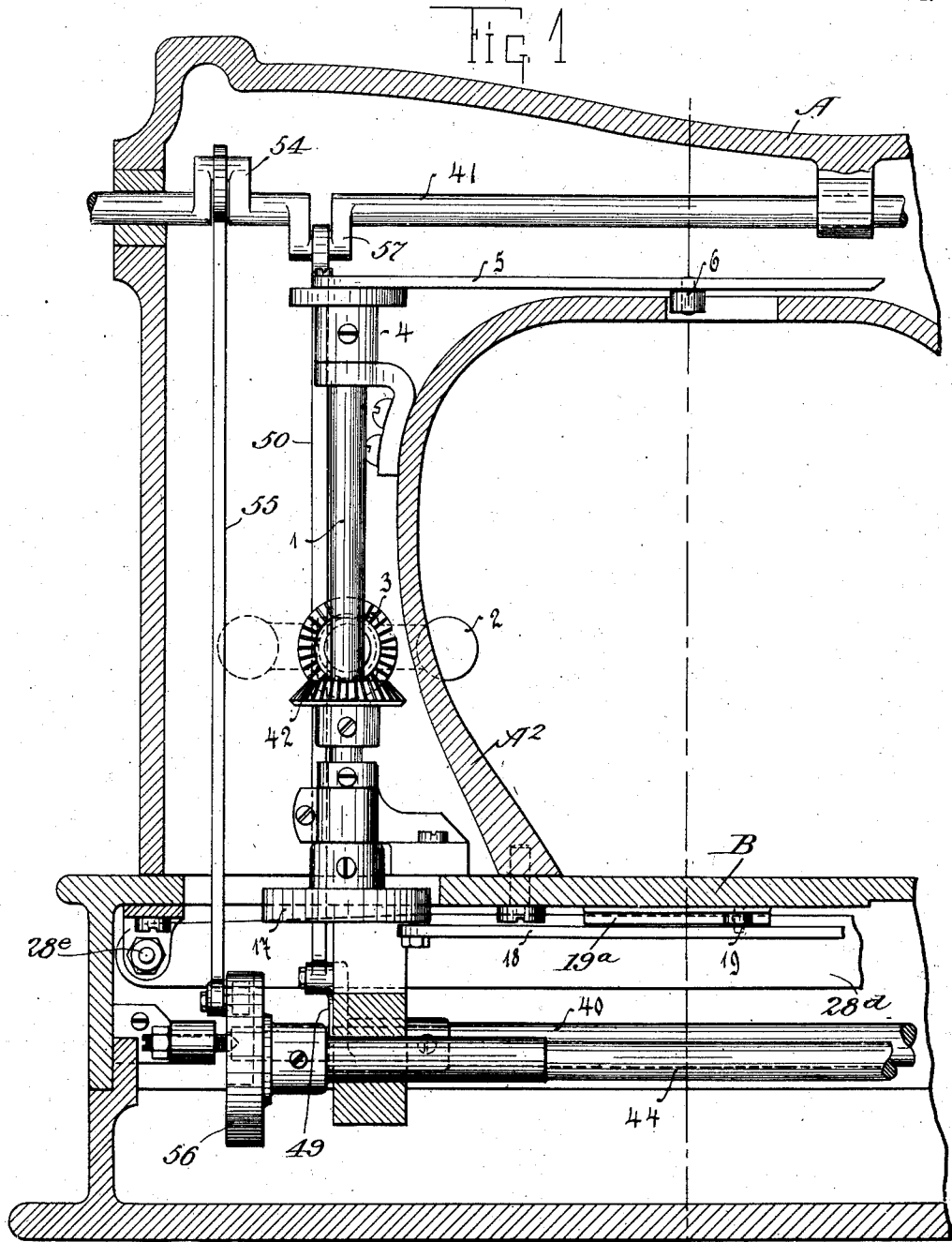


No. 874,032.

PATENTED DEC. 17, 1907.

