

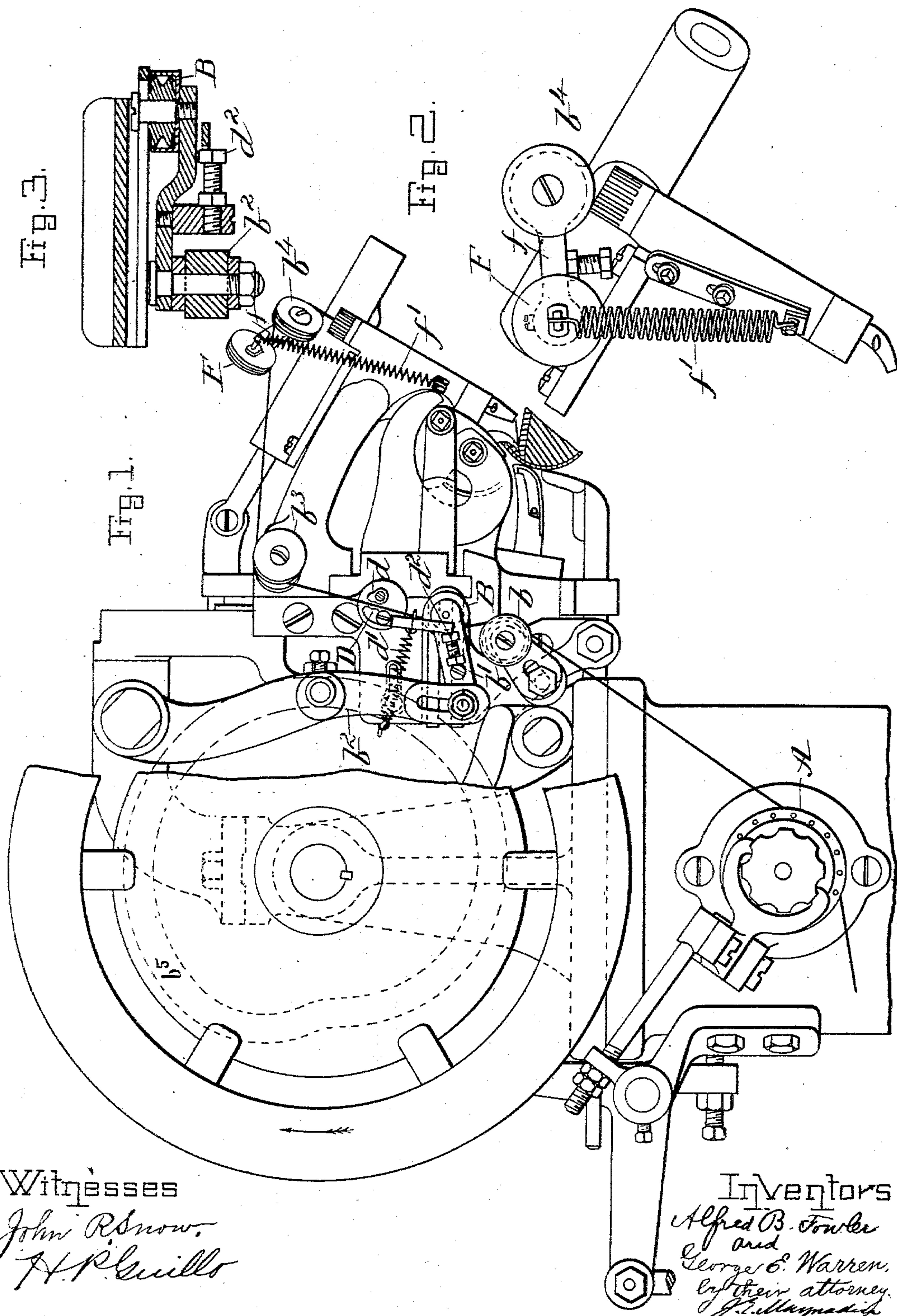
(No Model.)

2 Sheets—Sheet 1.

A. B. FOWLER & G. E. WARREN.
SEWING MACHINE.

No. 564,985.

Patented Aug. 4, 1896.



Witnesses
John R. Snow.
H. P. Guillo

Inventors
Alfred B. Fowler
and
George E. Warren.
By their attorney,
J. L. Hammond

