

No. 748,914.

PATENTED JAN. 5, 1904.

S. B. BATTEY.
THREADING DEVICE FOR SEWING MACHINES.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig 1

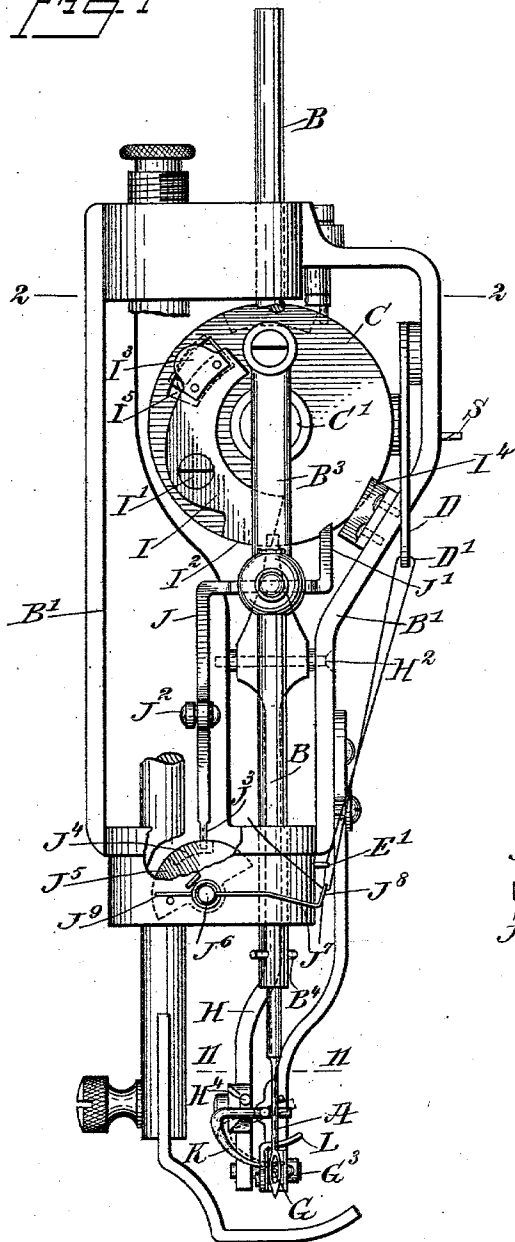


Fig 2

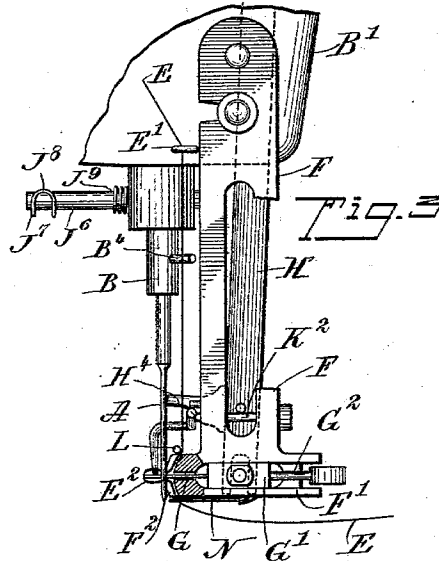
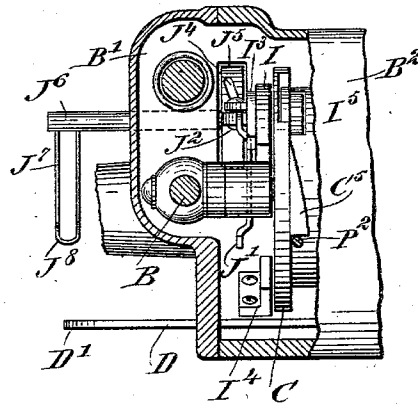
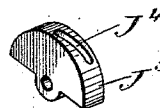


