(No Model.)

W. F. DIAL.

ROTARY SHUTTLE MECHANISM FOR SEWING MACHINES.

No. 304,708. Patented Sept. 9, 1884.

Figure 1

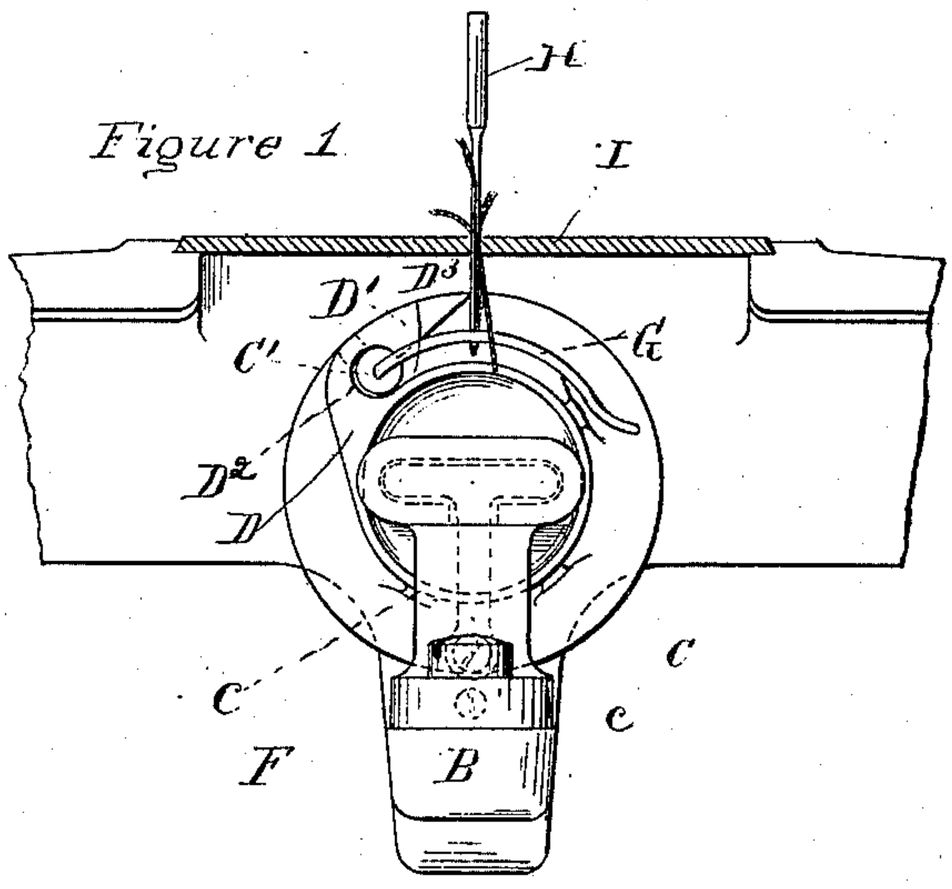


Figure 2.

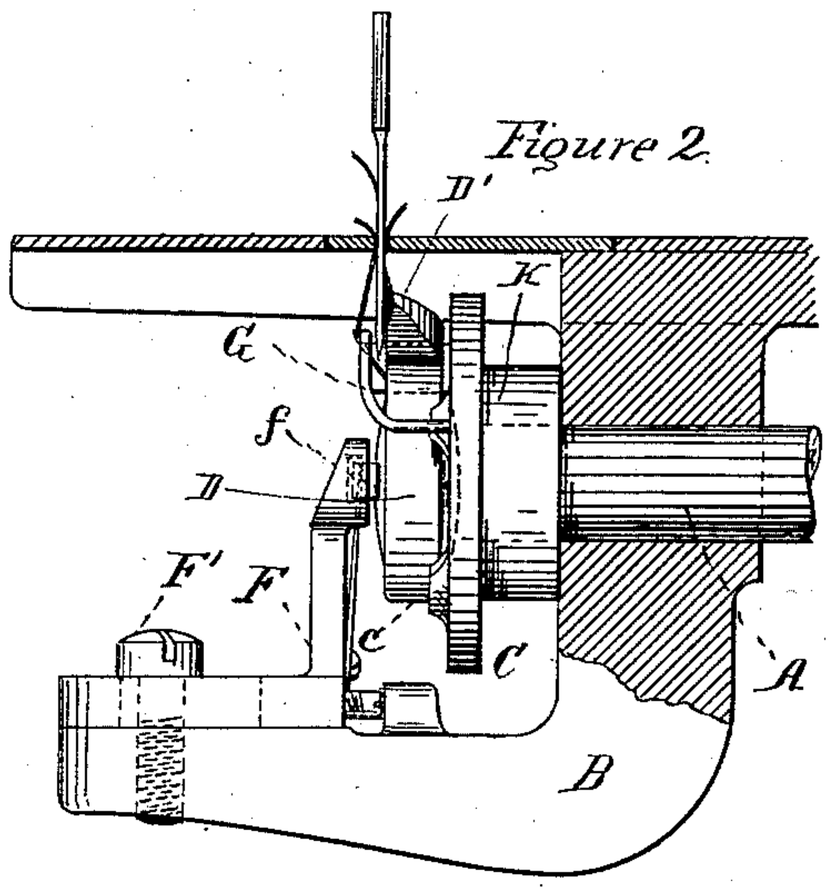


Fig. 3.

