2 Sheets—Sheet 1.

A. STEWARD.

Sewing-Machine.

No. 207,454. Patented Aug. 27, 1878.

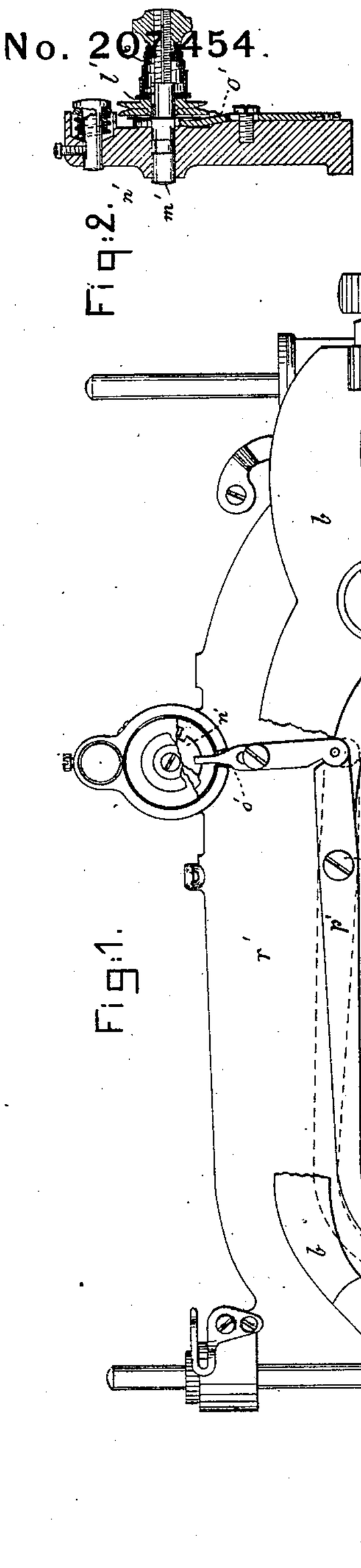

Fig. 2.

Fig. 1.

Fig. 3.

Witnesses.

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N. E. Whitney.

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by Crosby & Gregory Attys

2 Sheets—Sheet 2.

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Fig:8.

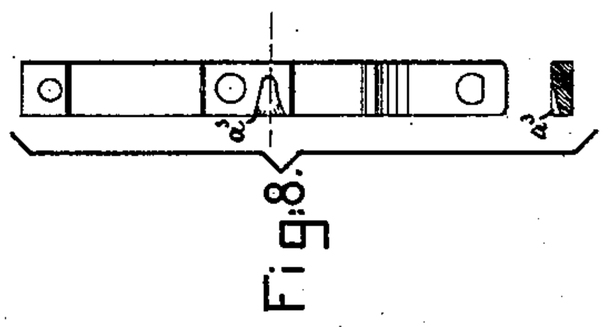


Fig:7.

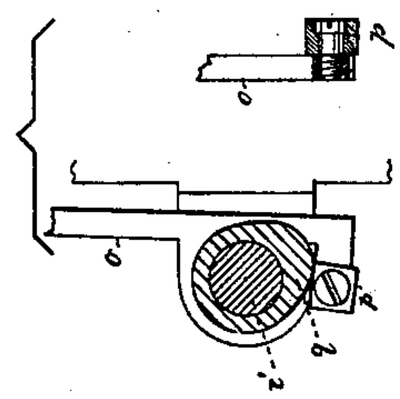


Fig:6.

