

(No Model.)

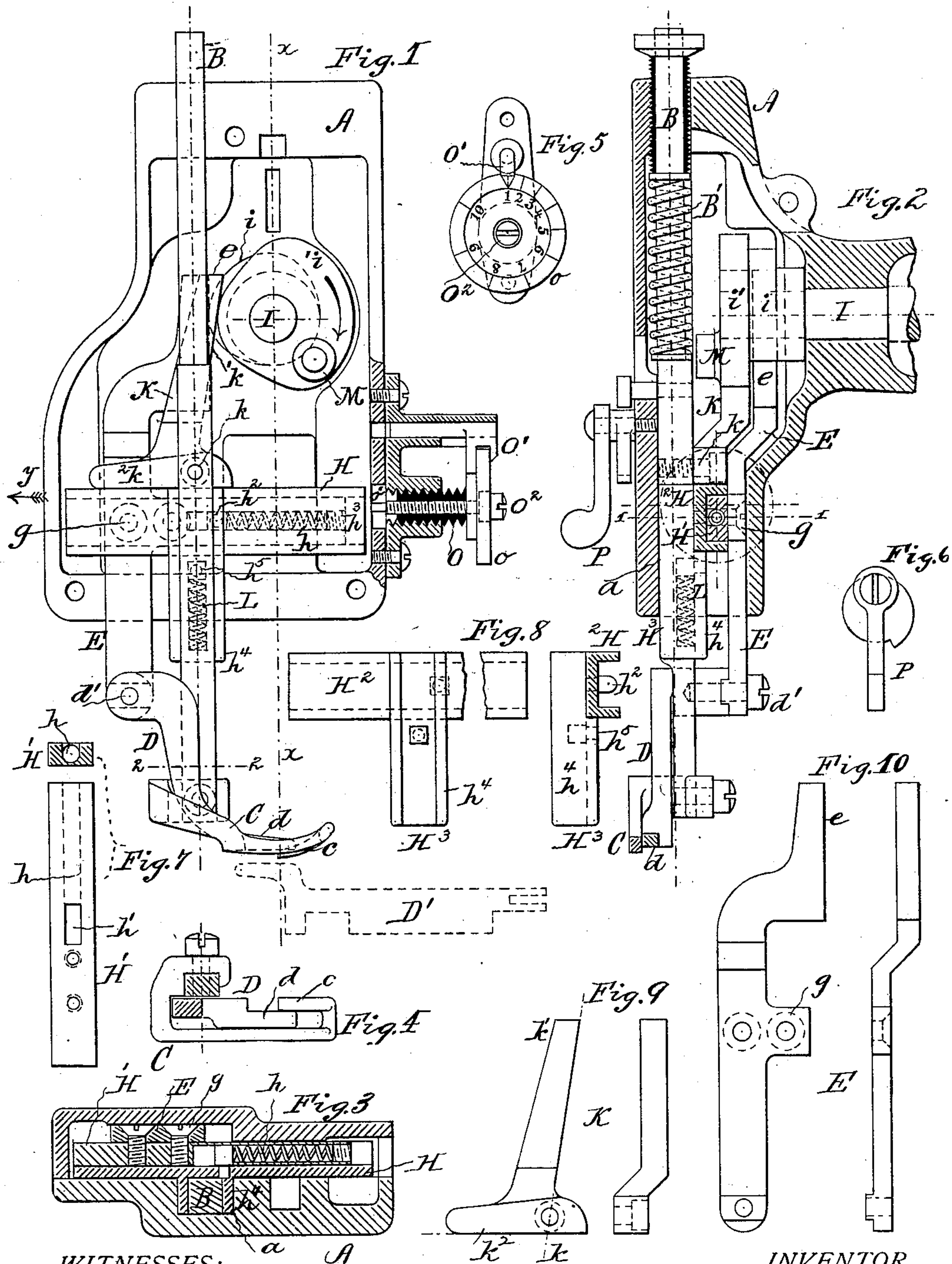
4 Sheets—Sheet 1.

C. LUESSEN.

FEED MECHANISM FOR SEWING MACHINES.

No. 253,731.

Patented Feb. 14, 1882.



WITNESSES:

Kurt Peuckert
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(No Model.)

