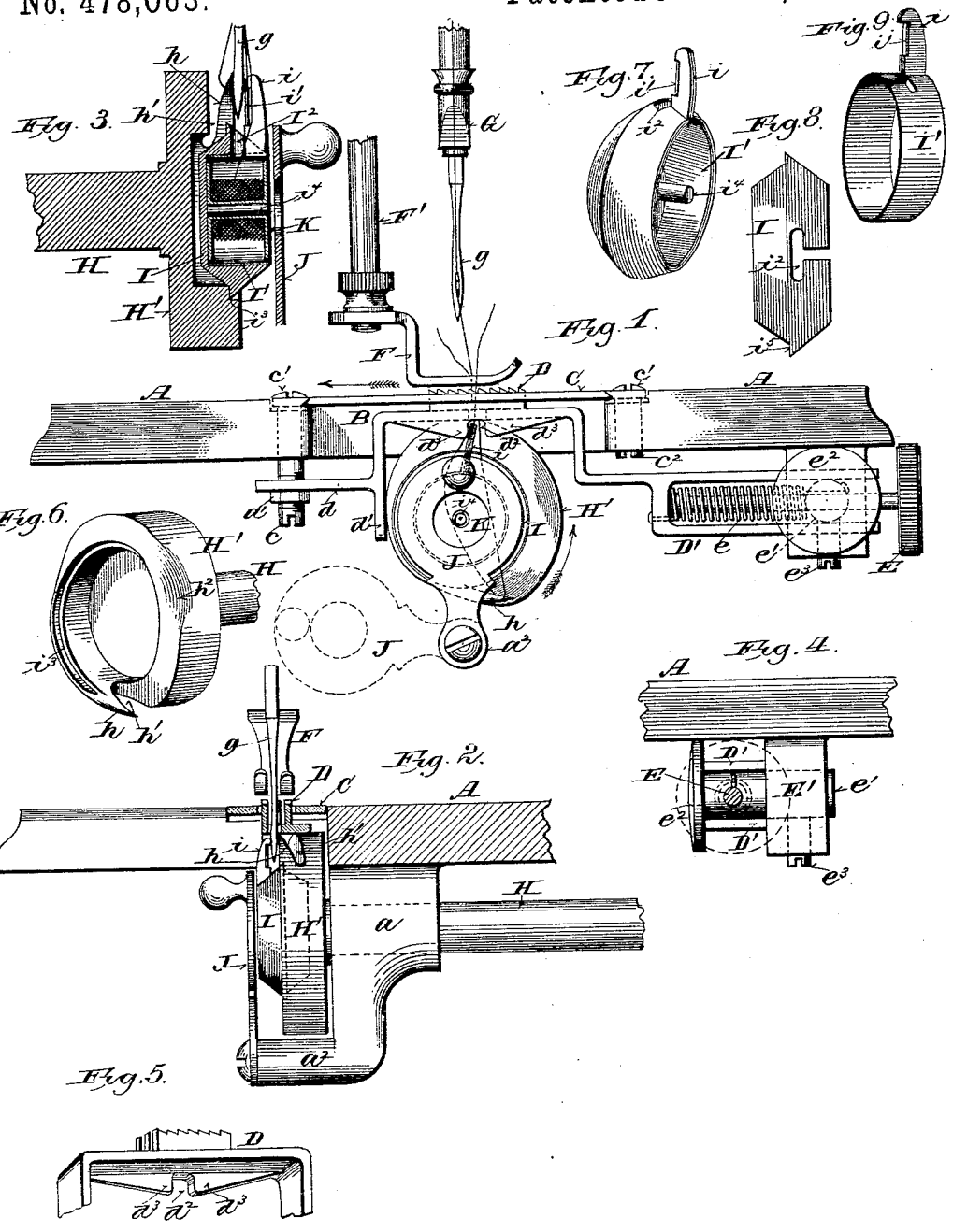
(No Model.) 2 Sheets—Sheet 1.

F. LICHTFELDT.

SEWING MACHINE.

No. 478,063. Patented June 28, 1892.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 10.

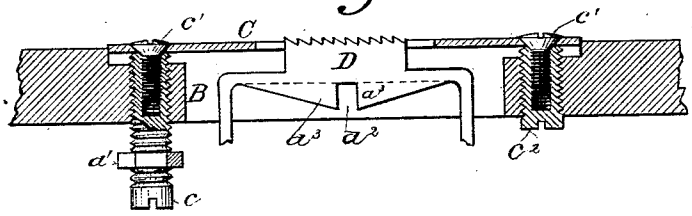


Fig. 11.

