

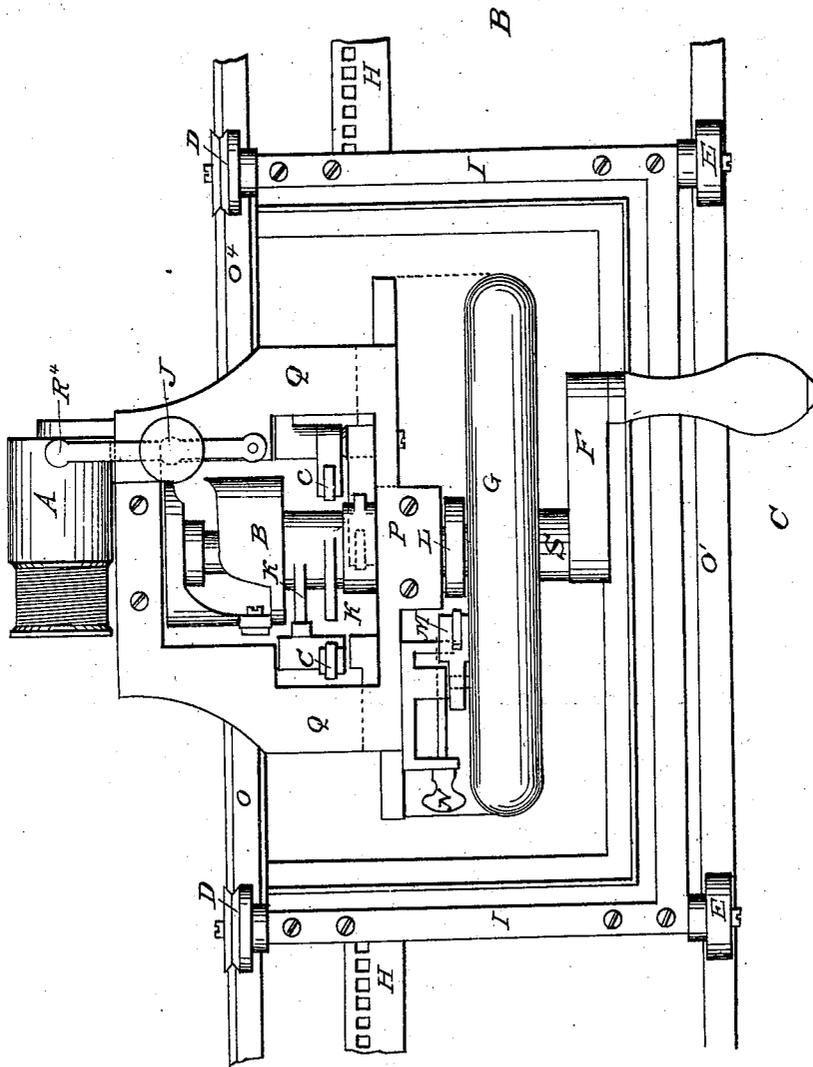
J. A. BRADSHAW.

Sewing Machine.

No. 5,942.

Patented Nov. 28, 1848.

