June 22, 1965 W. A. VASICEK 3,190,974

CLAMPING MEANS FOR AN ARTICLE-SUPPORTING BOOM

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Fig. 1.

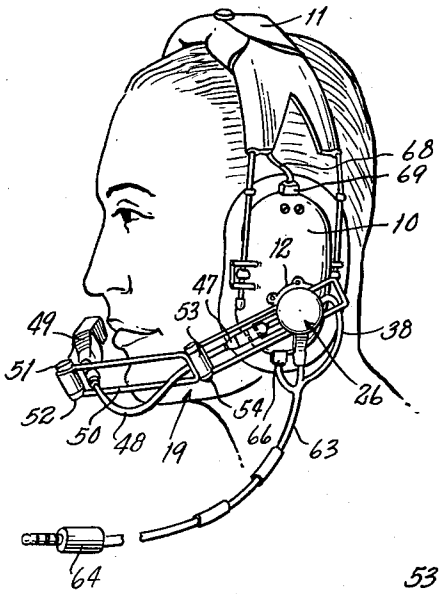


Fig. 2.

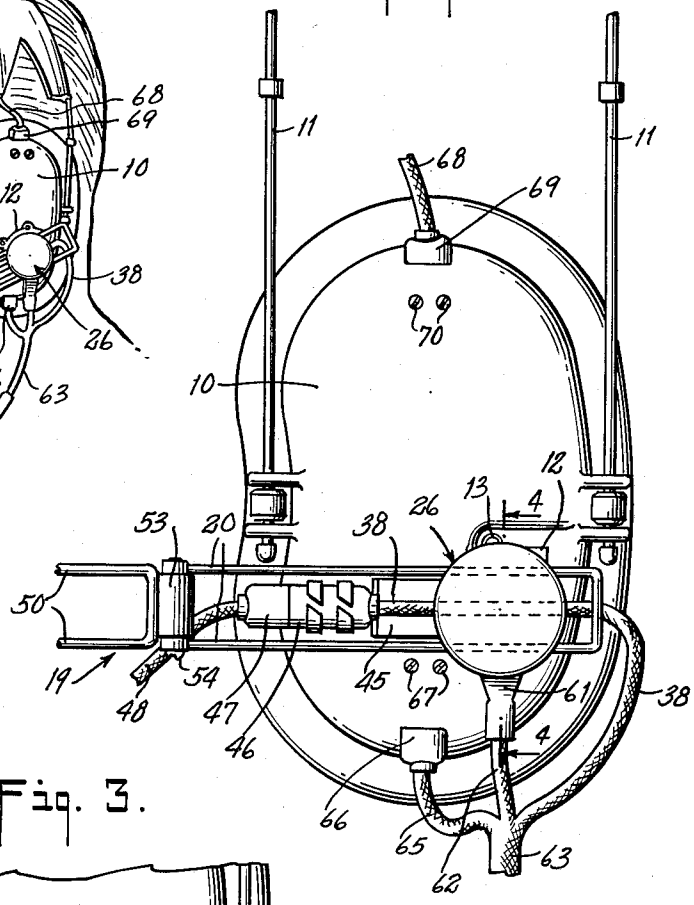
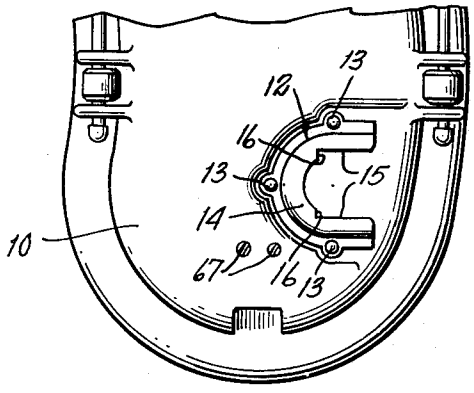


Fig. 3.



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Fig. 4.

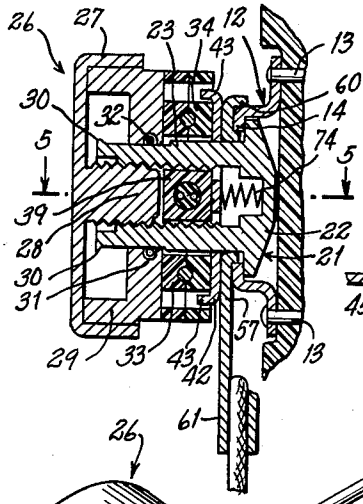


Fig. 5.

