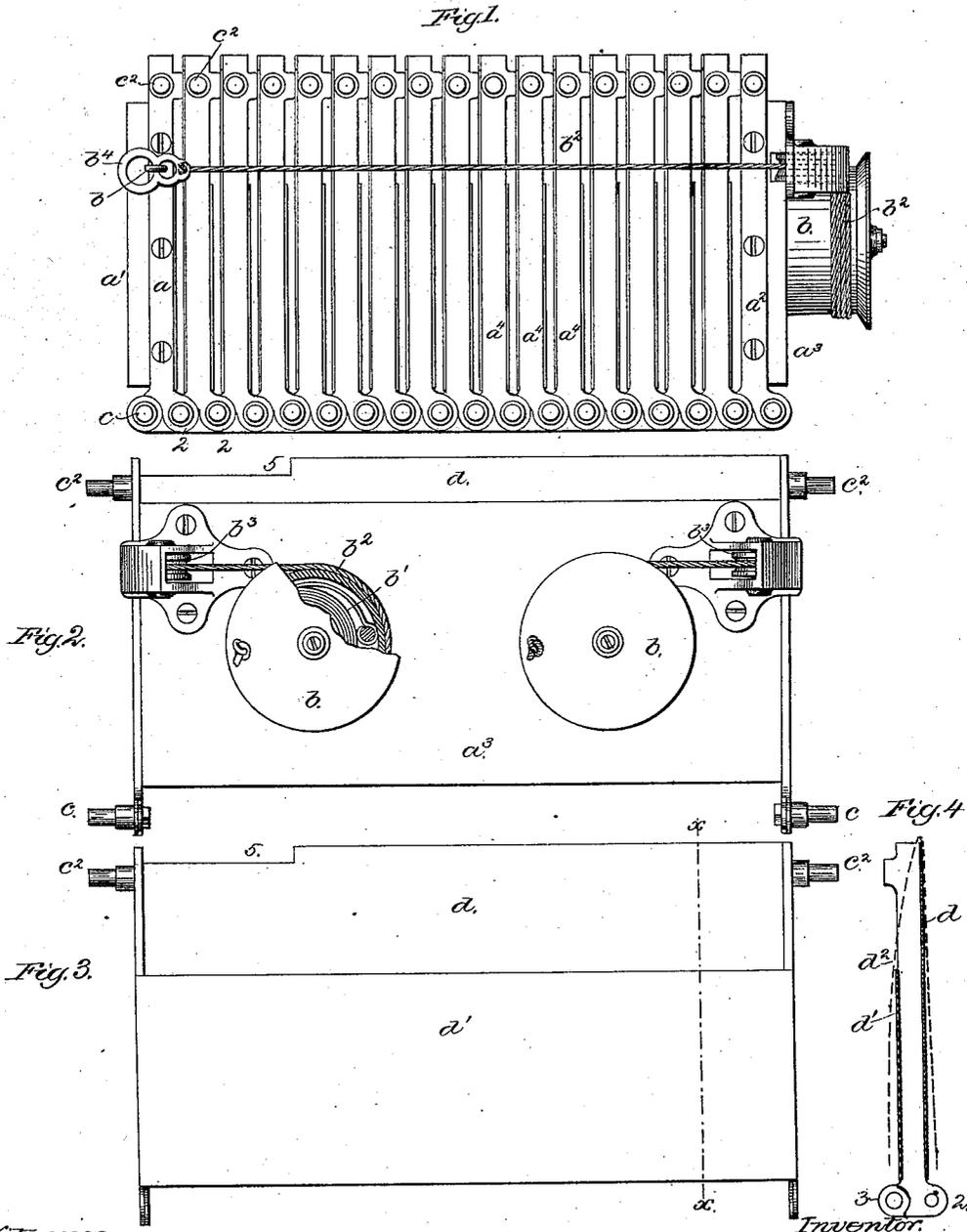


E. S. BOYNTON.

SIGNATURE PRESENTING MECHANISM FOR BOOK SEWING MACHINES.

No. 294,961.

Patented Mar. 11, 1884.



Witnesses.  
 John F. C. Penderfort.  
 L. J. Connor.

