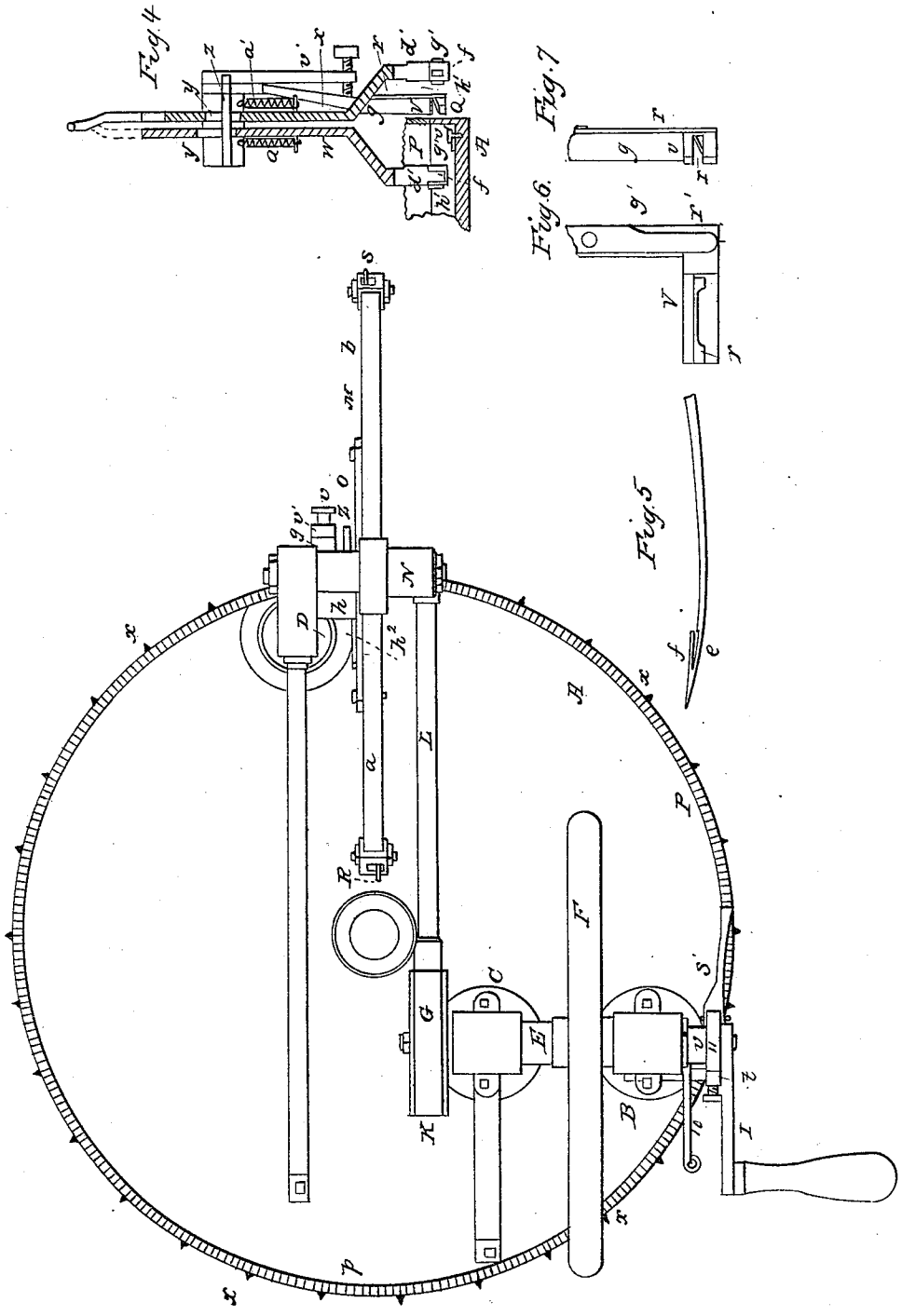
3 Sheets—Sheet 1.

P. B. ROBINSON.

Sewing Machine.

No. 7,824. Patented Dec. 10, 1850.