A. PFEUFER.
SEWING MACHINE.
APPLICATION FILED APR. 23, 1906.

6 SHEETS—SHEET 1.



Wm. J. Bywater
Patent Attorney

Inventor:
Anton Pfeufer

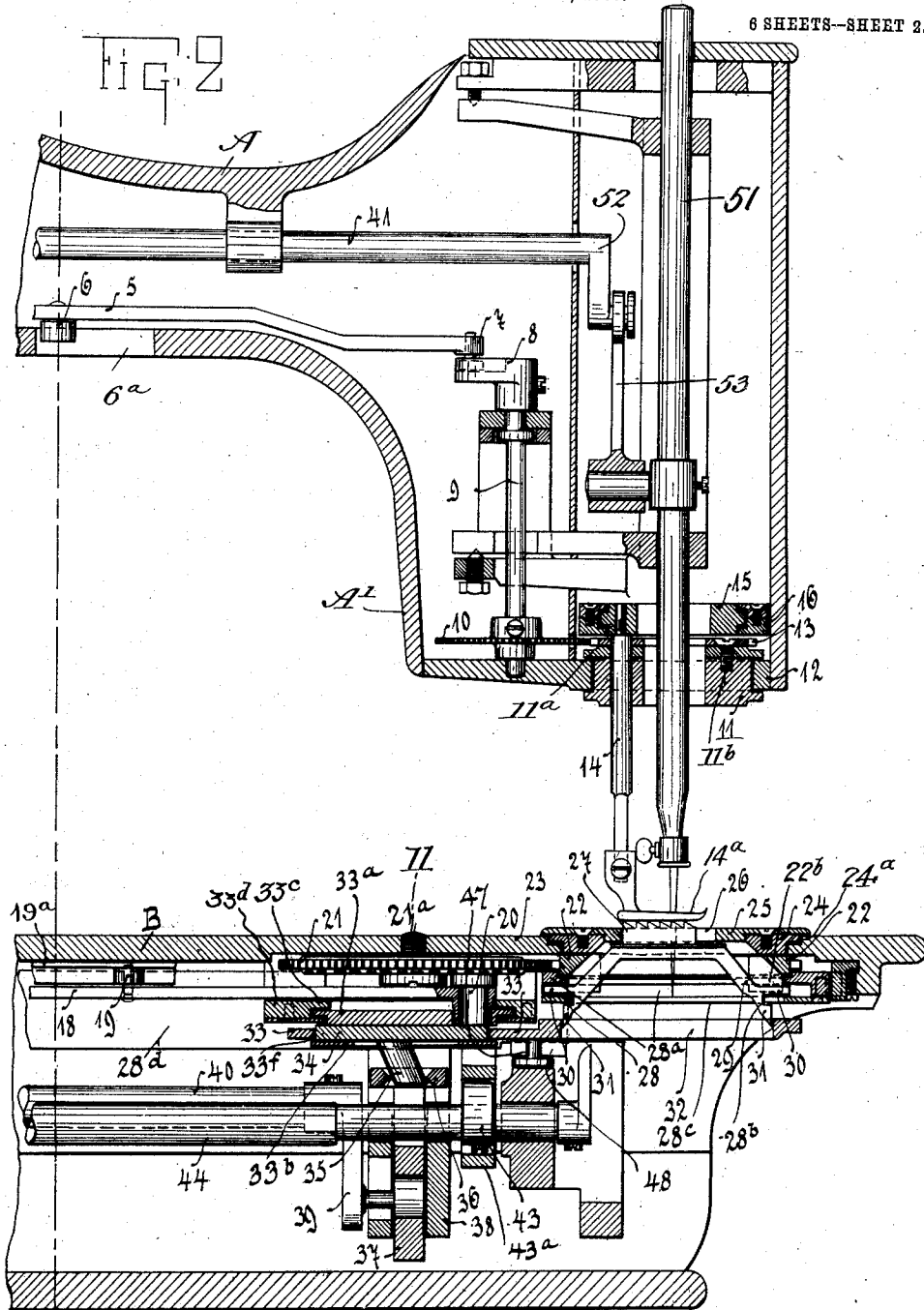
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6 SHEETS—SHEET 2.



