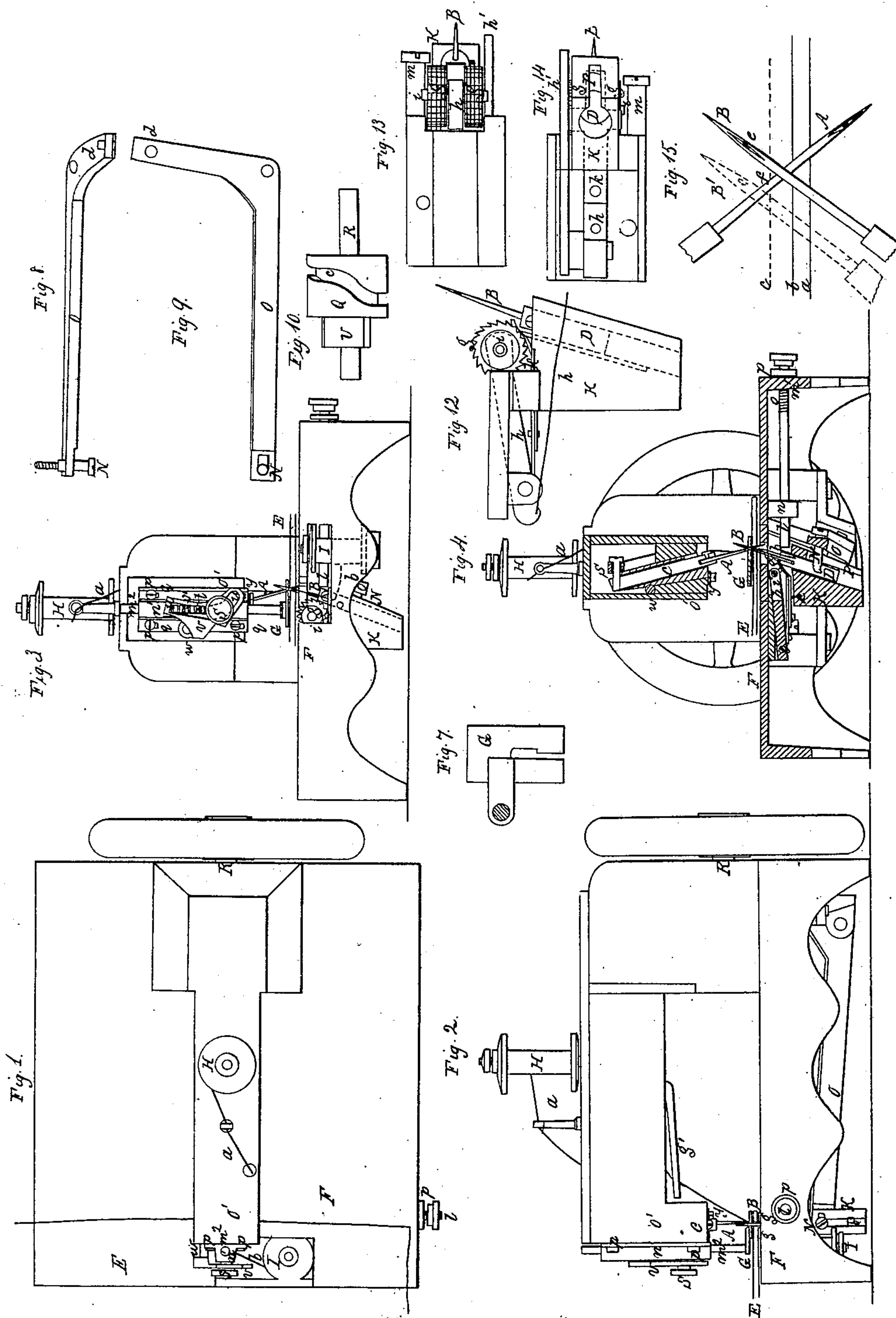


C. HODGKINS.
SEWING MACHINE.

2 Sheets—Sheet 1.

No. 9,365.