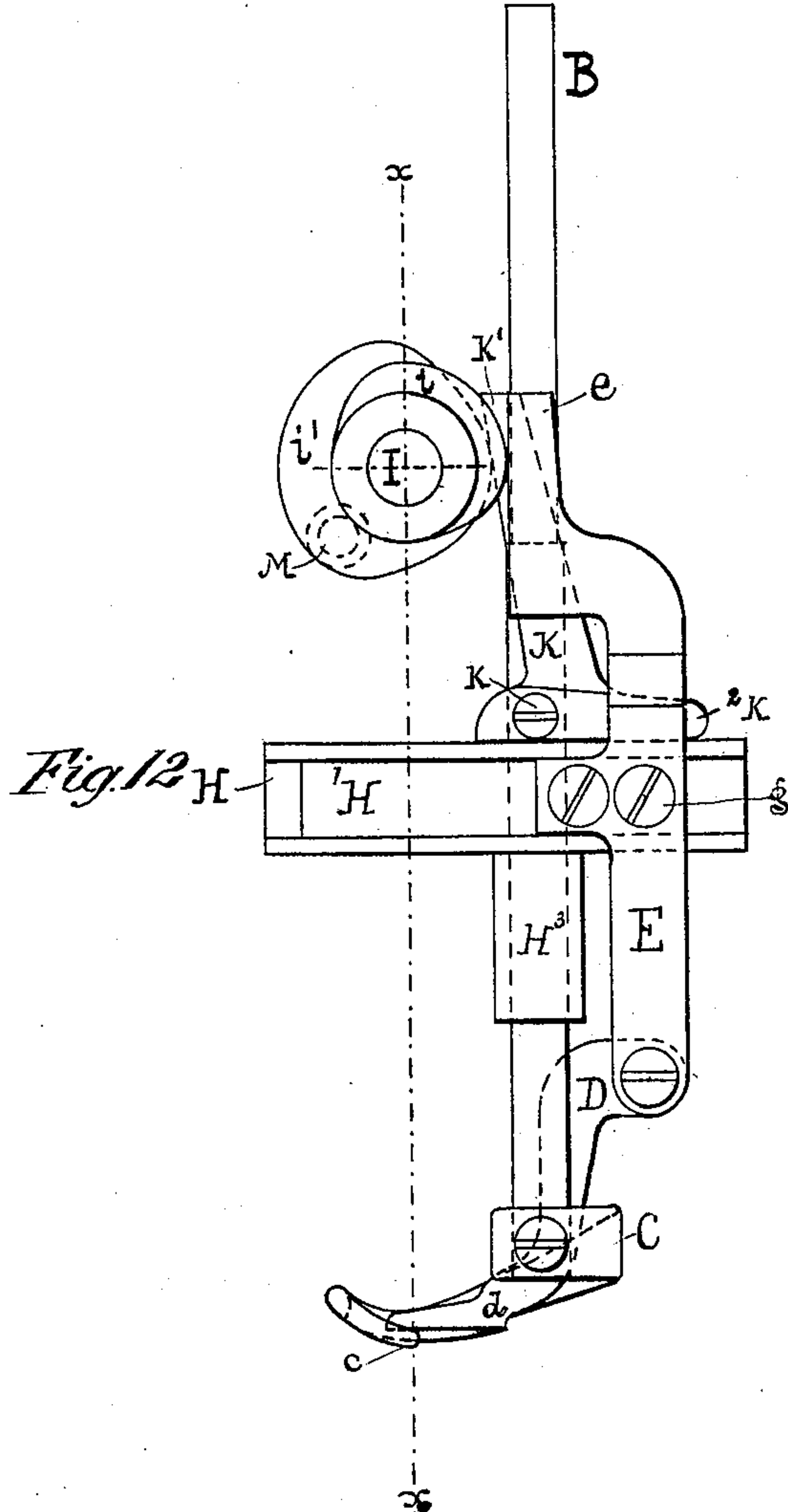
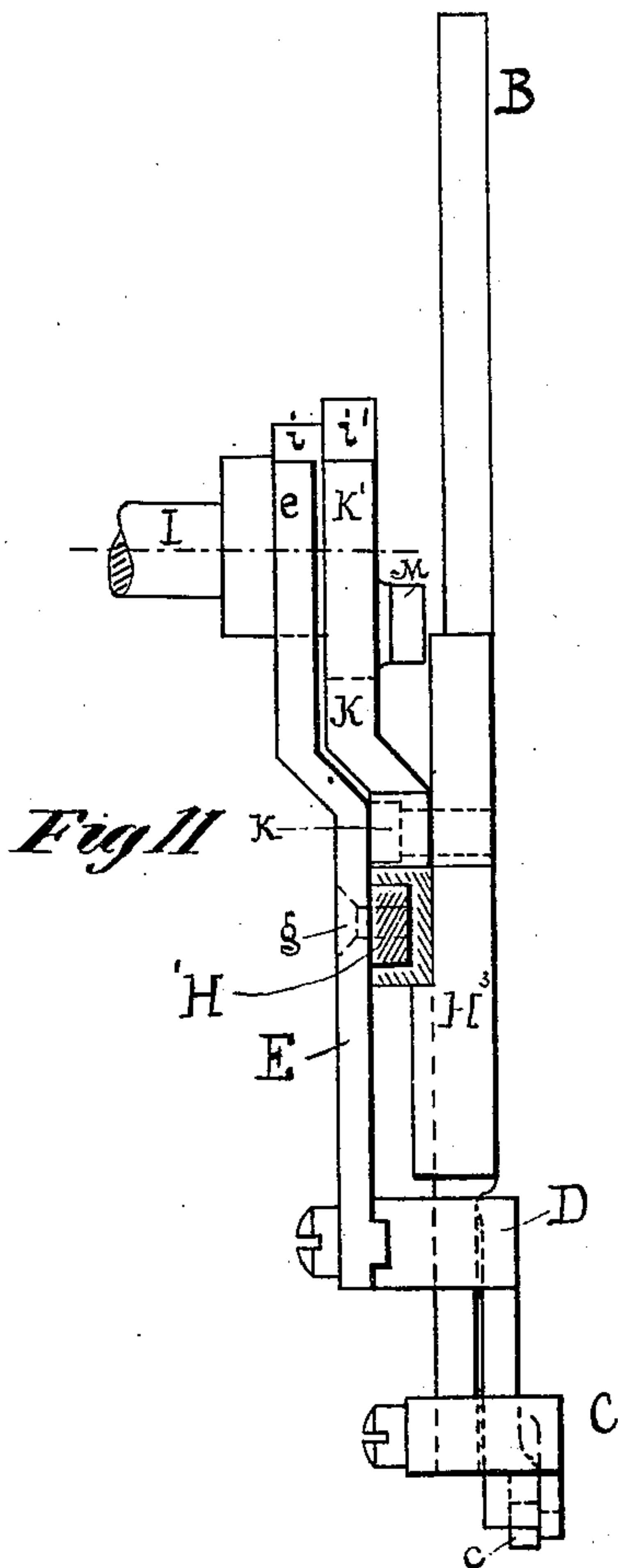
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(No Model.)