Witness:
Walter J. Bywater
John Pfeufer

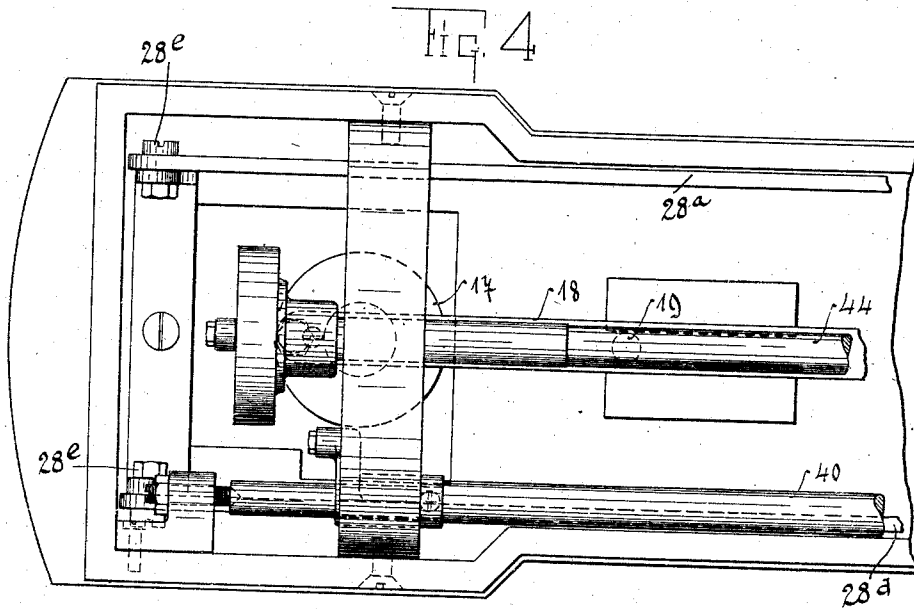
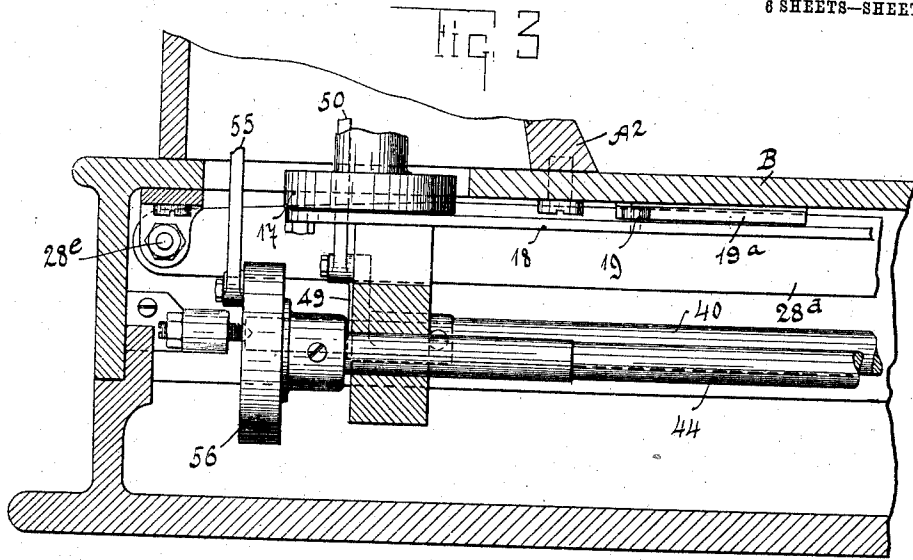
Inventor:
Arthur Pfeufer

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6 SHEETS—SHEET 3.



