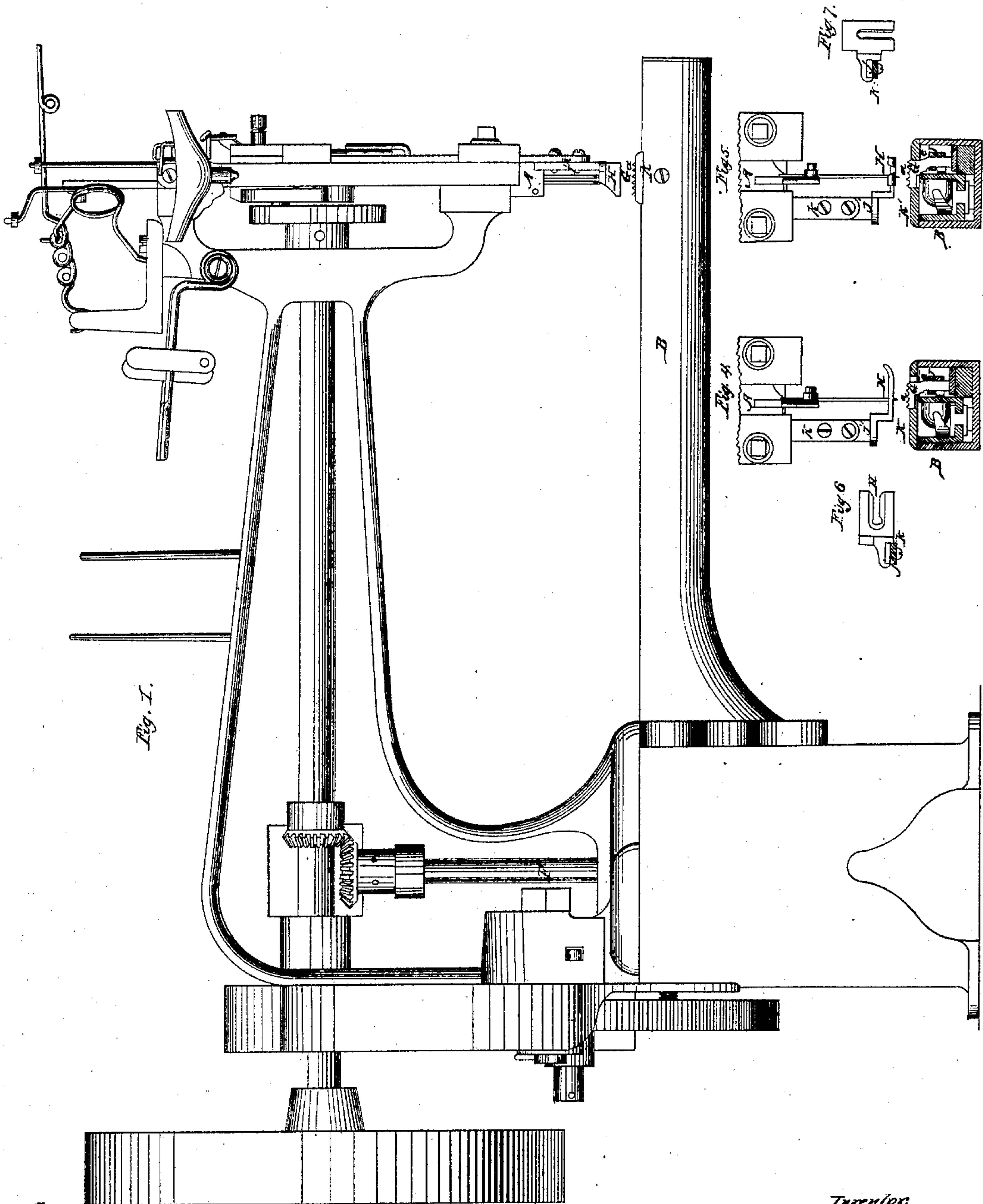


I. M. SINGER.
SEWING MACHINE.

No. 34,906.

