June 5, 1934. O. KLEINSCHMIT ET AL 1,961,422

MECHANISM FOR AUTOMATICALLY SEVERING THE TERMINAL THREADS OF A STITCHED BOOK OR THE LIKE

Filed Feb. 11, 1931 2 Sheets-Sheet 1

Fig. 1.

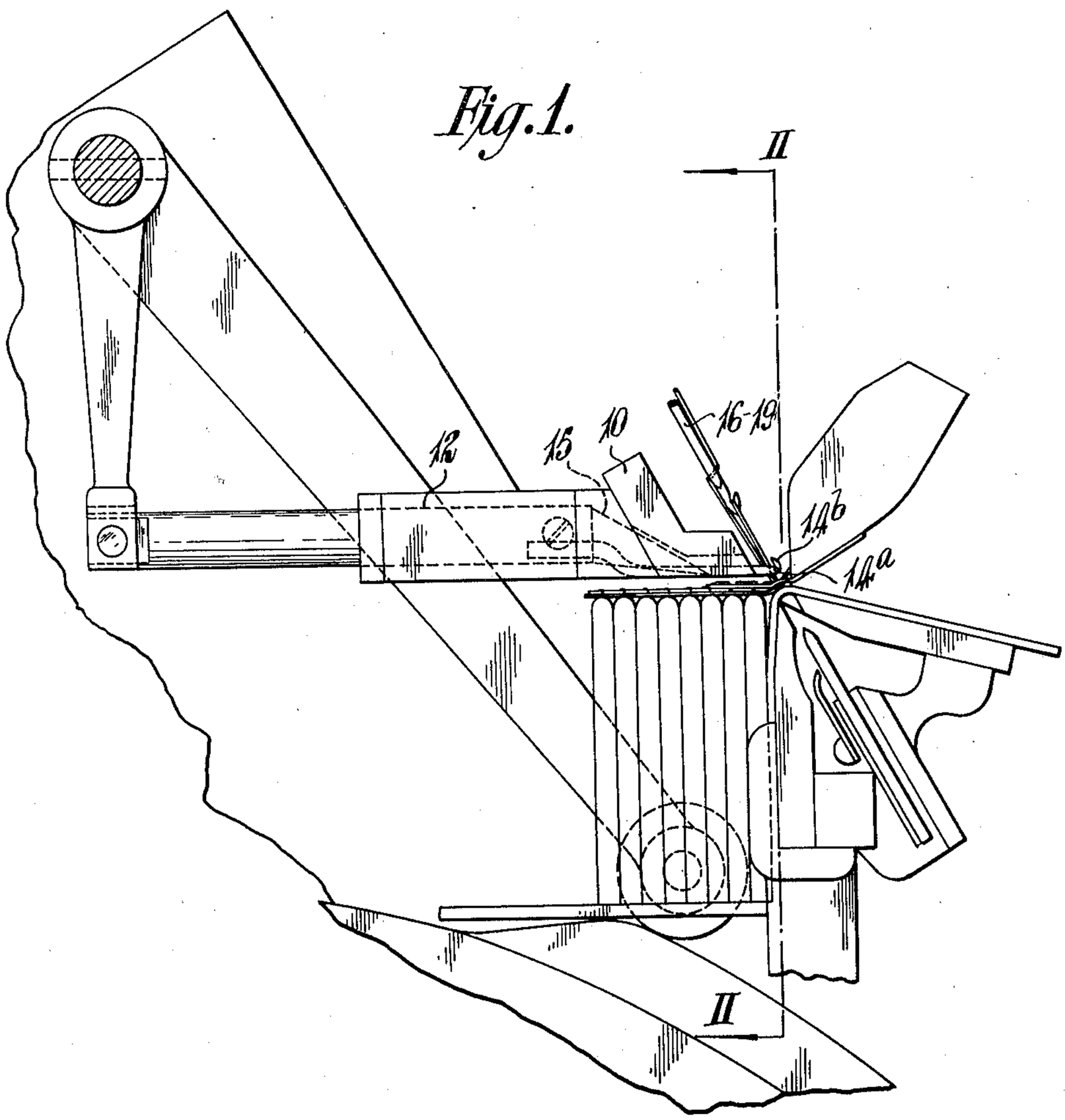


Fig. 3.

