(Model.) 5 Sheets—Sheet 1.

R. LEAVITT.

SEWING MACHINE.

No. 285,417. Patented Sept. 25, 1883.

FIG. 1

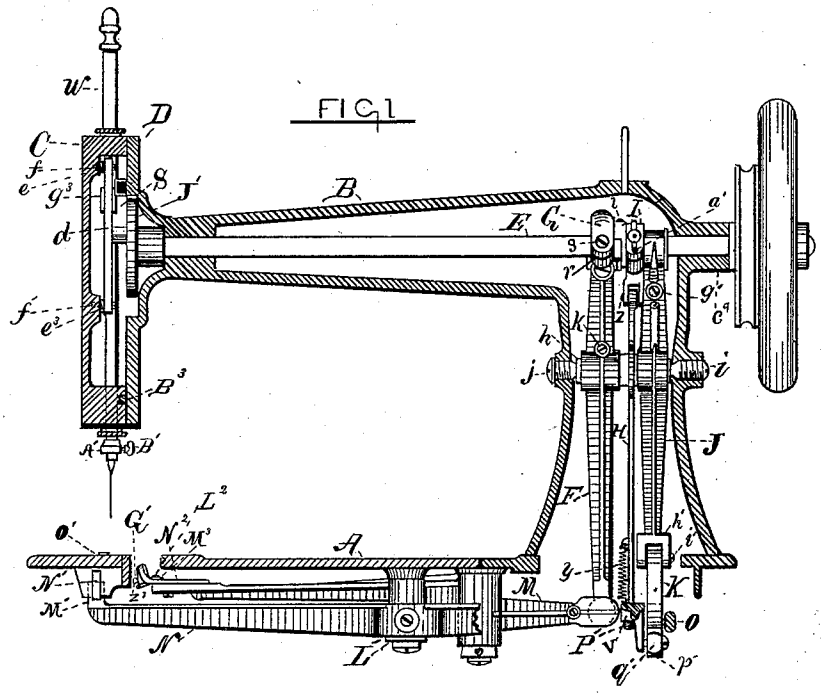
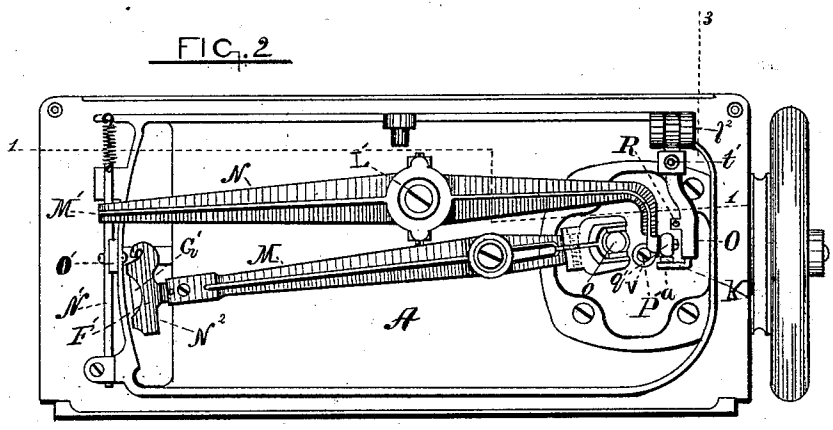


FIG. 2



Witnesses.
Edward Mather
William Houghtaling

Inventor.
Rufus Leavitt
by Geo. D. Phillips

(Model.)

R. LEAVITT.

5 Sheets—Sheet 2.

SEWING MACHINE.

No. 285,417. Patented Sept. 25, 1883.

