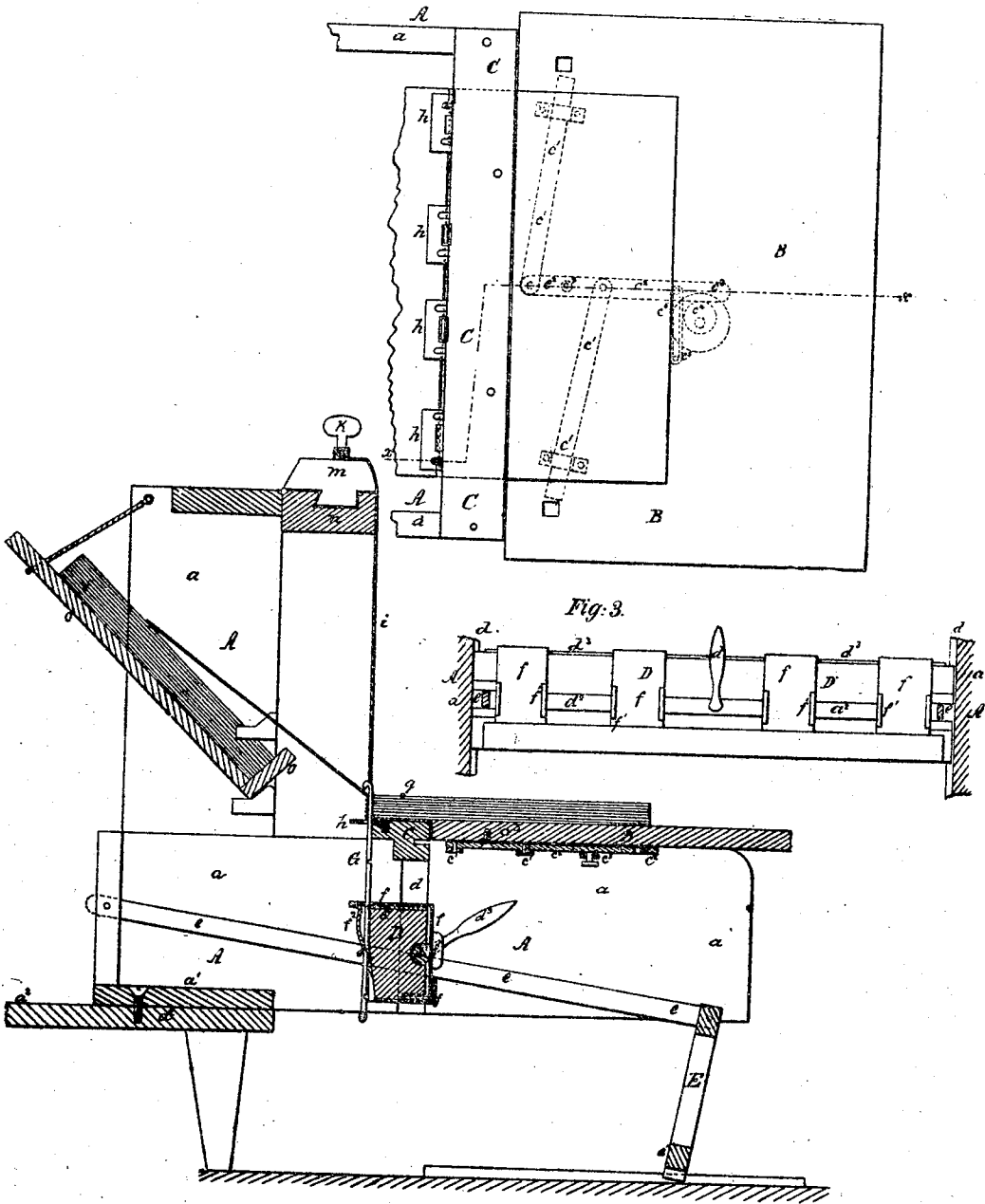


No. 66,899.

PATENTED JULY 16, 1867.

F. SIMS.  
BOOK SEWING MACHINE.

2 SHEETS—SHEET 1.



Inventor:  
F. Sims  
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BOOK SEWING MACHINE.

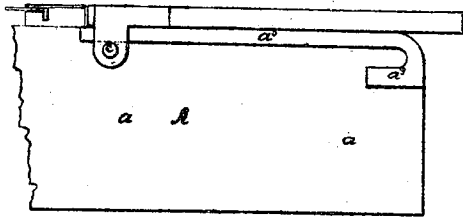


Fig. 7.

