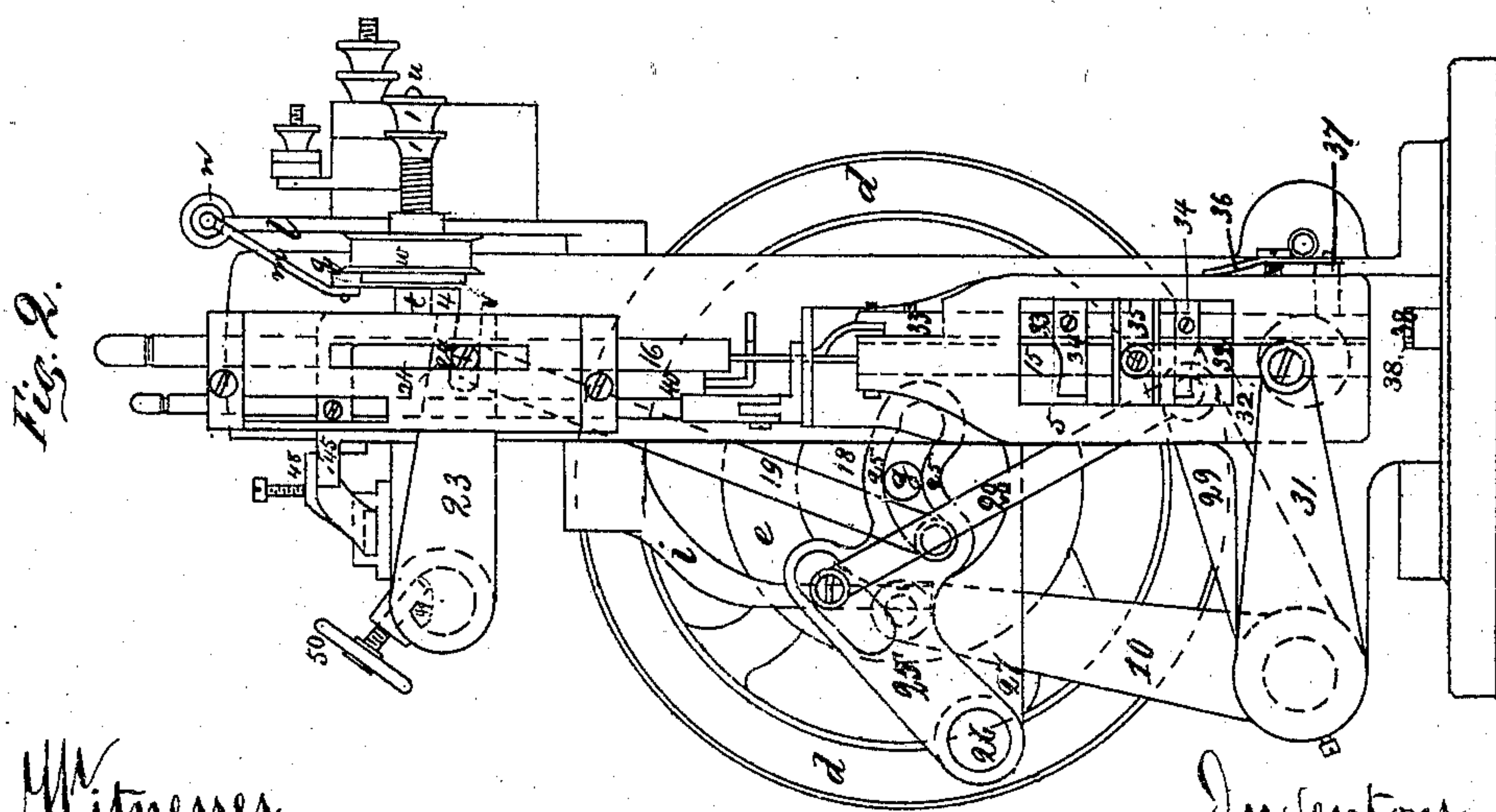