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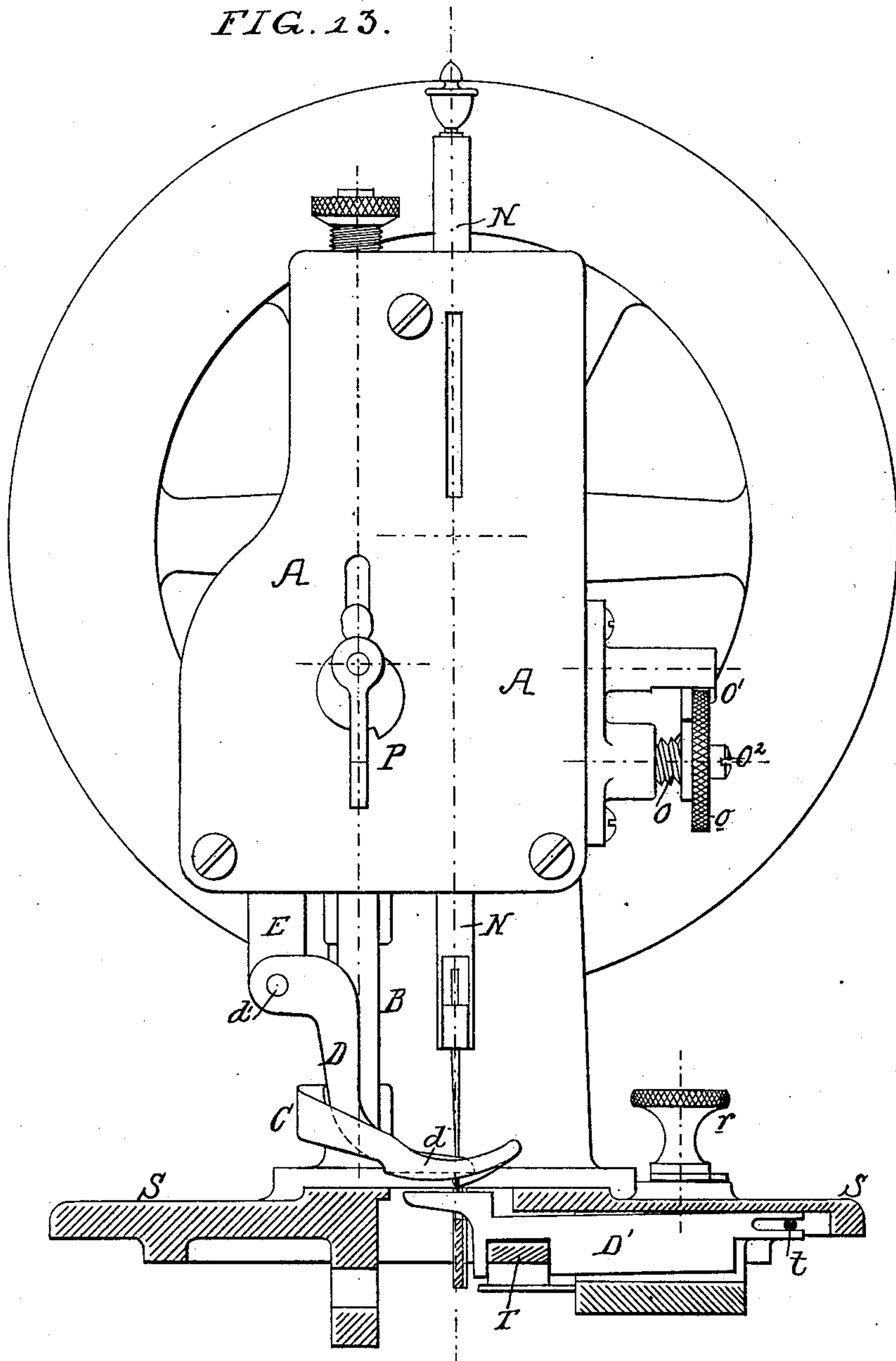
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FIG. 13.



