2 Sheets--Sheet 1.

E. G. PARKHURST & H. G. THOMPSON.

Book Sewing-Machines.

No. 151,507. Patented June 2, 1874.

Fig. 1.

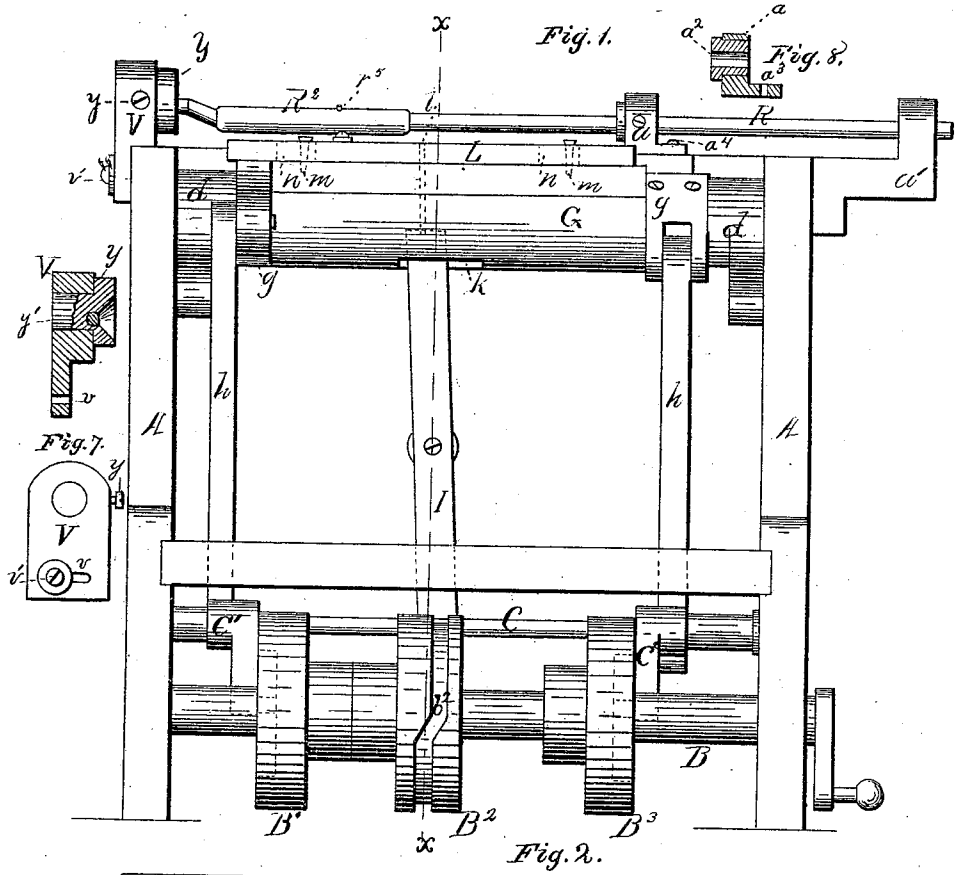
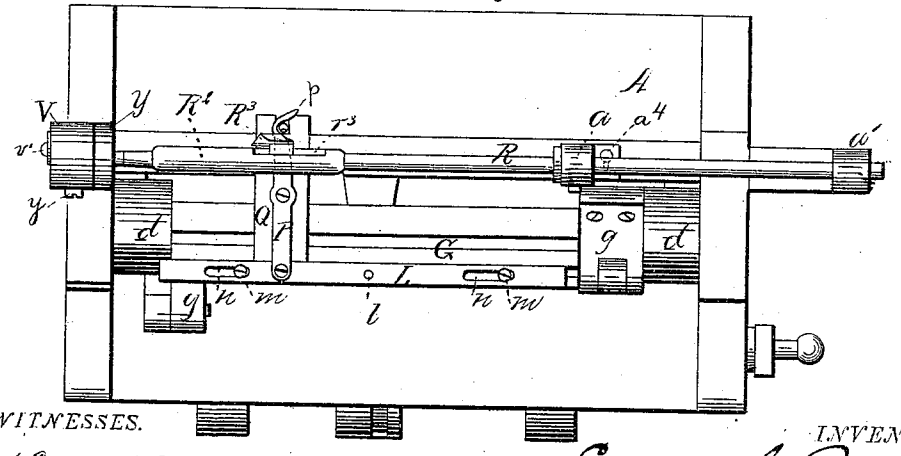


Fig. 8.