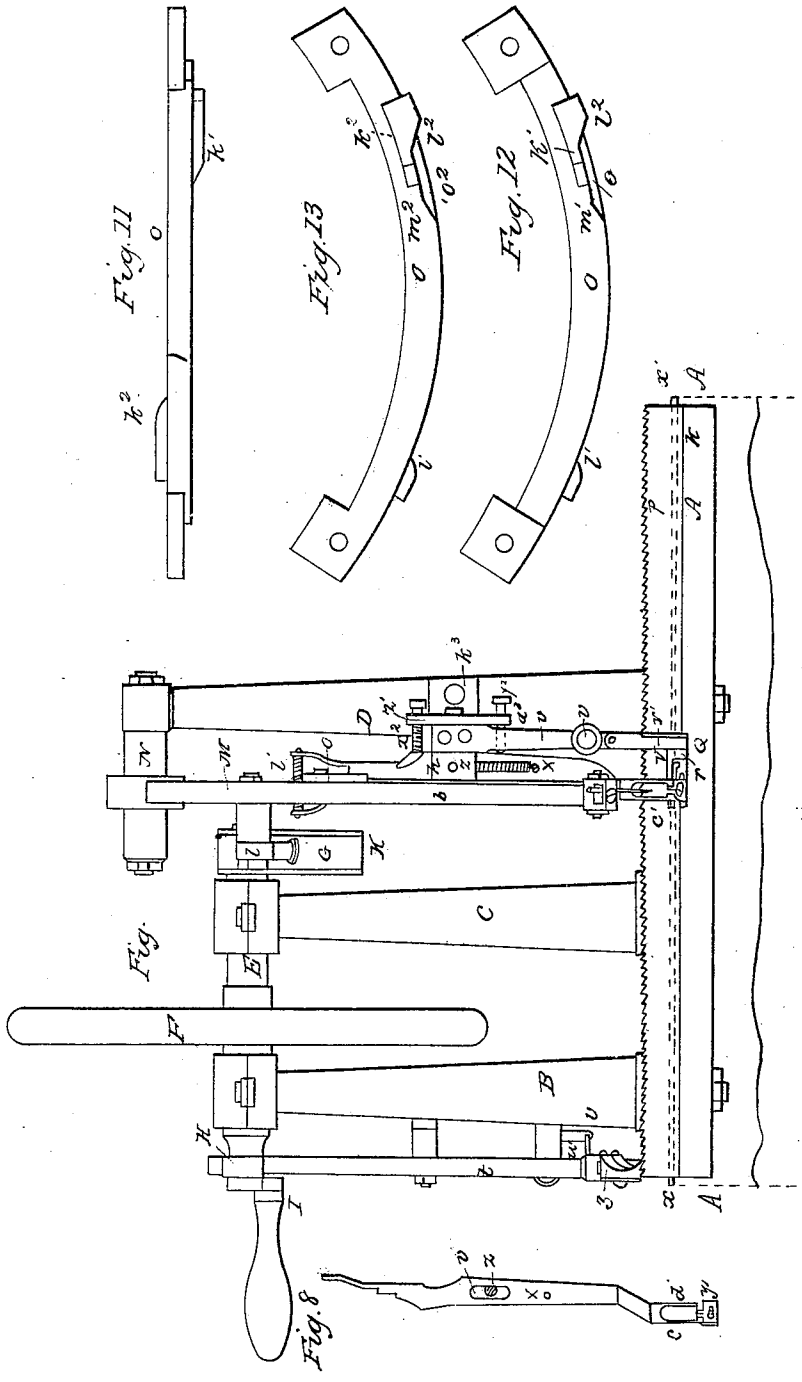
P. H. ROBINSON.

3 Sheets—Sheet 2.

Sewing Machine.

No. 7,824.

Patented Dec. 10, 1850.