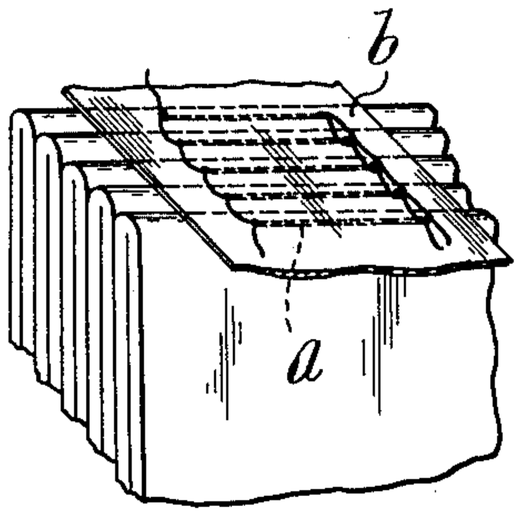
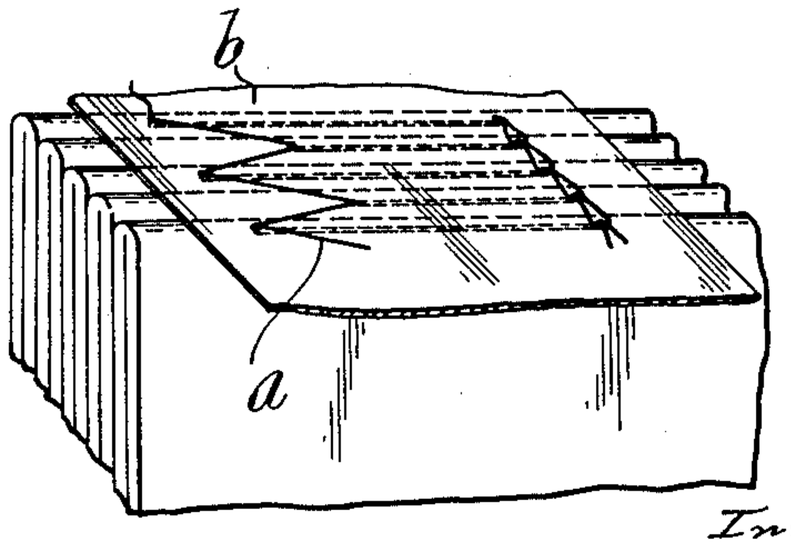


Fig. 4.



Inventors:
Oscar Kleinschmit
and Oskar Müller
By Lucius Ramick Attorney

June 5, 1934. O. KLEINSCHMIT ET AL 1,961,422

MECHANISM FOR AUTOMATICALLY SEVERING THE TERMINAL THREADS OF A STITCHED BOOK OR THE LIKE

Filed Feb. 11, 1931 2 Sheets-Sheet 2

Fig. 2.