FIG. 3

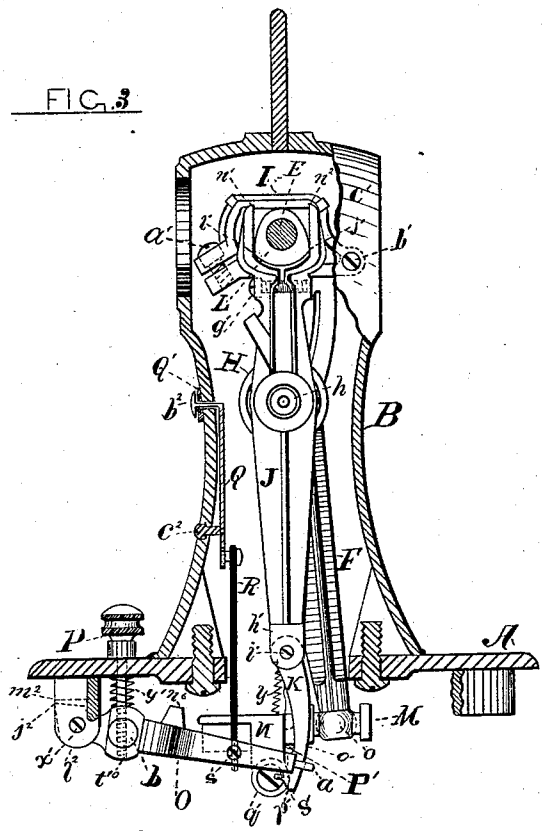


FIG. 4

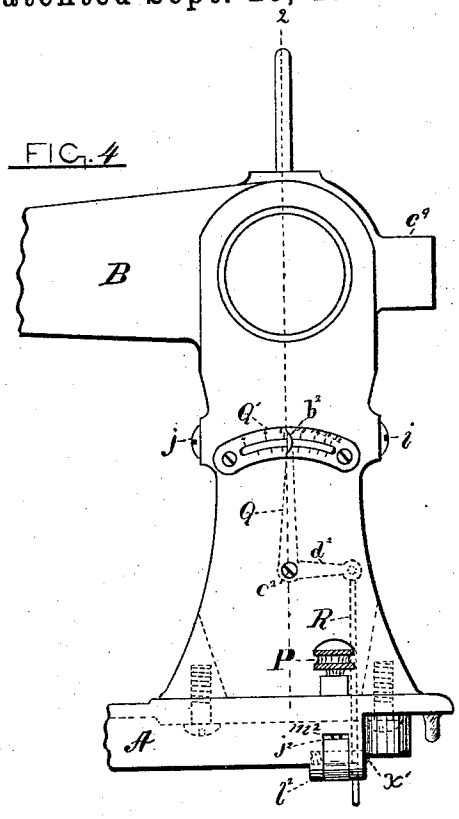


FIG. 5

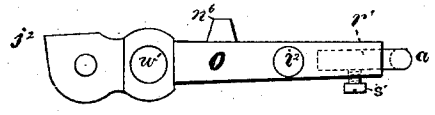


FIG. 10

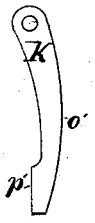


FIG. 6

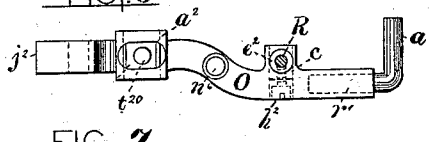


FIG. 7

FIG. 9

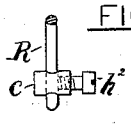
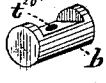


FIG. 8



Witnesses.

Edward Hatheu

William Houghtaling

Inventor.

Rufus Leavitt

by Geo. N. Dillp

(Model.)

5 Sheets—Sheet 3.

R. LEAVITT.

SEWING MACHINE.

No. 285,417. Patented Sept. 25, 1883.