Patented Apr. 8, 1862.



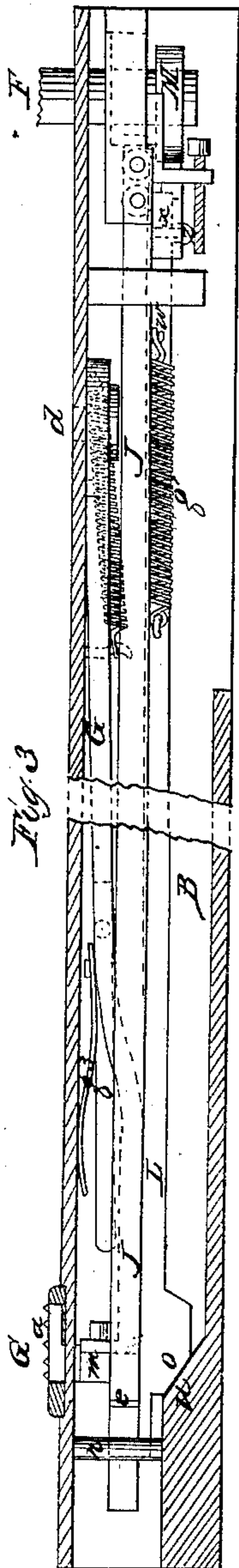
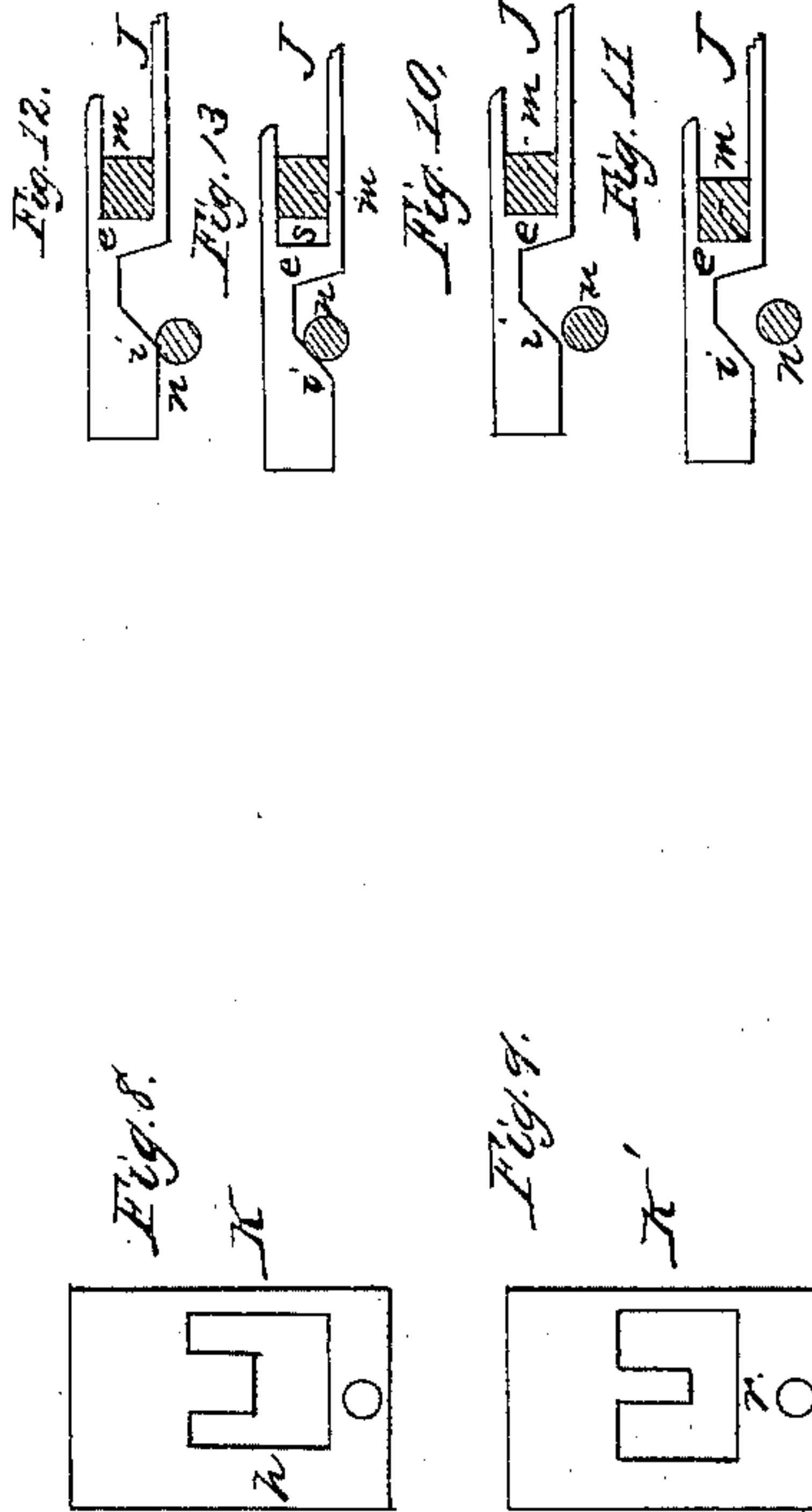