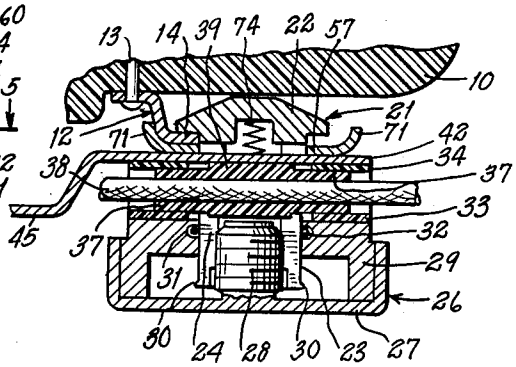
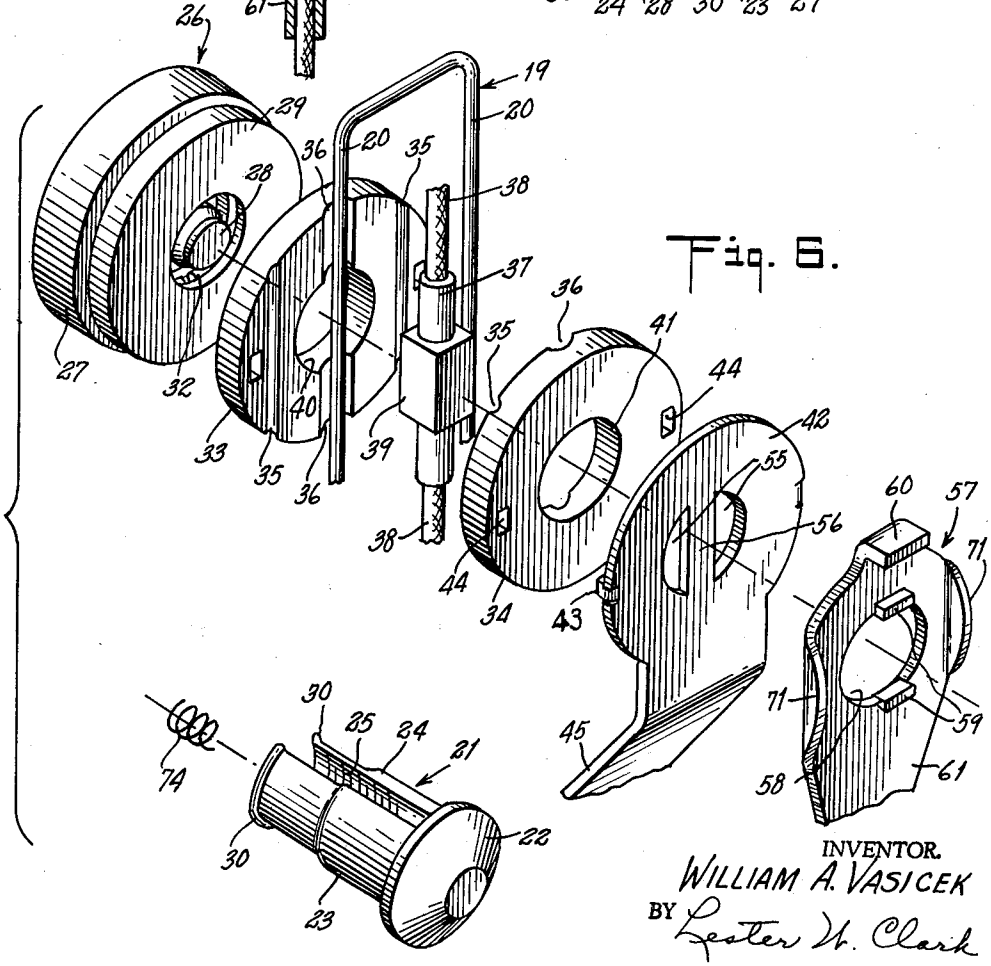


Fig. 6.