FIG 11

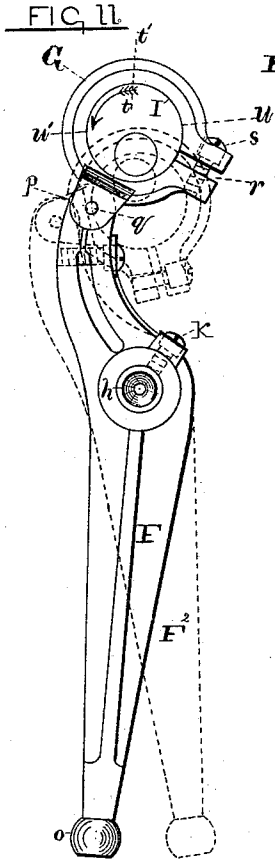


FIG 12

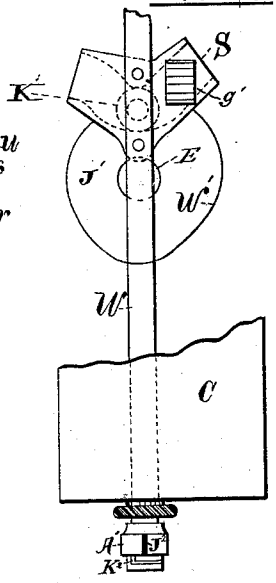


FIG 13

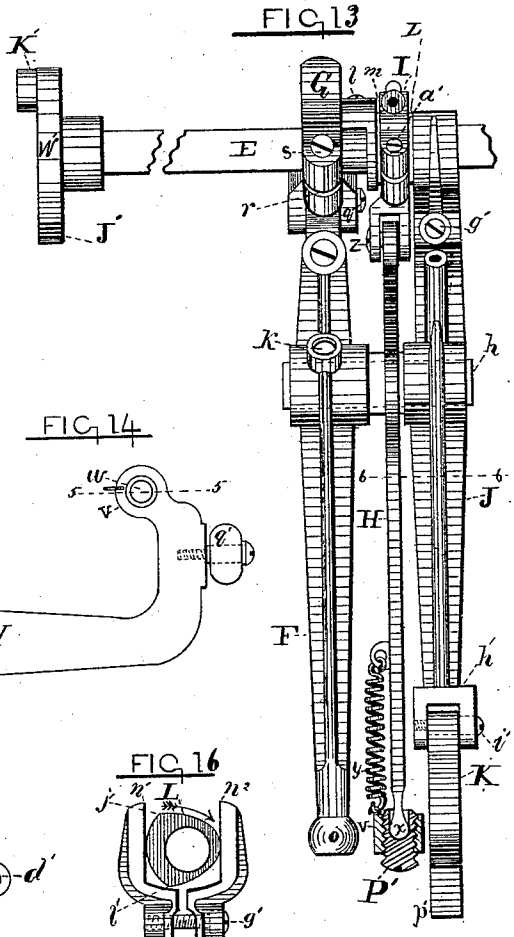


FIG 14

FIG 15

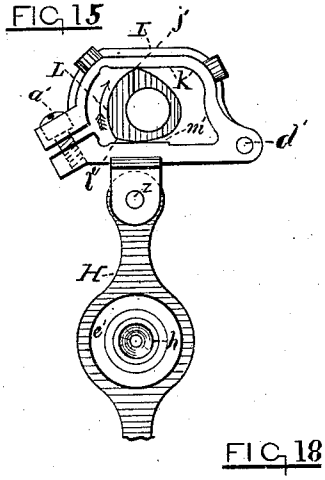


FIG 16

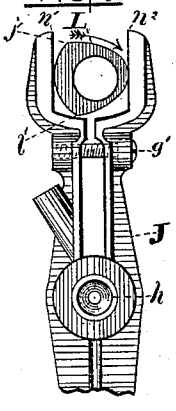


FIG 17

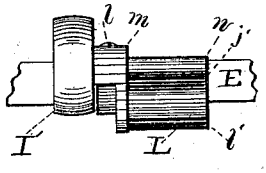
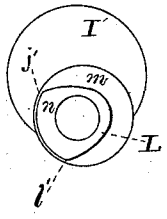


FIG 18



Witnesses.

Edward Mather

William Houghtaling

Inventor.

Rufus Leavitt

by Geo. H. Phillips

(Model.)

5 Sheets—Sheet 4.

R. LEAVITT.

SEWING MACHINE.

No. 285,417. Patented Sept. 25, 1883.

FIG 19

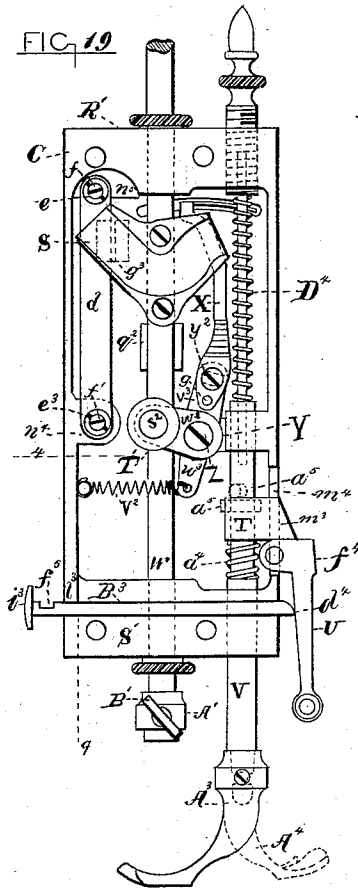


FIG 20

FIG 21

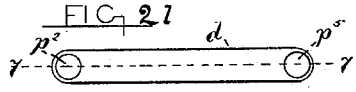


FIG 22

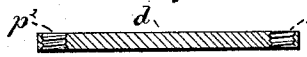


FIG 23

FIG 24

FIG 25

FIG 26

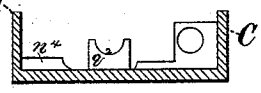


FIG 27

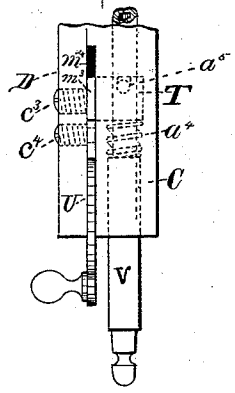


FIG 28

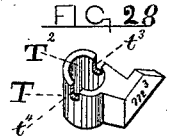


FIG 29

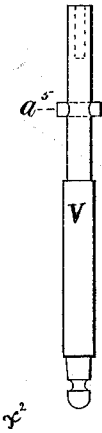


FIG 30

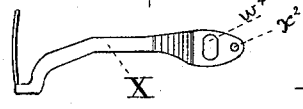
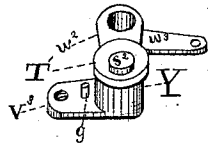


FIG 31



Witnesses.
Edward Flather
William Houghtaling

Inventor.
Rufus Leavitt
by Geo. B. Phips.

(Model.)

5 Sheets—Sheet 5.

R. LEAVITT.

SEWING MACHINE.

No. 285,417. Patented Sept. 25, 1883.