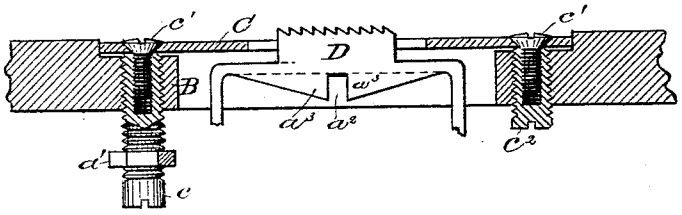
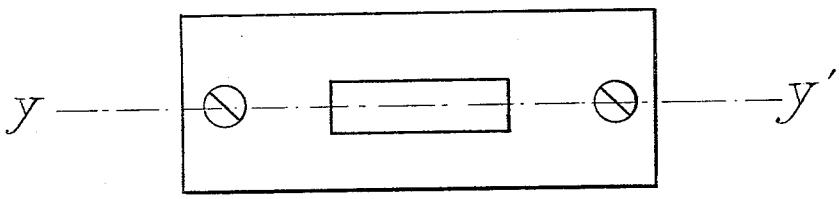


Fig. 12.



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UNITED STATES PATENT OFFICE.

FREDRICK LICHTFELDT, OF MILWAUKEE, WISCONSIN.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,063, dated June 28, 1892.

Application filed September 14, 1889. Serial No. 323,975. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK LICHTFELDT, a citizen of the United States, residing at 674 Walker street, in the city and county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in sewing-machines, and more in particular to the stitch-forming mechanism, which improvements are fully set forth in the following specification and will finally be pointed out in detail in the claims.

The object of my invention is to produce a machine consisting of a fewer number of parts, possessing greater durability, and costing less to manufacture than those in common use. I attain these objects by the mechanism illustrated in the accompanying drawings, which are made a part of these specifications.

Figure 1 is an end view of a portion of a sewing-machine embodying my invention. The parts of a sewing-machine unnecessary to the explanation of my invention are omitted from the drawings, as my invention is applicable to sewing-machines of well-known forms. Fig. 2 is a side elevation of my invention with the feeder, throat-plate, and a part of the bed-plate shown in section. Fig. 3 is a sectional side elevation of the bobbin-case, revolving hook and shaft, and the swinging guard, and is cut by a vertical plane passing through the center of each of these parts. Fig. 4 is a view of the feeder-guide pin and stud. Fig. 5 is a perspective view of a portion of the feeder and circular tension-spring detainer. Fig. 6 is a perspective view of the revolving hook and feed-cam and a portion of its shaft. Fig. 7 is a perspective view of the bobbin-case with its tension-spring in its place. Fig. 8 is an edge view of the bobbin-case, showing the opening for the needle and the inlet for the tension-spring. Fig. 9 is a perspective view of the self-fastening circular tension-spring. Fig. 10 is a section cut on line y and y', Fig. 12, and showing the throat-plate, a portion of the bed-plate, also the female screws c and c^2 with male screws c' and c'. In this view the throat-plate is shown elevated above the upper surface of the bed-plate. Fig. 11 is the same view as Fig. 10, with this exception, that the throat-plate is shown below the upper surface of the bed-plate. Fig. 12 is a plan view of the throat-plate.

Similar letters and numerals refer to similar parts throughout the several views.

A is the bed-plate.

a is a stud formed upon the bed-plate which constitutes a bearing for one end of the bobbin-carrier shaft, and a^2 is the bobbin-guard stud. The working space B (shown in Figs. 1 and 2) is an opening in the bed-plate, which has formed around its upper edge a recess for the reception of the throat-plate C. The throat-plate C is secured in its place by means of screws c' and c' passing down through the throat-plate C, and into the upper end or female portion of differential screws c and c^2, as shown in Figs. 11 and 12. Differential screws c and c' are throat-plate-regulating screws with threads upon their outer surfaces and have corresponding threads in the holes in the bed-plate through which they pass. By loosening screws c' and c' and turning screws c and c^2 into the bed-plate the throat-plate C will be raised above the upper surface of the bed-plate A, as shown in Fig. 11, and which serves to adjust the throat-plate in its relation to the feeder D. In order to lower the throat-plate C, the screws c' and c' are slightly withdrawn. The differential screws c and c^2 are then unscrewed until the throat-plate is in position, as shown by dotted lines, under the throat-plate and the heads of male screws c' and c', as shown in Fig. 1. The screws c' and c' are then tightened, which secures the throat-plate. Screw c is provided with a nut a', which serves to adjust the feeder D in a vertical direction, and also serves with screw c as a guide for slide-bar d.

Feeder D is composed of the following elements, as will be seen by referring to Figs. 1 and 5: The usual part which passes up through the throat-plate C, the horizontal part directly beneath the throat-plate, which serves as a working surface and which operates the feeder in a vertical direction by the revolution of the feed-cam H', the vertical part d^2, which also constitutes a working surface and which by the revolution of the feed-cam H'

serves to carry the feeder D forward, the slide-bar d, the bobbin tension-spring detainer d^3 and the feeder-spring seat, or the upper and lower slide-bars D′. All of these elements, constituting the feeder as a whole, I prefer in practice to make in a single piece.

E is the stitch-regulating screw that has its threaded seat in feeder-guide pin e', as shown in Fig. 4, passing through feeder-spring e, Fig. 1, against feeder-spring seat D′, in which feeder-spring e is fastened, and pulling toward the feeder-guide pin e', where it is fastened on the other side, as shown in Figs. 1 and 4, by a groove cut in the threaded seat of the stitch-regulating screw E.

