

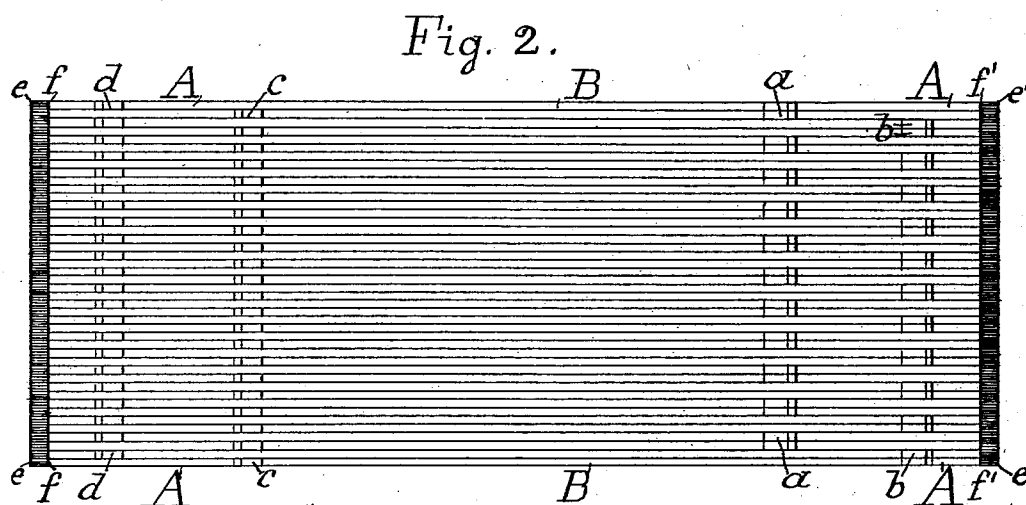
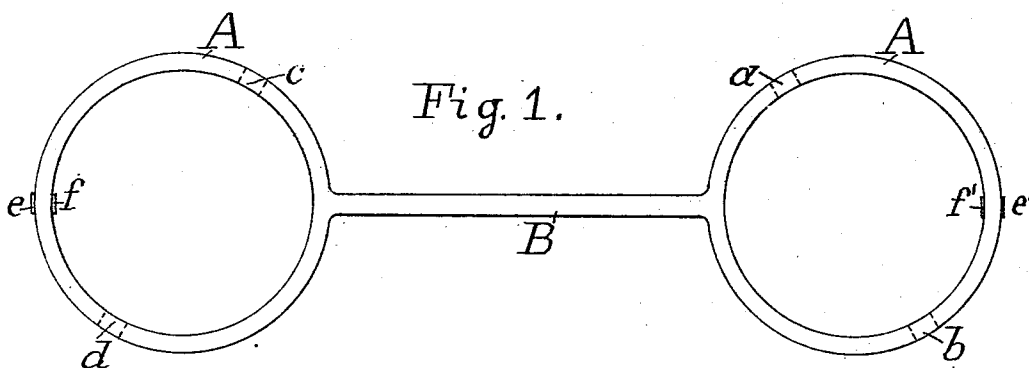
(No Model.)

3 Sheets—Sheet 1.

H. DAVENPORT.
REED FOR WARPING.

No. 569,179.

Patented Oct. 13, 1896.



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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