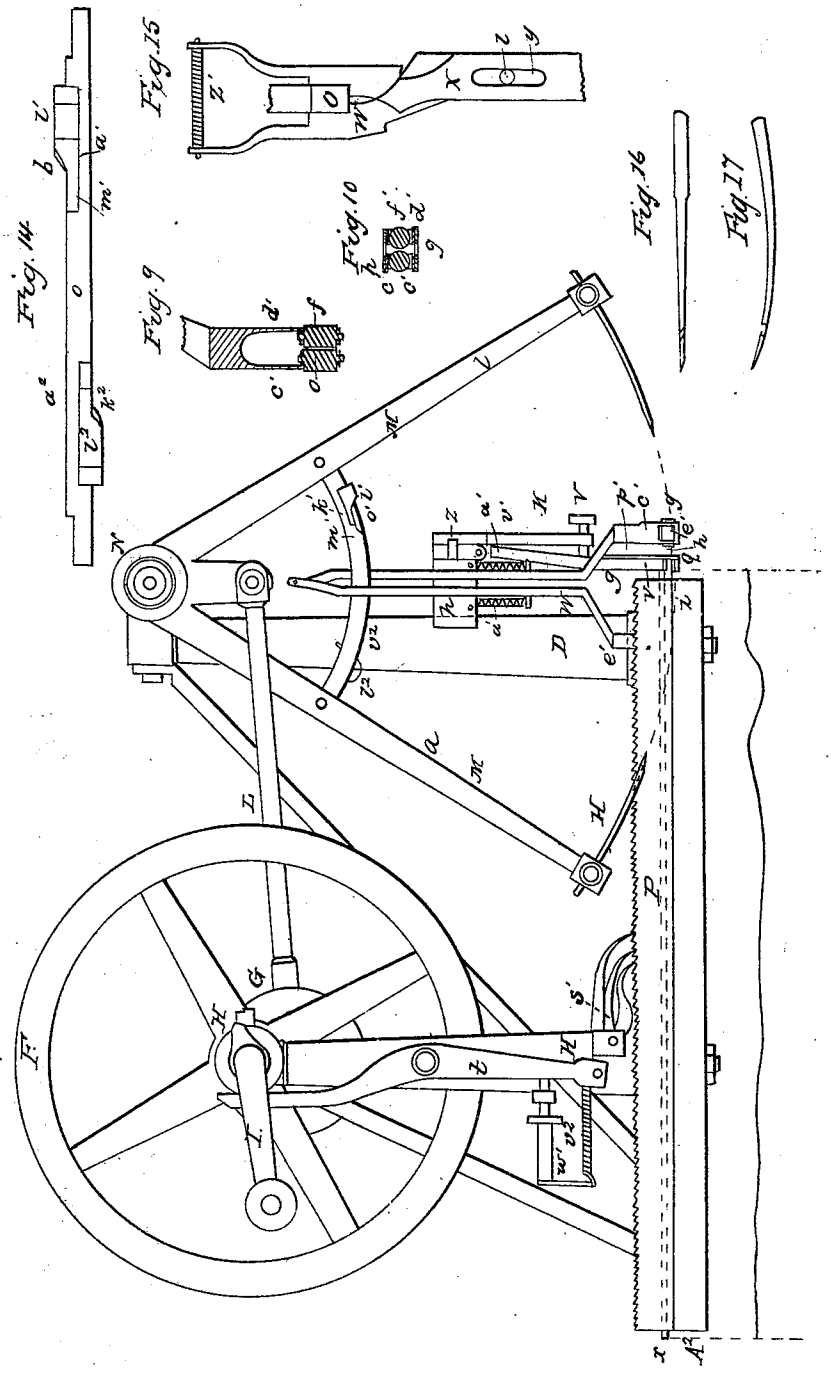
E. B. ROBINSON.

Sewing Machine.

3 Sheets—Sheet 3.

No. 7,824.

Patented Dec. 10, 1850.



UNITED STATES PATENT OFFICE.

FREDERICK R. ROBINSON, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **7,824**, dated December 10, 1850.

To all whom it may concern:

Be it known that I, FREDERICK R. ROBINSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Sewing-Machine; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 denotes a top view of my sewing-machine; Fig. 2, a side elevation of it; Fig. 3, a front elevation of it. Fig. 4 is a vertical section of the two thread-guides, the pressers, the supporting-plate, and the rotary cloth-holder. Such other figures as may be necessary to a full and complete description of the invention, will be hereinafter referred to and described.

