My invention relates to bows and relates particularly to bows for archery of the type permitting disassembling of the bow during periods of non-use into two parts for convenience in transporting the bow.

It has been proposed to construct bows, intended for various archery purposes, of steel, and moreover it has been recently proposed to construct a bow comprising a pair of halves each similarly made of solid steel, tapered toward their tips and ribbed on their rear sides in such a way as to accomplish the properties of distributed weight and resiliency desired to be had in bows to a very marked degree.

Herefore also it has been proposed to provide a bow for archery having a pair of wooden limbs joined together in a handle so as to permit the limbs to be removable from the handle, whereby the space occupied by the bow in transportation is approximately decreased by one-half.

However, in order to prevent the halves from being displaced relative to the handle, it has previously been necessary, so far as I am aware, to secure the handle and bow halves together by pins or the like, which have various objections such as being inefficient in the main purpose of joining the handle to the bow halves, coming loose after a number of operations and the like.

An object, therefore, of my present invention is to provide means particularly adaptable for bows having halves of non-circular solid sectional form, a securing means whereby the handle or paradox supporting the handle may be removably secured to one or both halves of the bow.

Another object of my invention is to provide for the removably securing of a bow half to a handle paradox without the necessity of employing pins or liek interlocking means which are susceptible to wear and tear to which the bows are subjected in practice so as to effect depreciation of such flimsy securing means.

Another object of my invention is to provide a paradox for a bow having at least one of its metallic limbs adapted to be removably secured thereto merely by projecting the handle end of the limb into an end socket of the paradox with applied pressure and which will effectually hold such limb in place without the possibility of displacement during use.

Another object of my invention is to provide a bow limb receiving paradox for an archer's bow adapted to removably hold the limb during use without any possibility of relative rotation of the limb and the paradox.

Another object of my invention is to provide an improved handle or paradox for an archer's bow which will be most efficient in use, which will stiffen the mid part of the bow during use and securely hold the limbs of the bow in place and which may be produced in quantities in a relatively inexpensive manner.

Referring now to the drawings:

Fig. 1 shows in elevation a bow embodying the principles of my invention.

Fig. 2 is a longitudinal medial section through the paradox thereof shown enlarged relative to Fig. 1 and with an end of one of the bow limbs in place, the end of the other bow limb being merely shown in elevation ready for insertion in its socket at the other end of the paradox.

Fig. 3 is an elevational view of the mid portion of the bow on the same scale as the view of Fig. 2 with the bow limbs in place in the paradox and with the mid portion of the paradox shown as broken away and illustrated in section to show the position of the ends of the bow limbs when both are in operative position, a showing of the wood being omitted.

Fig. 4 is a section taken on the line 4-4 of Fig. 2.

Fig. 5 is a section taken on the line 5-5 of Fig. 2.

Fig. 6 is a perspective view of a resilient liner extending within the paradox throughout its length and defining the resilient sockets for the shank ends of the bow-limbs.

Fig. 7 is a perspective view of the paradox supporting tube.

Fig. 8 is a rear elevational view of end fragments of one of the like bow-limbs, and Fig. 9 is a side elevational view of the shank end fragment thereof.

Fig. 10 is a perspective view of one of the perforated caps disposed at the end of the paradox tube Fig. 7, and adapted to receive through their perforations the bow-limbs into the paradox sockets.

Referring now to all the figures of the drawings in all of which like parts are designated by like reference characters, at
and 2 I show a pair of bow halves comprising limbs of a bow having a relatively rigid paradox section 3 which joins the halves together. The paradox 3 comprises a supporting tube 4, hand grip 5, preferably of cork or like material, with flanged collars 6 and 7 soldered or otherwise secured to the tube securing the cork hand grip in place, like end caps 8 telescoped over the two ends of the tube 4, the end caps being apertured as shown at 9, Figs. 4 and 10, for the reception of the shank portions such as 10 of the bow halves or limbs, 1 and 2. Within the paradox, I provide a socket tube 11 of approximately T-shaped cross-sectional form made preferably of steel with resilient walls, which extends from end to end within the tube 4 and is tightly wedged into position therein with its longitudinally extending curved wall 12 held tightly in engagement with an inner wall of the tube by virtue of the pressure inserted by a pair of wood strips 13 and 14 serving as fillers fitting in the tube 4 between the medial rib 15 of the socket tube 11 and the opposing inside walls of the tube 4 and at the same time making compressive engagement with the turned wall portions 16 of the socket tube so as to force the curved wall 12 thereof in tight fitting engagement with the inner wall of the paradox tube.