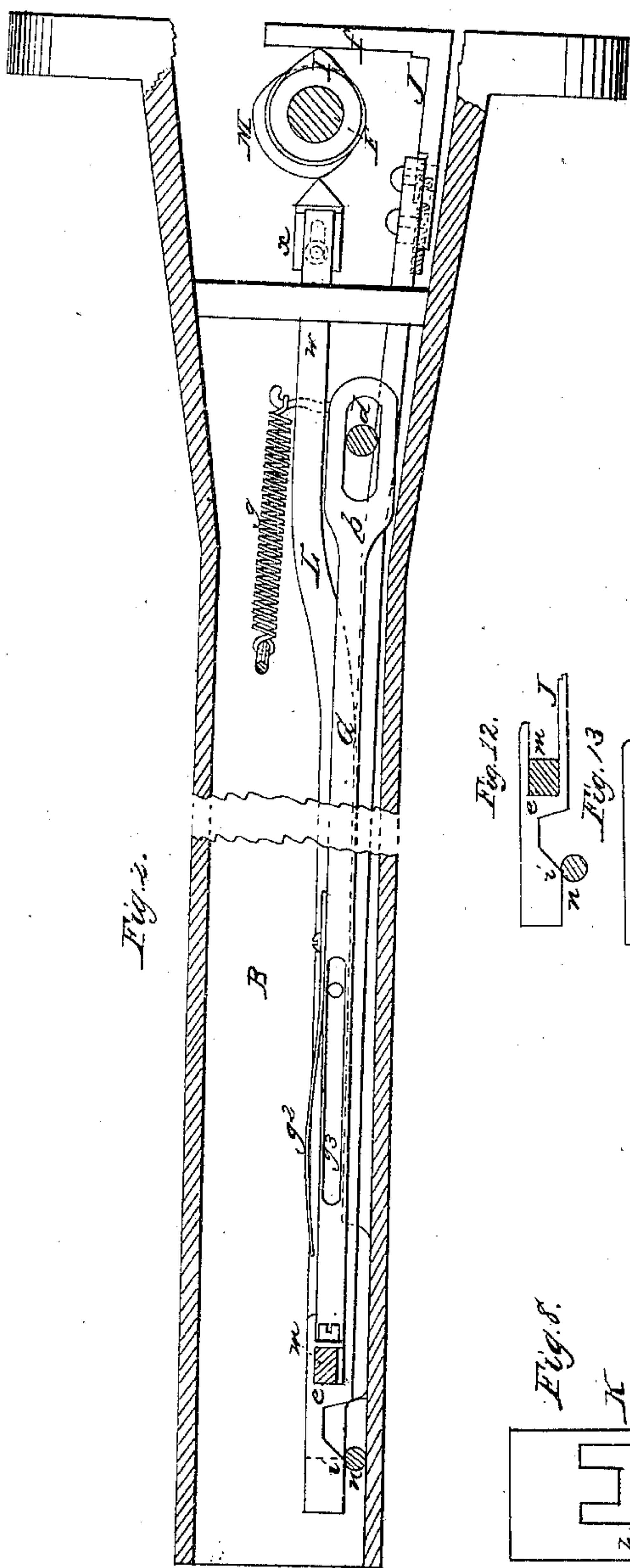
Witnesses.
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UNITED STATES PATENT OFFICE.

