

No. 697,184.

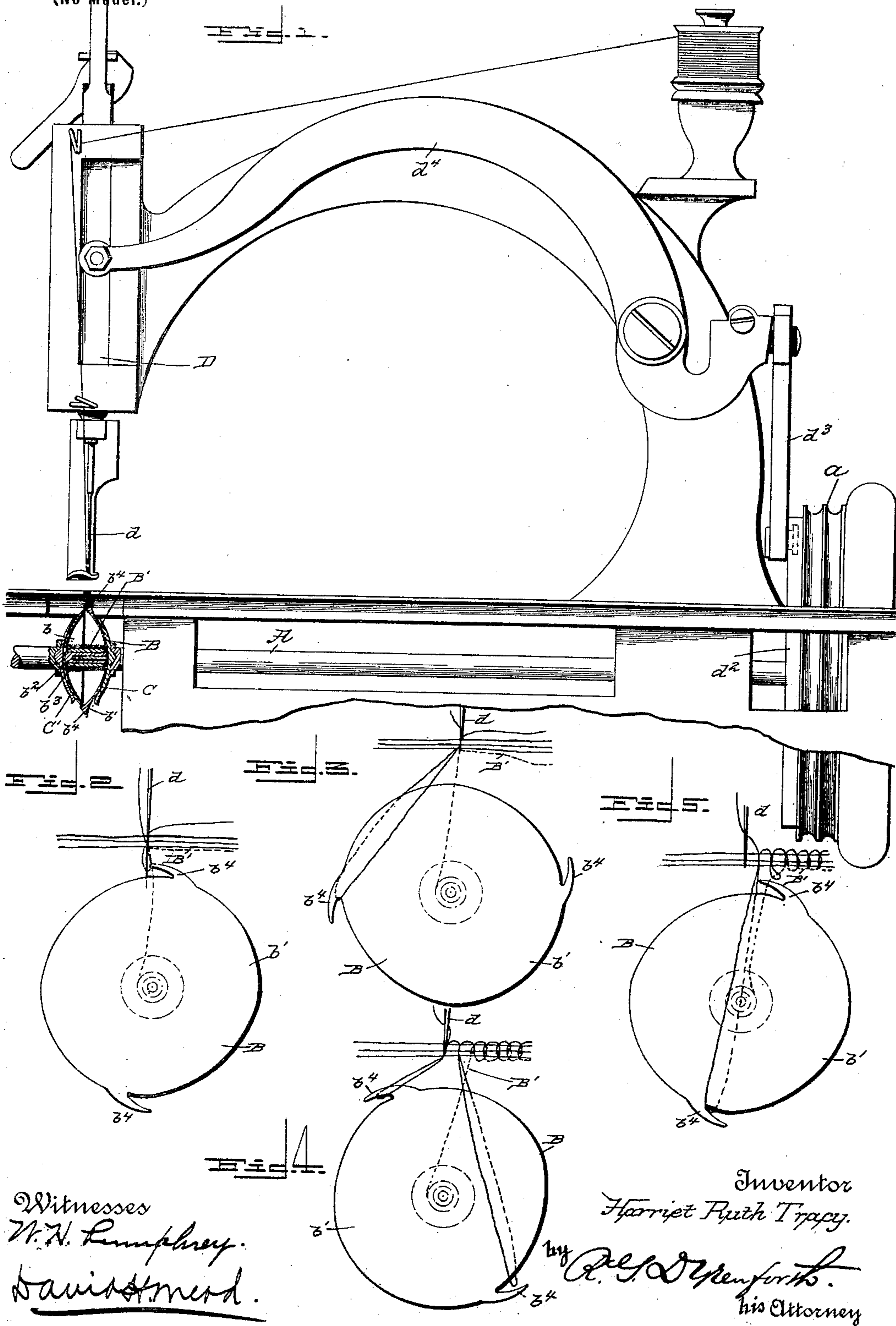
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H. R. TRACY.

LOOP TAKING MECHANISM FOR SEWING MACHINES.

(Application filed Dec. 11, 1890.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## LOOP-TAKING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 697,184, dated April 8, 1902.

Application filed December 11, 1890. Serial No. 374,287. (No model.)