Witnesses:
Ulysses J. Bywater
Frank J. Fuller

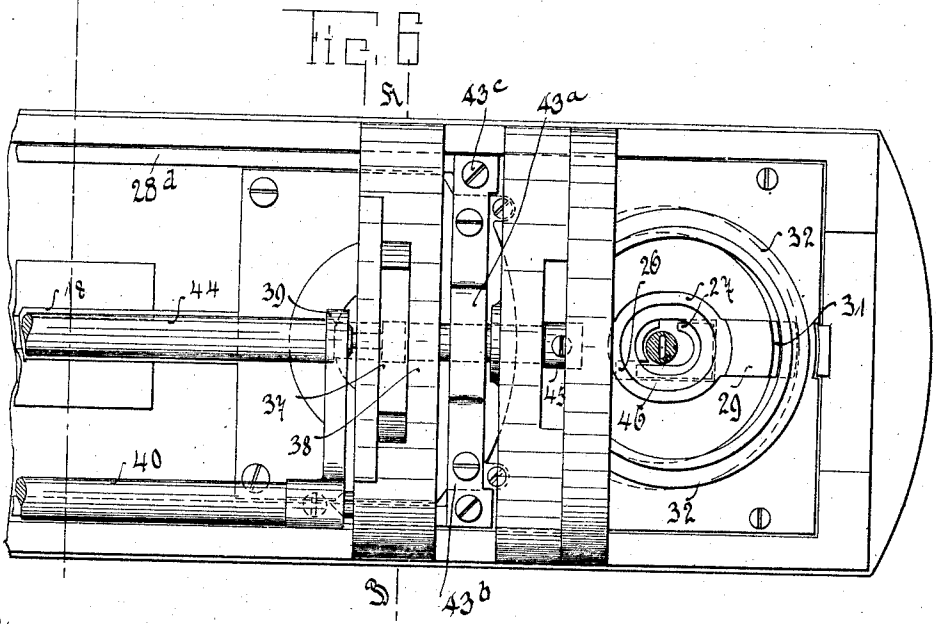
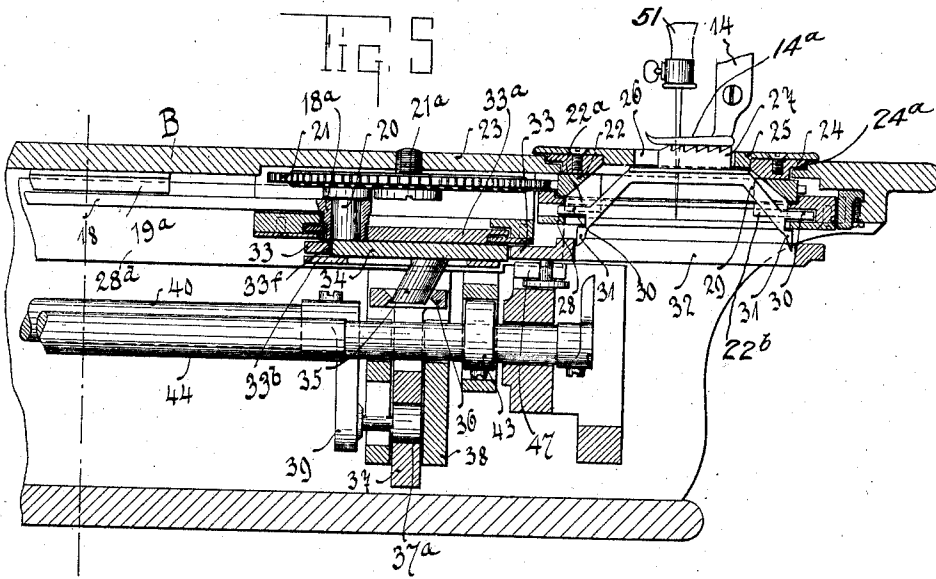
Inventor:
Anton Pfeufer

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8 SHEETS—SHEET 4.



Witnesses:
Ulysses J. Bywater
Louis Muller

Inventor:
Arthur Pfeufer

A. PFEUFER.
SEWING MACHINE.
APPLICATION FILED APR. 23, 1906.

FIG. 7

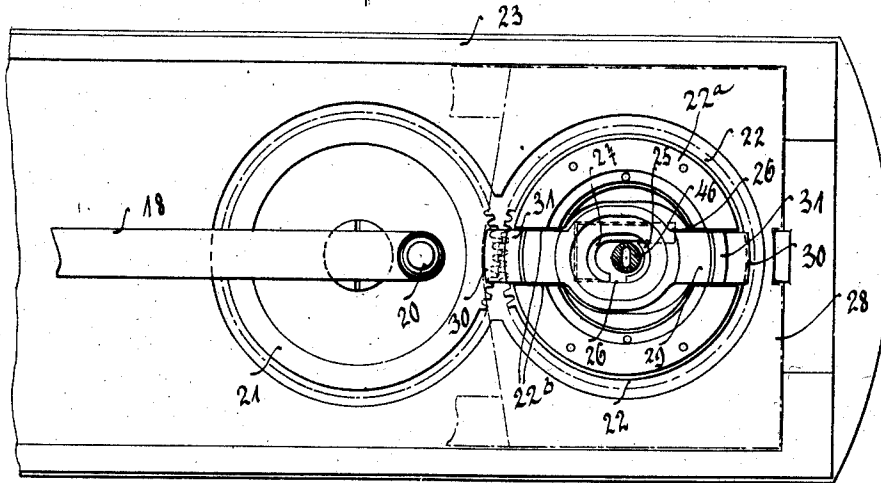
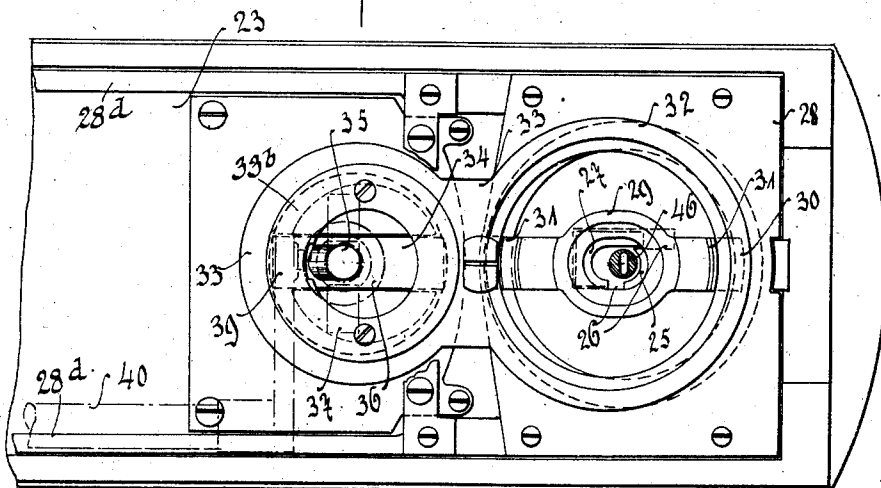