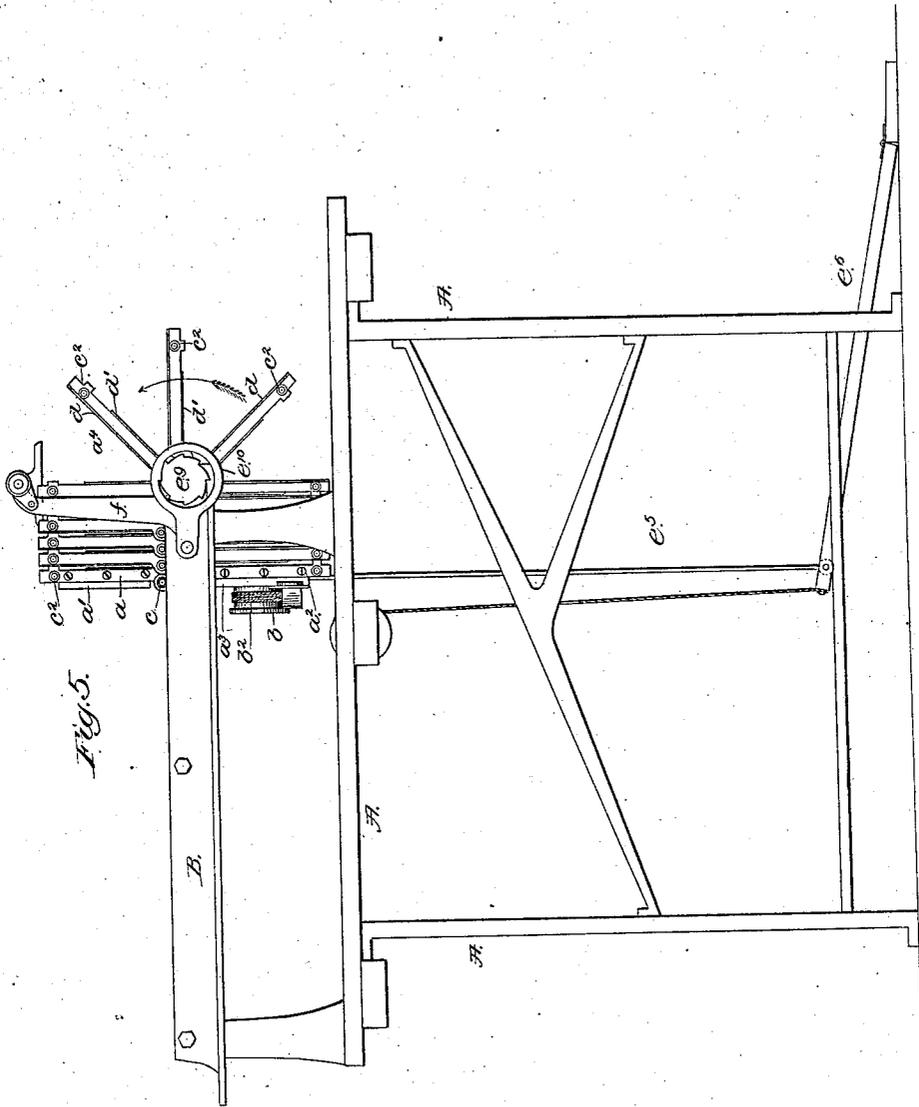
Inventor.  
 Edward S. Boynton,  
 by Crosby & Gregory, Attys.

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(No Model.)

3 Sheets—Sheet 3.

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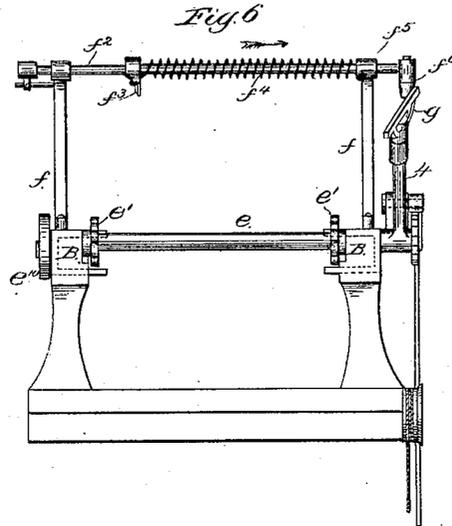


Fig. 9.

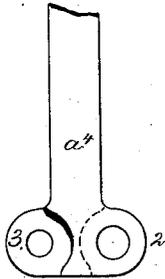


Fig. 7.

