United States Patent

Lee

[15] **3,658,157**

[45] **Apr. 25, 1972**

[54] ARCHERY BOW TUNING AND STABILIZING ATTACHMENT

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[22] Filed: **May 15, 1970**

[21] Appl. No.: **48,665**

Related U.S. Application Data

[62] Division of Ser. No. 772,075, Oct. 31, 1968, Pat. No. 3,525,822.

[52] **U.S. Cl.** ..... **188/1 B**
[51] **Int. Cl.** **F16f 7/10**
[58] **Field of Search** ..... 124/23, 24; 188/1 B

[56] **References Cited**

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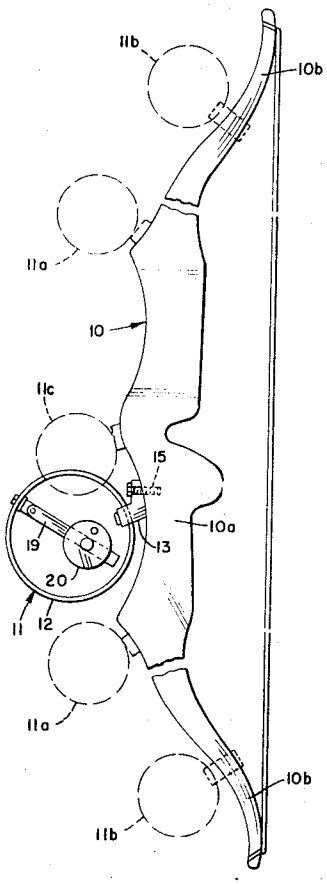
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Attorney—Munson H. Lane and Munson H. Lane, Jr.

[57] **ABSTRACT**

A torque ring adjustably secured at a selected point to an archery bow. A tuning bar has one end thereof universally adjustably secured to the torque ring and has a weight adjustably mounted thereon. The tuning bar is resiliently flexible for oscillation with the weight in any selected plane with respect to the plane of the bow, under shock transmitted from the bow to the torque ring.

6 Claims, 9 Drawing Figures



PATENTED APR 25 1972

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SHEET 1 OF 2

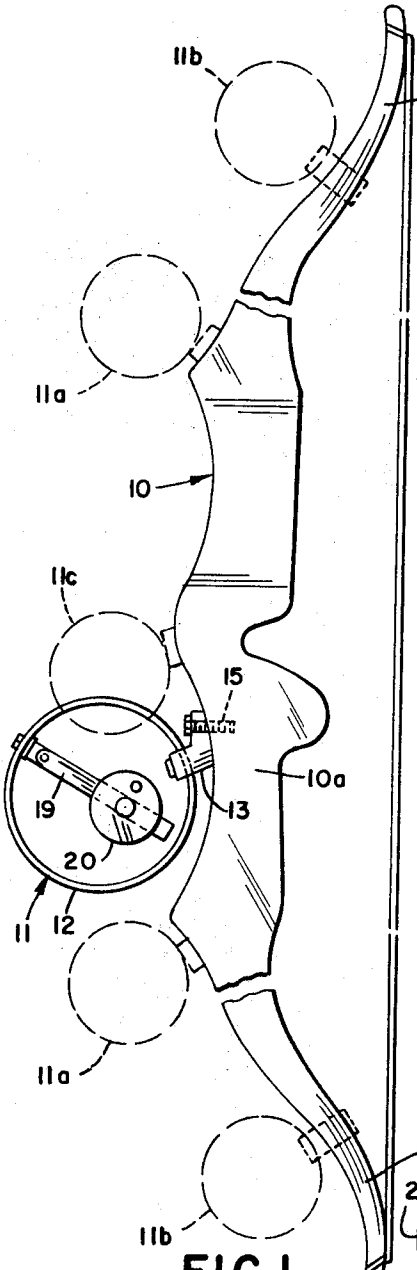


FIG.1.

