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RUFFLING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED JUNE 11, 1909.

984,080.

Patented Feb. 14, 1911

2 SHEETS—SHEET 1.

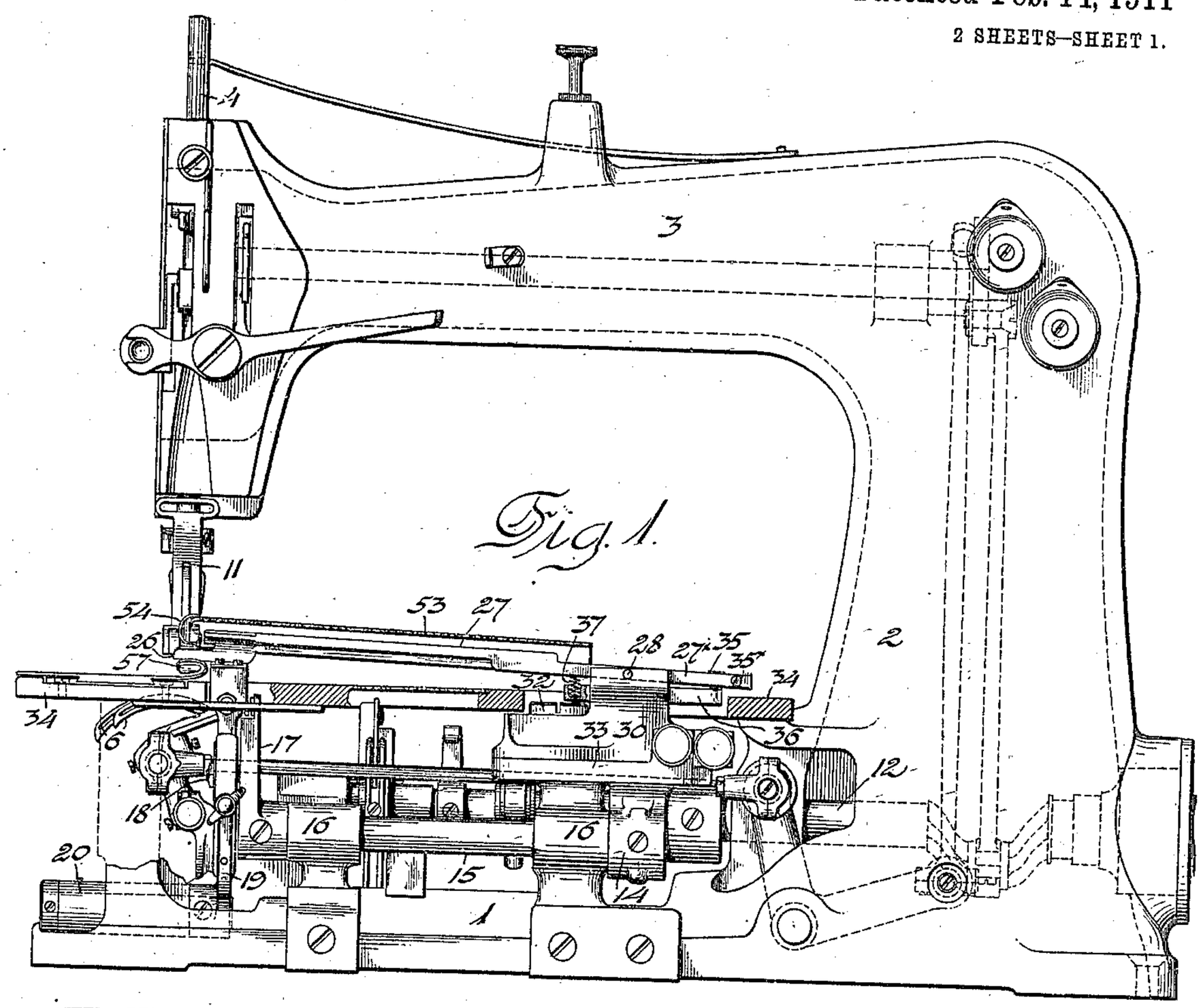

Fig. 1.