FIG. 32

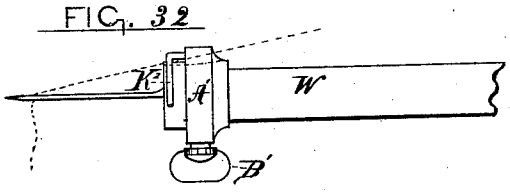


FIG. 33

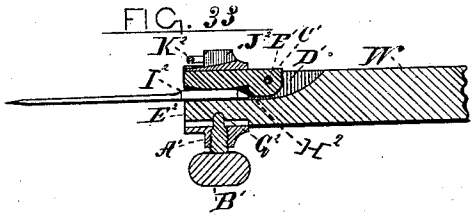


FIG. 34

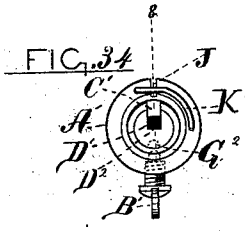


FIG. 35

FIG. 36

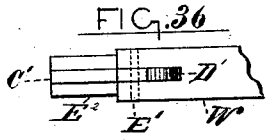


FIG. 37

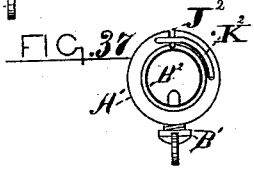


FIG. 38

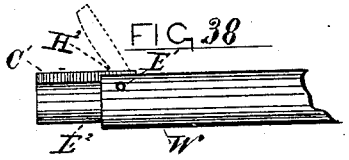


FIG. 39

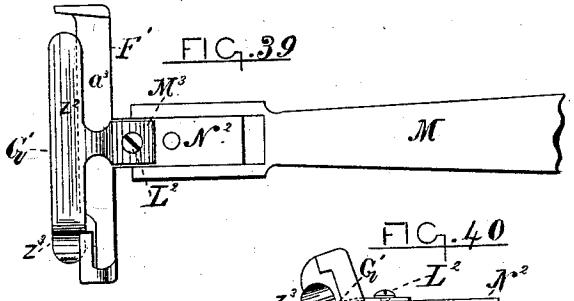
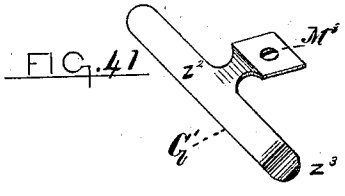


FIG. 40

FIG. 41



Witnesses.
Edward Flather
William Houghtaling

Inventor.
Rufus Leavitt
by Geo. H. Phillips

UNITED STATES PATENT OFFICE.

RUFUS LEAVITT, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE HOWE MACHINE COMPANY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 285,417, dated September 25, 1883.

Application filed December 8, 1882. (Model.)

To all whom it may concern:

Be it known that I, RUFUS LEAVITT, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is 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, reference being had to the drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of sewing-machines in which the movement of a vibrating shuttle-lever is derived through an oscillating lever from a driving-shaft journaled in the goose-neck, or upper part of the arm which actuates the needle-bar.

The object of my invention is to adjustably connect the feeding and lifting mechanism by means of which the proper relation with each other may at all times be maintained; to provide, also, a simple contrivance to raise the presser-foot a short distance, or half lift, when required; to provide a take-up capable of being adjusted; to provide a guide-bar to engage with and guide the needle-bar cam and the means for adjusting the same; to provide a simple and efficient needle-clamp to be used in combination with a self-setting needle; and, also, an elastic vibrating tongue attached to the shuttle-carrier on which the shuttle rests, and which operates to deaden the noise caused by the shuttle striking the carrier.

To more clearly understand my invention, reference is had to the drawings accompanying this specification, and forming part of the same, in which—

Figure 1 represents a vertical longitudinal section through the center of the goose-neck or arm and a section of the bed through the dotted line 1 of Fig. 2; Fig. 2, a plan view of the bottom of the bed; Fig. 3, a sectional view of the goose-neck or arm through the dotted line 2 of Fig. 4 and of the bed through the dotted line 3 of Fig. 2; Fig. 4, a broken side elevation of the goose-neck or arm and bed, showing the operation of the indicator; Figs. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18, detail views; Fig. 19, an interior view of the face-plate; Figs. 20, 21, 22, 23, 24, and 25, detail views; Fig. 26, a transverse sectional view of the face-plate, taken through the dotted line 4 of Fig. 19; Fig. 27, a broken edge view of the lower portion of the face-plate and the flange of the goose-neck or arm; Figs. 28, 29, 30, and 31, detail views; Fig. 32, a view of the needle-clamp and a portion of the needle-bar; Fig. 33, a longitudinal section of the needle-clamp and needle-bar; Fig. 34, an end view of the needle-clamp and needle-bar; Fig. 35, an end view of the needle-bar; Fig. 36, a plan view of the needle-bar, showing the needle-latch attached therein for holding the needle; Fig. 37, an end view of the needle-clamp; Fig. 38, a side view of the bar and latch. Fig. 39 is a plan view of the upper side of the shuttle-carrier, with the vibrating tongue attached, showing also a portion of the shuttle-lever; Fig. 40, a side view of the shuttle-carrier and tongue; Fig. 41, a perspective view of the vibrating tongue.

Referring to the figures above mentioned, the letter A indicates the bed; B, the goose-neck or arm; C, the face-plate; D, the front flange of the arm to which the face-plate is attached; E, the driving-shaft; F, the eccentric-lever; G, the eccentric-strap attached thereto; H, the lift-rod; I, the yoke connection attached to the same; J, the feed-cam lever; K, the feed-link connected therewith; L, the cam for operating the feed, lift-rod, and eccentric levers; M, the shuttle-lever; N, the feed-lever; O, the adjusting-lever; *a*, a right-angular lug or arm secured in the end thereof; P, the stitch-regulating screw; *b*, the stitch-regulating screw-nut; Q, the stitch-indicator; R, the stitch-indicator rod; *c*, the indicator-swivel; S, the needle-bar cam; *d*, the needle-bar-cam guide; *e* e^3, adjusting-screws; *f f'*, set-screws to secure the same; T, the presser-bar guide; U, the presser-bar lifter; V, the presser-bar; W, the needle-bar; X, the take-up; Y, the take-up rocker; *g*, the take-up rocker-pin; Z, the take-up rocker-stud; A', the needle-clamp; B', the needle-clamp screw; C', the needle-latch; D', the slot in the needle-bar for the latch; E', the pin on which the latch swings; F', the shuttle-carrier; G', the vibrating tongue.