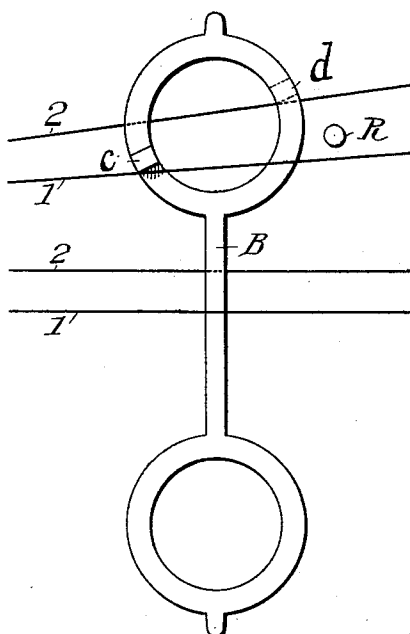
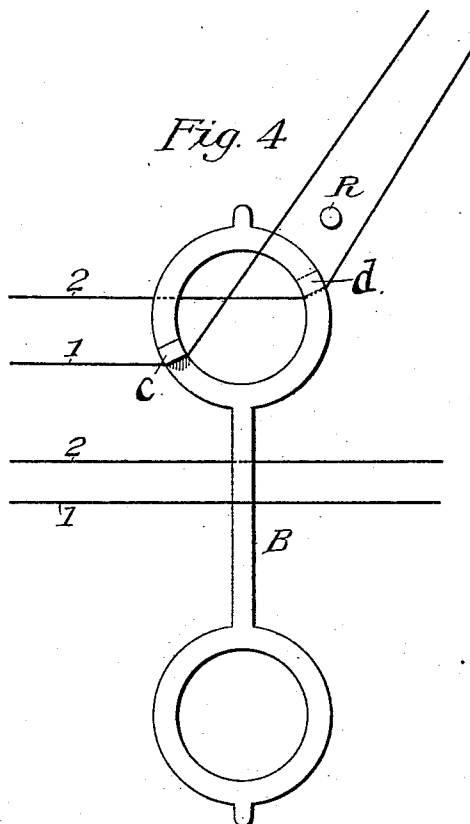


Fig. 4.



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Fig. 5.

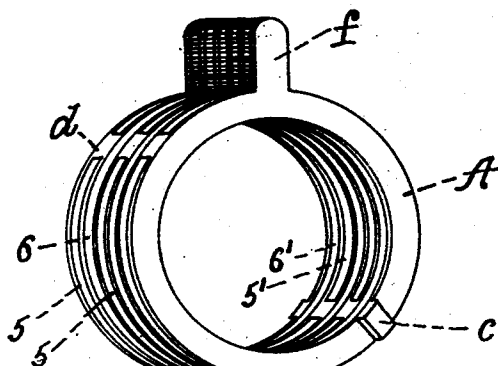
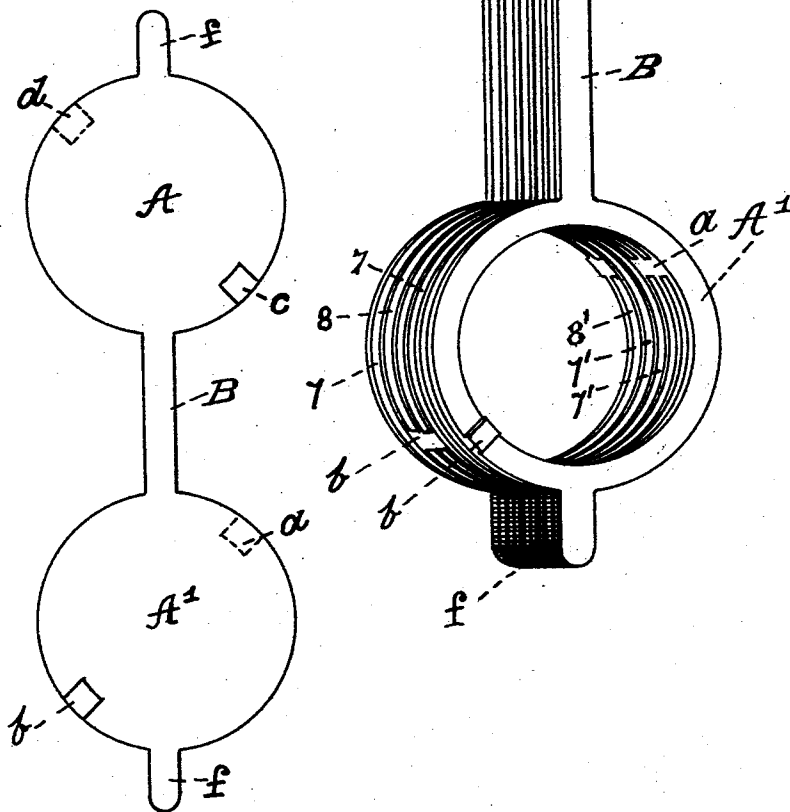


Fig. 6.



