April 27, 1965 J. C. RAMSEY 3,180,620

ARCHERY BOW STRINGER

Filed April 26, 1963 4 Sheets-Sheet 1

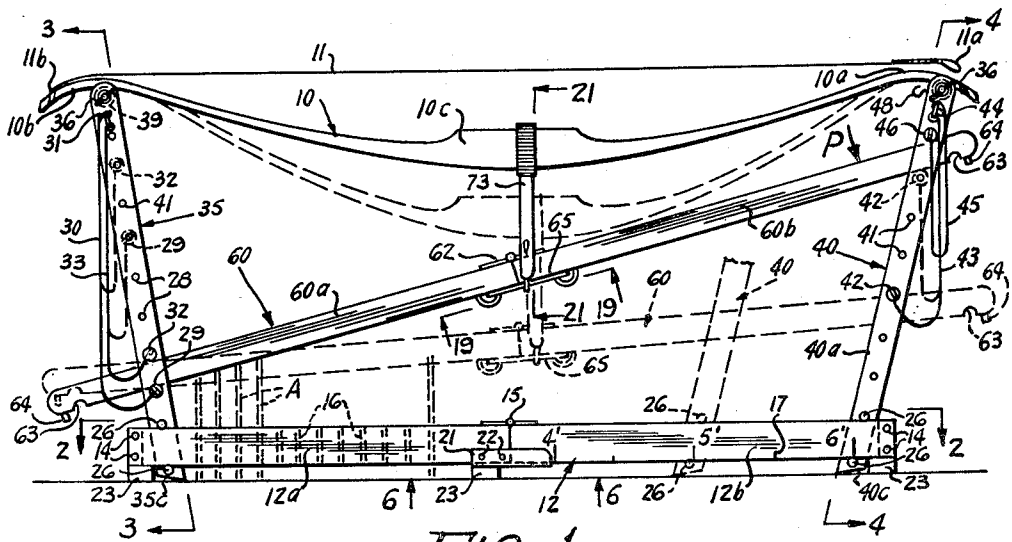

FIG. 1

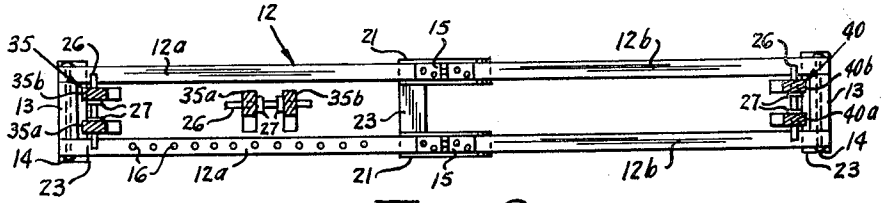

FIG. 2

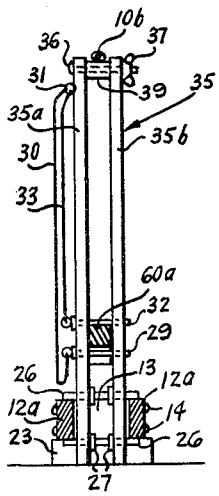

FIG. 3

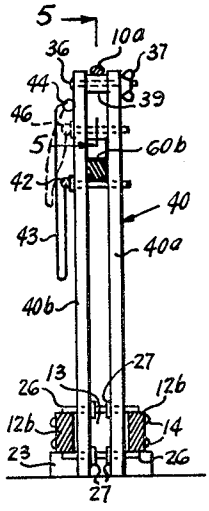

FIG. 4

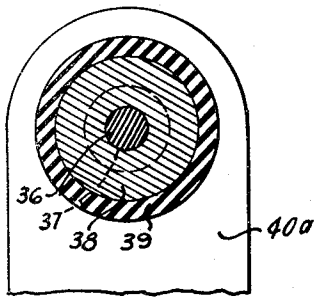

FIG. 5

INVENTOR.
JAMES C. RAMSEY
BY
Kimmel & Crowell
ATTORNEYS.

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ARCHERY BOW STRINGER

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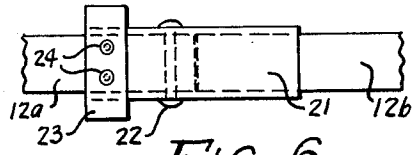



FIG. 6

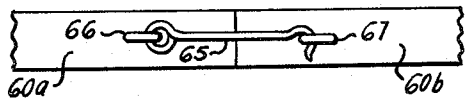



FIG. 19

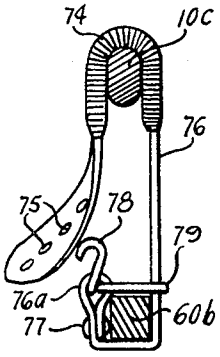



FIG. 22

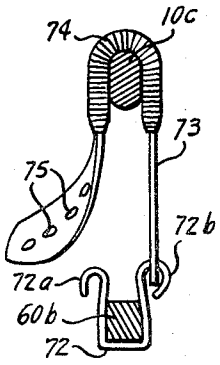



FIG. 21

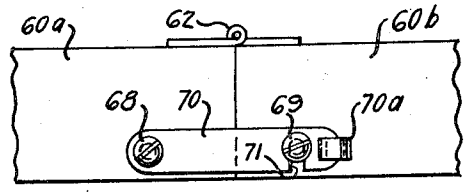



FIG. 20

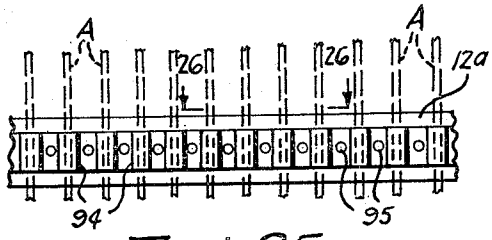



FIG. 25

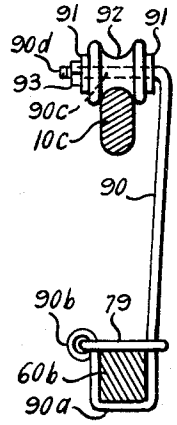



FIG. 24

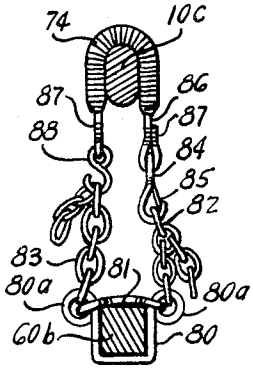



FIG. 23

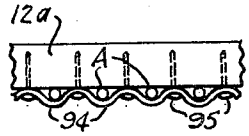



FIG. 26

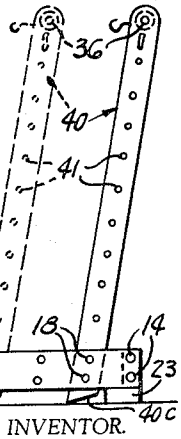
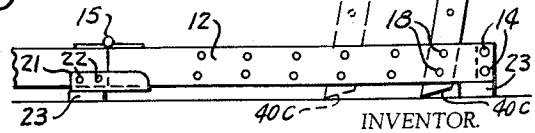



FIG. 11




INVENTOR.
JAMES C. RAMSEY
BY
Kimmel & Crowell
ATTORNEYS.