I. M. SINGER, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 34,906, dated April 8, 1862.

To all whom it may concern:

Be it known that I, ISAAC M. SINGER, of the city, county, and State of New York, 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 my invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a sewing-machine with my improvements applied thereto. Fig. 2 represents a horizontal section of a portion of the same at the line *xx* of Fig. 1. Fig. 3 represents a vertical longitudinal section of the same at the line *xx* of Fig. 2; and Figs. 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 represent views of detached parts of the same.

My improvements have reference particularly to the feed mechanism of sewing-machines. In sewing some kinds of work—such, for example, as boot-legs—it is necessary to sew seams both longitudinally and crosswise, while from the nature of the article it can be supported only upon a support extending longitudinally through it. In such machines a feed-motion has been used which feeds the material either lengthwise or crosswise to the support, according to the direction of the slot in the guide or throat-piece in which the feed-plate reciprocates.

The object of the first part of my invention is to effect the same result by simpler and less costly means; and it consists in the combination of the feed-plate or feed-bar of a sewing-machine with a cam or its equivalent to move it to and fro in one direction, and with inclined blocks to cause the movement of the feed-plate in a direction crosswise to the first direction in such manner that movement is imparted to the feeding-surface in one direction or the other interchangeably, according to the direction of the slot in the guide employed to regulate the direction of feed.

The object of the second part of my invention is to enable the feed-bar to be protruded to greater or less distances above the surface of the support for the work by adjusting the machine; and it consists in combining the feed-bar with mechanism constructed in parts in such manner that by adjusting the relative positions of these parts the feed-bar is caused to protrude more or less above the surface of the support of the work.

The third part of my invention consists in

the combination of the same feed-bar or feed-plate with mechanism for moving it either longitudinally or transversely to the support of the material, according to the guide employed, (so that both of these movements are attainable in the same machine,) and also with mechanism for varying the protrusion of its feeding-surface.

The first two parts of my invention may be used separately, if deemed expedient.

The machine represented in the accompanying drawings is fitted particularly to the sewing of boot-legs, although it may be used for other purposes, A being the needle-bar, which in this instance is constricted to hold two needles for sewing a double seam when sewing crosswise to the support of the work.

B is the support of the work, which also contains the feed-bar, the shuttle-driver, the shuttle, and the shuttle-race. The shuttle and its race are removed in Figs. 2 and 3 to enable the feed mechanism to be seen more clearly.

As the construction and operation of the sewing mechanism of such machines is well known, I do not deem it necessary to describe it in detail, but shall proceed at once to the description of those parts of the machine which embody my invention.