Fig 4



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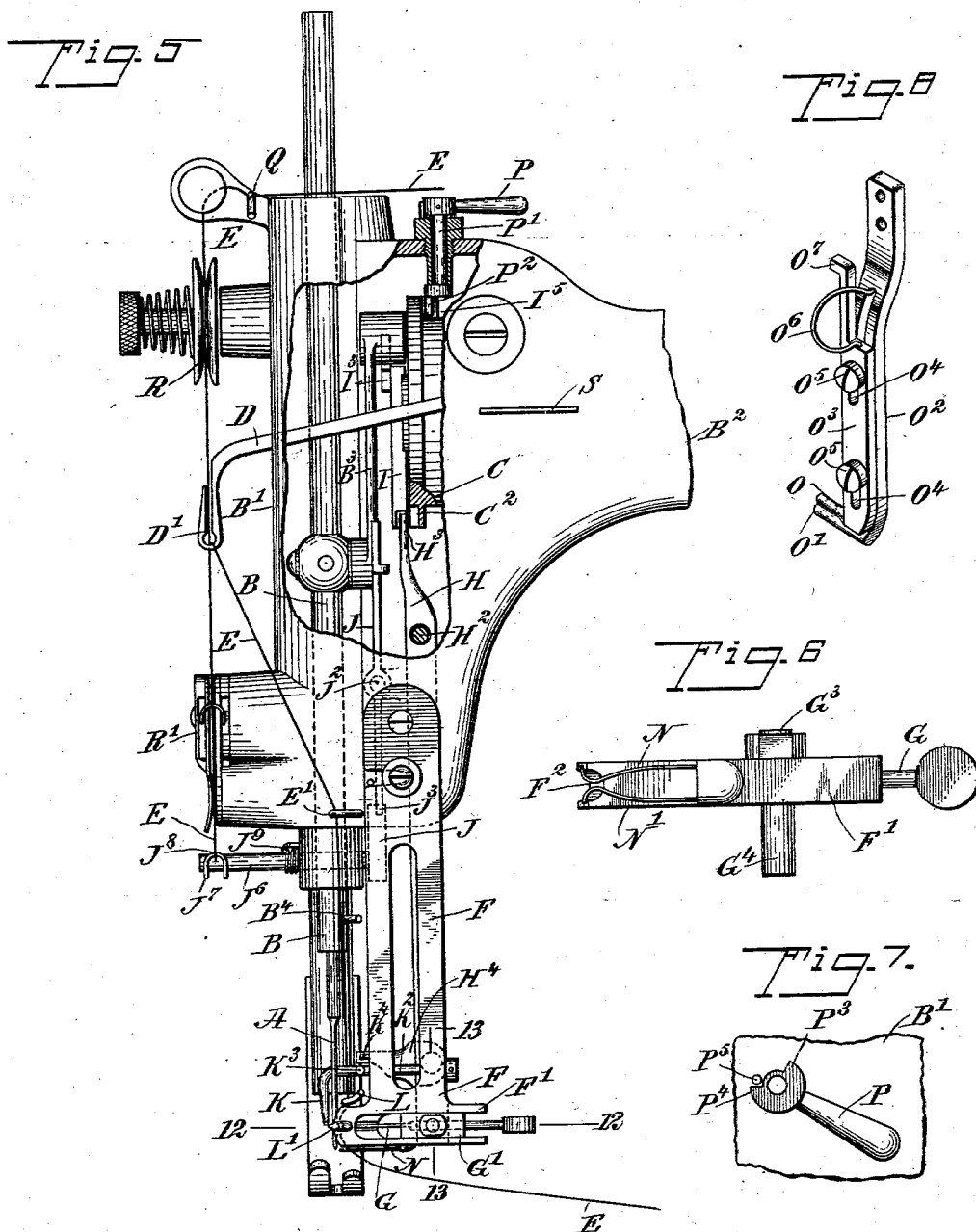
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ATTORNEYS.

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NO MODEL.

3 SHEETS--SHEET 2.



WITNESSES:

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No. 748,914.

