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[54] **QUICK MOUNT ISOLATOR STAND ADAPTOR**

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[52] **U.S. Cl.** **179/149**; 179/178

[51] **Int. Cl.**[2] **H04M 1/14**

[58] **Field of Search** ..... 179/149, 146 R, 147, 178

[56] **References Cited**

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Primary Examiner—William C. Cooper
Attorney, Agent, or Firm—Burmeister, York, Palmatier, Hamby & Jones

[57] **ABSTRACT**

An adaptor for removably mounting a hand held type microphone on the end of a shaft of a stand, such as a floor or desk stand, which has a housing defining a cavity and a block of compliant material provided with a recess for receiving the end of the shaft of the stand disposed within the cavity. The block is compressed or deformed within the cavity of the housing by a plunger actuated by a cam to securely lock the housing on the end of the stand shaft. The microphone is attached to the cam, thus providing a swivel mount for the microphone. The adaptor utilizes one swivel position of the cam releasing stress on the compliant block to release the adaptor from the end of the shaft and other positions of the cam to stress the compliant block to engage the end of the shaft.

10 Claims, 8 Drawing Figures

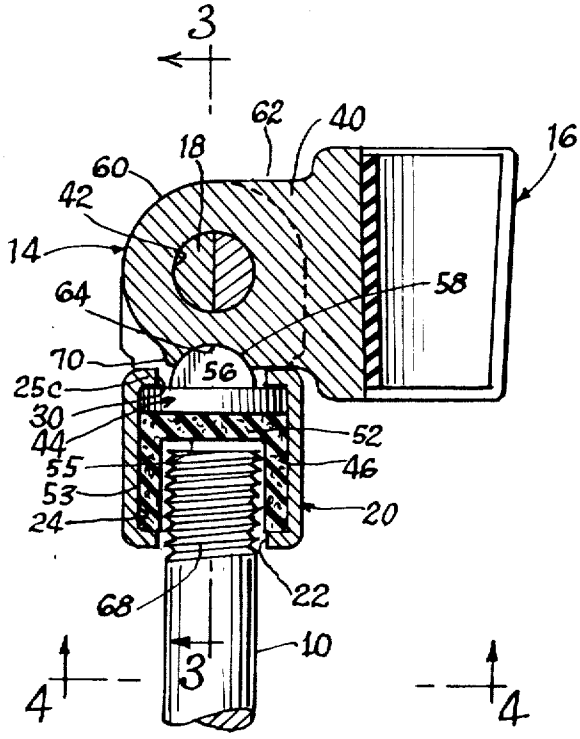


Fig. 1

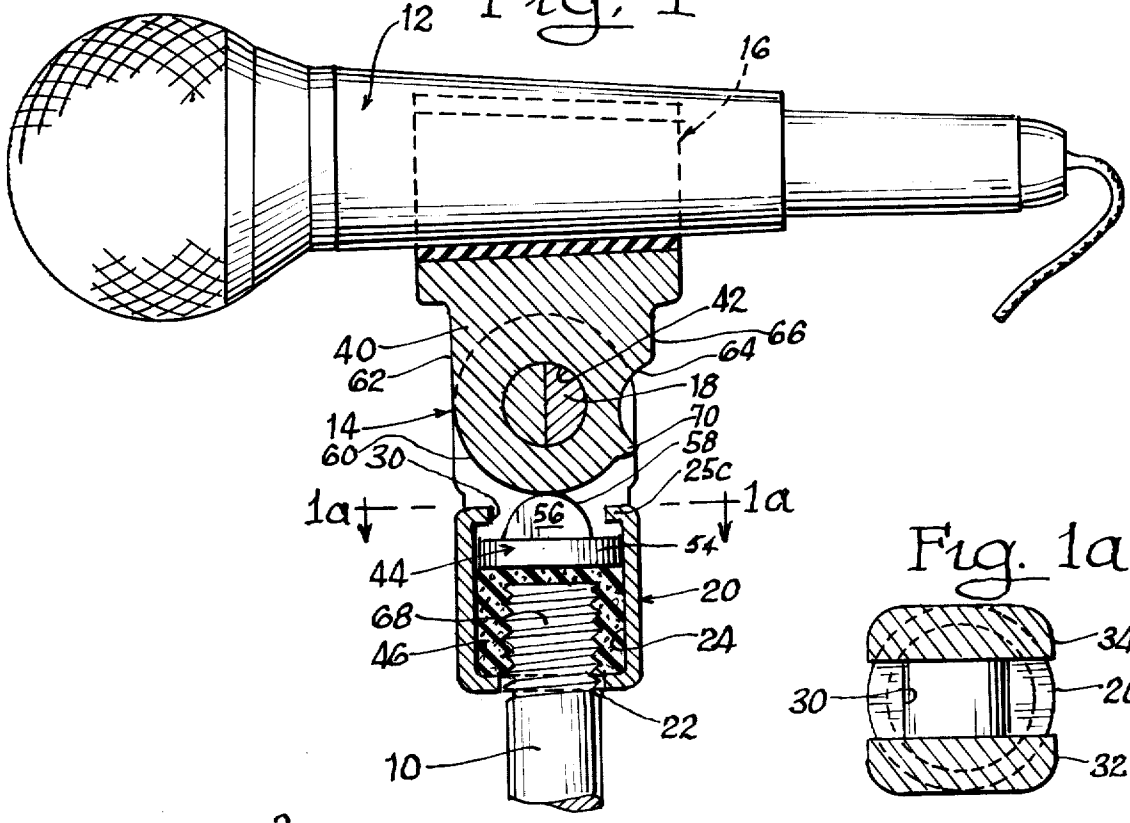


Fig. 1a

Fig. 2

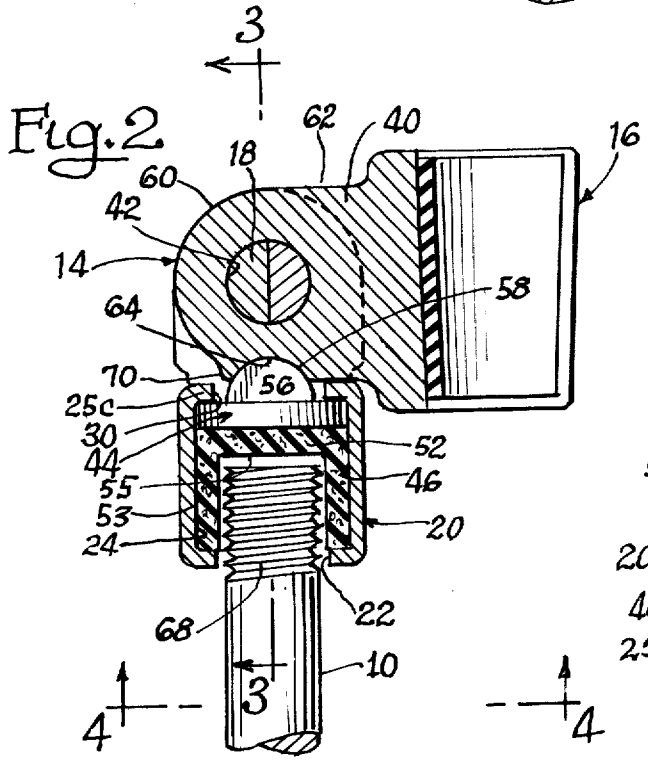


Fig. 3

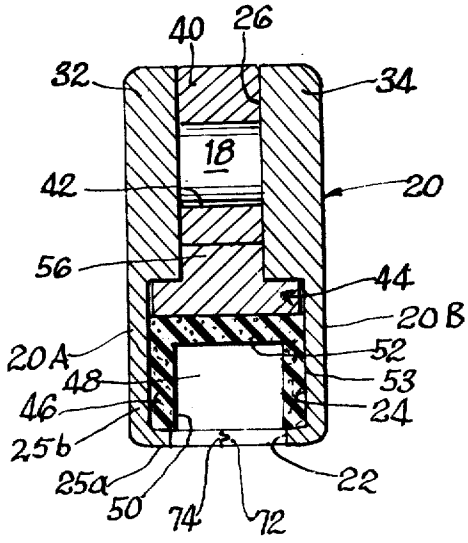


Fig. 4

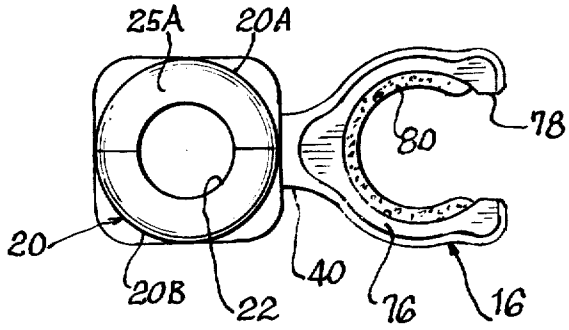
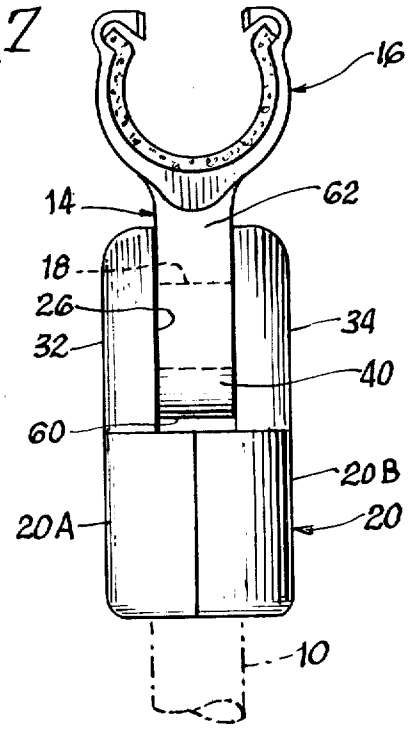