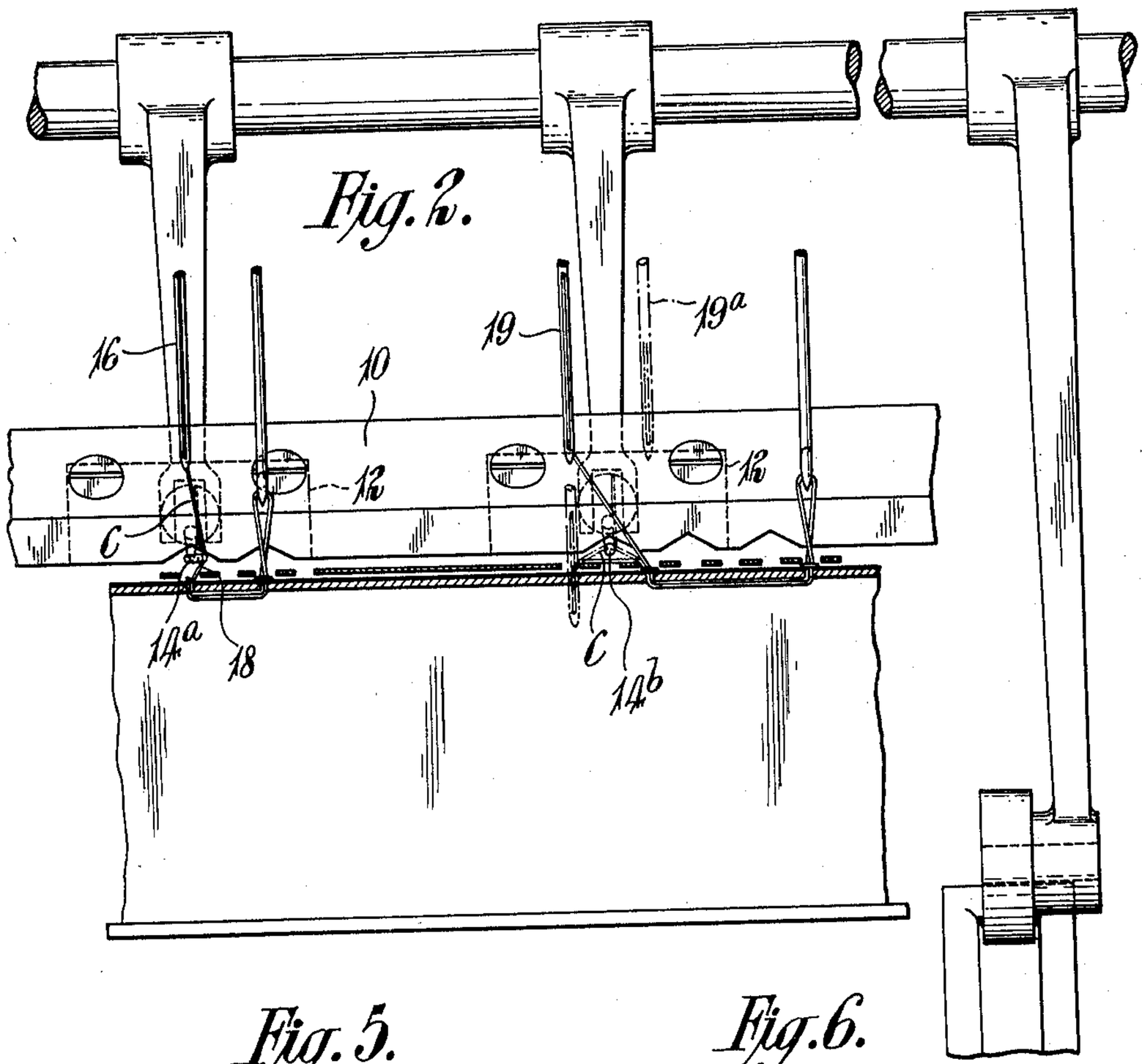


Fig. 5.