*To all whom it may concern:*

Be it known that I, HARRIET RUTH TRACY, a citizen of the United States, residing at New Brighton, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sewing-machine looper mechanism; and its object is to provide a simplified and improved multihook looper construction in which one of the hooks upon a looper takes up the loop previously opened out by another of said hooks. Upon a shaft or other revolving member I mount a loop-taker or shuttle, which may receive a spool, ball, or cop of thread and is provided with a plurality of successive hooks, projections, or loop-takers, operating one after another to engage the needle-thread as the needle descends, one of said hooks always acting as a take-up for the loop of needle-thread drawn out by another of said hooks and the looper or shuttle being so mounted upon said revolving shaft or member as to permit the passage of the loops or needle-thread entirely around it. Said revolving shaft is connected with a reciprocating needle, whereby the needle is caused to act in unison with the loop-seizers upon said looper, the latter being both supported upon and rotated by said shaft or member and the loops of needle-thread passing between the looper and the shaft.

In the accompanying drawings, in which the invention is illustrated, Figure 1 represents a side elevation of a sewing-machine made in accordance with my invention, the improved shuttle and the means for connecting the shuttle to the driving-shaft being shown in section. Fig. 2 is a view showing the position of the needle and the shuttle when the needle-thread is about to be engaged by one of the hooks of the shuttle. Fig. 3 is a view showing the position of the needle and the shuttle when the shuttle has completed a quarter of a revolution after one of its hooks

has engaged the needle-thread. Fig. 4 is a view showing the position of the needle and shuttle after one loop of the needle-thread has been formed and is about to be drawn up to inclose the shuttle-thread, also showing a second loop of the needle-thread engaged by the other hook of the shuttle about to be opened and to be passed around the shuttle to inclose the shuttle-thread; and Fig. 5 is a view showing the position of the needle and shuttle when the first loop formed is about to be drawn up entirely into the cloth, carrying with it the shuttle-thread, and when the needle is about to descend for the purpose of allowing one of the loops to engage the needle-thread to form another loop.

In the drawings, A represents a power-shaft mounted in suitable bearings in the lower portion of the machine and is provided with a band-wheel *a*, through which motion is imparted to the shaft from suitable motive power to be described farther on.

B represents a loop-taker or shuttle of metal, consisting of two parts *b* and *b'*, connected by a rod or bar *b<sup>2</sup>*, attached to one section of the shuttle, receiving a projection *b<sup>3</sup>* from the other portion, the rod or bar being so formed that independent rotation of the parts of the shuttle is prevented. The rod or bar *b<sup>2</sup>* serves the dual purpose of connecting the parts of the loop-taker B and of furnishing a shaft for the reception of a spool, ball, or cop of thread, from which the shuttle-thread *B'* of the machine is taken.

The parts of the loop-taker B are so arranged when in operative position as to leave a circumferential slot through which the shuttle-thread *B'* is permitted to pass freely. On the periphery of the portion *b'* of the loop-taker B are the two hook-shaped projections *b<sup>4</sup>*, designed successively to engage the loop from the needle.

The looper B is so supported upon the driving-shaft A as to permit the passage of the thread between the support and the looper and at the same time insure the revolving of the looper or shuttle by the shaft. This may be carried out in any suitable manner, and I have illustrated in the present embodiment of the invention one means of accomplishing

the end, consisting of the shuttle-carrying sockets or shells C and C'. The peripheral contour of the shell or shuttle B may be of any suitable form, preferably approximately elliptical, as illustrated. The sockets C and C' may be of corresponding form, if desired. One of these holders is attached to each portion of the divided shaft and incloses or holds the shuttle in such manner as to permit the passage between the shuttle and the sockets C C' of thread-loops, while at the same time the shuttle or shell is revolved by the revolution of the shaft. Thus it will be seen that the looper is both sustained upon and revolved by the shaft and that the thread-loops pass entirely around the looper or shuttle and between the same and the shaft.

D represents the needle-bar of the machine, to which is attached in the usual manner the needle *d*. Motion is imparted to the needle-bar through the cam *d*<sup>2</sup>, the vertical connecting-rod *d*<sup>3</sup>, having a projection entering a groove in the cam, and the connecting-lever *d*<sup>4</sup>. The form of the cam *d*<sup>2</sup> is such that the needle-bar is given two reciprocating motions to each revolution of the driving-shaft. The parts are so arranged and the movements so timed that the hooks or projections from the shuttle B are in position to enter the loop from the needle as the latter after having reached the limit of its downward movement begins to ascend.

