

A. H. DE VOE.  
RUFFLING AND STITCHING MACHINE.  
APPLICATION FILED NOV. 9, 1908.

955,951.

Patented Apr. 26, 1910.

4 SHEETS—SHEET 1.

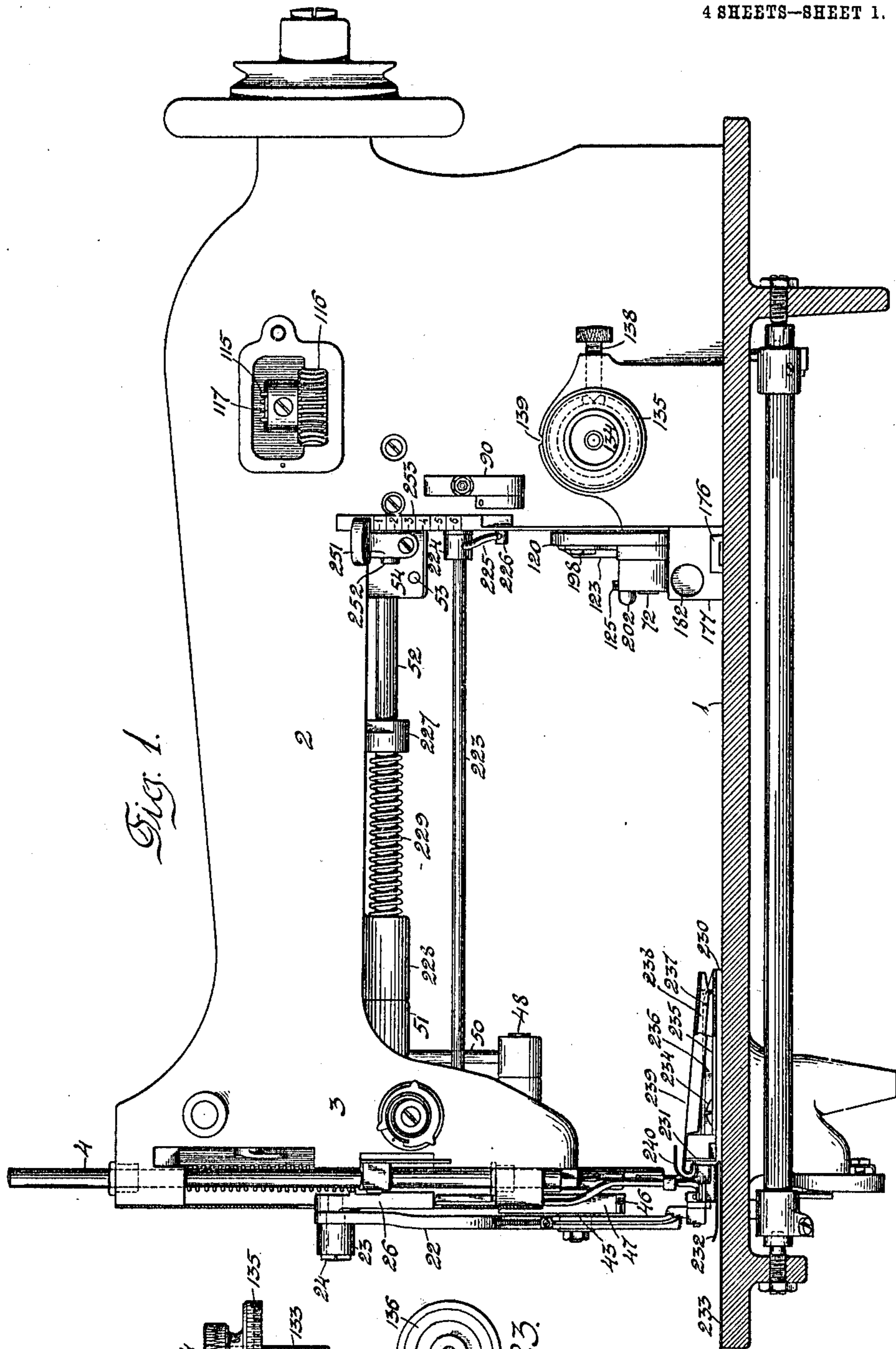


Fig. 1.

WITNESSES

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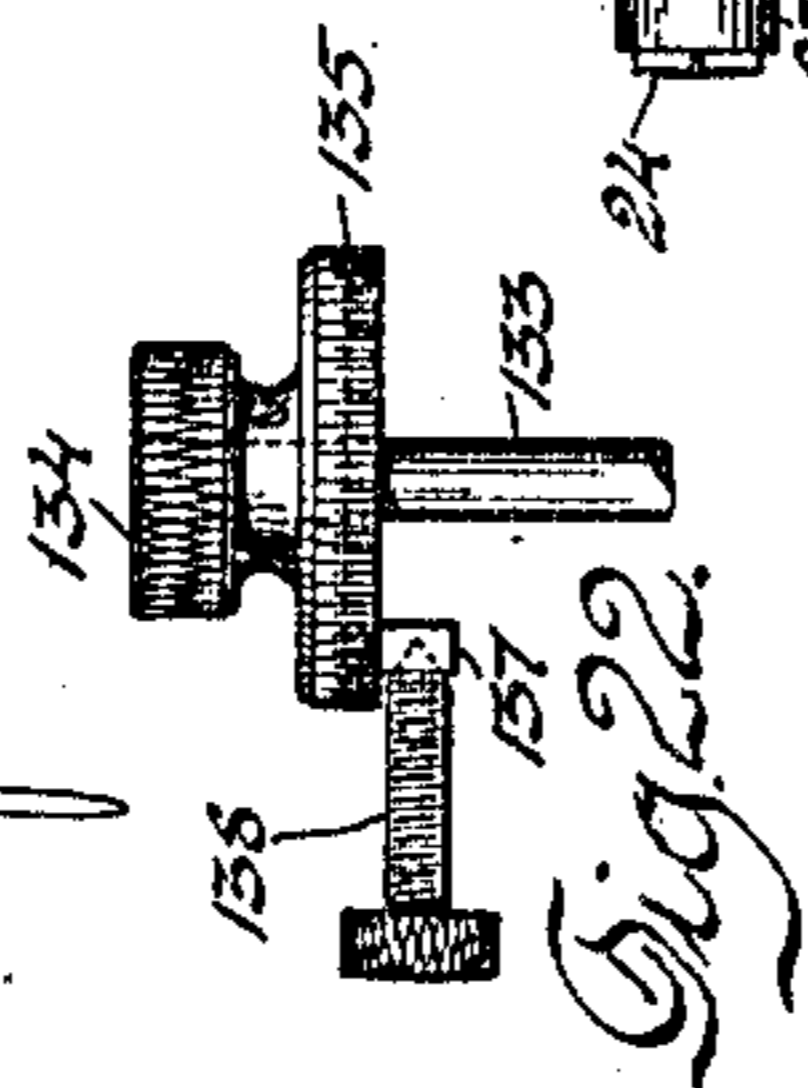


Fig. 22.

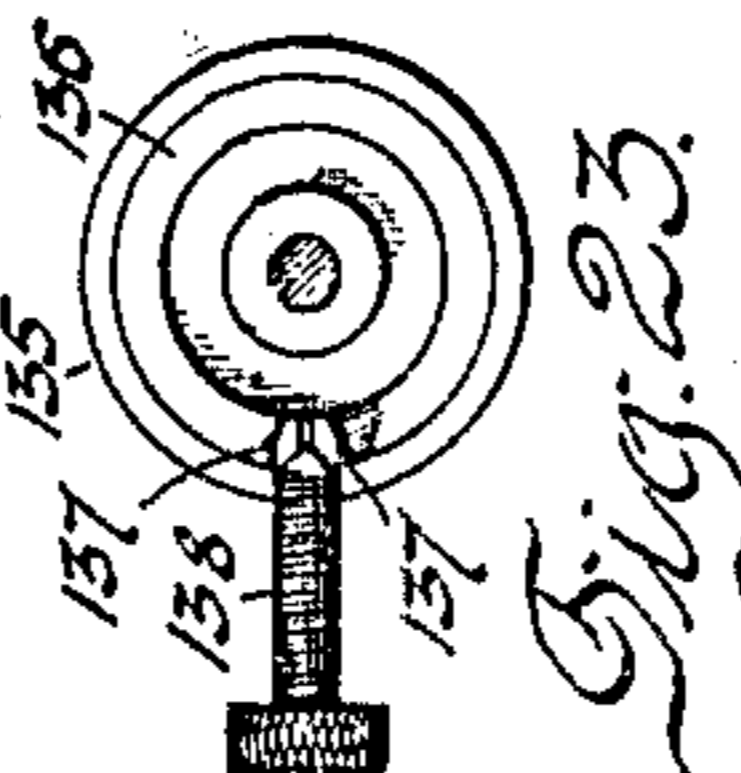


Fig. 23.