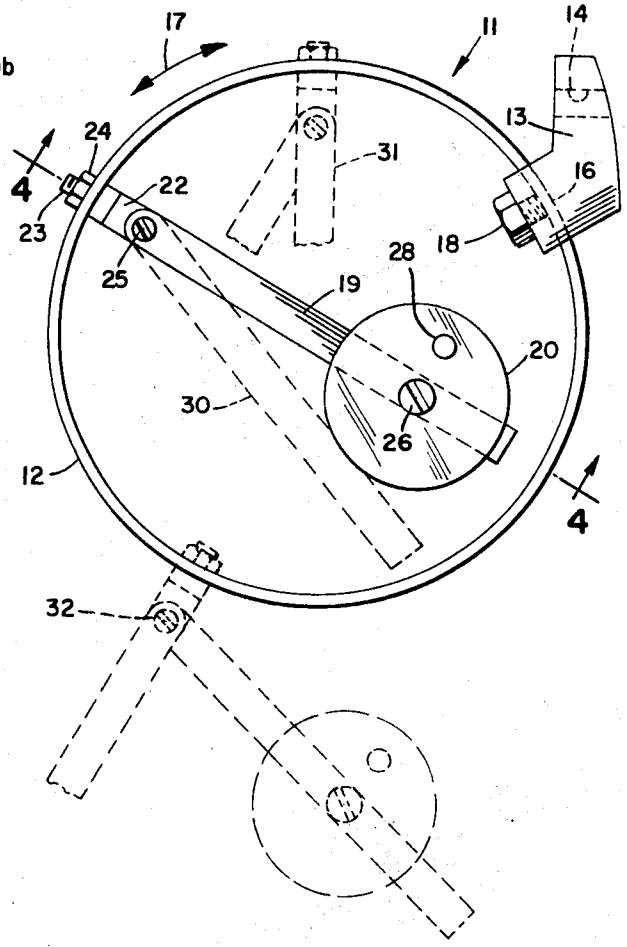


FIG.3.

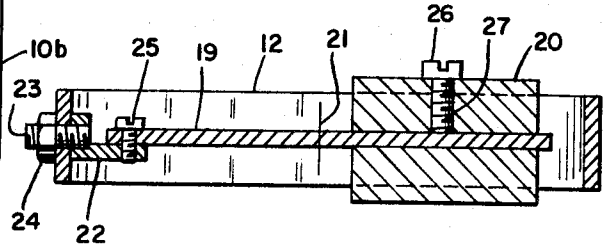


FIG.4.

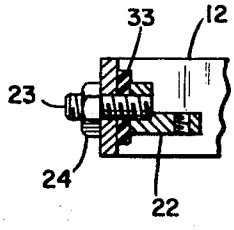


FIG.5.

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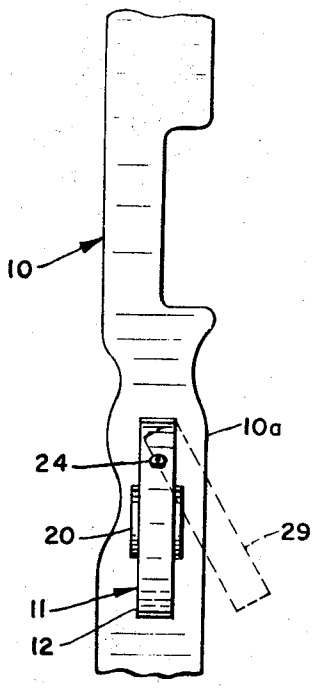


FIG. 2.

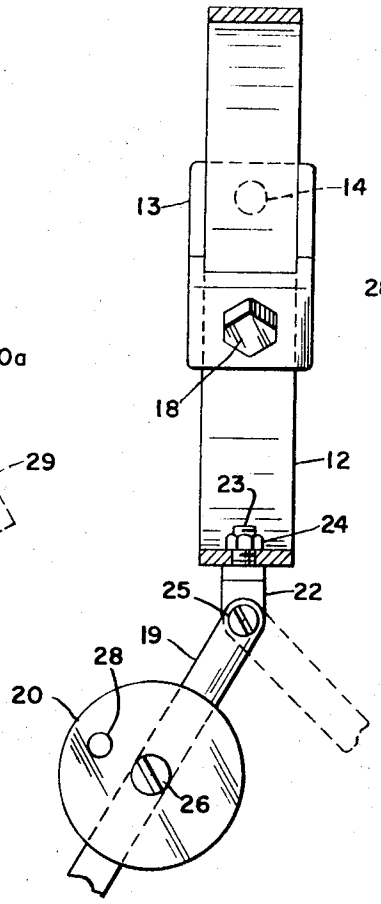


FIG. 6.

