

J. G. GOURDEAU.  
SPACING DEVICE FOR WARPS.  
APPLICATION FILED DEC. 3, 1906.

921,236.

Patented May 11, 1909.

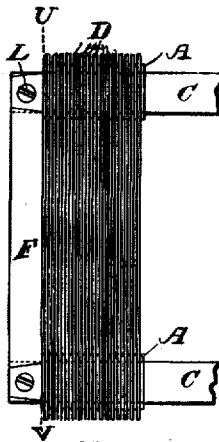


Fig. 1.

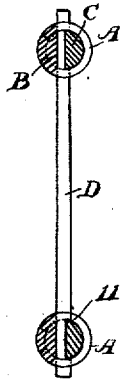


Fig. 2.

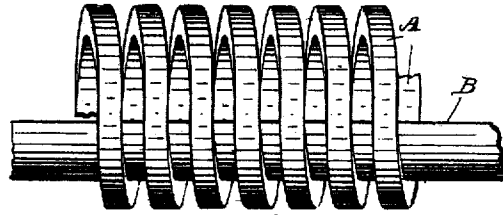


Fig. 3.

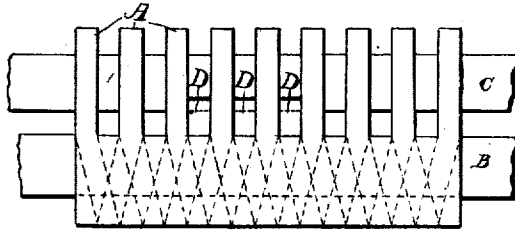


Fig. 4.

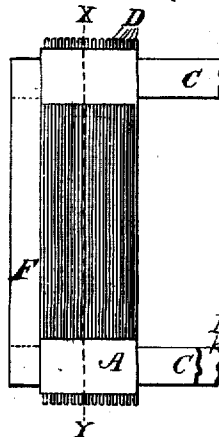


Fig. 5.

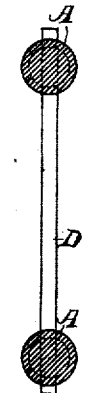


Fig. 6.

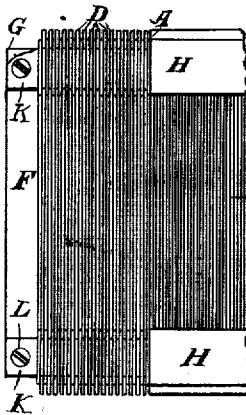


Fig. 7.

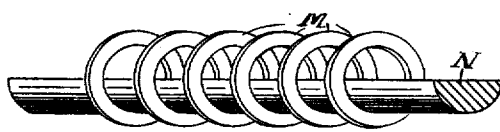
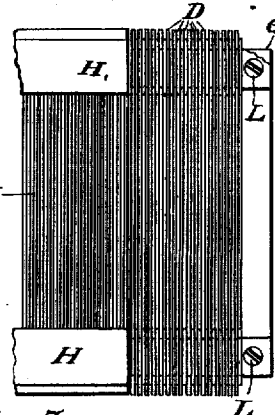


Fig. 8.

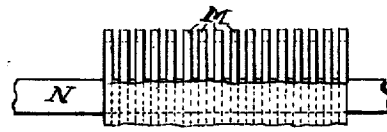


Fig. 9.

Witnesses.

Judge A. Nicol.  
Silas A. Parr.

Inventor.

John G. Gourdeau,  
by his attorney,  
Gardner W. Hession.

# UNITED STATES PATENT OFFICE.

JOHN G. GOURDEAU, OF LAWRENCE, MASSACHUSETTS.

## SPACING DEVICE FOR WARPS.

No. 921,236.

Specification of Letters Patent.

Patented May 11, 1909.

Application filed December 3, 1906. Serial No. 346,171.

*To all whom it may concern:*

Be it known that I, JOHN G. GOURDEAU, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Spacing Devices for Warps, of which the following is a specification.

My invention relates to devices for spacing the yarn in warps, and it is used in connection with looms, slashers, drawing in machines for harnesses, and other machines in which warps are treated. It is especially adapted for spacing and holding the metal teeth or dents of reeds and of lease combs and slasher combs.