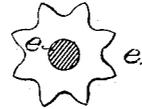


Fig. 8.

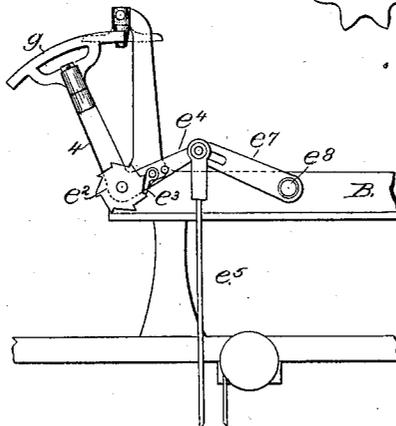
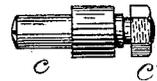


Fig. 10.



Witnesses.

John F. C. President  
L. F. Connor.

Inventor.

Edward S. Boynton.

by Henry Gregory  
Attys

# UNITED STATES PATENT OFFICE.

EDWARD S. BOYNTON, OF BRIDGEPORT, CONNECTICUT.

SIGNATURE-PRESENTING MECHANISM FOR BOOK-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 294,961, dated March 11, 1884.

Application filed November 12, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD S. BOYNTON, of Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Signature-Presenting Mechanism for Book-Sewing Machines, of which the following description, in connection with the accompanying drawings, is a specification.

This invention is an improvement on United States Letters Patent No. 232,446, granted to me September 21, 1880, to which reference may be had. In that patent the signature-holding plates were of equal lengths, and were hinged to each other and to the centers of a series of crossed arms joined together at their ends, after the manner of "lazy-tongs." With a holder of the kind therein described it was found necessary in practice to have a separate holder for books containing different numbers of signatures, which was quite expensive.

One object of this my present invention is to so make the holder that the number of signature-holding plates may be increased or decreased in number at will with facility, according to the number of signatures in the book to be made. To enable this object to be gained, the two plates, which hold each signature and keep it open for the entrance between its halves of the mechanism which is to remove the signatures from the holder, are secured directly to end pieces, so that the said plates lie parallel; but the plates are of different widths, in order to permit the edge of the widest plate to lie exactly in the center fold of its signature, while the narrowest plate does not enter the signature so far, and consequently the signature at its center fold is not injuriously opened, as would be the case if both plates were of the same width. The narrow plate extends about half-way into the signature, thus leaving sufficient space between the two parallel plates for the passage between them of the devices for discharging the signature therefrom. Making the plates of two widths and locating each with the other, as herein described, obviates injurious spreading of folded signature. The end pieces, to which the plates are secured, have double ears, and the ears of adjacent end pieces are pivoted one with the other by means of screw bolts or pins, which are of sufficient length outside the ears to form pins, which,

when the chain-like holder, composed of the said end pieces and plates, is applied in the filling-machine, may be engaged by a star-wheel, which acts to move the holder, and at the same time the chain-like holder, as it passes over the star-wheel and is bent, causes the signature-holding plates to be successively separated one pair from the pair next to it, for the easy introduction on the plates of a signature, after which, in the further movement of the chain, the pairs of plates composing the holder are successively closed as the chain assumes a straight-line position. These end pieces, at or near their opposite ends, are provided centrally with pins, which are engaged by a pawl of the sewing-machine, to be described in another application, such pawl operating to feed the holder forward intermittently and hold it securely in place while each signature is being removed therefrom. When the holder has been properly filled with signatures, the end pieces are substantially parallel, and the chain-like holder is substantially straight; but the end pieces composing the chain-like holder are connected each with the other only at one end. To enable the pawl referred to to operate upon the pins at the free ends of the end pieces and move the holder, it is necessary to clamp the end pieces together in some proper way. To do this the end pieces composing the ends of the chain are also connected by solid plates, preferably of wood, to thus form heads or ends.

The clamping mechanism herein shown, to hold the plates and ends together properly in the sewing-machine, is composed of cords and two hollow drums, each containing a clock-spring, the normal tendency of which is to wind the cords on the said drums. Each cord is provided at its outer end with a ring to engage a hook on the opposite head of the holder, and the cords are drawn out more or less, according to the number of signature-holding plates in the chain-like holder, the tension of the springs being increased proportionately as the cords are drawn off the drums.