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ARCHERY BOW STRINGER

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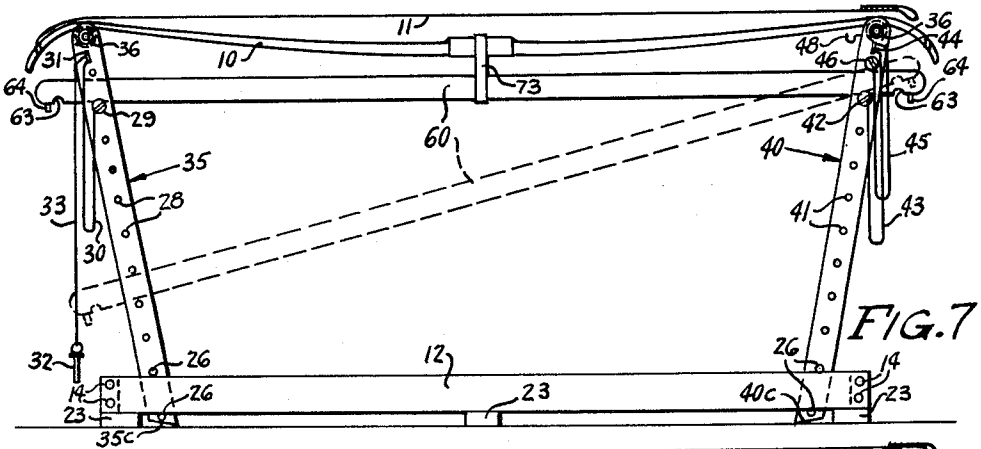

FIG. 7

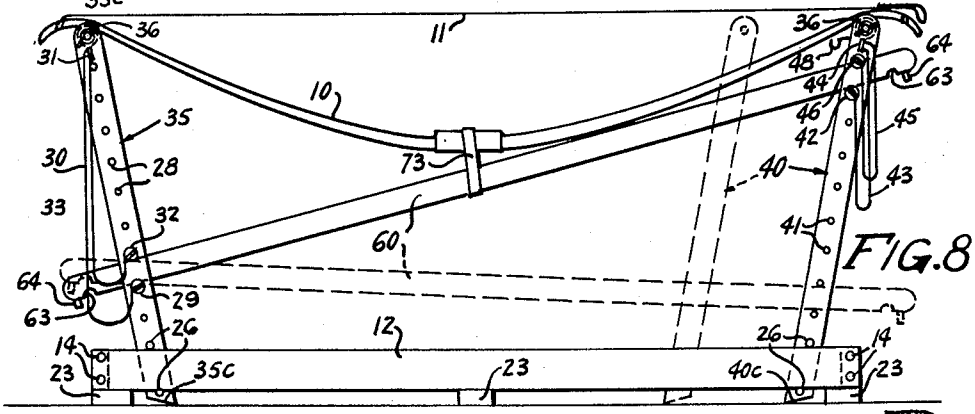

FIG. 8

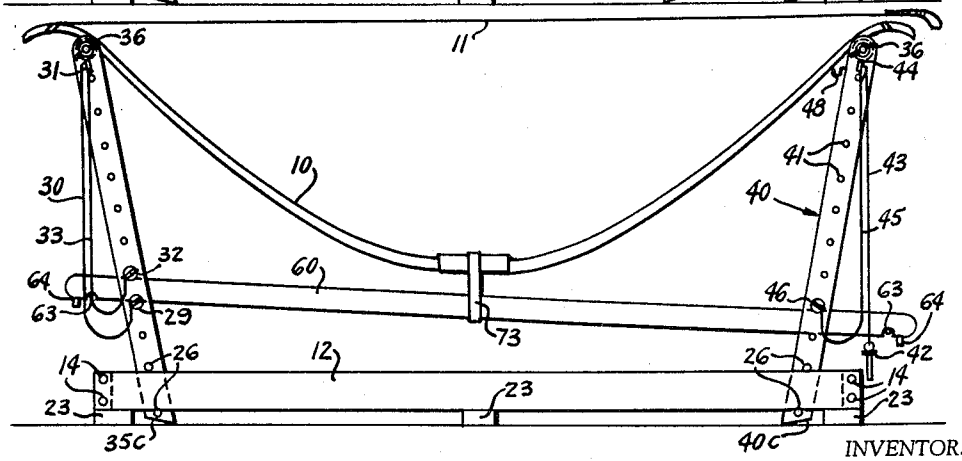

FIG. 9

INVENTOR.
JAMES C. RAMSEY

BY Kimmel & Crowell
ATTORNEYS.

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ARCHERY BOW STRINGER

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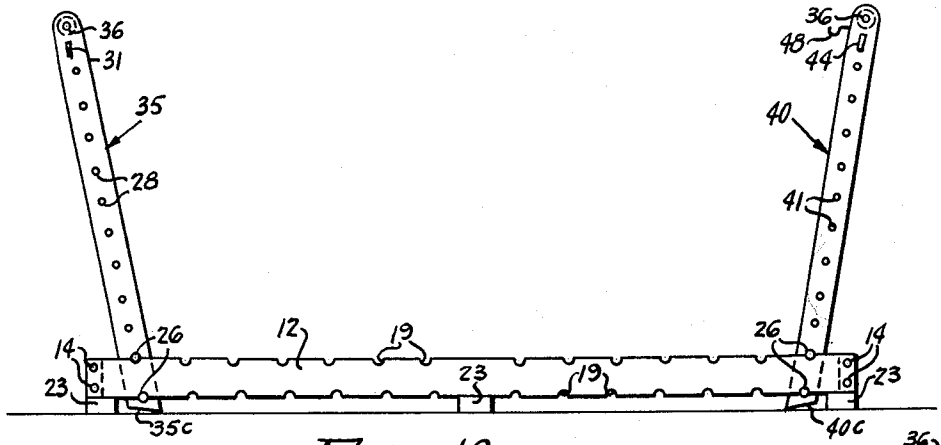


FIG. 10

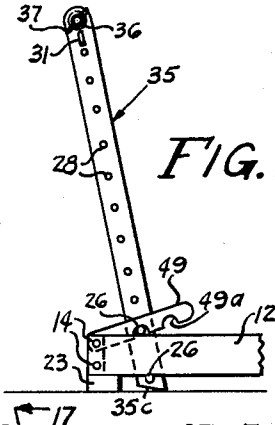


FIG. 12

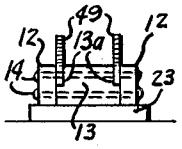


FIG. 13

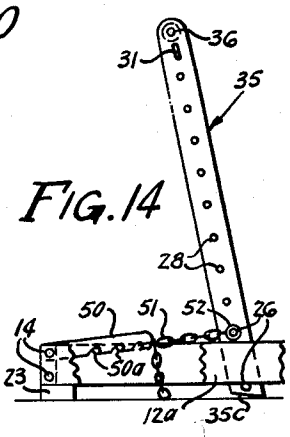


FIG. 14

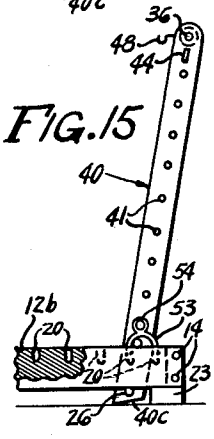


FIG. 15

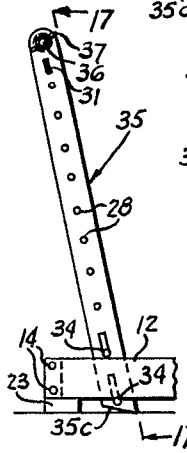


FIG. 16

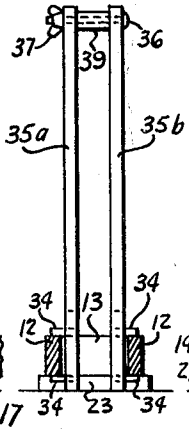


FIG. 17

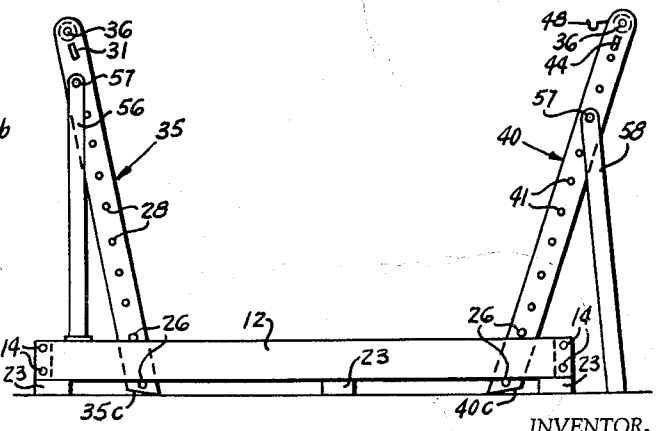


FIG. 18

INVENTOR.
JAMES C. RAMSEY

BY Kimmel & Crowell
ATTORNEYS.