Fig. 7.

Fig. 2.



WITNESSES.

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2 Sheets--Sheet 2.

E. G. PARKHURST & H. G. THOMPSON.

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Fig. 3.

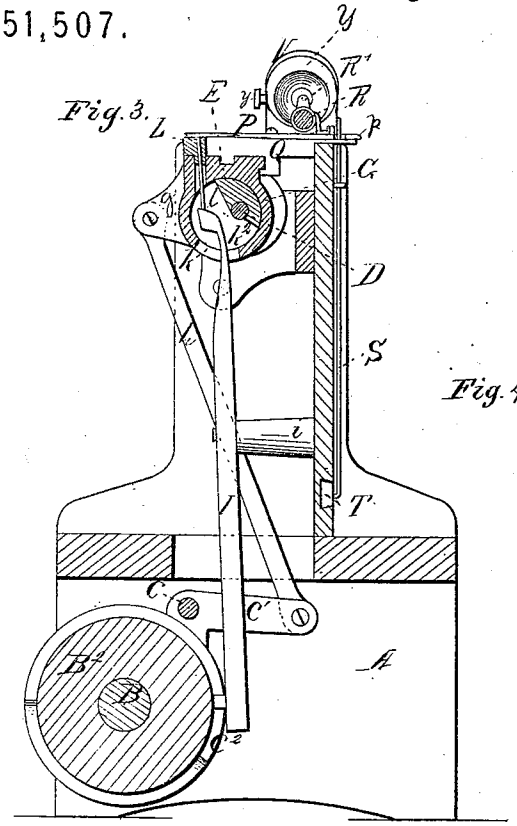


Fig. 4.

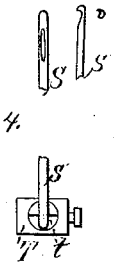


Fig. 5.

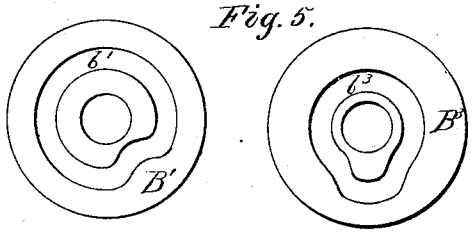
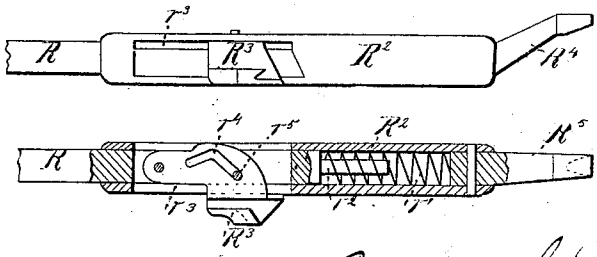


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD G. PARKHURST, OF HARTFORD, AND HENRY G. THOMPSON, OF MILFORD, CONNECTICUT.

IMPROVEMENT IN BOOK-SEWING MACHINES.

Specification forming part of Letters Patent No. **151,507**, dated June 2, 1874; application filed January 24, 1874.

To all whom it may concern:

Be it known that we, E. G. PARKHURST, of Hartford, county of Hartford, and H. G. THOMPSON, of Milford, county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Book-Sewing Machine, of which the following is a specification:

Our invention relates to improvements on that for which Letters Patent No. 74,948 were granted February 25, 1868, and No. 91,175, granted June 8, 1869, to David M. Smyth; and it consists in, first, a combination of devices for raising the signature clear of the needles preparatory to being folded; second, a thread-carrier of peculiar construction for manipulating the interlacing thread; third, a block provided with an adjustable plug for raising or lowering the needle to correspond with signatures of different thicknesses; fourth, an adjustable guide of peculiar construction for readily adjusting the thread-carrier to the proper position for sewing signatures of different thicknesses and lengths; fifth, the combination of a bumper with the thread-carrier for facilitating the operation thereof.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a top view. Fig. 3 is a transverse vertical section taken on the line *x x*, Fig. 1. Fig. 4 is a representation of different portions of the needle. Fig. 5 represents two of the cam-wheels. Fig. 6 represents a side view and a sectional view of the thread-carrier. Fig. 7 represents a sectional and side view of bumper. Fig. 8 represents a sectional view of guide *a*.