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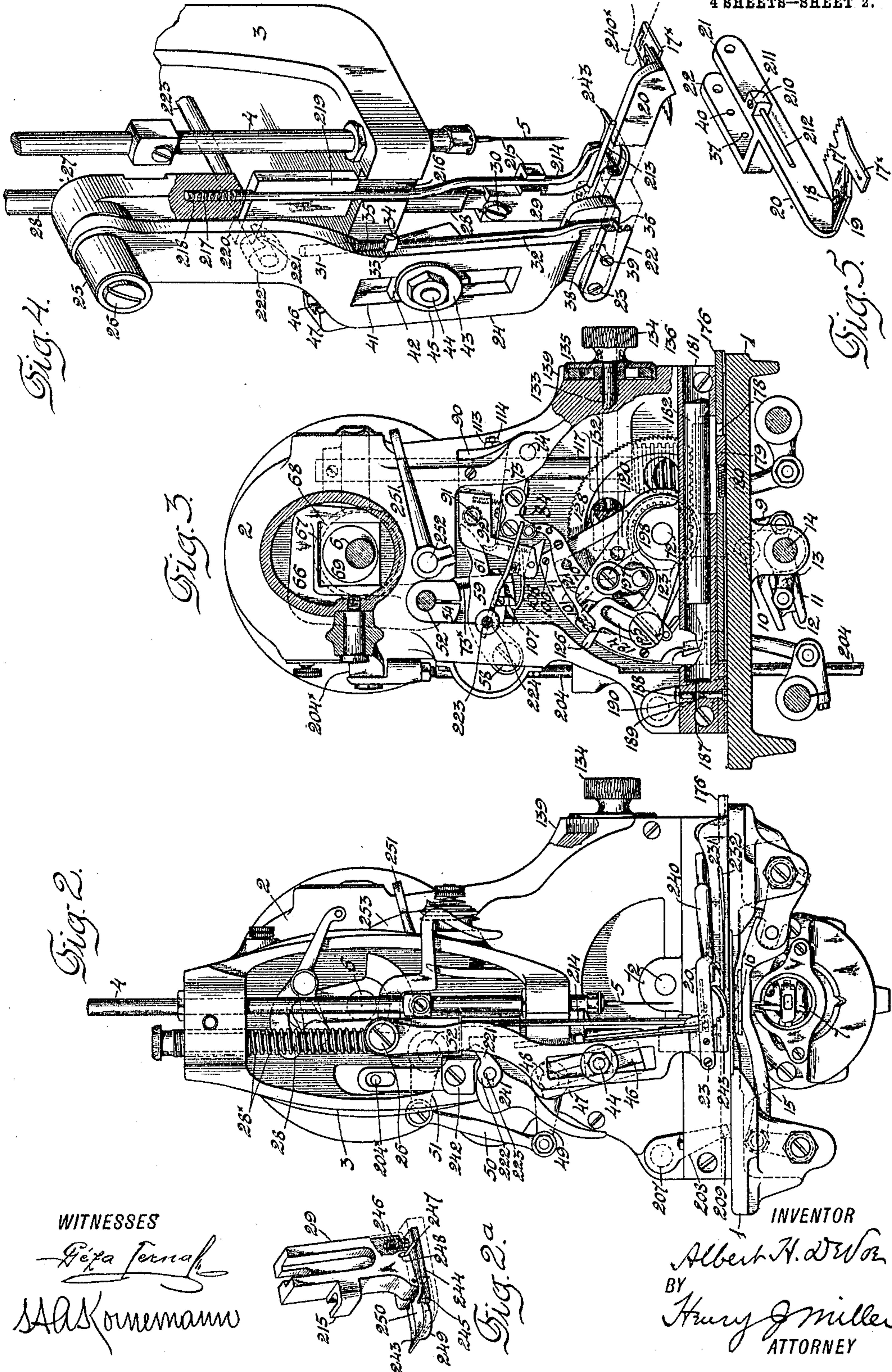
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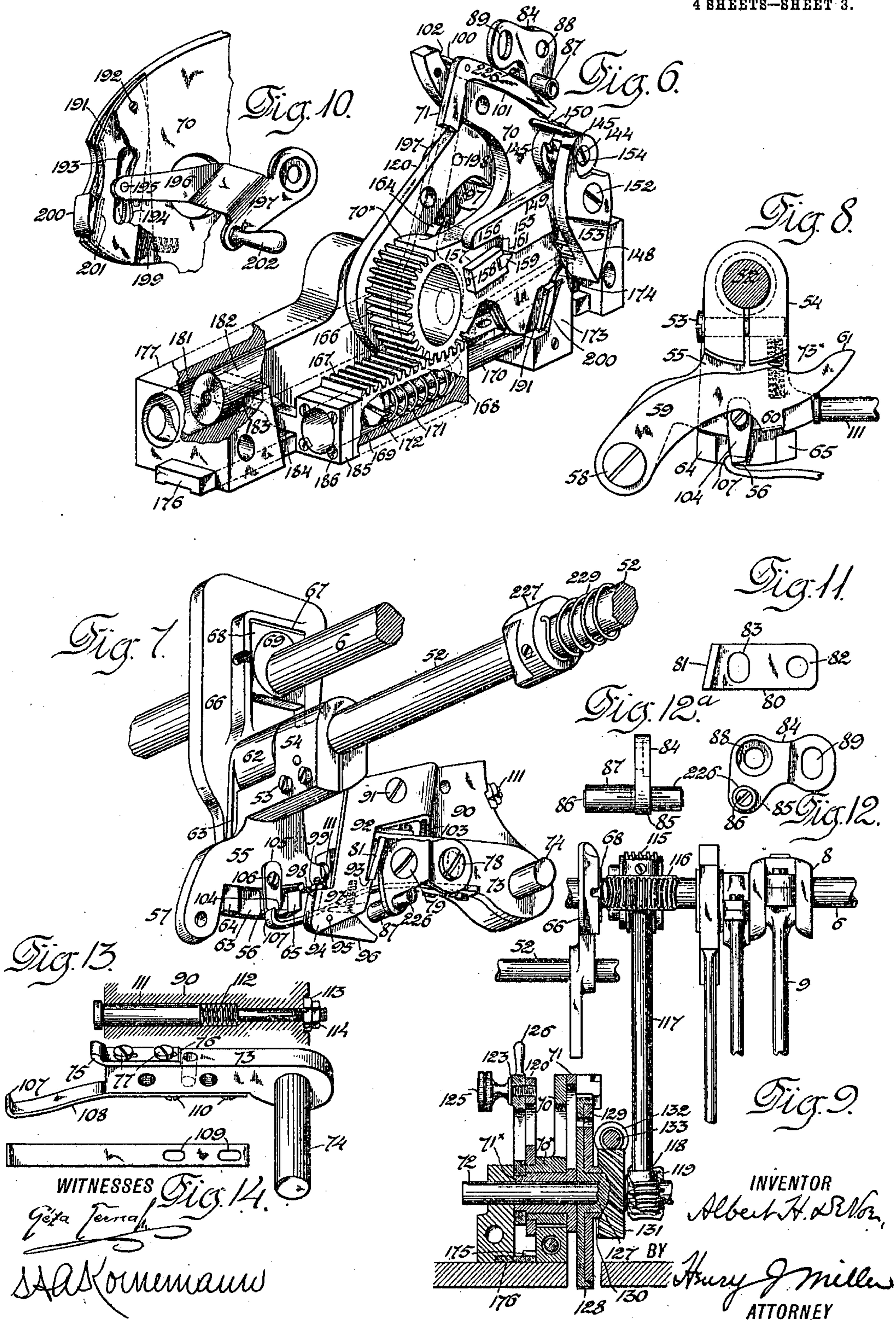
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4 SHEETS—SHEET 3.



