

Dec. 21, 1965

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3,224,440

SURGICAL BOW ASSEMBLY

Filed June 10, 1963

2 Sheets-Sheet 1

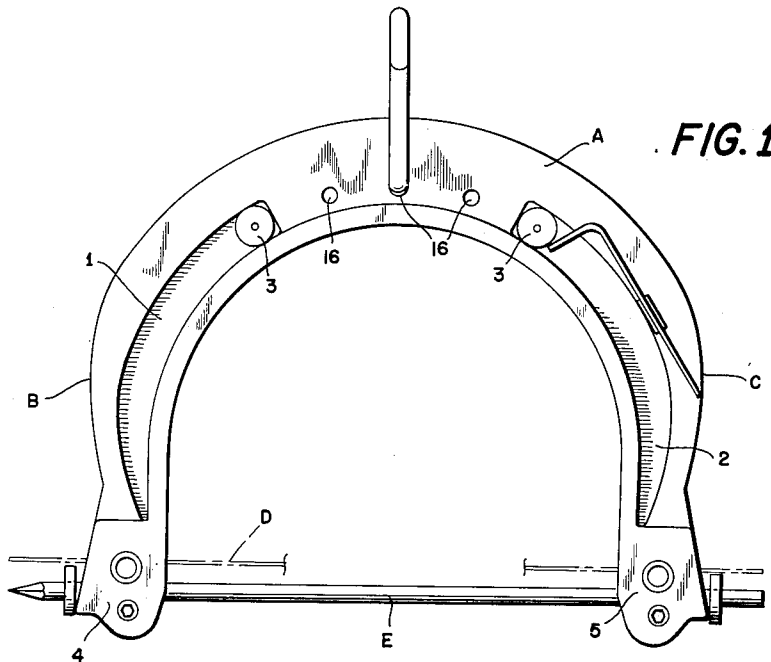


FIG. 1

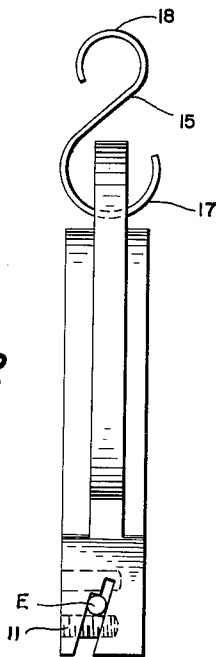


FIG. 2

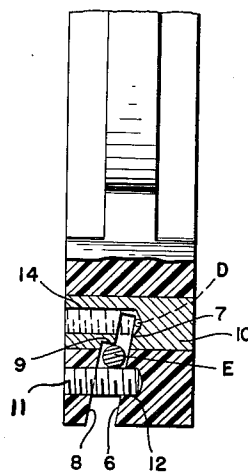


FIG. 3

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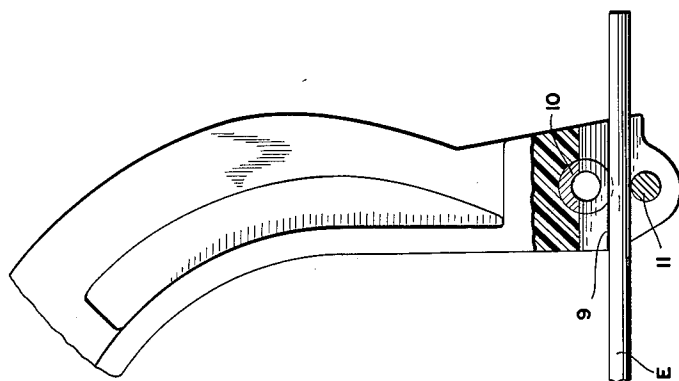


FIG. 5

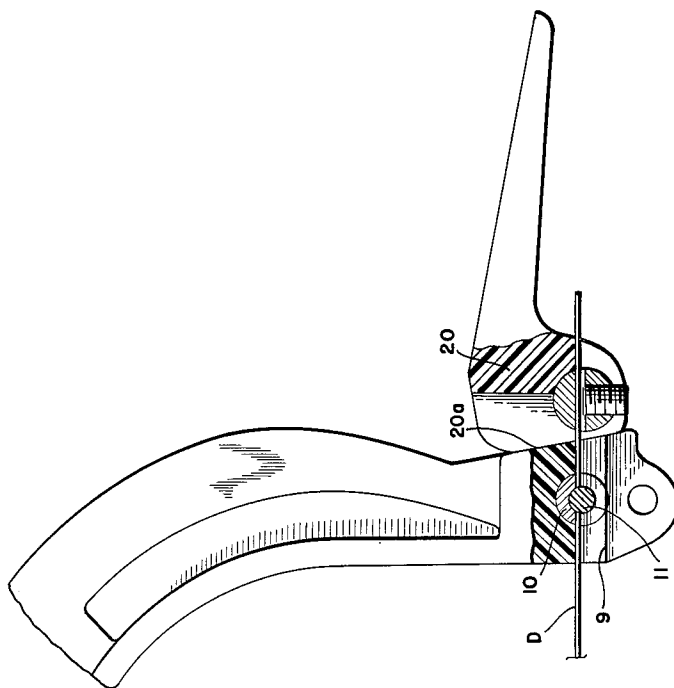


FIG. 4

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SURGICAL BOW ASSEMBLY

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6 Claims. (Cl. 128-84)