This invention is an improvement upon the construction for which application was made by me August 24, 1906, Serial Number 331,927.

It consists, principally, in the substitution for the coil of round wire shown in that patent, of a coil of flat wire curved edgewise or of a series of flat washers. The result attained is a segmental spacing rib above the flat surface of which rise a series of parallel loops of rectangular cross section between which the dents are placed and are held in place by a retaining segmental rib passed over them and through the loops. The principal improvement is that it permits the building up of reeds, combs, etc., with a larger number of dents to the inch than is possible where the round wire is used. This is because the bearing surface between the dents and the loops, instead of being tangential, is flat, and because there is a considerably greater depth with very little width of metal between the dents, thus making a stronger construction than the other. Moreover, if a small wire is wound upon a large mandrel, the resulting coil has no strength nor firmness, but if it is wound upon a small mandrel, the resulting coil is much stiffer. However, if dents are placed between the loops of a coil of small diameter, the points of contact are nearer together and the dents are not held so stiffly. Besides, in reed making, if a coil of small diameter is used, it must be built up by wooden or metal strips to form a reed cap of the desired size to fit the groove in the lathe. By using my device, a coil of any desired size can be used

and no building up for the reed cap is necessary.

In the drawing, Figure 1 is a front view of the end of a reed. Fig. 2 shows a section of Fig. 1 on the line U V. Fig. 3 is an enlarged view showing the manner in which the coiled flat wire incloses the rib to which it is to be soldered. Fig. 4 shows the actual position of the loops of the coil after they have been placed and soldered to the rib, and shows a few dents in place. Fig. 5 shows the end of a reed wherein the wire coil is soldered to both ribs. Fig. 6 is a section of Fig. 5 on the line X Y. Fig. 7 shows an adaptation of my device to the ends only of a reed. Fig. 8 shows the manner in which washers may be substituted for a wire coil. Fig. 9 shows the washers soldered in place.

The principal feature of my invention is the spacing rib which is constructed by winding a metal strip A of substantially rectangular cross section edge-wise about a mandrel of the desired size into a spiral coil. This coil A is then passed over a segmental spacing rib B, as shown graphically in Fig. 3. The distances between the loops of the coil are then spaced in a suitable manner, as by the insertion of the teeth of a comb between them. This process changes the regular spiral curve into a series of parallel flat loop sections connected by curved or slanting sections, as shown by the dotted lines in Fig. 4. The coil A is then soldered to the curved surface of the segmental rib B, as shown in Fig. 4. To build a reed, two of these ribs B with inclosing coils A are placed parallel with each other and at a suitable distance.

The dents D which consist of flat strips of metal preferably provided with uniform slots or notches 11 of about the length of the inside diameter of the loops of coils A are then inserted between the loops of coils A.

Retaining ribs C are then passed over the dents and through the slots or notches therein and through the loops of coils A. The upper and lower sets of segmental ribs, with inclosing coils, are connected by end pieces F fastened to ribs B and C by screws L or by other suitable means.

It can be readily seen that as the loops of the coil A are flat and the cross section of the dents D is flat, when the dents are in place, they form together a substantially solid piece

of metal at their central portion. The retaining rib C is passed through the uniform notches 11 near the ends of the dents and thus the whole construction is substantially solid, see Fig. 4.

The flat wire coil permits a much smaller space being allowed between the dents and, as the dents themselves can be made very thin, a much larger number of counts to the inch is possible.

Figs. 5 and 6 show a soldered reed of similar construction. In this construction, both the segmental rib B with the coil of wire A, the retaining rib C and that part of the dents D comprised therein all in place, are dipped into the solder, thus forming a solid mass. In this case, the dents are not detachable, but the reed is very stiff and strong, and by this process, reeds of very fine counts can be built. In such reeds, the ribs should fit closely the spaces between the dents and the inside of the coils to obtain the strongest construction.

