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Patented Dec. 3, 1901.

W. M. AMMERMAN.

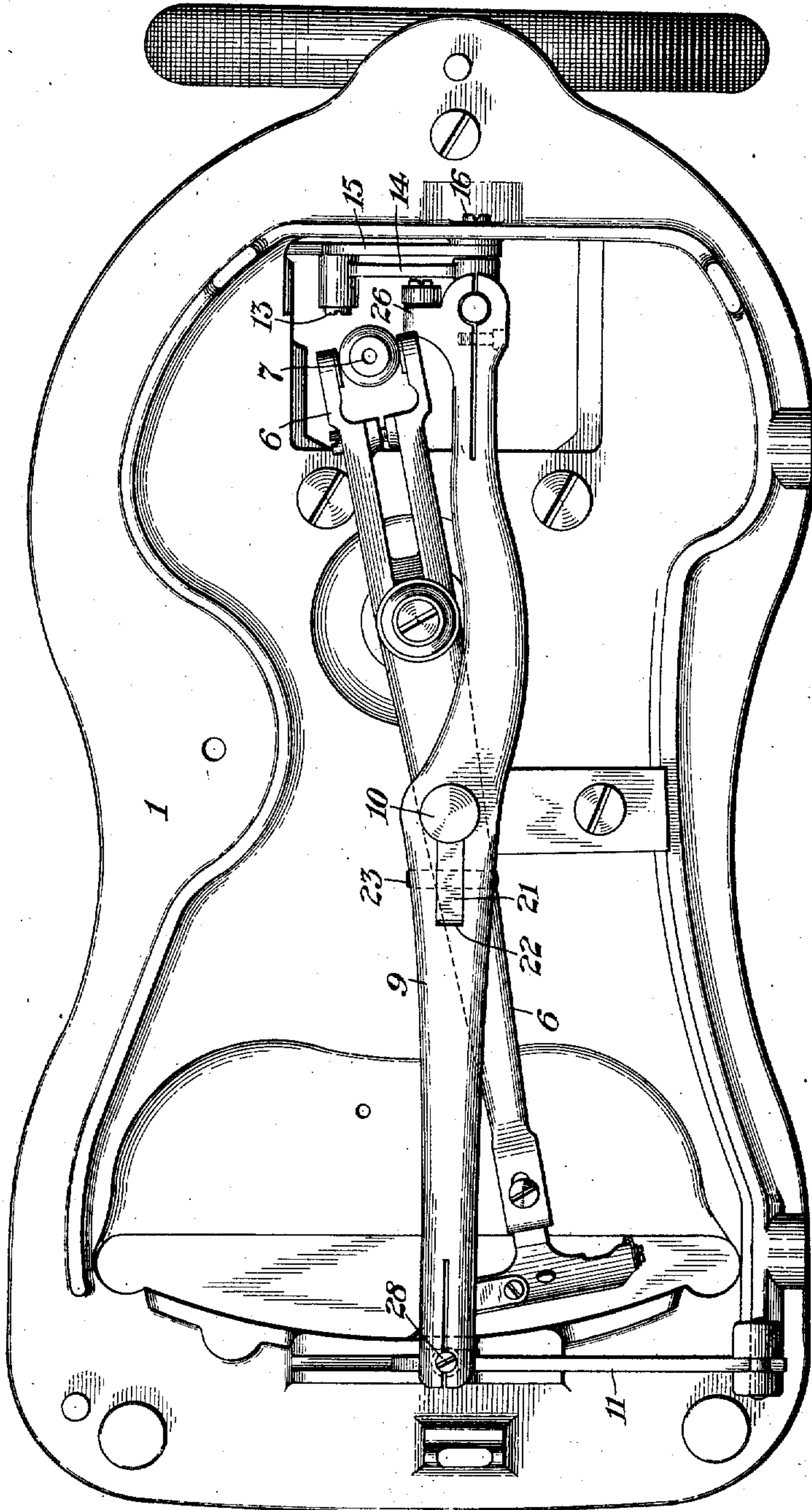
FEEDING MECHANISM FOR SEWING MACHINES.