The levers F and J, Fig. 1, operate in the usual manner on the stud *h*, which oscillates freely on the center screws, *i j*, the eccentric-

lever F being attached thereto by the set-screw K, while the feed-cam lever J works freely thereon.

The levers F J and rod H (see Fig. 13) are all connected with and operated by the cam L, a detached view of which may be seen at Fig. 17 attached to a section of shaft E by the set-screw *l*, also an end view of the same, Fig. 18.

One end of the cam L, Fig. 17 is provided with the eccentric I′, which engages with the eccentric-strap G, Fig. 11, for controlling and operating the lever F. The cam L and eccentric are formed integral from the same casting, and that part extending from the shoulder *m* to the end *n* constitutes the cam L, and is adapted, from its peculiar construction, to operate within a square hole or forked lever having its sides parallel. It controls and operates the lift-rod H and feed-cam lever J, as seen at Figs. 15 and 16.

Fig. 13 represents a view of the oscillating levers F and J, lift-rod H, and cam L, attached to the shaft E, properly grouped and arranged for operation, but detached from the arm. On the end of the shaft E is the needle-bar-cam flange J′, having the needle-cam roll K′, which engages with the needle-bar cam S, Fig. 12, which represents a view of a section of the face-plate, needle-bar, needle-bar cam, and flange J′.

Fig. 11 represents a side view of the oscillating or eccentric lever, at the lower end of which is the ball *o*, which engages with the forked end of the shuttle-lever M in the usual manner, the other end, *p*, being jointed to the eccentric-strap G by the screw *q*, on which the strap G can freely swing. This strap is attached, as before stated, to the eccentric I′ of the cam L, and works freely thereon, the strap being separated by the cut *r*, and by means of the adjusting-screw *s* the proper tension is maintained. When the shuttle has passed through the loop, the point *t* of the eccentric, as it approaches the point *u* of the strap, will give a slow motion to the shuttle as it nears its extreme throw, and between the points *u* and *t′* the shuttle will have ceased its movements, and the needle-bar will be carried to its highest position, as indicated at Fig. 12. In passing over this upper center it is essential that the lever F, which operates the shuttle-lever, should remain stationary until the needle-bar is ready to begin its downward movement. The time occupied in passing the center is short, it is true, but long enough to allow movement to the eccentric-lever, so that the shuttle will let go, and will have made considerable progress in its backward movement before the needle-bar begins its descent. Now, as there is a dead-point when the needle-bar has reached its highest position, there should also be a corresponding dead-point on the eccentric-lever, and this is successfully accomplished by means of the eccentric-strap G. The highest point *t* of the eccentric I′, in traveling from the point *u* of the strap to the point *t′* of the same, Fig. 11, merely lifts the strap G, which swings on connection-screw *q*, while the lever F remains stationary. This gives the time required for the needle-bar to pass the dead-center. When this is passed, the highest point *t* of the eccentric I′, approaching in the direction of the arrow toward the point *u′* of the strap, imparts motion to the lever F and carries it to the other extremity of its throw, as indicated by the dotted position F^2. Thus the shuttle and needle pull together and the stitch is fully completed, leaving no slack threads, the upper and lower threads being drawn firmly onto the fabric and the loop or lock formed in the center of the same. This is what is called the "Howe stitch."

The feed-lever N, Fig. 2, works on the universal joint L′, and its end M′ is connected to the feed-bar N′, which carries the feed-surface O′. The other end, *v*, of lever N is provided with the adjusting-screw P′, as seen more clearly at Fig. 13, which represents a sectional view of the adjusting-screw P′ and end *v* of the feed-lever through the dotted line 5, Fig. 14.

The screw P′ has the hole *w*, preferably rounding at the bottom to receive the ball-shaped end *x* of the lift-rod H. The screw P′ and lift-rod H are kept in contact by the spring *y*. The connection of the lift-rod H with the feed-lever N would be a difficult thing to accomplish were it not for the adjusting-screw P′, by means of which they are readily brought in contact. The other end of the rod H is loosely connected with the yoke I by the screw *z*, and the yoke is operated by the cam L, Fig. 15, which shows that portion of rod H above the dotted line 6, Fig. 13. The yoke I is provided with the adjusting-screw *a′* to compensate for wear. Said yoke I is also connected with and swings freely on the screw *b′*, Fig. 3, which shows the small portion *c′* of the rear of the arm in full. The end of this screw or pin *b′* enters the hole *d′* of the yoke, Fig. 15. This connection is necessary, as the yoke is loosely connected to the lift-rod H, and it operates to keep it in proper position in relation to the cam L. The central portion of lift-rod H is not intended to fit the stud *h;* but the hole *e′* of the rod is made sufficiently large to clear the stud *h* as it rises and falls with the feed. The feed-cam L also operates in the forked end of the lever J against the perpendicular sides *n′ n²*, Fig. 16, which represents that portion above the dotted line 6 of Fig. 13. The forked end is adjusted to compensate for wear by adjusting-screw *g′*, and the lower end, *h*, is forked to receive the feed-link K, which works freely on the screw *i′*.