FIG. 8



Witnesses
Wm. J. Bywater
Louis Pfeuffer

Inventor:
Anton Pfeuffer

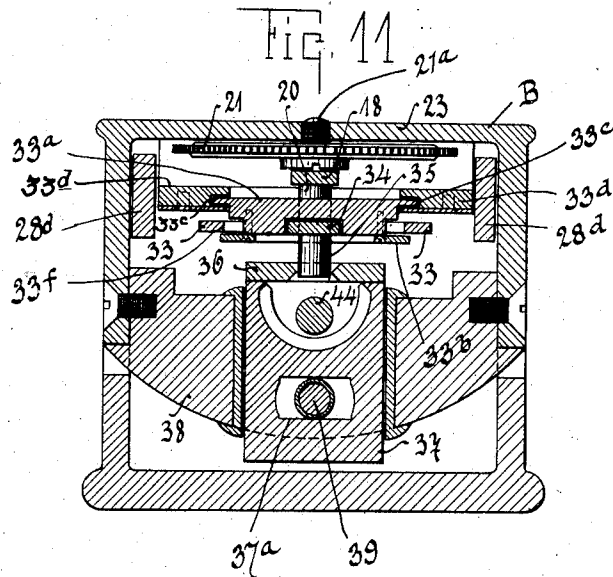
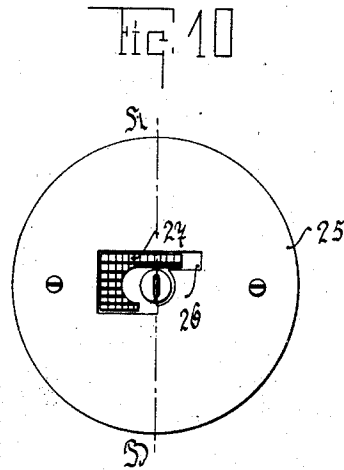
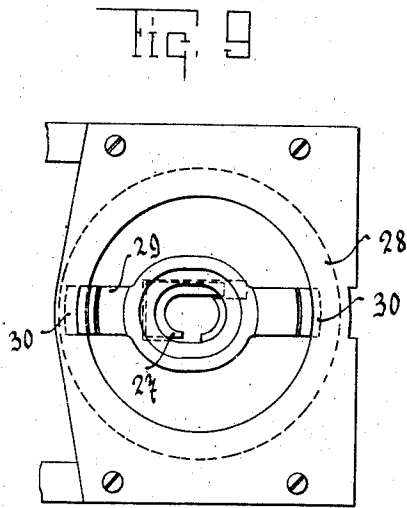
No. 874,032.

PATENTED DEC. 17, 1907.

A. PFEUFER.
SEWING MACHINE.

APPLICATION FILED APR. 23, 1906.

6 SHEETS—SHEET 6.



Witness:
Ulysses J. Bywater
Charles Mueller

Inventor:
Anton Pfeufer

UNITED STATES PATENT OFFICE.

ANTON PFEUFER, OF LANDSHUT-NEUSTADT, GERMANY.

SEWING-MACHINE.

No. 874,032.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed April 23, 1906. Serial No. 313,329.

To all whom it may concern:

Be it known that I, ANTON PFEUFER, whose post-office address is Landshut-Neustadt, Bavaria, in the Empire of Germany, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in sewing machines of the class designed to afford means for permitting stitching of the fabric or other material in a variety of directions.

The invention has for its object the provision of means for adjusting the presser foot and feeder simultaneously and in prescribed relation with respect to each other to permit stitching in zig-zag or other forms of irregular lines, the adjustment of the presser foot and the feeder being effected in prescribed relation with respect to the vertical plane of movement of the needle bar.

The invention has for a further object the provision of means for raising and lowering the feeder with respect to the presser foot for the purpose of gripping and releasing the material when feeding the same and said means is designed to operate in this manner upon the feeder in any position to which the latter may be adjusted.

A further object of the invention consists in the provision of means for imparting reciprocating motion to the feeder for the purposes of feeding the material, said means serving to operate said feeder in any position to which the same may be adjusted.