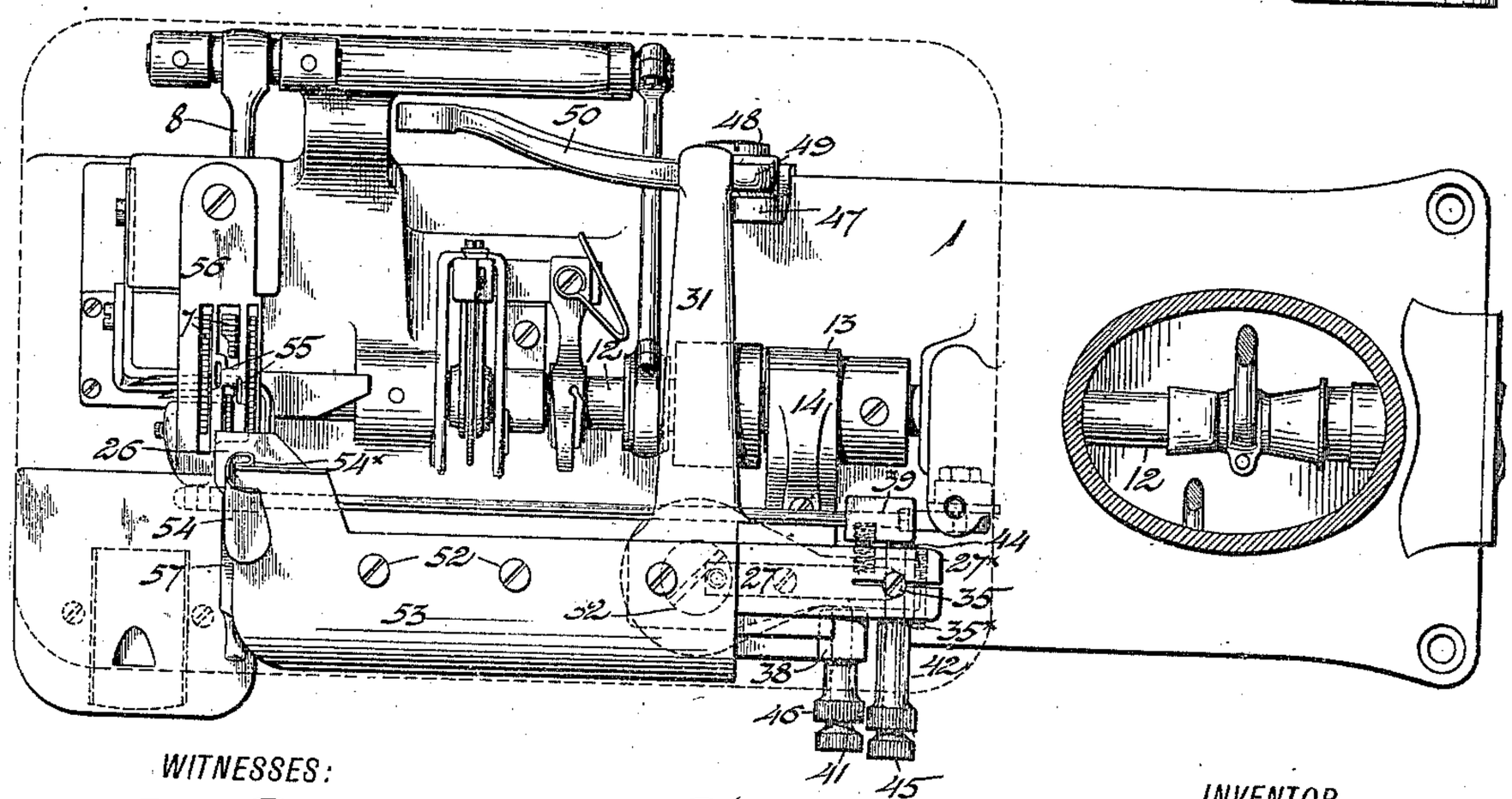

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