United States Patent Office 3,180,620 Patented Apr. 27, 1965



3,180,620

# ARCHERY BOW STRINGER

James C. Ramsey, Shop of the Red Eagle, Lincoln, N. Mex.

Filed Apr. 26, 1963, Ser. No. 276,020
10 Claims. (Cl. 254—123)

This invention relates to an archery bow stringer which may be used both for the stringing and the unstringing of archery bows. The present application is a continuation-in-part of my co-pending application, Serial No. 102,196, also entitled "Archery Bow Stringer," filed on April 11, 1961, now abandoned.

It is well known to string archery bows by various hand methods, one of the more common of these being the so-called "step through method," which will be next explained. This latter method is nearly always used for stringing strong bows, or bows with reversely curved limb ends. Unless however, the "step through method" of stringing a bow is carried out very carefully and in the proper manner, which it usually is not, it results in a twisted bow, or one in which the bow limbs become gradually warped, or the handle of the bow is pulled over sideways in a twist, thereby damaging the bow. Many good bows are thus damaged or even broken the very first time that they are strung up, especially by inexperienced archers.

The "step through method" is commonly used for the strictly manual stringing and unstringing of archery bows. It is carried out in the following manner: The loop at one end of the cord or string is inserted in the nock in the reversely curved lower limb of the bow, the loop at the other end of the string being free of the nock in the reversely curved upper limb of the bow. The archer holds the bow at its upper end with his right hand and the string with his left hand away from the bow, and, with the lower limb end of the bow hooked over the front forward part and the outer side of his left foot, the bow is thus firmly held down. The back of the bow limb then abuts his left foot. He then "steps through" between the bow and the string with his right leg and braces his right foot firmly on the floor or ground. With his right hand he now moves the bow about until the thickened mid-section, which is termed the handle, rests against the outer rear side of his thigh or buttock, the bow now assuming a diagonal position. With his right hand he next pulls forwardly against the back of the reversely curved upper end of the bow by using his thigh at the bow handle in the manner of a fulcrum, until the loop at one end of the bow string can be slipped into the nock at the reversely curved upper limb of the bow, thus completing the stringing of the bow. He now removes his right leg from its position between the strung bow and the bow string.

It can thus be seen that when using this "step through method," there is a considerable chance of twisting and warping the reversely curved ends of the bow, or of twisting and warping, or even breaking, the bow handle section, unless this method is carried out very carefully. The latter involves the placing of the bow handle in exactly the right position against the thigh, seeing that the reversely curved lower end of the bow rests in exactly the right position against the left foot, that the right hand draws the reversely curved upper end of the bow forwardly in a true line with the bow handle and the reversely curved lower end, and that the bow is not twisted to one or the other side of this true line. For a left handed person, the hand and foot positions herein described would, of course, be interchanged. The manufacturers of bows deplore the use of this "step through method" of stringing bows.



The primary object of the present invention is to provide an archery bow stringer that will make it much easier to string, or unstring, an archery bow, especially the strong bows of the hunting type, than can be done by any of the manual methods for stringing and unstringing such bows.

Another object of the present invention is to provide an archery bow stringer by which the stringing and unstringing of bows is made a straight out mechanical operation, avoiding the manual "step through method," which method has heretofore been used for stringing and unstringing bows with reversely curved ends, and in particular strong bows.

A further object of the present invention is to provide an archery bow stringer by which the bows may be strung without being twisted over or warped out of proper shape at the limb ends and the reversely curved tips of the latter, and twisting the bow handle sideways and damaging, or even breaking same.

An additional object of the present invention is to provide an archery bow stringer which can be easily and quickly set up, which is easily and quickly adjustable for the reception of various lengths of bows, and which can be operated easily and quickly in the stringing and the unstringing of all types of bows.

Still another object of the present invention is to provide an archery bow stringer of the character herein described which is sturdy in construction, durable in use, reliable and efficient in operation, and relatively simple to manufacture and assemble.

The archery bow stringer constructed in accordance with the above objects, and now to be described, utilizes a lever for flexing the bow in the stringing operation. The inventor has found that it is very easy to both string and unstring the 60# and 65# bows on it, both the straight end bows and those having reversely curved ends, by pressing down on the operating lever either with his foot or his hand. On occasions a child has been able to restring the 60# and 65# bows on the archery bow stringer so constructed.

Still other objects, advantages, and improvements will become apparent from the following specification, taken in connection with the accompanying drawings, in which:

FIGURE 1 is a side elevational view of the archery bow stringer according to the present invention;

FIGURE 2 is a horizontal sectional view taken on the section line 2—2 of FIGURE 1 and looking in the direction of the arrows, showing aligned holes in one of the side boards of the base for receiving arrows;

FIGURE 3 is a vertical sectional view at one end, taken on the section line 3—3 of FIGURE 1 and looking in the direction of the arrows;

FIGURE 4 is also a vertical sectional view at the other end, taken on the section line 5—5 and looking in the direction of the arrows;

FIGURE 5 is a detail vertical sectional view taken on the section line 5—5 of FIGURE 4 but enlarged in scale, showing one of the bow supporting standards, and at the upper end of the latter one of the bow limb rests;

FIGURE 6 is an under plan view, taken along the line 6—6 of FIGURE 1 and looking in the direction of the arrows, showing the keeper for holding the two sections of the side boards forming the base in longitudinal alignment;

FIGURE 7 is a side elevational view similar to FIGURE 1 but showing a modification of the archery bow stringer for stringing any type of archery bow, and especially for stringing bows with very long recurves or bows having long torque stabilizers at the handle section;

FIGURE 8 is a side elevational view of the archery bow stringer illustrated by FIGURE 7, showing how two steps may be used in stringing a bow, especially one with a long recurve or one with long torque stabilizers at the handle area;

FIGURE 9 is a side elevational view of the archery bow stringer illustrated by FIGURES 7 and 8, with the operating lever in its lowermost position and the bow flexed to its final position;

FIGURE 10 is a partial side elevational view, similar to FIGURES 1, 7, 8, and 9, showing a different form of the engagement means for slidably supporting the standards on the base;

FIGURE 11 is a partial side elevational view, also similar to FIGURES 1, 7, 8 and 9, showing the right stand in two different positions and still another form of engagement means for slidably supporting the standard on the base;

FIGURE 12 is a partial side elevational view showing part of the base, one of the bow supporting standards and a latching device for the latter;

FIGURE 13 is a partial end elevational view, showing the part of the base, one bow supporting standard, and the latching device for the latter, as shown in FIGURE 12;

FIGURE 14 is a partial side elevational view, similar to FIGURE 12, showing a different form of the latching means for securing the bow supporting standards on the base;

FIGURE 15 is a partial side elevational view, also showing part of the base, one of the bow supporting standards, and another form of device for detachably securing the standards in position on the base;

FIGURE 16 is a partial side elevational view, showing part of the base, one of the bow supporting standards, and another form of engagement means for slidably supporting the standards on the base;

FIGURE 17 is a partial end elevational view showing part of the base, one of the bow supporting standards and the slidable engagement means between the two according to FIGURE 16;

FIGURE 18 is a partial side elevational view, similar to FIGURE 1, showing braces for the bow supporting standards;

FIGURE 19 is an under plan view, taken on the line 19—19 of FIGURE 1, showing one form of latch device for holding the halves of the operating lever in alignment;

FIGURE 20 is a partial side elevational view of the operating lever, showing another form of the latch device for holding the halves of the latter in alignment;

FIGURE 21 is a detail vertical sectional view, taken on the section line 21—21 of FIGURE 1 and looking in the direction of the arrows, showing one form of the pull down connector;

FIGURE 22 is a view similar to FIGURE 21, showing a different form of pull down connector;

FIGURE 23 is also a view similar to FIGURE 21, showing another form of pull down connector;

FIGURE 24 is likewise a view similar to FIGURE 21, showing an additional form of pull down connector;

FIGURE 25 is a detail partial side elevational view of one of the side boards of the base, showing an arrow holder on the latter for holding the arrows while the bow stringer is on display for sale or when in use at any other time, as may be desired;



FIGURE 26 is a horizontal sectional view, taken on the section line 26—26 of FIGURE 25 and looking in the direction of the arrows, showing the arrows in place on the bow holder.