The cross-sectional form of the sockets provided by the tube 11 such as that shown at 17, Fig. 6, conforms sufficiently closely to the cross-sectional form of the shanks 10 of the bow halves so that a snug-fitting engagement may be had within the socket tube between its inner walls and the outer walls of the bow limb shanks.

As will be seen by reference to Figs. 8 and 9, although the bow limbs taper generally, as shown by Fig. 1, from the paradox ends of the limbs toward their tips 18 each supporting the cord 19, the shanks 10 of the bow limbs taper slightly toward their ends 20, which are chamfered as shown at 21, to facilitate easy introduction of the shanks into their sockets by the perforated openings 9 of the paradox caps.

It will be understood, of course, that these openings 9 will be in longitudinal alignment with the socket tube 11 so that a bow limb shank projected through one of the apertures 9 will be invariably directed thereby into one of the open ends 17 of the socket tube 11. The edges 22 of the openings 9 are also chamfered toward their outermost portions as indicated best at 23, Fig. 2, to facilitate introduction of the shanks 10 of the bow limbs.

The socket tube 11 may be made of a seamless tube of cylindrical form or it may be made with a seam which preferably, however, will be brazed either before or after the formation of the tube into the form of a socket as illustrated in Fig. 6. The seamed construction permits the tube 11 to be made from a strip of metal rather than from a tube, thus cutting down the cost of production.

It will be understood that when the tapered shanks 10 are forced into socket passage 17, that the outward pressure exerted by the inward telescoping movement of the shanks is yieldingly resisted by the resilient walls of the tube 11 and the wood fillers 13 and 14 which resist outward deformation of said walls and by the resiliency of the wood material, restore the walls to non-expanded form immediately when the bow limb is removed.

Although the bow limbs may be separately removable, I prefer to secure one of the bow limbs such as the bow limb 2 in place as illustrated in Fig. 2, so tightly that it will resist removal by pull much more than the other bow limb. I may secure this result by coating the shank of the bow limb 2 with adhesive before inserting it in the socket or in any other suitable way such as by placing a wire in the socket so as to decrease its effective cross-sectional area prior to insertion of the shank which then must be pressed on by the application of considerably greater force than would be normally applied in the insertion of or removal of the other bow limb in its socket.

It will be understood that although I have illustrated and described both bow limbs as being removable from the paradox by manually overcoming the effects of the frictional contact had between the shanks and the inner walls of their sockets receiving them, that I contemplate also the above described construction wherein one of the bow limbs is always retained in its socket preferably by the use of an adhesive.

By referring also to Fig. 9, it will be seen that the shanks of the bow limbs are not quite straight but partake somewhat of the natural curvature of the bow limbs and effects a tighter wedging of the limbs in the metallic tubular socket 12 than would otherwise be the case since the socket passage does not normally partake of this curvature and resiliently resists being deformed, slightly, responsive to the projection of the slightly curved shanks 10 into the sockets.

It will be seen that the lateral ribs 24 and the medial rib 25 of the bow limbs project into corresponding sockets of the recess and that relative rotation of the socket and bow limbs is thereby effectually prevented. The caps 8 soldered or otherwise rigidly secured to the ends of the paradox tube 4 when the bow limbs are in place projecting through the perforations 9 of the caps, effectually prevent any relative rotation of the bow limbs and socket tube 11 relative to the paradox tube 4.
By reference particularly to Figs. 2 and 3, it will be seen that the ends of the bow limbs approach but preferably do not contact with each other, a space of being preferably left between the ends of the bow limb shanks when these have been forced inwardly as far as is possible. The curvature of the bow limbs and the degree of taper given them in their shank portions, operate to practically prevent further projection of the shanks into the sockets.