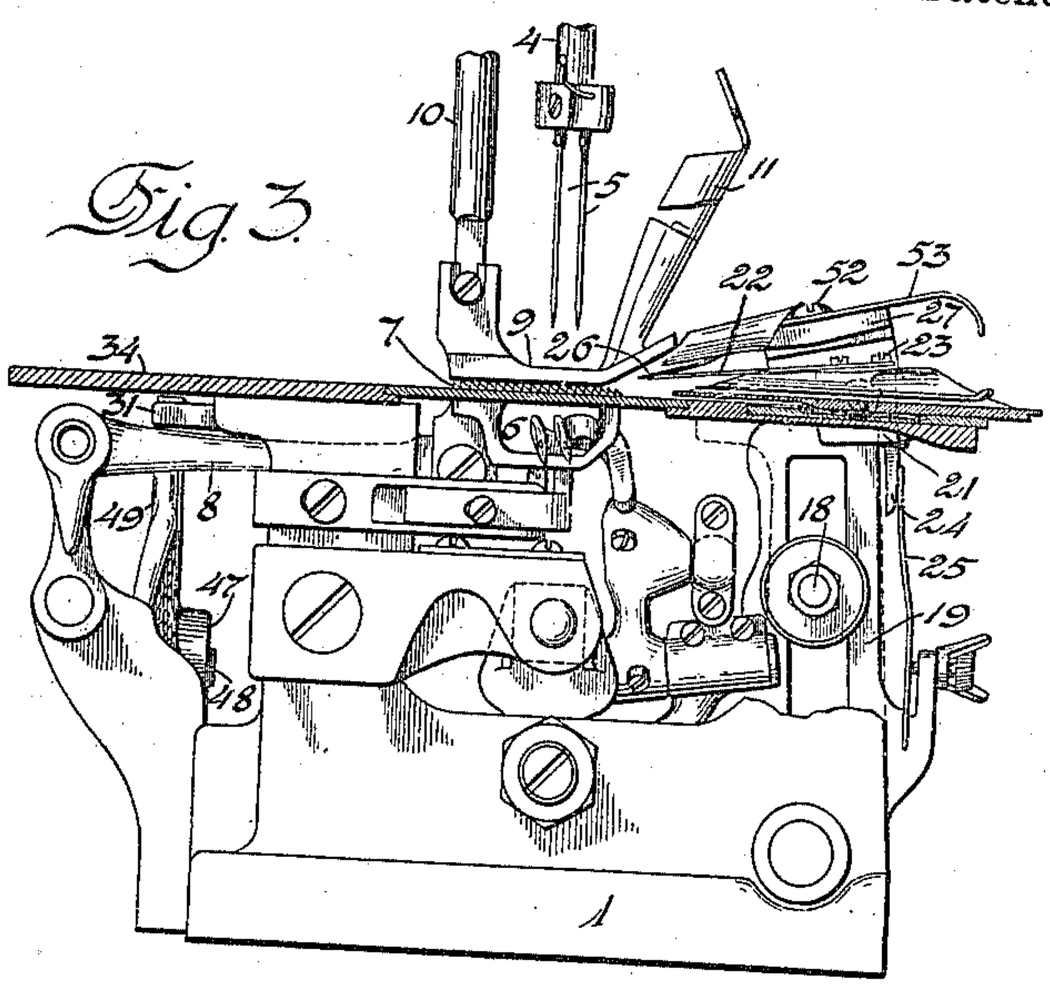

Fig. 4.

