(No Model.) 2 Sheets—Sheet 1.

C. F. HARLOW & E. E. ANGELL.

SEWING MACHINE.

No. 349,393. Patented Sept. 21, 1886.

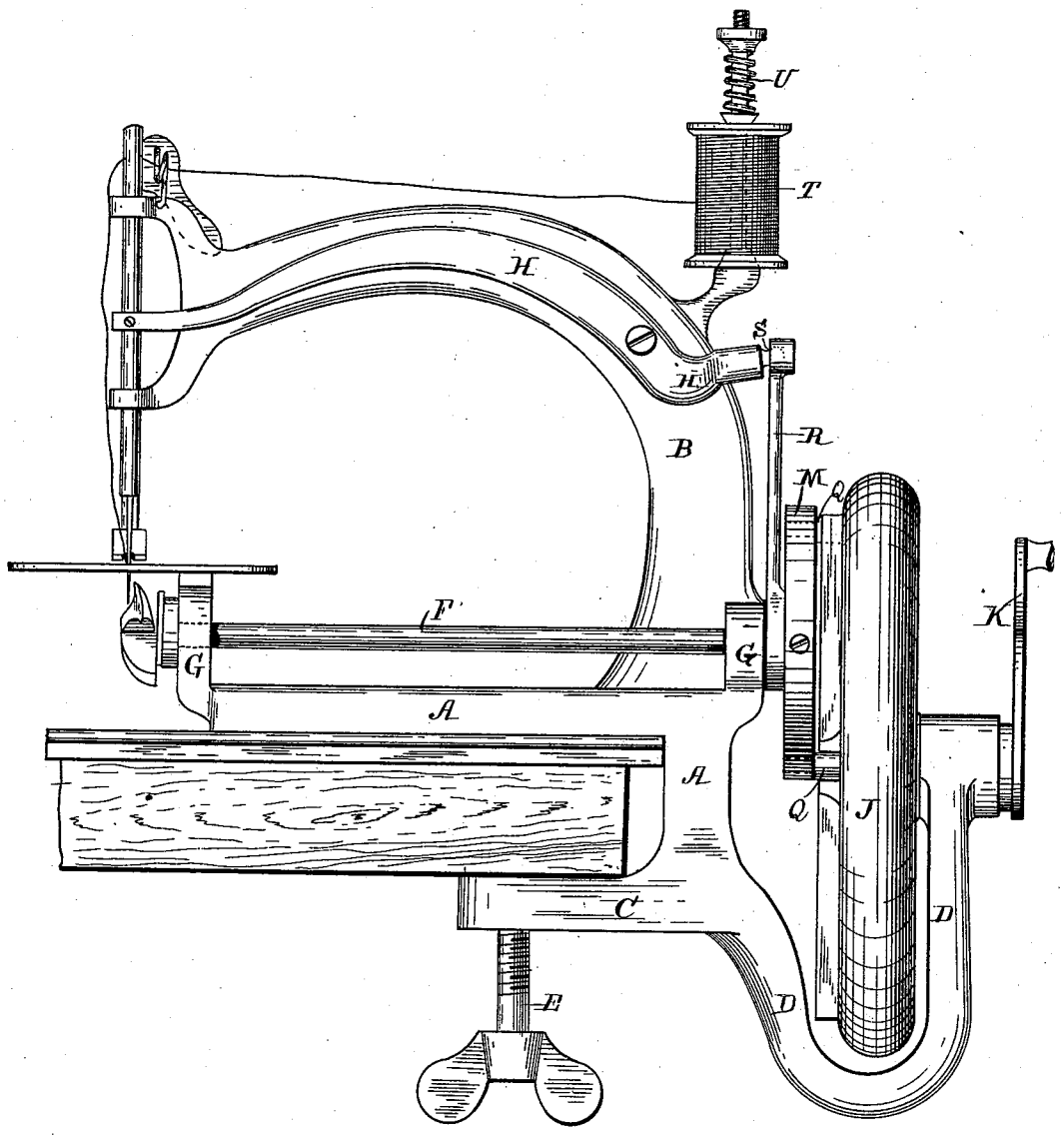

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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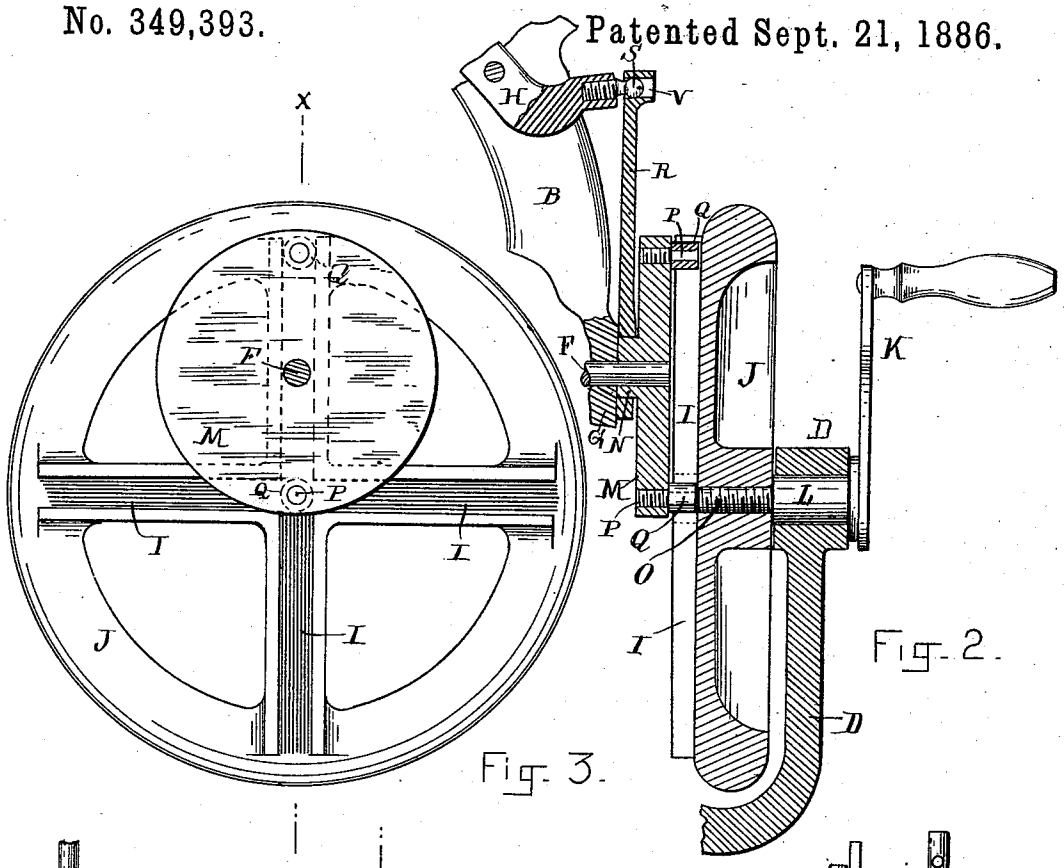

Fig. 2.

Fig. 3.

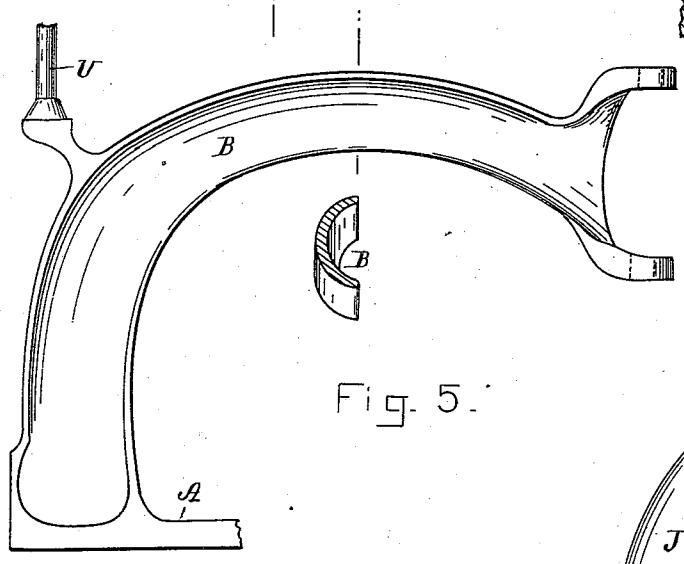

Fig. 5.

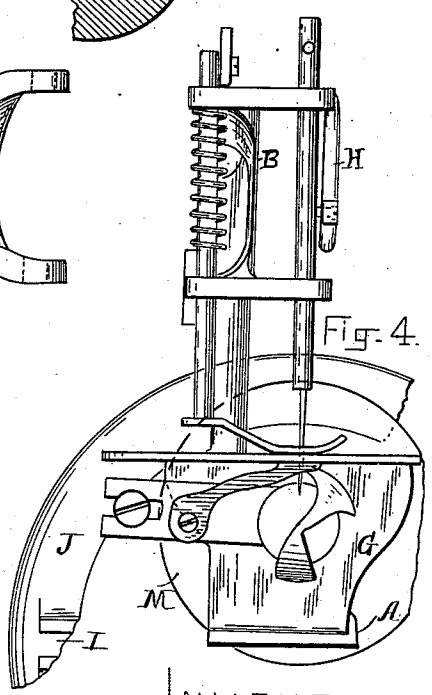

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES F. HARLOW AND EDWIN E. ANGELL, OF MALDEN, ASSIGNORS TO THE GLOBE SEWING MACHINE COMPANY, OF BOSTON, MASS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 349,393, dated September 21, 1886.

Application filed February 2, 1885. Renewed February 11, 1886. Serial No. 191,639. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. HARLOW and EDWIN E. ANGELL, citizens of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

The object of this invention is to simplify and cheapen sewing-machines by lessening their weight, number of parts, and expensive fittings without lessening their efficiency, and also to furnish a machine so simple in construction that even a child can understand and operate it with little or no instruction.