When the eccentric-lever F is in the position as shown in full lines, Fig. 11, the needle-bar, as before stated, is at its highest point, and the feed-surface O′, Fig. 1, is raised to its highest position. When the lever F begins its backward movement, the cam L will lift the rod H, and as the feed-lever N is attached to the rod H by the spring *y*, it will raise the end of the lever N back of the universal joint L′, Figs. 1 and 2, and cause the feed-sur-

face O′ to drop. Then the cam L will occupy the position in relation to the yoke I as seen at Fig. 15. The distance from the point j' to the point l' of the cam, Fig. 15, represents the highest part of the same, and the cam, in traveling the distance between these two points will hold the lift-rod H up and the feed-surface below the bed until the feed-surface has been carried back to its starting-point by the lever J. The point l' of cam L will then engage the lower surface, m', of the yoke-depressing rod H and lever N, raising the feed-surface above the bed in a position to feed forward, which is effected by cam L coming in contact with the fork of lever J, when the cam will occupy the position as represented at Fig. 3, the point l' engaging with the face n' and carrying the upper part of the lever to the left and the lower end of said lever to the right. The lever would also carry the feed-link with it, but the movement of the link is arrested by the lug a. Said lug serves as a fulcrum for the link K, which thus becomes a lever, and the feed is adjusted or regulated by adjusting the position of said fulcrum, and thereby changing the relative length of the arms of the lever.

The inner face, p', of the link, Fig. 10, engages with the roll q' of the feed-lever N, (see Fig. 3,) a better view of which roll is seen at Fig. 14, where the roll q' is attached to the lever N, said lever engaging with feed-bar N′, Fig. 2, which carries the feed-surface O′, and by such action of the link K said feed-surface is moved forward. The object of the roll q' on the lever N is to enable it to travel up and down on the face p' of the link K when the lever N rises and falls with the lift-rod H, thereby reducing the friction of these surfaces.

When the cam L is in the position in relation to the lever J indicated by Fig. 16, the feed-surface will have traveled its full limit, and will be held in that position until after the point l' of the cam L leaves the perpendicular face n' of the fork. In the meantime the point j' of the cam engages with the yoke, Fig. 15, raising the same, causing the feed-dog or surface to drop by the operation, as before stated. The point j' will then engage with the opposite face, n^2, of the fork of lever J, and carry the feed-surface back to its starting-point. While the feed-surface is below the bed, and on its return movement, the needle will have descended and withdrawn from the fabric in time for the levers, by the operation as stated, to raise and carry the surface forward. A decided advantage is thus obtained by having the actuating-levers operated by the same cam, as they can more readily be adjusted and accurately timed in their respective movements in relation to each other than could be accomplished if they were operated by independent cams. All that is required in setting a cam such as described is to place it in a position so that any one of the levers will be correctly timed, and all the rest will operate in perfect harmony with it.

A hole is provided in the end of the adjusting-lever O to receive the shank r' of the lug a, (see side elevation, Fig. 5,) which is secured therein by the set-screw s'. The lug a is arranged to be adjusted to the circle o' of link K. (See Fig. 6.) The lever O is operated by the stitch-screw P, Fig. 3, the lower end, t^{10}, of which is threaded and fits a corresponding threaded hole, t^{20}, in the nut b, a top view of which is seen at Fig. 7 and a perspective view at Fig. 8. The nut b enters the hole w' of the adjusting-lever, Fig. 5, and oscillates freely therein. The lever O, swinging freely on the screw x' of the lug l^2 of the bed, is raised and lowered by means of the stitch-screw P, and varies the length of the stitch by changing the position of the lug a on the circle o' of the link K. The spring y', situated between the lever O and the bottom of the bed A, operates to carry the lever down when the screw P is turned back. The lever O describes in its movements an arc of a circle as it travels up and down the link K. Therefore the elongated hole a^2 is provided in lever O, Fig. 6, extending through the same, to allow free play to the screw P in the oscillating movement of the lever. The length of the stitch is shown on the plate Q′ by the pointer b^2 of the indicator Q, Fig. 4, which latter swings on the screw c^2, situated in the arm B, the short arm d^2 of the indicator connecting with the rod R, which passes through the hole e^2 of piston-lever O, Fig. 6, and has attached to it by the set-screw h^2 the round swivel c. Said swivel oscillates freely in the hole i^2 of lever O, Fig. 5, similar in its operation to the nut b. A section of rod R, with the set-screw, is shown at Fig. 9. By turning the screw P to the right or left, the position of the lever O will be altered, and by means of the indicator the length of stitch indicated on the plate Q′. To prevent the lever O from being carried down so low as to drop from the link K, the point j^2 of the lever will engage with the shoulder m^2 in the lug l^2, Fig. 3, and arrest its progress, the projection n^6 of the lever engaging with the bottom of the bed to limit the travel upward.

