To all whom it may concern:

Be it known that I, RALPH M. SHARAF, a citizen of the United States, and a resident of the borough of the Bronx, in the city and State of New York, have invented certain new and useful Improvements in Shuttle-Shifting Means for Sewing Machines, of which the following is a specification.

The present invention relates to improvements in shuttle shifting means for sewing machines, and particularly to an improved means for the adjustment of such shuttles in sewing machines of the two needle type, an object of the invention being to enable the convenient and accurate adjustment of the two shuttles, and simultaneously therewith, the corresponding adjustment of the feed dogs, throat plates and shuttle operating means.

A further object of the invention is to provide such means which will be simple and reliable in construction.

With these and other objects in view, an embodiment of my invention is shown in the accompanying drawings, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the accompanying drawings:

Figure 1 is a plan view of the shuttle end of the base plate of the sewing machine, showing the same embodied therein, and with the throat plates removed;

Figure 2 is a similar view, showing the throat plates in place;

Figure 3 is a vertical longitudinal sectional view along the line 3—3 of Figure 1;

Figure 4 is an end view;

Figure 5 is a vertical transverse sectional view along the line 5—5 of Figure 1;

Figures 6 and 7 are fragmentary views showing the method of adjustment;

Figure 8 is a section taken on the line 8—8 of Figure 7;

Figures 9 and 10 are plan views of the two retaining plates employed; and

Figures 11, 12, and 13 are detail views of the auxiliary adjusting arms.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, the base plate 10 is provided with a shuttle opening 11 at each side of which extend longitudinal ridges 12 and 13, between which and upon the ledge formed interiorly thereof are slidably secured throat plates 14 and 15, and a removable filler plate 16. The means for adjusting these throat plates will be herein-after more fully pointed out.

Bearings supports 17 and 18 extend downwardly from the base plate 10, and a shuttle driving shaft 19 is supported in them. A pinion gear 20 upon the end of the shaft 19 is engaged by a gear 21, provided upon the end of a counter drive shaft 22, rotated in any suitable manner from the main drive shaft. More gears 25 and 26 are provided upon the shaft 19, which engage more gears 25 and 26 carried by the shafts 27 and 28 of the shuttle hooks or loopers 29 and 30, mounted in the adjustable supporting saddles 31 and 32. The gears 23 and 24 are carried by sleeves 33 and 34 keyed to the shaft 19 in such a manner as to have free longitudinal movement thereon, and to be rotated therehy. Annular groove recesses 35 and 36 are provided in the said sleeves 33 and 34 to enable the same to be engaged by the adjusting means hereinafter referred to.

The shuttle saddles 31 and 32 are provided at each side of the upper ends thereof with flanges 37, 38 and 39 and 40 respectively, and in which there are provided longitudinally disposed slots 41, 42, 43 and 44. Bolts 45, 46, 47 and 48 are screwed into the base plate, and extend downwardly through the said slots of the shuttle saddles, and are provided below the flanges thereof with loosely mounted sleeves 49, 50, 51 and 52 respectively, which are of greater diameter than the width of the slots and thereby retain the shuttle saddles in engagement with the base plate.

Upon the lower ends of the bolts which extend beyond the ends of the sleeves, there are mounted two plates 53 and 54, said plates being provided at each of the four corners thereof with holes 55 and 56 respectively, through which the threaded ends of the bolts protrude, to receive retaining nuts 57. These retaining nuts are normally slightly loose so that, unless other tightening means are employed to force the sleeves 49, 50, 51 and 52 tightly against the flange of the shuttle saddles, the saddles are free to move lengthwise for adjustment, the slots 41, 42, 43 and 44, permitting such movement. These plates 53 and 54 are
curved inwardly at their sides to reduce the material employed therein. The plate 55 is provided at its inner face with curved reinforcing ribs 58 and 59 (Fig. 10), so arranged as to permit the movement of the mitre gears 23 and 24 without interference therewith. The plate 54 is provided centrally with an enlarged portion 60, having a threaded opening 61 therethrough, and diagonal reinforcing ribs 62 extend therefrom to the corners of the plate. A set screw 63 engages the threaded opening 61, and is adapted to bear at its end against the upper plate 53. By turning this screw inwardly, it will be seen the plate 53 is forced tightly against the sleeves 49, 50, 51 and 52, at the corners, lifting the same and thereby securing the shuttle saddles tightly against the base plate, as clearly indicated in Figure 6, thereby preventing movement of the shuttle saddles. When the saddles are to be moved, it is only necessary to loosen this one set screw 63 without removal or adjustment of any other part, thereby loosening all of the sleeves, and the engagement of the shuttle saddles with the base plate permitting the ready movement thereof.