Figure 1 represents in side elevation one of my improved holders closed, it having that one of its sides up which is necessary to retain the signatures on the plates; but when put into a book-sewing machine, such as will

be described in another application to be made by me, the said holder will be inverted. In this figure the signatures are omitted. Fig. 2 is a rear end view of the holder, showing that one of its heads which carries the drums and springs of the holder-clamping mechanism. Fig. 3 is a face view of the two parallel plates, of different width, which receive about them the signature; Fig. 4, a section of Fig. 3 on the dotted line  $x x$ , a signature being shown thereon in dotted lines. Fig. 5 shows part of the filling-machine to which the chain-like holder is applied in order to fill it readily with signatures; Fig. 6, a partial end view of Fig. 5, looking at it from the right, with the signature-holder omitted; Fig. 7, the star-wheel enlarged; Fig. 8, a right-hand end view of Fig. 6; Fig. 9, a view of one of the end pieces enlarged, and Fig. 10 a view of one of the pins for connecting the end pieces together.

The signature-holder may contain any desired number of plates and end pieces, according to the number of signatures in the book to be made. Commencing with the end pieces  $a$  of the holder, they are rigidly attached to the head  $a'$ , preferably, for lightness, made of wood. The end pieces  $a''$  at the opposite end of the holder are likewise joined by a wooden head,  $a'''$ , to which are secured two drums,  $b$ , each of which contains a clock-spring,  $b'$ , as shown in one of them in Fig. 2. Each drum has connected with it a cord,  $b''$ , which is extended over a sheave,  $b'''$ , properly supported on the said head. The outer end of each cord is provided with, preferably, a double eye,  $b^4$ , one portion thereof engaging a suitable hook,  $b^5$ , of the end piece  $a$ , the other portion of the eye serving for the reception of the finger, to enable the cord to easily draw out. The tendency of the springs  $b'$  is to wind the cords upon the drums  $b$ , and when the cords are drawn out and the eyes  $b^4$  are connected with the hooks on the end pieces  $a$ , the springs drawing on the ends keep the holder, composed of any desired number of end pieces, firmly clamped together. The end pieces  $a$  and the intermediate end pieces,  $a^1$ , of any desired number, are each provided with two ears, 2 3, (see Figs. 1 and 9,) the ears 3 of each end piece being countersunk to receive the ears 2 of an adjacent end piece. These ears 2 3 are joined together as a chain by means of pin-bolts  $c$ , (see Figs. 2 and 10,) which, extended through the said ears, are provided with nuts  $c'$ .

The end pieces  $a^1$  at opposite sides of the holder are connected together by the signature-holding plates  $d d'$ , placed parallel each with the other, but of different widths, the plate  $d$ , which extends into the signature to its central fold, being the widest. The narrow plate  $d'$  extends into the signature more or less, but never to its central fold, so as to injuriously open the signature  $d^2$ , (shown in dotted lines, Fig. 4,) thus leaving between the two parallel plates

$d d'$  an open space of sufficient width for the passage of the devices, which act upon the said signature at its center fold and discharge it from the holder and present it to the sewing mechanism, as will be described in my application for sewing-machine referred to. The pin-bolts  $c$  serve to connect together readily in a chain any desired number of end pieces and plates  $d d'$ . The free ends of the end pieces are provided centrally with rigid pins  $c^2$ , just in line with the space between the plates  $d d'$ , so that when the holder shown in Fig. 1 is placed in the book-sewing machine, but inverted, the said pin  $c^2$ , then at the lower side of the holder, will come into position to be acted upon by suitable pawls, to be therein described, which will intermittently move the signature-holder forward and hold it in such position that the open space between the plates  $d d'$  will be presented exactly in position below the devices which are to enter between the said plates to remove the signature thereon from the holder.