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UNITED STATES PATENT OFFICE.

HERBERT DAVENPORT, OF PATERSON, NEW JERSEY.

REED FOR WARPING.

SPECIFICATION forming part of Letters Patent No. 569,179, dated October 13, 1896.

Application filed March 9, 1895. Serial No. 541,129. (No model.)

To all whom it may concern:

Be it known that I, HERBERT DAVENPORT, of the city of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Reeds for Warping, of which the following is a specification.

The object of my invention is to provide a reed for warping which, from its simplicity of construction and ease of operation, will greatly facilitate the forming of a single or a double cross or lease or a cross of two or more threads in preparing warps and to avoid the necessity of changing reeds, one reed only being employed for any one combination, thus saving the trouble and expense as well as avoiding the waste of material in threading a reed each time a warp is to be made.

When my improved reed is once threaded, it is not necessary to be changed, as the ends left in the reed when one warp is made may be tied to the ends of the next warp-threads as the bobbins are changed instead of threading the reed anew for the next warp.

At present in warping the single or double filaments are separated either by lifting the strands by hand or by the use of a reed in which the dents are so united by blocks that in the center of the reed longitudinally a row of eyes or openings is formed which alternate throughout the length of the reed with spaces which are open from the top to the bottom of the reed-frame. These reeds may be so constructed that the eyes or openings in the center of the reed are either single or double. When these eyes are double, the double eyes alternate with two vertical slits extending from the top to the bottom of the reed-frame.

Under the methods now in use in order to change from a cross of single threads to a cross of groups of more than one thread it is necessary to change reeds or to employ two reeds, as shown in patent obtained by me June 20, 1893, No. 500,097.

My improved reed obviates the necessity of using more than one reed, and with it any desired cross of threads may be obtained by uniting with blocks the number of dents required to carry the desired number of threads to be crossed.

The improvements in my reed consist in the peculiar construction thereof, as will be

hereinafter described in the specification and will be shown in the accompanying drawings, which form a part thereof.

The invention consists of a reed composed of dents having wide or enlarged ends, either with or without an eye or opening at each end thereof, which may be formed in any suitable manner, the dents being secured at top and bottom in a suitable frame with the necessary spaces between the dents, the upper ends or eye portions of the dents being joined at different portions by blocks soldered between said portions of the dents, leaving a space between the middle portions of dents where all the threads pass through, as shown in the accompanying drawings, and the ends or eye portions of the dents being joined by blocks soldered between them, as is also shown in the accompanying drawings.

Figure 1 is a side view of one of my improved dents for reeds for warping.

Fig. 2 is a front view of a portion of one of my improved reeds for warping, showing certain dents connected at the top and bottom of the reed by blocks inserted between the dents, two dents being joined at the top of the reed and three dents being joined at the bottom of the reed in alternate groups on the opposite edges of the dents, the series of blocks at or near one edge being located at a greater distance from the center of the reed than the corresponding series on the opposite edge.

Figs. 3 and 4 are side views of dents, showing the connecting-blocks that join the dents and serve to engage the warp-threads that pass between the dents and the manner of passing the warp-threads over wide or enlarged portions of the dents or the eyes of the dents for the purpose of forming a cross of threads or a lease. In said figures the horizontal threads represent positions which all of the threads may take in passing through the reed when not raised or lowered for the purpose of forming the lease or cross. The reed is supposed to be stationary in these figures and the strands or warp-threads to be raised by hand, R representing the rod which is placed between the separated threads. In Fig. 3 the threads 1 are on one side of the dent and the thread or threads 2 are on the opposite side of the dent. The block c is on this side of the dent and the block d is on the

opposite side. As a consequence, when the threads 1 and 2 are raised by hand and made to pass over the wide end of the dent the threads 1 are engaged by the blocks *c* on one edge of the dent and are allowed to pass on the opposite edge, as shown in Fig. 4, while the threads 2 are engaged by the blocks *d* on the opposite edge and opposite side of the dent and the rod *R* may be inserted, as shown.