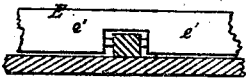


Fig. 8.

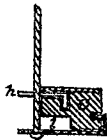


Fig. 10.

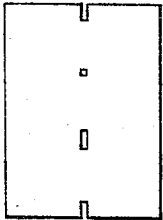


Fig. 11.



Fig. 9.

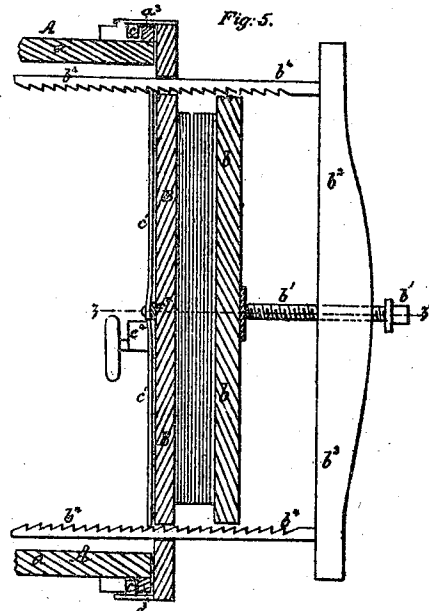
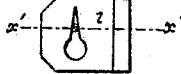
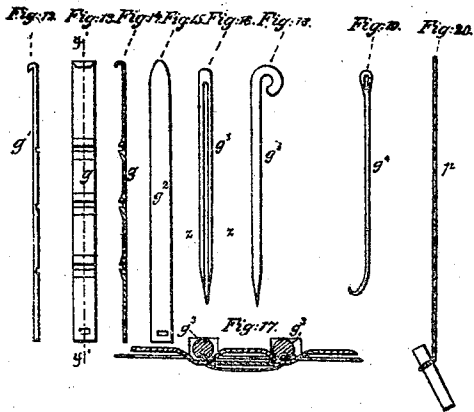
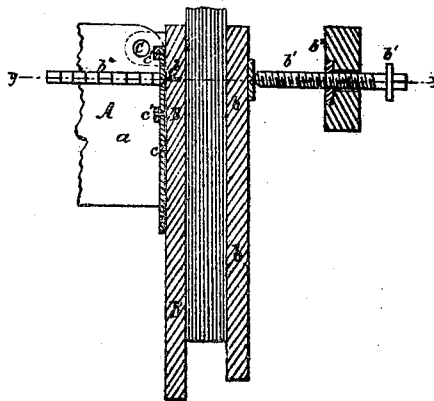


Fig. 5.

Fig. 6.



Witnesses.

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# United States Patent Office.

FERDINAND SIMS, OF GALVESTON, TEXAS.

Letters Patent No. 66,899, dated July 16, 1867.

## BOOK-SEWING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, FERDINAND SIMS, of Galveston, in the county of Galveston, and State of Texas, have invented a new and improved Book-Sewing Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a plan or top view of a portion of my improved book-sewing machine.

Figure 2 is a vertical longitudinal section of the same taken on a plane indicated by the line  $x x$ , fig. 1.

Figure 3 is a front elevation of the needle-holder D.

Figure 4 is a side elevation of a portion of the machine.

Figure 5 is a horizontal section of the press taken on a plane indicated by the line  $y y$ , fig. 6.

Figure 6 is a vertical cross-section of the press or clamp taken on a plane indicated by the line  $z z$ , fig. 5.

Figure 7 is a front view of a portion of the pedal E.

Figure 8 is a vertical section through one of the cord-holders or keys  $l$ , taken through the line  $x' x'$ , fig. 9.

Figure 9 is a top view of one of the cord-holders or keys  $l$ .

Figure 10 shows one sheet or section of the paper as it is prepared by me before I apply it to my machine.

Figure 11 shows the same section folded together.

Figure 12 is a face view of the round-hooked needle  $g'$ .

Figure 13 is a face view of the flat hooked-and-eyed needle  $g$ .

Figure 14 is a vertical cross-section of the same taken on the line  $y' y'$ , fig. 13.

Figure 15 is a face view of the flat-eyed and pointed needle  $g''$ .

Figure 16 is a face view of the grooved needle  $g^3$ .

Figure 17 is a horizontal cross-section through two of the grooved needles on an exaggerated scale, also showing the manner in which they are applied to the book.