In the operation of the machine, two threads of the machine being arranged, the needle-thread lying along the work to be operated upon and the shuttle-thread below the work, motion is imparted to the power-shaft and the needle is forced down through the cloth and below the work-plate, carrying the needle-thread through and beneath both cloth and work-plate. As the needle begins to ascend one of the hooks of the shuttle engages the loop of the needle-thread, and as the shaft carrying the shuttle revolves the loop thus engaged is spread out over the diverging faces of the shell or shuttle, as shown in Fig. 3, partially opening the loop. As the shuttle continues to revolve and as the loop reaches the position shown in Fig. 4 the other hook of the shuttle is in a position approaching the needle and the needle is about to descend to form another loop of the needle-thread to be engaged by the hook. After the second hook has engaged the needle-thread and as the shuttle continues to revolve the loop formed by the first hook is drawn up through the cloth and down through the last opening made by the needle, forming a second loop, and as the second loop assumes the position shown in Fig. 5 the first loop formed is about to be drawn up into the cloth, carrying with it the shuttle-thread, which is inclosed by the loop of the needle-thread as it is formed and passed around the shuttle.

To insure a clear understanding of the operation of the device, it may be stated that each hook passes through the loop of the nee-

dle-thread formed by the other hook just prior to the time at which it engages the needle-thread and at a time when the loop carried by the lower hook is held taut, thus preventing danger of entanglement or of the upper hook engaging the loop carried by the lower hook.

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

1. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided with hooks which one at a time seize the loops of needle-thread; said shuttle or the like being constructed for receiving a ball, spool or cop of thread, and being so mounted as to permit the passage of the loop of thread entirely around it; and a device whereby the shuttle is sustained and revolved; the construction and arrangement being such that the thread passes between said revolving device and said shuttle, and one of said hooks takes up the loop previously opened out by another of said hooks.

2. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided with hooks which one at a time seize the loops of needle-thread; said shuttle being constructed for receiving a ball, spool or cop of thread; and a revolving shaft whereon the shuttle is carried; one of said hooks taking up the loop previously spread out by another of said hooks.

3. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided with opposite peripheral hooks which one at a time seize the loops of needle-thread; said shuttle being constructed for receiving a ball, spool or cop of thread, and being so mounted as to permit the passage of the loop of thread entirely around it; and a device whereby the shuttle is sustained and revolved; the construction and arrangement being such that the thread passes between said revolving devices and said shuttle or the like, and one of said hooks takes up the loop previously spread out by another of said hooks.

4. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided with opposite peripheral hooks which one at a time seize the loops of needle-thread; said shuttle being constructed for receiving a ball, spool or cop of thread; and a revolving shaft whereon said shuttle is carried; one of said hooks taking up the loop previously spread out by another of said hooks.

5. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided with a series of hook-shaped peripheral projections; and a shaft whereon said shuttle is carried and whereby it is revolved; said shuttle being so carried upon said shaft that the

thread may pass entirely around the shuttle and between the shuttle and the shaft; and one of said projections taking up the thread-loop previously spread out by another of said projections.

6. In a sewing-machine having a reciprocating needle, the combination of a shuttle or the like arranged near thereto and provided upon opposite sides with hook-shaped peripheral projections; and a shaft whereon said shuttle is carried and whereby it is revolved; said shuttle being so carried upon said shaft that the thread may pass entirely around the shuttle; and one of said projections taking up the thread-loop previously spread out by another of said projections.

7. In a sewing-machine having a reciprocating needle, the combination of a sectional shuttle arranged near thereto and provided upon opposite sides with hook-shaped peripheral projections; and a two-part shaft whereon said shuttle is carried and whereby it is revolved; said shuttle being so carried between the parts of said shaft that the thread may pass entirely around the shuttle and between said parts of said shaft; and one of said projections taking up the thread-loop previously spread out by another of said projections.