The object of my invention is to produce either what is generally termed "stitch and back stitch" sewing, or ordinary stitching. By "ordinary stitch and back stitch" sewing I mean that in which a thread, after being carried through a piece of cloth from its front to its rear side, is moved backward the width of the stitch, is next again carried through from the rear side to the front side of the cloth, is next carried forward laterally double the width of the stitch, or some other suitable distance greater than the width of the stitch, and is next passed through the cloth from its front side to its rear side, such operation being successively repeated in the formation of the stitches. By "ordinary stitching" I mean that in which a thread is passed through the cloth from its front side to its rear side, is next moved forward the width of the stitch, is carried backward through the cloth from its rear side to its front side, is next carried forward the width of the stitch, and is again passed through the cloth from its front side to its rear side, and so on. This is frequently called the "running" or "basting" stitch.

Although the elements which constitute the combination of my machine may be adapted to the production of either of the above kinds of sewing, and this by slight changes in the mechanical contrivances by which the motions are produced and regulated, they may also be adapted, by proper changes, to the production of the ordinary cordwainer's stitch, which is produced by two threads which cross one another every time they are passed through the cloth. It is to be understood, however, that the movements of such elements, in order to produce the cordwainer's stitch, must be effected and regulated by suitable mechanical contrivance applied to them, the application of such mechanical contrivances, as well as their selection or adoption, being the work of the mechanic who constructs the machine, and not, generally speaking, one of invention.

In Figs. 1 and 2, A represents a circular base-plate, table, or stand, on which the operative parts of the machinery are supported by means of three or any other suitable number of columns, B C D, raised vertically thereon. E is the driving-shaft, which carries a fly-wheel, F. It has an eccentric, G, on one end and a cam, H, on its other, the said shaft being put in motion by means of power applied to a crank, I, or in any other suitable manner. The eccentric operates, in connection with the surrounding band K and its connecting-rod L, to give a reciprocating or pendulous motion to the needle-frame M, which is arranged as seen in the drawings, and is supported upon a horizontal shaft, N, that projects from the column or pillar D, as seen in the drawings. The said needle-frame is composed of two bars, *a b*, united together at their upper ends, and connected together at about one-third their entire length below their place of connection by a circular curved bar or arc, O. The lower end of each of the legs *a b* of such frame carries a curved needle, R or S, such needle being made to extend from the inner side of the leg, as seen in the drawings. Each needle is constructed as represented in side view in Fig. 5 on an enlarged scale—that is to say, it is provided with a long eye, *e*, which has a spring, *f*, fixed to one end of it and forming a part of the needle, as seen in said Fig. 5. Each needle during the movements of the needle-frame passes through a slot, *i*, made through the flange *k*, which is erected vertically upon the base-plate, and which serves to support a circular hoop, P, which I denominate the "cloth-holder," and which I shall hereinafter more particularly describe. The slot or passage *i* may be about a half an inch in its horizontal length, or it may be of a greater or less length, as circumstances may require. Its width vertically should be sufficient to receive each needle and allow it to freely play through

it. The said slot on its front and rear sides is provided with a flaring mouth-piece or presser, Q or U, which is formed in its vertical section as seen in Fig. 4. In its horizontal length the flaring mouth-piece should be about that of the slot. That mouth-piece which is on the rear or inner side of the flange which supports the cloth-holder is fastened to the base-plate, whereas the one on the outer side of the flange projects from an arm, *g*, which extends down from a frame, *h*, screwed to the post D by means of a screw, k^3. The front mouth-piece is made through a part of a projection, V, which is arranged in front of the flange and cloth-holder, and is intended to prevent the cloth from being drawn off the points *x x x* of the cloth-holder during the operations of the outer needle, S, as well as those of the inner needle, R.

Fig. 6 represents a front view, and Fig. 7 an end view, of the projection V, the same being drawn on an enlarged scale. In such figures it will be seen that the said projection is provided with a passage-way, *r*, of a sufficient depth to receive the points of the cloth-holder and to permit the free horizontal rotation of the whole series of them, or their horizontal passage through the said contrivance. The arm *g* is hinged at its upper end to the frame *h*, and in such manner as to enable it to be freely moved either toward or away from the cloth-holder, its distance from the cloth-holder being regulated by an adjusting-screw, *v*, which is screwed horizontally through the lower end of an arm, *v'*, which extends downward from the frame *h*, and so as to bring the adjusting-screw directly in front of the arm *g*. Each mouth-piece should be so made as to cause the spring of the needle when it passes through the mouth-piece to close entirely downward. The thread-guides, which are seen at W and X, are two bent bars of metal, arranged in the positions as seen in Figs. 2 and 3. Both of these bars are adapted to the frame *h* in such manner as to be capable of being freely and separately moved, not only upward and downward, but in lateral directions in planes which may be said to be at right angles to the plane of movement of the needle-frame.