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3,190,974

CLAMPING MEANS FOR AN ARTICLE-SUPPORTING BOOM

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Filed Jan. 25, 1962, Ser. No. 168,710
4 Claims. (Cl. 179—156)

The present invention relates to a clamping device for adjustably attaching an article-supporting boom to a supporting means and particularly for clamping a boom of the type used to hold a microphone or the like adjacent to the mouth of a person so as to hold such microphone boom at an adjustable position on a supporting means comprising a head-engaging member.

It has now been common to support a microphone or the like in front of the mouth of a person who is to speak into it and to support the boom which particularly holds the microphone in an adjustable manner so that it may be located in front of the speaker's mouth or alternatively so that it may be moved to and held in an inoperative position, for example, above his head and out of his line of vision, such devices being useful whether or not the microphone is used in conjunction with receiving devices such as one or more earphones carried by a headband or the like. These devices are useful not only for telephone operators, for example, but also for persons having to do with television or radio broadcasting, pilots and other personnel in aircraft and many other situations which will suggest themselves to those skilled in the art.

Due to the known differences between different people, it is practically necessary that the microphone boom in such an arrangement shall be adjustable in various ways, preferably angularly about a securing clamp of some kind located adjacent to the wearer's ear and preferably also with the boom slidable with respect to that clamp and with the adjustment capable of being fixed in some suitable way during ordinary use. These adjustments combined with at least one pivotal adjustment intermediate the length of the boom give substantially universal adjustability which is desirable in use.

The present invention is an improvement upon that set out in the copending application of George Cagen, Serial No. 168,711, filed concurrently with the present application, now Pat. No. 3,128,352, and having the same title and being assigned to the same assignee as the present application. The line of division between these two cases is based upon the principle that the Cagen invention is senior to the present one and that application is, therefore, intended to include all subject matter common to the two, the present application being directed solely to matter which is disclosed herein and not disclosed in the Cagen application aforesaid.

As such, the particular details and many of the features which are common to these two applications and which are disclosed and claimed in the Cagen application will not be discussed at this time in detail. The present application is particularly directed to an improvement upon that shown in the Cagen application aforesaid, namely, the provision of simpler mechanism which will positively hold the clamping assembly to a U-shaped bracket carried by a support, for example, an earphone shell in a headset-microphone combination, so that when the entire clamping assembly is clamped tight, this clamping assembly is effectively locked to the support by interengaging parts including the U-shaped bracket aforesaid. Further, in accordance with the present invention, when the clamping assembly is partly loosened, so as to permit an adjustment of the position of the boom in any of the several ways in which this boom may be adjusted, but without such loosening of the clamping assembly as will permit the total removal of the clamping assembly from its supporting U-shaped bracket, this clamping assembly is still positively locked to the bracket.

The functional result just described is achieved in accordance with the present invention by means which are in general simpler and cheaper than those disclosed in the Cagen application and which particularly provide for the locking of the clamping assembly to a U-shaped bracket whether that bracket be associated, for example, with the right earphone shell or the left earphone shell of a headset, i.e. whether the U of the U-shaped bracket be open to the right or to the left, suitable means being provided as in the Cagen case for preventing up and down relative movement between the clamping assembly and the U-shaped bracket.

A preferred embodiment of the present invention is shown in detail in the accompanying drawings, in which:

FIG. 1 is a view in elevation of the clamping device embodying the present invention associated with a microphone boom and adjustably securing it to an earphone-containing shell, which is held in place around the ear of a user by a suitable headband;

FIG. 2 is a view on a somewhat larger scale of the clamping means showing its relation to the earphone shell;

FIG. 3 is a fragmentary view in elevation on substantially the same scale as FIG. 2 of the lower portion of the earphone shell with the clamping means and microphone boom completely removed therefrom;

FIG. 4 is a view on a further enlarged scale and in vertical section substantially on the line 4—4 of FIG. 2, showing the internal construction of the clamping means of the present invention and its relation to the U-shaped clamp member which is secured to the earphone shell;

FIG. 5 is a fragmentary view substantially in horizontal section, taken on the 5—5 of FIG. 4; and

FIG. 6 is an exploded view in perspective of the clamping means, and a portion of the microphone boom showing the parts in the order in which they are assembled together and illustrating the construction of certain of the parts. In this figure the parts shown below are intended to be in prolongation of the lower right portion of the parts shown above.

