



# UNITED STATES PATENT OFFICE.

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OF SAME PLACE.

## MANUFACTURE OF MANDOLINS.

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*To all whom it may concern:*

Be it known that I, GEORGE B. DURKEE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Manufacture of Mandolins, of which the following is a specification.

The particular and extensively-used musical instrument known as the "mandolin" is formed with a proximately half-pear-shaped body having a stem or neck, which serves as the finger-board. The peculiar shape of the body of such instrument renders it necessary to construct the same of strips extending between the front and the rear or tail end of the body and glued together along their meeting edges. Prior to my invention the process of thus forming the body of a mandolin has consisted in bending the strips upon a former-block adapted to the required shape of the said body and gluing the strips together along their meeting edges successively as they are placed upon the former-block, the mode of holding a newly-laid strip up to the previously-laid strip until the glue has hardened being to wrap a cord or band around the former-block, so as to bend and hold the strip thereon as long as required, after which the cord or band is unwrapped and another strip similarly applied. The glue-joint between the meeting edges of the strips has been found of insufficient strength by itself, and hence after a number of strips sufficient to form the body have been fitted and glued together it has been customary to glue within the hollow body a backing or lining of tough paper or cloth, the flexibility of such material permitting it to be applied within and fitted to the inner side of the proximately half-pear-shaped body of the instrument.

The objects of my invention are to dispense with the use of the internal paper or cloth lining heretofore employed in the manufacture of mandolins, and hence to improve the quality of the tone or resonance of such instrument by avoiding the deadening effect resulting from the use of a paper or cloth lining, to strengthen the body of the mandolin without impairing the tone of the instrument, to dispense with the use of cords or bands for holding the strips

in place upon the former-block, and to provide more reliable and efficient means for the attainment of such end, and to generally facilitate and improve the manufacture of mandolins.

To the attainment of the foregoing and other useful ends my invention consists in matters hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 represents a longitudinal central section of a mandolin whereof the body portion is constructed under my improvement. Fig. 2 represents in perspective my improved former-block with the backing-ribs and a portion of the strips for forming the body of a mandolin applied thereto. Fig. 3 is a bottom plan view of the former-block. Fig. 4 is a perspective view of the former-block. Fig. 5 represents, on a larger scale, one of the clamps. Fig. 6 is a sectional detail on line *x x*, Fig. 4, showing a portion of the former-block. Fig. 7 is a sectional detail through a portion of the former-block, and shows a modification of the means for securing the clamps to the former-block.

The former-block A is substantially half-pear-shaped, and for practical purposes preferably consists of a metal shell, whereof the convex face is divided into a number of flat widths, *a*, running from end to end thereof. Each one of these "flat surface widths"—as they may be called—is necessarily curved longitudinally, so as to follow the general curvature from end to end of the former-block. Each of said surface widths is, however, superficially flat or straight on a line taken transversely at any point along its length. The strips *b* are flat or straight transversely to their length, so as to correspond to the flat surface widths of the former-block, it being observed that Fig. 6 illustrates in transverse section a portion of the former-block and shows the formation, in cross-section, of the flat surface widths *a*. These flat widths or divisions of the surface, which correspond in number to the number of strips *b* required for the body B of the mandolin, and which serve as guides for laying on the strips, decrease or taper in width toward their ends in correspondence

with the taper necessary for the strips. Along each of the two opposite side edges the surface width  $a$  for the wider edge strip,  $b'$ , of the mandolin-body can, however, be made somewhat rounded, as best illustrated in Fig. 6.

5 The former-block is flattened at its smaller end, as at  $a^2$ , to provide a seat for the wooden end or neck piece, C, that is to be fitted to such end of the former-block preparatory to laying on the strips and as a convenient means for holding the neck-piece C in place as long as may be necessary. The former-block is at

10 said end provided with one or more screw-holes for the reception of ordinary screws, which can be temporarily inserted through the neck-piece, as in Fig. 3, whereof a screw, D, for such purpose is shown. The opposite larger end of the former-block is provided with a socket,  $a^3$ , Fig. 3, wherein a wooden

20 tail-end or heel-piece, E, will be fitted and temporarily held by one or more screws, F, it being observed that the ends of the strips of the mandolin-body are to be secured to these end pieces, C and E, as illustrated in Fig. 1.

25 The convex face of the former-block is provided with transversely-arranged grooves A', wherein cross strips or ribs G are to be fitted and held preparatory to the operation of laying on the strips  $b$  and  $b'$ , which form the body

30 of the mandolin.

The grooves A' can be arranged in various ways, either extending separate from one another from one to the other of the two side edges of the former-block, or they can intersect each other to some extent, as herein shown, it being observed, however, that the end portions of the grooves next adjacent to the edges of the former-block should neither deviate toward one or the other of the ends of the former-block, since if such deviation were made it would be impracticable to remove the ribs from the grooves after the securing of the strips to the ribs.

The ribs G are to be bent in any suitable way—as, for example, upon a hot iron—and then laid in the grooves A', which should be made each slightly less in depth than the thickness of a rib, so that when a rib is laid within a groove the portion of the rib included within any one of the flat widths  $a$  of the face of the former-block will rise slightly above the plane of such flat surface, the object being to permit the strip to be then filed or otherwise reduced in thickness to exactly conform to the surface

45 of the former-block, and also to permit the ribs to present a suitable surface whereon the strips can be laid and glued. The ribs G are to be laid in the grooves and temporarily secured therein by clamps H, which will be applied at intervals upon the face of the former-block and successively removed as the strips are laid down. These clamps also serve as means for temporarily holding down the strips.