Figure 18 is a side view of the grooved needle  $g^3$ .

Figure 19 is a side view of the bent or curved needle  $g''$ .

Figure 20 is a side view of the weighted cord  $p$ .

Similar letters of reference indicate like parts.

This invention relates to a machine in which different sections of paper, each section containing one or more sheets, are sewed together previous to their being bound. With the aid of this machine the different sections of paper are sewed together with the greatest ease and dispatch, by one continuous thread, which is passed around needles, cords, or metal plates, forming loops around some of the said needles or cords, so that when all the sections are sewed together the said needles, &c., are withdrawn, and cords or parchment bands substituted in their place, when the book will be ready for binding.

The invention consists—

First. In the general arrangement and construction of the machine in which the book is held for the purpose of being sewed together.

Second. In the manner of preparing the paper with notches and slots, so that the aforementioned needles, plates, or cords may pass through these notches or slots and enable the operator to pass the continuous thread from section to section; leaving space at the ends for trimming the book without cutting the thread.

Third. In the arrangement and construction of a press which, when attached to this machine, facilitates the finishing of the book after the same has been sewed, and by means of which, also, the different sections of paper are held together for the purpose of cutting or sewing the aforesaid notches or slots into the paper, and whereby, also, the book, when sewed, is held for the purpose of strengthening its back, with a system of stitching over the parchment bands, which is done with the aid of the grooved and the curved needles.

Fourth. In the construction of an adjustable needle-bar in which the aforesaid needles and plates are held in their respective places, the said needles being provided with notches which fit against the projecting edge of a metal plate attached to the upper side of the needle-bar, the edge of the plate fitting into the notches. The needles are secured to their respective places firmly, and prevented from being drawn out, by means of an eccentric-bar extending nearly the whole length of the needle-bar. The said eccentric presses certain metal

plates against the needles, thereby forcing the latter against the aforesaid projecting edge on the top of the needle-bar. Springs attached to the plates through which the needles pass serve the purpose of holding the needles in place prior to their being secured by the eccentric, and facilitating the removal of the needles with the book.

Fifth. In the adjustable plates attached to the needle-bar. These plates are perforated with slots for the needles to pass through, and are operated by the eccentric, as heretofore described. The plates are adjustable sideways, so as to allow different spaces between the needles on different-sized books.

Sixth. In the arrangement of a pedal by means of which the aforesaid needle-bar and all its appendages are raised and lowered at will.

Seventh. In the arrangement of the needle-guide. This consists of a wooden bar secured stationary to the machine. In this bar four, or more or less, metal plates are arranged, somewhat resembling those attached to the needle-bar, and, like them, laterally adjustable. These plates are provided with slots similar to those in the needle-bar plates, and the needles, passing through these slots, project above the guide-plates about one-eighth of an inch, plus the thickness of the paper already sewed. By means of these guide-plates the needles are steadied and a superior workmanship is secured.

Eighth. In the arrangement of cords, which may be substituted for the needles at each end of the book; said vertical cords being held at their lower ends in laterally-adjustable keys, from which they may be easily detached by cutting off a knot when the sewing is finished, while at the top each cord is wound around and held tightly by a pin which is (like a violin screw) screwed into a laterally adjustable block sliding on a board which forms part of the main frame of the machine, and is considerably higher than the tablet on which the paper is sewed.

Ninth. In the construction of the aforesaid slotted keys by which the lower ends of the cords are held. These keys are also laterally adjustable in the same block or bar in which the guide-plates slide.

Tenth. In the construction of the needles which are used in connection with the continuous thread to hold the different sections of paper together. Said needles may be round or flat, with or without eyes, at their lower ends, and with sharp or rounded hooks at their upper ends, as may be desired.

Eleventh. In the construction and application of the grooved and the curved needles, which are used when very strong books are to be made, in which case, after the book has been looped to the needles in the ordinary manner, two grooved needles are substituted for two of the round-hooked needles, and the space, say about three-eighths to one inch in width, between them, is filled up with a regular layer of twine, which is applied with the curved needle, whereby a parchment band laid between the needles will receive a layer of thread on both its sides, on the inside being the continuous thread, while on the outside the new layer, applied by the curved needle, holds the said band in place, as will be hereinafter more fully described.