The invention has other objects and special features which will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

In the drawings, Figure 1 is a vertical section of the arm of a sewing machine taken through the base thereof and showing in elevation the device of my invention. Fig. 2 is a continuation of the view illustrated in Fig. 1 showing the outer overhanging portion of the arm. Fig. 3 is a sectional view similar to Fig. 1 showing the lower base portion of the arm and the parts below the machine table. Fig. 4 is a bottom view of Fig. 3.

Fig. 5 is a continuation of Fig. 3 showing the parts below the machine table, Figs. 5 and 3 being views generally similar to Figs. 1 and 2, without the arm, and showing the parts in a different position of adjustment. Fig. 6 is a bottom view of the parts shown in Fig. 5 and is a companion view to Fig. 4. Fig. 7 is a top plan view of feeder operating mechanism with the machine table removed. Fig. 8 is a bottom plan view of the feeder operating mechanism. Fig. 9 is a plan elevation of feeder mechanism showing the cloth plate removed. Fig. 10 is a top plan view of the cloth plate. Fig. 11 is a sectional view taken on line 11-11 of Fig. 2.

Like numerals of reference designate similar parts throughout the different figures of the drawings.

The invention will now be described in connection with the specific embodiment herein illustrated but it will be understood that the invention is not to be limited by such specific showing except for such limitations as the claims import.

As shown A designates the arm provided with the usual head A' and arm base A² the latter being secured to the machine table B. I will first describe the means for adjusting the presser foot and feeder in unison to any desired position. Main operating shaft 41 is mounted in suitable bearings in the arm and driven from any convenient source of power and is provided on its outer end with a crank 52 connected by link 53 with the needle bar 51 for imparting reciprocation thereto. Adjacent the rear end of the arm the shaft 41 is provided with a crank 57 which is connected by a link 50 with a crank 49 mounted on a shaft 40. Through the foregoing means the shaft 41 oscillates the shaft 40 and the latter serves through mechanism hereinafter described to impart reciprocating motion to the feeder. The shaft 41 is also provided with a crank 54 connected by a link 55 with a disk 56 mounted on shaft 44 and through which connection shaft 44 is oscillated and acts through mechanism hereinafter described for raising and lowering the feeder for the purposes of gripping and releasing the cloth or material being operated upon at the completion of the reciprocating movement of the feeder.

The foregoing serves to convey a general idea of the general disposition and function of the apparatus and I will now proceed to

describe in detail the adjusting means for the presser foot and feeder.

A vertically disposed shaft 1 is mounted in suitable bearings in the base A² of the arm and is provided between its ends with a bevel gear 42. A bevel gear 3 and a crank 2 afford means for operating the shaft 1 which will hereinafter be termed the adjusting shaft. On the upper end of said shaft 1 is mounted a disk 4 to which one end of a crank rod 5 is eccentrically mounted. The other end of said rod 5 is secured at 7 to a crank 8 mounted upon a shaft 9. Intermediate of its ends the rod 5 carries a roller 6 which operates in a slot 6^a in the arm A and serves as a movable pivot by means of which rotary motion may be communicated from the disk 4 to the crank 8 in a well known manner. The shaft 9 carries a gear pinion 10 which meshes with a pinion 13, the latter serving to rotate the presser foot to the desired position of adjustment by means of the following construction. The stem 14 of the presser foot is mounted in a rotatable member 15 desirably provided with an annular flange seating in a recess formed in a two part member 16 rigidly secured to the head A'. The member 15 is provided with a central opening to accommodate the needle bar 51 and the axis about which the member 15 rotates co-incides with the vertical axial plane in which the needle bar 51 moves so that as the member 15 is rotated it maintains the stem 14, and necessarily the presser foot 14^a, in prescribed relation with respect to the needle bar. An annular bearing flange 12 mounted on the head A' supports a rotatable member 11 provided with an annular recess embracing said flange 12.

In order to facilitate assembling of the parts the member 11 is provided with a removable upper portion 11^a and conveniently the pinion 13 is secured to the member 11 by a screw 11^b which passes through the pinion and part 11^a into the member 11. Said member 11, together with the pinion 13, is provided with a central opening to accommodate the needle bar 51 and the axis of rotation of the member 11 and gear 13 co-incides with the axial plane of movement of the needle bar 51. The stem 14 projects through the parts just described into the member 15 and the latter will be for convenience termed and referred to as the foot member while the part 11 will be referred to as the pinion member.