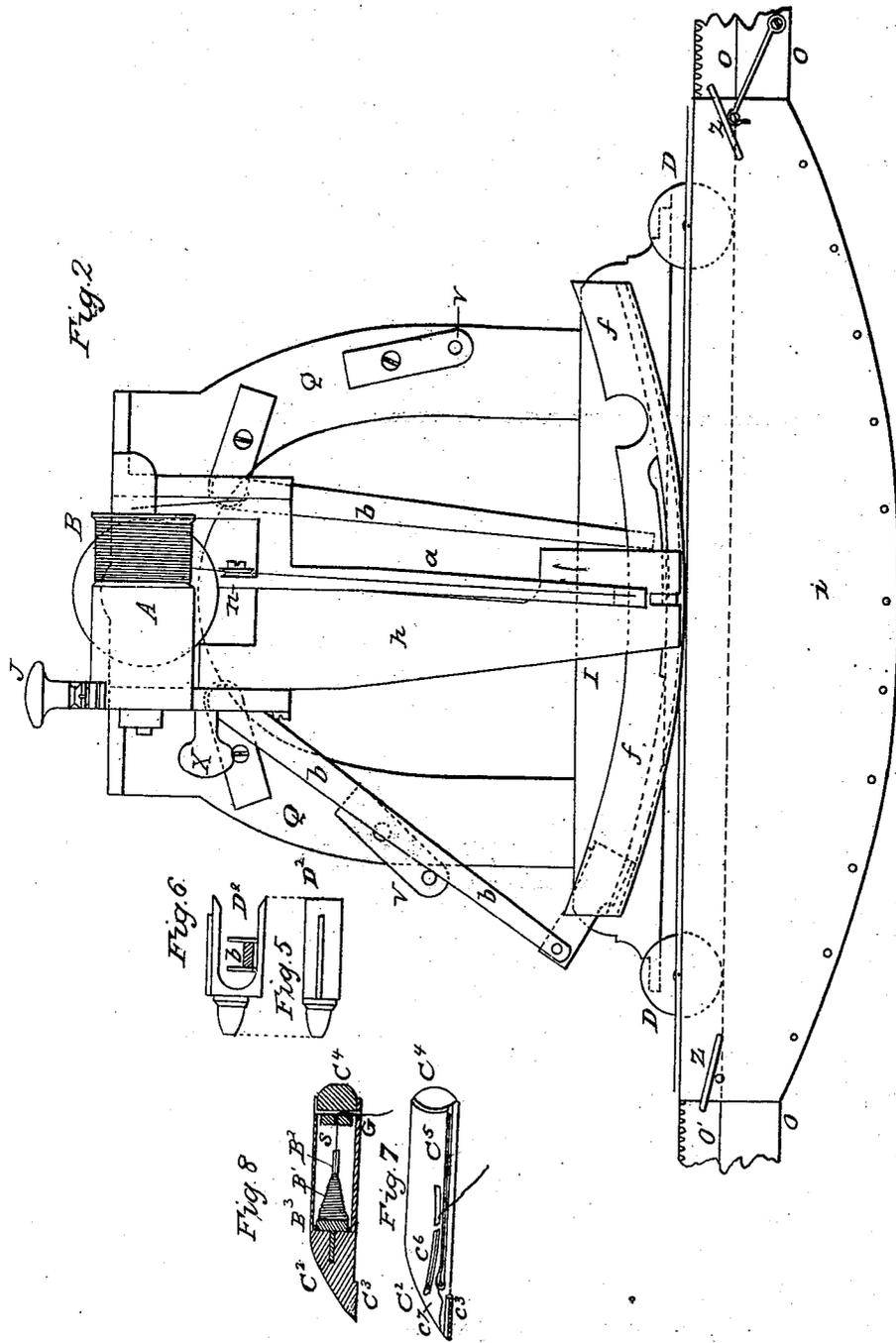
Fig. 1.