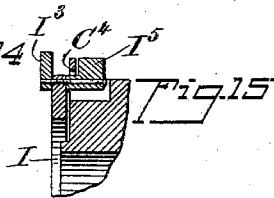
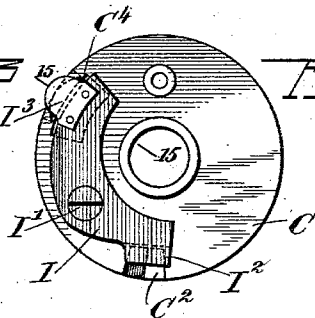
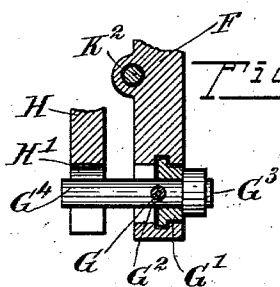
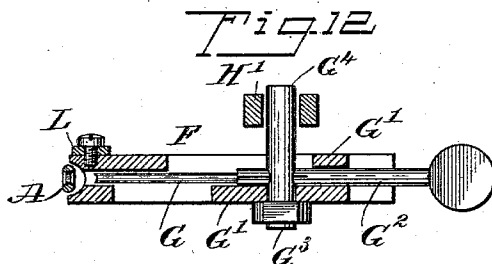
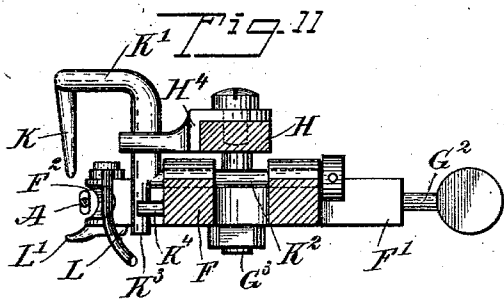
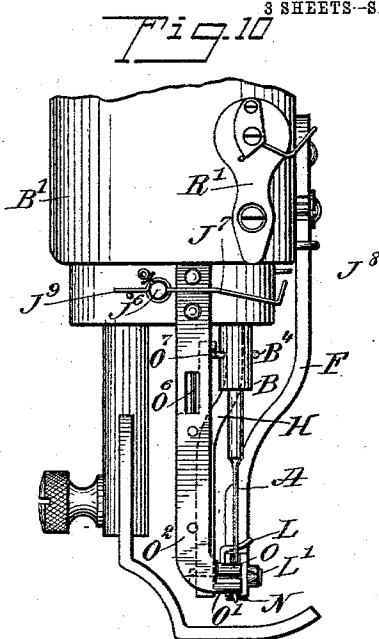
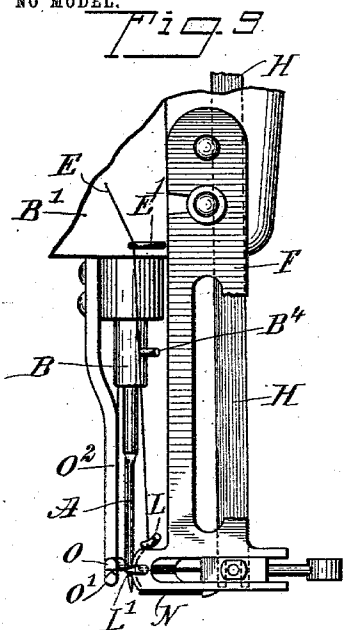
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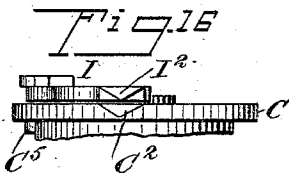
NO MODEL.

3 SHEETS--SHEET 3.



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UNITED STATES PATENT OFFICE.

SUMTER B. BATTEY, OF NEW YORK, N. Y.

THREADING DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 748,914, dated January 5, 1904.

Application filed June 1, 1903. Serial No. 159,481. (No model.)

To all whom it may concern:

Be it known that I, SUMTER BEAUREGARD BATTEY, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Threading Device for Sewing-Machines, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved threading device for sewing-machines arranged to automatically thread the needle in case the thread breaks, hence requiring no stopping of the sewing-machine by the operator for threading purposes.

A further object of the invention is to allow the operator to throw the threading device into action at any time in case the automatic thread-controlled device should fail.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an end elevation of the improvement as applied, the cover of the head of the sewing-machine arm being removed and parts being broken out. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1.