The feeding of the material to be sewed in the machine represented is effected by the conjoined action of a reciprocating feed-bar, G, and a spring presser-foot, H, between the acting surfaces of which two members the material is introduced by raising the presser-foot. The feed-bar is made in two parts to enable it to be introduced easily into the machine, and its feeding-surface or feed-plate *a* is toothed to enable it to take a secure hold of the material. The butt *b* of the feed-bar is slotted, so as to work upon a fixed pivot, *d*. This feed-bar is moved longitudinally for feeding by the action of a cam, I, which is secured to a rotating shaft, F, and operates upon the butt *f* of a bar, J, whose outer end, *e*, embraces three sides of the shank of the feed-plate of the feed-bar, so that whenever this bar J is moved by the cam it tends to draw the feed-plate longitudinally with the support B toward the rotating shaft F. The feed-bar is fitted with a spring, *g*', that tends to move it longitudinally antagonistically to the action of the bar J. The bar J is also fitted with a spring, *g*', which forces it toward the rotating shaft F whenever the cam

I, in its rotation, permits this movement. The outer end of the bar J is also fitted with an inclined block, *i*, and a pin, *n*, is secured in the support B in such position that whenever the inclined block at the outer end of the bar is borne against the pin the longitudinal movement of the bar, drawing the inclined block *i* across said pin, will cause the outer end of the bar to move transversely to the support B. A spring, *g*², is provided to bear the outer end of the bar J against the pin *n* and cause said end to move transversely antagonistically to the action of said pin when the bar is moved outward by the spring *g*'. As the outer end of the bar J is thus moved longitudinally and also transversely to the support B, it has all the motions necessary to move the feed-plate either lengthwise or crosswise. In order that it may effect either operation without the other, two guides or throat-pieces, K K', are provided for the machine. Each of these guides has an opening in it of sufficient size to permit the feed-plate to move freely in that direction only in which the feed is to be effected, the guide K' being adapted to longitudinal feeding and the guide K to cross or transverse feeding. These guides, when in place, occupy the same position in the machine, so that the same screw will secure either one in place. The hole or throat in the transverse guide K is in such a position that the feed-plate is permitted to move transversely with the outer end of the bar J, but is not permitted to follow the longitudinal movement of this bar when it is moved outward (from the rotating shaft) by the spring *g*', the shank *m* of the feed-plate being retained by the outer side, *h*, of the throat of the transverse guide (against which it is pressed by the action of the spring *g*) at the nearest point to the rotating shaft F to which the bar can draw it when moved by the cam I. Hence when the transverse guide is used the bar, although moved longitudinally by the cam I and spring *g*', and also transversely to the support B by the action of the pin *n* on the incline *i* and the spring *g*, is permitted to impart a transverse movement only to the feed-plate and feed-bar, and when the bar J moves outward from the rotating shaft a space, *s*, Fig. 13, is left longitudinally between the shank of the feed-plate and the bar. The relative positions of the shank of the feed-plate and the bar at the two extreme vibrations of the feed-plate are shown at Figs. 12 and 13. The hole or throat in the longitudinal guide K' is in such a position that the feed-plate is permitted to move longitudinally with the outer end of the bar, but is not permitted to move transversely therewith, the shank *m* of the feed-plate being retained by the hinder side, *r*, of the throat (against which it is pressed by the spring *g*²) at the greatest distance transversely from the pin *n*' (see Figs. 10 and 11) to which it could be moved by the action of the said pin on the inclined end *i* of the bar J. Hence when the longitudinal guide is used the

spring is not permitted to bear the inclined end of the bar J against the pin *n*, and consequently the longitudinal movement of the bar alone is imparted to the feed-plate. In the machine represented the end of the bar J is hooked, so as to embrace the side of the feed-plate shank that is farther from the pin *n*, so that the end of the bar is held by this shank out of contact with the pin *n* when the longitudinal guide is used.

