

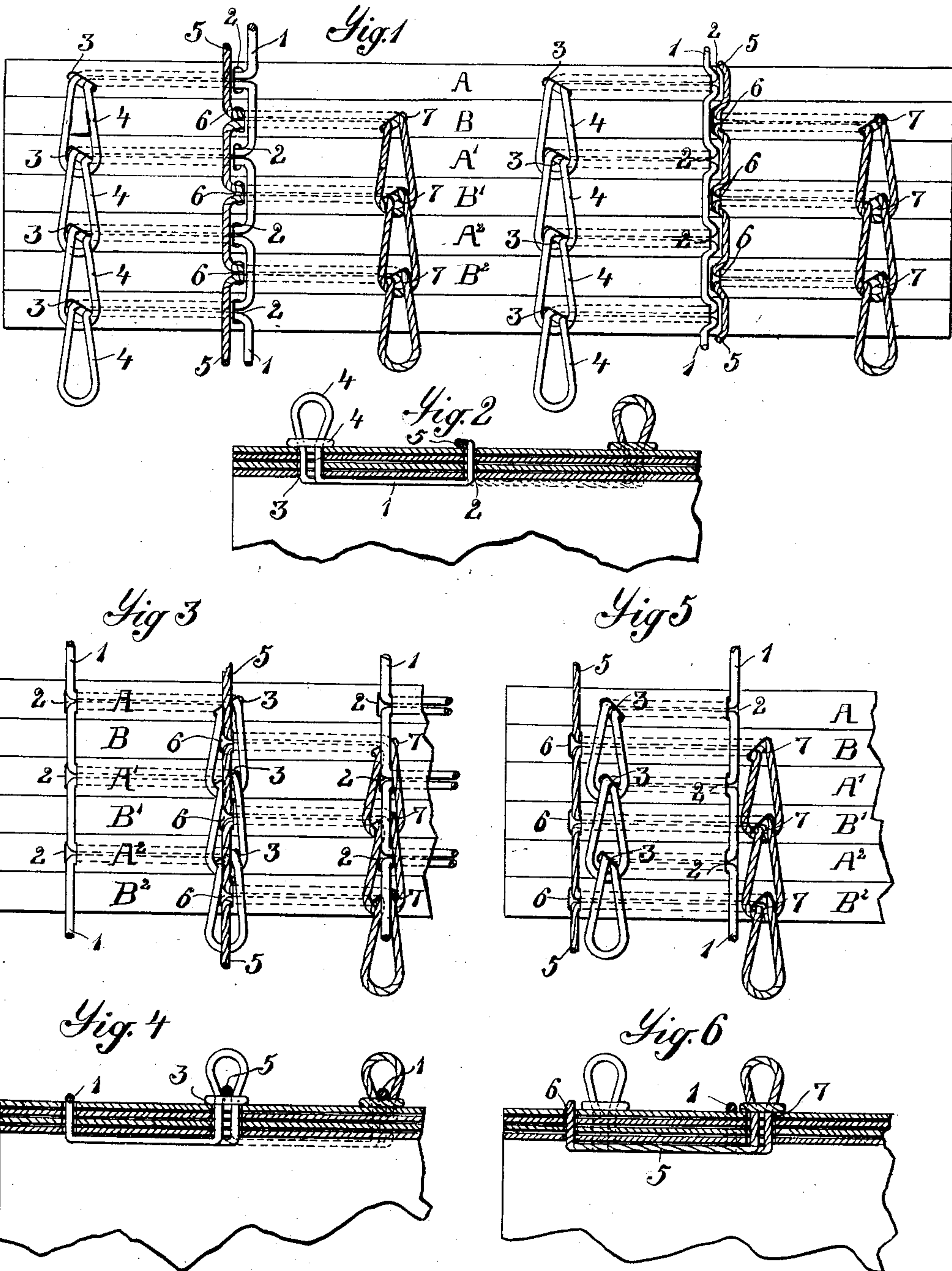
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G. C. KIMBALL.  
BOOK.

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NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## BOOK.

SPECIFICATION forming part of Letters Patent No. 771,555, dated October 4, 1904.

Application filed May 13, 1903. Serial No. 156,911. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE C. KIMBALL, a citizen of the United States, residing at Hartford, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Books, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in securing together the signatures of books and pamphlets, and has for its object to produce a book or pamphlet the signatures of which are secured together by threads, a thread or threads being looped through alternate signatures and the loops interlocked, the signatures between those secured by the thread or threads referred to being held together by a thread or threads which are looped through these signatures, the loops being interlocked.

A further object of the invention is to produce a book or pamphlet the signatures of which are secured together by threads, a thread or threads being looped through alternate signatures, the loops being interlocked, and another thread or threads being looped through the signatures between the signatures held by the first thread or threads, the loops being interlocked, the bonds or certain of them formed by the lines of thread across the signatures being arranged so as to lock the signatures against endwise movement.