Fig. 8 represents a front side view of the outer thread-guide, X, as it appears when detached from the rest of the machinery. Each of the said thread-guides is provided with a slot, *y*, through which a fulcrum-pin, Z, passes, the position of said pin being seen in Figs. 2 and 3. Each of the said thread-guides has one end of a retracting-spring, *a'*, attached to it, as seen in Figs. 2 and 3, the other or upper end of the said retracting-spring being fastened to the frame *h*, such spring being so arranged and made to operate as to lift the thread-guide upward when necessary. The upper arm or part of one of the thread-guides is arranged on one side of the curved arc O, while the upper arm or part of the other thread-guide is disposed on the opposite side of the said arc, both thread-guides being connected at their upper ends by helical spring *b'*, which draws said ends toward one another. The lower end of each thread-guide is forked, the prongs or sides *c' d'* of such fork being springs, and made, respectively, to contain two vertical friction-rollers, *e' f'*. (See Figs. 9 and 10, respectively vertical and horizontal sections of the lower end of the thread-guide, and exhibiting the thread-plates *g' h'*, which are fastened to one of the springs, *d'*, and project by the other, *c'*.) Each of the said thread-plates has a hole, *i'*, made through it for the passage of the needle, which passes through the plates and between the vertical friction-rollers. As soon as either needle enters the cloth that thread-guide through which said needle does not pass or extend should have a lateral motion imparted to it far enough to carry it out of the way of the point of the needle. Such lateral motion is given to it by means of one of two cams, *k'* or k^2, arranged upon the side of the arc O, as seen in Figs. 11, 12, and 13, Fig. 11 being a top view of said arc, and Figs. 12 and 13 being, respectively, views of its opposite sides. The lateral movement aforesaid of the thread-guide being completed, the said thread-guide should immediately have a slight downward movement imparted to it, which movement is effected by a cam, *l'* or l^2, arranged upon the arc, as seen in Figs. 11, 12, and 13, the cams *k' k² l' l²* being made to work against suitable shoulders or bearings-faces formed upon the upper arms of the thread-guides.

Fig. 14 represents an under side view of the arc O, while Fig. 15 is a cross-section of it, showing the formation of the upper arms of the thread-guides and their application to the arc O. On each side of the arc there is a small cam, *m'* or *m''*, arranged as seen in Figs. 12, 13, and 14, the lower side of the arc between these two cams being a circular arc, such as will produce no vertical motion of either thread-guide while it is moving in contact with it.

To each cam *m'* or m^2 is applied a continuation, *o' o²*, of the circular arc or portion between the said cams *m'* or m^2, this continuation operating to produce no vertical movement of one thread-guide during such time as the other thread-guide is depressed a short distance by the cam *m'* or m^2, which is immediately annexed to it. We will now suppose one of the thread-guides moved downward into its lowest position, or that in which it should be to allow the passage of its needle through it. As soon as the needle commences to enter the thread-guides the cam *m'* or *m''* connected with the arm of the other thread-guide moves by such arm so as to allow the retractive spring of the thread-guide to which said arm belongs to elevate the thread-guide so as to carry the thread which extends through said thread-guide above the path of the needle, so that when the thread-guide is next moved laterally the needle may pass directly under that part of the thread which is between the thread-guide and the

cloth. Next, such lateral movement of the thread-guide takes place sufficient to carry said portion of the thread laterally across and over the path of the needle. This having been accomplished by the action of one of the cams which produced the lateral movements, as afore described, next the thread-guide is depressed a short distance by one of the cams l' l^2, and so as to fairly lay the thread upon the needle and behind the rear end of the spring f thereof, and so as to cause the thread on the retraction or return movement of the needle to be drawn under the spring and into the eye of the needle and through the cloth by the needle.