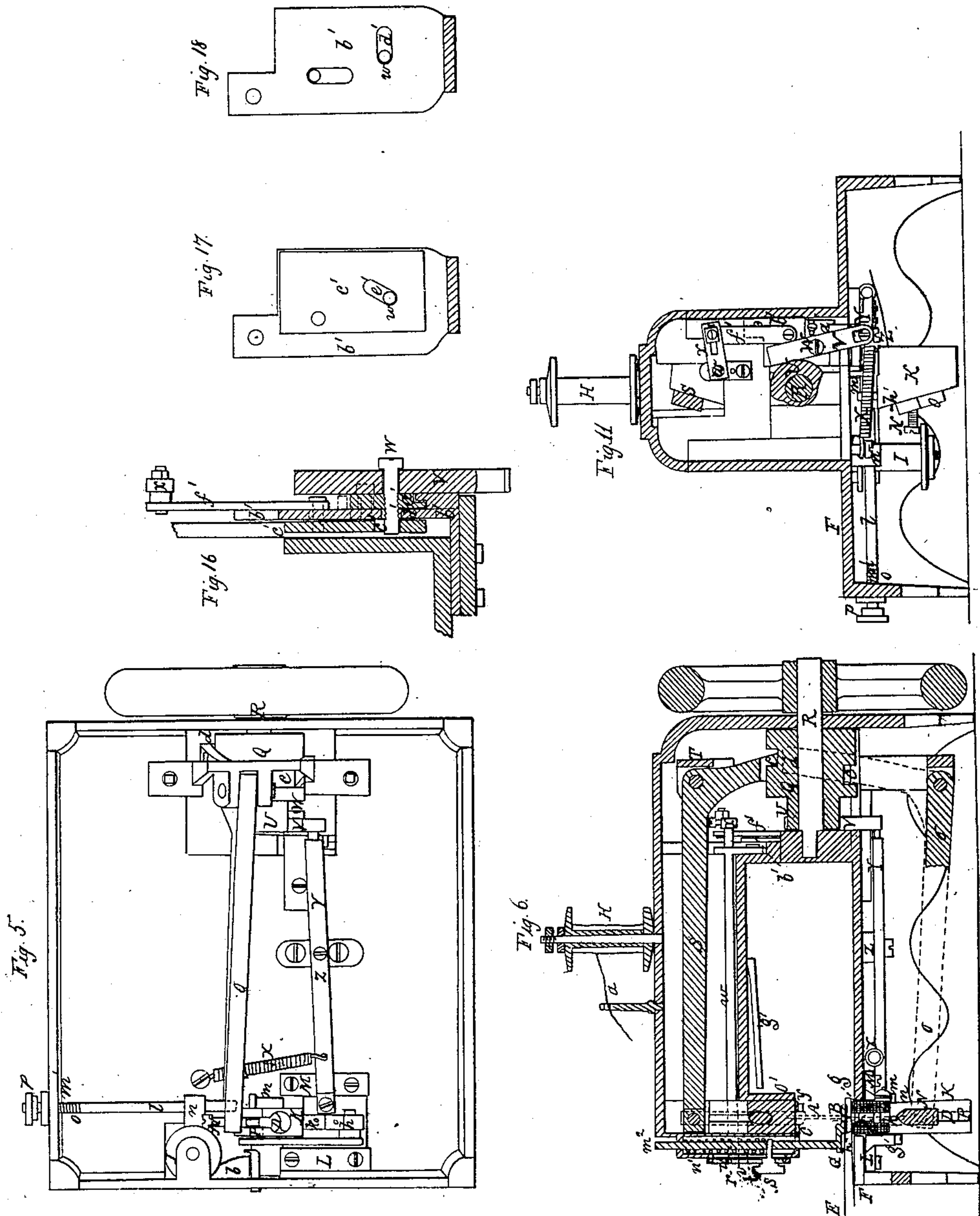
Patented Nov. 2, 1852.



C. HODGKINS.
SEWING MACHINE.

No. 9,365.

Patented Nov. 2, 1852.



UNITED STATES PATENT OFFICE.

CHRISTOPHER HODGKINS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
NEHEMIAH HUNT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 9,365, dated November 2, 1852.

To all whom it may concern:

Be it known that I, CHRISTOPHER HODGKINS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Sewing Cloth; and I do hereby declare that the same are fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 denotes a top view of my improved sewing-machine. Fig. 2 is a side elevation of it. Fig. 3 is a front end view. Fig. 4 is a vertical and transverse section taken through the front needle and representing the parts that are toward the fly-wheel. Fig. 5 is an under side view of it. Fig. 6 is a vertical, central, and longitudinal section of it.