In using a sewing-machine it is advantageous to have a slot in the presser-foot extending in the line of feed from the place where the needle passes down to the side of the foot toward which the material to be sewed advances. As the line of feed in the present machine is sometimes lengthwise with the support and sometimes transversely thereto, according to the direction in which the feed-plate is guided, it is advantageous to have a presser-foot plate with a slot adapted to each direction of feed. Two foot-plates, Figs. 6 and 7, are therefore provided for the present machine, each having a shank, *j*, by which it is secured to the stem *k* of the presser-foot on which the spring bears by which the presser-foot is depressed. If deemed advisable, a single foot-plate having a V-shaped slot in it may be used, the portion of the plate between the two arms of the slot being connected with the remainder by a bridge. In the present machine the feed-plate is raised and lowered by the action of a reciprocating bar, L. The end of this bar has an inclined block, *o*, upon it, which slides upon an inclined block, *u*, secured to the support of the material B, and the shank *m* of the feed-plate rests upon the upper surface of the reciprocating bar, and is held in contact therewith by a spring, *g*³. Hence when this reciprocating bar is moved from the rotating shaft F its outer end, which sustains the feed-plate, is raised, and the feed-plate is protruded above the surface of the throat-plate or guide K, which supports the material in the vicinity of the needle, and when the reciprocating bar L is moved toward the rotating shaft F its outer end is permitted to descend and the feed-plate resting on it is depressed by the spring *g*³ until it is below the surface of the throat-plate or guide K.

The movement of the reciprocating bar L at the proper time to raise and lower the feed-plate is effected by a cam, M, secured to the rotating shaft F, and by the spring *g*', which moves the reciprocating bar antagonistically to the cam whenever the cam, in its rotation, permits such movement, one of the ends of this spring being attached to the bar L and the other to the bar G. The cam M is set in such relation to the cam I, that imparts the horizontal movement to the feed-plate, that the feed-plate is raised when it is moved to feed and is lowered when it is moved back to take a new hold upon the material. In order to embody the second part of my invention, the reciprocating bar L is made in two parts, *w* and *x*, which are fitted to slide upon each other, and

are secured together in any desired relation by means of a screw, *z*, which passes through a slot formed in the extremity of one of the parts of the bar. From this construction it follows that the two parts of the bar may be slid more or less over each other, so as to shorten or lengthen the distance between the bearing on the cam and the inclined end *o*, and the two parts may be secured by the clamp-screw in any desired relationship. When the distance of the inclined block *o* from the cam is shortened the said block is not pushed as far up the stationary incline *u* by the cam, and consequently the feed-plate is not protruded as far above the surface of the support for the material. When, on the other hand, the distance of the inclined block *o* from the cam is lengthened, the said block is pushed farther up the stationary incline by the cam, and the feed-plate is protruded a correspondingly greater distance. The operator thus has it in his power to vary the extent of the protrusion of the feed-plate by the adjustment of the mechanism for raising it.

As the second part of my invention is used in a machine embodying also the first part of it, and the two are so combined that they act in concert, the present machine contains the third part of my invention as well as the first two. My invention is not limited to the peculiar construction of the members of the combinations, but consists in the combinations as entireties; and although I have found it expedient to construct, arrange, and combine the members of my combinations in a particular manner in order to embody these combinations

in the particular machine represented in the drawings, I do not limit myself to that particular construction and arrangement, as machines of different plans will probably require a different construction and arrangement of mechanism in order to embody my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the feed-bar of a sewing-machine with a cam (for causing the feeding-surface to reciprocate in one direction) and with inclined blocks, (that will cause it to reciprocate in a direction crosswise to the first,) the combination being such that the feeding-surface can be caused to move either longitudinally or transversely to the support of the material, according to the guide which is employed to regulate the direction of the feed, substantially as specified.

2. The combination of the feed-bar of a sewing-machine with mechanism for raising it and lowering it that is constructed in parts which are adjustable, so as to vary the distance to which the feeding-surface is protruded above the support of the work, substantially as specified.

3. The combination of the same feed-bar with mechanism for moving it either longitudinally or transversely to the support of the material, and also with adjustable mechanism for varying the protrusion of its feeding-surface, substantially as set forth.

I. M. SINGER. [L. S.]

In presence of—

CYRUS P. LEE,
C. G. HETRICH.