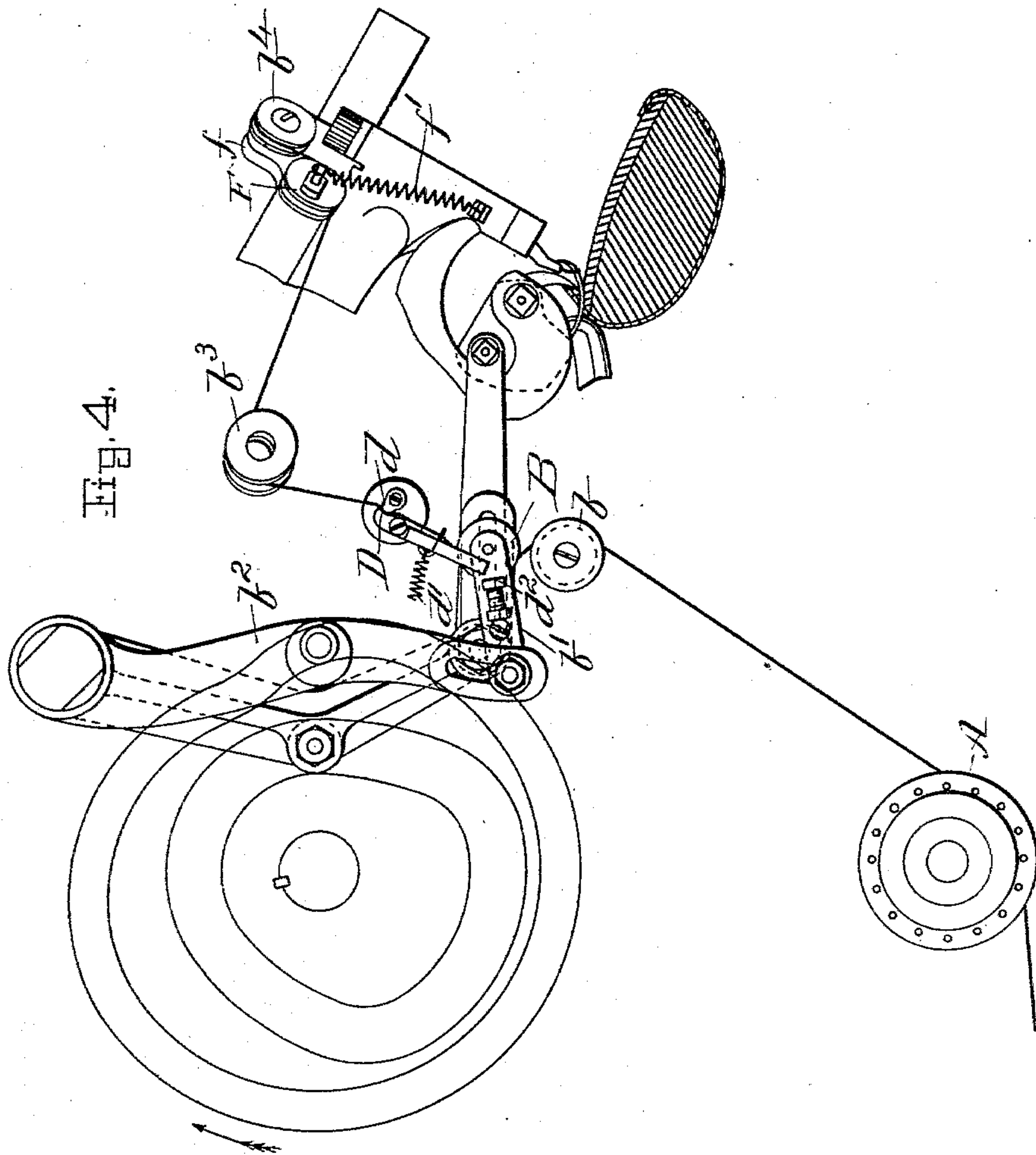
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UNITED STATES PATENT OFFICE.

ALFRED B. FOWLER AND GEORGE E. WARREN, OF PAWTUCKET, RHODE ISLAND, ASSIGNORS TO THE LINCOLN SEWING MACHINE COMPANY, OF EXETER, NEW HAMPSHIRE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 564,985, dated August 4, 1896.

Application filed May 1, 1895. Serial No. 547,775. (No model.)

To all whom it may concern:

Be it known that we, ALFRED B. FOWLER and GEORGE E. WARREN, of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Means for Handling Thread in Hook-Needle Chain-Stitch Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of so much of a sewing-machine as is requisite to illustrate our invention. Fig. 2 is an elevation of a device for taking up slack thread. Fig. 3 is a sectional elevation of a pull-off device. Fig. 4 is an elevation showing the main parts in another position from that shown in Fig. 1.

In hook-needle chain-stitch sewing-machines the thread is ordinarily drawn taut by the back stroke of the needle; that is, when the hook-needle has completed its back stroke the thread is taut on one side of the material in the form of a loop held by the needle-throat, and on the other side of the material the thread is taut through the looper and other thread-guides back to the tension. As the needle is moved toward the material the loop of thread in its throat is slackened, and when the needle has penetrated the material the loop lies loosely about the shank of the needle, and the looper then lays the thread in the hook of the needle, so that when the looper has operated the thread on one side of the material is in the form of a slack loop about the needle-shank, and when the needle is drawn back it draws a new loop through the material and through the preceding loop, which is thus tightened and thereby furnishes a part of the thread for the succeeding loop, the rest of the thread being drawn from the tension; and all the thread which the needle draws from the tension renders in the throat of the needle under the strain due to the tension, which is objectionable, especially in machines for sewing turn shoes and welts. This objection has long been well known to all skilled in the art, but heretofore all attempts to overcome it have been based upon the plan of first drawing back the thread, so as to leave no supply of thread in one loop for the next loop; sec-

ondly, pulling off thread from the tension, and thirdly, providing means for forming a bight of thread between the material and the throat of the needle, all of which will be well understood by those skilled in the art, especially upon referring to the following patents: No. 374,936, to Campbell, dated December 20, 1887; Nos. 412,703 and 412,704, to French *et al.*, dated October 8, 1889; No. 473,870, to French *et al.*, dated April 26, 1892, and No. 533,639, to Eppler, dated February 5, 1895.