60 As a simple and convenient construction, each clamp can consist of a plate,  $h$ , bent reversely at opposite ends and provided with a thumb-screw,  $h'$ . The former-block is provided with

threaded holes or sockets  $a^4$ , wherein the thumb-screws can be fitted, a convenient arrangement of such perforations being substantially that herein illustrated.

After laying the ribs G in the transverse grooves of the former-block and clamping the ribs in such position the strips can be applied, the preferred method being to commence with the middle strips and work to each side. The strips will be glued to the ribs, and also desirably glued together along their edges, although the ribs serve to hold the strips without any edge gluing of the latter. In laying a strip, it will be first applied at one end to one of the end pieces—for example, the heel-piece E—and then bent down upon the former-block A, the clamps H being applied to hold the strip down as it is bent upon the former-block,

75 as in Fig. 2, wherein certain of the strips are represented as having been laid and permanently secured to the ribs, while one of the strips is shown partially laid with its portion thus bent down upon certain of the ribs held by several of the clamps. After a strip has been laid, the glue is permitted to harden, after which the operator will remove the clamps from the strip and proceed to lay another strip, removing such clamps from the ribs as may be in the way. The ribs afford a strong and efficient means for holding the strips, and render the subsequent application of a cloth or paper lining unnecessary, thereby avoiding any impairment of the tone of the instrument.

100 The clamps hold the strips positively in place during the hardening of the glue, and constitute convenient, effective, and ready means for holding the strips down in place upon the ribs.

The grooves A' hold the ribs in exact position during the entire process of forming the body, and permit the ribs to be first sunk into the face of the former-block to an extent to permit the outer or exposed surfaces of the ribs to primarily lie sufficiently above or out from the planes of the surface widths  $a$  to enable the operator to reduce the ribs in thickness in correspondence with the contour of the face of the former-block, of which latter the several surface widths  $a$  form guides for such reduction. This said reduction will, when made, form along each bent rib a succession of flat straight lengths of surface corresponding to the widths of the strips.

It will be observed that the great nicety and accuracy required in the manufacture of these instruments render the manufacture of mandolins within the range of the intelligent workman, as well as within the province of the highest skilled labor. After, for example, the middle strips have been laid and glued to the ribs, the next succeeding strips can be laid, one at each side of the middle pair, and while the glue is hardening the operator can proceed to work with another former-block whereon another mandolin-body is to be constructed.

120 The arrangement of clamps upon the face of the former-block permits the latter to be temporarily placed out of the way without endan-

gering any loosening up of the clamps either during the act of removing the former-block from such support as it will be held upon during use or during the act of subsequently replacing it upon the support.

While the threaded sockets in the former-block and the thumb-screws of the clamps constitute desirable means for holding the clamps in place, it will be evident that other analogous means could be employed—as, for example, in place of threaded holes, the former-block could be provided with grooves for the reception of binding-screws or the like, as in Fig. 7, wherein a portion of the former-block is shown provided with a T-groove, *a*<sup>5</sup>, wherein, as an equivalent of the thumb-screw *h*<sup>1</sup>, the stem *h*<sup>2</sup> of a thumb-nut is fitted to slide, the stem in such case being at its lower end provided with a headed end to adapt it to the T-groove, and at its upper end threaded to engage the thumb-nut *h*<sup>3</sup>.

What I claim as my invention is—

1. As an improved device for use in the production of mandolins, a former-block shaped in conformity to the substantially half-pear-shaped body of a mandolin and provided along its convex face with transverse grooves formed for the reception of ribs, to which the longitudinal strips composing a mandolin-body can be secured while the ribs are held within said transverse grooves, substantially as and for the purpose described.

2. As an improvement in devices for use in the production of mandolins, the former-block shaped in conformity to the half-pear-shaped body of a mandolin, combined with clamps and means for applying the same to the former-block, substantially as described, for holding upon the former-block the strips which are to form the body of a mandolin, and which are to be successively laid upon the former-block and held thereon until secured together, substantially as and for the purpose set forth.

3. As an improvement in devices for use in the production of mandolins, the former-block shaped in conformity to the substantially half-pear-shaped body of a mandolin and provided

along its convex face with transverse grooves for the reception of ribs, to which the longitudinal strips of a mandolin-body may be secured during the process of forming the mandolin-body and while the ribs are held within said transverse grooves of the former-block, combined with clamps and means for applying the same to the former-block, substantially as described, at points for temporarily holding the ribs within said grooves and for holding the strips down upon the ribs while the latter are received and held within the grooves, substantially as and for the purpose set forth.

4. The herein-described improvement in the art of constructing mandolins, consisting in bending a set of ribs in conformity to the transverse curvature of the required proximately half-pear shape of a mandolin-body, holding said ribs upon a former-block shaped to conform to the ultimate form of the body of the mandolin, and laying in series upon the ribs thus held a sufficient number of bent strips to form the mandolin-body and securing said strips to the ribs by suitable glue or cement, substantially as and for the purpose described.

5. The herein-described improvement in the art of forming the body portions of mandolins, consisting in bending a set of strips in conformity to the transverse curvature to be given to the body portion of a mandolin, placing said ribs partially below the convex surface of a former-block corresponding to the ultimate required shape of the mandolin-body and divided into a series of longitudinal flat surface widths, reducing the ribs in thickness at points to form along the exposed surface of each rib a succession of straight flat surface lengths, each corresponding to the width of one of the longitudinal strips of a mandolin-body, and securing to said ribs, substantially in the manner described, a series of strips to form a mandolin-body.

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Witnesses:

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