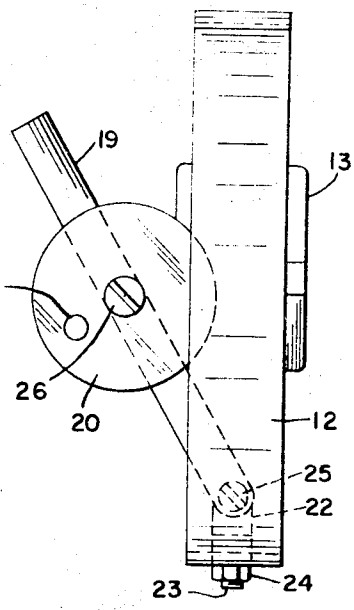


FIG. 7.

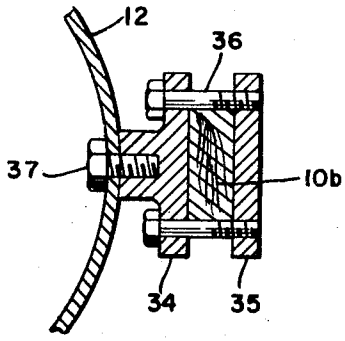


FIG. 9.

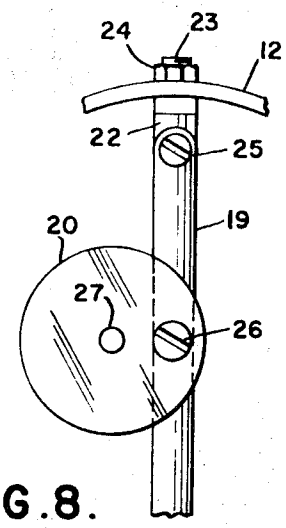


FIG. 8.

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ARCHERY BOW TUNING AND STABILIZING ATTACHMENT

The present application is a division under Rule 147 of my application Ser. No. 772,075, filed Oct. 31, 1968, now U.S. Pat. No. 3,525,822.

This invention relates to new and useful improvements in archery bows, and in particular the invention concerns itself with a bow attachment which is capable of efficiently translating the stored energy of a drawn bow into arrow thrust, whereby to reduce energy loss, minimize shock to the archer's arm, and eliminate the tendency of the bow to jump, cant, or rotate.

It is generally known that the provision of a mass moment of inertia on the handle portion of a bow has beneficial effects, and the principal object of the invention is to provide a bow attachment which includes a mass or weight carried by an oscillatory tuning bar, the mass inertia being effective to control vibration, absorb shock, stabilize the bow, and produce an increased arrow thrust, as above outlined.

Briefly, the attachment of the invention also includes a torque ring to which one end of the tuning bar is secured by an adjustable, universal connection, and adjustable mounting means for the torque ring at a selected point on the bow, the arrangement being such that the tuning bar with its weight may be set for oscillation in any desired plane relative to the plane of the bow. Also, the weight itself is adjustable on the tuning bar to afford a desired frequency and amplitude of oscillation in any selected plane, whereby the inertial effect of the weight may be utilized to the best advantage.

The device of the invention is simple in construction, efficient in operation, attachable to any conventional bow, and capable of economical manufacture.

With the foregoing more important object and features in view and such other objects and features as may become apparent as this specification proceeds, the invention will be understood from the following description taken in conjunction with the accompanying drawings, wherein like characters of reference are used to designate like parts, and wherein:

FIG. 1 is a side elevational view of an archery bow with the attachment of the invention in situ thereon, various other possible locations of the attachment being shown by dotted lines;

FIG. 2 is a fragmentary front elevational view of the bow with the attachment;

FIG. 3 is an enlarged elevational view of the attachment per se;

FIG. 4 is a cross-sectional view, taken substantially in the plane of the line 4—4 in FIG. 3;

FIG. 5 is a fragmentary sectional detail showing a slightly modified connection of the tuning bar to the torque ring;

FIG. 6 is a fragmentary view, partly in section and partly in elevation, showing the tuning bar and weight outside the torque ring;

FIG. 7 is an elevational view of the attachment in another, differently adjusted position;

FIG. 8 is a fragmentary elevational view showing the weight in a differently adjusted position on the tuning bar; and

FIG. 9 is a fragmentary sectional detail showing a modified form of the torque ring mounting means.