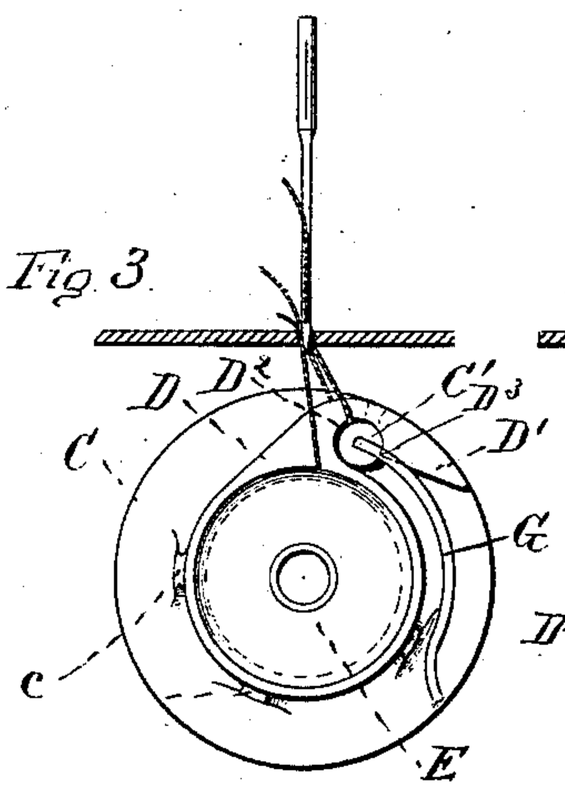


Fig. 4

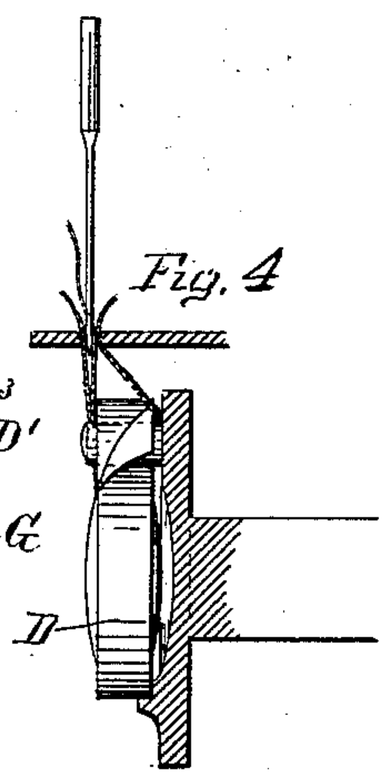


Fig 5.

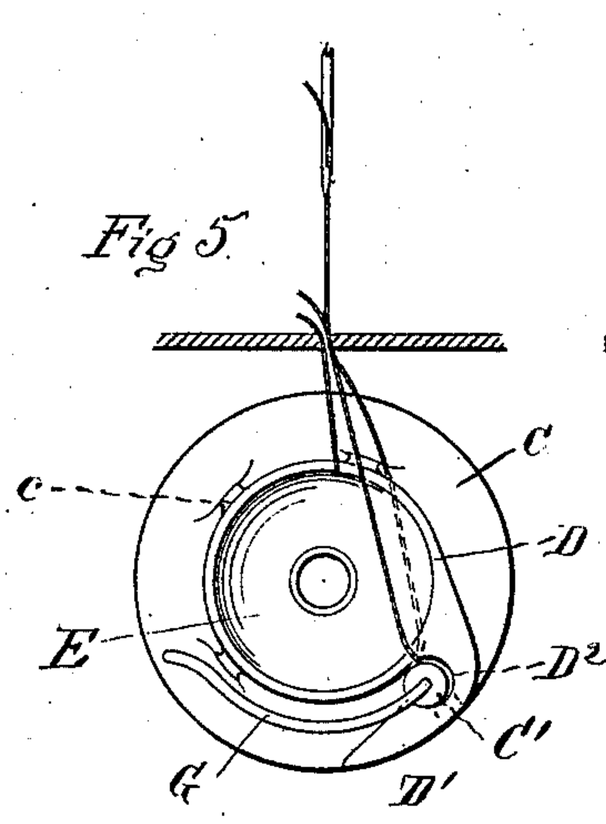
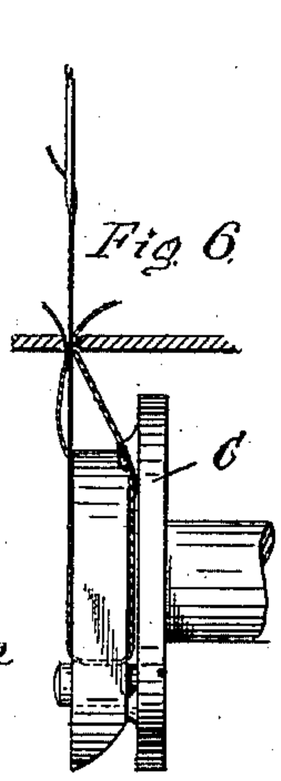