It will be clear from the foregoing that when the adjusting shaft 1 is rotated movement will be imparted to the stem 14 and the latter will revolve about the needle bar 51 maintaining the foot 14^a in prescribed relation with respect to the needle bar in any position in which it may be adjusted. It is necessary to at all times maintain the feeder, which is indicated at 27, in prescribed rela-

tion with respect to the presser foot 14^a and the means for effecting this adjustment will now be described in detail.

The feeder 27 is mounted upon a bridge 29 which spans the spaces usually allotted to the shuttle and its mechanism, not herein shown. At its lower ends the bridge 29 is provided with supporting lugs 30 and shifting lugs 31 between which is formed a recess 28^b for engagement with parts whereby the bridge and feeder are raised and lowered for gripping and releasing the material. A movable supporting member 28 substantially rectangular in outline is provided with an annular recess 28^a for receiving the supporting lugs 30. Said recess is closed from below by an annular plate 28^c secured to the support 28 by screws or other like means, the inner margin of the plate 28^c being engaged by the walls of the recess 28^b to limit reciprocating movement of the bridge 29. By reference to Fig. 2 it will be noted that the supporting member 28 and the bridge portions engaging the same are so proportioned as to permit the bridge and the feeder to be reciprocated throughout the limit of movement permitted of said feeder. The lateral margins of the support 28 are rigidly secured to the free ends of arms 28^d of which are two in number the opposite ends of said arms being pivotally mounted at 28^e to any suitable stationary part as shown in Figs. 1 and 4. Having described the general construction of the feeder and the manner in which it is supported I will now return to the mechanism for shifting the feeder in unison with the presser foot and I will hereinafter describe the means acting through the arm 28^d for imparting vertical movement to the feeder.

A cloth plate 25 is mounted upon a revoluble member 24 seated at 24^a in the machine table B, Fig. 2, the cloth plate 25 being provided with a slot 26 through which the feeder 27 projects and in which it moves in the usual manner. A pinion 22 is mounted upon the revoluble member 24 and the parts are conically formed on their lower portions to permit requisite movement of the bridge 29. The pinion 22 is provided on its lower face with segmental extensions 22^a the ends 22^b of which are adapted for engagement with the bridge 29 to effect rotation of the feeder in unison with the cloth plate and pinion, said extensions being clearly shown in Fig. 7. A pinion 21 mounted on a stud 21^a depending from the machine table B meshes with pinion 22. A crank rod 18 is connected at one end with the pinion 21 by means of a pin 20 and at its other end with a disk 17 mounted on the adjusting shaft 1. Between its ends said rod carries a roller 19 operating between guides 19^a mounted on the bottom of the machine table B whereby rotary motion is communicated from the adjusting shaft 1 to the pinion 21 and there-

through to the pinion 22 and the bridge 29. It will thus be seen from the foregoing that by operating the crank 2 the presser foot 14 and feeder 27 are adjusted in unison and in prescribed relation with respect to each other.

I will now complete the detailed description of mechanism which serves to raise and lower the feeder 27.

10 The shaft 44 carries at its outer end an eccentric 43. An eccentric strap 43^a surrounds the eccentric 43 and is provided with lateral extensions 43^b, Fig. 6, secured at 43^c to the arms 28^d. As oscillatory motion is
15 imparted to shaft 44 by means of the crank 54 and link 55 the feeder 27 is raised prior to its reciprocation in one direction and is lowered subsequent to such reciprocation by means of the connection of the bridge 29
20 with the support 28 which is mounted upon the arms 28^d.

I will next describe in detail the means for reciprocating the feeder in all of the different positions to which it may be adjusted.

25 33 designates a member which is provided at one end with an annular opening 32 the inner surface of which is adapted to be engaged by the shifting lugs 31. The lugs 31 are so proportioned and the member 33 is so
30 disposed with respect to the bridge 29 as to permit vertical movement of the latter and maintain engagement at all times between the lugs 31 and said annular opening 32. Said member 33 is provided with a pivotal
35 extension 47 adapted for engagement with guides 48 formed on any convenient stationary part. The guides 48 permit free movement of the pivotal extension 47 longitudinally of the member 33, referring to Fig. 2
40 and during such longitudinal movement the parts 47 and 48 merely serve as guides but when the member 33 is shifted laterally of its longitudinal axis said part 47 forms a movable fulcrum for the member 33. Said
45 member 33 is provided with an annular opening 33^f in which a reciprocating member 34 operates, said reciprocating member engaging the inner wall of the opening 33^f to reciprocate or shift the member 33 in any desired
50 direction. Said reciprocating member 34 is seated in a revoluble shifting member 33^a and is retained in a slot or groove formed in said member by a ring 33^b which is rigidly
55 attached to 33^a by any suitable means such as screws. The ring 33^b also forms a support for the inner portion of the member 33 and serves to maintain the reciprocating member 34 and the member 33 in horizontal
60 alinement with each other. The revoluble shifting member 33^a is provided with an annular flange which seats in an annular recess 33^c formed in a rigid support 33^d which latter is secured to any stationary part such for
instance as the machine table B.