My machine sews with two needles working through the cloth in opposite directions, and the one being made to cross the path of the other. It performs a lock-stitch, the loops made by each thread being locked in the cloth by those of the other.

In the drawings, A and B represent the two needles, each being inserted and fixed in a needle carrier or slide, C or D, which is supported so as to slide freely in a longitudinal direction. The angular position of one needle with respect to the other is as denoted in the drawings. The cloth is shown at E by red lines, and as resting on the top of the table or bed-plate F of the machine, and kept from rising upward by a presser, G, through which the needles work, a top view of the said presser being given in Fig. 7.

H I are the bobbins that carry the two threads *a b*. Each needle is provided with an eye or hole, made through it at about one-third or one-half of an inch from its point. While the thread *a* is taken from the bobbin H (which is placed on top of the machine) and passed through the eye of the needle A in a direction toward the front end of the machine, the other thread, *b*, is taken from its bobbin I and passed through the eye of the needle B in an opposite direction.

The operation of sewing by the machine may be thus described: The lower needle passes up through the cloth, so as to carry its eye entirely and some distance through it. It next

falls or moves back a short distance. In doing this the thread which had been drawn tightly against its sides will be loosened and caused to bow out or stand out, so as to permit the point of the upper needle to pass freely between it and the said lower needle when said upper needle next descends. Next, the upper needle is made to descend, so as to pass between the lower needle and the thread thereof and into the cloth a short distance, but not to the extent of its downward motion. Next, the lower needle is made to descend entirely through the cloth and to the extent of its downward motion. Next, the upper needle is made to further descend and to the full extent of its downward motion. Next, the lower needle is moved laterally to the right or toward the upper needle a distance sufficient for the formation of a stitch. Next, the upper needle rises a little, so as to loosen and bow its thread, (as did the other needle, as before described.) Next, the lower needle passes into the bow of the thread and into or through the cloth a short distance, but not to the full extent of its motion. Next, the upper needle is raised up to its highest position and entirely out of the loop previously formed thereon, it being so elevated for the purpose of enabling the lower needle, when it next ascends, to draw such loop around the thread instead of around the upper needle, which it would do were the said upper needle not previously drawn out of the loop before made on it. Next, the lower needle ascends and draws the thread into the cloth. Just previous to the taking place of the first portion of the downward motion of the lower needle, such needle and the cloth are conjointly moved in a direction toward the other needle the distance required for the formation of the next stitch.

In machines that have been operated with two needles working directly across one another and through the cloth, as do those of my machine, each needle has had a regular uninterrupted forward-and-back motion, and not an intermittent forward or an intermittent back movement of the kind imparted to the needles of my machine. When one needle passes entirely through the cloth to the extent of its motion before the withdrawal of the other needle commences to take place, the latter needle will, when it next passes through the cloth,

draw its thread around the first needle, and thereby leave it not closely drawn into the cloth; but if one needle is drawn out of the cloth after the other needle has caught the thread of the first and before the second has completed its movement through it, the latter draws its thread down closely into the cloth and around the other thread only and not around the former needle. Consequently in this way a tight sewing or stitches drawn closely into the cloth can be produced. It is therefore that a particular part of my invention consists in so operating the needles that each one, immediately after the other has caught its thread, shall be drawn out of the cloth before the other has completed its forward movement, and this to prevent the entering needle from drawing its thread around the other and cause such entering needle to draw its thread around the thread only of the other, whereby such thread and the other thread are drawn closely into the cloth. This is a highly important part of my invention, and I have been thus particular in referring to it, in order that it may be clearly understood.