Referring to the drawings, Figure 1 is a diagrammatic elevation illustrating a number of signatures secured together in accordance with the invention. Fig. 2 is a detail section of the construction shown in Fig. 1. Figs. 3 and 4 illustrate, in elevation and section, respectively, a modification of the invention shown in Figs. 1 and 2. Figs. 5 and 6 illustrate, in elevation and section, respectively, another modification.

Referring to the drawings, the letters A A' A<sup>2</sup> and B B' B<sup>2</sup> indicate a series of signatures, the signatures marked B alternating with the signatures marked A. The signatures A A' A<sup>2</sup> are secured together by a thread or a plu-

rality of threads, the loops of this thread or these threads being carried across the intermediate signatures B B', &c., and being interlocked. Similarly the signatures marked B B' B<sup>2</sup> are secured together by a thread or a plurality of threads, the loops being carried over the intermediate signatures A A', &c., and interlocked. The specific arrangement of the threads by which the signatures are thus secured may be considerably varied. Three different arrangements of the threads are illustrated, though other arrangements within the invention are possible.

Referring to Figs. 1 and 2, which illustrate the preferred arrangement of the threads, the signatures are connected by four threads, though the number of threads may be varied and will be varied according to the size and character of the book, and the threads are so arranged that the alternate signatures are connected by a plurality of sets of bonds. The threads which connect the A A' A<sup>2</sup> signatures are marked 1, and the threads which connect the signatures B B' B<sup>2</sup> are marked 5. In securing together the signatures the threads 1 are passed into the signature A through entrance-openings 2 along the interior of the signature and are brought out in the form of loops 4 through exit-openings 3, the loops 4 being carried across the intermediate signature B to a position over the signature A'. These threads are also passed through entrance-openings 2 in the signature A' and along the interior of this signature, being brought out in the form of loops 4 through exit-openings 3 in the signature A', these loops 4 being passed through the loops which were brought over from the signature A. After the loops from the signature A' have been passed through the loops from the signature A they are carried across the intermediate signature B' to a position over the signature A<sup>2</sup> and the operations described are repeated across the book. The threads 5 are manipulated in the same manner as the threads 1, except that they are carried into and out of the signatures B B', &c., the entrance-openings for the B signatures being marked 6 and the exit-



openings 7. From this it follows that the signatures A A', &c., are connected together by sets of bonds which cross the intermediate signatures B B', &c., the lines of threads  
 5 across the back of the signatures between the entrance-openings forming bonds and the lines of interlocked loops also forming bonds. The signatures B B', &c., are also connected together by sets of bonds which cross the  
 10 signatures A A', &c. These bonds will of course vary in number, according to the number of threads employed.

It will be understood, of course, that in the practical formation of a book the signatures  
 15 will be fed to the sewing mechanisms, which form the stitches alternately—that is to say, an A signature will first be put into position and operated on by the sewing mechanisms, and then a B signature will be put into posi-  
 20 tion and operated upon by the sewing mechanisms, the loops of the threads from the A signature being held by their sewing mechanisms until the sewing mechanisms which operate upon the B signature have acted and  
 25 a second A signature is fed into position. It will also be understood that the entrance and exit openings may be formed either by the devices which carry the threads into and out of the signatures, or they may be formed by  
 30 punches or in any other suitable manner.

If the bonds were disposed across the backs of the signatures, so that the bonds which connect the A signatures were at some distance  
 35 from the bonds which connect the B signatures, the A signatures would be capable of a considerable endwise movement with respect to the B signatures, and vice versa. In sewing some styles of books it is desirable to secure the signatures so as to prevent this lateral  
 40 movement, and this may be done by properly arranging the bonds with respect to each other, so that the bonds which secure the A signatures will prevent the B signatures from having any endwise movement, and the bonds  
 45 which secure the B signatures will prevent the A signatures from having any endwise movement. This locking arrangement of the bonds, which is effected by juxtaposing certain of them, may be accomplished in various ways.  
 50 In the preferred construction certain of the bonds which connect alternate signatures will be arranged closely adjacent to the bonds which connect the intermediate signatures, the arrangement being preferably such that  
 55 an endwise movement of either set of signatures in either direction will bring a bond connecting that set against a bond connecting the other set. In the construction shown in Figs. 1 and 2 the bonds which are formed by the  
 60 lengths of threads between the entrance-openings are arranged close together, the bonds formed by the thread 1 being arranged between the bonds formed by the thread 5. With this arrangement it will be noted that if any signa-  
 65 ture of either set tends to move endwise in

either direction the bond which connects that signature to the others of its set will be brought against the connecting-bond of the other set of signatures and the movement checked. In the construction illustrated in Figs. 1 and 2, fur-  
 70 thermore, the stitches are so arranged that the bonds at the ends of the book or group of signatures are those which are formed by interlocking loops, so that the signatures are firmly tied together at the top and bottom of the book. 75