E′ is a stud projecting from the lower side of the bed-plate A and forms a support for the feeder-guide pin e'. Feeder-guide pin e' is provided with a flange e^2 and is adjusted and secured in its seat in stud E′ by set-screw e^3, as shown in Fig. 4. The presser-foot F is fastened to the presser-foot bar F′ by a thumb-nut, as shown in Fig. 1.

G is the usual reciprocating needle-bar and is provided with a short eye-pointed needle g, as shown in Fig. 1.

The bobbin-case I has a self-fastening circular tension-spring I′ (separately shown in Fig. 10) with projections that pass up through the throat-outlet in the bobbin-case I. The extensions i serve to secure the tension-spring in its place in the bobbin-case and also as a guide for the thread as it is delivered from the bobbin. The bobbin-case when placed in the machine is held in place by the swinging guard J. The protection-fold i' in tension-spring extensions to circular tension-spring I′ is produced by folding one piece in the other, as shown in Fig. 10, and prevents the thread that comes from the bobbin K, which is placed on the bobbin-stud i^4 in the bobbin-case I, from slipping out of its proper place.

The bobbin-case is put in the machine with the open side toward the bobbin-case guard J.

The operation of my device is as follows: The threaded needle g, which is shown in Fig. 1 at its highest point, passes down through the hole in the throat-plate, and when in position, as shown in Figs. 2 and 3, the thread is caught by the revolving hook h and carried down and around the bobbin-case I, and by means of slot h', Fig. 7, the loop is caused to pass back of the flange i^5 and bobbin-case carrier i^3 upon the shuttle, and from this point the thread is brought up through the hole in the throat-plate C by the take-up, which is not shown in the drawings, but may be of any of the usual forms. As the needle g moves upward above the presser-foot the revolving hook i^3, with its cam, which revolves continuously in the direction of the arrow X, Fig. 1, carries the feeder D upward and then forward in the direction of arrow Y, which moves the fabric along under the presser-foot F. The feeder D in turn is retracted by means of the coil-spring e.

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

1. The combination, in a sewing-machine, with the stitch-forming mechanism, of a bed-plate having a recess for the reception of the throat-plate, a throat-plate provided with a slot for the passage of the feeder and secured in said recess by means of screws c' and c', passing into the upper ends, respectively, of the differential screws c and c^2, the differential screws c and c^2 passing up through the bed-plate and adapted to adjust the throat-plate in a vertical direction with reference to the upper surface of the bed-plate and to the feeder, as shown and described.

2. The combination, in a sewing-machine, with the stitch-forming mechanism, of a revolving hook having an internal peripheral groove, a bobbin-case formed of two truncated cones, their bases meeting in a flange, an opening 12 for the passage of the needle and the extension of the circular tension-spring, a circular tension-spring adapted to fit in said bobbin-case, having an extension projecting into a suitable bearing in the feeder, whereby said bobbin-case has its bearing in said peripheral groove and is prevented from turning, substantially as shown and described.

3. The combination, in a sewing-machine, with the stitch-forming mechanism, of a revolving hook, bobbin-case, and circular tension-spring, the former provided with a suitable recess for the reception of the bobbin-case, a bobbin-case having beveled sides and a flange upon its periphery which has its seat in the revolving hook, the circular tension-spring which fits within the bobbin-case and which is provided with extensions that pass up through the opening in the edge of the bobbin-case, the circular tension-spring extensions provided with a fold for the protection of the thread, substantially as and for the purposes set forth.

4. The combination, in a sewing-machine, with the stitch-forming mechanism comprising a revolving hook and feeder, said hook provided with an eccentric periphery for moving the feeder in an upward and forward direction, the latter provided with a spring for retracting its forward movement, and means for adjusting said feeder vertically, substantially as and for the purposes set forth.

5. The combination, in a sewing-machine, with the stitch-forming mechanism comprising a revolving hook, bobbin-case, with its circular tension-spring, and the feeder, said hook provided with an eccentric periphery for moving the feeder upward and forward, said feeder provided with a spring for retracting its forward movement, means for adjusting it vertically, and detainers, in conjunction with the circular tension-spring, to prevent the revolution of the bobbin-case, substantially as and for the purposes set forth.

6. The combination, in a sewing-machine, with the stitch-forming mechanism, of a revolving hook having an eccentric periphery,

a feeder constructed so as to be operated by said eccentric and provided with a spring for retracting its forward movement, the screw c, with nut a', which serves as a guide for the forward portion of the feeder, and the stud e^2 as a guide for the rearward portion, stud e^2 also constituting a bearing for the stitch-regulating screw, substantially as and for the purposes set forth.

In testimony that I claim the foregoing improvements in sewing-machines, as above described, I have hereunto set my hand this 29th day of August, 1889.

FREDRICK LICHTFELDT.

Witnesses:
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