(Application filed May 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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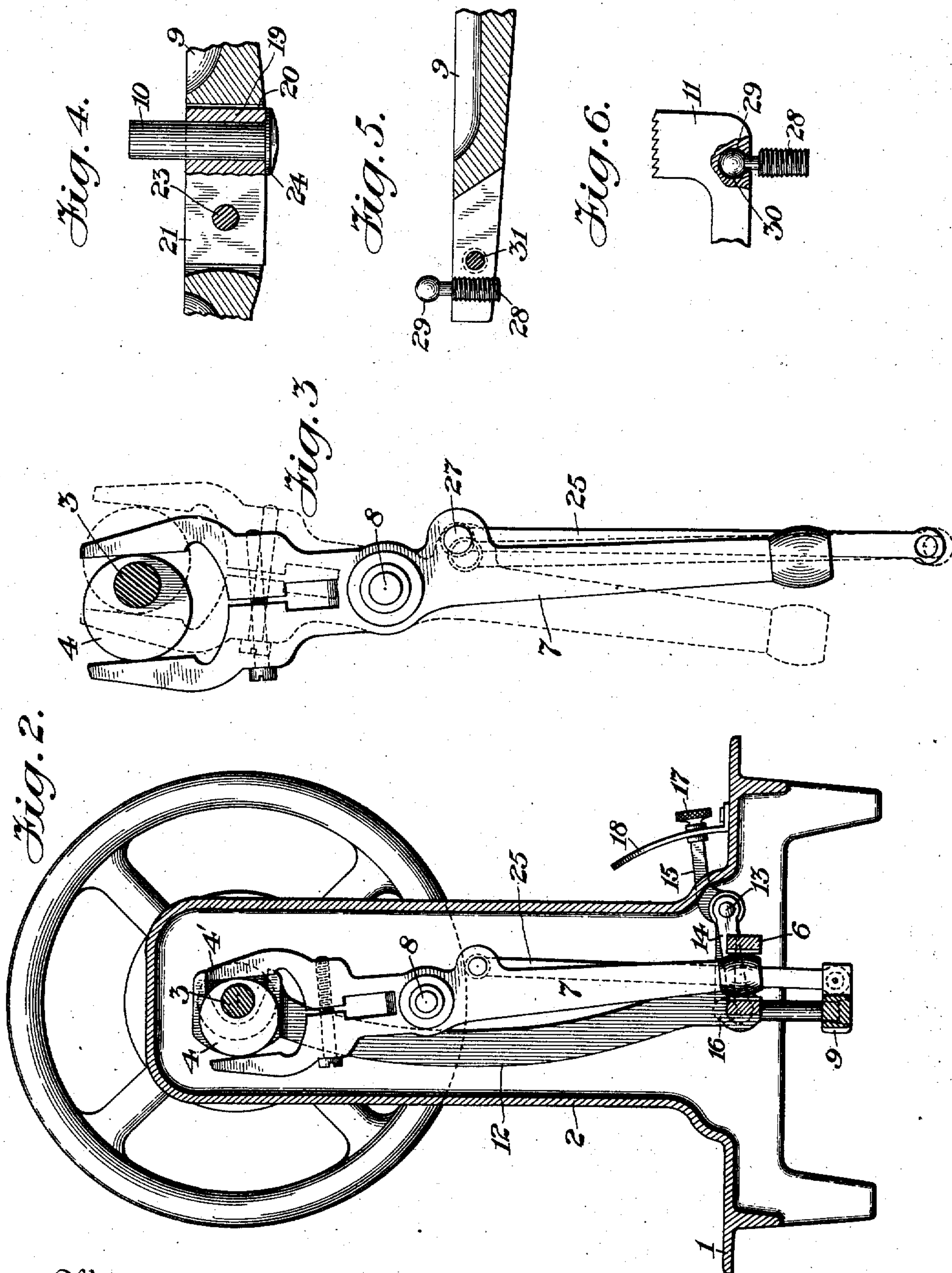
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2 Sheets—Sheet 2.



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FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 687,951, dated December 3, 1901.

Application filed May 18, 1901. Serial No. 60,795. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. AMMERMAN, a citizen of the United States, and a resident of the city and county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has for its object the production of an improved feeding mechanism for sewing-machines in which each of the several movements of the feeding device or bar will be positive and also in which the several parts comprising the mechanism for actuating the feeding device or bar will be so constructed and arranged as to secure an increased lightness and uniformity of operation, together with a minimum amount of noise. This object I secure by means of the new and novel construction and combination of parts, as hereinafter set forth in detail, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a bottom view of a sewing-machine embodying my invention. Fig. 2 is a sectional elevation of the same on line 2 2 of Fig. 1 looking in the direction indicated by the arrow. Fig. 3 is an enlarged detail view illustrating different positions assumed by certain of the connections in the vertical arm of the machine at different times during the operation of the machine, and Figs. 4, 5, and 6 are enlarged detail views to be hereinafter referred to.