This invention relates to orthopedic devices of the traction bow type and comprehends improvements in my prior Patent No. 3,088,460, dated May 7, 1963.

One of the objects of the invention is to provide means for utilizing the traction bow either with tensioned wires or with relatively heavy pins which are not in tension as may be required by the nature of the circumstances under which the bow is to be utilized by the surgeon.

Another object of this invention is to provide a structure which may be made from any suitable material including X-ray translucent plastics, the device embodying structure permitting selective use of either a tensioned wire or a heavy non-tensioned pin.

These and other objects of the invention will more clearly hereinafter appear by reference to the accompanying drawings forming a part of the instant specification, and wherein like characters of reference designate corresponding parts throughout the several views, in which:

FIG. 1 is a front elevation of the device showing a non-tensioned pin in position and illustrating the position of an alternately used tensioned wire;

FIG. 2 is an end elevation of the structure of FIG. 1;

FIG. 3 is an elevation, partly in section, of one of the bow end structures;

FIG. 4 is a fragmentary elevation, partly in section, of one of the bow terminals; and

FIG. 5 is a view similar to FIG. 4 omitting the illustration of the tensioned wire.

In the present disclosure the bow or yoke member includes a base portion A and two resilient arms B and C, the arms being formed of a suitable material permitting them to be compressed by suitable means, as shown in my prior patent, for applying tension to a wire D when the latter is used in lieu of the pin E. The arms of the yoke are formed in their side faces with elongated recesses 1 and 2 having suitable depth and dimension to provide storage sockets for limit washers 3 which conventionally are placed on the pin E to prevent the longitudinal displacement of the latter when in use, as shown in FIG. 1. The sockets further are so constructed and arranged as to provide the essential inherent resiliency to facilitate the use and the operation of the device.

The free ends of the arms B and C are formed with enlarged head portions 4 and 5, these head portions 4 and 5 being generally identical in structure to provide for wire and pin recesses and seats and the use of appropriate fasteners for these parts. Referring to FIGS. 2 and 3, it will be seen that each of the heads 4 and 5 is formed with diagonal slots, the slots extending transversely of the head and being aligned one with the other. As best shown in FIG. 3, the diagonal slots are defined by outer walls 6 and inner walls 7 and 8, the walls 7 being offset with respect to the wall 8 to provide a relatively narrow slot for the seating of the tensioned wire D and to further provide a shoulder or seat 9 at the junction of the walls 7 and 8 for the seating of the relatively heavy pin E. The narrow portion of the slot is of less width than the diameter of the pin E so that the latter cannot be moved into the narrow portion of the slot which is formed for the wire D, as heretofore mentioned.

A metal insert or bushing 10 is shown extending transversely through the slot and is formed with a slot corresponding to and aligned with the narrow slot in the head so that a tensioned wire D can be locked in the base of this narrow slot in the metal insert by a screw

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11 which can be seated by an Allen wrench. The screw 11 is threaded into a screw opening axially formed in the insert 10, which feature is shown in my prior patent heretofore mentioned.

A screw opening 12 is formed generally parallel to the screw opening 14 in the insert 10, the screw opening 12 being positioned outwardly of the screw opening 14 and beyond the shoulder or seat 9 to form an area above the shoulder or seat 9 to accommodate the pin E which is positioned between the shoulder 9 and the screw 11 and is loosely retained thereby. By having the screw openings 12 and 14 of the same diameter, the same screw which may be used for locking the tensioned wire D may also be used in the opening 12 for positioning and securing the pin E. The slots and the walls defining the slots, as well as the shoulder 9, forming a seat for the pin E are identical and aligned in each of the heads 4 and 5 so that the wire D or the pin E will be appropriately aligned when positioned and in use.

The head structure will be noted from the drawings illustrating the invention as relatively heavy and the threaded socket 12 is placed sufficiently inward from the end walls to provide structural support for the screw 11 when placed in the threaded recess 12 to support the load which will be applied thereto when the assembly is under load by the use of appropriate weights, as is conventional in the use of such devices. The weights are connected to the wire loop 15 which extends through one of the openings 16 in the base of the bow. The wire loop 15 includes one bent terminal 17 which can extend through one of the openings 16 in the base of the bow and another bent terminal 18 which is adapted for connection with appropriate cables or other means connected to the tensioning weights.