65 From the foregoing it will be seen that the

support 33^d sustains the revoluble shifting member 33^a, the reciprocating member 34, and one end of the member 33. The connection of the rod 18 with the pin 20 whereby the gear 21 is rotated is formed by a sleeve
70 18^a which preferably with the pin 20 projects downwardly into the revoluble member 33^a in a manner to rotate the latter in unison with the pinion 21.

I will next describe the means whereby
75 reciprocating motion is imparted to the member 34.

The reciprocating member 34 is provided with an actuating member preferably in the form of an angularly disposed stud 35 projecting downwardly through the ring 33^b
80 into engagement with an actuating member preferably in the form of a ring 36 having inner receiving surfaces extending from a relatively sharp engaging edge. Said ring is
85 mounted upon a slide 37 or may as shown be formed integral therewith and said slide is provided with a slot 37^a. Said slide 37 is mounted to reciprocate vertically in ways formed in a yoke 38, Fig. 11, rigidly secured
90 to any suitable stationary part. The shaft 40 is provided with a crank 39 which projects into the slot 37^a and reciprocates the slide 37.

It will be seen from the foregoing that
95 means are provided for adjusting the presser foot and feeder in unison and in prescribed relation with respect to each other. It will be further noted that means are provided for reciprocating the feeder with respect to the
100 presser foot in any position to which the latter may be adjusted and further that means are provided for imparting vertical movement to the feeder in any position to which the same may be adjusted. Finally the
105 means for adjusting the feeder in unison with the presser foot also coöperates with shifting means connected with the reciprocating devices in a manner to cause the latter to reciprocate the feeder in the plane to which it is
110 adjusted.

The foregoing paragraph and the general operation may be made clear by the following recapitulation. The shaft 41 being continuously driven from any suitable source of
115 power continuously oscillates the shafts 40 and 44. The shaft 44 acting through the eccentric 43 and yoke 43^a, bars 28^b, support 28, and bridge 29 imparts an up and down movement to the feeder 27. The shaft 40
120 acting through the crank 39, slide 37, and stud 35 continuously reciprocates the member 34 and the latter acting through the member 33 reciprocates the bridge 29 and consequently the feeder 27. The adjusting
125 shaft 1 acting through the rod 18 and pinions 21 and 22 rotates the feeder 27 about the needle bar to the desired position of adjustment and simultaneously rotates the revoluble shifting member 33^a and therethrough
130

the reciprocating member 34 in such a manner as to always maintain the latter in such parallel or angular relation with respect to the feeder 27 as to reciprocate the latter in the direction of its length in any position to which the same may be adjusted. Shaft 1 also acts through the rod 5, shaft 9 and gears 10 and 13 to shift or rotate the presser foot in unison with the feeder and in prescribed relation with respect thereto so as to maintain the presser foot and feeder in parallel relation with respect to each other.

I claim:—

1. A sewing machine comprising in combination, a needle bar, a rotatable member provided with a gear, a presser foot secured to said rotatable member, an adjusting shaft, a movably pivoted crank rod and gear connection between said adjusting shaft and presser foot gear, a feeder, a rotatable member engaging said feeder and provided with a gear, a movably pivoted crank rod and gear connection between said adjusting shaft and feeder gear, and means for rotating said adjusting shaft whereby said presser and feeder are adjusted in unison.

2. A sewing machine comprising in combi-

nation, a rotatable feeder, means for rotating said feeder, a member associated with said feeder having universal movement in one plane, a reciprocating member for actuating said first mentioned member, and a shifting member operated by said means to adjust said reciprocating member in unison with said feeder.

3. A sewing machine comprising in combination, a rotatable feeder, means for rotating said feeder, a fulcrumed member associated with said feeder and adapted to have universal movement in one plane, a reciprocating member for operating said fulcrumed member and provided with an inclined stud, an actuated slide engaging said stud to operate said reciprocating member, and a shifting member operated by said means to adjust said reciprocating member in unison with said feeder.

In testimony whereof I affix my signature in presence of two witnesses.

ANTON PFEUFER.

Witnesses:

ULYSSES J. BYWATER,
LOUIS F. MUELLER.