In said drawings the frame of the machine, comprising the bed-plate 1 and its attached bracket-arm 2, the main or driving shaft 3, journaled in the upper horizontal portion of said bracket-arm and provided with a cam or eccentric 4 thereon, the horizontally-arranged vibrating shuttle-lever 6, pivotally mounted on the under side of the bed-plate, and the lever 7, pivotally supported upon a fulcrum-pin 8 in the upright portion of the bracket-arm and provided with a fork at its upper end which embraces the said cam or eccentric 4 on the driving-shaft to receive motion therefrom and with a ball or rounded portion at its lower end working in a fork at the rear

end of the shuttle-lever to operate the latter, are all, so far as described, of usual and well-known construction as found in the "Domestic" sewing-machine.

A feed-lever 9, mounted to swing on a pivot-pin or stud 10 on the under side of the bed-plate, is operatively connected at one end with the feed-bar (indicated at 11) and at its opposite or rear end is engaged by suitable actuating means from which it receives a horizontally-vibrating movement to communicate the desired horizontal or longitudinal movement to the feed-bar. The actuating means for thus operating the feed-bar may be of any suitable construction, the same, as herein shown, consisting of a pitman-lever 12, which is yoked at its upper end over the cam or eccentric 4 to be reciprocated vertically thereby and at its lower end being rounded and passed through an opening in the rear end of the feed-lever 9 to effect connection therewith. As a means for causing lateral or vibrating movement to the lower end of said pitman-lever, so as to actuate the feed-lever, I connect the same with a fulcrum-pin 13 through the medium of a pivoted link 14. By this construction, the fulcrum-pin being in proper position relative to the point of connection between the link and the pitman-lever, the lever-connecting end of said link is caused to move in an arc at an angle to the direction of reciprocation of the pitman-lever and so cause a lateral or vibratory movement of the latter.

In order that the lateral or vibratory movement of the pitman-lever may be varied so as to regulate the horizontal or feeding movement of the feed-bar through the medium of the feed-lever 9 and so change the length of stitch, I have supported said fulcrum-pin upon a lever 15. This lever 15, which I term the "stitch-regulator," is pivotally connected at one end to the bed-plate of the machine by means of a pivot 16 and at its opposite end projects through a suitable opening in the arm 2 and is provided with a clamping-nut 17, which coacts with an arc-plate 18 on the bed-plate to secure the stitch-regulator in any desired position. By raising or lowering the outer end of this stitch-regulator the position of the fulcrum-pin carried thereby is so changed as to cause the lever-connecting

end of the link to swing at a greater or less angle to the pitman-lever and so increase or diminish the vibratory movement of the latter, and thereby the length of stitch. This particular form of adjustment for regulating the movement of the feed-lever does not form a part of the present invention, the same being embodied in another application of mine now pending, bearing Serial No. 10,483.

In accordance with my present invention I provide a universal connection of the feed-lever 9 with its supporting-stud 10, whereby said lever at its ends may be capable of receiving a compound vertical and horizontal movement, and thus permitting the same to be actuated in a manner to communicate to the feed-bar its vertical as well as horizontal movements.

Any suitable form of universal connection of the feed-lever with its supporting-stud 10 might be employed; but the construction which I prefer and as shown in the drawings is as follows: A sleeve 19, as most clearly shown in Fig. 4, is loosely fitted on the stud 10, within an opening 20 in the lever 9. This sleeve 19 is provided with a lateral arm or extension 21, which extends into a corresponding slot 22 in the feed-lever and is connected with the latter by means of a horizontally-arranged pivot-pin 23, extending through the same. By this construction the feed-lever is capable of a vertically-rocking movement on the pin 23, while its horizontal movement is permitted by the sleeve 19, turning on the stud 10, the said sleeve, which forms the medium of connection between the feed-lever and the stud 10, being retained in position on the latter by means of an enlarged head 24 on said pin engaging with the lower end of the sleeve, as most clearly shown in Fig. 4. One of the features of this particular form of universal connection is that the fulcrum 23 for the feed-lever in its vertical movement is brought nearer to the feed-bar than the fulcrum 10 of the lever in its horizontal movement. By thus shortening the front or feed-bar-carrying arm of the lever the lifting power of the latter is of course increased, and so acts to correspondingly increase the lightness in running or operation of the machine.