The apparatus for manipulating the chain-like holder to open it correctly for the easy introduction of the signature is composed of a frame,  $A$ , of suitable shape to support two guides,  $B$ , properly grooved to receive the outwardly-projecting ends of the screw pins or bolts  $c$ , each end piece of the signature-holder being suspended in the said guides. Extending across between these guides, at one end, is a shaft,  $e$ , having upon it two star-wheels,  $e'$ , having spaces of proper shape to receive the pin-bolts  $c$ , and which, during the rotation of the shaft  $e$  and star-wheel, carry the holder along, and at the same time, as the holder passes over the shaft  $e$  and star-wheels, bend it and separate adjacent pairs of plates  $d d'$ , as shown in Fig. 5, to have signatures applied to them, after which the said end pieces, as the chain is again straightened, will be placed substantially parallel each with the other, as designated by the end pieces above the level of shaft  $e$ . The cords  $b''$  are loosened and carried on the drum when the chain-like holder is first placed in the filling-up apparatus; but as soon as all the end pieces arrive into their higher plane above the shaft  $e$ , all the plates  $d d'$  having been provided with signatures, the said end pieces and heads are clamped together by the cords and springs, as shown in Fig. 1. The shaft  $e$  is provided with an operating-ratchet,  $e^2$ , which is engaged by a pawl,  $e^3$ , on a pawl-carrier,  $e^4$ , made as an elbow-lever and turning on the shaft  $e$ . This pawl-carrier is connected by link  $e^5$  with a pedal,  $e^6$ , kept elevated at one end in any suitable or usual way, so that by pressing on the pedal the shaft  $e$  may be rotated intermittently. The extent of movement of the pawl-carrier is governed by the slotted stop-link  $e^7$ , pivoted to the frame at  $e^8$ . At its opposite end (see Fig. 5) the shaft  $e$  has a retaining-ratchet,  $e^9$ , and ring-detent  $e^{10}$ . The filling-machine has two standards,  $f$ , (one near each end of shaft  $e$ ,) which support a

guided slide-rod,  $f^2$ , having a side register,  $f^3$ , to even the signatures on the plates  $d$   $d'$ . The rod  $f^2$  has upon it a tension-spring,  $f^4$ , to keep it pressed in the direction of the arrow, Fig. 6, and at its end the said rod has a head,  $f^5$ , provided with a roller,  $f^6$ , which is acted upon at each backward movement of the pawl-carrier by an adjustable segmental cam,  $g$ , carried by the upper arm, 4, of the pawl-carrier  $e^1$ .

10 The edge of the plate  $d$  which enters the central fold of the signature is cut away, as at 5, (see Figs. 2 and 3,) so as to leave room for the movement of the side register,  $f^3$ , and enable it to cover the head of the signature at its central fold, no matter what may be the thickness of the signature or the number of its pages. This side register acts against the heads of the signatures thereon arrive in line with it, and

20 pushes the signatures all into correct line upon the highest part of the plate  $d$ , placing all the signatures with their ends in line. The pins  $c^2$  are connected with the end pieces,  $a$   $a^2$ , centrally, so that each end piece is acted upon independently when the holder is being

25 fed forward in the book-sewing machine, such independent feeding of each end piece providing automatically for variations in the thickness of the signatures or plates, thus avoiding the liability of the signature-removing devices of the book-sewing machine striking the plates  $d$ .

I claim—

35 1. A signature-holder composed of a series of chain-jointed end pieces and connected plates carried thereby, to operate substantially as described.

2. In a signature-holder, two parallel plates of different widths connected at their ends

with end pieces, to thereby leave between the 40 plates a suitable opening for the passage of the devices which are to remove the signatures from the said plates, substantially as described.

3. The end pieces  $a^4$ , combined with the two 45 parallel plates  $d$   $d'$ , connected therewith, the latter being cut away at 5, to permit the signature to be acted upon at its head, substantially as described.

4. The plates  $d$   $d'$ , combined with the attached end pieces  $a^4$ , provided with independent 50 feeding-pins  $c^2$ , substantially as described.

5. A signature-holder composed of chain-jointed end pieces and connected plates, combined with the heads and with the spring-actuated drums, and cords to clamp the end pieces 55 together, substantially as described.

6. In a signature-holder, the end piece  $a$ , provided with a hook, and the end piece  $a^2$ , and head  $a^3$ , combined with the spring-actuated drums, and cords provided with double 60 eyes  $b^4$ , substantially as described.

7. The shaft  $e$  and star-wheels thereon and guides B, combined with the chain-jointed signature-holder, to operate substantially as 65 described and separate the adjacent end pieces and plates for the reception of signatures.

8. The shaft  $e$ , star-wheels, guides B, and chain-jointed signature-holder, combined with the side register mechanism to push into line the ends of the signatures on the plates of the 70 holder, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD S. BOYNTON.

Witnesses:

A. STEWARD,  
J. STEVER.