While the invention is broadly applicable to a clamping means for adjustably attaching any article-supporting boom to a supporting means, it is illustrated and will be described herein in its application to adjustably clamping a microphone boom to a supporting means which comprises an earphone shell held in place by a headband and including an earphone through which the wearer may receive in addition to talking into a microphone, the arrangement being that either the microphone, or the earphone, or both, may be used.

From the point of view of the present invention, the supporting means is illustrated as an earphone shell **10**, which is carried by a headband **11** and is provided with suitable cushioning means, not shown in detail, so that it may be positioned and supported about the ear of a person without undue discomfort even though such person may be called upon to wear the apparatus for long periods of time. The details of construction of the shell **10** or of the headband **11** per se form no parts of the present invention. What is important to the present invention is that the shell **10** shall have secured thereto a U-shaped bracket **12**, FIGS. 3, 4 and 5, which may be secured to the shell **10** by rivets **13** or any other equivalent means. The bracket **12** has a raised inwardly directed flange portion **14** having substantially parallel inner guideway parts **15** terminating in shoulders **16**.

Arranged to be secured to the U-shaped bracket **12** and held against inadvertent movement therefrom by means hereinafter to be described is a clamping assem-

bly, parts of which are shown in exploded perspective in FIG. 6 and which serves to position and hold in adjusted positions a microphone boom 19 including a pair of substantially parallel portions 20. The clamping assembly comprises a stud member generally indicated at 21 having an enlarged head portion 22 having an outside shape formed as a surface of revolution. Said stud member is further provided with an internally threaded diametrically slotted stem portion 23, the slot being indicated at 24 and serving for a purpose hereinafter described. The threads in this portion are indicated at 25. Arranged to be threaded into the stud member 21 is a thumbscrew member generally indicated at 26 and comprising an outer shell part 27 having an outwardly threaded bolt portion 28 integral or rigid therewith, and an inner shell part 29, which in use is preferably fixed in the outer part 27 in any suitable way. The threaded bolt portion 28 is arranged to be screwed into the threads 25 of the stud member 21 when the parts are all completely assembled together. The arrangement is such, as hereinafter more particularly described, that when these parts 26 and 21 are tightly threaded together, all the parts will be locked in position as aforesaid. When this threading together is eased off by successive increments, various adjustments may be made also as hereinabove set out.

In order that the various parts of the clamping assembly shown in FIG. 6 may not be completely disassembled from each other when this action is not particularly desired, the stud member 21 is provided on the innermost end of its stem portion 23 with an outwardly extending flange 30. This flange in assembling the parts must pass inside the hollow space between the parts 27 and 29. As shown, the member 29 has at its smallest diameter portion an inwardly open annular groove 31 within which is located a split spring ring 32, the latter having its ends spaced from one another and having a normal position or unstrained diameter such that force is required to expand the ring 32 to move the flange 30 through and past the position of this spring ring. Thus, when the stem portion 23 extends past the position of the spring ring 32, so that the flange 30 is located in the hollow space between the parts 27 and 29 as shown, for example, in FIGS. 4 and 5, the spring ring 32 tends to grip the sides of the stem portion 23 and to prevent the stud member 21 moving wholly away from the thumbscrew member 26 due to the engagement between this spring ring 32 and the flange 30. This is so even though the threaded bolt portion 28 is wholly unscrewed from the threads 25 of the stud portion 21, so that all parts hereinafter described which are located between the stud portion 21 and the thumbscrew member 26 are retained against inadvertent bodily removal or disassembly by this resilient connection. However, upon the application of sufficient force, the stud member 21 can be bodily removed from the thumbscrew member 26 by reason of the flange 30 spreading the spring ring 32 resiliently and within its elastic limit sufficiently so that the thumbscrew member 26 may be bodily removed from the stud member 21 and all the intermediate members hereinafter described may be disassembled.

