, a needle-bar, a shuttle-carrier, a shuttle, a feed-bar provided with a feed-dog, a two-part rotary shaft comprising a needle-carrying bar ac-

tuating shaft and a cam shaft, the latter having formed integral with it a feed-cam and a shuttle-actuating crank, said crank being provided with an enlarged annular portion having a convex periphery formed at an angle to the axis of said cam shaft, and connections for operatively connecting said two-part shaft with the needle-bar, shuttle-carrier and feed-bar, the connection for connecting said shaft with said shuttle-carrier being bifurcated to engage the convex periphery of said crank, the engaging walls of said bifurcated portion consisting of plane surfaces.

3. In a sewing machine, a needle-bar, an eye pointed needle carried by said bar, a shuttle-carrier, a shuttle, a bobbin carried by said shuttle, a feed-bar provided with a feed-dog, a two-part rotary shaft comprising a needle-bar-actuating shaft and a cam shaft, the latter having formed integral with it a feed-cam and a shuttle-actuating crank, said needle-bar-actuating shaft and cam-shaft each being journaled in a single bearing formed in the overhanging arm and arm standard, respectively, and connections for operatively connecting said two-part shaft with the needle-bar, shuttle-carrier and feed-bar, including a shuttle-actuating lever bifurcated to coact with said shuttle-actuating crank.

4. In a sewing machine, a needle-bar, an eye pointed needle carried by said bar, a shuttle carrier, a shuttle, a feed-bar provided with a feed-dog, a feed-bar lever, bearing lugs on the bed-plate, said feed-bar and feed-bar lever being operatively connected by a circular bearing and held in vertical alinement with each other by said bearing lugs, a two-part rotary shaft, and connections for operatively connecting said two-part shaft with the needle-carrying bar, shuttle carrier and feed bar.

5. In a sewing machine, a needle-bar, an eye pointed needle carried by said bar, a shuttle-carrier, a shuttle, a bobbin carried by said shuttle, a feed-bar provided with a feed-dog and a two-part rotary shaft comprising a needle-bar-actuating shaft and a cam shaft, the latter having formed integral with it a feed-cam and a shuttle-actuating crank, a driving pulley mounted independently of said two-part shaft, and connections for operatively connecting said two-part shaft with the needle-carrying bar, shuttle-carrier and feed-bar, in combination with means for varying the amplitude of the feed movements of said feed-bar including a stitch-regulating lever mounted to turn on the same axis as said driving pulley.

6. In a sewing machine, a needle-bar, a shuttle carrier, a feed bar, a rotary shaft consisting of a plurality of sections, comprising a needle bar actuating section, and a cam-

carrying section, the latter provided with a
feed cam and shuttle-actuating crank, a sin-
gle bearing for each of said sections and con-
nections for operatively connecting said sec-
5 tions with the needle bar, shuttle carrier and
feed bar.

Signed at Bridgeport, in the county of

Fairfield, and State of Connecticut, this 9th
day of March A. D. 1907.

EDWARD B. ALLEN.

Witnesses:

A. K. WILLIAMS, Jr.,

A. DONIHUE.