Fig. 5 is a view showing several of my new dents joined together, forming a portion of one of my improved reeds for warping, and illustrating the novel arrangement of the stop-blocks between the enlarged ends of the dents, blocking some of the spaces on each side of said enlargement, the space that is open on one side being blocked on the opposite side, and vice versa, the series of blocks on one side or edge being lower than the series of blocks on the opposite edge. In this figure *A* represents the top of the reed and *A'* the bottom. At the top of the reed in this figure the dents are joined in alternate groups of two by the blocks *d* and *c*, there being a clear space 6 between each of the groups connected by the block *d* on one edge of the dents and a clear space 6' between each of the groups connected by the block *c* on opposite edges of the dents, while at the bottom of the reed three dents are joined together on the opposite edges of the dents by the blocks *a* and *b*, respectively, so that there are two clear spaces 7' 7' and two blocked spaces 8' 8', and so on, alternately formed by the placing of the blocks *a*, and two open spaces 7 and two blocked spaces 8, and so on, alternately formed by the blocks *b*.

Fig. 6 is a plan view of dent having the enlarged end without the openings at the end.

The large or wide portions of my improved dents composing my improved reed may be so connected by blocks at the top or bottom as to enable a rapid separation and crossing of as many threads or filaments as are desired.

Owing to the difficulty of showing in a drawing the crossing of the threads, single or double, in a reed having the dents connected, as shown in Fig. 2, I have deemed it sufficient to show the method of crossing the threads by means of Figs. 3 and 4.

Between the dents, at their upper and lower extremities, are blocks joining the dents, and they may be secured together in a solid whole at said extremities in any appropriate manner, but I prefer to solder the ends of the dents and the blocks between them together, which being done the reed may be placed in any suitable support.

Some of the advantages attained by this new reed are that it takes the place of the two reeds described in Davenport's patent, dated June 20, 1893, No. 500,097, and does the work of the said two reeds. In this new reed it is obvious only one reed is to be threaded originally, while in said last-mentioned patent there are two reeds to be threaded, and as is occasionally the case a thread or threads break and are pulled through the reed, and

in that case it is easier to rethread one reed than two. Again, in drawing the silk through a reed there is an accumulation of matter, that gathers on account of the friction of the silk with the reed-dents, which interferes to some extent with the rethreading of the reeds.

When two or more reeds are used, there is an increased friction, and consequently more wear on the thread. Hence one reed is easier to manage and more economical than four.

To get a lease or cross with two or more reeds, one or more are either raised or lowered.

My reed may be stationary, and the threads may be raised or lowered by hand or by a rod, and a cross of alternate single threads, or a cross of alternate groups of two threads, may be obtained by the one reed herein described and illustrated in the drawings. Herein consists the advantage in having enlarged ends, for in the middle or *B* portion my reed is like an ordinary single reed, while its wide enlarged end gives me a large field in which to separate and prepare for leasing, which is equivalent, by manipulating the silk threads, as I do, to two more reeds. In other words, my reed is a single reed in its middle portion and a double reed at its upper and lower portions by reason of the peculiar and novel arrangement of the blocks, and consequently it does the work of two reeds, and not only that but of two reeds that are not similarly constructed.

In the drawings, *A* represents the upper eyes of the dents, and *A'* the lower eyes of dents at the bottom of reed, *B B* the central portion of the dents, *e f* the binding or frame which holds the dents together at the top of the reed, and *e' f'* represent the binding or joinder of the dents forming the bottom frame of the reed.