Referring to FIG. 4, the cammed tensioning structure or jacks of my prior Patent No. 3,088,460 is illustrated at 20 for tensioning the wire D when the latter is used, the wire being shown in full lines in this figure. The cammed tensioning device 20 coacts against a flat face 20^a formed at the outer face of each of the enlarged terminals of the bow. The flat faces 20^a are inclined inwardly and towards the base of the bow as to facilitate the use of the camming device by preventing its displacement toward the end of the bow structure. In FIG. 4 the relatively heavy pin E is shown held in position by the lock screw 11, the pin E resting on the shoulder 9 which is defined in part by the wall structure of the insert or bushing 10, it being noted by reference to FIG. 3 that the shoulder defining the wider part of the diagonal slot is formed partly by the insert 10, as this shoulder is positioned inwardly sufficiently from the end of the bow so as to utilize this reinforced structure, it being understood that the bushing 10 is made of appropriate metal and forms a reinforcement for the bow terminal in which it is positioned.

What I claim is:

1. A wire bow structure for surgical use comprising an X-ray lucent molded plastic body including a base portion and spaced arms, means for connecting said bow structure with a traction applying system, said arms being resiliently associated with their base for movement toward and away from each other, head members formed at the ends of the arms, coplanar recesses formed in the head members, each of said recesses being defined in part by an offset wall portion providing a shoulder, said shoulders lying in a common plane, spaced transversely extending openings formed in each of the head members and extending into said recesses, and fastening means selectively insertable in either of the transverse openings.

2. A wire bow structure for surgical use comprising a body including a base portion and a pair of spaced

arms, said arms being resiliently associated with their base for movement towards and away from each other, head members formed at the ends of said arms, means for connecting said bow structure to a traction device, a pair of spaced walls defining aligned recesses in each of the head members, a portion of one of each of said pair of walls being laterally offset to define a supporting shoulder spaced from the bottom of the defined recesses, said shoulders being aligned with each other, each of said heads being formed with a pair of spaced openings extending transversely of the head members, one of the transversely extending openings of each of the heads extending through to the bottom portions of the recesses and the other opening of each of the heads extending through the head at a point spaced above each of said shoulders, and securing means extending through said recesses whereby wires or pin members positioned at the base of said recesses or on said shoulders may be secured in position by said securing means.

3. A plastic bow assembly for surgical use comprising an integral X-ray lucent molded plastic body of U form and including a base portion and a pair of resiliently displaceable spaced arms, means for connecting said bow assembly to a traction device, head members formed at the outer end portions of said arms, said head members being provided at their outer sides with jack mounting faces, coplanar slots extending inwardly through said head members, said slots defined by spaced walls having their inner portions aligned to receive and position a wire therein, insert members extending transversely through said head members and through said slots, slots formed in said insert members registering with the slots in said head members to form seats for said wire, screw members extending through said insert members and intersecting said slots at their base portions for securing the wire when positioned therein, aligned pin mounting shoulders formed in one of the walls defining each of said slots, and aperture means extending through said heads and slots outwardly of said shoulders to receive a fastening means for preventing the lateral displacement of a pin when positioned therein.

4. The structure of claim 3 characterized in that the

aligned pin mounting shoulders formed in one of the walls defining each of said slots include portions of the insert members.

5. The structure of claim 3 characterized in that the screw members extending transversely through the insert members and intersecting the slots at their base portions for securing the wire are removable from the insert members for insertion in the transverse aperture means in the head members outwardly of the pin mounting shoulders to form the fastening means for preventing the lateral displacement of a pin when positioned against said shoulder.

6. A plastic bow assembly for surgical use comprising an integral X-ray lucent molded plastic body of U form and including a base portion and a pair of resiliently displaceable spaced arms, means for connecting said assembly to a traction applying system, head members formed at the outer end portions of said arms, said head members being provided at their outer sides with jack mounting faces, coplanar slots extending inwardly through said head members, said slots defined by spaced walls having their inner portions aligned to receive and position a wire therein, insert members extending transversely through said head members and through said slots, slots formed in said insert members registering with the slots in said head members to form seats for a wire, screw members extending through said insert members and intersecting said slots at their base portions for securing a wire, aligned pin mounting shoulders formed in one of the walls defining each of said slots, and aperture means carried by said heads outwardly of said shoulders to receive a fastening means for preventing the displacement of a pin when the latter is associated with the pin mounting shoulders.

References Cited by the Examiner

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3,088,460 5/1963 Wright ----- 128-84

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