The object of our invention is to pull off thread from the tension while maintaining the supply of thread in the loop already drawn, so that when the needle is drawn back the thread for the new loop is provided partly by the thread in the preceding loop and partly by the thread drawn from the tension by the pull-off mechanism.

In the drawings, A represents a tension device of well-known construction, through which the thread passes from any proper thread supply over a guide-truck *b*, which is preferably adjustable, as shown, and back of the pull-off truck B through the brake D *d*, shown as applied by its spring *d'*, acting on the moving member D when that member is released from stop *d*² on the arm *b'*, which carries pull-off truck B. Arm *b'* is adjustably connected to lever *b*², which is oscillated by its cam-roll and cam *b*⁵, as clearly shown in Figs. 1 and 4.

From the brake D *d* the thread extends over guide-truck *b*³, and thence under the slack-taking truck F, which is on arm *f*, controlled by the light spring *f'*, and which acts in connection with truck *b*³ on one side of it and truck *b*⁴ on the other side of it to take up any slack in the thread, for, as will be seen in Fig. 1, slack-taking truck F is held against the pull of the light spring *f'* when the thread is taut, but in case of any slack the spring *f'* will cause truck F to take it up.

The pull-off truck B, its arm *b'*, its lever *b*², together with the moving member D of the brake, are best shown in Figs. 1 and 4, and Fig. 3, which also illustrates the ways in which the headed journal of the pull-off truck B slides.

The slack-taking truck F, its arm *f* and

spring f' , together with the looper and the guide-truck b^4 , are best shown in Fig. 2.

The parts not lettered are too well known to require description.

5 In Fig. 1 the needle is at the end of its back stroke to set the stitch by tightening the thread from the hook of the needle through the between substance, through the looper, over truck b^4 , under truck F, over truck b^3 ,
10 through the open brake D d , past pull-off truck B, and guide-truck b to the tension A.

In Fig. 4 the thread is held by the brake D d and the pull-off truck B has just commenced to pull off thread through the tension,
15 while the looper has laid the thread in the hook of the needle and the slack-taking truck F has taken up the slack. The pull-off truck B completes its back stroke, pulling off thread from the tension, but not taking up the thread,
20 for the brake D d prevents pull-off truck B from acting as a take-up, the main object being to pull off thread from the tension without pulling the thread back, so as to leave a thread supply on both sides of the needle, the
25 thread in the preceding loop being the supply for one side of the needle and the thread given up by the pull-off being the supply for the other side of the needle. As the needle draws a new loop of thread through the material
30 and the preceding loop the pull-off truck B makes its forward stroke supplying thread for the new loop, and the old loop then lying slack about the shank of the needle also supplies thread for the new loop, the result being
35 not only that we dispense wholly with the bight-forming mechanism essential in all other hook-needle machines with a pull-off mechanism, but also materially reduce the rendering of the thread to and fro.

40 While we show a thread-brake for preventing the truck B from acting as a take-up, it will be obvious that the essential matter is that the thread shall be pulled off from the tension without being so taken up or pulled

back as to shorten the preceding loop enough 45 to make a bight-forming mechanism or its equivalent necessary for providing the proper thread supply on one side of the needle, as in each and all of the patents above referred to, for our invention is a machine of a new class, 50 which, while like that class of hook-needle sewing-machines described in the patents above referred to in that it has a pull-off mechanism for pulling off thread from the tension, and like the older class of hook-needle sewing-machines in that it maintains in each 55 loop a thread supply for the next loop, yet differs from both these classes in mode of operation as well as in result.

What we claim as our invention is— 60

1. In a hook-needle chain-stitch sewing-machine the combination of a tension; a looper; a hook-needle; which draws a loop of thread through a preceding loop and tightens the stitch by its loop-drawing stroke; a pull-off 65 mechanism between the tension and the needle; and means to hold the thread on the needle side of the pull-off mechanism and thereby prevent that mechanism from acting as a take-up and compel it to draw thread from the tension; all organized and operating to form and 70 tighten the stitch substantially as described.

2. In a hook-needle chain-stitch sewing-machine the combination of a tension; a looper; a hook-needle; which draws a loop of thread 75 through a preceding loop and tightens the stitch by its loop-drawing stroke; a pull-off mechanism between the tension and the needle; and a thread-brake between the pull-off mechanism and the needle; all organized and 80 operating to form and tighten the stitch substantially as described.

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Witnesses:

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