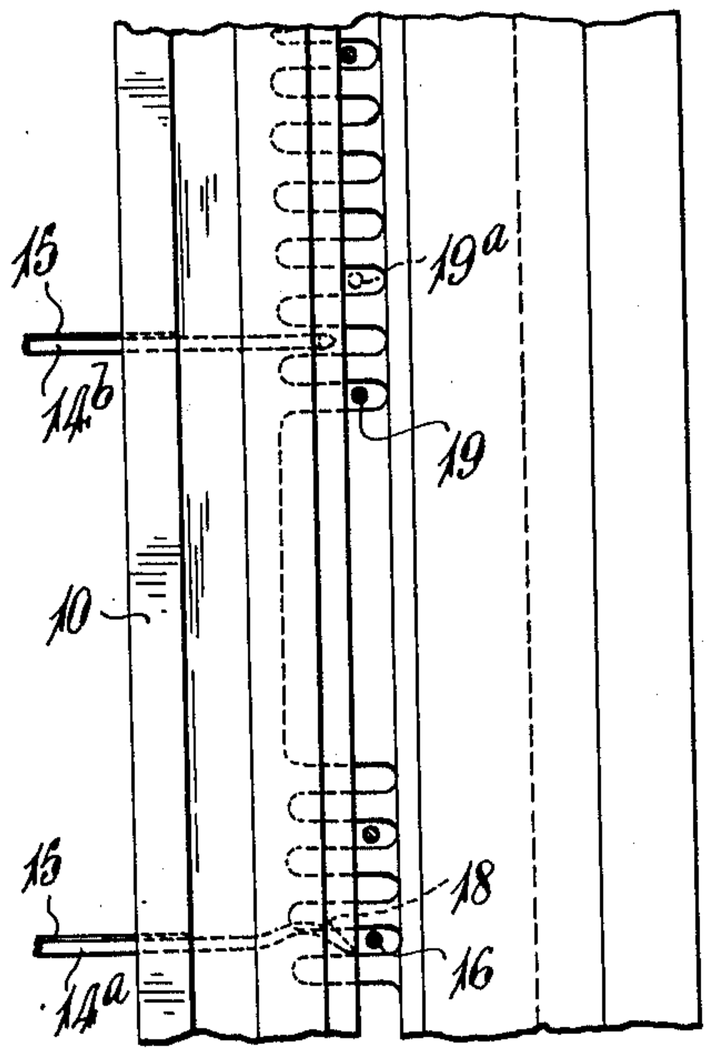
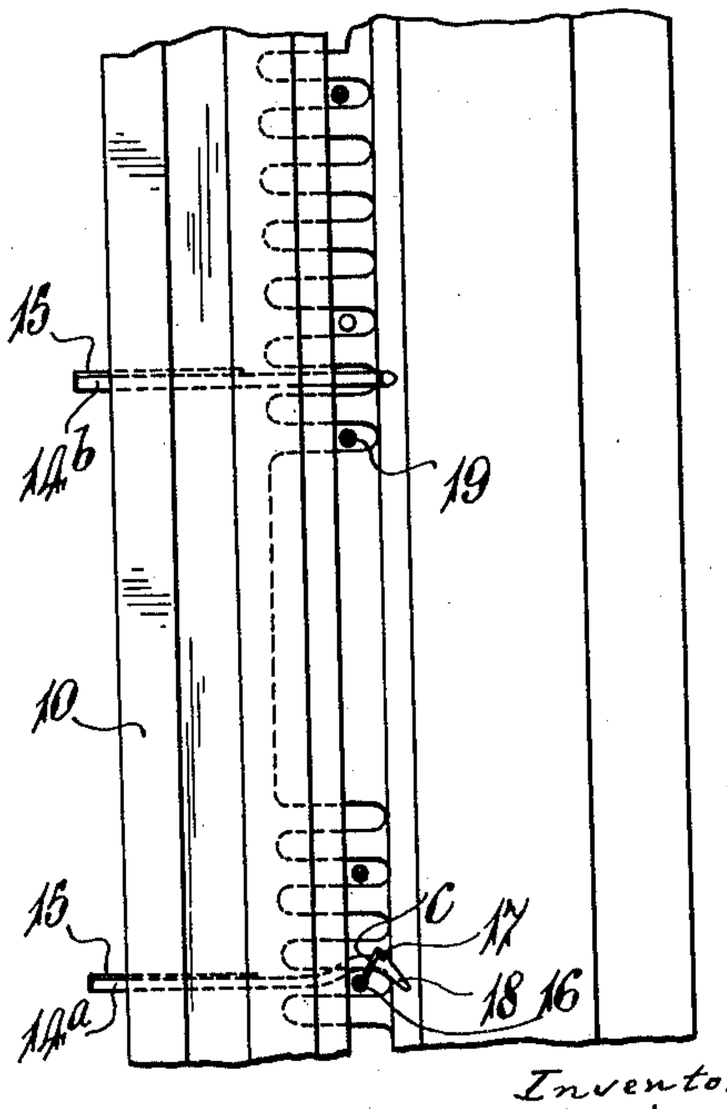


Fig. 6.



Inventors:
Oscar Kleinschmit
and Oskar Müller
By Lunt, Dunnigan & Watson Attorneys

Patented June 5, 1934

1,961,422

UNITED STATES PATENT OFFICE

1,961,422

MECHANISM FOR AUTOMATICALLY SEVERING THE TERMINAL THREADS OF A STITCHED BOOK OR THE LIKE

Oscar Kleinschmit and Oskar Müller, Leipzig-Plagwitz, Germany, assignors to firm Gebruder Brehmer, Leipzig-Plagwitz, Germany

Application February 11, 1931, Serial No. 515,067
In Germany October 25, 1930

22 Claims. (Cl. 112—252)

The present invention relates to book-stitching machines and more particularly concerns that type of machine in which means are provided for inserting, if desired, both simple chain-loop stitches and also cross or staggered stitches into the sections of a continuously stitched book-pad, as is well-known in the art.