Fig. 3 is a front elevation of the improvement as applied, parts being in section and the plunger being in position after having pushed the thread through the needle-eye.

Fig. 4 is a perspective view of the cam for the controlling device of the thread. Fig. 5 is a front elevation of the improvement as applied, parts being broken out. Fig. 6 is an enlarged under side view of the improvement, showing more particularly the thread-clamping jaws on the under side of the guideway.

Fig. 7 is a plan view of the lever for throwing the device into or out of action in case the automatic device is out of order. Fig. 8 is a perspective view of the thread retainer or catcher for high-speed sewing-machines.

Fig. 9 is a front view of the improvement as applied, parts being broken out. Fig. 10 is an

end elevation of the same. Fig. 11 is an enlarged sectional plan view of the improvement on the line 11 11 of Fig. 1. Fig. 12 is a like view of the same on the line 12 12 of Fig. 5. Fig. 13 is an enlarged transverse section of the same on the line 13 13 of Fig. 5. Fig. 14 is a face view of the crank, showing the cam device for actuating the lever connected with the plunger-carrying cross-head. Fig. 15 is a sectional side elevation of the same on the line 15 15 of Fig. 14, and Fig. 16 is an inverted plan view of the same.

The sewing-needle A of the sewing-machine of any approved construction is secured in a needle-bar B, mounted to slide vertically in the head B' of a sewing-machine arm B², and the said needle-bar B is pivotally connected by a pitman B³ with a crank C, secured to a shaft C', extending through the sewing-machine arm and driven in the usual manner. The crank C is preferably in the form of a disk and is provided at its hub with a peripheral cam-groove for engaging a friction-roller on a thread-arm D, having on its free end an eye D' for the passage of a thread E, extending from the said eye D' down through a fixed eye E' on the front of the head B' to the eye of the needle A.

The features so far described belong to an ordinary sewing-machine on which the improvement is applied.

On one side of the needle A is arranged an arm or support F, depending from and screwed or otherwise fastened to the front of the head B', and on the said support F is arranged a longitudinal guideway F' for a cross-head G' to slide in, the said cross-head carrying a split shank G², in which is clamped a plunger or pin G for pushing the thread E through the eye of the needle at the time the needle-bar moves into its uppermost position. This plunger G, its shank G², and the cross-head G' are positively reciprocated from the crank C of the sewing-machine, and for this purpose the following device is provided:

Through an eyebolt G³, held transversely in the cross-head G', extends the split shank G² for clamping the plunger G in position in the shank and for holding the latter in place in the cross-head G', and this bolt G³ is provided at its rear end with an extension-pin G⁴, (see Figs. 12 and 13,) engaged by a fork H' on

the lower end of a lever H, fulcrumed at H² on the head B' and having its upper pin-like end H³ standing in close proximity to the face of the crank C to be engaged by a cam device on the said crank for imparting a quick swinging motion to the lever H, which then by the pin G⁴ imparts a quick reciprocating motion to the cross-head G' and the plunger G to push the latter through the needle-eye and to return the plunger to a non-active position, the entire movement taking place while the needle-bar is nearing the end of its upward stroke, and before it begins its return or downward stroke.