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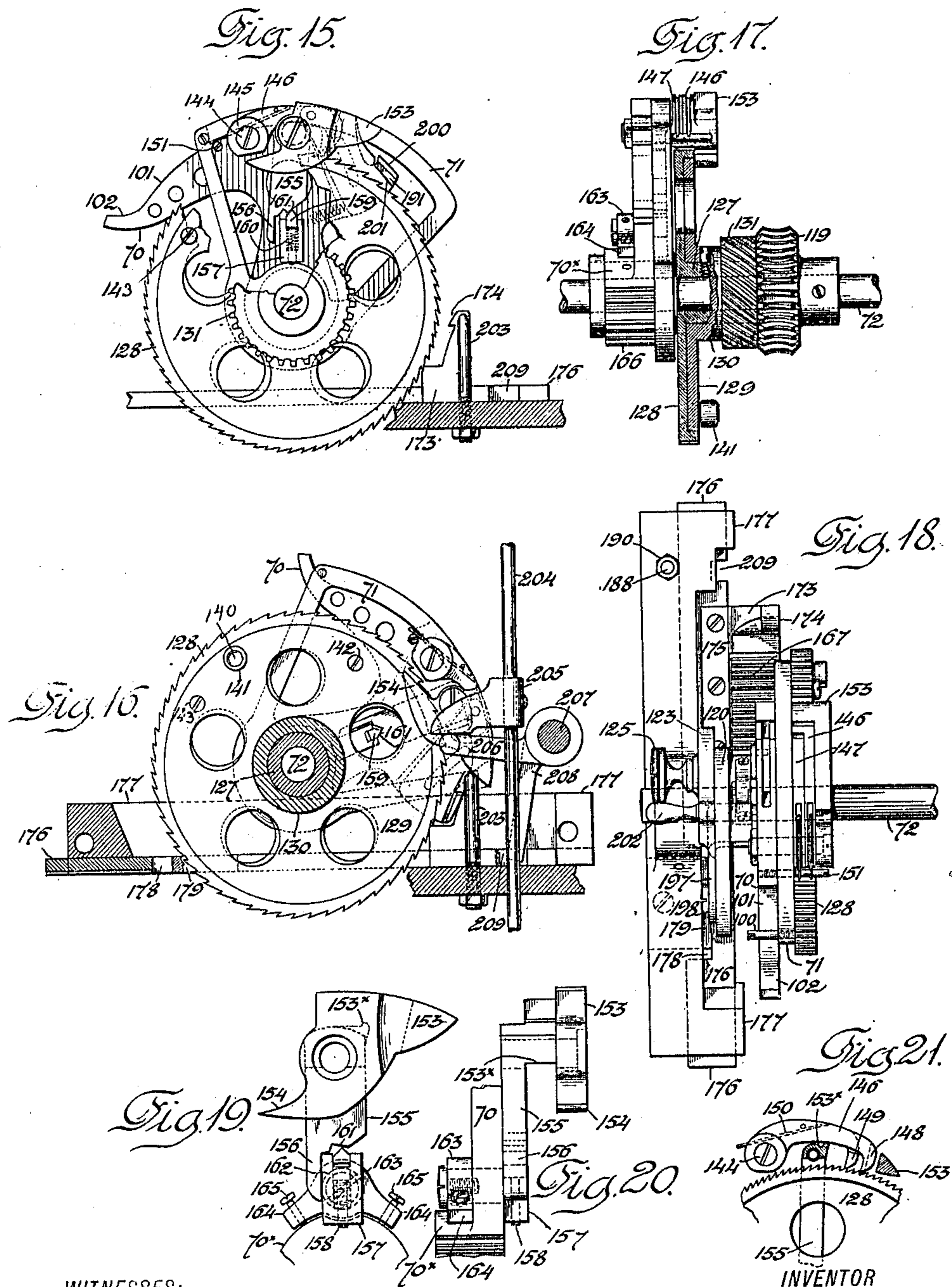
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

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## RUFFLING AND STITCHING MACHINE.

955,951.

Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed November 9, 1908. Serial No. 461,697.

*To all whom it may concern:*

Be it known that I, ALBERT H. DE VOE, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Ruffling and Stitching Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an improvement in that class of ruffling and stitching machines forming the subject of my United States Patent No. 837,668, of Dec. 4, 1906, and it has for its object to increase the effectiveness and facility of manipulation of the same in producing spaced series of ruffles with intermediate plain stitching.

20 The invention consists in the various features of construction herein shown and described and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying the present improvements, Fig. 2 a front end elevation of the same with the face-plate of the bracket-arm removed, Fig. 2<sup>a</sup> a perspective view of the presser-foot with a portion represented in dotted lines, and Fig. 3 a transverse sectional elevation of the machine representing the parts behind the head of the bracket-arm, with the adjacent cover-plate removed. Fig. 4 is a perspective view of the ruffling device detached from its actuating mechanism, and Fig. 5 a perspective view of the ruffling blade and its carrier. Fig. 6 is a perspective view, taken from the rearward side, of the controlling mechanism for the ruffler rock-shaft coupling device, and Fig. 7 a perspective view of the main-shaft, the ruffler rock-shaft and means for detachably coupling the same together. Fig. 8 is an elevation of the same with certain of the parts omitted. Fig. 9 is a sectional elevation of the controlling mechanism for the ruffler rock-shaft coupling device. Fig. 10 is a perspective view representing the latch device of the controlling mechanism. Figs. 11, 12, 12<sup>a</sup>, 13 and 14 are detail views of individual parts of the means for controlling the coupling device. Figs. 15 and 16 are side elevations showing the oscillatory members of the controlling mechanism in two different positions, and Figs. 17 and 18 are edge views of the same respectively, the

former being partly in section. Figs. 19 and 20 are, respectively, a side and edge view of the pawl shifting devices of the controlling mechanism. Fig. 21 is a detached elevation of a portion of the ratchet-wheel of the controlling mechanism with the clutch-pawls in operative relation therewith. Figs. 22 and 23 are respectively, edge and side views of the adjusting button and its holding device for determining the initial position of the oscillatory members of the controlling mechanism.

As shown in the drawings, the machine is constructed with the usual bed-plate 1 carrying the overhanging bracket-arm 2 provided at its forward end with a head 3 in which is mounted the needle-bar 4 with needle 5 and deriving reciprocating movements from the main-shaft 6 in a manner well-known, the needle 5 cooperating with an oscillating shuttle having the bobbin-case 7 and deriving its movements from a crank 8 upon the main-shaft through the pitman 9 connected with one arm of a rocker fulcrumed at 10 and having a second arm 11 slotted to embrace a slide-block 12 pivotally mounted upon a crank-arm 13 of a longitudinally arranged shuttle driving shaft 14 mounted in suitable bearings beneath the bed-plate and provided with the usual shuttle-driver operatively engaging the shuttle, as in my said prior patent. The feeding mechanism comprises the feed-bar 15 carrying the feed-dog 16 and is actuated by means common to the well-known Singer oscillating shuttle type of machine.

The ruffling blade 17 is formed with the usual sharpened notched and serrated edge and is fitted to and secured by means of a screw 18 upon a transversely ribbed and inclined seat afforded by the lateral arm 19 of a carrying lever 20 forked at its rearward end to form the parallel spaced members 21 and 22 which embrace and to which is pivotally connected by means of the pin 23 the lower extremity of the vibrating lever 24 provided at its upper end with a boss 25 fitted upon the fulcrum screw-stud 26 carried by a block 27 which is fixed upon the presser-bar 28 squared at its lower end to receive the socketed shank 29 of the presser-foot which is secured thereto by means of the fastening screw 30.

To maintain the ruffling blade normally

pressed downward toward the bed-plate, the offset central portion of the front edge of the lever 24 is formed with a substantially vertical socket 31 entered by the upper end of a push-rod 32 provided with a thrust collar 33 secured adjustably thereon by means of a screw 34 and between which and the upper end of the socket 31 is interposed a spring 35. The push-rod 32 is formed at its lower end with a laterally extending pin 36 entering an aperture 37 in one of the spaced members of the blade-carrier 20 by means of which the pressure of the spring 35 is communicated to said carrier. The offset lower end of the vibrating lever 24 is provided with a vertical slot 38 entered by a transverse stop-screw 39 which in turn is secured in a threaded aperture 40 in one of the members of the carrier 20, the engagement of the opposite ends of the slot 38 with the stop-screw 39 determining the range of movement of the blade-carrier 20, and hence the rising and falling movements of the ruffling blade in relation to the lever 24.

The swinging ruffling lever 24 is formed in its lower portion with a vertical slot 41 in which is loosely fitted a slide-block 42 confined between washers 43 upon the bolt 44 provided upon its outer end with the nut 45 and having its head fitted to the T-shaped slot 46 of a depending arm 47 of an intermediate rock-shaft 48 having fixed thereon the rearwardly extending crank-arm 49 connected by means of the pitman 50 with a similar arm 51 of the ruffler actuating rock-shaft 52 mounted in suitable bearings beneath the bracket-arm 2. As will be observed, the adjustment of the bolt 44 toward and from the intermediate rock-shaft 48, constituting the fulcrum of the arm 47, determines the length of throw of the lever 24, and consequently the operative or work-advancing movement of the ruffling blade 17.