A represents the frame of the machine, which is constructed in any suitable manner. In the lower portion, on one side, is a shaft, B, running the entire width of the frame, and carrying three wheels, B^1 B^2 B^3. Above the shaft B, and nearer to the center of the frame, is a shaft, C, which also runs the entire width of the frame, and which forms the fulcrums for two bell-crank levers, C^1 C^2. In the upper portion of the frame is a shaft, D, which passes eccentrically through a cylinder, E, and has its bearings in blocks *d d* attached to the frame. Surrounding the cylinder E is a block, G, the upper side of which is flat, and the remaining portion is cylindrical. At each end of the block G is a lug, *g*, to each of which lugs is pivoted the upper end of a pitman, *h*. One pitman connects with the bell-crank lever C^1, and the other pitman connects with the bell-crank lever C^2. The wheel B^1 has a cam-groove, b^1, on one of its sides, which groove is circular, with a depression inward toward the center. The wheel B^3 has a cam-groove, b^3, on its side, with a projection outward toward the periphery. The bell-crank C^1 engages with the wheel B^1 by means of a stud working in the cam-groove b^1, and the bell-crank C^2 engages with the wheel B^3 by means of a stud working in the cam-groove b^3. One of the lugs *g* is a part of, or made fast to, the block G, and the other lug *g* is attached to the cylinder E, so that, as the shaft B is revolved, the wheel B^1, through the pitman *h* and lug *g*, gives a rocking motion to the block G, and the wheel B^3, through its pitman *h* and lug *g*, gives a reciprocating rotary motion to the cylinder E. The wheel B^2 has a cam-groove, b^2, in its face, in which works a stud on the lower end of a straight lever, I, which is pivoted about midway of its length to a projection, *i*, on the frame A. The upper end of this lever passes through an opening or slot, *k*, in the under side of the block G, and into a recess, k^2, formed in the cylinder E. (See Fig. 3.) On the upper side of the block G rests a bar, L, secured to the block by screws *m* passing through slots *n*, so as to allow the bar to move longitudinally. About midway of the length of the bar L a pin, *l*, projects downward and enters a hole in the upper end of the lever I, as shown in full lines in Fig. 3, and in dotted lines in Fig. 1. On the upper side of the bar L are pivoted the ends of the latches P, which have their fulcrum on a lifter or finger, Q, attached to the upper side of the block G, and its opposite end formed into a hook, *p*.

In the drawings but one of these latches and lifters has been shown, but in a working machine I use one for each of a series of needles.

A series of needles are attached to the frame. One of these needles, S, is shown in

Fig. 3. The lower end is bent and inserted in a hole in a cylindrical plug, *t*, held in place by a set-screw in a block, T, so that by loosening the set-screw the plug *t* may be turned so as to elevate or lower the needle when required. The block T slides in a dovetailed groove in the frame, as shown in Fig. 3, for the purpose of adapting the machine for sewing books of different lengths by moving the needles close together or farther apart. The point or upper end of the needle projects slightly above the upper side of the lifter or finger Q, through a notch therein, as shown in Figs. 2 and 3.