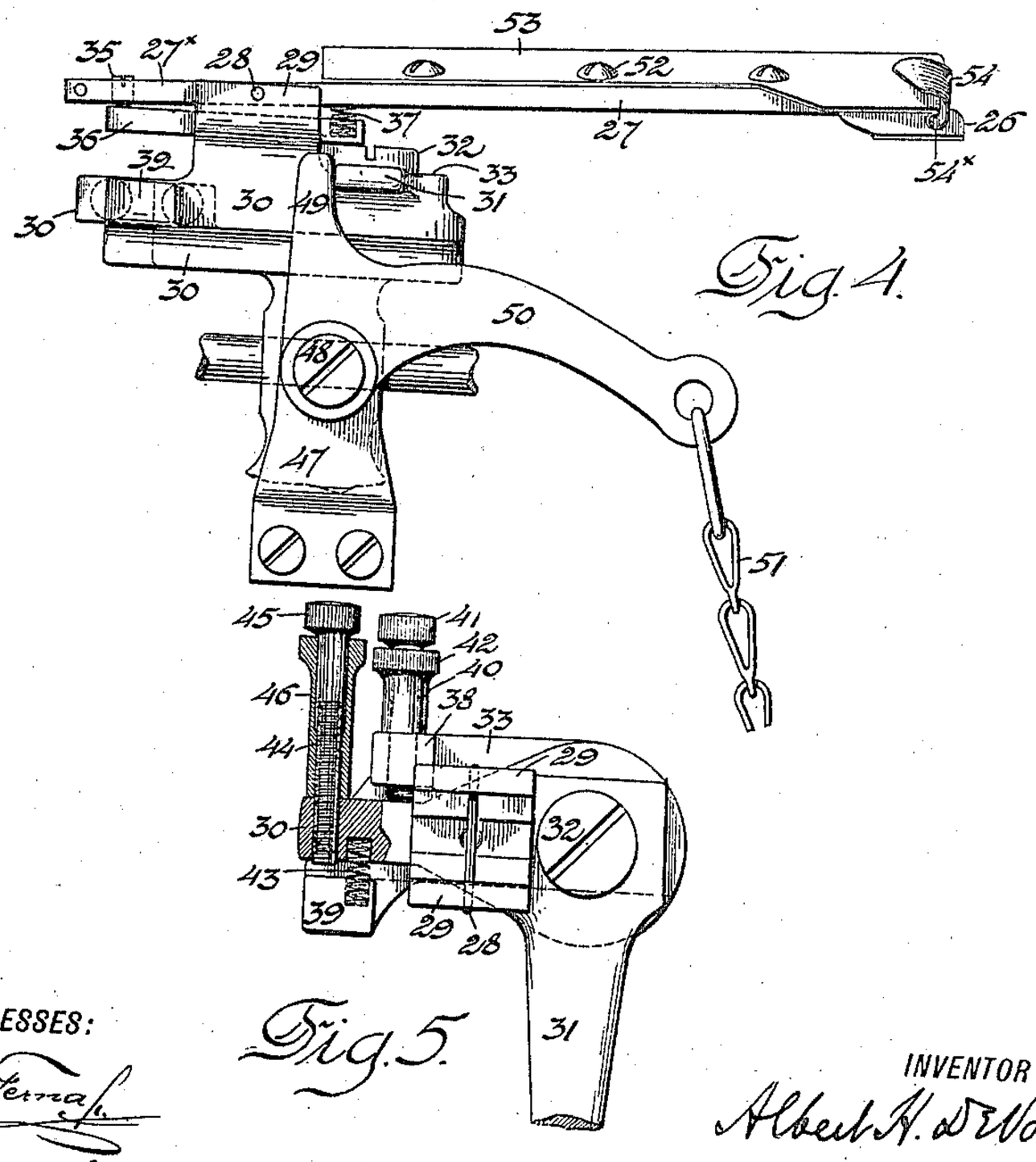

Fig. 5.

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RUFFLING MECHANISM FOR SEWING-MACHINES.

984,080. Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed June 11, 1909. Serial No. 501,460.

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 Mechanism for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in that class of ruffling and stitching machines in which the ruffling action is adapted to be varied while the machine is in operation, and it has for its principal object the provision of means whereby the range of the ruffling action may be conveniently adjusted.

It has for its further object to provide means whereby an edge-folder associated with the ruffling mechanism may be maintained in position for effective operation in turning corners when the ruffling action is temporarily increased.

According to the present invention, in a sewing machine provided with a uniformly reciprocating ruffler-blade, a separator- or shield-plate adapted for coöperation with the ruffling blade is fixed upon the free end of a swinging lever extending transversely of the direction of feed and pivotally mounted upon a fulcrum-pin arranged parallel with the direction of feed and itself mounted upon one arm of an angular carrier-lever having a vertical fulcrum upon the machine frame so as to swing in a plane parallel with the work-plate. The said arm of said carrier-lever is normally pressed into contact with the operative end of a stop-screw mounted in a fixed part of the machine and extending forwardly thereof, and said arm carries a forwardly extending stop-screw whose operative end engages a fixed shoulder of the machine frame which serves to determine its other extreme position, and therefore the range of retractive movement of the separator-plate. The vertically tilting lever upon which the separator-plate is mounted has fixed above the separator-plate an edge-folder whose delivery end extends in advance of the fulcrum of the carrier-lever, whereby the shift of said lever to retract the separator-plate for increasing the ruffling action serves to throw the delivery end of the folder slightly outward transversely of the line of seam so as to counteract the tendency of the increased ruffling action to contract the marginal portion of the ruffled ply of material, and insure uniformity in the ruffled and stitched product.