Fig. 6.



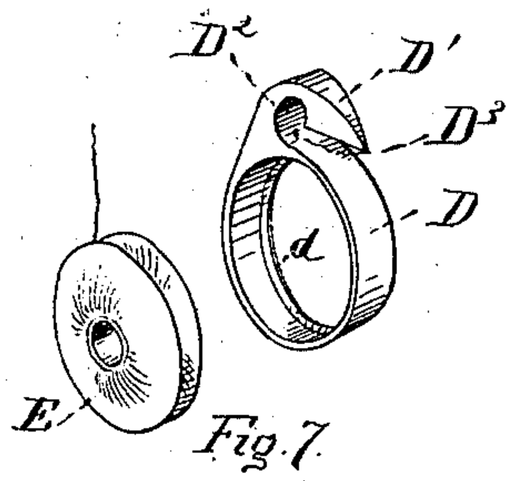


Fig. 7.

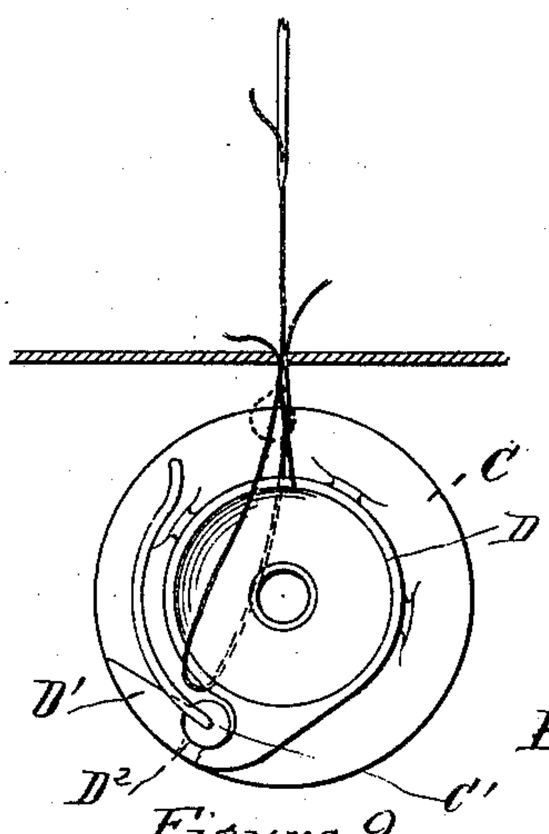
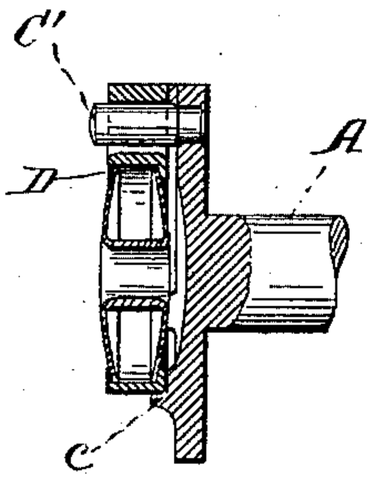


Figure 9.

Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILBUR F. DIAL, OF BRIDGEPORT, CONNECTICUT.

ROTARY-SHUTTLE MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 304,708, dated September 9, 1884.

Application filed January 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILBUR F. DIAL, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Rotary-Shuttle Mechanism for 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.

My invention has for its object to simplify the construction of that class of sewing-machines in which a rotating shuttle passes through the loop in the needle-thread during the formation of each stitch.

With this end in view my invention consists in the construction and combination of elements, as hereinafter fully described, and then designated by the claims.