Referring now to the accompanying drawings in detail, the numeral **10** generally designates a conventional archery bow, having the bow tuning and stabilizing attachment **11** mounted on the handle portion **10***a* thereof. Preferably, although not necessarily, the attachment is mounted on the handle portion near the center thereof, but depending upon an individual archer's preference, two smaller attachments may be used as indicated at **11***a*, **11***a* adjacent the ends of the handle portion, or two such smaller attachments may be mounted as at **11***b*, **11***b* near the ends of the limbs **10***b* of the bow. Also, if desired, the two smaller attachments at either the locations **11***a* or **11***b* may be used in conjunction with a third small attachment at a location **11***c* near the center of the handle portion **10***a*, in order to attain what may be referred to as the triangulation principle.

In any event, as illustrated in FIGS. **3** and **4**, each attachment comprises a torque ring **12** in the form of an annular band, which is adjustably secured to the bow **10** by mounting means such as, for example, a mounting block **13**, the latter having an aperture **14** for reception of a suitable screw **15** (see FIG. 1) for securing the block to the bow. The block **13** also has a slot **16** through which the ring **12** is slidably adjustable in a circumferential direction as indicated at **17**, the ring being locked in a selected, adjusted position relative to the block **13** by a suitable set screw **18**, as will be readily apparent.

A tuning bar **19** is secured at one end thereof to the ring **12** and carries a weight **20**, the bar being resiliently flexible and capable of oscillation with the weight, for example as indicated at **21** in FIG. **4**. The bar **19** is connected to the ring **12** by a universal connection of any suitable type which, for illustrative purposes has been shown as comprising an L-shaped bracket **22** provided with a screw-threaded stud **23** which extends through an aperture in the ring **12** and carries a nut **24** for securing the bracket in place. The bar **19** is attached to the bracket **22** by a screw **25** and the universal connection in this arrangement is obtained by adjusting the bar **19** laterally about the axis of the screw **25** and/or turning the bracket **22** about the axis of the stud **23**.

The weight **20** is slidably adjustable along the length of the bar **19** and is locked in a selected position by a set screw **26** disposed in a screw-threaded aperture **27** at the center of the weight. However, the weight may also be provided with an eccentric aperture **28** for the screw **26**, so that the weight may be secured to the bar in eccentric relation, as shown in FIG. **8**.

Virtually infinite adjustments are possible in order that the tuning bar **19** with its weight **20** may oscillate in any desired plane relative to the plane of the bow **10**, and some of these are shown for illustrative purposes in the drawings. First, the ring **12** may be secured in any desired location on the bow, as already mentioned. Second, the mounting block **13** may be fastened to the bow by the screw **15** so that the ring **12** is either aligned longitudinally with the bow as shown by the full lines in FIG. **2**, or that it is angularly offset by any angular deviation to either side of the bow, as exemplified at **29** in the same Figure. Third, by loosening the set screw **18** in the mounting block **13**, the ring **12** may be slid circumferentially through the block as indicated at **17**, whereby the point of connection of the bar **19** to the ring may be moved circumferentially closer to or further away from the mounting block, so that shock transmitted by the bow has to travel a lesser or a greater distance along the ring before reaching the tuning bar. In this regard it is to be noted that the torque ring inherently possesses a certain amount of resiliency, so that the transmitted shock is dampened to a greater or lesser degree during its passage along the ring, depending on the length of travel.

Fourth, the position of the weight **20** longitudinally on the bar **19** may be adjusted so as to provide for a lesser or greater frequency and amplitude of oscillation in any selected plane, as afforded by a fifth adjustment of the universal connection **23**, **24** of the bar **19** to the ring **12**, which permits oscillation of the bar **19** in a plane parallel to the ring, or transversely of the ring, or in any other angular relationship to the ring. As for example, in FIG. **4** the bar **19** may oscillate as at **21** in a plane parallel to the ring axis, but if the bracket **22** is turned through 90° about the stud **23**, the bar may oscillate in a plane transverse to the ring axis.

