No. 896,137. PATENTED AUG. 18, 1908.

D. MILLS.

THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED MAR. 17, 1898.

2 SHEETS—SHEET 1.

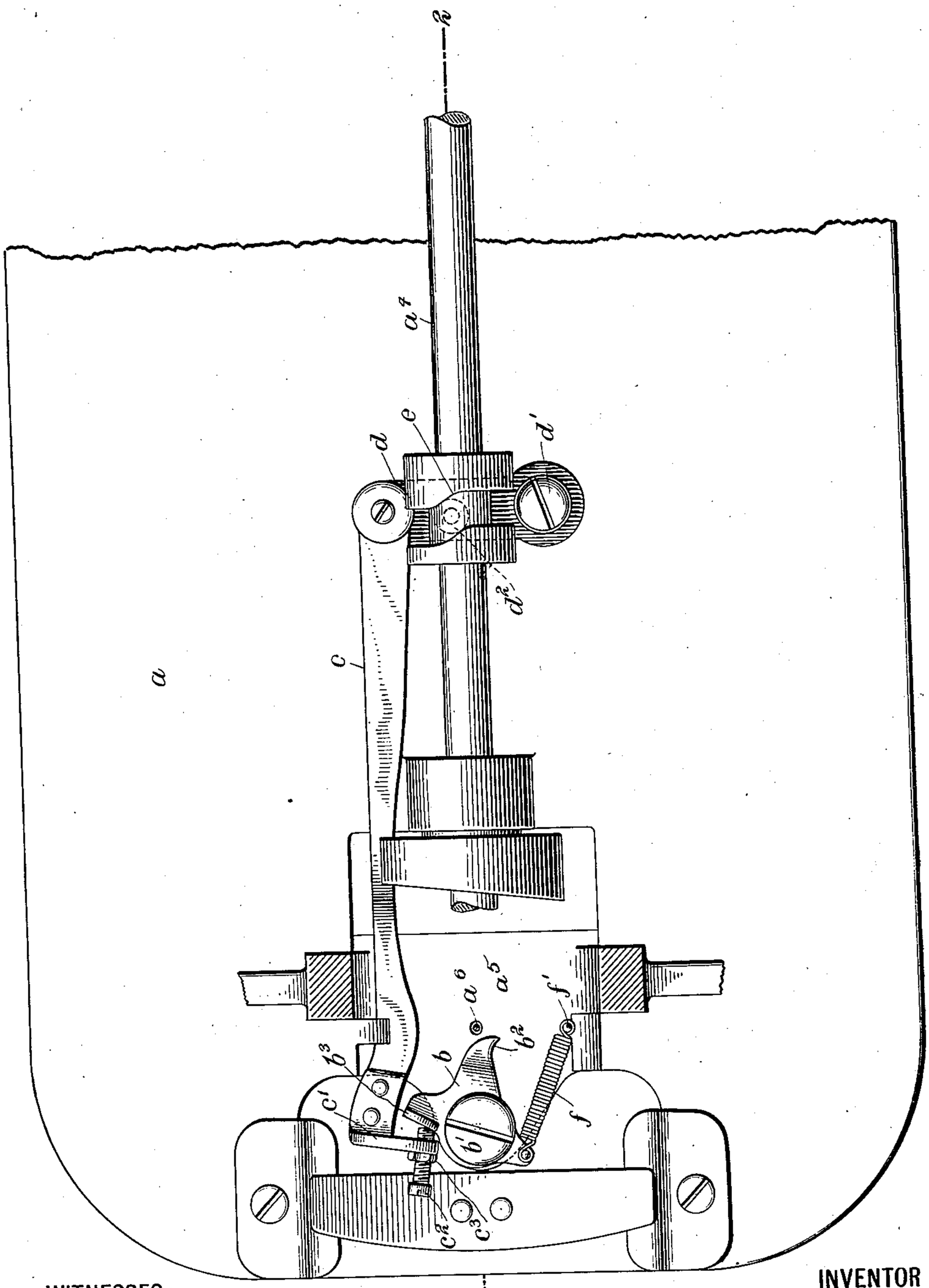

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

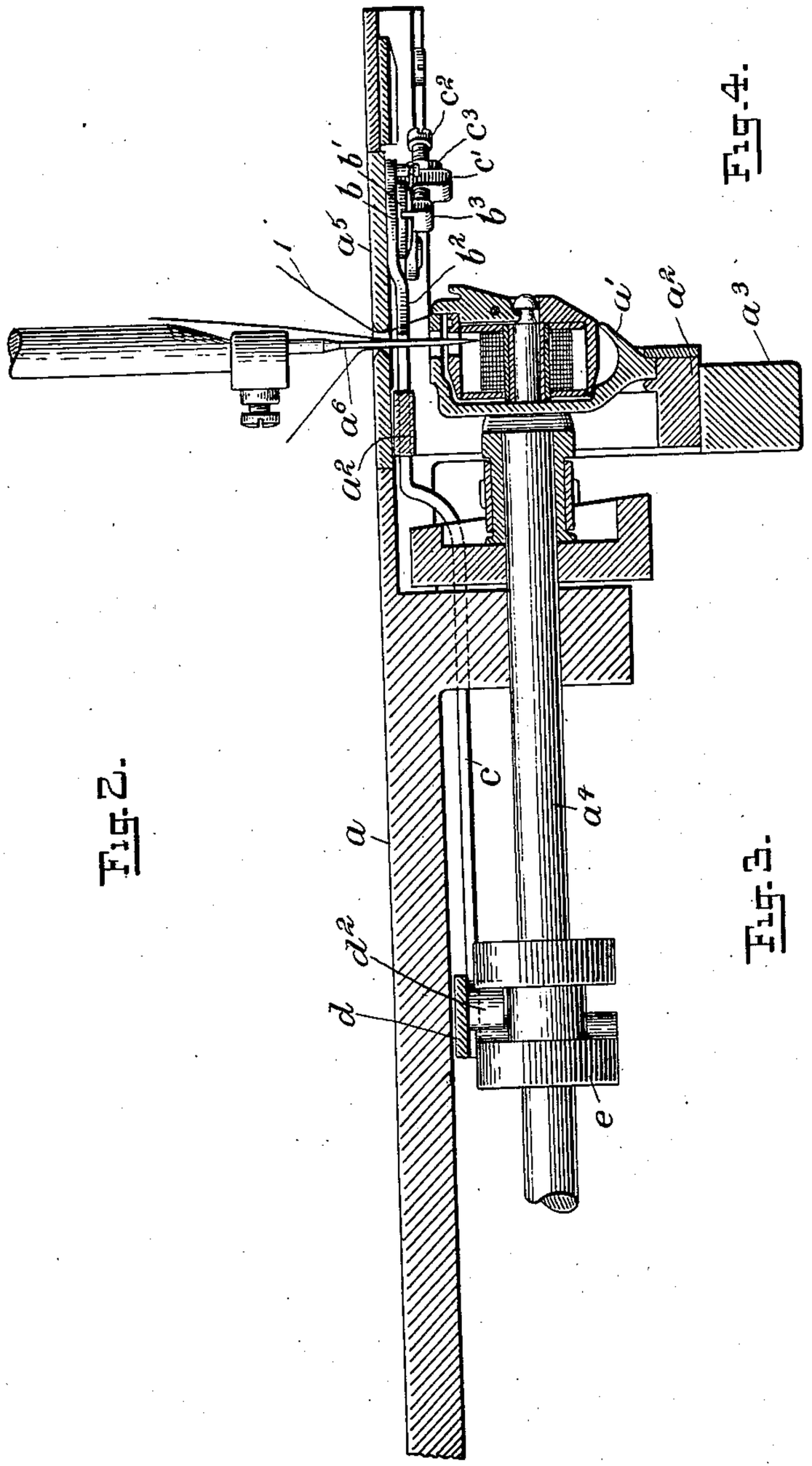

Fig. 2.