The cam device on the crank-disk C consists of a V-shaped groove C² (see Figs. 14 and 16) and a lever-cam I, fulcrumed at I' on the face of the crank C and having one end provided with a V-shaped offset I², adapted to pass in front of the groove C² to engage the pin-like end H³ of the lever H, whereby the V-shaped offset of the lever-cam I and the walls of the groove C² impart a quick swinging motion to the lever H for the purpose above mentioned, and at the same time the wrist-pin of the crank C moves into an uppermost position. (See Fig. 1.) The other end of the lever-cam I is provided with a projection I³, adapted to be engaged by the end J' of a lever J, fulcrumed at J² on the head B' and having its lower end J³ engaging an oblique cam-groove J⁴ in a cam J⁵, secured on a shaft J⁶, mounted to turn in suitable bearings on the lower end of the head B', as plainly shown in Figs. 1 and 5. An arm J⁷ is secured on the shaft J⁶ and is provided with an eye J⁸ for the passage of the thread E up to the eye D' of the thread-arm D, so that the thread exerts an upward pressure against the eye J⁸ to hold the cam J⁵ normally in the position shown in Fig. 1. A light spring J⁹ presses the shaft J⁶ to impart a turning motion to the latter and the cam J⁵, as soon as the pressure of the thread on the eye J⁸ relaxes—for instance, on the breaking of the thread—so that the cam J⁵ is caused to swing to impart a swinging motion to the lever J and bring the end J' thereof into the path of the projection I³ to give a swinging motion to the lever-cam I for the offset I² to swing opposite the groove C² and into the path of the pin-like end H³ of the lever H. Thus when a thread breaks the mechanism just described causes a reciprocating of the plunger G for the latter to push the thread E through the needle-eye as soon as the needle-bar moves into an uppermost position. As soon as the thread is again engaged with the needle-eye and the sewing proceeds in the usual manner then the thread again exerts an upward pull on the eye J⁸, so that the shaft J⁶ and the cam J⁵ are turned back to the normal position (shown in Fig. 1) against the tension of the spring J⁹, whereby the lever J is returned to an inactive position—that is, its end J' is moved out of the path of the projection I³ on the lever-cam I. As soon as the

V-shaped offset I² is actuated in conjunction with the groove C² to impart a swinging motion to the lever H then this end of the lever-cam I moves in engagement with a fixed cam I⁴ on the head B' to impart a return swinging motion to the lever-cam I, (see Fig. 14,) thereby moving the offset I² out of engagement with the pin-like end H³ of the lever H.

From the foregoing it will be seen that the needle-threading device is automatically actuated whenever the thread breaks, and the needle is rethreaded without requiring the operator to stop the machine for threading purposes. It will also be seen that the needle-threading device is inactive as long as the thread remains in an unbroken condition; but as soon as the thread breaks the plunger G is reciprocated to push the thread through the needle-eye, and the plunger is actuated by a mechanism actuated from a movable part of the sewing-machine as soon as the said mechanism is thrown in gear by the thread-controlled device.

When the plunger G pushes the thread E through the eye of the needle, (see Fig. 3,) then the thread forms a loop E², and this loop is now engaged by a thread retainer or catcher to prevent the thread from returning with the plunger G on the latter's return stroke and to allow the needle to carry the thread down into the work of forming the stitch.

The thread retainer or catcher for ordinary machines is preferably in the form of a horn K, mounted to swing transversely and adapted to pass with its free end into the loop E² as soon as the latter is formed. The horn K operates in unison with the plunger G and needle-bar B, and for this purpose the horn K is secured by its L-shaped shank K' to a shaft K², extending longitudinally and journaled in suitable bearings in the support F, and the said shank K' is adapted to be engaged by a cam-arm H⁴, secured on the lever H, so that when the latter receives a swinging motion from the right to the left the cam-arm H⁴ engages the shank K', and thus imparts a swinging motion to the horn K for the latter to pass into the loop E² as soon as the latter is formed. The loop E² is held in the horn K until the needle B moves into a lowermost position, and at this time a pin or projection B⁴ on the needle-bar engages the forward end K³ of the shank K' (see Fig. 11) to impart a return swinging motion to the horn K back to its former position. The downward swinging motion of the horn K is limited by a pin K⁴, held on the support F and extending into the path of the end K³ of the shank K', as indicated in Fig. 11.

In order to enable the operator to bring the thread into proper position for the end of the plunger G to engage the thread and push it through the needle-eye, a groove F² is provided on the front end of the guideway F', and this groove is preferably curved, as indicated in Fig. 3, and across the groove F² on the top extends a guide-arm L, and on the

front of the guideway, below the guide-arm L, is arranged a fixed horn L' (see Fig. 11) to permit the operator to quickly pass the thread under the guide-arm L and over the horn L', which directs the thread into the groove F², and consequently into the path of the plunger G, preferably slightly recessed at its forward end (see Fig. 12) to properly fit the thread.