Arranged to be located concentrically with the threaded connection between the threaded member 28 and the internal threads 25, i.e. the interthreaded parts of the stud member 21 and the thumbscrew member 26 are a pair of clamping members 33 and 34 constituting two of the intermediate members above referred to and which may be of suitable plastic material, affording a desired frictional contact with the parallel portions 20 of the microphone boom 19. Materials which are suitable for use to form the clamping members 33 and 34 are such plastic materials as polyamides such as the trademark material "Zytel" which is made and sold by E. I. du Pont de Nemours & Co. and known polyfluoroethylenes, as the trademark materials "Kel-F," which is now made and sold by Minnesota Mining & Mfg. Co. and "Teflon" which is made and sold by E. I du Pont de Nemours & Co.

Each of the clamping members 33 and 34 is provided with groove 35 for receiving and grippingly engaging the parallel portions 20 of the boom 19.

In addition, each of the clamping members 33 and 34 is provided with a diametrically disposed groove 36 for receiving a transversely arranged sleeve member 37 housing a conductor cable 38. A central portion of the member 37 is made with a substantially square cross-section as shown at 39, which is received in a portion of each of the large central openings 40 and 41 of the members 33 and 34 respectively, the substantially cylindrical end portions of the sleeve member 37 being received in the grooves 36. In this way the conductor cable 38 is always caused to pass in the same direction through the members 33 and 34 as the parallel portions 20 of the microphone boom, so as to afford uninterrupted electrical connection to the microphone carried by this boom. Movement of the sleeve 37 in a direction longitudinally thereof is prevented by its enlarged square cross-sectional portion shown at 39 being received within the central openings 40 and 41 at the assembled position of the parts. It is further noted in this connection that the diametrical slot 24 in the stem portion 23 of the stud member 21 is provided so that this member may embrace the square portion of the sleeve 37 shown at 39 and project through the holes 40 and 41 so as to permit the bolt portion 28 threading into the internal screw threads 25 as shown in FIGS. 4 and 5.

In the form of the invention shown in the drawings, a metal part 42 is provided having a substantially circular portion concentric with the axis of the bolt portion 28 and threads 25 which is normally arranged to be substantially permanently secured to the clamping member 34 by a pair of integral tab portions 43, which are arranged to extend through apertures 44 in the clamping member 34 and to be bent so as to hold the parts 34 and 42 together as a unit against normal disassembly. The part 42 has an outwardly extending portion 45, the outer end of which is offset in the direction of the axis of the clamp, as shown best in FIGS. 5 and 6 and is arranged to support a plug 46 which is connected electrically to the end of cable 38 which has passed through the sleeve 37 as shown in FIG. 2. Cooperating with the plug 46 is a complementary plug 47 which is connected by a cable 48 to a microphone 49. As shown, the microphone 49 is carried by an outer portion 50 of the boom 19 to which it is pivotally connected at a joint 51. The freedom of swinging movement of the microphone 49 about the pivotal connection and with respect to the boom section 50 is controlled by a suitable screw at 52, FIG. 1. The microphone boom portion 50 is similarly connected to the inner portion of the boom comprising the parallel portions 20 by a joint 53, FIGS. 1 and 2, which is arranged for pivotal movement substantially parallel to the joint 51; and the freedom of swinging movement of the microphone boom portion 50 with respect to that portion comprising the parallel members 20 is similarly controlled by a screw 54, which may be adjusted to control the amount of friction at the joint, and if desired, to lock the boom section 50 to the inner section comprising the parallel members 20.

The part 42 at the center portion thereof has a pair of holes 55 which are similar in their outside substantially circular contour to the hole 41, but are separated by a diametrical band 56 which is preferably integral with the part 42. In the assembled position of the parts, the band 56 will pass through and be located in the diametrical slot 24 of the stud member 21, so that the part 42 will be required to turn with the clamping portions 33 and 34; and also the stud member 21 and the thumbscrew member 26 will both turn bodily and as a unit with the clamping members 33 and 34. At the same time, the outwardly extending portion 45 will also turn

with these members, so that the plug 46 will always be held centrally of the parallel boom portions 20, rotating therewith about the axis of the clamping means, which is shown as two parts of a broken line in FIG. 6.

Also mounted coaxially of the clamping member between the stud member 21 on the one hand and the thumbscrew member 26 on the other is a part 57, which has a central aperture 58 for surrounding the stem portion 23 of the member 21 and further, serves several other functions as hereinafter set out.