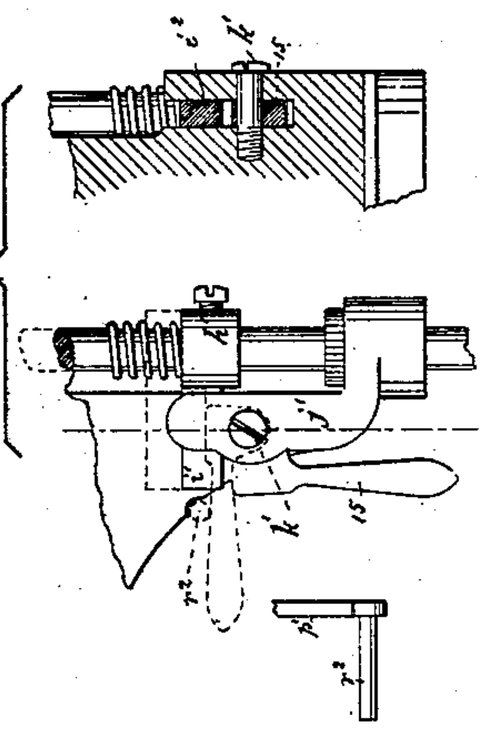


Fig:5

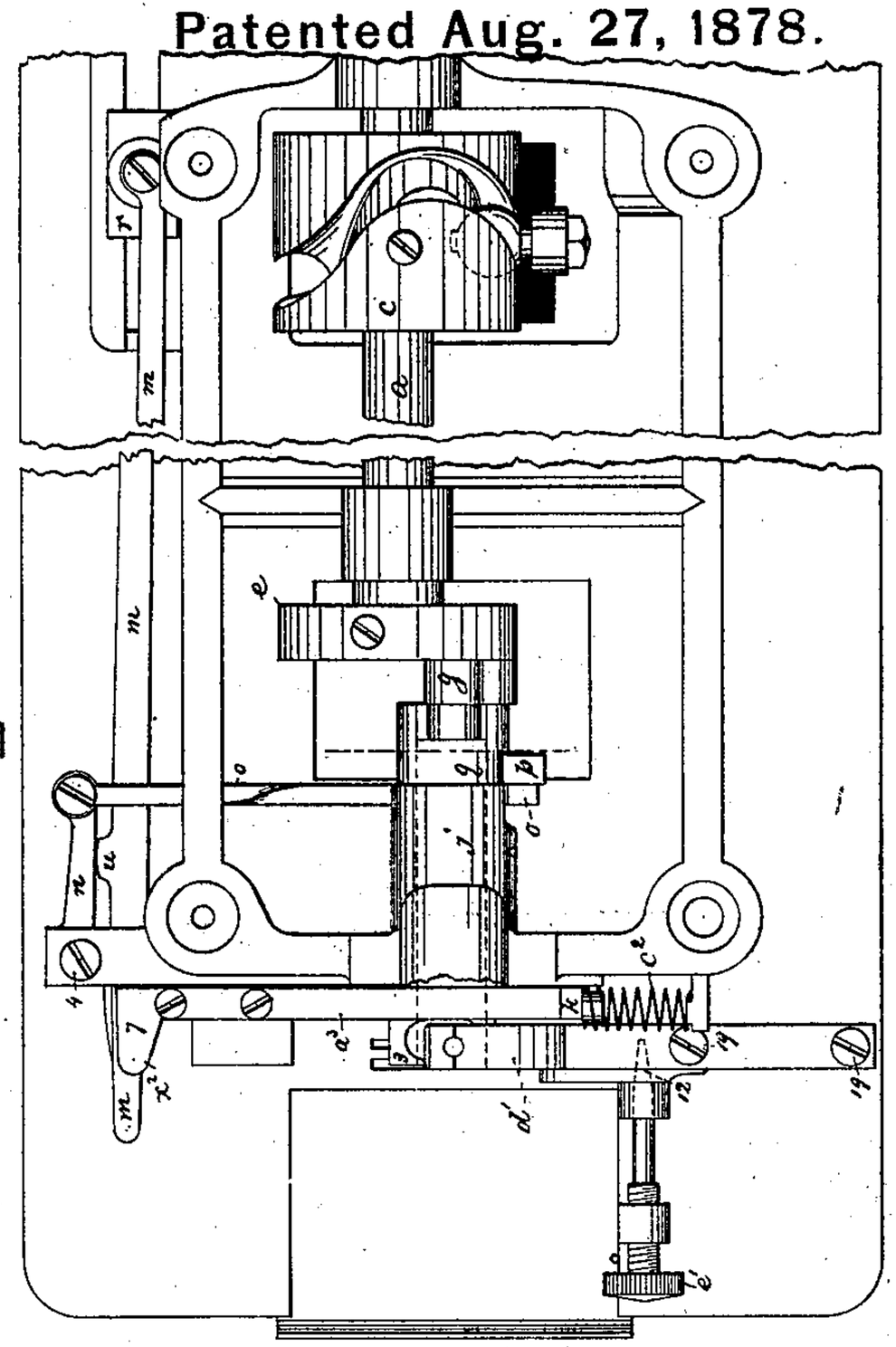
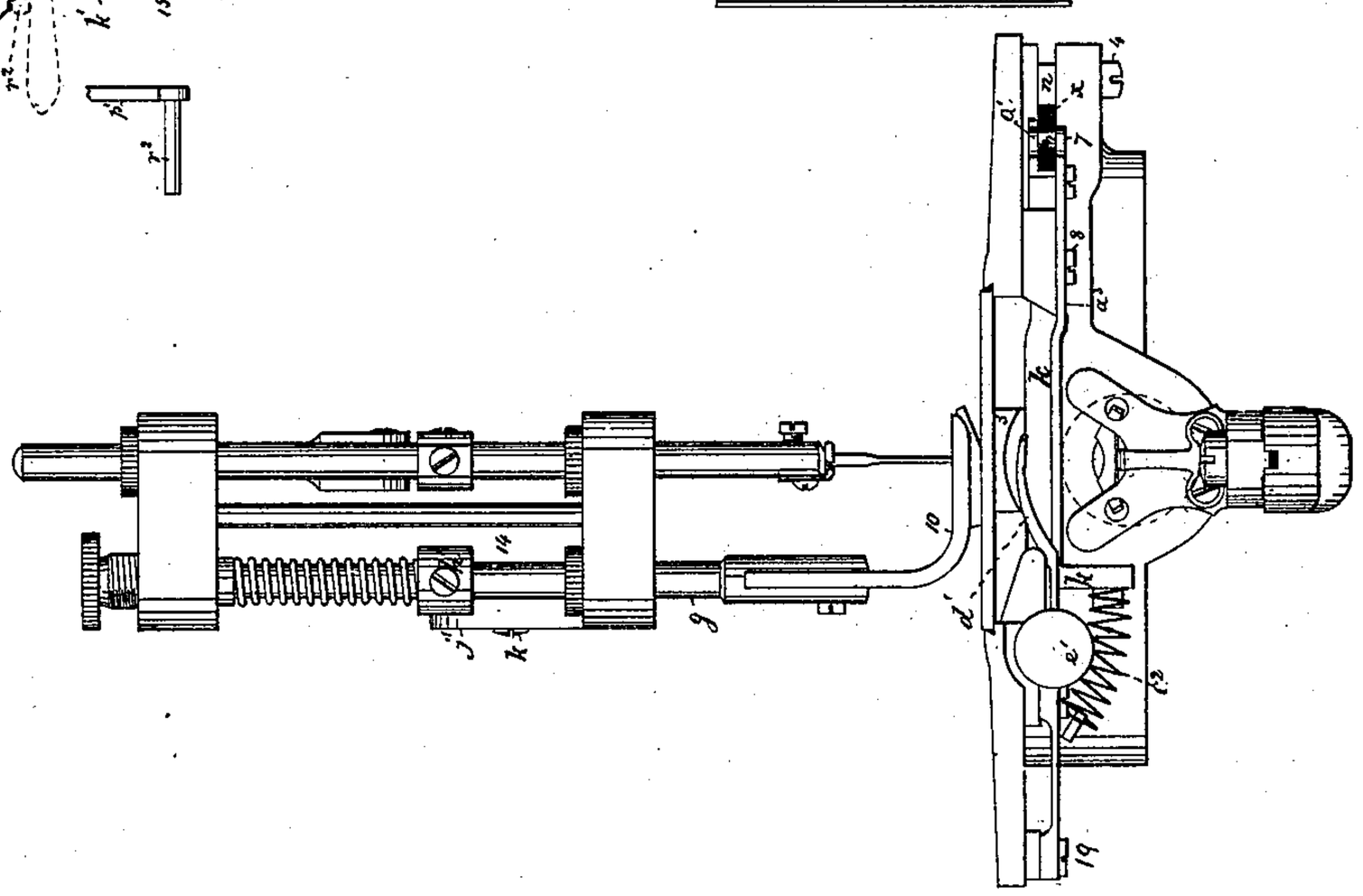