The frame A of the machine, which consists of two side-boards,  $a$ , and a supporting or bottom board,  $a^1$ , is secured to a table by means of screws or other suitable devices, as shown in fig. 2, the table  $a^2$  being represented by red lines. By the sides  $a$  is supported the tablet B which slides forward and backward, and is level with the top of the guide-bar C when in position for sewing. The tablet B may be folded down, as shown in figs. 6 and 7, when it will, in conjunction with a board,  $b$ , screw,  $b^1$ , and cross-head,  $b^2$ , form a press or clamp for finishing the books and for other purposes. At each side of the tablet, near to its rear end, is attached a friction-pin or small roller,  $c$ , which, catching under a flange,  $a^3$ , attached to the sides  $a$ , prevents the tablet from being misplaced, laterally as well as vertically, while it permits perfect freedom of movement backward and forward. At the front end of the sides the flange  $a^3$  is bent back and forms a short groove, in which the pins  $c$  rest when the tablet is folded down for the press, and whereby the said tablet is held when in the latter position, all of which is completely shown in figs. 4 and 5. The cross-head  $b^2$  is adjusted by means of two ratchet-bars,  $b^4$ , one of which is secured to either end of the cross-head, fig. 5. These ratchet-bars are passed through holes cut through the tablet B, and are then held in place by pawls  $c^1$ . The said pawls (below the tablet) are pivoted to a lever,  $c^2$ , which is attached to the under side of the tablet, and swings around a pin,  $c^3$ . The lever and pawls are operated by an eccentric cam,  $c^4$ , and a spring,  $c^5$ . When the cam is turned from the lever the spring will drive the pawls into the teeth of the ratchets, all of which is shown in figs. 2, 5, and 6, and by dotted lines in fig. 1.

The needle-bar D, which slides up and down in grooves  $d$  cut into the sides  $a$  of the machine, is operated by means of a pedal arrangement, E. The latter consists of an oblong wooden frame, (vertically adjustable as to height,) which is attached, by means of levers  $e$ , to the main frame of the machine, and reaches down to the floor (or to a board on the floor) of the apartment in which the machine is set up. The levers  $e$  are pivoted to the very rear end of the machine, and pass through the needle-bar D, so that the latter is raised or lowered as the levers are raised or lowered by means of the pedal E. The more the latter is brought to a vertical position the higher will be the needle-bar. The lower pedal-bar  $e^1$  may be provided with notches at one or more places, fitting over cleats attached to the floor, and held in any desired position by friction-springs, which press against the sides of the groove and the cleat, (see fig. 7.) By this arrangement any lateral displacement of the pedal is effectually prevented, but it will be very easy to change its vertical position, and consequently depress or raise the needle-bar. The latter is in turn prevented from moving forward or backward by means of appropriate guides fitting in the grooves  $d$ , whereby only an up-and-down motion of the needle-bars is permitted. The needle-holders  $f$  are sheet-metal plates fitting partly around the needle-bar D in such a manner that they may be easily adjusted sideways, while only a very small play forward is permitted to them, and an up-and-down play is effectually prevented. This upper surface is provided with perforations for the needles G to pass through. These perforations are just wide enough to hold the needles and to prevent their playing sideways; but they are longer than the needle is thick, so that when the needle-holders are pressed forward by the eccentric  $d^2$ , by

means of the handle  $d^1$  by which the latter is operated, the needle will be pressed against the projecting edge of the plate  $d^2$  attached firmly to the needle-bar D. The needles are provided with notches, as seen, and when pressed against the needle-bar these notches should just fit to the edge of the plate  $d^2$ , thereby preventing an up-and-down movement of the needles on the needle-bar. The needle-holders are provided with handles  $f^1$ , to facilitate their being moved sideways when needed. A spring,  $f^2$ , is attached to the rear end of each needle-holder, and serves the purpose of keeping the needles in place before they are secured by the eccentric. The needle-guide bar C, which is secured to the machine exactly above the needle-bar, is just level with the tablet B, as seen in fig. 2. Within grooves cut into the said guide-bar C, slide laterally the guide-plates  $h$ , which are provided with slots corresponding with those in the needle-holders. When once arranged in proper position, the guide-plates may be steadied by means of wedges, pins, or other suitable devices.