In the accompanying drawings, Figure 1 is an elevation of a sewing machine embodying the present improvement, with the work-plate in section, and Fig. 2 a plan of the same with the overhanging portion of the bracket-arm and the work-plate omitted. Fig. 3 is a front end view of the lower portion of the machine. Fig. 4 is an enlarged rear side view of the separator-plate, its carrier and shifting means, and Fig. 5 is a plan of the carrier-lever and its support.

As shown and described in my pending application Serial No. 457,538, filed October 13, 1908, the frame of the machine is constructed with the base 1 and bracket-arm comprising the hollow standard 2 and overhanging portion 3 in which is journaled the vertically reciprocating needle-bar 4 carrying the needles 5 coöperating with the thread-carrying loopers 6 in the production of parallel double chain-stitch seams, the under ply of the work being advanced by the action of the feed-dog 7 carried by the feed-bar 8, in a manner well-known. The presser-foot 9, opposed to the feed-dog 7, is secured upon the lower end of the presser-bar 10 and carries upon its forward end the strip fold-guide 11.

The main-shaft 12, journaled in the base 1, carries the ruffler-actuating eccentric 13 embraced by a forked lateral arm 14 upon the ruffler-actuating rock-shaft 15 mounted in fixed bearings 16 and having fixed upon its forward end the upright arm 17 adjustably connected by means of the screw-stud 18 with the upright arm 19 fulcrumed upon the supporting rocking pin 20 which is mounted within a suitable bearing at the front end of the machine bed. Pivoted upon the upper end of the vibratory arm 19 is the block 21 having the ruffler-blade 22 fixed thereon by means of screws 23 and provided with a depending finger 24 engaged by the free end of the spring 25 carried by the arm 19 whereby the ruffling blade 22 is yieldingly pressed upwardly. The ruffling blade thus

receives uniform reciprocatory operative or work-advancing movements throughout the operation of the machine, its range of movement being initially determined by the adjustment of the pivotal connection 18 between the actuating arm 17 and the blade-carrying arm 19.

Overlying the operative end of the ruffling blade 22 is the separator-plate 26 which is fixed by suitable means upon the free end of a lever 27 pivotally mounted to tilt vertically upon the pin 28 which extends transversely of the bifurcated lug 29 extending upwardly from the shorter arm 30 of an angular carrier-lever disposed substantially parallel with the main-shaft 12 whose other arm 31 extends backwardly to the rear of the machine, the carrier-lever being fulcrumed by means of the stud-screw 32 tapped into a horizontal seat 33 upon which the lever 30 31 is adapted to oscillate in a plane parallel with the work-plate 34. The lever 27 is provided with a rearward extension $27^{\times}$ carrying the vertically adjustable screw-pin 35 whose point normally rests upon one end of a rod 36 secured within the lug 29 and having its opposite end formed with a socket between the bottom of which and the under side of the lever 27 is interposed the spring 37 adapted to maintain the lever 27 normally raised upon its pivotal pin 28. The lever extension $27^{\times}$ is shown formed with a longitudinal slit and provided with a transverse clamp-screw $35^{\times}$ adapted to draw the separate parts of the extension together to clamp the screw-pin 35 in position. The turning of the stop-pin 35 in one or the other direction obviously varies the initial extent of elevation of the separator-plate 26 above the work-plate 34.