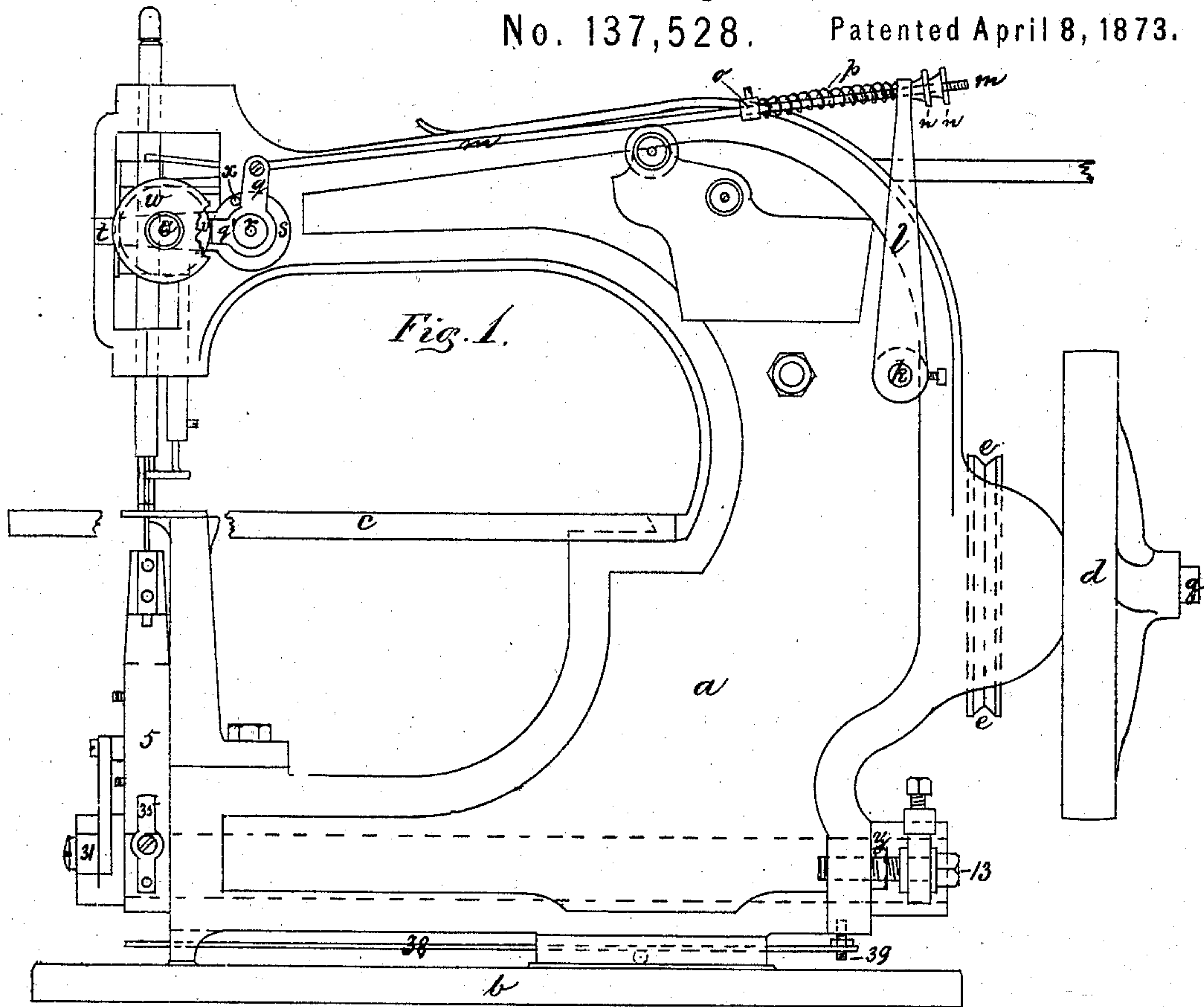