Fig:4.



Witnesses

L. F. Connor.

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Inventor.

Aurelius Steward

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UNITED STATES PATENT OFFICE.

AURELIUS STEWARD, OF BRIDGEPORT, CONN., ASSIGNOR TO WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **207,454**, dated August 27, 1878; application filed May 6, 1878.

To all whom it may concern:

Be it known that I, AURELIUS STEWARD, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented an Improved Sewing-Machine, of which the following is a specification:

This invention relates to sewing-machines of the Wheeler & Wilson class, and is specially designed as an improvement upon the machines described in United States Letters Patent Nos. 175,463, 124,360, and 145,570, to which reference may be had.

Figure 1 represents, in side elevation, a sewing-machine constructed in accordance with this invention, a portion of the needle-bar-actuating arm being broken away to show other parts; Fig. 2, a detail of the tension device; Fig. 3, a detail of the set-screw for adjusting the feed-lever; Fig. 4, a front elevation of the machine; Fig. 5, a partial under-side view, the parts being broken out to economize space upon the drawing, the hook and feed-lifting cam being removed; Fig. 6, details of the presser-foot lifting and guiding devices; Fig. 7, a detail of the feeding mechanism, and Fig. 8 a detail of the friction-finger to produce tension on the bobbin-thread.

The needle-operating and take-up mechanisms, and the construction and operation of the rotating hook with reference to the needle, are in this present invention as in Patent No. 175,463.

The feeding device is lifted by a cam with which it is always in contact, and is moved forward by a lever which derives its motion in one direction from a radius-bar or arm, which is actuated by a link or connection set in movement by a second cam on the hook-shaft, with which it is kept in constant contact, whereby the feed is made practically silent. The tension device for the needle-thread is mounted upon a stud or center-pin, which is adapted to be locked when the machine is in use, and to be released when the presser-lifting lever is elevated, whereby the needle-thread is permitted to run freely from the spool carrying it, to enable the work to be readily removed from under the presser-foot, thereby obviating the necessity of drawing the needle-thread by hand, as is usual for such purpose in other machines.

The main shaft *a* is provided with an eccentric to move the needle-driving arm *b*, and with a cam, *c*, to actuate the take-up *d*, all as in the patented machine referred to. At the forward end of this shaft *a* is a disk, *e*, provided with a crank-pin, which is connected, by means of the link *g*, with a pin on a crank, *h*, at the rear end of the hook-shaft *i*, supported in a bearing, *j*, placed out of line with the main shaft, the rotation of the latter shaft, through the link *g*, imparting to the hook-shaft the variable motion substantially such as described in Patent No. 124,360, wherein is employed a differential disk. The hook *f* is as commonly made.

The feed-bar *k*, having the usual serrated block 3, is raised by a cam, *l*, on the hook-shaft, (see Fig. 1,) is moved forward by a feed-lever, *m*, acted upon by the radius-bar or arm *n*, pivoted at one end to the bed of the machine by a screw-pivot, 4, and joined to a connecting-link, *o*, provided with a swivel-block, *p*, acted upon directly by a cam, *q*, both the cams *l* and *q* being so arranged with reference to the feeding devices as to always remain in contact with the parts directly moved by them, so as to make the feed silent.

The feed-lever *m*, pivoted upon a block, *r*, and fitted to and made adjustable in suitable guideways at the rear of the machine, and guided at its front end by passing into a slot, *x*, which permits it to move only longitudinally and laterally, is provided with an adjusting set-screw, 5, and friction-spring *t*, preferably located above the supporting-bed, whereby the lever *m* may be moved longitudinally to place the projection *u* thereon at such distance from the fulcrum of the radius-bar as is necessary to produce the proper length of stitch, for the radius-bar is forced against such projection *u* each time that the connecting-link *o* is moved positively by the cam *q*.

It will noticed that the feed employed in this instance is of the class wherein the feed-points 3 overhang or project laterally from the bar *k*. To steady and support such bar against strain of the presser-foot, which would

tend to overturn it, the rear end of the bar is provided with tail-pieces a^1 7, which are shaped as shown in Fig. 5, their ends x^2 being of such length as to extend laterally from the bar to a distance substantially equal to the distance which the feed portion 3 projects laterally from the bar *k*. The forward end of the feed-lever is made to rest between these tail-pieces a^1 7, as shown, and to move forward and backward with the feed-bar, such feed-lever acting to support the back end of the feed-bar and to prevent its overtipping. As the lever *m* moves with the bar *k*, all friction and cramping between the forward-moving feed-bar and its side supports—friction caused by the pressure of the presser-foot upon the overhanging portion 3, which is common in other machines—is obviated.

The tail-piece 7 is formed as part of a hardened-steel bar or plate, a^3, attached to the feed-bar by screws 8, such plate also receiving the wear of cam *l*. Tail-piece a^1 is herein shown as made part of *k*. This feed-bar *k* is moved positively upward by a cam and forward by the feed-lever *m*, but is returned after such movements by a spring, c^2. This bar, to be returned easily by the spring c^2, must play freely between its side bearings; and consequently, when moved upward and forward against the stress of the presser-foot 10, this bar *k* is liable to be deflected from its proper straight line to the extent of its looseness between its supports. To obviate this lateral deflection and insure a straight-line movement of the feed, the spring c^2 is so placed that, besides moving the feed-bar downward and backward, it also crowds or cramps the feed-bar in that direction in which the presser-foot, by its action upon the overhanging portion 3, would cramp it, thus preventing any farther movement in such direction by the presser acting as described. This spring, so inclined, is shown in Figs. 4 and 5.