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(No Model.)

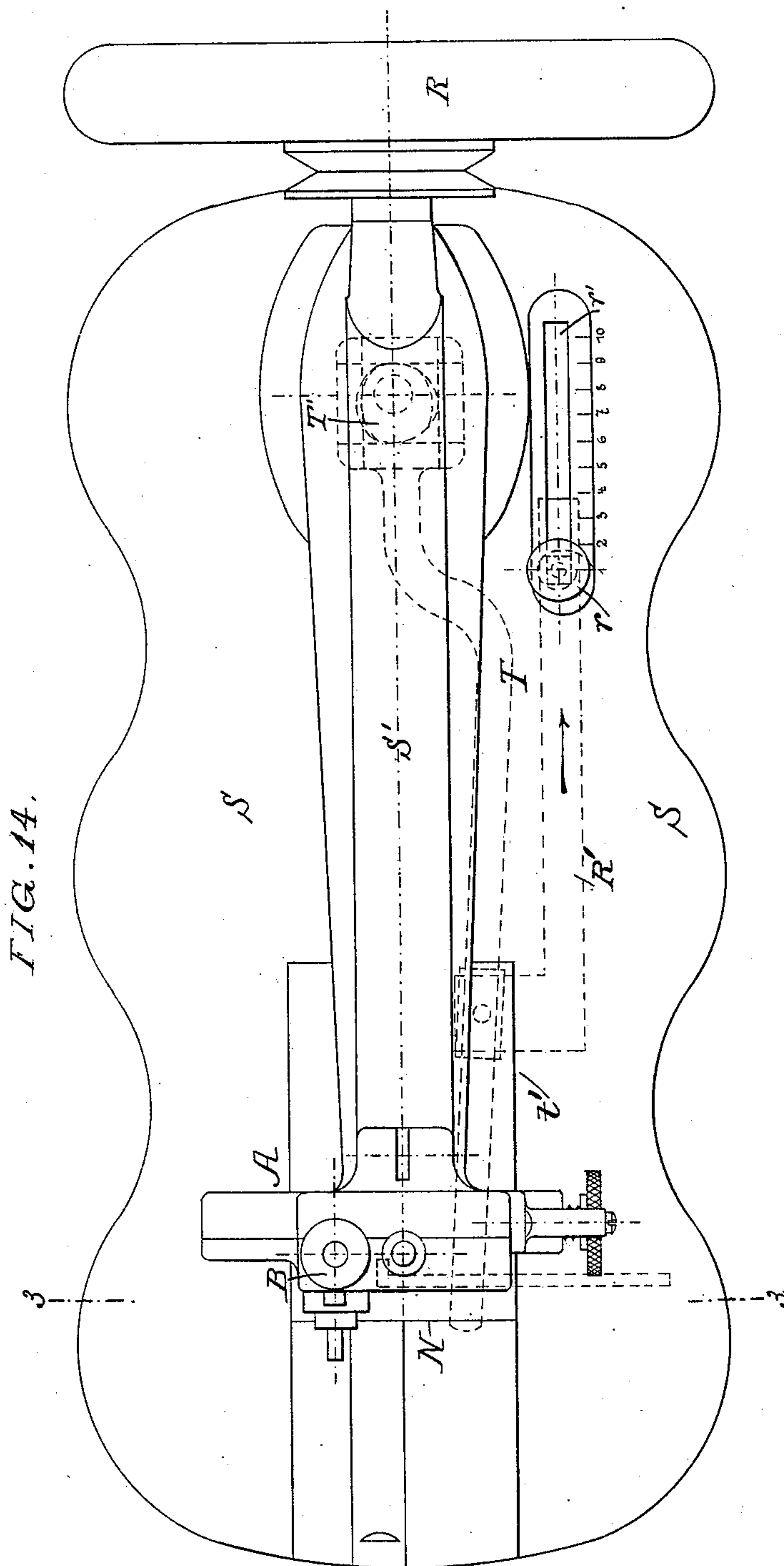
4 Sheets—Sheet 4.

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Witnesses.

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UNITED STATES PATENT OFFICE.

CLAUS LUESSEN, OF CELLE, NEAR HANOVER, GERMANY.

FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 253,731, dated February 14, 1882.

Application filed October 18, 1880. (No model.)

To all whom it may concern:

Be it known that I, CLAUS LUESSEN, a subject of the Emperor of Germany, and a resident of Celle, near Hanover, Germany, have invented certain new and useful Improvements in Feed Mechanisms for Sewing-Machines, of which the following is a specification.

My invention relates more particularly to that class of sewing-machines in which an upper feed-dog and operating mechanism are employed, either with or without a lower feed mechanism; and the object of my invention is to improve the construction of this upper feed mechanism, as more fully described herein-after.

In the accompanying drawings, Figure 1, Sheet 1, is a front view of the head of the machine with the face-plate removed, the device for regulating the upper feed being shown in section; Fig. 2, a vertical longitudinal section through the head; Fig. 3, a section on the line 1 1, Fig. 2; Fig. 4, a section on the line 2 2, Fig. 1; Fig. 5, a front view of the index for the upper-feed regulator; Fig. 6, a detached view of the cam-lever for lifting the presser-foot; Figs. 7, 8, 9, and 10, detailed views of detached parts; Figs. 11 and 12, Sheet 2, a side and rear view respectively of the devices for carrying and operating the upper feed-dog, shown detached from the machine; Fig. 13, Sheet 3, a front view of a sewing-machine, showing my improvements applied thereto, and with the bed-plate in section on the line 3 3, Fig. 12; and Fig. 14, Sheet 4, a plan view of the machine, drawn to a smaller scale, showing the lower-feed mechanism in dotted lines.

In these drawings I have shown my invention as applied to a Singer sewing-machine, S being the bed of the machine, S' the frame, R the fly-wheel, A the head, and N the needle-bar, these parts, together with the lower-feed mechanism illustrated in Fig. 13 and by dotted lines in Fig. 14, all being of the ordinary construction.