Upon the rearward portion of the rock-shaft 52 is clamped by means of screws 53 the split hub 54 of a depending segmental crank-arm 55 having a downwardly projecting tooth 56 intermediate its ends and a depending ear 57 upon which is pivotally mounted by means of the screw-stud 58 the coupling lever 59 formed upon its lower edge with the coupling tooth 60 and with a curved cam-finger 61 extending beyond the same. Upon the rock-shaft 52 is loosely mounted adjacent the split hub 54 of the arm 55 the hub 62 of a crank-plate 63 having a segmental lower end provided with the spaced lateral teeth 64 and 65 embracing the tooth 56 of the fixed crank-arm 55, the lateral tooth 65 projecting beyond the face of the arm 55 for a purpose which will presently appear. Attached to the crank-arm 63 is a yoke-plate 66 extending upwardly therefrom and provided with a substantially vertical slideway 67 in which is fitted the

slide-block 68 which is in turn fitted upon the actuating eccentric 69 carried by the main-shaft 6. As will be observed, the rotation of the eccentric 69 with the main-shaft produces the vibration of the yoke-plate 66 which is communicated to the loose crank-arm 63 upon the ruffler shaft 52. When the coupling lever 59 is maintained in raised or inoperative position, as indicated in Figs. 3 and 8, the arm 63 vibrates idly during the plain-stitching operation of the machine without producing any effect upon the ruffling device; but when the coupling lever is released, its tooth 60 descends behind the outer portion of the tooth 65 of the vibrating lever 63, while the tooth 64 engages the adjacent face of the depending tooth 56 of the fixed arm 55, thus coupling the two arms together and causing the rocking of the shaft 52 and the consequent operative movement of the ruffling blade 17 through the connecting mechanism.

As described in my prior Patent No. 837,668, the position of the coupling lever 59 is controlled by means of a two-part pattern-cam comprising a primary member 70 and a secondary or auxiliary member 71 mounted upon the controller shaft 72 and carrying relatively adjustable tripping points for the coupling lever controller and its latch respectively. The controller comprises a laterally extending lifting lever 73 mounted upon the fixed horizontal fulcrum-pin 74 and provided upon its upper edge with a nose-piece 75 whose shank is formed with longitudinal slots 76 entered by the fastening screws 77 by loosening which the nose-piece may be adjusted endwise into the desired relation with the cam-finger 61 of the coupling lever 59 which normally rests thereon. Upon the forward face of the lifting lever is secured by means of fastening screws 78 and 79 the latch-plate 80 having the laterally projecting tooth 81 and provided with a round screw-aperture 82 to receive the screw 78 and a transverse slot 83 to receive the fastening screw 79. Overlying the latch-plate 80 is a second plate 84 having a projection 85 upon its lower edge upon which is mounted the pin 86 carrying the roller 87 adapted to engage the tripping portion of the primary cam-member 70. The plate 84 is provided with a round aperture 88 to receive the fastening screw 79 and a transverse slot 89 to receive the fastening screw 78. As will be observed, the loosening of the fastening screws enables the plates 80 and 84 to be independently adjusted upon the respective fastening screws as fulcrums so as to secure the proper cooperation of the parts. The bracket-piece 90 fixed in a slot in the bracket-arm, carries a fulcrum-stud 91 upon which is pivotally mounted the angularly shaped latch-lever 92 whose forward edge is provided with a

notch to form a latch-shoulder 93 for engagement with the lower or operative end of the latch-tooth 81 carried by the lifting lever 73. The lower end of the latch-lever 92 is provided with a forked lug 94 between the spaced members of which is pivotally mounted upon the transverse pin 95 the yielding tripping finger 96 pressed downwardly by means of a spring 97 interposed between its upper edge and the inner end of a socket in the latch-lever 92. The upper edge of the tripping finger rearward of the pivotal pin 95 is engaged by the point of a stop-screw 98 tapped into a rearward extension of the lever 92 above the same and provided with a set-nut 99 for holding the same in the desired position of adjustment. The forward or operative portion of the tripping finger 96 is wedge-shaped and presents a downwardly inclined forward shoulder adapted for positive engagement with a lateral tripping pin 100 upon the cam-member 71 in the operative movement of the same toward the rearward side of the machine in order to shift the latch-lever 92 to disengage its shoulder 93 from the tooth 81 of the lifting lever for releasing the same for operative engagement of its roller-stud 87 with the concentric portion 101 and upwardly inclined portion 102 of the primary cam-member 70; while its upwardly inclined lower edge is so presented to such tripping pin 100 in the return movement of the cam-member that the finger is merely lifted in opposition to its spring 97 without affecting the position of the latch-lever 92 which is caused to assume operative or locking relation with the latch-tooth 81 under the action of the spring 103 interposed between the same and the lever 73 when the latter is raised by engagement of its roller-stud 87 with the upwardly inclined cam-portion 102 of the cam-member 70, which causes the nose-piece 75 to lift the coupling lever 59 so as to uncouple the crank-arms 55 and 63 to interrupt the ruffling action.

When the coupling lever 59 is raised out of engagement with the tooth 65, in case the fixed arm 55 is not in its extreme forward position so as to bring the ruffling blade 17 into extreme retracted position, the succeeding engagement of its tooth 56 by the rearward tooth 64 of the arm 63 throws it into extreme forward position in which the laterally extending locking finger 104 upon the plate 105 overlying the tooth 56 and secured in position by means of the screw 106, is engaged by the upwardly extending cam-hook 107 of the locking arm 108 whose shank is provided with longitudinal slots 109 entered by fastening screws 110 by which it is adjustably secured to the lower edge of the lifting lever 73. At the same time, the forward extremity of the segmental lower portion of the arm 55 is thrown into contact with the

buffer-pin 111 fitted to a transverse socket in the bracket-piece 90 and having its reduced forward portion surrounded by a spring 112 interposed between the head of the same and the opposite extremity of the socket, the threaded rearward end of the pin being provided with a thrust nut 113 and a lock-nut 114 by means of which the position of the operative end of the pin may be adjusted. It will be observed that, by these means, not only are the vibrating arms 55 and 63 positively locked together, throughout the period of operation of the ruffling device, but the arm 55 is similarly locked in inoperative position. As will be observed, the arm 108 is made sufficiently thin and resilient to permit the hook 107 to yield, in case it is caused to rise in advance of the beveled forward edge of the locking finger 104, under which condition the forward movement of the finger and its engagement with the rounded nose of the hook 107 causes the depression of the latter which springs upwardly behind the abrupt rearward edge of the finger so as to positively engage the latter and hold it securely in its forward position.

As described in my prior patent, the main-shaft 6 carries a worm 115 meshing with a worm-wheel 116 upon the vertical shaft 117 carrying at its lower end a worm 118 meshing with the worm-wheel 119 fixed upon the rearward end of the controller shaft 72 within the lower portion of the upright member of the bracket-arm. The secondary cam-member 71 is provided with the forwardly projecting hub 71\* upon which is loosely fitted the hub 70\* of the primary cam-member 70. Upon the reduced extremity of the hub 70\* is fixed the segment arm 120 provided upon its outer edge with the graduated scale 121 coöperating with the pointer carried by a second arm 123 fixed upon the reduced outer end of the hub 71\* and provided with a segmental slot 124 entered by the shank of a fastening screw 125 tapped into the arm 120 and adapted, through the overlying arms, to maintain the cam-members in the desired position of adjustment. For convenience in shifting the arm 123 it is provided with a radial finger 126 adapted to be grasped by the operator. Fixed upon the shaft 72 intermediate the worm-wheel 119 and the hub 71\* of the cam-member 71 is the hub 127 of the ratchet-wheel 128 recessed in its rearward face to receive the disk 129 whose hub 130 is loosely fitted upon the hub 127 and carries the angular gear 131 meshing with the smaller gear 132 fixed upon a spindle 133 extended forwardly and provided with the knurled headed button 134 with the peripherally graduated indicator wheel 135 having its inner face recessed to receive the split clutch-ring 136 provided in its adjacent extremities with the rearwardly projecting and oppositely be-

eled lugs 137 affording a tapered intermediate recess entered by the tapered point of the screw 138 tapped into one side of the bearing of the spindle 133. As indicated in the drawings, the top of the said bearing is provided with a notch 139 through which the peripheral graduations of the wheel 135 may be seen. The disk 129 carries upon its rearward face the tripping stud 140 upon which is mounted the anti-friction roller 141 and is provided also with the spaced stop-pins 142 and 143 to engage the bed-plate adjacent and at opposite sides of the disk in order to limit the latter's circular movement between extreme positions.

The primary cam-member is provided upon its rearward face with a screw-stud 144 upon which are mounted the hubs 145 of two pawls 146 147 whose teeth 148 and 149 are both normally pressed into operative relation with the peripheral teeth of the ratchet-wheel 128 by means of the springs 150 carried by the respective pawls with the ends resting upon the screw-pin 151. The teeth 148 and 149 of the pawls are so spaced apart that while one is in engagement with a tooth of the ratchet-wheel 128 the other assumes a position midway of two other teeth of the ratchet-wheel, as represented in Fig. 21, so as to insure prompt initial coupling of the primary cam-member to the ratchet-wheel at the beginning of each ruffing operation. Adjacent the stud 144 is disposed another screw-stud 152 affording a pivotal support for the pawl-lifter 153, which is formed with an upper edge adjacent the operative ends of the pawls 146 and 147 with a cam face substantially concentric with the curvature of the auxiliary cam-member when the pawl-lifter is in its operative or outer position, and upon the opposite side of the supporting stud 152 with a tail 154 whose upper edge is adapted to engage the flatted hubs 145 of the clutch-pawls and whose curved lower edge affords a cam surface adapted for engagement with the tripping roller-stud 141 of the disk 129.