In the construction shown in Figs. 1 and 2 it will be noted that the threads 1 and 5 are carried in opposite directions from the entrance-points of these threads—that is to say, in the particular form illustrated in these fig-  
 80 ures the threads 1 are carried to the left from their entrance-openings and the threads 5 are carried to the right from their entrance-openings. It follows, therefore, that the lengths of thread which lie inside adjacent signatures  
 85 are not opposite each other—that is, are not in register with each other, thus producing a stitch which is characterized in the art as “on and off.” The on-and-off method of sewing has the advantage of making a thinner book,  
 90 because the threads in the interior of adjacent signatures are not opposite each other; but it is difficult with the on-and-off methods of sewing to produce a firmly-stitched book. In the construction shown it will be noted that the  
 95 signatures are firmly and reliably secured together, and this, too, by the on-and-off method.

In the construction shown in Figs. 3 and 4 the threads are somewhat differently ar-  
 100 ranged. In these figures the thread 1 is carried into the entrance-openings 2 and out in the form of loops through the exit-openings 3, and the entrance-openings 6 for the threads 5 are in the same line as the exit-openings 3 for the loops of the threads 1. In this con-  
 105 struction, therefore, the thread 5 in entering the B signatures passes through the loop of the thread 1, which has been brought out from the A signature. The bonds formed by the loops of thread 1 and the lengths of thread be-  
 110 tween the entrance-openings for the thread 5 are interlocked, so that relative endwise movement of the signatures is prevented. In other respects the stitch illustrated in these figures is similar to the stitch heretofore described,  
 115 except that all the threads are carried in the same direction from their entrance-points.

In the construction shown in Figs. 5 and 6 the threads 1 and 5 are carried in opposite di-  
 120 rections from their entrance-points, as in Fig. 1; but the entrance-points of thread 1 are closely adjacent to the exit-points of thread 5. In this arrangement the bonds formed by the lengths of thread between the entrance-openings and by the loops of one thread are  
 125 between the bonds formed by the lengths of thread between the entrance-openings and by the loops of the other thread. This arrangement of stitches forms a very secure construction of book; but the stitches formed are “all 130



along," as they are termed in the art—that is to say, the lengths of thread in each signature lie opposite or are in register with the lengths of thread in adjacent signatures.

5 What is claimed is—

1. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads, the threads which connect the signatures of each set passing over and being unconnected with the signatures of the other set, substantially as described.

15 2. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads which are passed into the signatures, along them and out in the form of loops which are interlocked, whereby each connecting-thread forms two bonds, the bonds which connect the signatures of each set passing over the signatures of the other set, substantially as described.

25 3. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads which are passed into the signatures, along them and out in the form of loops which are interlocked, whereby each connecting-thread forms two bonds, the bonds which connect the signatures of each set passing over the signatures of the other set, the lengths of thread between the entrance and exit points in adjacent signatures being out of register, substantially as described.

30 4. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads forming bonds, the bonds which connect each set of signatures passing over the signatures of the other set, and a bond or bonds of one of the sets being positioned in close relation to a bond or bonds of the other set so as to prevent endwise move-

ment of the signatures, substantially as de- 50 scribed.

5. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads forming bonds, the bonds which connect each set passing over the signatures of the other set and two of the bonds which connect one of the sets being arranged between and closely adjacent to two of the bonds which connect the other set, substantially as described.

6. A book or pamphlet comprising a series of signatures arranged in sets, the signatures of one set alternating with the signatures of the other set, and the signatures of each set being connected by threads forming bonds, the bonds which connect each set of signatures passing over the signatures of the other set, a bond or bonds of one of the sets being positioned in close relation to a bond or bonds of the other set so as to prevent endwise movement of the signatures, and the lengths of thread in the interior of adjacent signatures being out of register, substantially as described.

7. A book or pamphlet comprising a series of signatures arranged in sets the signatures of one set alternating with the signatures of the other set, the signatures of each set being connected by threads which are passed into the signatures, along them, and out in the form of loops which are interlocked, whereby each connecting-thread forms two bonds, the bonds which connect the signatures of each set passing over the signatures of the other set, two of the bonds for one set of signatures being arranged between and closely adjacent to two of the bonds of the other set, and the lengths of thread in the interior of adjacent signatures being out of register with each other, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE C. KIMBALL.

Witnesses:

C. C. KIMBALL,

ROBT. H. SCHUTZ.