E. E. & F. BEAN.
Wax-Thread Sewing-Machines.

No. 137,528. Patented April 8, 1873.



Witnesses:
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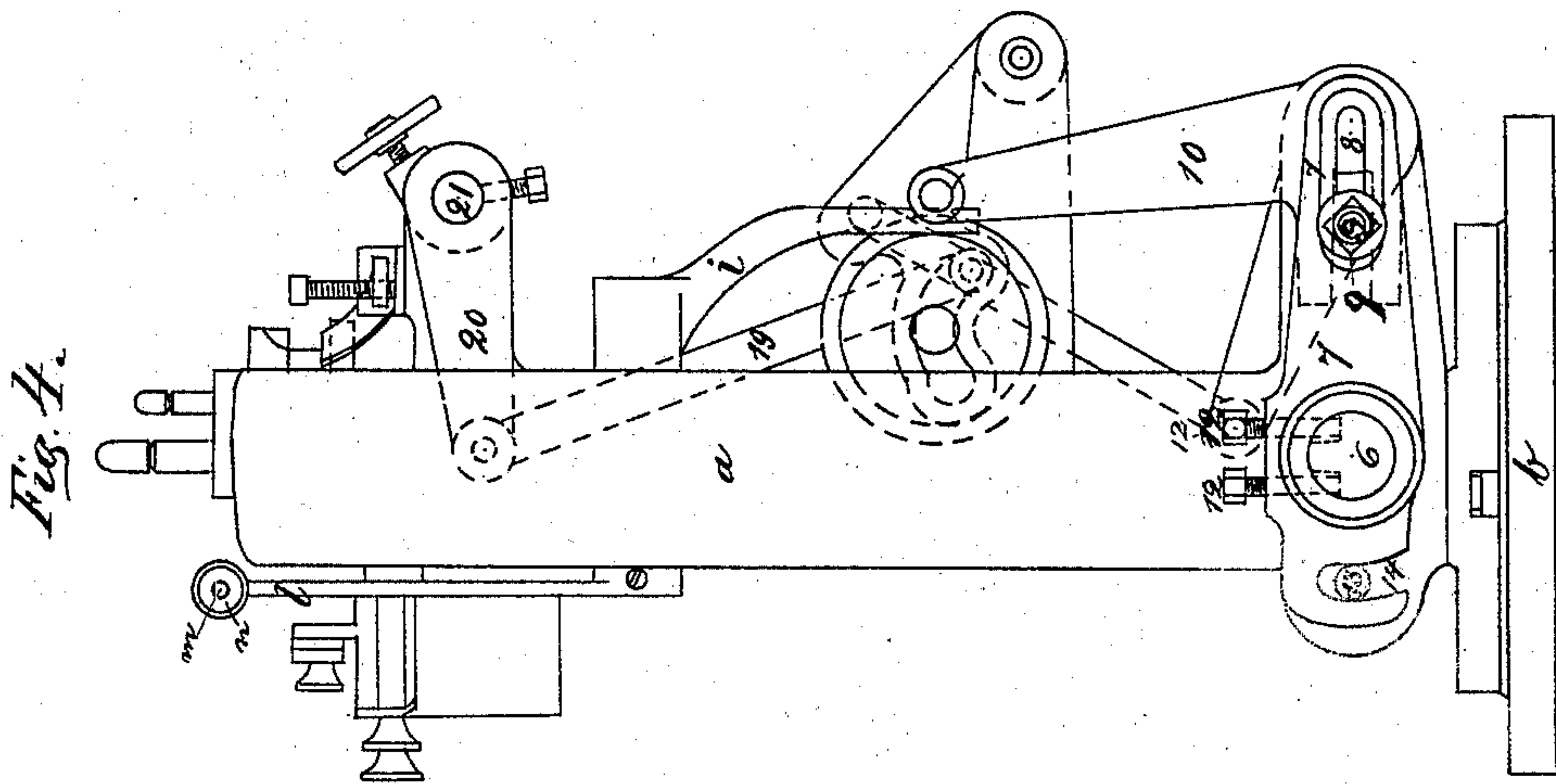
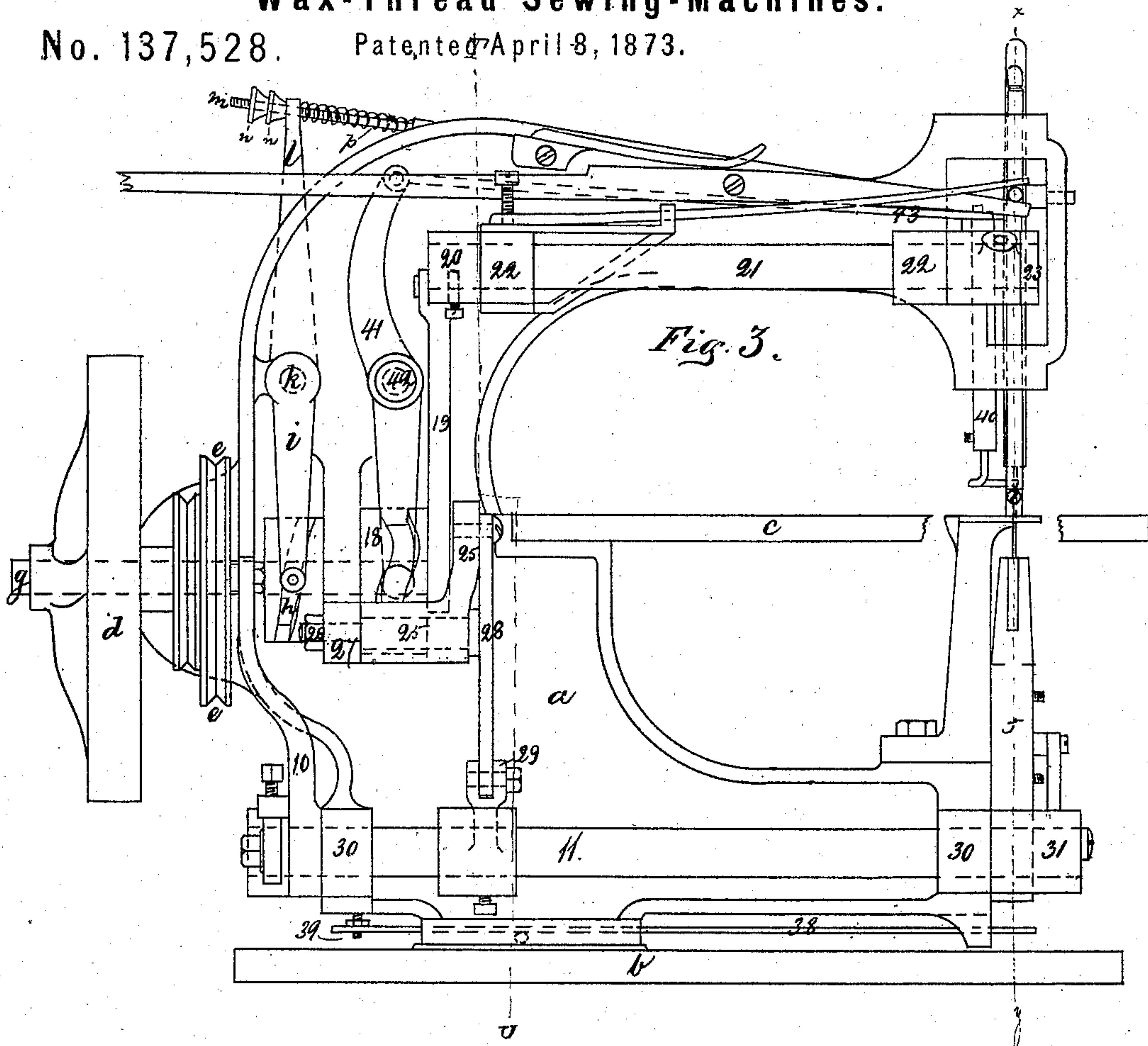
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