Each section of paper is prepared in a manner similar to the one shown in figs. 10 and 11. A notch or slit is cut into each end, and further notches in the middle, one notch wherever a band is to be placed at the back of the book. When the paper is folded together the notches in the middle are cut by means of broad saws, either circular or straight, or by a chisel with projecting flanges to cut the sides. The slots in the ends may be also cut with a saw, but the leaves may there simply be separated with a common knife. The needles may be round like the needle G in fig. 2, or they may be flat sheet-metal needles like the needle  $g$  in figs. 13 and 14. They are all provided with hooks at their upper end, as shown. These hooks are rounded off, but may be pointed in case it should be found desirable not to provide the notches in the paper. The needles will then be pierced through each section of the paper. The needles may or may not be provided with eyes at their lower ends. A kind without eyes,  $g^1$ , is shown in fig. 12. The hooks may also be omitted for certain purposes, hereinafter mentioned, in the round needles as well as in the flat ones. In that case the round needles will be like the common sewing-needles now in use, while the flat pointed ones without hooks, but with eyes, will appear like  $g^2$  in fig. 15. Another kind of needle,  $g^3$ , is shown in figs. 16, 17, and 18. These are provided with a groove cut into their entire length, as seen, and the needle  $g^4$ , shown in fig. 19, is a common needle with a curved or bent point. It is sometimes found desirable to substitute at one or both ends of the book a cord instead of a needle. In this case the cord  $i$  which is wound around a pin,  $k$ , is attached at its lower end to a slotted key-plate,  $l$ , shown in figs. 8 and 9. The slot in this plate is tapering, as shown, so that a cord of any thickness whatever may be passed through it. A knot is then tied into the lower end of the cord, and the latter is then pushed towards the narrower end of the slot until it is well clamped between the surrounding edges. The key-plate  $l$  slides on the guide-block C in a manner similar to the guide-plates  $h$ . The pin  $k$  is screwed into a block,  $m$ , the latter sliding laterally in a groove cut into a board,  $n$ , supported by the frame A, as shown in fig. 2. An inclined rack or paper-holder, O, is attached to the frame A in any suitable manner. The paper to be sewed is placed upon the same, and is taken from it by the operator.

The *modus operandi* of this machine is as follows: The operator stands or sits in front of the machine at O, in fig. 2. With his hands he can reach to the rack to take down one section of paper after the other. With his foot he operates the pedal E. In the first place he takes a number of sections, places them in the press and prepares the paper by cutting the necessary notches and slots into the back. He then removes the cross-head  $b^2$  and the board  $b$ , slides the tablet B up until it comes in contact with the guide-bar C, and adjusts the pedal and needle-bar so that the needles will project about one-eighth of an inch above the guide-bar and tablet. The needles must, of course, be adjusted to the notches in the paper, that is, they must be round where the notches are cut narrow, or flat where the notches are wide. The needles must also be adjusted laterally to correspond exactly with the notches, so that when the operator takes one section down, opens it, (see fig. 10,) and places it upon the tablet, the upper hooked ends of the needles will pass through the notches in the paper. The operator then, while the paper is still unfolded, passes a thread, the end of which is fastened to the side of the frame, and which thread is unwound from a spool, in the rear of the needles and under their hooks. It will be observed that the hooks on the needles point towards the rear of the machine. A thread laid across the paper in the rear of the needles will consequently be below the hooks, and will, when they are slightly drawn down, be prevented from leaving its proper place. When the thread is laid beneath the hooks the needles are drawn down to engage the thread, then the paper is folded together, and the next section is taken down from the rack and placed so that the needles pass through the notches. The thread is then passed around the last needle to the right or left so as to form a loop, and then passed in rear of and under the hooks of the other needles, as described. This procedure is repeated with each section until the required number of sections are thus bound together. Thus it is seen that the thread passes out at the end of one section and in at the end of the next. I can modify this process by omitting the slots at the end of the book and simply using a common threaded needle, which instead of taking the thread around through slits at the ends of the sections passes it through the extreme left or right notches, and around the extreme left or right needle or cord, and thence in through the corresponding notch in the next section which is laid on. The thread passes under the hooks of the intermediate needles, and is disposed of as described in case of the spool being used. This process is used for first-class blank-books or other books where the binder objects to the slots at the ends; and all that is gained over the common mode of sewing is the expeditious sewing at the intermediate notches between the extreme right or left notches. With each additional section the operator must raise the needle-bar slightly, so that the needles will project about one-eighth of an inch above the top of the paper. When the needle-bar is raised as high as it can be, and more paper has to be sewed yet, it becomes necessary to raise the needles in the needle-holders, so that the projecting plate  $d^2$  will catch into the next notch of the needle. This is done by releasing the hold of the eccentric  $d^2$  upon the needle-holders. The paper will hold the needles sufficiently while the needle-bar is brought down to the next notch, when the eccentric secures the needles in their new position, and the operation of sewing may be resumed.