Similar reference numerals refer to similar parts throughout the several views of the drawings.

Referring now to the drawings in detail and to FIGURE 1, in particular, this figure shows the archery bow stringer according to the present invention and an archery bow in two inverted positions on same, in full line position before being strung and in dotted line position while being strung. The archery bow is generally designated by the reference numeral **10**. The particular type of bow illustrated here has reversely curved ends, the upper end being designated **10***a* and the lower end **10***b*. At its midsection the bow has its greatest thickness, this being termed the handle and is designated **10***c*. The bow has its opposite ends reversely curved and has nocks or notches therein for reception of the string or cord **11**. This string is received between the reversely curved ends **10***a* and **10***b* of the bow by loops **11***a* at its opposite ends, which are received in the nocks or notches.

The archery bow stringer according to the present invention is supported on a base, which is principally comprised by pairs of parallel side boards **12**—**12**, each of which is preferably made in two halves **12***a* and **12***b*. At their outer ends the side boards **12***a*—**12***a* are in part secured in spaced parallel relationship by an end plate **13**, bolts **14** extending through aligned holes in the side boards and the end plates. The side boards **12***b*—**12***b* are similarly in part secured in spaced parallel relationship by an end plate **13** and bolts **14**. At their abutting ends the side boards **12***a* and **12***b* are secured together by hinges **15**, which are attached to their top edges by suitable screws. This is the preferred location for the hinges **15** but they could as well be placed on the bottom edges of the side boards **12***a*–**12***b*, or on one side of either pair of abutting side boards. This construction of the side boards in two halves **12***a* and **12***b*, hinged together, provides for collapsing the archery bow stringer, to reduce the amount of space taken up during shipment and storage. The side boards **12**—**12** may, however, each be made in a single piece, as shown in FIGURES 9, 10, and 18.

In order to maintain the two sections **12***a* and **12***b* of each side board in horizontal alignment, a pair of keepers **21**—**21** is provided. These are in the form of U-shaped channel members but with the bottoms of the U's flattened. The keepers **21** each receive one of the side boards between their side flanges, for instance, the side boards **12***a* and **12***b*, and are secured in place by bolts **22**, which extend through aligned holes in the side flanges and the side boards. As thus secured to the side boards **12***a*—**12***a*, the keepers **21** extend beyond the inner ends of same, and the inner ends of the side boards **12***b*—**12***b* are freely received between the side flanges of these extensions, when the side boards **12***a* and **12***b* are in horizontal alignment. Foot rests **23** are secured to the side boards **12***a*—**12***a* and **12***b*—**12***b* at the outer ends of same, and also to the side boards **12***a*—**12***a* adjacent the inner ends of same, by nails or screws **24**, as shown in FIGURE 6. These foot rests are also part of the means for maintaining the side boards **12***a*—**12***a* and **12***b*—**12***b* in spaced apart parallel relationship.

The bow **10** is supported while being strung by a pair of approximately vertically positioned standards **35** and **40**. These standards are substantially identical in construction, particularly as regards their upper and lower ends. The standard **35** is comprised by spaced apart parallel bars **35***a*–**35***b* and the standard **40** by spaced apart parallel bars **40***a*–**40***b*. Adjacent their lower ends the bars **35***a* and **35***b* have aligned spaced apart holes therein and the bars **40***a* and **40***b* are formed with holes identical-

ly positioned. In the aligned holes in the bars there are force fitted lower and upper cross rods **26—26** of stiff steel, the lower cross rods being positioned below the bottom edges of the side boards **12***a*—**12***a* and **12***b*—**12***b* and the upper cross rods being positioned above the top edges of the side boards **12***a*—**12***a* and **12***b*—**12***b*, so as to allow the standards to be inclined outwardly with respect to the vertical center line, as shown in FIGURE 1. This relative spacing of the cross rods **26—26** also allows one or both of the standards to be moved inwardly along the side boards, for instance, the standard **40** to be moved inwardly along the side boards **12***b*—**12***b* to the dotted line position shown on FIGURE 1, so as to accommodate bows **10** of shorter lengths. An index marking **17** may be placed along one of the side boards, for instance, the side board **12***b*, to mark the several positions of the standard **40** for bows **10** of shorter lengths. At their lower ends the parallel bars of the standards are beveled outwardly and upwardly at **35***c* and **40***c*, respectively. These beveled lower ends of the parallel bars rest on the supporting floor or ground and hold the standards in position inclined at angles with respect to the vertical center lines, as shown.

A spacing means is also provided for maintaining the bars **35***a*–**35***b*, and the bars **40***b*—**40***b* in parallel relationship and at a fixed distance apart. This spacing means is comprised in part by collars **27** on the cross rods **26**, which abut the inner faces of the bars **35***a* and **35***b*, and **40***a* and **40***b*. The cross rods **26—26** are made of stiff strong metal and the collars **27—27** may be integrally formed thereon by turning the entire unit from cylindrical stock at least equal in diameter to that of the finished collars. The collars **27—27** may also be formed separately and with axial holes therethrough and secured to the rods **26** by welding or soldering. Further, in place of the collars **27—27** diametrical holes may be formed through the rods **26**, at the locations of the collars **27—27** thereon, and pins or cotter keys inserted through these holes.

At a short distance above the top cross rod **26**, the bars **35***a* and **35***b* of the left standard are formed with another pair of aligned spaced apart holes. A keeper bolt **29** is inserted in the lowermost aligned holes; likewise, a fulcrum bolt **32** is inserted in the uppermost aligned holes. These may be eye bolts and, as shown in FIGURE 8, may be captive bolts, a chain **30** being secured at one end in the eye bolt **29** and a chain **33** at one end to the eye bolt **32** and both chains being secured at their other ends to a screw eye **31**. As shown in FIGURE 9, the upper ends of the chain **30** and **33** may be secured to the standard **35** under the head of the bow limb rest bolt **36**, the shank of the bolt passing through the terminal link of the chains. When the openings through the links of the chain are not wide enough to receive the bolt **36**, a ring **47** may be secured to the terminal links, the shank of the bolt passing through and the head of the bolt abutting this ring. An operating lever **60**, to be later described, is received adjacent one end between the bars **35***a* and **35***b* of the left standard and between the keeper bolt **29** and the fulcrum bolt **32**. The spacing between the bars **35***a* and **35***b* is slightly greater than the width of the operating lever, so as to allow vertical clearance, and likewise the spacing between the keeper bolt **29** and the fulcrum bolt **32** is slightly greater than the thickness of the operating lever, so as to allow vertical clearance.