In order to separate the stitched books from a book-pad stitched in this manner it is necessary to sever the interconnecting threads between the adjacent books.

Hitherto this operation has been performed manually although, when the interconnecting threads form part of idle stitches provided between the adjacent books, the threads may be severed mechanically as described in the co-pending application No. 501,128, filed by Andre Rivlois and Oskar Müller on December 9, 1930. Such stitches may, however, be inserted in book-pads without the use of interposed idle stitches, or alternatively the stitches may be utilized with or without idle stitches to secure backing strips to the book-pads. In this case it may prove to be impractical to use the mechanism described in the above numbered co-pending application.

The object of the present invention is to provide means for mechanically severing the interconnecting threads between the adjacent books of a stitched book-pad when the latter is stitched without the provision of idle stitches between the books, or with staggered stitches and/or provided with a backing strip as is known in the art.

According to this invention mechanism is provided for use in a thread-stitching machine whereby the thread leading from the terminal stitch of a stitched book to the initial stitch of an adjacent book is engaged mechanically and guided to thread severing means.

In order that the above description may be more readily understood, one embodiment of the invention will now be described with reference to the accompanying drawings which show, by way of example, one constructional form of the invention applied to a stitching machine of the swinging carrier type whereby both simple chain-loop stitches and staggered stitches may be inserted, if desired, into the book-sections in known manner. Referring to the accompanying drawings:

Fig. 1 is an elevational view of the thread-severing apparatus shown positioned adjacent the stitching mechanism of a book-stitching machine.

Fig. 2 is a sectional view taken on line II—II of Fig. 1.

Fig. 3 shows part of a book-pad provided with a backing strip stitched with a simple chain-loop stitch.

Fig. 4 shows part of a book-pad provided with a wide backing strip which is stitched thereon by means of staggered or cross stitches.

Fig. 5 is a diagrammatic plan view showing the thread guides in the retracted position, and

Fig. 6 is a view corresponding to Fig. 5 but with the thread guides in the advanced position.

Referring to Figs. 3 and 4, it will be seen that when a backing strip is attached to the back of the book-pad, either by means of a simple chain-stitch (Fig. 3) or by staggered stitches (Fig. 4) the thread guide or selector as described in the co-pending application No. 501,128 described above will not find the connecting thread *a* since when the simple chain stitch is used, the the thread *a* will be positioned under the backing strip while, in stitching the book-pads with staggered stitches the connecting thread *a* although now positioned on top of the backing strip *b*, is displaced from side to side during the stitching and so renders difficult the correct registration of the thread guide and requisite interconnecting thread.

Referring to Figs. 1 and 2, it will be seen that the thread guiding and severing apparatus is arranged to function in a manner similar to that described in the above referred to co-pending application. A guide bar or rail 10, extending transversely over the machine, carries a series of conveniently adjustable guide-supports 12 in which guide members are securely mounted. The latter members each carry a thread selector or guide 14*a* or 14*b* and are adapted to be reciprocated from the main drive of the machine in a substantially horizontal plane by the mechanism shown in the drawings. A thread severing member 15 is mounted adjacent to or on each thread guide 14*a* or 14*b* and may be adapted to be reciprocated with the associated thread guide or to remain stationary as desired. As shown more clearly in Figs. 5 and 6, the thread guides 14*a* which are associated with the simple chain-loop stitching means are positioned immediately below and in line with the stitching needles 16. The extremity of each thread guide 14*a* is curved and provided with a hook 17 having an obliquely slanting nose 18 (Figs. 2, 5 and 6). Upon engaging the taut thread *c* (Figs. 2 and 6) the nose 18 of the thread guide will deflect the thread and so cause the latter to slide over the curved nose and thus lodge behind the hook 17 (Fig. 6).