The throat plates 14 and 15 are made removable with the shuttle saddles by securing the same respectively to each of the said saddles by means of screws 64 which engage tapped holes 65 provided in supporting blocks 66, formed upon the upper surface of the shuttle saddles. The throat plates 14 and 15 are provided with openings 67 and 68 respectively for the needles and the feed dogs, and between the inner adjacent edges of the throat plates there is provided the removable filler plate 16 before referred to. Said filler plates will be provided in varying sizes to fill the openings formed upon adjustment of the shuttle saddles and throat plates in either direction. Adjacent the throat plates 14 and 15, and also slidable between the ridges 12 and 13, there are provided removable cover plates 69 and 70 which may be removed when desired to gain access to the shuttle.

A rock shaft 71 having a concentric rock shaft 72 mounted therein, is supported at the front of the base plate, and at the rear thereof there is provided a rock shaft 73. Crank levers 74 and 75 are mounted respectively upon the ends of the rock shafts 71 and 72, and to these levers are pivotally secured the forward ends of feed bars 76 and 77 which carry the feed dogs 78 and 79 disposed in the openings 67 and 68 of the throat plates. The levers 74 and 75 are keyed to the shafts 71 and 72 in such a manner as to permit free longitudinal movement of the levers, and annular recesses 80 and 81 are provided respectively in the hubs of said levers to permit the engagement therewith of adjustment means hereinafter referred to. The rear ends of the feed bars are provided with slots 82 which slidably engage blocks 83 carried upon crank levers 84 and 85, mounted upon the rock shaft 73, and keyed thereto in such a manner as to permit free longitudinal movement thereof. These crank levers 84 and 85 are likewise provided with recesses 86, 87 to permit the engagement therewith of the adjustment means hereinafter referred to. The levers 74 and 75 will be seen, impart the to and fro movement to the feed bars and the dogs carried thereby, and the levers 84 and 85 impart a lifting movement there to the sleeves.

Upon the inner face of the shuttle saddle 31, there is secured by means of screws 88 a plate 89, which carries at each side thereof arms 90 and 91 respectively, these arm being bent rearwardly and forwardly respectively from the said plate 89. At the ends of the arms there are provided yokes 92 and 93 respectively which engage the grooves 86 and 80 of the levers 84 and 74 respectively. The lower edge of the plate 89 is provided with a downwardly extending portion 94, having a yoke 95 which engages the groove 35 of the sleeve 33, which carries the mitre gear 23. To the inner face of the shuttle saddle 32 there is secured by means of screws 96, a plate 97 having arms 98 and 99, provided at their ends with yokes 100 and 101 which respectively engage the grooves 87 and 81 of the levers 85 and 75. This plate and arms which is shown in detail in Figure 12, is similar to that secured to the saddle 31, with the exception that the downwardly extending portions 94 and 95 are omitted. Upon the outer face of the saddle 32 there is secured by means of screws 102 a plate 103 having a downwardly extending portion 104 thereon provided with a yoke 105, which engages the groove 36 of the sleeve 34 carrying the mitre gear 24. It will thus be seen that upon movement of the shuttle saddles in either direction, the gears 23 and 24 are correspondingly moved, together with the throat plates, feeding dogs and the operating levers, so that a complete adjustment takes place by merely moving the shuttle saddles.

In order to bring about the simultaneous and convenient moving of the shuttle saddles toward and away from each other after the same have been loosened by means of the set screw 63, I provide a screw 106 oppositely threaded from the center, and passing through lugs 107 and 108 provided on the respective shuttle saddles 31 and 32. This screw 106 is secured centrally thereof to a spiral gear 109, and supported at its ends upon adjustable bearing screws 110 and 111 mounted in upwardly extending brackets 112 and 113 of a bracket frame 114, sec.
cured at its inwardly extending ends 115 and 116 by screws 117 and 118 to the bearing supports 17 and 18. A tubular bearing 119 is provided integrally of the said frame 114, in which is mounted a spindle 120 having a knurled head 121 at its outer end, and provided at its inner end with a spiral gear 122 which meshes with the spiral gear 109 of the screw 106. By turning the knurled head 121 in either direction as desired, the shuttle saddles it will be seen, may be simultaneously and equally moved inwardly towards each other or outwardly away from each other, due to the opposite threading of the screw 106, thereby bringing about an accurate and quick adjustment of the entire shuttle and feed mechanism, including the throat plates.