At the tops of the standards **35** and **40** bow limb rests are secured between the bars **35***a* and **35***b* and between the bars **40***a* and **40***b*, respectively, of the standards. As shown in FIGURE 5, these bow limb rests are comprised by bolts **36** which extend through aligned holes in the bars **35***a*–**35***b*, and **40***a*–**40***b*, and have wing nuts **37** on their outer ends, rollers in the form of cylinders **38** surrounding the bolts **36**. These cylinders are made of any suitable material, such as hard wood, fiberglass, hard rubber or metal, etc., which cylinders have axial bores



therethrough for receiving the bolts **36**. When the cylinders are made of hard wood or metal, sleeves **39** of leather, or semi-hard rubber, surround same.

The cylinders **38** and the surrounding sleeves **39** of leather, or semi-hard rubber, are also part of the means for maintaining the bars **35***a* and **35***b*, and the bars **40***a* and **40***b*, respectively, of the standards in parallel spaced apart relationship. As stated above, the spacing of the bars **35***a* and **35***b*, as well as the spacing of the bars **40***a* and **40***b*, is slightly greater than the width of the operating lever **60**. It is also the case that the overall width of the bars **35***a*–**35***b*, and **40***a*–**40***b*, is in each case slightly less than the distance between the side boards **12***a*—**12***a* and **12***b*—**12***b*, respectively, of the base. The lower ends of the standards **35** and **40** are, therefore, received between the pairs of side boards **12***a*—**12***a* and **12***b*—**12***b*, respectively, with slight clearance. The bars **35***a*–**35***b* and **40***a*–**40***b* of the standards are rounded (not shown) on their outer corners below the upper cross rod **26**. This construction allows the standards to be positioned with their lower ends beneath the side boards **12***a*—**12***a* of the base with the rods **26** parallel to the longitudinal center line of the base, as shown in FIGURE 2, and then to be set in final position by turning through 90°, so that the upper cross rod **26** is over the upper edge of the side boards **12***a*—**12***a*, or **12***b*—**12***b*, and the lower cross rod **26** is beneath the bottom edge of the side boards **12***a*—**12***a* or **12***b*—**12***b*. Conversely, the standards may be removed from the base by rotating same through 90° in the opposite direction and lifting them out of the base.

The right standard **40** has a series of aligned holes **41** in the bars **40***a* and **40***b*, these holes being formed at equally spaced intervals along the longitudinal center lines of the bars. These holes are provided for the reception of a captive eye bolt **42**, which serves on a rest or keeper for the operating lever **60**, to be later described, while the bow is being set up for stringing. A chain **43** is secured at one end in the eye of the bolt **42** and at its other end to a screw eye **44**, which is mounted in either of the bars **40***a* or **40***b*. As shown in FIGURE 7, a fulcrum bolt **46** of the eye type may be used and this bolt would be inserted in aligned holes **41** in the bars **40***a* and **40***b*, above those in which the rest bolt **42** is inserted. This fulcrum bolt may also be of the captive type, having a chain **47** secured at one end in the eye and at its other end to the screw eye **44**. The fulcrum bolt limits the upward movement of the operating lever. Another screw eye **48** of the open type is mounted in either the bar **40***a* or **40***b* at the top of the standard. This latter screw eye receives the loop **11***a* on the bow string, when the bow is being set up for stringing.

In the modifications illustrated by FIGURES 7, 8, 9, 10, and 18, the side boards **12—12** are of one piece construction and the hinge **15** and the keeper **21** are here not used. The middle foot rest **23** is, however, used in each construction. Also, the lower ends of the standards are beveled at **35***c* and **40***c*, as in the modification according to FIGURE 1.

The modification illustrated by FIGURE 10 employs a different form of mounting means for the standards **35** and **40** on the base. In this construction, the side boards **12—12** are formed with a series of notches **19** in their upper and lower edges. A notch **19** in the upper edge and a notch **19** in the lower edge of each side board **12** form a pair for the reception of the upper and lower cross rods **26**, respectively, at the lower ends of each standard. The centers of each pair of notches to the left of the vertical center line are along a line which is inclined with respect to the vertical center line at the same angle as the left standard **35** assumes in FIGURE 1; similarly, the centers of each pair of notches to the right of the vertical center line are along a line at the same angle with respect to the vertical center line as the right standard **40** assumes in FIGURE 1.

In the modification illustrated by FIGURE 11, the right standard 40 is detachably secured to the side boards 12*b*—12*b* of the base by bolts 18. It will be understood that the left standard 35 is in similar manner attached to the side boards 12*a*—12*a*. These bolts are inserted in pairs in holes which are aligned through the side boards 12*b*—12*b* and each pair is positioned along a line at the same angle with respect to the vertical center line as the right standard 40 assumes in the modification illustrated by FIGURE 1. By setting the right standard 40 in a selected one of several positions with the bolts 18 inserted in a pair of aligned holes in the side boards 12*b*—12*b*, the archery bow stringer may be accommodated to bows of various lengths. The pairs of holes in the side boards 12*b*—12*b* for the bolts 18 here take the place of the index marks 17 on the side boards in the modification according to FIGURE 1.

In FIGURES 12 and 13, there are shown latch devices for holding with positive action the standards 35 and 40 in their desired angular positions with respect to the vertical center line. The end plates 13—13 here have right angle notches at their upper corners. Latch arms 49—49 are pivotally mounted in the notches 13*a*—13*a* on the upper cross bolt 14 and on the opposite sides of the standards 35 or 40. Each latch arm has one or more longitudinally spaced notches 49*a* on its underside. The latch arms 49—49 receive the upper cross rod 26 on the standard 35 or 40 to hold the standard in the desired angular position.

In FIGURE 14 there is shown a modification of the latch device according to FIGURES 12 and 13, which allows the standards 35 and 40 to be moved to greater distances from the ends of the base. The end plates 13—13 here have notches 13*a* at their upper corners. The two latch arms 49—49 at each end of the base in the modification illustrated by FIGURES 12–13 are here replaced by a pair of hooks 50 on the opposite sides of the standard 35 or 40, which are likewise pivotally mounted on the upper cross bolt 14, each hook having two notches 50*a* in its underside. A pair of chains 51 are each comprised by flat narrow links and each chain has a ring 52 at one end, which latter is received over the end of the upper cross rod 26 on one side of the standard 35 or 40. Any one of the links of the chain may be received between the outermost notch 42*a* and the end of the respective hook, or between the two notches.

In the modification illustrated by FIGURE 15, the side boards 12*b*—12*b* are formed with pairs of spaced holes 20—20 in their tops. U-shaped keepers 53 are inserted in the pairs of holes 20—20 on both sides of the standard 35 or 40, these keepers fitting over the upper cross rod 26. As so positioned, these keepers hold the standard 35 or 40 in the desired angular position. The keepers 53 have integrally formed rings 54 on their tops in which a chain, similar to the chain 43 on the eye bolt 42 in the modification according to FIGURE 1, may be secured at one end, to make the keepers captive members.

In the modification illustrated in FIGURES 16–17, the bars 35*a* and 35*b* of the left standard, as well as the bars 40*a* and 40*b* of the right standard, are made of metal. The cross rods 26—26 are here not used. Instead the bars 35*a* and 35*b* are severed along the sides and at one end of rectangular areas extending from the location of the cross rods 26 in the previous modifications and towards the outer ends of the bars, and the material so severed is rolled into split cylinders 34—34. These cylinders replace the cross rods 26 and receive the side boards 12*a*—12*a* or 12*b*—12*b* of the base.