The thread-carrier consists of a rod, R, working in guides a a^1 in the upper part of the frame A, so as to admit of a longitudinal motion, and provided with suitable means for operating it either by hand or by machinery. The guides a a^1 are adjustable, so that the carrier-rod may be raised or lowered, when desired, by means of an eccentric, a^2. A lateral adjustment is also provided for by the slot a^3 and set-screw a^4, in order that the thread-carrier may be moved to and from the needle without the vertical action attendant upon the movement of the eccentric. In a working machine I sometimes place the guide a upon a slide having a horizontal movement, and adjust the guide according to the length of the signature being sewed. The forward end of the rod R is surrounded by a sleeve, R^2, in which is a spiral spring, r^1, pressing against a piston or follower, r^2. Pivoted to the rod R is a hook, R^3, the shank of which is flat, and passes through a slot, r^3, in the sleeve. The shank has a slot, r^4, cut in it at an angle of about forty-five degrees inclination from the axis of the rod R. A pin, r^5, passes from the sleeve through the slot r^4. When the rod R is pressed into the sleeve, so that its end bears against the piston r^2 and compresses the spring r^1, the hook R^3 is forced laterally outward in consequence of the action of the pin r^5 in the slot r^4. The outer or forward end of the sleeve R^2 is bent upward at an angle of about thirty degrees inclination for a short distance, and then outward again parallel with the axis of the rod, as shown at R^4. This end R^4 when the rod is moved forward strikes against a bumper. The bumper V is attached to the top of the frame A opposite to the thread-carrier rod, and is made laterally adjustable by means of the slot v and screw v'; and the said bumper has a face-plate, Y, (see Fig. 7,) held in place by a projecting lug, y', and set-screw y, which renders the plate readily adjustable. In the face of this plate is a circular concavity, the center of which is a little to one side of the center of the plate. By the proper adjustment of the plate the center of the concave is kept opposite to and receives the forward end of the sleeve R^4 of the thread-carrier rod R after every forward movement, and carries the rod to the proper position for the action of the hook R^3 in throwing the loop around the last needle. This book-sewing machine is provided with a feeding-table and folder similar to that shown in Letters Patent No. 91,175 and No. 100,407. The folded sheets that are to be connected or sewed together to constitute a book or pamphlet are put together, and a series of notches cut across the back folded edges. The notches when so cut form holes in the sheets when opened out. The pile of sheets so notched is placed upon the feeding-table, with the notched edges toward the needles. The top signature is opened out by the attendant and slipped on the series of needles, the notches cut into the edges of the sheets forming holes to slip onto the needles when the sheets are opened out. The thread-carrier is then moved forward, the hook R^3 catching the loop in the thread of the feeding-needle and carrying it along until it is opposite the last needle, when the end R^4 comes in contact with the bumper V, which arrests the motion of the sleeve R^2. The motion of the rod R is continued, the end pressing against the piston r^2 and forcing the hook R^3 laterally outward, so as to throw the loop around the last needle. The thread-carrier is then moved back to its former position, and as the shaft B revolves the lifters Q raise the signatures clear of the needles, the hook on the point of the last needle catching the interlacing thread and preventing it from slipping off the needle, when the folders of the machine turn the signature, and the lifters or fingers Q press it down, and the operator places another signature in position for a similar operation, which operation is repeated until the required number of signatures has been sewed and the rear table filled. The backbands are then threaded into the needles preparatory to the removal of the books from the machine.

We claim as new and desire to secure by Letters Patent—

1. The combination of the cam-wheels B^1 B^3, bell-crank levers C^1 C^2, pitman h h, lugs g g, cylinder E, and block G, substantially as shown and described, for the purpose specified.

2. The needle-hook R^3 pivoted upon the rod R, provided with the slot r^4, working upon the pin r^5 of the sleeve R^2, all arranged and operating to catch, hold, and carry the interlacing thread from the first of a series of needles to, and passing the thread over, the last of the series, substantially as shown and described.

3. The block T, provided with an adjustable plug, *t*, for raising and lowering the needle as may be required by the different thicknesses of paper to be sewed, substantially as shown and described.

4. One or more adjustable guides, a, provided with eccentrics a^2, substantially as shown and described, arranged and operating so as to elevate or depress the thread-carrier rod.

5. One or more adjustable guides, a, having a transverse slot, a^3, and set-screw a^4, in combination with the thread-carrier rod R and the

frame of a book-sewing machine, substantially as shown and described, all arranged and operating so as to give to the guides a lateral adjustment.

6. The combination of guide *a*, provided with a transverse slot, a^3, and with the eccentric a^2, with a book-sewing-machine frame, for the lateral and vertical adjustment of the thread-carrier rod, substantially as shown and described.

7. In a book-sewing machine a bumper, V, that is laterally and vertically adjustable for receiving the end of the thread-carrier rod, in whatever position it may be adjusted by the guides, substantially as shown and described.

8. The bumper V, having the face-plate Y, with a concavity or bell-shaped mouth, and set-screw *y*, substantially as shown and described.

9. The combination of the laterally and vertically adjustable bumper V, having the face-plate Y, with the thread-carrier R, substantially as shown and described, all arranged and operating to bring the end of the carrier-rod to the proper position for the operation of the hook R^3 in throwing the thread over the last of the series of needles.

In testimony that we claim the foregoing as our invention, we hereunto affix our signatures this 20th day of January, 1874.

E. G. PARKHURST.
HENRY G. THOMPSON.

Witnesses:
CHAS. E. GROSS,
LEWIS SPERRY.