The bearing screws 110 and 111 permit of the accurate preliminary adjustment of the screw 106 by means of a screwdriver or the like, said bearing screws being provided with grooves 123 for this purpose. This adjustment usually takes place in fixing up the machines at the factory, and is permanent thereafter. I have illustrated and described a preferred and satisfactory embodiment of my invention, but it is obvious that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

I claim:

1. An adjustment means for sewing machines, comprising a plurality of looper hooks, saddles therefor having slots, bolts supported by the frame of the machine passing through the slots of the said saddles, means on the said bolts supporting said saddles adjacent to the frame, said means permitting movement of said saddles, and means for tightening the engagement of said last named means with said saddles to secure the said saddles against movement.

2. Adjustment means for sewing machines, comprising a plurality of looper hooks, a plurality of saddles therefor having slots, bolts supported by the frame of the machine passing through the slots of the saddles, sleeves on said bolts, a plate having openings through which the bolts pass, a plate being loosely movable on said bolts, a second plate mounted on said bolts in spaced relation to said first named plate, a set screw in said second plate adapted to engage said first plate for tightening or loosening the engagement of said first plate with said tubular slots to prevent or permit movement of said saddles.

3. An adjustment means for sewing machines, comprising a plurality of looper hooks, a plurality of saddles therefor having slots, bolts supported by the frame of the machine passing through the slots of the saddles, sleeves on said bolts, a plate having openings through which the bolts pass, said plate being loosely movable on said bolts, a second plate mounted on said bolts in spaced relation to said first named plate, a set screw in said second plate adapted to engage said first plate for tightening or loosening the engagement of said first plate with said tubular slots to prevent or permit movement of said saddles.
screw, a spiral gear on said screw, and means for rotating said spiral gear and said screw, said supporting means for said screw being adapted to be adjusted to place the spiral gear in normal position with respect to its operating means.

9. An adjustment means for sewing machines, comprising a plurality of looper hooks, saddles therefor having slots, bolts supported by the frame of the machine and passing through the slots of said saddles, means on said bolts for supporting said saddles adjacent to the frame, said means permitting movement of said saddles, means for bringing the last-named means into tight engagement with said saddles to hold the latter against movement, throat plates carried by said saddles and movable therewith, and means adapted to fill the gap between said throat plates upon the variable adjustment of said saddles.

10. An adjustment means for sewing machines, comprising a looper, a saddle therefor having a slot, a bolt secured to the frame of the machine and extending through said slot, means on said bolt adapted for loose engagement with said saddle to permit adjustment thereof, and means for bringing said first-named means into tight engagement with the saddle to secure it against movement.

11. An adjustment means for sewing machines, comprising a looper, a saddle therefor having a slot, a stationary bolt extending through and beyond said slot, a sleeve on the projecting portion of said bolt, adapted for loose engagement with said saddle to permit adjustment thereof, and means for forcing said sleeve into tight engagement with the saddle to secure it against movement.

12. An adjustment means for sewing machines, comprising a looper, a saddle therefor having a slot, a stationary bolt extending through and beyond said slot, a sleeve on the projecting portion of said bolt, adapted for loose engagement with said saddle to permit adjustment thereof, an abutment on the side of the sleeve opposite to that on which the saddle is located, a clamping member located on the bolt between the said abutment and the sleeve, and a pressure-exerting connection between said abutment and the clamping member to force the sleeve into tight engagement with the saddle to secure the latter against movement.

13. In a sewing machine, two throat plates mounted to be adjusted toward and from each other, and a filler plate adapted to be inserted in contacting relation between said throat plates upon a particular adjustment of said plates.

14. An adjustment means for sewing machines, comprising a plurality of looper hooks, saddles therefor having sliding relation with the frame of the machine, a plurality of means supporting said saddles adjacent to the frame and permitting sliding movement thereof, and singular means adapted to cooperate with said plurality of supporting means to fix said saddles relatively to said frame against movement.

In testimony, that I claim the foregoing as my invention, I have signed my name.

RALPH M. SHARAF.