This member serves to cooperate with the enlarged head portion 22 of the stud member 21 in gripping the flange portion 14 as best shown in FIGS. 4 and 5 in that it transmits pressure from the part 29 of the thumbscrew member 26 through the clamping members 33 and 34 and the metal part 42. In addition to this, the part 57 is provided with a pair of tab portions 59 arranged on diametrically opposite sides of the hole 58 and adapted in use to serve in part to position the entire clamping assembly with respect to the bracket 12 by bearing against the parallel sides 15 and against the shoulders 16 thereof. These relationships serve accurately to position the clamping assembly with respect to the bracket 12. In addition, the part 57 has a longer laterally extending tab 60 which is also integral therewith and which serves to extend over a part of the bracket 12 as seen at the upper portion of FIG. 4. The combination of the tab portions 59 and 60 cooperating with the bracket 12 serves to prevent rotation of the part 57 about the axis of the clamping assembly, i.e. the screw threaded portions thereof, and thus serves to prevent rotation of a lower or depending end portion 61 of the part 57. This portion 61 is used to grip an end 62 of a braid or the like which is firmly secured to or is a part of a conductor cable 63 carrying all the conductors to the head set including the microphone 49 and any receiver or receivers therein.

As seen in the several figures, the principal cable 63 which may be suitably connected to any desired telephone means by a plug 64 or the like, is provided with an end or holding branch 62 for holding this cable against mechanical tension, so that physical tension on the cable will not be transmitted to the electrical conducting portions thereon, some of which are included in the conductor cable 38, which carries the connections to the microphone, and others of which are included in a branch cable 65 connected to a plug 66 for connection to an earphone within the shell 10. This connection may be secured by screws 67 which are arranged to clamp on the conducting members of the plug 66 respectively and secure them against inadvertent disclocation. Furthermore, if it is desired to use a pair of earphones they may be electrically connected together by conductors within a cable 68 having a plug at its end as shown at 69 and arranged to have its conductors secured in a desired connected position by a pair of screws 70 respectively. It will be understood that the conductor cable 68 passes around over the head of the wearer through the headband 11 and may be similarly connected to an earphone associated with the other ear of the wearer, only the left ear shell and earphone combination being illustrated in the accompanying drawings.

By reason of the interconnection between the tabs 59 and 60 on the one hand with the U-shaped bracket 12 on the other, rotation of the part 57 is prevented, so that it is always in a proper position to secure the end of the cable 63 and particularly the braid end 62 thereof irrespective of any adjustments made in the position of the microphone boom and irrespective of any rotation of some of the clamping assembly parts about the axis of the clamping assembly as aforesaid.

In accordance with the present invention, and as distinguished from any disclosure in the Cagen application aforesaid, the part 57, which is sometimes known as a wire-holding part, is provided with a pair of bent-up portions or flanges 71, one of which is effective, as shown in FIG. 5, to surround and engage over the outside of the bight of the U of the U-shaped clamp 12, so as positively to prevent the clamping assembly, including the parts 21, 26, 33, 34, 42 and 57, from moving outwardly of the open end of the U of this bracket 12. This condition exists when the thumbscrew member 26 is fully tightened with respect to the stud member 21 in the position of the parts shown in FIG. 5 and also exists when the thumbscrew member 26 is unscrewed from the stud member 21 only sufficiently to permit any of the various adjustments of the boom 19 including both a rotative adjustment about the axis of the interthreaded portions of the members 21 and 26 and a sliding movement of the parallel portions 20 with respect to the clamping members 33 and 34 along the axis of the grooves 35. At the same time, when it is desired that the clamping assembly be bodily removed from the U-shaped bracket 12, this is permitted by further unscrewing and possibly wholly unscrewing the thumbscrew member 26 from the stud member 21, allowing these members and the clamping assembly to be retained as a unit by the interengagement of the flange 30 with the spring ring 32. Under these circumstances the part 57 and its flanges 71 may be sufficiently moved away from the raised portion 14 of the U-shaped bracket 12 so as to permit complete disengagement of the clamping assembly from this bracket.