The pawl-lifter 153 is provided with a substantially radial arm 155 having a stop-finger 156 adapted to engage a block 157 upon the rearward face of the primary cam-member 70 and provided with a socket in which is fitted the shank 158 of a latch-block 159 and provided with a surrounding spring 160 by which the wedge-pointed latch-block is pressed normally against the opposite sides of a correspondingly shaped tooth 161 formed upon the arm 155 adjacent the finger 156. As the wedge-shaped points of the members 159 and 161 are arranged to register only when the pawl-lifter 153 is in intermediate position, it will be observed that the spring-pressed latch-block 159, in its action upon the inclined sides of the tooth 161 tends to yieldingly maintain the pawl-lifter

in one or the other of its extreme positions. As represented in Fig. 21, the hub of the pawl-lifter is provided with a lateral projection 153\* adapted to engage the lower edges of the pawls 146 and 147 to lift the same from operative relation with the ratchet-wheel 128 when the pawl-lifter is in outer or operative position, thus unclutching the connected cam-members from the ratchet-wheel which receives a continuous rotary motion through the worm and worm-wheel gearing with the main-shaft before described.

To afford the desired angular adjustment for the latch-block 159, its supporting block 157 is formed as the head of a pin 162 passing through the cam-member 70 and having fixed upon its opposite end the collar 163 with oppositely extending arms 164 carrying adjusting screws 165 whose points normally rest upon the hub 70\* of said cam-member. As will be observed, by retracting one of the screws 165 and correspondingly advancing the other, the pin 163 may be circumferentially adjusted and the position of the latch-block 159 correspondingly varied in relation to the tooth 161.

Upon one side of the hub 70\* is formed a segmental pinion 166 which meshes with a rack 167 formed upon the top of a block 168 which is formed with a cylindrical socket 169 to whose reduced rearward end is fitted a guide-rod 170 normally maintained in its forward position by means of a spring 171 interposed between the rearward end of the socket 169 and a shoulder formed by the screw-head 172 at the forward extremity, while upon the rearward extremity of said rod is secured a head 173 carrying the forwardly extending detaining hook 174 and provided with a lateral flange 175 attached to the slide-bar 176 slidingly fitted within the bearing member 177 and provided with a lateral notch 178 entered by the stop-plate 179 carried by the bearing member 177. The stop-plate 179 is provided with a socket for the spring 180 interposed between the inner end of said socket and the adjacent end of the notch 178 in the slide-bar 176, whereby the detaining hook 174 is yieldingly pressed toward rearward or retracted position.

As the two-part pattern cam is advanced by the ratchet-wheel 128, it will be observed that the block 168 is caused to travel toward the front of the machine, thus winding up the returning spring 171, while the lifting of the pawls 146 and 147 serves to uncouple said parts to permit the cam-members 70 and 71 to return to initial position under the action of the spring 171 and the intermediate rack-and-pinion 167 and 166. In order to prevent too great concussion in the arresting of the retractive movement of the pattern-cam, the bearing member 177 is formed with

a cylindrical bore 181 in which is fitted the reciprocating plunger 182 provided with a lateral notch 183 entered, through a longitudinal slot in the side of the cylinder, by a rigid arm 184 projecting from a plate 185 secured by means of screws 186 to the forward end of the rack-block 168. The vent passage 187 at the rearward end of the cylinder 181 is intersected by a small screw-bolt 188 having a transverse aperture 189 adapted to register with the vent passage 187 by turning the screw-bolt 188 to adjust its aperture to the required vent opening with the vent passage 187. The speed of movement of the plunger 182 is controlled by the regulated flow of air to and from the rearward end of the cylinder behind the piston. The screw-bolt 188 is provided with a lock-nut 190 to prevent the turning of the bolt under the operation of the machine. The outer portion of the cam-member 70 opposite the inclined shoulder 102 is provided with a slot parallel with its face to embrace a latch-plate 191 pivoted within the same by means of a screw-pin 192 and formed with a cam-slot 193 adapted to register at the end nearest the pivotal pin 192 with a similar slot 194 in the front face of the cam-member, said slot being entered by a common stud 195 at the outer end of a spring arm 196 offset from a shift-lever 197 fulcrumed upon the screw-stud 198 carried by the segment arm 120. The latch-plate 191 is pressed normally outward by means of a spring 199 interposed between one end of a socket or recess formed in the member 70 and the inner end of the latch-plate, which latter is provided upon its outer edge with a transverse latch-piece 200 fitted to a notch or recess 201 in the adjacent edge of the member 70. As the slot 194 is concentric with the fulcrum-stud 198 around which the stud 195 moves, while the main portion of the slot 193 is eccentric thereto in the outer position of the latch-piece 200, it will be observed that, when the lever 197 is shifted by means of its handle 202 into the enlargement of the cam-slot 193 at the end nearest the pivotal pin 192, the latch-plate is free to swing upon such pivotal pin under the action of the spring 199 within the limits embraced by the enlarged end of said slot, but when the lever 197 is shifted to bring the stud 195 to the opposite ends of the slots 193 and 194, the latch-piece 200 is drawn into inoperative position in its notch or recess 201.

As previously indicated, when the pawl-lifter 153 is in its outer position and the pawl-teeth 148 and 149 disengaged from the teeth of the propelling ratchet-wheel 128, the cam-members are permitted to move under the action of the returning spring 171 toward initial position at the front of the machine, but as the tail 154 of the pawl-

lifter is engaged by the roller-stud 141, the pawl-lifter is tilted to release the pawls which, under the action of their springs 150, reengage the teeth of the propelling ratchet-wheel. The two-part cam being thus coupled with its propelling device, it begins its forward or operative travel without any effect upon the ruffling mechanism until the tripping pin 100 comes into engagement with the inclined forward edge of the tripping finger 96, when the latch-lever 92 is swung upon its fulcrum-pin 91 for disengagement from the latch-tooth 81 carried by the lifting lever 73, which latter is caused to fall and its roller-stud 87 to successively engage the portions 101 and 102 of the primary cam-member. The lever 73 carries downward with it the nose-piece 75, which releases the coupling lever 59 and permits it to drop behind the tooth 65 of the lever 63 under the action of the spring 73<sup>x</sup>, whereby the ruffling device is coupled to its actuating mechanism and the ruffling operation proceeds until the roller-stud 87 reaches the top of the inclined cam-portion 102 of the primary cam-member, as represented in Fig. 3 when the lifting lever 73 resumes its initial elevated position in which it is again locked by engagement of the shoulder 93 of the latch-lever 92 with its latch-tooth 81. The descent of the lever 73 in starting the ruffling operation evidently carries with it the locking arm 108 whose hook 107 becomes temporarily disengaged from the locking finger 104 upon the lever 55, but upon the rise of the lever 73 to initial position at the end of the ruffling operation, the locking arm 108 is caused to reengage the finger 104, as previously described, to insure the retention of the ruffling member in retracted position. The continued advance of the members 70 and 71 produces no further action upon the ruffling devices, but provides for their inoperation to permit the production of a succession of plain stitches upon an unruffled portion of the material, which continues until the outer cam-face of the pawl-lifter 153 encounters the rounded end of the stationary tripping pin 203 at the rearward side of the machine, when the pawl-lifter is tilted and the pawls disengaged from the propelling ratchet-wheel. At the same time, the latch-piece 200 rides over the point of the detaining hook 174 and snaps beneath the same, whereby the cam is locked in its advance position while the plain stitching operation is permitted to continue as long as may be desired.

To begin a new stitching and ruffling operation, the slide-bar 176 may be retracted to disengage the hook 174 from the latch-piece 200 by drawing down the treadle-rod 204 provided with the collar 205 having a lateral projection, which engages the lateral arm 206 fixed upon a rocking pin 207 which

is provided with a depending arm 208 entering a slot 209 in the slide-bar 176. The release of the latch-piece 200 permits the pattern-cam to return to initial position under the action of the returning spring 171, the tripping pin 100 passing beneath and brushing aside the spring-pressed finger 96 of the latch-lever 92 without otherwise affecting the coupling mechanism. As the rack-spring 171 is initially stronger than the detaining hook retracting spring 180, it will be observed that when the rack-spring is under considerable compression when the pattern-cam approaches its advance position as represented in Fig. 3, the spring 180 is compressed and the slide-bar 176 drawn forward in opposition thereto to bring the detaining hook 174 in operative relation with the latch-piece 200. When, however, the pattern-cam approaches its forward position upon its release by forcible retraction of the hook 174 in opposition to its spring 180, and the tension of the rack-spring 171 is reduced by its expansion under the return movement of the rack-block 168, the power of the spring 180 exceeds that of the spring 171 and forces the head 173 carrying the detaining hook 174 backwardly out of the range of movement of the block 168, so that no resistance is imposed upon the latter to arrest its backward movement to extreme retracted position at the time when its returning spring is the weakest.