The modification illustrated by FIGURE 18 is particularly adapted for the stringing and unstringing of very strong bows, in particular hunting bows. This modification includes stabilizing braces for the standards 35 and 40, which feature may well be utilized in the heavy bow stringer according to FIGURES 7, 8, and 9, to be later described. Stabilizing braces 56 are pivotally secured by a bolt or pin 57 to the standard 35 adjacent the upper end of the latter. These braces rest at their lower ends on the side boards 12—12 of the base, to hold the standard 35 in the desired angular position. Similarly, additional stabilizing braces 58 are pivotally secured by a bolt or pin 57 to the standard 40 adjacent the upper end of the latter. These latter braces rest at their lower ends on the supporting floor or ground to hold the standard 40 in the desired angular position. The braces 56 and 58 differ only in length and may, of course, be interchanged, the shorter brace 56 being pivotally mounted on the standard 40 and the longer brace 58 being pivotally mounted on the standard 35.

The operating lever 60 in the modification illustrated by FIGURE 1 is formed in two sections 60*a* and 60*b* to facilitate shipment and storage in the same manner as the base. As above stated, the lever 60 is freely received at one end of the section 60*a*, between the bars 35*a* and 35*b* of the left standard and between the keeper bolt 29 and the fulcrum bolt 32, which both are positioned in aligned holes through the bars 35*a*–35*b*. At its mid-section the two halves of the lever are pivotally secured together by a hinge 62, the leaves of which are attached to the adjacent tops of the halves preferably by bolts (not shown). At their abutting inner ends the two sections 60*a* and 60*b* are secured together by a latch device 65 or 70, as shown in FIGURES 19 and 20, respectively. In FIGURE 19 the latch device is on the bottoms of the two sections of the lever; in FIGURE 20 it is on the sides of the two sections, as will be later described. This latch device maintains the two sections of the operating lever in longitudinal alignment. As above stated, the outer end of the right section 60*b* of the lever is freely received between the bars 40*a* and 40*b* of the right standard. In the bottom of each section of the lever and adjacent the outer end of same there is formed a notch 63. The notch 63 in the left end 60*a* receives the keeper bolt 29 to function as a stop and prevent the lever from sliding outwardly between the bars 35*a*–35*b* of the standard; similarly, the notch 63 in the right section 60*b* of the lever receives the rest bolt 42 to function as a stop and prevent the lever from sliding toward the left and downwardly from between the bars 40*a* and 40*b* of the right standard. In each case a stop pin 64 is mounted on the underside of the lever between the notch 63 and the respective end of the latter. The notch 63 in the left end 60*a* of the lever receives the keeper bolt 29 and the notch 63 in the right end receives the rest bolt 42. If the lever is supported by the left standard 35, the notch 63 in the left end 60*a* will prevent the lever from sliding to the right and downwardly and thus passing from between the bars 35*a* and 35*b* of the standard. In case the notch 63 should override the keeper bolt 29, the associated pin 64 would prevent such action. Similarly, if the lever is supported by the right standard 40, the notch 63 in the right end 60*b* will prevent the lever from sliding to the left and downwardly and thus passing from between the bars 40*a* and 40*b* of the standard. Here also, in case the notch 63 should override the rest bolt 42, the associated pin 64 would prevent such action. While both the notch 63 and the pin 64 have been shown at each end of the lever, either could be omitted and the other used alone.

As above stated, one form of the latch device for holding the lever sections 60*a* and 60*b* in longitudinal alignment is shown in FIGURE 19. In this form it consists of an ordinary screen door hook and eye. The hook 65 is pivotally received at one end in a closed eye 66, which is mounted in the bottom edge of the lever section 60*a*, and is detachably engaged in a closed eye 67, which is mounted in the bottom edge of the lever section 60*b*.

As also above stated, another form of the latch device for holding the lever sections 60*a* and 60*b* in longitudinal

alignment is shown in FIGURE 20, and this form, as also stated, is attached on the aligned sides of the lever sections 60*a* and 60*b*. A latch plate 70 is pivotally secured at one end by a screw 68, which is mounted on one side of the lever section 60*a*. Adjacent its other end this latch plate has a transversely positioned notch 71 therein, which slidably engages under the head of a flat headed screw 69 on one side of the lever section 60*b*. At its free end the latch plate has a tongue which is severed along its sides and rolled into a split cylinder to form a finger rest 70*a*.

The modification of the archery bow stringer illustrated by FIGURES 7, 8, and 9 is intended for stringing heavy hunting bows, which generally have recurved ends of large radii of curvature, long torque stabilizers and their modulus may be 150# per inch, or greater. For such heavy bows it is preferable that the operating lever 60 be of one piece construction, as shown, although the two piece hinged construction illustrated in FIGURE 1 can still be used. As above stated, the base 12 is here also of one piece construction although a two section hinge connected base could likewise be used. It will usually be the case that a one piece operating lever 60 will be used with a single section base and a two part operating lever with a two section base. As above stated, the stabilizing braces 56 and 58 of the modification illustrated by FIGURE 18 are well adapted for use with this modification.

To facilitate operation from either the right end or the left end side of the archery bow stringer, the keeper bolt 29 and the fulcrum bolt 32 are also provided for the right standard and inserted in the holes 41 in the bars 40*a* and 40*b* of the latter, as shown in FIGURE 1. A second screw eye 31 may be provided in either the bar 40*a* or 40*b* for attachment of the chains 30 and 33 from the keeper bolt 29 and the fulcrum bolt 32, or these chains may be secured to the screw eye 44. Alternatively, these chains may be secured to the bow limb rest bolt 36 at the top of the standard 40 in the same manner as on the left standard in the modification according to FIGURE 9. Similarly, the rest or stop bolt 42 and the fulcrum bolt 46 are also provided in adjacent aligned holes 28—28 in the bars 35*a* and 35*b* of the left standard. To work from the left end, the right section 60*b* of the lever is placed between the keeper bolt 29 or 42 and the fulcrum bolt 32 or 46 adjacent the bottom of the right standard 40, and the left section 60*a* between and working upwardly or downwardly between the left standard bars 35*a* and 35*b*.

Four forms of the pull down connector, which may be used between the handle 10*c* of the bow and the operating lever 60, are shown in FIGURES 21, 22, 23, and 24, respectively. In the form shown in FIGURE 21, a U-shaped clip 72 receives the lever section 60*b*, the latter resting in the bottom of the U. One of the legs of the U terminates in an open hook 72*a*, and the other leg in a closed eye 72*b*. Adjacent the hook 72*a* and the eye 72*b* the respective legs of the U are bent slightly inwardly. With this form of construction the clip 72 is self retaining on the lever 60 but still may be slid along same, so as to be positioned at the center of the handle section 10*c* of the bow. A strap 73 has a single hole therein adjacent one end and a series of holes 75 along its longitudinal center line terminating adjacent the other end. The single hole adjacent the first end receives the eye 72*b* on the clip 72, the strap being put in place before the eye is closed. The strap 73 surrounds the bow handle 10*c* over about three-quarters of the periphery of the latter, and over the length which contacts the bow handle it is covered by padding 74. This padding may be felt wrapped around the strap and held in place by tape. At its free end the strap 73 has therein a longitudinally arranged series of holes 75 and may be engaged with any one of these holes receiving the hook 72*a* on the clip 72. A heavy cord having loops knotted or spliced at its opposite ends may well be used in place of the strap 73, if desired.

In the modification of the pull down connector illustrated in FIGURE 20, a strap 76 is used. This strap is doubled back on itself and the lapped sections secured together by a rivet 77 to form a loop 76*a*. A hook 78 is secured in the loop 76*a*. The strap is positioned with the loop 76*a* on one side of the lever section 60*b*, extends under the latter, and upwardly along the other side. A retaining ring 79, which is preferably split, flattened on its sides and rounded at its ends, is also received in the loop 76*a*, extends across the top of the lever section 60*b* and receives the strap 76 above the top of the latter. The strap 76 is otherwise identical with the strap 73 in the modification illustrated by FIGURE 21.