In the head A of the machine is the vertical presser-bar B, to the lower end of which is secured the presser-foot C, having on its under edge a projecting contact-piece, c, so as to reduce the surface contact with the cloth. This presser-foot is cut away on its inner side, so as to leave a space, as shown in the plan view,

Fig. 4, for the reception of the upper feed-dog, E. This dog is firmly secured at d' to a bar, E, while its foot d is adapted to the cut-away portion of the presser-foot, as shown in Figs. 1, 2, and 4.

The bar E, which is shown detached in Fig. 10, is secured by screws g g, Fig. 3, to a slide, H', adapted to a horizontal groove in a cross-head, H, hereinafter described. The upper end, e, of this bar bears against and is acted on by an eccentric or cam, i, on the crank-shaft I of the machine, Fig. 12. The cross-head H is of the form shown in Fig. 8, with a horizontal part, H², grooved to receive the slide H', and a vertical shank, H³, grooved to receive the square portion of the presser-bar B between the flanges h⁴ h⁴, Fig. 3, and this vertical shank H³ is itself adapted to a vertical groove, a, in the face-plate of the head of the machine. In a socket in the presser-bar is fitted a spiral spring, L, Figs. 1 and 2, the lower end of which bears on the presser-bar, while its upper end bears against a pin, h⁵, projecting from the vertical shank of the said cross-head into the socket, so as to provide a yielding bearing or cushion for said cross-head.

The presser-bar B is provided with the usual adjustable spring, B', for depressing the bar against the action of the devices hereinafter referred to, and a cam-lever, P, is provided for raising the presser-bar out of action in the usual manner.

To the presser B is pivoted, at k, a bell-crank lever, K. (Illustrated in detail in Fig. 9.) The long arm k' of this lever bears against and is acted on by a cam, i', on the shaft I, while the short arm k² bears on the cross-head H, so that when the cam i' forces the end k' away from the shaft the presser-bar will be raised and the cross-head depressed by the arm k².

In the slide H' is formed a socket for the reception of a spring, h, Fig. 3, which bears at one end against a screw-plug, h³, in the outer end of the socket, and at the other end against a pin, h², on the cross-head, projecting through a lateral slot, h', in the slide, Figs. 3 and 7.

The needle-bar N, which in Fig. 1 is indicated only by dotted lines, is connected to the wrist-pin M, by which the usual reciprocating motion is imparted to it.

The operation of the feed mechanism above

described is as follows: The parts being in the positions shown in Fig. 1, and the shaft I being then rotated in the direction of the arrow, the bar E and slide H', under the action of the spring *h*, will, as the cam *i* recedes, make their return-stroke—that is, move in a direction contrary to that pointed out by the arrow *y*, the foot *d* of the feed-dog D being clear of the cloth. Then the cam *i'* will so act on the lever K as to raise the presser-bar B and depress the cross-head H and the parts carried by it, including the dog D. At the same time the needle has been raised out of the cloth. The cam *i* then moves the bar E, slide H', and dog D in the direction of the arrow *y*, while the dog is still depressed by the lever K acting on the cross-head, and the dog D' (shown by dotted lines in Fig. 1) of the lower-feed mechanism being operated so as to move simultaneously with the upper dog, the cloth will be gripped between the two dogs and fed forward. As the cam *i'* continues to rotate so as to present its shortest radius to the bell-crank lever K, the spring B' causes the presser-bar B to descend and bring its foot down on the cloth, which it holds while the needle makes its down and up stroke. At the same time the spring *h* forces back the slide H', carrying the bar E, and thus brings the dog D into position to take a fresh hold of the cloth with the under dog, D'. The movements are thus so timed that the presser-foot descends just before the needle enters the cloth and rises from the cloth just after the needle is drawn therefrom. The upper and lower feed-dogs, acting conjointly, feed the cloth forward while the presser-bar and needle are raised, and make their return-stroke as the needle begins to descend.