The member 21 of the ruffler-carrier is provided with a lateral lug 210 formed with an aperture in which is adjustably secured by means of the set-screw 211 the horizontal pin 212, which is engaged from beneath by the laterally bent extremity 213 of a lifting rod 214 passing through a slotted guide-lug 215 in the shank of the presser-foot 29 and a recess 216 in the lower bearing member of the head 3 of the bracket-arm and entering a vertical socket 217 formed in the lower portion of the block 27, between the upper end of which socket and the top of the rod 214 is interposed the spring 218 normally pressing the rod into lower or inoperative position. The rod 214 has fixed thereon beneath the block 27 a plate 219 having a rearwardly extending lug 220 normally disposed above the lateral lifting finger 221 extending from a collar 222 fixed to the forward end of a rock-shaft 223 which has fixed upon its rearward end portion a collar 224 provided with a lateral arm 225 which normally rests upon a roller-stud 226 carried by the adjustable plate 84 mounted upon the lifting lever 73. It will be observed that the lifting rod 214 is normally maintained in its raised position, retaining similarly raised the carrier 20 with the ruffling blade 17 mounted thereon to enable the ply of material to be intermittently ruffled to pass freely beneath the same without resistance

in the plain stitching operation; but when the lifting lever 73 is dropped to permit the action of the coupling lever 59 to bring the ruffling mechanism into action, the descent of the stud 226 permits the shaft 223 to rock sufficiently under the action of the spring 218 to cause the carrier 20 to be lowered, whereby the ruffling blade is brought into operative relation with the work. The raising of the lifting lever 73 obviously acts through the rock-shaft 223 and intermediate connections to lift the carrier 20 into initial inoperative position.

In the drawings, the rock-shaft 52 is shown provided with a fixed collar 227 between which and the bearing 228 of the bracket-arm it is surrounded by a spring 229 attached at one end to said collar and at the other end to the bearing. The object of this spring is to insure the rocking of the shaft 52, upon the uncoupling of the arms 55 and 63, which causes the arm 55 to immediately assume its advance position, in which it is locked by the arm 108 of the lifting lever 73. It is evident, however, that while employment of this spring is preferable, it is not a necessary part of the mechanism.

As herein represented, the machine is provided with guides comprising the base-plate 230 carrying the upturned edge-guiding flange or lip 231 and the yielding separator-plate 232 spaced slightly above the supporting plate 233. Upon the separator-plate is secured for lateral adjustment by means of fastening screws 234 a hinged plate 235 provided with a slotted rib 236 in which is secured by means of the pivotal pin 237 one end of a tongue 238 depending from the scroll-plate 239 provided at its opposite edge with the edge-turning scroll 240 extending over and beyond the guiding flange 231. The reduced forward portion 240<sup>x</sup> of the folder extends above the backwardly and downwardly inclined tongue 17<sup>x</sup> upon one side of the ruffling blade, upon which it rests, as indicated in dotted lines in Fig. 4. When the ruffling mechanism is thrown out of action, the edge-folder is raised slightly with the ruffling blade, merely for clearance, but when the presser-foot is lifted in opposition to the presser-bar spring 28<sup>x</sup> by means of the treadle-rod 204 and rock-lever 204<sup>x</sup>, or by the finger-lever 241 acting upon a lug 242 carried by the presser-bar, for the insertion or removal of the work, the carrier 20 is raised still higher above the work-plate, and the hinged folder 240 is correspondingly raised, as represented in Fig. 1.

The presser-foot is shown with its shank 29 fitted within a longitudinal channel in the foot-plate 243 which is pivoted thereto intermediate its ends by means of the transverse pin 244 and is provided with the needle-hole 245. Interposed between the heel of the foot-plate and the upper end of a

socket formed therefor in the shank is a spring 246 normally pressing the heel portion downwardly, a transverse stop-pin 247 working between the opposite ends of the vertical slot 248 within the shank. The forward end of the foot-plate is provided with a longitudinal slot extending into one side of the needle-hole through which passes the depending guide-fin 249 of a spring-plate 250 secured upon the top of the foot-plate beneath the shank 29. The guide-fin 249 is normally disposed in its lower position to guide the folded edge of the upper ply of material to the needle, but it is caused to recede above the lower operative face of the foot-plate upon the movement of the ruffling blade to its extreme advance position, thereby permitting the ruffling blade to advance up to and beyond the needle-path beneath the presser-foot without limitation by such normally depending guide-fin.

As herein represented, the machine is fitted for applying yokes to shirt waists. For this operation, the yoke lining or inner ply of material is introduced beneath the separator-plate 232 with its edge in contact with the guide-lip 231, the back of the shirt body overlying the plate 232 beneath the ruffler-blade with its edge also in contact with the guide-lip 231, and the outer portion of the yoke or top ply of goods is introduced from beneath the bracket-arm with its edge within the scroll 240, the stitching being applied through the doubled margin of the upper ply and the overlapped edges of the lower plies of the garment. The presser-foot being lowered, the ruffler-carrier descends into operative position, permitting the edge-folder to assume its lower or operative position.

The length of stitch is regulated substantially as described in my prior Patent No. 837,668, by setting the stitch regulating lever 251 upon the fulcrum-carrying rock-shaft 252 for the desired number of stitches per inch, in register with the graduations of the segmental scale 253 at the front side of the bracket-arm. The clutch-screw 138 is then loosened and the button 134 is turned to bring the graduation of the indicator-wheel 135 corresponding with the desired number of initial stitches into register with the inspection notch 139 of the casing, whereby the disk 129 is set to bring its stop-stud 141 in the proper position for cooperating with the pawl-lifter 153 in clutching the pattern-cam to the propelling ratchet-wheel 128. The oscillatory controlling mechanism being locked in its advance position as represented in Fig. 16, the actuation of the treadle-rod 204, as before described, serves to retract the detaining hook 174 and permit the pattern-cam to move under the action of its spring 171 to initial operative position in which the tail 154 of

the pawl-lifter engages the stop-stud 141 to clutch the cam to the propelling wheel 128, whereupon the cam travels forwardly and so controls the coupling lever 59 as to permit the production of the desired number of plain stitches for stitching together the several plies of material in the initial portion of the seam, then causes the ruffling device to operate to ruffle or gather for the predetermined period the margin of the shirt body intermediate the two superposed yoke portions, after which the plain stitching is allowed to continue for the remainder of the seam. When the shift-lever 197 is shifted to bring the pin 195 into the ends of the slots 193 and 194 farthest from the fulcrum-pin 192 of the latch-plate, and the latch-piece 200 is thereby maintained retracted from operative relation with the detaining hook 174, the engagement of the tripping pin 203 with the outer cam-face of the pawl-lifter 153 unclutches the pattern-cam from the wheel 128 and permits the same to be immediately returned by its spring 171 for reclutching by means of the stop-stud 141; the machine being thus adapted to produce continuously uniformly spaced alternating series of plain stitched and ruffled fabric.

While the machine, as herein shown and described, includes many advantageous features of construction and arrangement, one of the most important of these is the construction and arrangement of parts whereby the means for carrying, actuating and controlling the operation of the ruffling blade are all disposed either remotely from or rearwardly of the needle-path, whereby the operator is enabled to handle the work with the same facility as with a plain stitching machine without ruffling mechanism. By pivotally connecting the blade-carrier to its supporting and actuating member and applying thereto the spring for depressing the ruffling blade behind the needle-path, the ruffling blade is adapted to be made very short and secured rigidly to such carrier, so as to allow the greatest facility for inspection by the operator of the work as it progresses, in addition to the freedom for presenting the several plies of fabric in the proper relation for the stitching and ruffling operations.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a ruffling blade carried by said ruffling lever, a rock-shaft mounted independently of the presser-bar, an operative connection between said rock-shaft and the ruffling-lever, actuating means for said

rock-shaft, and means for establishing and interrupting operative relation between said rock-shaft and its actuating means.

2. In a sewing machine, the combination  
5 with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a ruffling blade carried by said  
10 ruffling lever, a rock-shaft mounted in fixed bearings adjacent and independent of the presser-bar and below said fulcrum-stud, means for rocking the same, an arm upon  
15 said rock-shaft adjacent said ruffling lever, and a pivotal connection intermediate said arm and the ruffling lever.

3. In a sewing machine, the combination  
20 with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a ruffling blade carried by said  
25 ruffling lever, a rock-shaft mounted in fixed bearings adjacent the presser-bar and below said fulcrum-stud, means for rocking the same, an arm upon said rock-shaft adjacent said ruffling lever, and a pivotal stud carried by said arm and adjustable lengthwise  
30 of the latter and of said ruffling lever and affording a direct coupling between the same.