The modification of the pull down connector illustrated by FIGURE 23 also utilizes a U-shaped clip 80, which is similar to the U-shaped clip in the modification illustrated by FIGURE 21. One difference is that the clip 80 has straight legs, which are both rolled into closed eyes 80*a* at their tops. This clip receives the lever section 60*b* with the bottom of the latter on the bottom of the clip and the legs of the clip against the respective sides of the lever section. A keeper bar 81 has open eyes (not shown) at its opposite ends and is positioned across the top of the lever section 60*b*, with its eyes respectively received in the eyes 80*a* on the upper ends of the legs of the clip 80. While the keeper element 81 has been described and is shown as a metal rod having closed eyes at its opposite ends, a cord or thong placed across the top of the lever 60 and tied in position at its opposite ends through the loops 80*a*—80*a* of the clip may well be used. A chain 82 has one end link secured in the eye 80*a* on one of the legs of the clip and a chain 83 has one end link secured in the eye 80*a* on the other end of the clip.

The bow engaging member is here a heavy cord 86, which surrounds the bow handle 10*c* for three-quarters of the periphery of the latter and has the padding 74 thereon in the same manner as the straps 73 in the modifications illustrated by FIGURES 21 and 22, respectively. The cord 86 has its opposite ends doubled back on each other and the doubled lengths are secured together by splicing or knotting to form loops at the ends. The spliced or knotted portions of the cord may be served with wrappings of light cord 87 to smooth their outlines. On one side the loop at the end of the cord 86 is received in the closed eye of a snap hook 84; the free end of this hook is closed by a leaf spring 85 and may be engaged in any of the links of the short chain 82. On the other side the loop at the end of the cord 86 is received in the closed eye of an S-shaped hook 88; the free end of this hook may likewise be engaged in any of the links of the chain 83. The chains 82 and 83 are to be of the same length. Differences in the lengths originally provided may be taken care of by securing any link of the chain 82 in the snap hook 84 and any link of the chain 83 on the S-hook 88.

The modification of the pull down connector illustrated by FIGURE 24 utilizes a stiff rod 90 between the bow handle 10*c* and the lever section 60*b*. The rod 90 is formed with an integral U-shaped clip 90*a* at its lower end, which latter terminates in a closed eye 90*b*. As in the case of the clips 72 and 80 in the modifications illustrated by FIGURES 21 and 23, respectively, the clip 90*a* receives the lever section 60*b* with the bottom of the latter on the bottom of the clip and the legs of the clip against the sides of the lever section. A retaining ring 79, similar to the retaining ring 79 in the modification illustrated by FIGURE 22, is received at one end in the closed eye 90*b* on the upper free end of the clip 90*a*, extends across the top of the lever section 60*b*, and at its other end engages the rod 90.

At its upper end the rod 90 is formed with an integral substantially right angle extension 90*c*, which is screw threaded at its outer end at 90*d*. Two washers 91—91 are received on the extension 90*c* and a grooved roller 92 is rotatably mounted on the extension intermediate the washers and engages the inner edge of the handle

section 10c of the bow. A nut 93 is received on the threaded outer end of the right angle extension for holding the washers 91—91 and the roller 92 in place on the extension.

Arrows A may be held in place on the archery bow stringer according to the present invention. Where the latter is on display for sale the arrows A both enhance the appearance of the device and call the attention of prospective purchasers to its intended use. Also, the arrows are also held on the archery bow stringer, when the latter is set up on a range for the archer to select from as he shoots, in the same manner as a ground quiver is used. In the modification illustrated by FIGURE 1, one of the side boards 12a is formed with a series of transversely positioned holes 16, which extend from the top edge to the bottom edge. The shafts of the arrows A may be inserted in these holes for holding the arrows in vertical position on the archery bow stringer.

Another form of device for holding the arrows in place on the base of the archery bow stringer is shown in FIGURES 25 and 26. A strap 94 is formed into lengthwise sinusoidal shape. This strap is secured to the outer face of one of the side boards 12b by nails or screws 95, which are positioned in the troughs, and the alternate crests form loops for receiving the arrows A and holding same in vertical position.

In connection with using the archery bow stringer as a rack for arrows on a range, it is also noted that it can be utilized as a support for the bow when the latter is not being used.

In operation, the bow 10 is placed in inverted position on the bow stringer, with its reversely curved ends 10a and 10b resting on the bow limb rests 39—39 at the tops of the standards 35 and 40. The cord 11 is secured at one end to the bow, for instance to the end 10b of the latter, by fastening the loop 11b in the nock or notch at the latter end; the loop 11a at the other end of the cord is placed in the open screw eye 48 at the top of the right standard 40. The pull down connector is now put into position. Where the pull down connector as illustrated in FIGURE 21 is used, the clip 72 will already be in place on the lever section 60b and need only be centered with respect to a vertical center line through the handle section 10c of the bow. The strap 73 is now placed around the handle section 10c, with the padding 74 on the strap in contact with the handle section, and the free end of the strap engaged with one of the holes 75 in same on the hook 72a of the clip. With the bow 10 now firmly secured to the standards 35 and 40 and the operating lever 60, the archer withdraws the keeper bolt 42 from beneath the section 60b of the lever. The archer next steadies himself and the archery bow support by placing one hand on the top of the right standard 40. Then, by pressing downwardly on the section 60b of the operating lever with his foot at approximately one of the positions indicated by the arrows P in FIGURE 1, the lever is pivoted about the fulcrum bolt 32 and the pull down connector flexes the bow 10 to the position shown in dotted lines in FIGURE 1. When working from the opposite end, in which case the right end 60b of the operating lever is between the keeper bolt 42 and the fulcrum bolt 46 on the right standard 40 and the left end 60a is adjacent the top of the left standard 35, the operator will press downwardly with his foot at either of two corresponding positions on the left end. After the bow 10 has been flexed to the dotted line position, it may be held in this position by inserting the keeper bolt 42 through the proper holes 41 in the bars 40a and 40b of the right standard just above the top edge of the operating lever. This leaves the archer free to move from the right end of the archery bow stringer to the left end, to make any necessary adjustment of the string 11 in the nock at the left end 10b of the bow. After such adjustment has been made, or found not to be necessary, the loop 11a at the free end of the bow string is fastened in the nock at the right end 10a of the bow.

With the bow string 11 now secured at its opposite ends to the bow 10, the keeper bolt 42 is withdrawn from the respective aligned holes 41 in the bars 40a and 40b of the right standard and the pressure on the operating lever 60 is gradually released, allowing the bow to straighten out to a limtied extent and draw the string 11 taut. The pull down connector is then unfastened on one side and removed from the handle section 10c of the bow. In the case of the modification of the pull down connector illustrated in FIGURE 24, the operating lever is lifted upwardly a short distance at the end 60b, until the groove in the roller 92 clears the bow handle 10c. The bow 10 may now be removed from the archery bow stringer.

As above stated, the modification illustrated in FIGURES 7, 8 and 9 is particularly adapted to the stringing of certain types of bows, in particular heavy hunting bows, having recurved ends of large radii, long torque stabilizers, and with a modulus of 150# per inch or greater. For this operation it is preferable that the operating lever 60 and the base 12 both be of one piece construction. It is also preferable that, when the bow is resting on the bow stringer for being strung, the operating lever 60 be in an approximately horizontal position and spaced a short distance below the bow handle 10c, while the pull down connector 73 is being attached. Then in the first step of stringing the bow, the left end 60a of the operating lever is pressed downwardly as far as may be required, as shown in dotted lines, while the right end 60b of the lever pushes upwardly against the stop bolt 46, extending through the aligned holes 41 in the bars 40a–40b of the right standard. In the second step the rest bolt 42 is removed and the right end 60b of the lever is pressed downwardly between the bars 40a–40b of the right standard, as far as may be required to allow the loop 11a of the bow string to be slipped into the nock in the right end 10b of the bow. In this way the bow 10 is levered down twice, first by the left end 60a of the lever being swung downwardly, and then further by the right end 60b being swung downwardly.