In order to insert the staggered stitches into the book-pad, the stitching needle 19 is periodi-

cally displaced in known manner during its stitching operation to the positions shown in full and chain dotted lines in Fig. 2. Referring more particularly to Figs. 5 and 6, the thread guide 14*b* is shown positioned midway in the path of lateral travel of the stitching needle 19. The member 14*b* is shaped as a straight needle having a hooked extremity. From the arrangement of the threads *a* shown in Fig. 4 it follows that a loose thread loop is not available to engage the member 14*b* but when positioned as above described and arranged to reciprocate in timed relation to the movement of the stitching needle, the thread *c* becomes laid across the thread guide and is retained by the hooked extremity of the latter.

As above mentioned, the means employed for reciprocating the thread guides and also for timing the movements of the said guides may be as described in the co-pending application No. 501,128 mentioned above, and it will be readily appreciated that the actuating mechanisms of the thread guides 14*a* and 14*b* may be linked together to synchronize the movement of the thread guides when both types of stitches are simultaneously inserted in the same book-pad.

The operation of the mechanism is as follows: When the stitching needle 16 has completed the terminal stitch of a completely stitched book forming part of a book-pad, the said stitching needle is retracted upwardly and so draws the thread *c* taut in an upward direction as shown in Figs. 1 and 2. The thread-guide 14*a* which is in line with the needle 16 and retracted (Fig. 5) is then advanced by the timed actuating mechanism and so engages the inclined nose 18 with the thread *c*. The continued forward movement of the thread guide 14*a* causes the thread *c* to slide round the nose 18 and finally to lodge behind the hook portion 17 thereof (Figs. 2 and 6). The thread *c* which is thus retained upon the thread guide 14*a* is then carried downwards by the stitching needle 16 when the latter inserts the initial stitch into the adjacent book section and is so laid across the thread guide 14*a* to be retracted together with the latter during the reciprocating movement of the actuating mechanism. During the stitching of the subsequent sections of the book-pad, the thread *c* is progressed along the thread guide 14*a* and is eventually brought into contact with the thread-severing member 15 and so severed. In the meantime when dealing with book-pads in which both types of stitches are inserted, the thread guide 14*b* has also received a thread *c* in the following manner. The thread guide 14*b* is timed to be positioned in the retracted position shown in Fig. 5, when the stitching needle 19 is inserting stitches into the intermediate sections of a book, and until the stitching needle has completed the terminal stitch of a completely stitched book. The stitching needle is then once more retracted upwardly and displaced laterally from the chain-dotted position 19*a* to the full line position shown in Fig. 2, and at this moment the thread guide 14*b* is advanced to the position shown in Fig. 6. Thus, when the stitching needle 19 descends to insert the initial stitch into the adjacent book, the thread *c* is laid across the thread guide 14*b* behind the hooked extremity thereof as shown in dotted lines in Fig. 2. The subsequent retraction of the thread guide 14*b* then draws the thread slightly in advance of the attached book and in due course, during the progress of the book-pad, the thread *c* is guided towards the thread severing member 15 and severed thereby.

We do not wish to limit the scope of the invention to the specific form of reciprocating and timing mechanism shown in the accompanying drawings, since it will be obvious that such mechanism may be readily varied in accordance with the particular type of stitching machine in which the invention is embodied.

We claim:

1. In a book-stitching machine, in combination, a stitching needle adapted to be displaced laterally during its operative movement, a thread guide provided with a hooked extremity positioned in the lateral path of travel of the said stitching needle, means for reciprocating the said thread guide, means for controlling the movement of the said thread guide, a thread severing member, means for engaging a thread carried by the said stitching needle with the said thread guide, and means for contacting the said thread with the thread severing means.

2. In a book-stitching machine, means for severing the interconnecting threads of a continuously stitched book-pad, comprising a thread severing device, a thread guide extending from said thread severing device to a thread leading from the stitched book-pad, and means for engaging said thread guide with said thread so that the latter becomes looped over the said thread guide and progresses along the guide during the travel of the book-pad to engage said thread severing member.

3. In a book-stitching machine, means for severing the interconnecting threads of a continuously stitched book-pad, comprising a thread severing device, a thread guide extending from said device to a thread leading from the stitched book-pad, means for engaging said thread guide with said thread, and means for retaining said thread upon said thread guide so that the thread becomes looped over said guide and progresses along the guide during the travel of the book-pad to contact with said thread severing device.