4. In a sewing machine, the combination  
35 with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a ruffling blade carried by said ruffling  
40 lever, and means for actuating said ruffling lever comprising an actuating rock-shaft, means for rocking it, a second rock-shaft mounted in fixed bearings adjacent the presser-bar and below the first-mentioned  
45 rock-shaft, crank-arms upon said rock-shafts, a pitman connection intermediate said crank-arms, a depending arm upon the second rock-shaft adjacent said ruffling lever, and a pivotal connection intermediate  
50 said depending arm and the ruffling lever.

5. In a sewing machine, the combination  
55 with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade mounted upon said carrier, means for imparting swinging movements to said lever,  
60 manually controlled means connected with said fulcrum for lifting said lever bodily, and automatically acting means independent thereof for lifting the ruffler blade from  
65 operative relation with the work.

6. In a sewing machine, the combination  
with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel  
70 with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade mounted upon said carrier, a spring for pressing said carrier downwardly and connected therewith at a point rearward of the  
75 needle-path, means for lifting the ruffling lever and carrier, means independent thereof for lifting said carrier, and means for imparting swinging movements to said lever. 80

7. In a sewing machine, the combination  
with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel  
85 with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade mounted upon said carrier, a push-rod journaled at one end in a bearing afforded by  
90 the ruffling lever and pivotally attached at the opposite end to the carrier rearward of the needle-path, a spring for pressing said push-rod downwardly, and means for imparting swinging movements to said lever. 95

8. In a sewing machine, the combination  
with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel  
100 with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade mounted upon said carrier, a push-rod journaled at one end in a bearing afforded by  
105 the ruffling lever and pivotally attached at the opposite end to the carrier rearward of the needle-path, a spring for pressing said push-rod downwardly, means for adjusting the pressure of said spring, and means for  
110 imparting swinging movements to said lever.

9. In a sewing machine, the combination  
with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel  
115 with that of the needle-path and provided with a socket extending lengthwise thereof, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling  
120 blade mounted upon said carrier, a push-rod journaled at one end in said socket of the ruffling lever and pivotally attached at the opposite end to the carrier rearward of the needle-path, a thrust-collar fixed upon and  
125 adjustable lengthwise of said push-rod, and a spring surrounding said push-rod and interposed between said thrust-collar and the end of the socket in the ruffling lever.

10. In a sewing machine, the combination 130

with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a ruffling lever fulcrumed rearward of and adapted to swing in a plane parallel with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade rigidly secured upon said carrier, a spring for pressing said carrier downwardly and connected therewith at a point rearward of the needle-path, and means for imparting swinging movements to said lever.

11. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, and feeding mechanism, of a presser-foot, a presser-bar by which the same is carried, a lifter for said presser-bar; a ruffling lever fulcrumed upon said presser-bar and adapted to swing in a plane parallel with that of the needle-path, a carrier pivotally connected to said ruffling lever rearward of the needle-path, a ruffling blade mounted upon said carrier, a lifter connected with said carrier also rearwardly of the needle-path, and means for actuating said lifter to raise the carrier from operative position.

12. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, means for lifting said presser-bar, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a carrier pivotally connected to said ruffling lever, a ruffling blade mounted upon said carrier, means for pressing said carrier downwardly, means comprising a member carried by said ruffling lever for limiting the circular movement of the carrier upon its pivoted connection with the ruffling lever, and means for imparting swinging movements to said ruffling lever.

13. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, means for lifting said presser-bar, a fulcrum-stud mounted upon and sustained by the presser-bar, a ruffling lever mounted upon said fulcrum-stud, a carrier pivotally connected to said ruffling lever, a ruffling blade mounted upon said carrier, means for pressing said carrier downwardly, a pin-and-slot connection intermediate said ruffling lever and carrier for limiting the movement of the latter upon the former, and means for imparting swinging movements to said ruffling lever.

14. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, means for lifting the presser-bar, a swinging ruffling lever fulcrumed upon said presser-bar, a ruffling blade carried by said lever, a pivotally

mounted edge-guide having its operative portion supported by a connection with said ruffling lever, and means for actuating said ruffling lever.

15. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar by which the same is carried, means for lifting the presser-bar, a swinging ruffling lever fulcrumed upon said presser-bar and arranged rearward of the stitch-forming mechanism, a carrier pivotally connected with said ruffling lever and extended forwardly of the stitch-forming mechanism, a ruffling blade mounted upon said carrier in advance of the stitch-forming mechanism, means for limiting the movement of said carrier upon its supporting lever, an edge-guide pivotally mounted independently of said carrier and having an operative portion resting upon said ruffling blade, and means for actuating said ruffling lever.

16. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a guide-fin mounted upon and disposed intermediate the opposite edges of said presser-foot and normally extending below its operative face but adapted to yield upwardly, a presser-bar by which the presser-foot is carried, means for lifting the presser-bar, a swinging ruffling lever, a ruffling blade carried by said ruffling lever, and means for swinging said ruffling lever to carry said blade beneath the presser-foot and into engagement with said guide-fin whereby the latter is thrust into inoperative position above the operative face of the presser-foot.

17. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed said rock-shaft adjacent the vibrating arm, a coupling lever formed with a cam-finger mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever, means for actuating the same, and a nose piece endwise adjustable upon said lifting lever and adapted for engagement with the cam finger of said lifting lever in moving the same for coupling and uncoupling said vibrating and swinging arms.

18. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member whereby said arms may be coupled and uncoupled, means for operating said coupling member, a spring-pressed buffer pin adapted to engage the fixed arm in one of its extreme positions, and a locking device adapted to retain said arm in contact relation with said buffer pin.

19. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member whereby said arms may be coupled and uncoupled, means for operating said coupling member, a spring-pressed buffer pin adapted to engage the fixed arm in one of its extreme positions, and an automatically acting locking device adapted to retain said arm in contact relation with said buffer pin.

20. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, means for actuating said lifting lever, a stop for the fixed arm in one of its extreme positions, and a locking device carried by said lifting lever and adapted to engage and retain said fixed arm in contact with said stop.

21. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, means for actuating said lifting lever, a stop for the fixed arm in one of its extreme positions, a locking finger carried by said swinging arm, and a locking arm adjustably mounted upon said lifting lever and provided with a hook adapted to engage said locking finger.

22. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relations between said arms, a lifting lever for moving said coupling member into and out of operative position, a controlling cam, means for actuating said cam, and a follower plate adjustably mounted upon said lifting lever and provided with a follower for said controlling cam.

23. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon

one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, a controlling cam, means for actuating said cam, a latch-lever mounted upon a fixed fulcrum, an adjustable latch-piece carried by said lifting lever and adapted to engage the latch-lever, a cam follower carried by said lifting lever, and means carried by said cam for shifting said latch-lever.

24. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, a controlling cam, means for actuating said cam, a latch-lever mounted upon a fixed fulcrum, a latch-piece carried by said lifting lever and adapted to engage the latch-lever, a cam follower carried by said lifting lever, a spring interposed between an offset member of the latch-lever and said lifting lever whereby the former is thrown toward the latch piece of the lifting lever and the latter is pressed toward said cam, and means carried by said cam for shifting said latch-lever.

25. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, a controlling cam, means for actuating said cam, a latch-lever mounted upon a fixed fulcrum, spaced fastening screw-studs mounted upon said lifting lever, an overlying latch-plate and follower plate formed with oppositely arranged round and transversely slotted holes entered by the respective fastening screw-studs, a latch-piece formed upon said latch-plate and adapted to engage said latch-lever, and a roller-stud mounted upon said follower-plate and adapted for operative engagement with said cam.

26. In a sewing machine, the combination with a ruffling device including a rock-shaft, and an actuator therefor comprising a vibrating arm, of a swinging arm fixed upon said rock-shaft adjacent the vibrating arm, a coupling member movably mounted upon one of said arms and adapted to establish driving relation between said arms, a lifting lever for moving said coupling member into and out of operative position, a controlling cam, means for actuating said cam, a latch-

lever mounted upon a fixed fulcrum, a tripping finger pivotally mounted upon said latch lever and provided with angularly disposed operative edges, a stop-screw carried by said latch-lever and affording an adjustable stop for determining the initial position of said tripping finger, a tripping member carried by said cam and adapted to engage alternately the two operative edges of said tripping cam, and a latch piece carried by said lifting lever and adapted to engage said latch-lever.

27. In a sewing machine, the combination with a ruffling blade, actuating means therefor, and means for lifting the same clear of the work, of means initially set in operation by manually controlled means and automatically controlled in its action by a connection with a moving part of the machine whereby the ruffling blade lifting means is operated.

28. In a sewing machine, the combination with a ruffling blade, actuating means therefor, and means for lifting the same clear of the work, of means automatically controlled in its action by a connection with a moving part of the machine for causing the simultaneous interruption of both the operation and the lifting of said ruffling blade.

29. In a sewing machine, the combination with a ruffling device including a ruffling blade, an actuator therefor, and a coupling device for establishing and interrupting operative relation between the ruffling device and the actuator, of means for lifting said ruffling blade, and means initially set in operation by manually controlled means and automatically controlled in its action by a connection with a moving part of the machine for causing the simultaneous disengagement of the operative members of said coupling device and actuation of the blade lifting means.