In sewing together two or more thicknesses of fabric it is sometimes necessary, as in the sewing of parts of garments, to have one piece travel a little faster than the other; and in order to make this differential feed automatic, I provide the upper and lower feed mechanism with means for independently adjusting the length of movement of the feed-dogs. In my improved upper-feed mechanism the length of horizontal movement of the dog, and consequently length of feed of the cloth, is adjusted by regulating the length of movement of the slide H'. A screw, O, adapted to a threaded opening in a piece secured to or forming part of the head immediately opposite the end of the slide H', is provided with a graduated head or dial, *o*, as indicated in Fig. 5. An index-finger, O', is provided to show the position to which the screw has been turned. Passing through the screw O is a set-screw, O², whose inner end, *o'*, forms a stop to limit the movement of the slide H' when the latter is moved toward the said adjustable stop *o'* by the spring *h*. By turning the screw O the extent of movement of said slide is controlled and the movement of the bar E and feed-dog regulated. The pitch of the thread or threads on the screw O should be such that in just less than a single complete revolution of said screw

the slide H' may be moved from its extreme inner position to a position in which the bar E will be out of range of the cam *i*. The object of employing the set-screw O² instead of simply the screw O is that the set-screw gives a point for wear, so as to save the screw O, and also allows of an adjustment to make up for wear and lost motion.

The lower-feed motion may be of any of the well-known forms, as I do not limit myself to any particular construction of lower feed. In the drawings, Figs. 11 and 12, I have shown the well-known form of feed mechanism usually applied to the Singer machine. This mechanism consists essentially of a feed-dog, D', Fig. 13, mounted on a pin, *t*, on the under side of the bed-plate, and devices for imparting to it the necessary upward and forward motion to produce the feed. This motion is imparted from a cam, T', Fig. 14, on the upright shaft of the machine through the medium of a lever, T, passing through a guide, *t'*, which is pivoted on the end of an adjustable arm, R'. This arm is adapted to guides on the under side of the bed-plate, and is provided with a thumb-nut, *r*, passing through a slot, *r'*, in the bed-plate. By loosening this nut and moving it in the slot *r'* the arm R' may be moved so as to change the position of the guide *t'*, which forms the fulcrum of the lever T, and so change the length of movement of the end of the latter and the length of movement of the lower feed-dog.

The edge of the slot *r'* is provided with graduation-marks, which should correspond with those on the head *o* for the upper feed-dog, so that both feeds may be regulated with reference to each other, and the two feeds differentiated or rendered uniform, as may be desired.

It will be observed in connection with the upper-feed mechanism that when the presser-bar B is raised by the action of the lever K the pressure of the spring B' is through said lever transferred to the cross-head H, and from the latter, through the bar E, to the feed-dog D, while when said feed-dog rises and the presser-bar comes down the pressure of the spring is imparted to the latter only. The movements of the presser-foot and feed-dog are thus alternated under the action of one and the same spring.

Although I have shown my improvements as applied to a Singer sewing-machine, they may be applied to various other styles of sewing-machines without departing from my invention.

I claim as my invention—

1. In a sewing-machine, the combination of a presser-foot with feed-dog D, bar E, slide H', and cross-head H, having a vertically-reciprocating motion.

2. The combination of the feed-dog bar E, its slide H', and cam with cross-head H, carrying said slide, elevating-spring L, and devices for depressing said cross-head, substantially as described.

3. The combination of the presser-bar and

spring L with cross-head H, carrying the feed-dog bar, pin h^5 , bell-crank lever K, and cam, all substantially as specified.

4. The combination of the presser-bar and
5 spring L with cross-head H, slide H', feed-dog bar E, lever K, and operating-cams, all substantially as set forth.

5. The combination of the head of a sewing-machine and feed-dog bar E with cross-head
10 H, slide H', to which said bar E is secured, and screw O in the machine-head, forming an adjustable stop for the slide, all substantially as described.

6. The combination of the feed-dog bar E
15 and slide H', carrying said bar, with adjusting-screw O and its set-screw O², substantially as and for the purpose set forth.

7. The combination of the feed-dog bar E and slide H' with adjusting-screw O, having a graduated plate and index-finger, O'. 20

8. The combination of the presser-bar and spring B' with lever K and cross-head H, carrying the feed-dog bar, whereby the said spring acts on the said presser-bar and on the feed-dog through the lever, as set forth. 25

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of September, 1880.

CLAUS LUESSEN.

Witnesses:

WILLIAM C. FOX,
JOHS. KRACKE.