By inspection of the drawings, it will be seen that during each back movement of the needle through the cloth the spring of the needle is closed down by one of the mouth-pieces or pressers immediately before the said spring is drawn back through the cloth. The mouth-piece or presser becomes necessary when the needle is formed with a spring; but when said needle is made as represented on an enlarged scale in Figs. 16 and 17, the former being a top view of the needle, and the latter a side view of it, such mouth-piece or presser is not essential to the operation of such needle. The needle, as exhibited in the two last-named figures, is formed with a round or elongated eye extending through it, which eye has a diagonal passage-way made into it, as seen in top view in Fig. 16.

In sewing with this machine we do not make use of a continuous thread unwound from a bobbin, as do those machines which produce a chain-stitch; but we make use of a short piece of thread—such as a person uses when sewing by hand with an ordinary sewing-needle—and on commencing to sew we simply pass one end of the thread between a spring, r', and the arm g, against which said spring bears, and we extend the thread and lay it over the back needle after it has passed through the cloth, and in such manner as to enable the needle to receive the thread into its eye when the needle is drawn back. The said needle during its retraction will draw the thread through the cloth and the back thread-guide and continue to draw upon the thread until that end of the thread which was not held by the spring, as before mentioned, has been drawn entirely through the cloth and the inner thread-guide. The front needle in the meantime has advanced and passed through the outer thread-guide and entirely through the cloth and to the extent of its motion inward. During such advancement a lateral movement of the inner thread-guide toward the right causes the thread to be laid over the said needle. The needles next are moved forward, and during such movement the thread passes into the eye of the outer needle, is drawn through the cloth and the front thread-guide and entirely out of the other needle, which passes through the cloth as before, and under the thread, which, by the lateral movement of the outer thread-guide, has been laid or left over it, ready for the next back movement of the needle.

The circular motion of the cloth-holder is to be regularly intermittent, each movement of it being a sufficient distance to produce the length of each stitch as required to be made in the cloth. In order to produce the stitch and back stitch or forward and back stitch sewing, the two needles must not be arranged in the same vertical plane; but they should be arranged, respectively, in two vertical parallel planes, situated, or supposed to be, at a distance apart from one another equal to the length of a stitch, the outer needle being placed on the right of the other. The cloth-holder is to be moved forward only during each outward movement of the needle-frame, and such motion should take place while the needles are out of the thread-guides or cloth.

The machinery which produces the intermittent circular motion to the metallic hoop or cloth-holder is as follows: The upper surface of the cloth-holder has a series of ratchet-teeth formed entirely around it. One or more pawls or ratchets, s', joined to the lower end of a lever, t', works into said ratchet-teeth. The said lever t' moves upon a fulcrum at w', as seen in Figs. 2 and 3, and is moved in one direction by the action of the cam H, and in an opposite direction by a retractive spring, v'', affixed to it, and to a stationary arm, w', arranged as seen in the drawings.

In the adaptation of my machine to the production of ordinary stitching—that is to say, stitching without a back stitch—the two needles must be arranged in the same plane with each other, while a forward movement of the cloth-holder should take place during each movement of the two needles either outward or inward. The cloth-holder has a series of points projecting from its outer surface and close to its lower edge and at suitable distances apart from one another. The cloth to be sewed is placed upon these points, as represented at A^2 by dotted lines. The friction-rollers of the lower ends of the thread-guide are sprung together by the springs so as to firmly hold the thread when passed between them. Each thread-guide has a stop-screw, x^2 or y^2, applied to it, as seen in Fig. 3, the two stop-screws being screwed, respectively, through projections Z^2 a^3, the whole being arranged in such manner as to enable the screws to serve as rests or stops for their respective thread-guides to bear against under the draft of the connecting-spring at the upper ends of the thread-guides.

Although I have described my invention under certain forms and arrangements of its different parts, as exhibited in the drawings, yet I do not intend to confine it always thereto, as I mean to make use of any others which may be adopted to advantage, while I do not essentially change the principle or character.

I claim as new—

1. The combination of two needles, two thread-guides, and a cloth-holder made to op-

operate together, substantially in the manner and for the purpose as hereinbefore set forth.

2. The improvement of making the needles with springs and applying mouth-pieces or pressers to them, and on each side of the flange of the base-plate, the whole being substantially as above described.

In testimony whereof I have hereto set my signature this 15th day of October, 1850.

FREDERICK R. ROBINSON.

Witnesses:

R. H. EDDY,

FRANCIS GOULD.