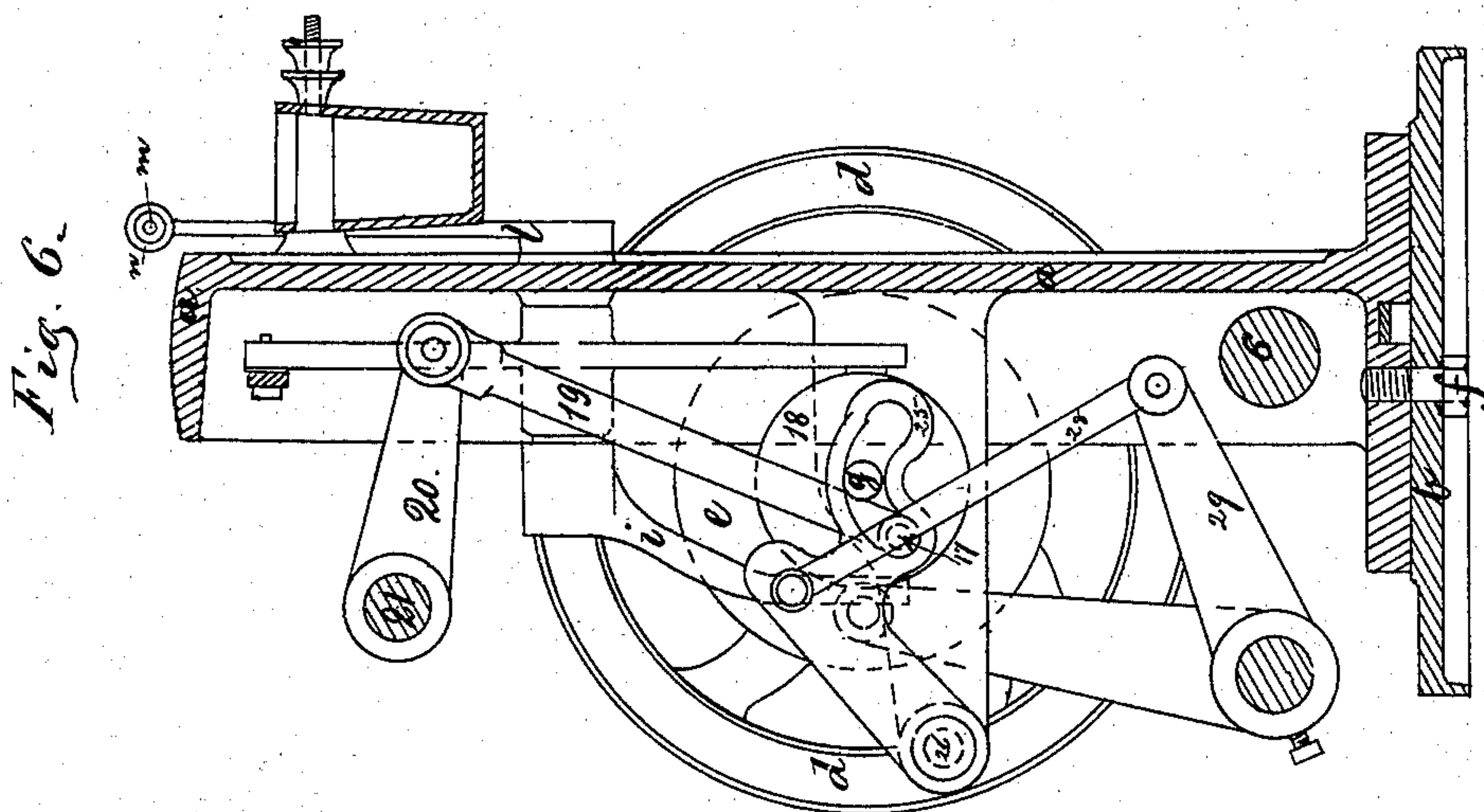
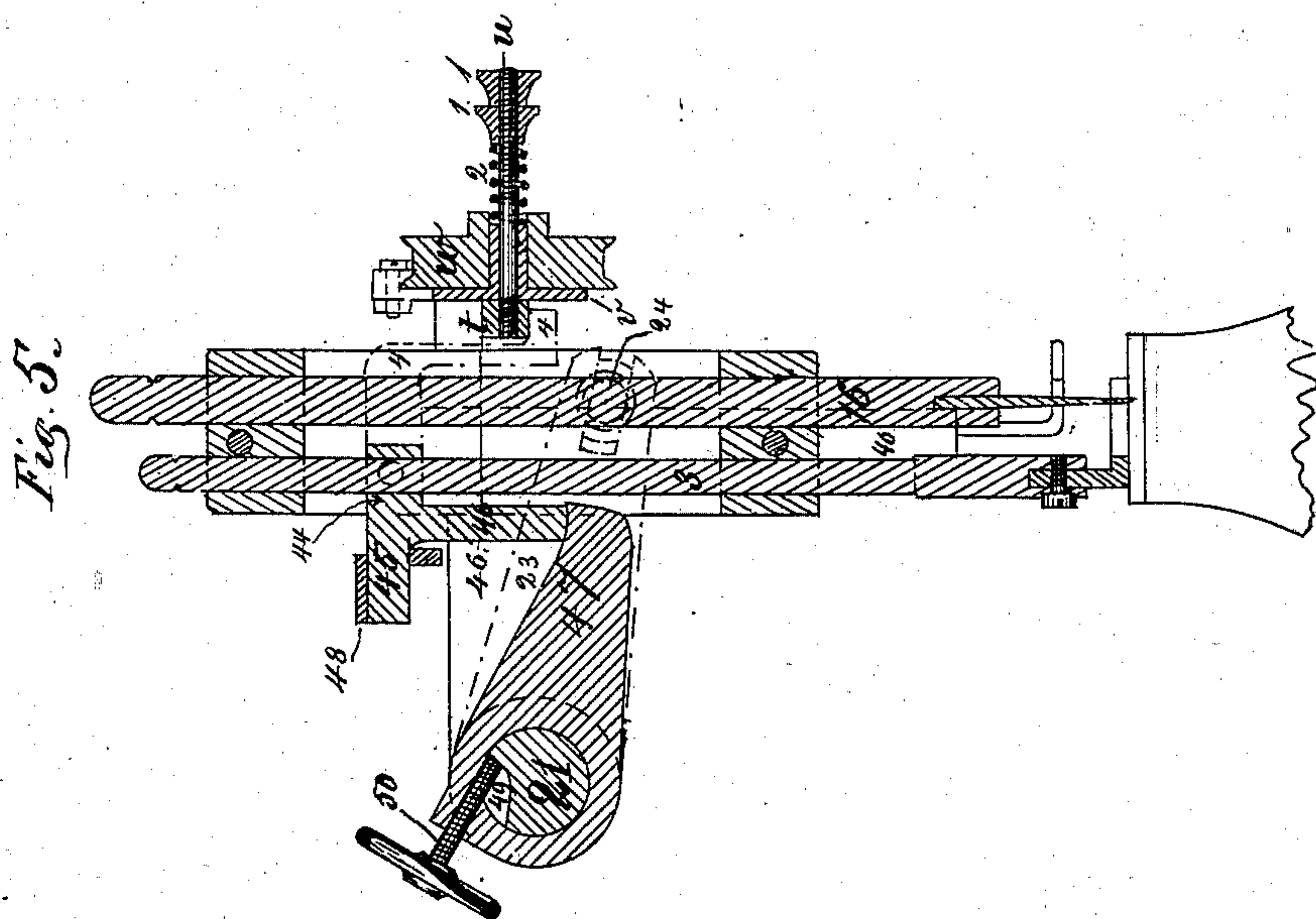
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UNITED STATES PATENT OFFICE.