To unstring a bow on the archery bow stringer according to the present invention, very much the same procedure is followed, only the order of the steps is reversed.

For shipment and storage, in order to conserve space, the pull down connector will be removed from the operating lever 60 and the operating lever from its position between the bars 35a and 35b of the left standard and between the bars 40a and 40b of the right standard. The latch 65, or the latch 70, as the case may be, will be released and the section 60a folded over and onto the section 60b of the operating lever, or vice versa. Further, the standards 35 and 40 will be removed from the base by turning each standard through 90° about its longitudinal center line, so that the cross rods 26—26 are parallel to the longitudinal center line of the base, as shown in FIGURE 2 and then lifting them out of the base. Likewise, the section 12a—12a will be folded over and onto the section 12b—12b of the base, or vice versa. A pair of straps (not shown) either free or attached to the base 12 may be provided for securing all of the parts together in a compact and neat bundle.

Having now fully described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. A bow stringer for archery bows comprised by an elongated base, pairs of standards each formed by parallel bars mounted on the base for movement toward and away from the respective ends of the latter, a lever pivotally mounted between the bars of one standard and swingingly positioned between the bars of the other standard, a spacer member between the bars of each standard separating same by a distance slightly greater than the width of the lever, cross members insertable through the bars of each standard above and below the lever and spaced apart a

distance slightly greater than the height of the lever, a bow limb rest for one end of a bow between the bars of each standard and spaced adjacent the top of the latter, and a vertically positioned pull down connector secured at its lower end to the lever and engageable at its upper end with the bow at the mid-length of the latter for flexing the bow downwardly between its supported ends, when the lever is swung downwardly between the bars of the latter standard.

2. A bow stringer for archery bows comprised by an elongated base of rectangular cross-section, pairs of standards each formed by parallel bars mounted on the base for movement toward and away from the respective ends of the latter, a lever pivotally mounted between the bars of one standard and swingingly positioned between the bars of the other standard, spacer members between the bars of each standard separating same by a distance slightly greater than the width of the lever, cross members insertable through the bars of one standard above and below one end of the lever spaced apart a distance slightly greater than the height of the lever and forming the pivotal mounting for the latter with the other end freely extending between the bars of the other standard, a bow limb rest for the one end of a bow between the bars of each standard and spaced adjacent the top of the latter, and a vertically positioned pull down connector secured at its lower end to the lever and engageable at its upper end with the bow at the mid-length of the latter for flexing the bow downwardly between its supported ends through the swinging action of the lever, when the latter is pressed downwardly between the bars of the second pair of standards for stringing the bow.

3. A bow stringer for archery bows comprised by an elongated base of rectangular cross section, pairs of standards each formed by parallel bars, adjustable mountings for positioning the standards on the base at opposite obtuse angles with respect to the longitudinal center line of the bars and at selected positions along the latter comprised by cross rods at the lower ends of the standards spaced apart a distance slightly greater than the height of the base, a lever pivotally mounted on the bars of one of the standards and swingingly positioned between the bars of the other standard, spacer members between the bars of each standard separating same by a distance slightly greater than the width of the lever, cross members extending through the bars of the first standard above and below one end of the lever spaced apart a distance slightly greater than the height of the lever and forming the pivotal mounting of the latter on the first standard, a bow limb rest for one end of a bow between the bars of the standards and spaced adjacent the tops of the latter, and a vertically positioned pull down connector having a bottom section partially surrounding the lever at the mid-length of the latter and a top section engageable with the bow at the mid-length of the latter for flexing the bow downwardly between its supported ends through the swinging action of the lever when the latter is pressed downwardly between the bars of the second pair of standards for stringing the bow.

4. A bow stringer for archery bows comprised by an elongated base of rectangular cross section, pairs of standards each formed by parallel bars, adjustable mountings for positioning the standards on the base at opposite obtuse angles with respect to the longitudinal center line of the base and at selected positions along the latter comprised by cross rods at the lower ends of the standards spaced apart a distance slightly greater than the height of the base, a lever pivotally mounted on the bars of one of the standards and swingingly positioned between the bars of the other standard, spacer members between the bars of each standard separating same by a distance slightly greater than the width of the lever, cross members extending through the bar of each standard and spaced apart a distance slightly greater than the height of the lever for forming the pivotal mounting of one end of the lever on either standard with the other end of the lever extending freely between the bars of the other standard, a bow limb rest between the bars of each standard and spaced adjacent the top of the latter, and a vertically positioned pull down connector having a bottom section partially surrounding the lever at the mid-section of the latter and a top section engageable with the bow at the mid-length of the latter for flexing the bow downwardly between its supported ends through the swinging action of the lever, when the latter is pressed downwardly between the bars of the second pair of standards for stringing the bow.

5. An archery bow stringer comprised by a base, a pair of vertically directed standards mounted on the base, a bow limb rest at the top of each standard, a lever slidable along either or both of the standards, a lever pivot mounted in a substantially horizontal position on one of said pair of standards, a lever pivot mounted in a substantially horizontal position on the other of said pairs of standards, and a connecting device on said lever engageable with a bow supported on said bow limb rests, said lever being operable and swingable from either end of the archery bow stringer.

6. An archery bow stringer comprised by a base, a pair of vertically directed standards each formed by parallel spaced apart bars mounted on the base, a bow limb rest between the bars of each standard at the top of the latter, a lever positioned between the bars of the standards, a pivot member insertable through the bars of one of the standards above the lever, a removable keeper member insertable through the bars of the other standard above the lever, and a connecting device on said lever engageable with a bow supported on said bow limb rests.

7. An archery bow stringer comprised by a base, a pair of vertically directed standards mounted on the base and each comprised by parallel spaced apart bars with the bars of each standard having a series of longitudinally spaced holes therein and the holes in the bars of each standard being aligned, a bow limb rest between the bars of each standard at the top of the latter, a lever positioned between the bars of the standards, a keeper bolt and a fulcrum bolt insertable through a pair of holes in the bars of either standard below and above the lever, respectively, and a connecting device on said lever engageable with a bow supported on the bow limb rests.

8. An archery bow stringer comprised by a base including parallel spaced apart members each formed in two sections, hinges uniting the two sections of each member, a pair of vertically directed standards each comprised by parallel spaced apart bars having their lower ends beveled upwardly and outwardly mounted on the base, bow limb rests between the bars of each standard at the top of the latter, a lever formed in two sections with one of the sections between the bars of one standard and the other section between the bars of the other standard, a hinge uniting the two sections of the lever, a pivot mounting for said lever between the bars of one of the standards, and a pull down connecting device secured at one end to said lever and engageable at its other end with a bow supported on said bow limb rests.

9. An archery bow stringer comprised by a base including parallel spaced apart members, vertically directed standards comprised by parallel spaced apart bars received adjacent their lower ends between the parallel spaced apart members and having their lower ends beveled upwardly and outwardly, fastening elements securing the standards to the parallel spaced apart members at obtuse angles with respect to the center line of the base, bow limb rests between the bars of each standard at the top of the latter, a lever positioned between the bars of the standards, a pivot member for said lever mounted between the bars of one of the standards, and a connecting device on said lever engageable with a bow supported on said bow limb rests.

10. An archery bow stringer comprised by a base in-

cluding parallel spaced apart members, vertically directed standards comprised by parallel spaced apart bars received adjacent their lower ends between the parallel spaced apart members and having their lower ends beveled upwardly and outwardly, a bow limb rest between the bars of each standard at the top of the latter, cylindrical members on the outer side of each bar of both standards above and below each of the parallel spaced apart members, a lever positioned between the bars of the standards, a pivot member for said lever between the bars of one of the standards, and a connecting device on said lever engageable with a bow supported on said bow limb rests.



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