The slide or carrier D of the lower needle is supported by and slides freely up and down in a carriage or block, K, that is held up to the under side of the base-plate by suitable ways or contrivances, L M, that permit it to slide freely in a transverse direction. A screw-pin, N, projects from the carrier and extends through the front end of the longer arm of a bent lever, O, the said pin being made to work in a slot, P, cut through the block K. The upper arm of the lever O has a pin or stud, *d*, that is made to enter a cam-groove, *c*, formed in a cylinder, Q, fixed on the driving-shaft R. Fig. 8 is a top view of the lever, and Fig. 9 is a side view of it. Fig. 10 is a side view of the shaft R and its cams. Another bent lever, S, whose fulcrum is at T, is also moved by the said cam, the front end of the said lever S being connected with the carrier C of the upper needle, and the said cam is properly made so as to impart to the needles their up and down movements, as above described. On the fly-wheel shaft R there is another cam, U, which operates against the upper end of a lever, V, whose fulcrum is at W, (see Fig. 11,) which denotes a transverse section of the machine, taken through the said cam and exhibiting the mechanism that is on that side of it toward the needles. The lower end of the lever V is jointed to another lever, Y, which has its fulcrum at Z, and its other end is jointed to the carriage K, of which Fig. 12 is a front side view, Fig. 13 a top view, and Fig. 14 a bottom view, as it appears when detached from the bed-plate. The carriage receives its movement in one direction or to the left by the action of the cam U against the lever V, while it gets a movement in the opposite direction by the retractile force of a spring, X, one end of which is fixed to the lever Y. There are two burrs or toothed cylinders, *g g*, affixed to a spring, *h*, that is attached to the upper part of the car-

riage K. These levers are made to freely revolve on an axle, *i*, and under them there is a spring-brake, *k*, that is so applied and formed that during the time the needle-carrier of the lower needle is being raised upward it shall abut against the spring-brake and press it against the under side of the peripheries of said burrs, and so as to prevent them from turning around while the carriage is being moved toward the left. The upper parts of the peripheries of these burrs are made to rest against and be pressed into the under side of the cloth. Consequently when the carriage K is so moved to the left the burrs being moved with it and all rotary motion of them arrested, they will move the cloth with them. On the descent of the needle-carrier the burrs will be relieved of the pressure of the friction-brake, so that when the carriage is next moved toward the right by the retractive power of the spring X they will freely rotate on their axle and produce no movement of the cloth. The amount of movement toward the right is regulated by an adjustable stop-rod, *l*, against the inner end of which the head of a screw or projection, *m*, from the carriage abuts at the completion of its movement to the right. This adjustable stop-rod is supported by the projections *m' n* from the bed-plate. It has a screw, *o*, cut on it, which screw is made to screw into one of the said projections, so that in turning the stop-rod on its axis either in one direction or the other it may be forced inward or outward, as occasion may require, in order to vary the length of stitch to be made by the machine. A clamping-nut, *p*, is screwed on the stop-rod, and when screwed up against the projection *m'* or side of the frame serves to keep the stop-rod in position. Such a mode of regulating the length of stitch will answer when the machine is employed to sew cloth of a constant thickness, but it will not, without much inconvenience, render the machine able to sew cloth varying in thickness. Now, as the machine is liable to be used at one moment to sew together two pieces of cloth of one thickness when laid together, and at the next moment to be employed to sew two pieces of cloth of a different thickness together, it becomes necessary to provide it with some mechanism by which it may be at once adjusted by any thickness of the cloth to properly sew through such thickness. The difficulty that is liable to occur by an increase of thickness of the cloth may be explained by Fig. 15, in which, suppose A B to represent the two needles and the lines *a b* the cloth, the distance between said lines being the thickness thereof. We desire the needle A to pass between the line *b* and the eye *e* of the needle B, and to enter the cloth at the right of where the needle B passes out of it on line *b*. Now, if we vary the thickness of the cloth, or suppose its upper surface to be represented by the dotted line *c*, or the cloth to have a thickness equal to the distance between the lines *a* and *c*, it will be seen that the needle A would pass into the cloth at *f* be-

fore it would pass in between the bow of the thread of the needle B. In order to make the needle A pass through the said bow before it enters the cloth, it will be seen that the needle B must be moved to the left to the position denoted at B' by dotted lines. Thus an increase of thickness of the cloth requires a movement of the lower needle toward the left, in order that the upper needle may not enter the cloth before it passes through the bow of the thread of the lower needle.