Rising from the fixed seat 33 are two spaced lugs 38 and 39 between which the reduced outer end of the lever-arm 30 is adapted to move. The lug 38 is transversely apertured to receive the threaded shank of the contact-screw 40 extending through the same and having its knurled head 41 extended toward the front of the machine. The shank of the screw intermediate the lug 38 and the head 41 is provided with a locking sleeve 42 for maintaining the screw in the desired position of adjustment. The forward edge of the lever-arm 30 is maintained normally in contact with the point of the screw 40 by means of a spring 43 interposed between the bottoms of sockets formed in the opposite edge of the lever-arm 30 and the adjacent face of the fixed lug 39. The lever-arm 30 is provided with a transverse threaded aperture entered by the forwardly extending contact-screw 44 provided with the knurled head 45 adjacent that of the screw 40, and similarly provided with a locking sleeve 46. As will be observed, the engagement of the forward edge of the lever-arm 30 with the point of the contact-screw 40 determines the initial lateral position of the carrying lever 27 and the separator-plate mounted thereon, while the engagement of the point of the contact-screw 44 with the adjacent side of the fixed lug 39 similarly determines the extreme retracted position of the lever 27 and the separator-plate, thus fixing the range of variation of the ruffling action for a given adjustment of the machine.

Rising from the rearward side of the base 1 is a bearing lug 47 carrying the fulcrum-screw 48 upon which is mounted an angular operating lever comprising an upwardly extending arm 49 adapted to engage one edge of the arm 31 of the carrying lever and a laterally extending arm 50 to the outer end of which is secured the cord or chain 51 connected with a knee-lever or treadle beneath the machine-supporting table. The depression of the arm 50 of the operating lever causes the operative engagement of the upright arm 49 with the lateral arm 31 of the carrier-lever, which causes the forward movement of the lever 27 and the retraction of the separator-plate 26 to a position determined by the adjustment of the contact-screw 44, thereby exposing more or less of the material to be ruffled to the action of the ruffling blade and correspondingly increasing the ruffling action.

Secured upon the top of the lever 27 by means of the fastening screws 52 is the plate 53 to whose forward edge is secured the edge-turning scroll or folder 54 whose delivery end $54^{\times}$ extends somewhat in advance of the fulcrum-screw 32 upon which its carrying lever 27 turns, said folder being directed toward the path of one of the needles as indicated in Fig. 2, wherein the position of the needles is indicated by the needle-apertures 55 formed in the throat-plate 56. As will be readily observed, when the carrying lever 27 is shifted upon the fulcrum-screw 32 to retract the separator-plate 26, the delivery end of the folder 54 receives a retractive movement somewhat obliquely to the direction of feed, and therefore has a slight movement transversely to the line of seam so as to increase the depth of the stitching from the folded edge of the ply of material guided thereby. This slight lateral movement of the fold-guide is advantageous, for the reason that, in the increased fulling of the material owing to its greater exposure to the ruffling blade, the ruffled margin presented for the stitching operation is liable to be somewhat reduced, and the slight lateral movement of the folder across the line of seam tends to compensate for this de-

fect and insure uniformity of the spacing of the stitching from the edge of the ruffled ply of material.

In the drawings, a lower edge folding guide 57 for the under ply of material is shown beneath the upper folder 54, the separator-plate 26 and ruffling blade 22, but this forms no part of the present improvement.

The convenience of handling the work in introducing and withdrawing the same from the machine is greatly increased by adapting the several work-engaging parts to be separated for the free movement of the several plies of material independently; and in the present improvement, the employment of the adjustable stop-screw 35 permits the separator-plate, which is normally pressed downwardly by the forward end of the presser-foot, to rise only partially when the presser-foot is raised, thereby spacing the same intermediate the bottom of the presser-foot and the top of the throat-plate and permitting the easy adjustment of the plies of material above and below this member.

In the mechanism of my pending application before mentioned, the means of adjusting the initial and extreme retracted positions of the separator-plate do not permit of changes in variation of the fullness of the ruffles to such extent as is sometimes desired; but by the present improvement, the disposition of the contact-screws 40 44 at the front of the machine and with their knurled heads conveniently exposed to the operator, enables the required adjustment to be made in the shortest possible time, and with the greatest convenience.

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

1. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a swinging lever extending transversely of the direction of feed by which said separator-plate is carried, a fixed fulcrum upon which said lever is mounted to swing parallel with the work-plate, an adjustable stop coöperating with said lever in determining its initial position, a spring for normally maintaining said lever in operative relation with said stop, and means for shifting said lever to change the operative relation of the separator-plate with the ruffling member.

2. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a swinging lever extending transversely of the direction of feed by which said separator-plate is carried, a fixed fulcrum upon which said lever is mounted to swing parallel with the work-plate, adjustable stop-members coöperating with said lever in determining its range of movement and extended forwardly thereof and exposed at the front of the machine, and means for shifting said lever to change the operative relation of the separator-plate with the ruffling member.

3. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a swinging lever extending transversely of the direction of feed by which said separator-plate is carried, a fixed fulcrum upon which said lever is mounted to swing parallel with the work-plate, fixed abutments between which said lever is adapted to move, an adjustable contact-screw carried by said lever and adapted to engage one of said fixed abutments, an adjustable contact screw mounted in the other of said fixed abutments and adapted to engage said swinging lever, and means for shifting said lever between the limits imposed by said contact-screws to change the operative relation of the separator-plate with the ruffling member.

4. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a carrier, a fulcrum upon which said carrier oscillates in a plane parallel with the work-plate, a tilting lever pivotally mounted upon said carrier to swing transversely of the work-plate, and having said separator-plate rigidly attached thereto, a spring intermediate said carrier and lever to maintain the latter normally raised, a stop for limiting the movement of said lever under the action of its spring, and means for shifting said lever within the direction of feed to change the operative relation of the separator-plate with the ruffling member.

5. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a carrier, a fulcrum upon which said carrier oscillates in a plane parallel with the work-plate, a tilting lever pivotally mounted upon said carrier to swing transversely of the work-plate and having said separator-plate rigidly attached thereto, a spring intermediate said carrier and lever to maintain the latter normally raised, a stop and an adjusting screw adapted to engage the same, one of said members being provided upon said carrier and the other upon said lever, and means for shifting said

lever within the direction of feed to change the operative relation of the separator-plate with the ruffling member.

6. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a lever to which said separator-plate is secured, a carrier upon which said lever is mounted, said carrier being fulcrumed to swing in a plane parallel with the work-plate and provided with a projecting arm, a support for said carrier formed with spaced abutments between which the arm of said carrier is adapted to move laterally, adjustable stops applied to the carrier-arm and said abutments for limiting the extent of movement of said carrier, and means for shifting said carrier upon its fulcrum to change the operative relation of the separator-plate with the ruffling member.

7. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a lever to which said separator-plate is secured, a carrier upon which said lever is mounted, said carrier being fulcrumed to swing in a plane parallel with the work-plate and provided with a projecting arm, a support for said carrier formed with spaced abutments between which the arm of said carrier is adapted to move laterally, a stop-screw mounted upon the carrier-arm and adapted to engage one of said abutments, a stop-screw mounted in the other of said abutments and adapted to engage said carrier-arm, and means for shifting said carrier upon its fulcrum to change the operative relation of the separator-plate with the ruffling member.

8. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a swinging lever extending transversely of the direction of feed by which said separator-plate is carried, an edge-guide mounted upon said swinging lever with its delivery end above said separator-plate, a fixed fulcrum disposed in front of the delivery end of said edge-guide relative to the direction of feed and upon which said lever is mounted to swing parallel with the work-plate, and means for shifting said lever to change the operative relation of the separator-plate and edge-guide with the ruffling member.

9. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engagaing member, a separator-plate, a plural-armed carrier-lever fulcrumed at the front of the machine to swing parallel with the work-plate and having a rearwardly projecting arm extending to the back of the machine, a support for said separator-plate mounted upon said carrier, and an angular operating lever fulcrumed at the rear of the machine and beneath the work-plate to swing transversely of the latter, and having one arm adapted to engage the rearwardly extending arm of said carrier and another arm from which the same receives its operative movements from beneath the machine.

10. In a sewing machine, the combination with the work-plate and stitch-forming and feeding mechanisms, of ruffling mechanism including a work-engaging member, a separator-plate, a fixed fulcrum, a swinging carrying lever for the separator-plate mounted upon said fulcrum and freely movable thereon parallel with the work-plate, a stop in the path of movement of said carrying lever, a spring acting upon said carrying lever in a direction transverse to said fulcrum for yieldingly maintaining such lever in operative relation with said stop, and means including an operating lever connected with said carrying lever for shifting the latter to change the position of the separator-plate.

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.