In order to hold the thread stretched vertically in the groove F², a holding device is arranged on the bottom of the guideway F', and this holding device is preferably in the shape of spring clamping-arms N and N', (see Fig. 2,) secured to the under side of the guideway F' and extending with the free ends under the groove F², and the terminals of the said arms are curved outwardly in opposite directions to allow a ready entrance of the thread between the arms.

For very fast running machines the thread retainer or catcher is preferably in the form shown in Figs. 8, 9, and 10—that is, two clamping-jaws O O' are provided, located one on top of the other, of which the lowermost arm, O', projects from the lower end of a bracket O², bolted or otherwise fastened to the head B'. The other jaw, O, is held on an arm O³, having elongated slots O⁴ for the passage of bolts O⁵, screwing in the bracket O² and forming a vertical guide for the arm O³, and the upper end thereof is pressed on by a spring O⁶ to normally hold the jaw O in contact with the jaw O', and the upper end of the arm O³ is provided with an offset or lug O⁷, adapted to be engaged by the rear end of the pin B⁴, previously mentioned and secured on the needle-bar B. Now when the needle-bar rises the pin B⁴ engages the lug O⁷, so as to lift the jaw O to allow the loop E² and the free end of the plunger G to pass between the now separated jaws O and O', and as soon as the plunger starts on the return stroke and the needle-bar B descends then the arm O³ is forced downward by its spring O⁶ for the jaws O and O' to clamp the loop between them, thus holding the loop in position to allow the needle to carry the thread to the work for forming the stitch in the usual manner.

In case the automatic thread-controlled device above described should get out of order from any cause whatever, then the operator can readily actuate the lever-cam I by turning a handle P on a vertical shaft P', journaled in suitable bearings on the top of the arm B², the said shaft carrying at its lower end an eccentric-pin P², (see Fig. 5,) adapted to move into the path of a projection I⁵, extending from the lever-cam I through an opening C⁴ in the crank C to the rear thereof. (See Fig. 15.) The handle P is provided with shoulders P³ P⁴ (see Fig. 7) for abutting on a fixed pin P⁵ on the top of the head B', so as to limit the swinging motion of the said lever, it being understood that when the shoulder P³ is in engagement with the pin P⁵ then the eccentric-pin P² is out of

the path of the projection I⁵; but when the lever P is thrown forward to swing the shoulder P⁴ against the stop-pin P⁵ then the eccentric-pin P² moves into the path of the projection I⁵, so that when this projection I⁵ comes in contact with the pin P² a swinging motion is given to the lever-cam I to move the V-shaped offset I² over the groove C² and into the path of the upper end H³ of the lever H to give the latter a swinging motion for reciprocating the plunger G, as previously explained. As soon as the projection I⁵ has left the eccentric-pin P² then the latter is engaged by a cam-face C⁵ on the crank C to impart a turning motion to the shaft P' to swing the handle P back to its former position—that is, to swing the shoulder P³ again against the stop-pin P⁵, so that the eccentric-pin P² is automatically moved out of the path of the projection I⁵, and consequently at the next revolution the threading device is out of action, as the lever-cam I is returned to its normally inactive position by the cam I⁴.

It is understood that the thread E unwinds in the usual manner from a spool and then passes through an eye Q on the upper end of the head B' to then engage the usual tension device R, and from there pass through the eye J⁸ and up through the eye D', then through the eye E' to the guideway F², to be there engaged by the plunger G, as previously described.

In case the thread-controlled device is out of order then the thread is run from the tension device R through the usual second tension device R' and then up through the eye D' instead of passing the thread through the eye J⁸, as previously described.

In order to allow of cutting the thread conveniently at any time, the arm B² is preferably provided with a knife S, as plainly shown in Figs. 1 and 5.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a sewing-machine, of a needle-threading device, and means for actuating the said needle-threading device on the breaking of the thread, as set forth.

2. The combination with a sewing-machine, of a needle-threading device, and means for operating the said needle-threading device, actuated by a movable part of the sewing-machine on the breaking of the sewing-thread, as set forth.