Fig. 19 represents a view of the interior of the face-plate C, d indicating the needle-cam-guide bar, resting on the supports n^4 and n^5 of the plate. A view of bar d may be seen at Fig. 21, having the threaded holes p^2 p^5 to receive the threaded bushings e e^3, a view of one of which is shown at Fig. 23.

Fig. 22 is a section of bar d through the dotted line 7, Fig. 21.

Fig. 24 is a top view of the bushing provided with the hole f^3 for the set-screw f, Fig. 25, which screws into the supports n^4 n^5 of the plate.

On the needle-bar cam S, Fig. 20, is the guide g^3, which fits the guide-bar d and travels on the same, operating to keep the cam level and prevent cramping. Any imperfection in the construction of the cam or change of position of the needle-bar to which the cam is attached, or any difference in the height of

the supports n^4 n^5 which would interfere with the travel of the cam, may be counteracted by the adjustment provided at each end of the bar *d*.

The bottoms h^3 of the bushings, Fig. 23, rest on the supports n^4 n^5, and each end of the bar *d* is adjusted independently until the proper level is obtained in relation to the cam, when the bar is secured firmly down by the set-screws *f f'*.

q^2, Figs. 19 and 26, is a central bearing projecting from the inner surface of the face-plate C, to support the needle-bar and counteract any tendency of the same to spring laterally or be deflected from a straight line, which would cause it to stick and bind in the bearings in the ends R' and S' of the face-plate; but it does not operate in any manner to prevent the bar turning on its axis.

The mechanism which controls the take-up is similar in construction and operation to others of this class, except that an adjustment is provided on the take-up for the purpose of placing the same in the proper position in relation to the thread, and also to compensate for wear. The roll T' operates against the cam-shaped periphery W' of the flange J', Fig. 12, and is connected by the pin s^2 to the arm w^2 of the rocker Y. To the arm w^3 is attached the retractile spring v^2, and to the arm v^3 is secured the take-up X. The rocker Y oscillates on the stud Z. A perspective view of the rocker and roll is seen at Fig. 31. The take-up, Fig. 30, has the elongated hole w^4 for the screw y^2 and the pin-hole x^2 for the pin *g* on the arm v^3 of the rocker. By means of the elongated hole w^4 of the take-up, it may be adjusted and placed in its proper position in relation to the thread; also, in case of wear by constant motion of the roll T' on the flange J', which will reduce their surfaces and give a different time to the take-up, it can be adjusted to its original position.

Fig. 28 represents a perspective view of the presser-bar guide T, having the hole T^2 for presser-bar and transverse slots t^3 t^4 to admit the guide-pin a^5 of the presser-bar, Fig. 29. The guide T, Fig. 28, has the flange m^3, which enters the slot m^4 of the face-plate C, Fig. 27. The screw c^3 in the flange D of the arm B retains the flange m^3 of the guide against the side of the slot m^4. The screw c^4 supports the lifter, which also operates in the slot m^4.

Fig. 19 represents the guide T on the presser-bar V, and immediately below the guide is the spring a^4, which operates to keep the guide up to the pin a^5 of the bar V, said pin resting in the slots t^3 and t^4 of the guide, which prevents the bar from turning when the presser-foot is on the work. When necessary to swing the foot A^3 around, the bar V is raised, lifting the pin a^5 out of the slots of the guide T, the pin resting on top of same. (See dotted position of foot A^4, showing also the position of pin a^5.)

In fancy stitching, embroidering, &c., it is necessary at certain points to turn the work with as little delay as possible, and to do so it is usual to raise the foot from the fabric sufficient to relieve the pressure, and when the direction of the stitching has been changed the foot is permitted to drop. In machines of the ordinary construction it is inconvenient to reach and operate the lifter, situated as it is at the back of the face-plate, as both hands of the operator are required to guide the work; but by means of the push-rod, provided as shown at Fig. 19, the operator has perfect control of the lift without removing the hands from the work.

B^3 is the push-rod, operating in a transverse slot of the face-plate C, and having the button or head i^3 projecting from the plate nearest the operator, the other end, d^4, of the rod engaging with the handle of the lifter U. When necessary to lift the foot, the operator can reach the button or head i^3 with the thumb and push it in until the cut or notch f^5 of the rod B^3 coincides with the side wall, l^3, of the plate C, when the pressure of the spring D^4, acting through the medium of the guide T and lifter U, will cause it to engage therewith. By pressing downward on the button i^3 the notch f^5 will be disengaged and the foot lowered, thereby carrying the push-rod back to its original position.

Fig. 32 is a section of the needle-bar W and needle-clamp A' attached to the same.

Fig. 37 is an end view of the clamp. The hole B^2 represents the size of the needle-bar proper.

Fig. 35 represents an end view of the needle-bar, showing the groove D' to receive the needle and its latch. One side of the needle-shank is flattened, and such flat side of the same rests on the bottom D^2 of the groove D', said groove being cut in the needle-bar a distance sufficient for the latch C' to operate on the pin E', the latter extending transversely through the bar, Fig. 38.

The clamp A' (Fig. 33, which represents a view taken through the dotted line 8, Fig. 34) is placed on the small or reduced end E^2 of the needle-bar, the inner surface of the clamp A' resting on top of the latch C', the screw B' holding it firmly thereon, thus securing the needle. The point of the set-screw B' is reduced in size, and enters the hole G^2 provided in the bar W, opposite the latch, Figs. 33 and 34, thus serving to prevent the clamp A' from dropping off.