When the reed is first threaded, the warp-threads are passed through the spaces between the central portions of the dents *B B*, and all threads are on the same plane, as may be represented by the line 1 1 in Fig. 3. The warp-threads passing through the spaces between the central portions of the dents *B B* may be raised or lowered until they pass over the upper eyes *A* or over the lower eyes *A'*, and, as is obvious, the threads so raised or lowered will pass all the way across the upper or lower eyes, respectively, unless some obstacle be placed between the dents to prevent it. This obstacle I place there in the shape of a block, which is either soldered or otherwise secured between the dents, and I prevent the passage of as many threads across either the upper or lower eyes of the dents as I wish by inserting said blocks where required, the location of the blocks deciding just how far across the eyes or large ends of dents and on which side or portion of the eyes or wide ends of dents the threads may pass or be held, respectively.

In the various figures, *a b* represent blocks joining adjoining dents, as do also *c* and *d*, *a b* being employed in the lower dent-eyes

and *c* and *d* in the upper dent-eyes of the reed.

As by reference to Fig. 2 will appear, the first two upper dent-eyes in the reed, beginning in the right-hand side thereof, are joined by the block *d* at the part of the eye shown by *d* in Figs. 1 and 2, and the second and third upper dent-eyes are joined by a block *c* at that portion of the eyes shown by letter *c* in said figures, and so on alternately across the top of the reed. It is apparent, therefore, that if the warp-threads in Fig. 3 are pressed upward over the eyes *A A* every other thread, or the threads alternately, will be stopped by the blocks *d* and *c*, respectively, and that the threads will cross each other alternately, or there will be a cross of single threads, as is intended to be illustrated in Figs. 3 and 4.

In Fig. 3 the block *c* is on one side of the dent and the block *d* is on the opposite side, and so in Figs. 5 and 6 the block *c* is on one side and the block *d* is on the opposite side of the dent. The lower dent-eyes at the bottom of reed are joined, as shown in various figures, but especially in Figs. 2 and 5. In said figures *A' A'* are the lower dent-eyes, and the first three dents beginning to count from the right-hand side of reed are joined by the block *a* at the portion of the eye indicated, and the third, fourth, and fifth dents are joined where indicated by the block *b*, so that it necessarily follows when the body of warp-threads passing through the spaces between the central portions of the dents *B B* are pressed downwardly some of the threads will be held on one side of the lower dent-eyes by the blocks *a*, while some of the threads (and in each case the threads will be groups of twos alternately) will be retarded on the blocks *b*, located on an opposite side or different portion of the dent-eyes, as indicated by *b*, and otherwise will be free to move across the eyes as desired to enable the warper to insert the sticks. In this manner warp-

threads may be crossed in groups of twos alternately at the bottom of my reed, as shown, or by using the top eyes of my reed a single cross or a cross of single threads or every alternate thread, or in the same warp the cross may be changed from a single to a double cross, or vice versa, when dents are joined by blocks, as shown in drawings.

By joining four dents three threads may be crossed, and five dents four threads, and so on, or the threads may be alternate groups of two and three, &c. Any desired combination of crosses of threads may be accomplished by the insertion of extra blocks to join extra dents or by the removal or adding of blocks in the construction of a reed.

My improved reed when turned on its side will present the appearance of a single dent, as shown in Fig. 1.

The dents may be cut or stamped out of sheet metal or made of wire or any other suitable material, and may or may not have an opening or eye. I prefer to have an eye, but the large ends of dents without eyes will provide space for the location of blocks sufficient to allow the crossing of threads.

Having described the construction and use of my improved reed for warping purposes, what I claim as new, and desire to secure by Letters Patent, is as follows:

A warping-reed, comprising a series of dents having enlarged ends, series of stop-blocks secured between said dents at or near the edge of said enlarged ends, and arranged in groups alternately upon the opposite edges of said dents, the series of blocks at or near one edge being located at a greater distance from the center of the reed than the corresponding series on the opposite edge, substantially as shown and described.

HERBERT DAVENPORT.

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