3. The combination with a sewing-machine, of a needle-threading device having a plunger, means for actuating the plunger from a movable part of the sewing-machine, and a controlling device actuated by the sewing-thread and controlling the said means, as set forth.

4. A needle-threading device comprising a plunger, for pushing the thread through the needle-eye, actuating means for actuating the said plunger, a movable part of the sewing-machine for operating the said actuating means, and manually-controlled means for throwing

the said actuating means into gear, as set forth.

5. A needle-threading device comprising a plunger, for pushing the thread through the needle-eye, actuating means for actuating the said plunger, a movable part of the sewing-machine for operating the said actuating means, manually-controlled means for throwing the said actuating means into gear, and means for throwing the actuating means automatically out of gear after the needle is threaded, as set forth.

6. A sewing-machine provided with a needle-threading device having a plunger for pushing the thread through the needle-eye, and means for connection with a movable part of the sewing-machine, controlled by the sewing-thread, to actuate the plunger on the breaking of the sewing-thread at the time the needle moves into an uppermost position, as set forth.

7. The combination with a sewing-machine, of a needle-threading device, automatically actuated on the breaking of the thread, and a retaining device for engaging the thread after the latter is pushed through the needle-eye by the said threading device, as set forth.

8. The combination with a sewing-machine, of a needle-threading device, automatically actuated on the breaking of the thread, a retaining device for engaging the thread after the latter is pushed through the needle-eye by the said threading device, and means for actuating the said retaining device in unison with the said threading device, as set forth.

9. The combination with a sewing-machine, of a needle-threading device, automatically actuated on the breaking of the thread, and a retaining device for engaging the thread after the latter is pushed through the needle-eye by the said threading device, the said needle-threading device and the said retaining device being arranged on opposite sides of the needle, as set forth.

10. A needle-threading device forming a permanent fixture of a sewing-machine, comprising a plunger for pushing the thread through the needle-eye, a guideway for the thread, to bring the latter into the path of the plunger, the said guideway and plunger being arranged on one side of the needle, actuating means for actuating the said plunger from a movable part of the sewing-machine, a retaining device located on the other side of the needle, for engaging and temporarily holding the portion of the thread pushed through the needle-eye by the said plunger, and means for actuating the said retaining device in unison with the said plunger, as set forth.

11. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, and a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, as set forth.

12. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, and a thread-controlled device for moving the said cam into an active position on the breaking of the thread, as set forth.

13. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, and a thread-controlled device for moving the said cam into an active position on the breaking of the thread, the said thread-controlled device consisting of an arm carrying an eye, for the passage of the thread, a cam mounted to turn and carrying the said arm and a cam-lever engaged by the said cam and adapted to move the said crank-arm cam into an active position, as set forth.

14. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, and a thread-controlled device for moving the said cam into an active position on the breaking of the thread, the said thread-controlled device consisting of an arm carrying an eye, for the passage of the thread, a cam mounted to turn and carrying the said arm and a cam-lever engaged by the said cam and adapted to move the said crank-arm cam into an active position, the said arm, its cam and the cam-lever returning to a normal position by the reestablished tension of the thread, as set forth.

15. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, and a manually-controlled device for throwing the said cam into an active position, as set forth.

16. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-

bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, and a manually-controlled device for throwing the said cam into an active position, the said manually-controlled device being automatically returned by the crank, as set forth.

17. A needle-threading device for sewing-machines, provided with a reciprocating plunger for pushing the thread through the eye of the needle, a lever connected with the said plunger, a movable part of the sewing-machine for actuating the said plunger at the time the needle-bar moves into an uppermost position, and a horn mounted to swing, to engage the thread-loop pushed through the needle-eye, as set forth.

18. A needle-threading device for sewing-machines, provided with a reciprocating plunger for pushing the thread through the eye of the needle, a lever connected with the said plunger, a movable part of the sewing-machine for actuating the said plunger at the time the needle-bar moves into an uppermost position, a horn mounted to swing, to engage the thread-loop pushed through the needle-eye, means connected with the said lever, for moving the horn into an active position, and means on the needle-bar for returning the horn to an inactive position, as set forth.