The finger d^1, which regulates the tension of the bobbin or under thread, is, in its action upon the thread, substantially as in Patent No. 145,570; but instead of adjusting it through the agency of a lever, a screw, e', is employed, it having a conical end, 12, to act upon or within a conical seat or incline, a^3, made in or at the edge of the finger *d*. (See Fig. 8.) The inward turning of the screw increases the tension, and vice versa.

The ring-slide will be of any usual construction. The shank g' of the presser-foot is provided with an adjustable collar, h', having a wing, i', which is permitted to project into a slot or space between a part of the stationary head 14 and a lug, *j*, attached thereto, by which means the presser-foot is guided in a straight line as it is lifted by the feed, the upper end of the slot being open to permit the presser-foot to be elevated and turned away from the feed and needle when desired.

The presser-foot-lifting cam-lever 15 is pivoted within this slot upon a screw-pin, k', so as to act upon the lower edge of the wing. This screw-pin may be turned inward to close up the slot and compensate for wear of the wing.

The tension device l' for the needle-thread is and may be of any usual suitable construction; but instead of being supported upon a fixed stud, its stud is made so that it can be held fixedly or be allowed to revolve freely. This stud m', supported in suitable bearings, is provided, as shown in this instance, with a notched disk, n', which is adapted to be engaged by a spur, o', connected with the rear end of a tension-lever, p', pivoted at q' upon the overhanging arm r^1, the forward end of such lever p' being provided with a pin or projection, r^2, (see Figs. 1 and 6,) which, as the presser-foot-lifting lever 15 is elevated, as shown in dotted lines, acts upon such pin r^2 to move the lever and withdraw the spur o' from one of the notches in the disk n', which then allows the stud m' to freely rotate with the tension device, the latter, however, not rotating thereon, which permits the thread to be drawn freely from its supplying-spool as the operator removes the work from the machine, thus obviating the usual trouble of drawing the thread by hand to form slack for the removal of the work. When the machine is sewing regularly the spur engages one of the notches of the disk n', and holds the stud locked, when the tension device will act as usual.

It is obvious, instead of releasing the stud by this lever p', that the lever might be made to force the spur against a portion of the spring 16, which bears upon the tension device l', so as to remove the pressure of such spring from the pulley over which the thread is passed to release such pulley.

For the successful release of the tension device, as described, it is considered essential that the lever or device which releases it be actuated by the presser-foot-lifting lever rather than by a part rising and falling with the presser under the action of the feed and by reason of varying thicknesses of material, for in the latter case the tension would be liable to be released by seams, &c.

It will be noticed that the slot in which the block or pin *r* slides is provided with a scale, 18, to indicate different lengths of feed.

The finger d' is held in place by screws 19. The cloth-supporting bed 20 may be of any usual shape.

I do not claim, broadly, a tension device or spring which rests upon and derives its motion to release the needle-thread directly from the presser-bar itself when lifted, for in this my invention the release of the tension device depends directly upon the movement of the presser-foot lifter, and not the presser.

I claim—

1. In combination, the feed-bar, the adjustable lever *m* to support it at its rear end, the bar *n* to act upon the feed-lever to move it lat-

erally, the connected link *o*, the swivel-block *p* thereon, and a cam to vibrate the bar and a cam to raise the feed, substantially as described.

2. The feed-bar provided with the tail-piece a^1, combined with the bar a^3, provided with the tail-piece 7, substantially as and for the purpose described.

3. The feed-bar provided with the overhanging portion 3, and the feed-lever *m*, to support it at its rear end, combined with a cam to lift the feed-bar, and a spring, *c*, located with reference to the feed-bar, as described, to press it downward, backward, and laterally, substantially as and for the purpose described.

4. A tension device for the needle-thread and a lever, *p'*, adapted to hold and release it, as described, combined with the presser-foot-lifting lever, located to actuate the said lever *p'* and release the tension device, substantially as and for the purpose described.

5. The stud *m'*, notched plate *n'*, and a tension-pulley thereon, combined with a lever adapted to hold or release the notched plate and stud, as desired, substantially as described.

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

AURELIUS STEWARD.

Witnesses:
GEORGE H. DIMOND,
EDWARD S. BOYNTON.