4. In a book-stitching machine, means for severing the interconnecting threads of a continuously stitched book-pad, comprising a thread severing device, a thread guide extending from said thread severing device to a thread extending upwardly from the stitched book-pad, and means for engaging said thread guide with said updrawn thread so that the latter becomes looped over said thread guide and progresses along the guide during the travel of the book-pad to engage said thread severing member.

5. In a book-stitching machine, means for severing the interconnecting threads of a continuously stitched book-pad, comprising a thread severing device, a thread guide provided with a hooked extremity and extending from said thread severing device towards a thread leading from the stitched book-pad, and means for engaging the hooked extremity of said thread guide with said thread so that the latter becomes looped over said guide and progresses towards said thread severing member during the travel of the book-pad.

6. In a book-stitching machine, means for severing the terminal threads of a stitched book or the like, comprising a thread guide, a thread severing device mounted on said thread guide, and means for engaging said thread guide with the terminal thread to be severed so that the latter becomes looped over the said guide and progresses toward the thread severing device mounted on

the said guide finally to contact therewith during the travel of the book-pad.

7. In a book-stitching machine, means for severing the terminal threads of a stitched book or the like, comprising a thread guide provided with a hooked extremity, a thread severing device mounted upon said thread guide, and means for engaging the hooked extremity of said guide with a thread leading from a stitched book so that the said thread is progressed along the thread guide to engage the said thread severing device during the travel of the book-pad.

8. In a book-stitching machine provided with thread sewing needles, means for severing the connecting threads of a continuously stitched book-pad, comprising a thread severing device, a movable thread guide extending from the thread sewing needles to said thread severing device, means for positioning said thread guide so that the thread depending from one of said needles becomes looped thereover during the stitch-forming movements of said needles, and means for retaining said looped thread upon said thread guide until the looped thread is progressed along the said guide during the travel of the book-pad to contact with said thread severing device.

9. In a book-stitching machine, means for severing the interconnecting threads of a continuously stitched book-pad, comprising a thread guide adapted to reciprocate in the plane of the thread to be severed and shaped to engage said thread so that the latter becomes looped thereover, and a thread severing device associated with said thread guide and adapted to sever the said thread as the latter is progressed along said thread guide during the travel of the book-pad.

10. In a book-stitching machine, in combination, thread sewing needles, a thread guide comprising a substantially horizontal shaft having a hooked extremity, a thread severing blade mounted upon the said guide shaft, and means for imparting a reciprocatory movement to said shaft whereby the latter moves into the path of a thread depending from one of said sewing needles so that the thread becomes looped around the shaft to move into contact with the said thread severing blade during the travel of the book-pad.

11. In a book-stitching machine, in combination, thread sewing needles adapted to insert chain-loop stitches into a continuously stitched book-pad, a thread guide comprising a substantially horizontal shaft having a hooked extremity, a thread severing blade mounted upon the said shaft, and means for moving said shaft to engage the hooked extremity thereof with a thread extending from a formed chain-loop stitch so that the said thread becomes drawn over the said shaft and is progressed along the shaft to contact with the said severing blade.

12. In a book-stitching machine, in combination, a stitching needle adapted to be displaced laterally during its operative movement, a thread guide positioned in a plane lying intermediate the path of lateral movement of said needle, means for moving said guide periodically to a position beneath the path of lateral movement of said needle so that in the subsequent lateral movement of said needle a thread extending therefrom becomes looped over said guide, and a severing device associated with said guide to contact with and sever the looped thread.

13. In a book-stitching machine, in combination, a stitching needle adapted to be displaced laterally during its operative movement, a thread guide positioned in a plane lying intermediate the path of lateral movement of said needle, means for moving said guide periodically to a position beneath the path of lateral movement of said needle so that in the subsequent lateral movement of said needle a thread extending therefrom becomes looped over said guide, and a severing device mounted upon said guide to contact with and sever the looped thread.

14. In a book-stitching machine, in combination, a stitching needle adapted to be displaced laterally during its operative movement, a shafted thread guide having its thread-engaging extremity hooked and lying in a plane intermediate the path of lateral movement of said needle, a reciprocatory carrier adapted to support said thread guide and move the hooked extremity thereof to a position beneath the path of lateral movement of said stitching needle so that a thread extending therefrom becomes looped over said guide during the subsequent stitching operations of said needle, and a thread-severing device associated with said guide to contact with and sever the looped thread.