30. In a sewing machine, the combination with a ruffling blade, actuating means therefor, and means for lifting the same clear of the work, of means initially set in operation by manually controlled means and including means for maintaining the same in operation during the production of a succession of ruffling blade operative movements after the manual control has ceased, whereby the ruffling blade lifting means is automatically actuated.

31. In a sewing machine, the combination with driving means, a ruffling blade, actuating means therefor operatively connected with said driving means, and ruffling blade lifting means, of means operatively connected with the driving means for actuating the ruffling blade lifting means, and manually controlled means for setting the same in action.

32. In a sewing machine, the combination with driving means, a ruffling blade, actu-

ating means therefor operatively connected with said driving means, and ruffling blade lifting means, of means controlled in its operation by a connection with said driving means for actuating the ruffling blade lifting means, and manually controlled means for setting the same in action.

33. In a sewing machine, the combination with a ruffling device including a ruffling blade, an actuator therefor, and a coupling device for establishing and interrupting operative relation intermediate said ruffling device and actuator, of means for lifting said ruffling blade, a controlling cam, a swinging lever provided with a follower for said cam and with means for engaging and controlling said coupling device, a stud also carried by said swinging lever for actuating said blade-lifting means, and means for actuating said controlling cam.

34. In a sewing machine, the combination with a ruffling device including a vibrating lever, a blade-carrier pivotally connected therewith and provided with a lifting pin, a ruffling blade mounted upon said carrier, an actuator for said ruffling device, and a coupling device for establishing and interrupting operative relation intermediate said ruffling device and actuator, of a vertically sliding rod adapted for engagement with said lifting pin and provided with a lateral lug, a lifting rock-shaft, a fixed collar thereon provided with a finger adapted to engage said lateral lug, and means including a swinging lever for operating said coupling device and for rocking said lifting rock-shaft.

35. In a sewing machine, the combination with stitch-forming and feeding mechanisms, of a presser-foot, a presser-bar to which the same is attached, a block fixed upon said presser-bar and formed with a vertical guide-socket and carrying a fulcrum-stud, a ruffling lever mounted upon said fulcrum-stud, a blade-carrier pivotally mounted upon said ruffling lever and provided with a lifting pin, a ruffling blade mounted upon said carrier, a spring-pressed lifting rod having its upper end journaled in the guide-socket of said block and its lower end in operative relation with the lifting pin of said blade-carrier, a lifting rock-shaft provided with means for actuating said lifting rod in opposition to its spring, a ruffler actuating rock-shaft through which operative movements are communicated to the ruffling lever, an actuator, a coupling device intermediate said actuator and ruffler actuating rock-shaft, and common means for operating said coupling device and lifting rock-shaft whereby the ruffling blade is simultaneously thrown into action and lowered and is thrown out of action and raised from engagement with the work.

36. In a sewing machine, the combination

with stitch-forming and feeding mechanisms, of a ruffling device including a vibrating ruffling lever and a ruffling blade pivotally connected therewith and provided with a lifting pin, means for imparting vibratory movements to said ruffling lever, a reciprocating lifting rod adapted for engagement with said lifting pin and provided with a lateral lug, a lifting rock-shaft, a collar thereon provided with a lateral finger adapted to engage said lateral lug, a swinging controlling lever, a cam for imparting operative movements to said controlling lever, and a lateral arm upon said lifting rock-shaft adapted for engagement with said controlling lever.

37. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a propelling ratchet-wheel, means for actuating the same, a plurality of clutch-pawls carried by said cam with their respective teeth spaced apart differentially in relation to the spacing of the ratchet wheel teeth, and a pawl-lifter acting simultaneously upon said pawls in interrupting and establishing their operative relation with said ratchet-wheel.

38. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a propelling ratchet-wheel, means for actuating the same, a plurality of clutch-pawls carried by said cam with their respective teeth spaced apart differentially in relation to the spacing of the ratchet-wheel teeth, a pawl-lifter acting simultaneously upon said pawls in interrupting and establishing their operative relation with said ratchet-wheel, and automatically acting means for returning the cam to initial position after each unclutching operation.

39. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a propelling ratchet-wheel, means for actuating the same, a plurality of clutch-pawls carried by said cam with their respective teeth spaced apart differentially in relation to the spacing of the ratchet wheel teeth, a pawl-lifter pivotally mounted upon said cam and acting simultaneously upon said pawls in interrupting and establishing their operative relation with said ratchet-wheel, and provided with an arm substantially in radial relation with

its pivotal support and formed with a wedge-shaped tooth, a wedge-pointed spring-pressed latch-block opposed to said wedge-shaped tooth of the radial pawl-lifter arm, and an adjustable carrier for said latch-block mounted upon said cam.

40. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a propelling ratchet-wheel, means for actuating the same, a plurality of clutch-pawls carried by said cam with their respective teeth spaced apart differentially in relation to the spacing of the ratchet-wheel teeth, a pawl-lifter pivotally mounted upon said cam and acting simultaneously upon said pawls in interrupting and establishing their operative relation with said ratchet-wheel, and provided with an arm substantially in radial relation with its pivotal support and formed with a wedge-shaped tooth, a wedge-pointed spring-pressed latch-block opposed to said wedge-shaped tooth of the radial pawl-lifter arm, a carrier-block for sustaining said latch-block, a rotary pin mounted upon said cam and upon one end of which said carrier-block is fixed, and means for axially adjusting the position of said pin.

41. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a propelling ratchet-wheel, means for actuating the same, a plurality of clutch-pawls carried by said cam with their respective teeth spaced apart differentially in relation to the spacing of the ratchet-wheel teeth, a pawl-lifter pivotally mounted upon said cam and acting simultaneously upon said pawls in interrupting and establishing their operative relation with said ratchet-wheel, and provided with an arm substantially in radial relation with its pivotal support and formed with a wedge-shaped tooth, a wedge-pointed spring-pressed latch-block opposed to said wedge-shaped tooth of the radial pawl-lifter arm, a carrier-block for sustaining said latch-block, a rotary pin mounted upon said cam and upon one end of which said carrier-block is fixed, a collar fixed upon the opposite end of said pin and provided with oppositely extending arms, and adjusting means applied to said arms for tilting said collar and pin.

42. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a

controlling cam for operating said coupling member, a rotary propelling member, a clutch-device whereby driving relation is established and interrupted between said propelling member and cam, means including a spring for returning said cam to initial position after each advance movement with said propelling member, and a retarding device for arresting the movement of said cam as it approaches initial position.

43. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a rotary propelling member, a clutch device whereby driving relation is established and interrupted between said propelling member and cam, means including a reciprocating block and a spring connected therewith for returning said cam to initial position after each advance movement with said propelling member, an air cylinder having a contracted passage or port leading outwardly from the end toward which said block is pressed by its spring, and a plunger fitted within said cylinder and operatively connected with said reciprocating block.

44. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a rotary propelling member, a clutch device whereby driving relation is established and interrupted between said propelling member and cam, means including a reciprocating block and a spring connected therewith for returning said cam to initial position after each advance movement with said propelling member, an air cylinder having a contracted passage or port leading outwardly from the end toward which said block is pressed by its spring, a plunger fitted within said cylinder and operatively connected with said reciprocating block, and a valve within said port of the air cylinder.

45. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for es-

establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a rotary propelling member, a clutch device whereby driving relation is established and interrupted between said propelling member and cam, means for returning said cam to initial position after each advance movement with said propelling member, a detaining hook adjacent the path of movement of said cam, a spring-pressed latch-plate pivotally mounted upon said cam and provided with a latch-piece normally adapted to engage said detaining hook and with a cam-slot, and a spring shift-lever fulcrumed upon said cam eccentrically with the cam-slot of said latch-plate in outer or operative position and provided with a pin entering said cam-slot and adapted to frictionally engage an adjacent part of said cam whereby the working of said lever in normal operation of the machine is resisted.

46. In a sewing machine, the combination with a ruffling device and an actuator therefor, of a coupling member adapted for establishing and interrupting driving relation between said ruffling device and actuator, a controlling cam for operating said coupling member, a rotary propelling member, a clutch device comprising a rocking cam-member whereby driving relation is established and interrupted between said propelling member and cam, means for returning said cam to initial position after each advance movement with said propelling member, a stop-wheel, a tripping stud thereon adapted for engagement with said rocking cam-member to throw the clutch into action, a rotary spindle connected with said stop-wheel for turning the same to determine the position of its tripping stud, a frictional brake device for imposing a resistance to the turning of said spindle, and a fixed tripping pin also adjacent said controlling cam for engaging said rocking cam-member to throw the clutch device out of action at the end of its advance movement.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT H. DE VOE.

Witnesses:

HENRY J. MILLER,  
JOSEPH F. JAQUITH.