For the purpose of additionally strengthening the ends of the book, an extra thread,  $p$ , may be employed. The same is provided with a weight, as shown in fig. 20, and is passed around the continuous thread at each end of the book, before the continuous thread forms a loop around the end needle. After passing the weight around it is let go, and drops down at the back of the tablet, drawing tight the thread attached to it. Thus the loops of the continuous thread at the ends of the sections, and the sections themselves, are tied together. When a number of sections are thus sewed together they may be held down upon the tablet by one or more cords,  $q$ , which will keep the paper in proper place, and prevent it from rising from the table when the needles are pushed up. The said cord  $q$  is tightened by a screw or eccentric, or other suitable device. It may also be found desirable to use the cords  $i$ , instead of the needles, at the end notches. In that case the operation is precisely the same as if they were needles. When the sewing is completed the cords  $i$  are simply cut off, and, when needles are used, they must be drawn out, and cords have to be drawn in through the loops in their stead, to finish the book for the binder. To pass this cord through the loops and notches after the book has been sewed, it is simplest to provide the lower end of each needle with an eye, when the cord is threaded into each needle, the latter pulled out, and the cord substituted for it. Where flat needles are used, parchment or linen bands, instead of cord, must of course be employed. But as it may sometimes be found desirable to place the cords through the loops in the back of the book with separate needles, the flat-pointed needle  $g^2$  or a common sewing-needle will be found to answer that purpose. When the sections have all been looped on to the needles the book is taken out, with the needles, the eccentric  $d^2$  being of course previously turned so as to release the needles, when the book is placed, needles and all, into the press or clamp again. There the cords are passed through the loops in the back with the common sewing-needle or flat plate pointed needle before described. The sewing is then finished. For making very strong books, two of the round needles are placed near to each other in the needle-holders, and when sewed and placed in press, the grooved and curved needles are employed for further strengthening the space between the two needles. The grooved needles  $g^2$  are placed into the notches, the grooves towards the outside, as seen in fig. 17. The continuous thread will be outside of the needles, and the curved needle  $g^1$ , which is threaded, is passed into the groove of one needle, under one thread, and then into the groove of the next needle, making a loop wherever it comes in contact with the continuous thread, and laying an extra layer of thread outside of any parchment-band which may be placed between the two needles, which band, as well as the extra layer of thread, is shown in blue lines in fig. 17. The book, when sewed with the slotted end sections, must be trimmed close to the loops in the end, and will be found when sewed in my machine to be easier made and more substantially held together than could be done in the old style. It is also obvious that a great amount of labor and time is saved by my mode of sewing books.

I claim as new, and desire to secure by Letters Patent—

1. A machine for sewing books, made and operating substantially as herein shown and described.
2. I claim the manner of preparing the sections of paper with notches, slots, and slits at the ends, &c., substantially in the manner and for the purpose herein shown and described, and the use of sections thus prepared.
3. I claim the combination of the cross-head  $b^2$ , screw  $b^1$ , and board  $b$  with the tablet B, for the purpose of forming a press or clamp, operating substantially as herein shown and described.
4. I claim the needle-bar D, and its combination with the eccentric  $d^2$ , plate  $d^1$ , and needle-holders  $f$ , all made and operating substantially as herein shown and described.
5. I claim the slotted needle-holders  $f$  and springs  $f^2$ , constructed and operating substantially as herein shown and described.
6. I claim the pedal arrangement E, when combined with the levers  $e$  and needle-bar D, substantially in the manner and for the purpose herein shown and described.
7. I claim the slotted guide-plates  $h$ , made and operating substantially as herein shown and described.
8. I claim the application of the cords  $i$ , and the manner of holding the same in place, substantially as and for the purpose herein shown and described.
9. I claim the slotted key-plate  $l$ , made and operating substantially as herein shown and described.
10. I claim the needles G,  $g$ ,  $g^1$ , and  $g^2$ , made and employed and operating substantially in the manner herein shown and described.
11. I claim the needles  $g^3$  and  $g^4$ , when applied for the purpose herein shown and described.

F. SIMS.

Witnesses:

WM. F. McNAMARA,  
ALEX. F. ROBERTS.