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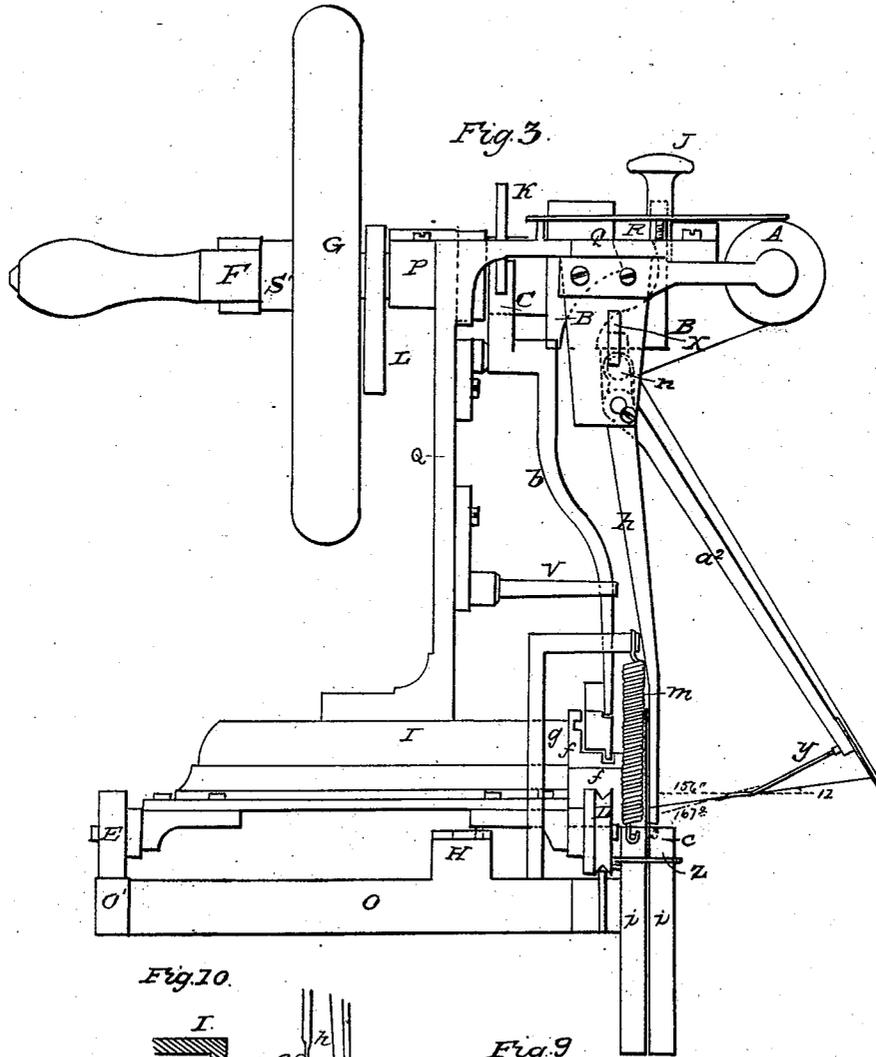


Fig. 10.

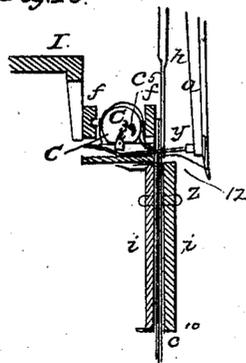
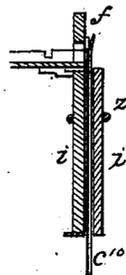


Fig. 9.





# UNITED STATES PATENT OFFICE.

JNO. A. BRADSHAW, OF LOWELL, MASSACHUSETTS.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 5,942, dated November 28, 1848.

### *To all whom it may concern:*

Be it known that I, JOHN A. BRADSHAW, of the town of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in the Machine for Sewing Seams in Cloth and other Substances; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a top or bird's-eye view of the machine. Fig. 2 is an elevation of the front or side A, Fig. 1. Fig. 3 is an elevation of the end B, Fig. 1. Fig. 4 is an elevation of the back or side C, Fig. 1. Fig. 5 is a plan, and Fig. 6 is a section, of the driver. Fig. 7 is a perspective view of the bobbin-case. Fig. 8 is a vertical longitudinal section of the bobbin-case and the helical spring and perforated rubber plate, showing the manner in which the thread is wound upon the bobbin and how it passes through between the perforated rubber and the plug to the outside of the case. Fig. 9 is a section of the clamp for holding the cloth, showing the manner of suspending it to the box. Fig. 10 is a section showing the flying bobbin-case in the act of passing through the loop of the first thread at the moment after the needle has been drawn back slightly to form the loop. Fig. 11 shows the manner of forming the loop of the seam. Fig. 12 represents the needle passed through the cloth with the thread to form a stitch.

Similar letters refer to corresponding parts in the several figures.