The shoulder H^2 of the latch C', Figs. 38 and 33, is intended as a stop for the needle-shank I^2, and determines the height of the needle.

J^2 is a thread-slot in clamp, and K^2 wire-thread guide.

The vibrating tongue G', Fig. 39, is constructed of thin metal, and is secured to the shuttle-carrier F' by the screw L^2, the shank M^3 of the tongue resting on the shank N^2 of the carrier. The tongue G' is raised above the surface a^3 of the carrier, Fig. 40, leaving an open space between them for vibration of the former. The shuttle will rest on the sur-

face z^2 of the tongue, and the end z^3 of the tongue, which is bent upward, will support the point or nose of the shuttle. In machines of the ordinary construction, when the shuttle-thread is pulling up, the shuttle is raised from the surface of the carrier, and as it lets go suddenly the shuttle will drop on the carrier and make a disagreeable clicking noise. This is entirely avoided and prevented by the vibrating tongue, as above described. The tongue, constructed, as it is, of thin metal, is very sensitive and readily yields to the shuttle, thus preventing the latter from striking hard on the carrier.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the feed-lever N and cam L, of the lift-rod H, for raising and lowering the feed, the lower end of said rod being adjustably connected to one end of the lever N by the screw P′, and said screw being brought and held in contact with rod H by the spring y, as set forth.

2. The combination, with the lift-rod H, adjustably connected to the feed-lever N, of the yoke I, loosely connected to said lift-rod H, and operated and controlled by the cam L, situated on the driving-shaft E, substantially as set forth.

3. The combination, with a vibrating oscillating feed-lever situated below the bed, and a vertical oscillatory lever having its upper end forked to engage with the feed-cam on the driving-shaft, of the feed-link K, loosely connected to the lower end of said vertical lever, said link engaging with a friction-roll situated on the vibrating feed-lever, and an adjusting-lever one end of which is pivoted to the bed and the other end provided with an adjustable lug engaging with the outer surface of the link K, whereby the movement of the feed is effected, as set forth.

4. The combination of the stitch-screw P, situated above the bed, and having its lower end threaded, and the spring y', with the adjusting-lever O, adjustably connected to the link K, and having between its ends the loosely-fitting nut or bushing b, transversely situated in said adjusting-lever, said bushing having a threaded hole to engage the threaded end of the stitch-screw, by means of which the adjusting-lever is raised and lowered and the length of the stitch is regulated, substantially as described.

5. The combination of the needle-bar and a needle-cam attached thereon, and a guide provided on the needle-cam, with the adjustable guide-bar having threaded bushings or rings in each end, which rest on the face-plate, by means of which the bar is brought to the proper level in relation to the needle-cam, and secured there by set-screws passing through the said bushings into threaded holes in the face-plate, as described.

6. In a sewing-machine, the combination of the cam-shaped flange J′, the take-up rocker Y, having arms w^2 w^3 v^3, stud Z, take-up roll T′, and spring v^2, with the adjustable take-up X, having elongated slot w^4 and pin-hole x^2, and arranged to be pivoted to the pin g of the rocker, and secured thereon by the set-screw y^2, as described.

7. The combination, in a sewing-machine, of the presser-bar V, having the pin a^5, situated transversely in said bar, the guide T, having transverse slots or grooves t^3 and t^4, to receive the pin a^5, the flange m^3, to engage with the lifter by means of which the bar is raised, the adjusting-screw c^3, to hold the guide T in position, and the spring a^4, by means of which the guide is kept in contact with the pin a^5 of the presser-bar, the bar being arranged, as described, to be lifted from the slots or grooves of the guide, and then swung around in any position required, as specified.

8. The combination, with the needle and the face-plate, of a central stationary bearing for said needle-bar, projecting from the inner surface of said face-plate, said bearing being constructed with a concave recess adapted to partially embrace said needle-bar, whereby the latter is prevented from springing laterally, substantially as set forth.

9. The combination, with the face-plate C and lifter U, of the push-rod B^3, having notch f^5 and head i^3, said push-rod being transversely situated in plate C, and having the end d^4 arranged in contact with the lifter, by means of which the presser-foot is slightly raised, as desired, substantially as described.

10. The combination, with the needle-bar W, having its lower end, E^2, smaller than the bar proper, and the groove D′ formed in said lower end to receive the shank of the needle, of the pivoted latch C′, swinging on the pin E′, said latch overlying the needle-shank, and being provided with the stop or shoulder H^2, to determine the height of the needle, and the shell-clamping device A′, encircling the small end E^2 of the needle-bar, and having thumb-screw B′, by means of which the shell A′ is brought firmly down on the latch and the needle held in place, as described.

11. In a sewing-machine, the combination, with the shuttle-carrier, of an overlying vibrating tongue attached to the said carrier, the said tongue being arranged to support the shuttle and maintain its proper level in relation to the loop, and adapted to slightly yield to the sudden jar or fall of the shuttle and recover its former position, substantially as described, and for the purpose set forth.

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

RUFUS LEAVITT. [L. S.]

Witnesses:
I. B. PRINDLE,
P. W. HARTSHORN.