Having thus described my invention in a specific embodiment, I am aware that numerous and extensive departures may be made from the embodiment herein illustrated and described but without departing from the spirit of my invention.

I claim:

1. In a bow for archery, the combination with a pair of bow limbs each comprising shanks of approximately T-shaped cross-sectional form, a paradox for receiving the shanks, said paradox comprising an outer tube comprising an outer hand grip, and a socket tube extending longitudinally within the paradox into which the shanks are adapted to be telescopably projected, said socket tube having walls adapted to be expanded outwardly by the injection of the shank and to frictionally retain the shank in the paradox.

2. In a bow for archery, in combination with a pair of bow limbs, each comprising shanks having portions concavo convexly arched in transverse sections and a medial rib extending under their concave side, of a paradox comprising shank receiving openings in its ends so formed as to prevent rotation of a received shank and resilient means within the paradox adapted to frictionally engage the bow limbs, comprising a sheet metal friction element extending longitudinally of the paradox and telescoped within the paradox having portions spring-pressed against a received bow limb shank and yieldable laterally responsive to insertion of the bow limb in the paradox.

3. In a bow for archery, in combination with a pair of bow limbs, each comprising shanks having portions concavo convexly arched in transverse sections and a medial rib extending under their concave side, of a paradox comprising shank receiving openings in its ends so formed as to prevent rotation of a received shank and resilient means within the paradox adapted to frictionally engage the bow limbs, comprising a sheet metal friction element extending longitudinally of the paradox and telescoped within the paradox having portions spring-pressed against a received bow limb shank and yieldable laterally responsive to insertion of the bow limb in the paradox, said friction element being in tubular form and presenting a mouth opening to the said paradox shank receiving opening.

4. In a handle for bows a combination with a tubular handle casing, a hand grip supported on the outer surface of the casing, said casing having an end wall perforated to receive the shank of a bow limb into the casing and adapted to engage non-circular portions of said bow limb so as to prevent relative rotation of the casing and shank and resilient friction means within the casing engageable with the lateral sides of an inserted shank to frictionally restrain the shank from improper displacement relative to the handle during operation of the bow comprising such handle.

5. In a handle for bows a combination with a tubular handle casing, a hand grip supported on the outer surface of the casing, said casing having an end wall perforated to receive the shank of a bow limb into the casing and adapted to engage non-circular portions of said bow limb so as to prevent relative rotation of the casing and shank and resilient friction means within the casing engageable with the lateral sides of an inserted shank to frictionally restrain the shank from improper displacement relative to the handle during operation of the bow comprising such handle, said resilient friction means comprising a formed tube with resiliently yieldable lateral walls engageable with lateral walls of a shank projected within the tube.

6. In a handle for bows, a combination with a tubular handle casing, hand grip supported on the outer surface of the casing, said casing having an end wall perforated to receive the shanks of bow limbs into the casing and adapted to engage non-circular portions of said bow limbs so as to prevent relative rotation of the casing and shanks and resilient friction means within the casing engageable with the lateral sides of an inserted shank to frictionally restrain the shank from improper displacement relative to the handle during operation of the bow comprising such handle.

7. In an archer's bow, in combination with a pair of oppositely extending bow limbs, of a tubular casing interconnecting the links, said casing comprising an outer hand grip, and an inner element for joining the limbs, said inner element being in the form of a partially collapsed metallic tube, said tube resiliently expandable by the wedging outwardly directed effort of the ends of the bow limbs inserted into opposite ends of the tube.

In testimony whereof I hereunto affix my signature this 14th day of October, 1927.

HALLIE M. WILCOX.