In the machine for sewing patented by Elias Howe, Jr., there exist many defects, which render its use difficult and its operation uncertain, which defects it is the object of my invention to remedy. Some of these defects are enumerated and described as follows: The curved needle used in Howe's machine will not by itself form the loop in the thread, which is necessary for the flying bobbin, with its case, to pass through, and has, therefore, to be aided in that operation by a lifting-pin, with the necessary mechanism to operate it. This is a very bungling device, and is a great incumbrance to the action of the machine, being an impediment in the way of introducing the cloth to be sewed, difficult to keep properly adjusted, and very frequently gets entangled

between the thread and the needle, by which the latter is frequently broken. This accident happens very often, notwithstanding all the precaution which it is possible for the most careful operator to exercise; and inasmuch as the delay occasioned thereby is very considerable, and the needles costly and difficult to replace, it is therefore very important that their breaking in this manner be prevented, which in my machine is done in the most effectual manner by dispensing with the lifting-pin altogether, the loop for the flying bobbin to pass through being made with certainty and of the proper form by means of my angular needle moved in a particular manner just before the flying-bobbin case is thrown. The shuttle and its bobbin for giving off the thread in Howe's machine are very defective, as will be quite evident on an examination of them. The bobbin is of a cylindrical form, and the thread is wound evenly upon it. To be again unwound with facility and uniformity the thread should be pulled in the direction of a tangent to the cylinder, which, from the construction of this shuttle and bobbin, it is impossible to do, as the thread passes out through an aperture in the side of the shuttle opposite to the middle of the bobbin. Consequently, when the thread is unwinding from either end of it, the unwinding coil will press obliquely against the adjacent coil toward the aperture, and thereby create a great deal of friction—sometimes sufficient to break the thread, and always enough to draw the stitches much tighter than when the thread is being unwound from the center of the bobbin. This irregularity in the tension of the thread, from the peculiar manner in which the stitches are made by this machine, operates very injuriously upon the quality of the sewing. The badly-contrived shuttle of the Howe machine renders indispensable the use of the clipping-piece, lever, cam, small lever in the sliding box, and spring operating on it. These parts are all dispensed with by the use of my neat and simple bobbin-case, which gives off its thread with certainty and uniformity and keeps it at any required degree of tension, and in traversing the sliding box unerringly forms the loop to make the stitch every time the needle passes through the cloth or other substance being sewed. The baster-plate in the Howe machine is very inconvenient and trou-

blesome to use, because of its extreme limberness, which renders it difficult to keep it from twisting and letting the cloth slip off, and also because of the numerous sharp points which unavoidably pierce and scratch the hands of the operator in the most annoying manner. These difficulties are obviated in my machine by the use of the clamp hereinafter described, which is a very simple and efficient device, possessing all the advantages and liable to none of the objections of the "baster-plate" above mentioned.

Having now enumerated the most prominent defects in the old machine, I will proceed to describe the construction and operation of my improvements to remedy the same, so that others skilled in the art may be enabled to make and use them.

The base or platform *o*, on which the carriage is placed, and to which the clamp *i* is attached; the carriage *I*, with its frame-work to support the operative portion of the machine; the cam-shaft *S'*, with the cams *B* *K* *L*, &c.; the balance-wheel *G*, the picker-staves *b* *b*, and drivers *D*<sup>2</sup>, the needle-arm *a'*, the system of compound straight and bent levers *M*, &c., with the click *T*, ratchet-wheel *R*<sup>2</sup>, cogged pinions *R* *R'*, and rack *H*, by the operation of which the carriage is moved simultaneously with the formation of the seam, are all constructed and operated in a manner substantially the same as the corresponding parts of the Howe machine. A particular description of them is therefore unnecessary, and I shall merely refer to them in describing my improvements:

*o*, Figs. 1, 3, and 4, is the base or platform, having a rack, *H*, running longitudinally along its upper surface parallel to the guides or ways *o'*, on which the carriage moves. *I* is the carriage upon which the standards *Q* *Q* are erected, which support the cam-shaft *S'*, with its cam *B*, which operates the needle-arm *a* and cams *K* *K*, that move the vibrating picker staves or arms *b* *b*, and the cam *L*, which operates the bent lever *M*, and with it the system of compound levers *M'* *M*<sup>2</sup> *M*<sup>3</sup>, connected together by joint-pins, which, by means of a dog, *T*, turn the ratchet-wheel *R*<sup>2</sup> and the cog-wheel *R'*, which is secured to the ratchet-wheel shaft, and which gears into the cog-wheel *R*, which meshes into the rack *H*. These wheels, operated by the aforesaid levers and cam, move the carriage along upon the ways *o'* every time the needle is withdrawn from the cloth a distance equal to the length it is required to make the next stitch. The cloth, being held between the clamp-boards, and these being attached to the way *o'*, which is stationary, remains in the same position, while the machine carrying the needle and thread moves along by the side of the seam as fast as it is formed. The length of the stitch is varied by turning the thumb-screw *N*, which brings the lever *M* more or less within the scope of the action of the cam *L*, which moves it as in the Howe machine.

The needle *y* (which constitutes one of my improvements) is of the form seen at *y*, Figs. 3, 10, and 12, and is attached to the vibrating lever *a*, by which, in the formation of each stitch, it is caused to pierce and protrude through the cloth, carrying with it the bend or loop of the first thread. The needle has two angular bends, as represented. Through the angle nearest the point the eye is made, through which, from the under side, the thread from the bobbin *A* is passed, as represented by the line 12, and from thence to the cloth. The needle is made of this shape in order that while it is passing through the cloth a loop or space for the bobbin-case to pass through may be formed between the thread, which passes in a straight line from the eye back to the cloth *c*<sup>2</sup>, where the stitch is being formed, as represented in Fig. 12, the thread forming the long side or hypotenuse of an obtuse-angled triangle when extended or stretched by the entrance of the needle the full extent that it is designed to enter, said portion of the thread being made to bow upward and form a loop for the passage of the bobbin-case through the same by the sudden withdrawal of the needle a short distance, said loop being directly in the path of the bobbin-case, as seen in Fig. 10, the beak or pointed end of which entering said loop without obstruction and passing between the needle and the thread, drawing out the slack of the latter to form the loop large enough for the bobbin-case to pass through with facility, which gives out the second thread that is to be drawn into the cloth by the said loop of the first thread on the withdrawal of the needle from the cloth, as seen in Fig. 10. Every time the needle pierces the cloth the vibrating clamp *h* is made to press the cloth firmly against the side of the curved trough or segment-box until after the needle is again withdrawn. This prevents any movement of the cloth during the formation of the stitch. The portion of the needle from the arm *a* to the first angle is made straight. From thence it is bent upward, forming an angle of about one hundred and fifty-four degrees with the first-named portion. It is then bent downward at the point, forming an angle of about one hundred and sixty-seven degrees with the middle or last-named portion. This shape of needle, when operated in the manner above described, will form the loop in the transverse thread without the use of the lifting pin heretofore used in the Howe machine.

The case *c*<sup>2</sup>, Figs. 7 and 8, of the flying bobbin is made of some kind of suitable metal and of convenient dimensions. The exterior form of the body of the case is that of a segment of a cylinder larger than a half-cylinder, while its interior is cylindrical. Its beak or front end is semi-conical in shape and solid, having a tongue, *c*<sup>3</sup>, formed on its under side corresponding to the groove in the bottom of the guide-trough or segment-box *f*, in which it runs. The back end of the case is closed up by a solid metallic plug, *c*<sup>4</sup>, screwed therein.