EDWIN E. BEAN, OF BOSTON, AND FRANK BEAN, OF MEDFORD, MASS.

IMPROVEMENT IN WAX-THREAD SEWING-MACHINES.

Specification forming part of Letters Patent No. **137,528**, dated April 8, 1873; application filed November 11, 1872.

To all whom it may concern:

Be it known that we, EDWIN E. BEAN, of Boston, in the county of Suffolk and State of Massachusetts, and FRANK BEAN, of Medford, in the county of Middlesex and State of Massachusetts, have jointly invented certain new and useful Improvements in Wax-Thread Sewing-Machines, of which the following is a specification:

Our invention consists in a self-adjusting take-up for the tension, as hereinafter described, for the purpose of regulating the amount of loop for different thicknesses of work; also, in the arrangement for adjusting the needle centrally with the awl, by means of a regulating-screw and slotted lever, and to the arrangement of regulating-screws for adjusting the feed-post in a vertical plane; also, in the means for operating the needle and awl by means of one crank and connecting-links and shafts, as described; also, in a spring for imparting a partial upward movement to the cast-off bar, to prevent the escape of the loop from the needle, until at the proper height; also, in the employment of one single cam and connecting devices for operating the thread-guide, needle, and awl; also, in an arrangement of parts for adjusting the lift of the foot-bar by means of an adjustable screw pressing against a seat in the rock-shaft.

This our invention is arranged throughout in such a simple and positive manner that a skillful operator is not needed to run the machine, as the most important moving parts have their positive motions arranged in such a manner that they need no attention or alteration after once being put together. The bearings for the operating-shafts are cast in one piece with the frame, by which arrangement great strength and durability is obtained.

On the drawing, Figure 1 is a side elevation of the machine. Fig. 2 is an end view. Fig. 3 is also a side elevation showing the opposite side of Fig. 1. Fig. 4 is a rear end view, with the fly-wheel and cord-pulleys detached. Fig. 5 is an enlarged section over the line *x y* taken on Fig. 3, and Fig. 6 is a cross-section over the line *T U*, also taken on Fig. 3.

Similar letters refer to similar parts wherever they occur on the drawing.

a on the drawing is the frame of the ma-

chine, secured to the base *b* by means of the screw *f*, shown in Fig. 6, around which it may be swung. *c* is the work-plate arranged in the ordinary way. *d* is the fly-wheel, and *e* is a cord or belt pulley, to which the motion is imparted from any ordinary source.