It will further be understood that as there are two flanges 71 as shown on the part 57, one will always be in use and the other idle in position of the parts in FIG. 5. If, however, the clamping assembly were moved, for example, to the other side of the wearer's head, so as to be engaged with a corresponding U-shaped bracket secured to the other earphone shell similar to that shown at 10, but associated with the right ear of a user, then the opening of such similar bracket would be to the left instead of to the right as seen in FIGS. 3 and 5; and the other flange 71 would be in use; while the one which is active at the left in FIG. 5 would then be idle.

Further, as seen in the accompanying drawings, there is provided a compression spring 74 which extends from the inside of a well or recess formed in the head portion 22 of the stud member 21 to the diametrical band 56 of the part 42. This compression spring is effective, when the stud member 21 is wholly or partly unscrewed from the thumbscrew member 26, to prevent relative dislocation of the parts and particularly rotary dislocation of the clamping members 33 or 34 with respect to the parallel portions 20 of the boom. When the thumbscrew member 26 is again tightened, with the parts in their appropriate position, the spring 74 is compressed in place and then has no special function. It will be understood that this spring may be omitted if its function is not particularly desired and with some corresponding saving in the cost of manufacture of the device.

Considering now the functional operation of the means which have been particularly described, it will be understood that when the thumbscrew member 26 is screwed into and fully tightened with respect to the stud member 21 and when the latter is in its operative position as shown in FIGS. 4 and 5, the microphone boom portions 20 are completely locked in a specific position with respect to the several members shown in FIG. 6 and all are locked and rigid with respect to the shell 10. This may be, for example, with the microphone shown in the position in FIG. 1.

If now it is desired solely to move the microphone into an inoperative position such as above the eyes of the operator and out of his line of vision by merely rotating the microphone boom members 20 and parts carried thereby around the axis of the clamping assembly and without any sliding movement of the boom portions 20 with respect to the clamping assembly, this may be done by unscrewing the thumbscrew member 26 a first increment with respect to the screw thread 25 of the stud member 21. This amount of the increment aforesaid will be found to

be a matter which can be quickly determined by experiment with any one apparatus, but is not necessarily quite the same from one to the next. In any event, the slight unscrewing of the thumbscrew member 26 sufficiently relieves the pressure of the rotatable parts of the clamping assembly against the non-rotatable parts including the part 57 and the bracket 12, so that the parts 26, 33, 34 and 42 and the microphone boom carried thereby may be bodily rotated along with the stud member 21, which must also rotate as the diametrical band 56 of the part 42 passes through the slot 24. This is permitted by the metal-to-metal frictional contact between the stud member 21 on the one hand and the U-shaped bracket 12 on the other and between the parts 42 and 57. At the same time, the frictional gripping action of the clamping members 33 and 34 onto the metal boom portions 20 is sufficient so that the boom 19 is prevented from moving relative to the clamping portions 33 and 34. During the rotation of the clamping assembly as aforesaid there is solely rotary relative movement between the stud member 21 and the U-shaped bracket 12.

If it is desired to make an adjustment longitudinally of the boom members 20 between these members and the clamping members 33 and 34, so as to adjust the microphone boom toward and away from the mouth of a wearer, then the thumbscrew member 26 is loosened a second increment, which again can be determined as to amount by a brief trial with any given device. This second increment of unscrewing movement sufficiently relieves the pressure of the clamping members 33 and 34 onto the parallel boom portions 20 so as to permit the sliding of these boom portions along the grooves 35 in addition to the angular movement of the boom previously mentioned. There are no additional relative movements of the several parts permitted under these circumstances.

When it is desired to move the clamping assembly and the boom 19 as a composite assembly wholly away from U-shaped bracket 12, the thumbscrew 26 is unloosened a still further increment up to and possibly including a complete unthreading of the bolt portion 28 from the screw threads 25. Under these circumstances the parts shown in FIG. 6 are free to move along the axis of the clamping assembly sufficiently so that the bent-up portion or flange 71 may be moved over the bight portion of the U-shaped bracket so as to permit bodily removal of the entire clamping assembly from the U-shaped bracket 12 as aforesaid. This assembly may, for example, then be positioned on the other earshell, if desired by the wearer, by suitable changes in the electrical connections, for example, the connection between the conductor cable 65 and plug 66 on the one hand with the socket means in the earphone or earshell, effected by loosening the screw 67 and connecting it appropriately with the other earphone and shell which is normally equipped with a similar U-shaped bracket and with a similar electrical connection. Alternatively, the entire microphone assembly and clamping assembly including the boom 19, cable 63 and the branch cable 65 may be removed as aforesaid from the earphone and earshell 10 and from the associated bracket 12 and attached to a corresponding bracket on a headset worn by another person, for example, all without complete disassembly of the clamping assembly itself, incident to the flange 30 being held inside the hollow portion of the thumbscrew member 26 by the spring ring 32.