The presser G is attached to the lower end of a vertical slide-rod, m^2 , that slides freely up and down in a box, n' , which is affixed to the front end of the arm o' of the frame of the machine by screws $p p p p$, that pass, respectively, through slots $q q q q$, made through the box. This is to enable the box to slide up and down a short distance on the screws. The rod m^2 is pressed downward by a spring, r , disposed around it in the box n' . There is a clamp-screw, s , which screws into the rod and through a slot, t , made in the front side of the box. The shank of this screw passes through an inclined slot, u , made through an arm, v , that projects down from the outer end of a horizontal shaft, w , which extends into the arm of the frame. The diameter of the shank of the screw is equal to the width of the slot u' , and such slot is so made that whenever the presser G is lifted up, so as to force the screw s upward, the screw shall cause the arm v to move to the right, and thereby turn the shaft w a little in its bearings, and so as to depress an arm, x , that is fixed to the other end of the shaft. The box n' is forced downward by the action of a spring, y .

The fulcrum-pin W of the lever V screws into and through a slide, a' , that is so affixed to a vertical stationary plate, b' , as to be capable of moving back and forth in a horizontal direction. The rear end or part of the screw is made to extend entirely through the stationary plate b' , as seen in Figs. 16 and 17, the former of which is a vertical section taken through the lever V, the slide-plate a' , the stationary plate b' , and a movable cam-plate, c' . Fig. 17 is a rear view of the plates b' and c' . Fig. 18 is a rear view of the plate b' . A horizontal slot, d' , is made through the plate b' , the pin W being caused to pass through such slot into an inclined slot, e' , cut through the plate c' , the said plate c' being so applied to the plate b' as to be capable of only a vertical movement either upward or downward. Such plate c' is jointed to the lower end of a connecting rod or bar, f' , whose upper end is jointed to the arm x of the shaft w . From the above it will be seen that when the cam-plate c' is raised upward the inclined slot of it will so act against the fulcrum-pin W as to move it in a horizontal direction away from the driving-shaft. So when such plate c' is depressed a contrary movement of the pin W will be effected. The nearer the pin W is carried horizontally toward the driving-shaft R the farther will the cam U, during its rotation, move

the lever V, so as to produce a consequent movement of the carriage K toward the left, the cam-slots and parts of the mechanism being so proportioned as to cause such movement of the block or carriage K (and of course the lower needle) to be in accordance with what would be necessary in order to carry the lower needle into its correct position under any variation of the thickness of the cloth. Should a seam or projection on the top surface of the cloth, or any sudden increase of the thickness of the cloth, or any matter in the cloth increasing its thickness in any part, come under the presser during the operation of sewing the cloth, it will lift it and the box n' , it being supposed that the presser-rod m^2 is clamped to the box n' by the screw S. This lifting of the box will cause such a movement of the arm v as will create the required movement of the lower needle toward the left, in order to enable the needles to sew through such increase of thickness of cloth under the presser.

In order to keep each thread from kinking up, it will be carried around one of two springs, $g' h'$, in its passage from its bobbin to its needle.

I do not herein intend to claim in the mechanism for feeding the cloth a notched bar which has a vertical or up-and-down motion for fastening the cloth upon and relieving it from the notches of said bar by striking it against a yielding plate, and a lateral motion or motion forward and back; but

What I do claim as an improvement thereon is—

1. The employment of one or more burr-wheels, g , applied to the carriage K, and kept continually against the cloth by a spring, (so as to preserve the cloth from falling away from the spring plate or presser over it,) in combination with a spring-brake, k , operated as described, the whole being combined and made to operate together substantially as specified.

2. In combination with the presser G and the lower needle, a mechanism by which an increase of thickness of the cloth is made to move the lower needle to the left the distance required to bring it into correct position with respect to the upper needle, so as to prevent the said upper needle from passing into the cloth before passing into the bow of the thread of the lower needle, as set forth.

3. The combination of the slide-rod n^2 , the box n' , screw S, slotted arm v , shaft w , arm x , connecting-rod f' , slide a' , stationary plate b' , and cam-plate c' , as applied to the fulcrum-pin W of the lever V and to the presser, for the purpose of moving the lever with respect or nearer to the cam U, for the purpose and in the manner herein described.

In testimony whereof I have hereto set my signature this 4th day of September, A. D. 1852.

CHRISTOPHER HODGKINS.

Witnesses:

R. H. EDDY,
GEORGE W. CUTLER.