15. The combination as claimed in claim 14, wherein the thread-severing device comprises a cutting blade mounted upon the shaft of the thread-guiding device.

16. In a book-stitching machine, means for severing the interconnected threads of a stitched book-pad or the like comprising, in combination, a substantially horizontal thread guide, means for reciprocating said thread guide longitudinally thereof, a stitching needle adapted to draw a thread across the path of travel of said thread guide, means for looping said thread over said thread guide so that the thread traverses said guide and moves longitudinally thereof, and a thread-severing member mounted adjacent said thread guide to engage the moving looped thread.

17. In a book-stitching machine, means for severing the thread extending from a stitched book, comprising a thread guide set in the plane of the thread, said guide being offset adjacent its free extremity to lie away from said plane and provided with an inclined nose extending from said offset portion into said plane, a severing device associated with said thread guide, and means for displacing said guide to engage said nose thereof with said thread which becomes looped over said guide and thereby guided into contact with said severing means during the subsequent stitching operations.

18. In a book-stitching machine, means for severing the thread extending from a stitched book, comprising a thread guide set in the plane of the thread, said guide being offset laterally adjacent its free extremity to lie away from said plane and provided with an inclined nose extending from said offset portion into said plane, a severing device associated with said thread guide, and means for displacing said guide to contact said nose thereof with said thread which becomes looped over said guide and thereby guided into contact with said severing device during the subsequent stitching operations.

19. In a book-stitching machine, means for severing the thread extending from a stitched book, comprising a substantially horizontal thread-guiding member set in the plane of the thread, said member being offset laterally adjacent its free extremity to lie away from said plane, and provided with an inclined nose extending from said offset portion into said plane, a thread-severing device mounted on said thread-guiding member, and means for imparting movement to said thread-guiding member to contact said nose

thereof with said thread which becomes looped over said guide and thereby guided into contact with said severing means during the subsequent stitching operations.

20. In a book-stitching machine, in combination, a reciprocatory stitching needle adapted periodically to hold extended a thread leading from a stitched book, a thread-guiding member set to operate in the plane of said thread, said thread-guiding member being offset adjacent its free extremity to lie clear of the path of said stitching needle and provided with an inclined nose leading from said offset portion into said plane, a thread-severing device adjacent said thread-guiding member, and means for imparting movement to said thread-guiding member to contact said nose thereof with said thread which becomes looped over said guide and thereby guided into contact with said severing device during the subsequent stitching operations.

21. In a book-stitching machine, in combination, a reciprocatory stitching needle adapted periodically to hold extended a thread leading upwards from a stitched book, a thread-guiding member set to operate in the plane of said thread, said thread-guiding member being offset laterally adjacent its free extremity to lie clear of the path of said stitching needle and provided with an inclined nose leading from said offset portion into said plane, a thread-severing device mounted upon said thread-guiding member, and means for imparting movement to said thread-guiding member to contact said nose thereof with said thread which becomes looped over said guide and thereby guided into contact with said severing device during the subsequent stitching operations.

22. In a book-stitching machine, in combination, a thread-stitching needle adapted to be displaced laterally during its operative movement, a thread guide positioned in a plane intermediate the path of lateral movement of said stitching needle, means for moving said thread guide into said lateral path of movement so that a thread depending from said needle becomes looped over said guide and progresses lengthwise of the latter in the subsequent stitching operations, a thread-severing member arranged to contact said looped threads, a second thread-stitching needle adapted periodically to hold extended a thread leading upwards from a stitched book, a thread-guiding member set to operate in the plane of said thread, said thread-guiding member being offset laterally adjacent its free extremity to lie clear of the path of movement of said second needle and provided with an inclined nose leading from said offset portion into said plane, a thread-severing device associated with said second thread-guiding member, and means for imparting movement to said second thread-guiding member to contact said nose thereof with said thread which becomes looped over said second guide and thereby guided into contact with said second severing device during the subsequent stitching operations of said second thread-stitching needle.

OSCAR KLEINSCHMIT.
OSKAR MÜLLER.