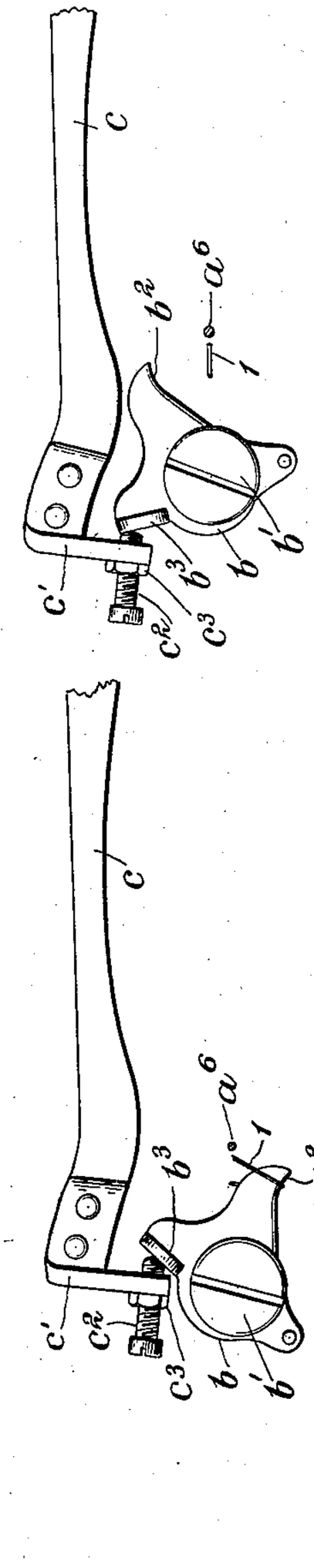

Fig. 3.

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THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

No. 896,137. Specification of Letters Patent. Patented Aug. 18, 1908.

Application filed March 17, 1898. Serial No. 674,155.

To all whom it may concern:

Be it known that I, DANIEL MILLS, a citizen of the United States, and a resident of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Thread-Controlling Mechanism for Sewing-Machines, of which the following description, taken in connection with the drawings herewith accompanying, is a specification.

This invention relates to that class of sewing machines employing a shuttle or looper for carrying the needle thread loop around a bobbin to interlock with the under or bobbin thread and form a lock-stitch. It is desirable in this class of machines that some means be provided for pulling off a sufficient amount of thread from the bobbin as may be required for each stitch, and present the same in a slack condition to the needle thread loop whereby it may be taken up by the latter without undue strain thereon in completing the stitch. Having this in mind, it has been the object of my present invention to provide a simple means for pulling the thread from the bobbin, that may be adjusted to pull off any desired length of thread according to the character of the work or thickness of the material being operated upon, and which will also operate without possibility of interfering with the needle or needle thread. This object I secure by means of the construction and arrangement of parts embodying my invention as hereinafter set forth in detail and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a bottom view of the bed-plate of a sewing machine embodying my invention, with the shuttle, shuttle-race frame, and their supporting hanger removed. Fig. 2 is a vertical section of a portion of the machine, taken through line 2—2 of Fig. 1, with the shuttle and its race frame in position, showing the relative positions of the parts during the formation of a stitch with the needle at its lowest point and the pull-off engaging the bobbin thread. Figs. 3 and 4 are detail views to be hereinafter referred to.

To explain in detail: a represents a portion of the bed-plate of a sewing machine, a' a rotating shuttle supported within a raceway casement a^2 which is located within a hanger a^3 on the under side of the bed-plate, and a^4 a driving shaft arranged beneath the bed-plate for operating the shuttle a'. The above parts are of the usual construction and arrangement as found in the "Standard" sewing machine, to which, as herein shown, I have applied my invention.

According to my present invention, a bobbin-thread pull-off in the form of an elbow lever b is pivotally secured to the under side of the needle plate a^5, by means of a pin or screw b', in a position so that the end b^2 of one of its arms will move in a path at one side of the vertical path of the needle a^6 and engage with the bobbin thread l, when being operated as will hereinafter be described. In the machine illustrated, the front edge of the shuttle projects forward of the path of the needle so that the bobbin thread in passing over the said front edge of the shuttle between the bobbin and the needle opening in the needle plate a^5, is held well forward or at one side of the path of the needle, as clearly shown in Fig. 1, to permit the said pull-off b to readily engage therewith without the necessity of crossing the path of the needle or otherwise interfering with the latter or the needle thread.

The pull-off b is adapted to be operated to alternately engage with the bobbin thread and draw a certain regulated amount of the same from the bobbin, and then release such thread to leave the same in a slack condition to be taken up by the upper thread, by any suitable actuating means, the means as herein shown being as follows: A rod or bar c, supported to have a longitudinally reciprocating movement on the under side of the bed-plate of the machine, is arranged with one end extending in a position for engaging with the pull-off b, and at its opposite or rear end has a hinged connection with a pivoted lever d, which latter is arranged at substantially right angles to the driving shaft a^4 and is pivotally secured at one end to the under side of the bed-plate by a pin or screw d'. This lever d is provided with a stud or pin