The self-adjusting take-up for the tension is arranged and operated in the following manner: On the driving-shaft *g* is keyed or secured a cam-wheel, *h*, that operates a rocking-lever, *i*, rocking around the pin or fulcrum *k*, as shown. The pin *k* projects through a bearing in the frame *a*, on the opposite side of which is secured another arm, *l*, as shown in Fig. 1, through the upper end of which projects a connecting-rod, *m*, provided on its extreme outer end with regulating-nuts *n n*, as shown. An adjustable collar, *o*, is slipped over and secured to the rod *m*, as shown, and a spiral spring, *p*, surrounds the rod *m* between the collar *o* and the upper end of the lever *l*. The forward end of the connecting-rod *m* is hinged to an angular rocking-lever, *q q'*, made to rock around the fulcrum *r*, as shown in Fig. 1. Around the same fulcrum is also movable the disk *s*, provided with a projecting arm, *t*, in which the pin *u* is screwed, serving as a support for the disk *v* and tension-roller *w*. The disk *v* and tension-roller *w* are secured together in a suitable manner, as shown in Fig. 5, and the pin *u* is provided with check-nuts *1 1* and spring *2*, by which the tension is regulated. The end of the arm *t* is lifted upward a distance more than the lift of the presser-foot bar *3*, by means of the rocking-levers and cams heretofore described; but the descent is governed by the arm *4*, secured to the presser-foot bar *3*, as shown in dotted lines on Fig. 5.

The operation of this arrangement is as follows: The tension-wheel *w* and the bar *t* are forced downward by the action of the lever *l* and rod *m*, operating the knee *q* that strikes against the pin *x* in the disk *s* at the same time as the knee *q'* releases its hold on the circumference of the disk *v* attached to the tension-wheel *w*, by which operation the bar *t* is forced down until it strikes the step *4* secured to the presser-foot bar *3*, during which time the thread on the tension-wheel *w* is allowed to run off the spool enough to form a

loop long enough for the thickest work; but as soon as the needle commences to rise up, the lever *l* reverses the action of the knee *q*, the end *q'* of which impinges against the disk *v* on the tension-wheel *w*, preventing it from turning, by which operation the arm *t* and tension-wheel *w* are raised upward simultaneously with the needle, whereby the loop is pulled up a variable distance according to the thickness of the stock. The spring *p* is for the purpose of allowing a positive throw of the lever *l* toward the tension-wheel *w*, so as to allow of the downward variations of the bar *t* resting on the foot 4, according to different thicknesses of work. As the said bar *t* always rises to a positive height, it will be seen that its descent is variable, according to the thickness of the work. The feed-post 5 is cast in one piece with or otherwise secured to the rocking-shaft 6, shown in Figs. 4 and 6, and also in dotted lines in Fig. 1. The rocking-shaft 6 is made to rock in bearings in the frame *a*, as shown, by means of a rocking-lever, 7, secured to its rear end, as shown in Fig. 4; the right end of said lever, as represented on the latter figure, is provided with a slot, 8, in which is an adjustable pin or stud, 9, that engages into the forked end of the angular rocking-lever 10, that is allowed to swing loosely around the rocking-shaft 11. The upper end of the lever 10 is provided with a pin and roller that engages in a grooved cam cut on the face of the pulley *e*, by which the angular lever 10 is operated; the feed of the needle may easily be changed by moving the stud 9 to the right or left in the slot 8. The proper position of the feed-post and needle can be adjusted vertically by means of the set-screws 12 12, screwed through the upper part of the lever 7, and resting in recesses cut in the shaft 6, as fully shown in Fig. 4. By this arrangement, the greatest nicety is obtained in adjusting the needle in a vertical plane. The post 5 with its shaft 6 is adjusted horizontally in such a manner that the needle and awl come centrally over each other, by means of the set-screw 13 passing through the arched slot 14 in the left end of the lever 7. The set-screw 13 has a collar on each side of the lever 7, as shown in Fig. 1, and the end of said set-screw 13 is screwed in the frame *a*, as shown; a check-nut, *y*, secures the screw 13 in place when properly adjusted. From this it will be seen that all that is needed to adjust the feed-post 5 and the needle in the direction of the shaft 6 is to turn the set-screw 13 a little to the right or left, and secure it by the nut *y*, when the lever 7 will be kept in place by the collars on the set-screw 13 embracing it on both sides. The arched slot 14 allows of a free rocking motion for the lever 7 over the screw 13, as shown and described. The needle-bar 15 and awl-bar 16 are operated by one and the same crank 17, attached to the cam-wheel 18 in the following manner: The awl-bar is operated by means of the connecting-rod 19 connecting the crank-pin 17 and

the rocking-lever 20. The lever 20 is attached to the end of the rock-shaft 21, movable in bearings 22 22 attached to the frame *a*, as shown.