The feed-lever receives its vertically-rocking movement from the upright shuttle-lever 7 through the medium of a link 25. This link 25 is connected at its lower end with the rear end of the feed-lever at 26 and at its upper end is connected with the lever 7 adjacent to its fulcrum at 27. The latter connection is made at a point as nearly as practicable beneath the fulcrum 8, so as to permit the link to work in as straight a line as possible and receive the greatest power of the lever 7. By means of this arrangement of the link 25 relative to the lever 7 and the previously-described position of the fulcrum 23, whereby the feed-bar-carrying arm of the horizontal feed-lever is shortened, an increased lifting power of the feed-bar is obtained with the

greatest ease and lightness in running of the actuating parts.

Connection between the front end of the feed-lever 9 and the feed-bar 11 is effected in the present instance by means of a threaded pin or screw 28, which is carried by the feed-lever and provided with a rounded or ball-shaped end 29, engaging with the feed-bar within a correspondingly-shaped opening 30 therein, as clearly shown in Fig. 6. As a means to permit of a vertical adjustment of the feed-bar the screw 28 is vertically movable within its opening in the feed-lever and provided with a lower slotted end to permit of its being raised or lowered by means of a screw-driver or other suitable tool. In order to permit the easy adjustment of the screw 28 and provide a means for holding the same in a stationary adjusted position, I have formed the feed-lever with a split or slotted end, in which the screw 28 is located, the two arms formed by such slot in the end of the lever being connected by a clamping-screw 31, which may be operated in one direction to draw the said arms together and clamp the interposed screw 28 in a stationary adjusted position or in the opposite direction to relieve the clamping pressure on said screw when it is desired to raise or lower the same.

Having thus set forth my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the feed-bar, of a feed-lever having a universal connection at a point between its ends with a suitable support and being operatively connected at one end with said feed-bar, a vertically-arranged vibrating lever, a link connection between said vibrating lever and the feed-lever for communicating vertical movement to the latter, the connection of said link with the vertical lever being adjacent to the fulcrum of the latter, and means for communicating horizontal movement to the feed-lever.

2. In a sewing-machine, the combination, with the feed-bar, of a feed-lever having a universal connection with its support, said connection comprising two fulcrums, one permitting of a horizontal movement of the lever and the other a vertical movement, the said fulcrum for the vertical movement being nearer the feed-bar than the fulcrum for the horizontal movement, a vertically-arranged vibrating lever, a link connection between said vibrating lever and the feed-lever for communicating vertical movement to the latter the connection of said link with the vibrating lever being adjacent to the fulcrum of the latter, and means for communicating horizontal movement to the feed-lever.

3. In a sewing-machine, the combination, with the feed-bar, of a feed-lever having a universal connection with its support, said connection comprising two fulcrums, one permitting of a horizontal movement of the lever and the other a vertical movement, the

said fulcrum for the vertical movement being nearer the feed-bar than the fulcrum for the horizontal movement, a vertically-arranged vibrating lever, a link connection between said vibrating lever and the feed-lever 5 for communicating vertical movement to the latter the said link being arranged to operate in a substantially vertical line and having a connection with the vertical vibrating 10 lever at a point adjacent to and below the line of the fulcrum of the latter, and means for communicating horizontal movement to the feed-lever.

4. In a sewing-machine, the combination, 15 with the feed-bar, of a feed-lever having a universal connection at a point between its ends with a suitable support, a universal connection between the front of said lever and the feed-bar, a vertically-arranged vibrating 20 lever, a link connection between said vibrating lever and the rear end of the feed-lever for communicating vertical movement to the latter the connection of said link with the vi-

brating lever being adjacent to and below the fulcrum of the latter whereby the link will 25 operate in a substantially vertical path, and means for communicating horizontal movement to the feed-lever.

5. In a sewing-machine, the combination, with the feed-bar, of a feed-lever having a 30 universal connection with its support, a universal connection between said feed-lever and the feed-bar, the latter connection comprising a vertically-adjustable pin or screw carried by the feed-lever and having a rounded or ball- 35 shaped end engaging with the feed-bar, means for securing said adjustable pin or screw in a fixed adjusted position relative to the feed-bar, and means for actuating the feed-lever 40 to communicate to the feed-bar both a vertical and a horizontal movement.

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