having an anti-friction roll d^2 thereon, which roll is engaged by a grooved cam *e* upon the rotating shaft a^4, from which the lever *d* is caused to receive a vibrating movement and thereby give the connected rod *c* a longitudinally reciprocating movement. The rod *c*, which rests upon the upper surface of the shuttle race-way casement a^2 to be supported and guided thereon, is provided with a downwardly turned portion *c'* at its front end having an adjusting screw c^2 supported thereby for engaging with the pull-off *b*, which latter is also provided with a downwardly turned flange b^3 to form an enlarged bearing surface to receive the engagement of the said screw c^2. When the rod *c* is moved in one direction, it acts upon the pull-off *b* to cause its thread engaging end or arm b^2 to engage with the bobbin thread and draw a certain amount of the same from the bobbin, and as said rod is moved back or in the opposite direction, the pull-off *b* is also returned to its normal starting position to disengage with the bobbin thread, under the action of a spring *f* which is connected at one end with a fixed pin *f'* on the needle plate and at its opposite end with the said pull-off *b*. This spring holds the lever *b* in contact with the rod *c* so that said pull-off will be caused to follow the latter on its return movement after having operated the pull-off.

The operation of the pull-off *b* relative to the other co-acting parts of the stitching mechanism, is as follows: At the beginning of the descent of the needle, the thread engaging arm b^2 of the pull-off *b* is in a position back from the path of the needle as shown in Fig. 4, but as the needle descends, the said pull-off arm b^2 is moved forward to engage with the bobbin thread *l*, its movement being so timed by the cam *e* that it will have moved forward of the path of the needle, as shown in Fig. 1, before the needle reaches the plane of the same, thus preventing possibility of contact between such parts in case the end of the pull-off should move across the path of the needle. After the pull-off arm b^2 has been moved forward to its limit to draw the desired amount of thread from the bobbin, as shown in Fig. 4, it remains stationary until the needle has raised above the needle plate and the shuttle is about to cast off the needle thread loop, at which time it is moved back to its normal starting position to leave the bobbin thread in a slack condition to be drawn up into or through the work by the upper thread without undue strain on the latter.

The movement of the pull-off *b* may be regulated to draw off more or less thread from the bobbin according to the thickness of the material being operated upon or the character of the work being performed, by turning the adjusting screw c^2 in the proper direction so that its lever engaging end will project more or less beyond its support *c'* and thereby regulate the distance of the movement or throw of the pull-off arm b^2, which movement, being greater or less, will regulate the amount of thread drawn from the bobbin as will be obvious. After the screw c^2 has been properly adjusted it is locked from undue movement by means of a jam nut c^3.

Having thus set forth my invention, what I claim as new and desire to secure by Letters Patent, is—

1. In a sewing machine, the combination, with a reciprocating needle, a bobbin, and a looper, of a bobbin-thread pull-off operative in a path at one side the path of movement of the needle, means for actuating said pull-off, and an adjustable contact device between the pull-off and its said actuating means for regulating the movement of the pull-off.

2. In a sewing machine, the combination, with a reciprocating needle, a bobbin, and a looper, of a bobbin-thread pull-off operative in a path at one side the path of movement of the needle, means for actuating said pull-off, and an adjustable device carried by said actuating means for contact with the pull-off.

3. In a sewing machine, the combination, with a reciprocating needle, a bobbin, and a looper, of a bobbin-thread pull-off operative in a path at one side the path of movement of the needle, means for yieldingly holding said pull-off in a normal stationary or inoperative position, means for actuating said pull-off, and an adjustable contact device between the pull-off and its said actuating means for regulating the movement of the pull-off.

4. In a sewing machine, the combination, with a reciprocating needle, a bobbin, and a looper, of a bobbin-thread pull-off operative in a path at one side the path of movement of the needle, means for yieldingly holding said pull-off in a normal stationary or inoperative position, means for actuating said pull-off, and an adjustable device carried by said actuating means for contact with the pull-off.

5. In a sewing machine, the combination, with a reciprocating needle, a bobbin, and a looper, of a pivoted bobbin-thread pull-off confined to movement in a path at one side of the path of movement of the needle, a reciprocating rod for engaging with said pull-off to move the same positively in one direction, means for moving said pull-off in the opposite or return direction, an adjustable contact device between said rod and pull-off, and means for regulating the movement of the latter.

6. In a sewing machine, the combination

with a reciprocating needle, a bobbin, and a looper, of a bobbin-thread pull-off in the form of a pivoted elbow-lever confined to movement in a path at one side of the path of movement of the needle for engaging the bobbin-thread, a reciprocating rod carrying an adjusting screw for engaging with said pull-off lever to move the same positively in one direction and a spring for moving said pull-off in the opposite or return direction.

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Witnesses:
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