In order to enable others skilled in the art to understand the construction of my improved machine, I will proceed to describe the same, referring by letters to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of the stitch-forming mechanism, showing the position of the parts just as the loop is about to be taken. Fig. 2 is a side elevation, showing the parts in the same position, with a portion of the bracket in section, and showing the shaft. Fig. 3 is an end elevation showing the stitch-forming mechanism after the taking of the loop; Fig. 4, a side elevation with shuttle in the same position as in Fig. 3, and showing the shuttle-carrying disk in section, the feed-cam being removed. Figs. 5 and 6 are end and side elevations, respectively, showing the position of the shuttle and the loop when the rotation of the shuttle is half completed. Fig. 7 shows the shuttle and bobbin detached. Fig. 8 is a section of the shuttle-carrying disk, the shuttle, and the bobbin; and Fig. 9 is an end elevation showing the rotation of the shuttle farther advanced than in Fig. 5, the take-up having commenced to draw up the loop.

Similar letters indicate like parts in the several figures.

A represents the shaft, supported near its end in a bracket, B, depending from the bed-plate of the machine.

C is the shuttle-carrying disk, having a stud or pin, C′, near its edge, for a purpose presently to be explained, and bosses *c c*, upon which the shuttle rests.

D is the shuttle, which carries the bobbin E, and is provided with hook D′, which catches the loop in the needle-thread, and with a recess, D^2, contracted at its opening, as at D^3. *d* is a shoulder against which the bobbin rests. In use the shuttle is placed over pin C′, which fits loosely in recess D^2, the contracted opening serving to prevent the shuttle from slipping off the pin. The shuttle is additionally secured against being thrown off by centrifugal force by the lugs or bosses *c c*, Figs. 2 and 8, which are provided with shoulders against which the shuttle rests. The shuttle is held in place upon the carrying-disk, and the bobbin is held loosely in the shuttle by a sliding arm, F, secured in place by a screw, F′, which works in a slot. This arm is provided with a spring, *f*, which presses against the bobbin, (see Figs. 1 and 2,) and by its friction against the bobbin furnishes the tension for the lower thread. The indirect action of this spring is to force the shuttle back against bosses *c c;* but the spring is made sufficiently yielding to allow the needle-thread to pass between the shuttle and the bosses at each revolution. G is a thread-guard, preferably made of wire and secured to the face of the disk, which acts to hold the shuttle-thread out of contact with the needle and the point of the hook, as clearly shown in Figs. 1 and 2.

H is the needle. I is the cloth-plate, and K is the cam for operating the feed mechanism. (Not shown.) I have shown no take-up for the needle-thread, as that is not of the essence of my invention. It will of course be understood, however, that a take-up of ordinary construction is used.

The operation is as follows: The shuttle is placed over pin C′, the bobbin so placed in the shuttle that it will unwind in a direction opposite to the rotation of the shuttle, and both are retained in place by spring *f* upon arm F, no threading of the shuttle being required, the end of the thread being merely allowed to hang over the side of the shuttle. As the manipulation of the needle-thread forms no part of my invention, I have omitted all direct reference thereto. It is only necessary,

as in all lock-stitch machines, that the action of the mechanism which manipulates the two threads should be accurately timed. The loop in the needle-thread, which is formed in the ordinary manner, is caught by the point of the shuttle, and as its rotation proceeds passes into recess D^2, there being ample room for it to pass between pin C′ and the edge of the recess. At this stage of the rotation of the shuttle (see Figs. 3 and 4) the shuttle is resting upon the bosses, the shape of the recess being such that resistance to the passage of the thread, owing to friction between the shuttle and pin, is avoided. As the rotation proceeds and the shuttle reaches the position shown in Fig. 5, the pull of the needle-thread is then sufficient to lift the shuttle and permit the loop to escape from recess D^2 without hinderance.

When the parts are in the position shown in Fig. 9, the take-up has commenced to act, the loop is entirely out of the recess in the shuttle, and is almost instantly drawn up, as shown in dotted lines near the top of the figure. When the rotation of the shuttle is completed, the point is in position to take a second loop, and so on. I am thus enabled, by my improved mechanism, to manipulate the two threads, and to produce a perfect lock-stitch, while retaining at the same time the simplicity of construction, small number of parts, and lightness of running that have heretofore been found only in single-thread machines.

I make no claim in this application to the subject-matter claimed in my applications Serial Nos. 118,402, 118,403, 118,404, or in my application Serial No. 128,395, filed April 18, 1884.

Having thus described my invention, I claim as new—

1. The disk having a pin near its edge, a thread-guard, and bosses, as described, in combination with a needle, a shuttle having a recess which loosely engages the pin, and a spring which holds the shuttle loosely against the disk, so that the shuttle may freely pass through each loop.

2. Shuttle D, having hook D′, shoulder *d*, and recess D^2, in combination with disk C, having pin C′, bosses *c*, and thread-guard G, and spring *f*, as described, and for the purpose set forth.

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

WILBUR F. DIAL.

Witnesses:

A. M. WOOSTER,

A. B. FAIRCHILD.