Fifth, by loosening the screw **25** the bar **19** may be adjusted from a diametrically extending or central position in the ring **12** as shown by the full lines in FIG. **3** to a laterally offset position exemplified by the dotted lines **30**, and here again infinite variations in adjustment are possible in all different planes. The same Figure (3) also exemplifies by the dotted lines **31** a different position of the bar **19** attained by the aforementioned circumferential adjustment of the ring **12** in the mounting block **13**, and it additionally shows a sixth possible adjustment where, as indicated at **32**, the parts have been reversed so as to place the bar **19** with its weight **20** on the outside, rather than the inside of the ring **12**. This may be obtained by

simply inserting the stud **23** through the ring from the outside and placing the nut **24** on the stud at the inside of the ring, so that the bracket **22**, the bar **19** and the weight **20** are disposed externally of the ring for oscillation of the bar and weight in any selected plane relative to the ring itself, as exemplified in FIG. **6**.

It will be apparent from the foregoing that three-dimensional facilities are provided for locating the weight anywhere in a sphere represented by the inside of the ring **12** and the length of the bar **19**, and also anywhere in a hemisphere located anywhere around the outside of the ring. The total effect of the various spherical, lateral, vertical, horizontal and rotary adjustments enables the archer to locate the mass moment of inertia at the exact point or points best suited for his purpose in establishing a center of gravity, bow cant, inclination and torque resistance to enhance his personal style of holding the bow and releasing the arrow. Also, it is possible to control the weight reaction to shock in an infinitely variable degree so that the weight will oscillate with the desired frequency and amplitude, regardless of the location of the weight.

The path of weight oscillation may be adjusted from a single plane arc to an elliptical form of movement by mounting the weight **20** eccentrically on the bar **19** as shown in FIG. **8**, thus creating an out of balance condition which will cause the weight to move in an elliptical path when subjected to shock. This ability to change the direction and form of oscillation becomes of importance when considered in connection with the facts that every archer has a unique technique and every bow has its own length, speed, force and path of limb motion. The device of the invention serves to compensate for faults of the archer being transmitted through the bow to affect the course and speed of the released arrow. Conversely, the device serves as insulation against shock and flutter of a sensitive bow reaching the archer's hand, with possible resulting shock, shaking, flinching and jerking arrow release.

FIG. **5** shows a small modification of the connection of the tuning bar mounting bracket **22** to the ring **12**, wherein a washer **33** of rubber, plastic, fiber or other resilient material has been provided on the stud **23** between the bracket and the ring to afford a cushioning effect.

If the device is to be mounted on the limb portion **10***b* of the bow which is relatively thin and not well suited to accommodate a screw such as the mounting screw **15** of the block **13**, a clamp-type mount may be employed as shown in FIG. **9**, wherein the bow limb portion **10***b* is clamped between a pair of clamp members **34**, **35** by screws **36** and the ring **12** is secured to one of the clamp members by a screw **37**, as will be clearly apparent.

While in the foregoing there have been shown and described the preferred embodiments of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure and various modifications and equivalents may be resorted to, falling within the spirit and scope of the invention as claimed.

What is claimed as new is:

1. A tuning and stabilizing attachment for an archery bow, said attachment comprising in combination, mounting means adapted to be secured at a selected point to a bow, a torque ring supported by said mounting means, a resiliently flexible tuning bar secured at one end thereof to said torque ring, a weight carried by said bar for oscillation therewith under shock transmitted to said ring from the bow and universally adjustable means securing said tuning bar to said torque ring whereby the bar may oscillate in a selected angular plane relative to the plane of the ring.

2. The device as defined in claim **1**, wherein said universally adjustable means are securable to said torque ring so as to dispose said tuning bar with said weight selectively inside and outside the torque ring.

3. The device as defined in claim **1**, together with means securing said weight to said tuning bar at a selected point longitudinally of the bar.

4. The device as defined in claim **1**, wherein said torque ring is adjustable circumferentially in said mounting means whereby to vary the circumferential distance of the secured end of said tuning bar from the mounting means.

5. The device as defined in claim **1**, wherein said tuning bar is adjustable at selected points about the circumference of said ring.

6. A tuning and stabilizing attachment for an archery bow, said attachment comprising in combination, mounting means adapted to be secured at a selected point to a bow, a torque ring supported by said mounting means, a resiliently flexible tuning bar secured at one end thereof to said torque ring, a weight carried by said bar for oscillation therewith under shock transmitted to said ring from the bow and means securing said weight selectively concentrically and eccentrically to said tuning bar.

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