In some kinds of weaving, notably in the case of silk, the selvaged edges of the warp, where the threads are doubled, wear out the dents at each end of the reeds much more rapidly than those in the center. To meet this condition, I build a reed, as shown in Fig. 7, wherein one rib G is of metal and throughout the central portion the other rib H is of wood. In the central portion, the dents J pass between these two ribs and are held in place by the usual pitch band construction. At each end, however, I solder coils of flat metal wire A, as in the first construction described, and place the dents D between the loops thereof. I hold the dents in place by means of short sliding ribs K which are themselves held in place by suitable screws L. Instead of the pitch band construction, I can use in the middle portion of the reed, the solid soldered metal construction, shown in Figs. 5 and 6, or any other similar construction, in which the dents are not readily detachable.

Instead of using the coil of flat metal wire in the construction of my spacing device, I can use a series of independent washers M which are slipped over the segmental rib N, as shown in Fig. 8. These washers M are closed up and suitably spaced and are then soldered to the curved surface of the segmental spacing rib N, as shown in Fig. 9. The result of this construction is that loops of flat wire project above the flat portion of the segmental spacing rib the same as where the continuous coil is used, but I find that it is easier to construct the spacing rib by using the coil.

What I claim as my invention and desire to cover by Letters Patent is:—

1. In a dent holding device, a segmental spacing rib to which are fastened a series of parallel semi-annular loops of rectangular

cross section which rise above the flat surface thereof.

2. In a dent holding device, a segmental spacing rib to which are fastened a series of semi-annular loops formed of flat wire curved edgewise which rise above the flat surface thereof.

3. In a dent holding device, a segmental spacing rib to which are fastened a series of semi-annular loops of rectangular cross section which rise above the flat surface thereof, dents between said loops, and a retaining rib passed over the dents and under the loops, as described.

4. A warp separating device, comprising a segmental rib and a coil of wire of rectangular cross section inclosing said rib and attached to the cylindrical surface thereof and projecting above the flat surface thereof.

5. In a dent holding device, a coil of wire of rectangular cross section, and a segmental rib inclosed therein and circumferentially fastened thereto.

6. In a dent holding device, a segmental metal rib, and a coil of wire of rectangular cross section inclosing said rib and soldered to the cylindrical surface thereof and projecting above the flat surface thereof.

7. In a dent holding device, a segmental metal rib, a coil of wire of rectangular cross section inclosing said rib and soldered to the cylindrical surface thereof, dents between the loops of said coil, and a sliding rib between the dents and the coil as described.

8. In a dent holding device, a segmental metal rib, a coil of wire of rectangular cross section inclosing said rib and soldered to the cylindrical surface thereof, dents between the loops of said coil and comprising slots near their ends, and a sliding rib through the slots in the dents and under the coil as described.

9. In a dent holding device, a segmental rib comprising a series of semi-annular loops of rectangular cross section which rise above the flat surface thereof, dents between said loops, and a retaining rib over the dents and under the loops and closely fitting the space between them, said segmental rib, dents, and retaining rib being soldered together, as described.

10. In a reed, parallel metal segmental ribs comprising at their central portion fixed retaining ribs and fixed dents and at their ends inclosing wire coils soldered to their curved surfaces, combined with dents and sliding ribs detachably between the loops of the end coils, connecting end pieces, and screws through the sliding ribs, the segmental metal ribs and the end pieces as described.

11. In a dent holding device, a segmental spacing rib to which are fastened a series of parallel semi-annular loops formed of flat metal strips curved edgewise which rise

above the flat surface thereof, dents between said loops, and a retaining rib passing over the dents and under the loops, as described.

12. In a dent holding device, a coil of wire  
5 formed of flat wire coiled edgewise, and a segmental rib which fits inside thereof and is circumferentially fastened thereto.

13. In a reed, a spacing rib comprising a series of parallel rings of flat cross section  
10 soldered together and to the curved surface of a segmental rib along a portion of their

circumference and free at the other portion, detachable dents between the free portions of the rings, and a retaining rib removably  
passed over the dents and inside the free 15 portion of the rings as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN G. GOURDEAU.

Witnesses:

HARRY R. LAWRENCE,

CHARLES W. CURIER.