The microphone boom 20 or the entire microphone-boom assembly may also be removed from the bracket 12 by completely unscrewing the thumbscrew member 26 and applying sufficient force for spring ring 32 to ride over the flange 30. Reassembly can be performed in the reverse order.

While there is shown and described herein but one specific embodiment of the invention, it is recognized that equivalents will be suggested to those skilled in the art from the foregoing particular disclosure. It is intended that the appended claims shall be construed to include all such equivalents to the extent permitted by the language thereof.

What is claimed is:

1. Clamping means for adjustably attaching an article-supporting boom to a supporting means wherein:

(a) said boom and a clamping assembly of said clamping means may be angularly adjusted as a unit with respect to said supporting means,

(b) said boom may be adjusted in a direction longitudinal thereof with respect to said clamping assembly while the latter is secured to said supporting means,

(c) said clamping assembly and said boom may be removably secured to said supporting means, and

(d) all the adjustments aforesaid and the securing of said clamping assembly to said supporting means are locked and controlled by a single manually operable means;

said clamping means comprising:

(1) a stud member having an end portion formed as a surface of revolution and having a threaded portion,

(2) a thumbscrew member having a threaded portion complementary to and arranged to be screwed to said threaded portion of said stud member, said thumbscrew member constituting said single manually operable means,

(3) means including said stud member and said thumbscrew member for graspingly engaging a portion of said boom so as to hold it rigid when said thumbscrew member is screwed tight with respect to said stud member, said members and means (1), (2) and (3) collectively constituting said clamping assembly,

(4) a substantially U-shaped bracket fixed to said supporting means in which said end portion of said stud member is removably engaged in the operative position of the apparatus, the threaded connection between said stud member and said thumbscrew member serving also, when these members are screwed tight together, to lock said stud member to said bracket by squeezing portions of said bracket between said end portions of said stud member and a part which is held in place between said stud member and said thumbscrew member, and

(5) one of the members of said clamping assembly, which is separate from and has a portion surrounding the threaded interconnection between said stud member and said thumbscrew member, having another portion in position to engage with the outside of the bight portion of the U of said U-shaped bracket at the operative position of the clamping means when said stud member and said thumbscrew member are tightly screwed together with the head of said stud member inside said U-shaped bracket, so as positively to prevent movement of said clamping assembly including said stud member toward the open end of the U of said U-shaped bracket at said operative position.

2. Clamping means in accordance wiuth claim 1, wherein said member of the clamping assembly, which has a portion in position to engage the outside of the bight portion of the U, has further parallel portions engaging parallel side parts of said U-shaped bracket to center said clamping assembly with respect thereto in a direction transverse of the U of said U-shaped bracket and to prevent rotation of this member of the clamping assembly with respect to the U-shaped bracket, irrespective of any relative rotational adjustment between the remainder of said clamping assembly and said bracket.

3. Clamping means in accordance with claim 2, wherein said member of the clamping assembly, which has a portion in position to engage the outside of the bight portion of the U of said U-shaped bracket is provided with another similar portion, and where

in these portions are symmetrically disposed on opposite sides of the axis of the interthreaded portions of said stud member and said thumbscrew member, so that one or the other of these portions will engage behind the bight of the U of a U-shaped bracket according as such bracket opens to the right or to the left, while said portions engaging the parallel portions of said U-shaped brackets prevent movement in a direction perpendicular thereto.

4. Clamping means in accordance with claim 2, in which the one of said members of the clamping assembly, which has a portion in position to engage with the outside of the bight portion of the U of said U-shaped bracket, has a further portion arranged to

be connected to a cable carrying conductors to a microphone carried by said boom, so that any strain on the cable will be transmitted to said clamping means rather than through said conductors to said microphone.

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