The novel features of our invention include a trammel connection of the balance-wheel with the rotary shaft and vibrating needle-bar, whereby, without cogs or belts, one revolution of said wheel revolves the shaft twice and gives two complete reciprocations to the needle; also, a new bearing for the balance-wheel, to permit of said connection of parts, together with the devices and combinations of devices set forth in the appended claims.

In the drawings, Figure 1 is a side elevation of a sewing-machine embodying the features of our invention. Fig. 2 is a vertical section on the line X, Fig. 3, through the balance-wheel and adjacent parts. Fig. 3 is a face view of the disk and grooved balance-wheel, looking toward the crank, showing the rotary shaft in transverse section. Fig. 4 is a partial end view, and Fig. 5 a detail, of the goose-neck.

Our improved machine, as shown, is designed to be clamped to a table or shelf, and to be operated by hand, and hence is not represented with legs, treadle, &c.; but it is obvious that these parts could be readily added without departing from the spirit of our invention.

The frame is cast in one piece, including the base A, goose-neck B, clamping-arm C, and bearing-arm D. The clamp-screw E passes through the arm C and bears against the under side of the table. The balance-wheel J is independent of the rotary shaft F, and has its only bearing at the extremity of the arm D, outside of said wheel, its rotating journal being the shaft L of the crank K, which shaft has a threaded prolongation, O, screwing axially into the hub of the balance-wheel, so as to be readily attached thereto and to give rotation in the right direction. The rotary shaft F has its bearings in lugs G, cast in one with the base A, and the needle-arm H is pivoted on the goose-neck B. (See Fig. 1.) Both are actuated at twice the speed of the balance-wheel J and crank K, as will now be described.

Fixed on the end of the shaft F is a rotating disk or bar, M, having an eccentric, N, cast in one with it, to receive the eccentric strap and rod which actuates the needle-arm, said disk having on its face, next to the balance-wheel, two projecting pins, P, located on radial lines diametrically opposite to each other. These pins are equidistant from the center of the disk, and are preferably furnished with rollers or slides Q, within which the pins may revolve. The inner face of the balance-wheel J or of its radial arms is furnished with two deep grooves, I, crossing each other at right angles at the axis of said wheel. These grooves receive the pins P, projecting from the adjacent face of the disk M, and the slides or rollers Q, mounted thereon, and these parts are arranged to traverse said grooves I when the balance-wheel is rotated. The axis of the balance-wheel is not coincident with that of the disk M and shaft F; but the former is shown as placed below the latter a distance equal to the distance of the axis of the pin P from that of the shaft F. The arrangement is such that as the balance-wheel is rotated the pins and rollers P Q, while at equal distances from the center of the disk M, are in their movements at varying distances from the axis of the balance-wheel, and alternately pass through said axis as they traverse the grooves I. (See Figs. 2 and 3.) By this movement each pin and roller passes from one radial half of a groove to the other half of the same groove, and as the pin recedes from the axis of the balance-wheel it becomes again a crank-pin in the face of the disk M, to give rotation to the shaft F, the other pin meanwhile approaching to and passing in its rotation similarly through the axis of the balance-wheel, where the grooves intersect. This shifting from one half of a groove to the

other half is effected by each pin twice during every revolution of the balance-wheel—that is, each pin reciprocates through the entire length of one of the grooves, back and forth, with every such revolution. As a consequence the disk M has imparted to it and to the parts driven by it twice the speed of said wheel. The shaft F, actuated as described, carries at its opposite end a rotary hook and spreader and a feed-driving eccentric, or other devices which co-operate with the needle to form the stitches; but description is not required, since said mechanism forms no part of our present invention.

The needle-lever H is vibrated on its pivot by means of the connecting-rod R, extending from the eccentric N to the short arm of said lever. The means shown of connecting the rod and lever consist of a ball, S, having a threaded stem to screw into said arm, and at the upper end of the rod R a cylindrical opening, V, of a diameter to receive the ball or screw-head S.

The thread-spool T is preferably mounted on an upright spindle, U, with conical bearings, about as shown in Fig. 1, and tension is obtained by a spiral spring and adjustable nut.

The arm or goose-neck B is cast, for strength and lightness, of crescent form in cross-section, as indicated in Fig. 5. This half-round hollowed form saves metal and labor in casting, and contributes to the lightening of the machine, which is one of our primary objects.

We claim as our joint invention—

1. In a sewing-machine provided with stitch-forming mechanism, the rotary shaft F, provided at its extremity with the member M, having two outwardly-projecting pins, P, in combination with the balance-wheel J, grooved perpendicularly on its inner face, whereby said pins may reciprocate in said grooves, substantially as and for the purpose set forth.

2. In a sewing-machine provided with stitch-forming mechanism, the looper-shaft F, having fixed on one end the disk M, formed with the eccentric N and pins P P, in combination with the needle-arm H and rod R, and with the grooved balance-wheel I J and its bearing-arm D, substantially as and for the purpose set forth.

In testimony whereof we hereto affix our signatures in presence of two witnesses.

CHARLES F. HARLOW.
EDWIN E. ANGELL.

Witnesses:
N. H. SPENCER,
E. A. PHELPS.