19. A sewing-machine provided with a needle-threading device, comprising a reciprocating plunger, for pushing the thread through the eye of the needle, a lever for imparting movement to the said plunger, a cam on the crank of the actuating device for the needle-bar, adapted to engage the lever and rock the same at the time the needle-bar moves into an uppermost position, a thread-controlled device for moving the said cam into an active position on the breaking of the thread, and a manually-controlled device, for moving the said cam into an active position in case the said thread-controlled device fails, as set forth.

20. A needle-threading device for sewing-machines, provided with a guideway for the thread, a reciprocating plunger for pushing the thread from the guideway through the needle-eye, the said guideway and plunger being located on one side of the needle, a horn mounted to swing on the other side of the needle, for receiving the loop of thread formed by the plunger, movable parts of the sewing-machine, and means controlled from the movable parts of the sewing-machine, for actuating the said plunger and horn in unison, as set forth.

21. A needle-threading device for sewing-machines, provided with a bearing having a guideway for the thread, a plunger mounted to reciprocate in the said bearing and adapted to engage the thread in the guideway and push the thread through the needle-eye, a guide-arm on the bearing, for guiding the thread to the guideway, and spring-clamps on the guideway, for engaging the thread, to

hold the latter stretched in the guideway, as set forth.

22. A needle-threading device for sewing-machines, provided with a bearing having a guideway for the thread, a plunger mounted to reciprocate in the said bearing and adapted to engage the thread in the guideway and push the thread through the needle-eye, a guide-arm on the bearing, for guiding the thread to the guideway, and spring-clamps on the guideway, for engaging the thread, to hold the latter stretched in the guideway, the said arm being arranged transversely on the top of the bearing and the spring-clamps being located lengthwise on the bottom of the bearing, as set forth.

23. A needle-threading device for sewing-machines, a bearing provided at its forward end with a vertical guideway for the thread, a guide-arm on the bearing, extending transversely from the rear side of the bearing over the top of the guideway, a pair of spring-clamps on the bottom of the bearing, and a projection on the front forward portion of the bearing, and extending lengthwise beyond the end of the guideway, as set forth.

24. A needle-threading device for sewing-machines, comprising a reciprocating plunger, a lever for imparting movement to the plunger, a needle-bar crank, a lever-cam fulcrumed on the said crank, and adapted to engage the said lever, to rock the same at the time the needle-bar moves into an uppermost position, and a handled crank-pin under the control of the operator, adapted to engage the said lever-cam, to move the latter into an operative position relative to the said lever, as set forth.

25. A needle-threading device for sewing-machines, comprising a reciprocating plunger, a lever for imparting movement to the plunger, a needle-bar crank, a lever-cam fulcrumed on the said crank, and adapted to engage the said lever, to rock the same at the time the needle-bar moves into an uppermost position, a handled crank-pin under the control of the operator, adapted to engage the said lever-cam, to move the latter into an operative position relative to the said lever, and a fixed cam for engaging the said lever-cam, to return the latter to a normal position after the needle is threaded, as set forth.

26. A needle-threading device for sewing-machines, comprising a reciprocating plunger, a lever for imparting movement to the plunger, a needle-bar crank, a lever-cam fulcrumed on the said crank, and adapted to engage the said lever, to rock the same at the time the needle-bar moves into an uppermost position, a handled crank-pin under the control of the operator, adapted to engage the said lever-cam, to move the latter into an operative position relative to the said lever, and a cam-face on the crank, for engaging the said crank-pin, to return the latter to a normal inactive position, as set forth.

27. A needle-threading device for a sewing-machine, comprising a crank-disk for operating the needle-bar and provided with a V-shaped notch on its face, a lever-cam fulcrumed on the face of the crank-disk and having a V-shaped end, adapted to swing over the said groove, a cam-block on the said lever-cam, a manually-controlled shaft, having a handle and an eccentric-pin adapted to engage the said cam-block, to impart a

swinging motion to the said lever-cam, and a threading device actuated by the said lever-cam, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SUMTER B. BATTEY.

Witnesses:

THEO. G. HOSTER,
EVERARD BOLTON MARSHALL.