Within the case is placed a bobbin, B', to hold the second thread with which the seam is made. Upon the spindle B<sup>2</sup> of the bobbin is secured a collar, B<sup>3</sup>, near its large end, which collar corresponds in diameter with the interior of the case. The large end of the spindle which projects beyond the collar of the bobbin fits into a hole made in the front end of the case. The thread is wound upon the spindle of the bobbin in the form of a cone, as represented in Fig. 8, the apex of which is placed toward the rear end of the case, so that it may be easily unwound by being drawn in a line with the spindle. Over the spindle, and fitting into a groove formed upon the collar thereof, is placed a helical spring, s, Fig. 8, which fills the interior of the case C<sup>2</sup> from the collar B<sup>3</sup> to the plug C<sup>4</sup> in the rear. Into the rear end of this helix a round collar, G', is inserted, perforated in the center with a small hole for the thread or silk to pass, the diameter of the larger portion of the collar corresponding with the diameter of the inside of the case. The thread from the bobbin passes through the hole in the center of the collar and out between the collar and plug through an aperture in the side of the case to the exterior thereof. The collar being pressed upon by the spring acts as a friction-rubber to prevent the thread from being drawn from the bobbin without being subjected to a sufficient degree of tension. The pressure of the rubber may be increased by screwing in the plug, which presses the collar harder against the spring, and in this manner the thread may be drawn with any degree of tension that it will bear. On the exterior surface of the case are two longitudinal grooves or channels, C<sup>5</sup> C<sup>6</sup>, connected by a transverse tunnel or tube at C<sup>7</sup>, through which the thread is caused to pass. These passages for the thread to pass through are to aid the spring and friction-rubber in giving it the required tension, and also for the purpose of diminishing its tendency to kink. The stitches are formed, as in the Howe machine, by the thread from the bobbin-case c<sup>2</sup> being looped round the thread of the needle and drawn together with a tension corresponding to the force with which the friction-rubbers act upon the thread. The manner in which the threads are looped together in the seam will appear more plainly by reference being had to Fig. 11, in which the dotted line represents the loops made by the first thread and the black those made by the second.

The clamp for holding the cloth is composed of two boards or plates, *i i*, lined on their sides next the article being held with cloth or other suitable substance, and provided with dowelpins to keep them in their proper relative position. The cloth or other article to be sewed is placed between the said clamp-boards, which are held together firmly by the springs Z, which may be of the form represented in the drawings, Fig. 2, or of any form more suitable. This clamp is suspended to the under side of the segment-box or guide-trough by

means of a flange or lip fastened to the upper edge of the inner clamp-board, which plate is hooked upon a pin inserted into the box or trough, and is prevented from moving longitudinally by a hook, which is attached by one of its ends to the way or track o', having the other end inserted into an aperture in the clamp-board. The ends of the clamp are at liberty to move vertically for the purpose of sewing angular and curved seams. The end of the clamp may be suspended to a fixed post or bar by a spring, such as that represented at *m*, Fig. 3, or by any suitable means. One edge of the aforesaid clamp is made straight for sewing straight seams. The other edge is made curved for sewing curved seams. The curved edge is provided with a flange attached to the inner half of the clamp in the same manner as described above for the straight edge. When this edge is used, the position of the clamp will be inverted. The importance of this clamp will be apparent when it is considered with what regularity and certainty seams may be sewed when the pieces of cloth are once clamped, how easily they can be raised and lowered at either end, turned and adjusted to the needle without any danger of separating the edges of the cloth in sewing various descriptions of curved seams, and with what facility pieces of cloth can be clamped without the use of basting-thread or basting pins or plates, in addition to the advantages heretofore enumerated. The flexible baster-plate will not answer the desired end. It not only allows portions of the cloth to slip from some of the pins, but that which is sustained on the remaining pins will hang down between the pins and make the seam crooked; and the pins will pierce holes in the cloth, which will injure it materially; and when satin and silk vests are being sewed, these holes are very objectionable. The Howe machine is stationary, and the baster-plate or cloth-holder progressive. The Bradshaw machine is progressive and the cloth-holder stationary.

Having thus fully described the manner in which I construct my machine for sewing seams and shown the operation thereof, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the rubber or friction plate, helical spring, and bobbin with the case, as described, for producing the required degree of tension in the thread while being unwound from the bobbin, substantially as set forth, whether the several parts be combined and arranged in the manner described, or other mode substantially the same, by which similar results are produced.

2. The peculiar construction of the flying-bobbin case carrying the second thread, as above described.

JOHN A. BRADSHAW.

Witnesses:

WILLIAM A. RICHARDSON,  
I. P. MARTIN.