8. In a sewing-machine having a reciprocating needle, the combination of a shuttle arranged near thereto and provided with hook-shaped projections; said shuttle being adapted to receive a spool, ball or cop of thread; and a revolving shaft whereon said shuttle is carried; said shuttle having diverging faces so as to spread out or open the loops of thread, which pass around said shuttle and between said shuttle and said shaft; one of said hooks approaching the needle when another thereof has fully drawn out a loop, and after seizing a bight of thread from the needle operating to take up said loop.

9. In a sewing-machine having a reciprocating needle, the combination of a shell arranged near thereto and provided upon opposite sides with hook-shaped projections; said shell being adapted to receive a spool, ball or cop of thread; and a revolving shaft whereon said shell is carried; said shell having diverging faces so as to spread out or open the loops of thread, which pass around said shell and between the same and said shaft; one of said hooks approaching the needle when another thereof has fully drawn out a loop, and after seizing a bight of thread from the needle operating to take up said loop.

10. In a sewing-machine having an ordinary needle, the combination of a carrier arranged near thereto and designed to receive a spool, ball or cop of thread, and provided with hook-shaped projections; and a driving-shaft connected with the carrier so as to support the same in such a manner as to impart motion thereto, and at the same time to permit the passage of thread between the shaft and the carrier, substantially as described; and one

of said projections taking up the thread-loop previously spread out by another of said projections.

11. In a sewing-machine having an ordinary needle, a carrier arranged near thereto and designed to receive a spool, ball or cop of thread, and provided upon opposite sides with hook-shaped projections; and a driving-shaft connected with the shell so as to support the same in such a manner as to impart motion thereto, and at the same time to permit the passage of the thread between the shaft and the carrier, substantially as described; and one of said projections taking up the thread-loop previously spread out by another of said projections.

12. In a sewing-machine, the combination of a shuttle or the like mounted so as to permit the passage of a loop of thread entirely around it, and provided with hooks for engaging loops of needle-thread; and a revoluble device whereon said shuttle or the like is supported and whereby it is revolved; said hooks projecting beyond said revoluble device, and being so disposed that one hook takes up the thread drawn out by the preceding hook.

13. In a sewing-machine, the combination of a shuttle or the like mounted so as to permit the passage of a loop of thread entirely around it, and provided upon opposite sides with hooks for engaging loops of needle-thread; and a revoluble device whereon said shuttle or the like is supported and whereby it is revolved; said hooks projecting beyond said revoluble device, and being so disposed that one hook takes up the thread drawn out by the preceding hook.

14. In a sewing-machine, the combination of a shuttle or the like having a plurality of hooks, and means for supporting said shuttle in operative position and causing the same to rotate; said supporting and rotating means including a rotating shaft whereon said shuttle is carried; and said hooks being so disposed that one takes up the thread drawn out by another.

15. In a sewing-machine, the combination of a shuttle or the like having a plurality of hooks, and means for supporting said shuttle in operative position and causing the same to rotate; said supporting and rotating means including a rotating shaft whereon said shuttle is carried; said hooks being so disposed that one takes up the thread drawn out by another; and said hooks projecting from the periphery of said shuttle on opposite sides thereof.

16. In a sewing-machine having a reciprocating needle, the combination of a looper arranged near thereto and provided with hooks which one at a time seize the loops of needle-thread; said looper being so mounted as to permit the passage of the loop of thread entirely around it; and a device whereby the looper is sustained and revolved; the construction and arrangement being such that

the thread passes between said revolving device and said looper, and one of said hooks takes up the loop previously opened out by another of said hooks.

5 17. In a sewing-machine having a reciprocating needle, the combination of a looper arranged near thereto and provided with hooks which one at a time seize the loops of needle-thread; and a revolving shaft whereon the  
10 looper is carried; one of said hooks taking up the loop previously spread out by another of said hooks.

15 18. In a sewing-machine having a reciprocating needle, the combination of a looper arranged near thereto and provided with hook-

shaped projections; and a revolving shaft whereon said looper is carried; said looper having diverging faces so as to spread out or open the loops of thread, which pass around said looper and between said looper and said shaft; one of said hooks approaching the needle when another thereof has fully drawn out a loop, and after seizing a bight of thread from the needle operating to take up said loop.

In testimony whereof I affix signature in presence of two witnesses.

HARRIET R. TRACY.

Witnesses:

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DAVID H. MEAD.