To the extreme end of the rock-shaft 21 is attached the forked lever 23, shown in dotted lines on Fig. 5. The needle-bar 15 is operated by means of the pin and roll 17, playing into the slotted arm 25 made to rock around a pin, 26, secured in the bearing 27 cast in one piece with the frame *a*. The slot in the arm 25 is curved in such a manner as to allow the needle to rest during a part of its stroke, when the other operating parts perform their functions. To the rocking-lever 25 is also hinged the connecting-rod 28 that imparts a rocking motion to the lever 29 secured to the rock-shaft 11 that is movable in bearing 30 30 attached to the frame *a*. On the extreme forward end of the rock-shaft 11 is secured the lever 31, the extreme end of which is hinged to the connecting-rod 32 that connects the lever 31 to the needle-bar 15, as fully shown in Fig. 2, by which arrangement the needle-bar is always operated with a positive motion, as fully shown and described. The cast-off bar 33 has a partial upward movement given to it by means of the spring 38, that commences to lift it as soon as the cross-bar 35 releases it, by which operation the cast-off follows with the needle until it is of the proper height to prevent the escape of the loop from the hook, by which arrangement the needle is always sure to pass through the loop. The cam 18 is grooved on its periphery, and, besides operating the needle-bar and awl-bar, it also serves another purpose, namely, that of operating the thread-guide bar 40. This is done by the rocking-lever 41, movable around the fulcrum 42. The lower end of said lever engages with the grooved cam 18, and the upper end of the said lever is jointed to the connecting-rod 43 that is connected to a crank on the upper end of the thread-guide bar 40 in the usual way.

The arrangement for adjusting the lift of the foot-bar 3 is carried out in the following manner: On the presser-foot bar 3 is secured a hub, 44, provided with a horizontal projection, 45, and a downward-projecting rod, 46, as fully shown in Fig. 5. On the rocking-shaft 21 is attached an adjustable lever, 47, the end of which lifts the rod 46, and with it the presser-foot bar 3, upward a distance according to the thickness of the material that is operated upon. A flat spring, 48, presses down the horizontal arm 45 as soon as the lever 47 ceases to act upon the projection 46. In the shaft 21 is cut a recess, 49, and through the hub of the lever 47 is tapped a hole for the reception of a screw, 50, the inner end of which rests against the recess 49, as shown in Fig. 5.

When it is desired to increase the lift of the presser-foot bar 3 all that is necessary to do is to turn the screw 50 down a little in the recess 49, when the lever 47 will be raised, and it will thus commence to lift the foot-bar 3 at an earlier part of the stroke, whereby the lift of the said presser-foot bar is increased. If the lift

of the presser-foot bar is to be decreased, turn the screw 50 in the opposite way.

Having thus fully described the nature, construction, and operation of our invention, we wish to secure by Letters Patent and claim—

1. The tension-roller *w*, disk *v*, arm *t s*, and knee *q q'*, in combination with the rod *m*, spring *p*, levers *l i*, cam *h*, and the presser-foot bar 3 with its step 4, all constructed and arranged substantially as and for the purpose set forth.

2. The mechanism for adjusting the needle centrally with the awl, consisting of the slotted lever 7 attached to the shaft 6 and adjusting-screw 13, or their equivalents, as and for the purpose shown and described.

3. The mechanism for adjusting the feed-post in a vertical plane, consisting of the screws 12 12 tapped through the lever 7 and resting in recesses made in the shaft 6, as shown and described.

4. The combination, with a needle-bar and

awl-bar, of the single crank *g* and its connecting mechanism for imparting the respective movements to the said bars.

5. The spring 38, arranged to slightly elevate the cast-off bar, to prevent the escape of the loop from the needle as it begins to rise, as described.

6. The combination, with a needle-awl and thread-guide, of a single cam-disk, 18, and its connected mechanism for imparting the respective movements to the said parts.

7. A shaft, 21, with its seat 49, in which the adjustable screw 50, tapped through the arm 47, rests, for the purpose of adjusting the position of the arm in relation to the shaft 21, as herein shown and described.

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