Fig. 7



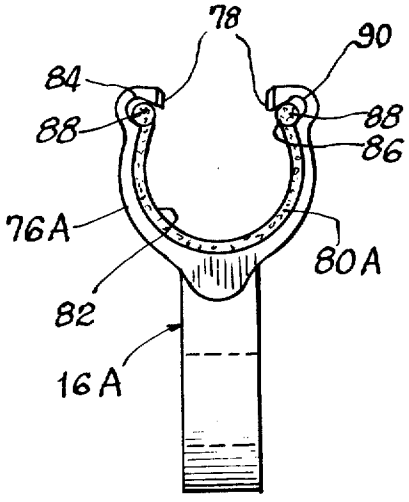


Fig. 6

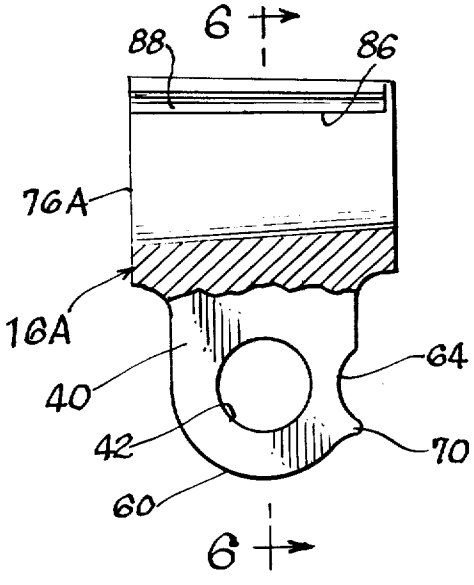


Fig. 5

QUICK MOUNT ISOLATOR STAND ADAPTOR

The present invention relates generally to microphones and more specifically to an adaptor which may receive and engage a hand held type microphone and which is adapted to be removably mounted on a stand.

The traditional adaptor for mounting the usual hand held microphone with a handle of circular cross section to a floor stand or desk stand is screwed onto the shaft of the floor stand, generally requiring a relatively large number of turns to complete mounting of the adaptor onto the shaft of the floor stand. Also, tradional adaptors use a spring loaded circular sleeve section for securing the adaptor to the microphone, the microphone cable and handle being pressed into the sleeve from one end. Such adaptors have proven to be satisfactory for uses in which the microphone remains on the stand for relatively long periods of time, but such adaptors are unsatisfactory for use by a performer who wishes to carry the microphone with him for portions of his act and return it to the stand at other times. The art has also developed a clevis or cradle type adaptor, open at the top, which may be screwed onto the end of the shaft of the microphone stand and which receives the handle of the microphone by snap action through the open end of the clevis. Such clevis type adaptors, however, cannot receive a live microphone because of the excessive noise generated by the active insertion or removal of the microphone into the clevis. It is an object of the present invention to provide an adaptor for mounting a microphone on the stand which permits the live microphone to be removed from or returned to the stand.

It is generally desirable to isolate a microphone from the mechanical vibrations and shocks which may be transmitted through a microphone stand to the microphone. A number of rubber suspension systems or isolators have been developed by the art for this purpose, but such suspensions have not reduced the difficulty with which a microphone is removed from a microphone stand. It is an object of the present invention to provide an adaptor for mounting a microphone on a microphone stand which facilitates removal of the microphone from the stand and which dampens and isolates the microphone from mechanical vibrations and shock which may be transmitted through the stand.

The adaptors used to mount a microphone on a microphone stand of the prior art have generally required the performer to utilize both hands to remove the microphone from the adaptor. It is an object of the present invention to provide an adaptor for mounting a microphone on a stand in which the microphone may be removed from the adaptor or placed on the adaptor by use of one hand only.

The present invention utilizes an adaptor having a housing which pivotally mounts a clevis for securing a microphone. The housing contains a cavity which has an opening and a body of compliant material is disposed within the cavity for receiving the end of the shaft of a microphone stand, and has a recess confronting the opening. The clevis is mounted on a cam which is pivotally mounted on the housing and adapted to deform or compress the compliant body to secure the shaft within the cavity in all but one pivotal position of the clevis, and the cam releases the stress on the compliant body in the one position of the clevis to release the adaptor on the shaft and permit removal of the adaptor from the shaft.

For a more complete description of the present invention, reference is made to the drawings, in which:

FIG. **1** is a vertical sectional view illustrating the shaft of the microphone stand, the adaptor, and a microphone in position on the adaptor, the adaptor being locked on the shaft of the microphone stand;

FIG. **1***a* is a sectional view of the adaptor taken along the line **1***a*—**1***a* of FIG. **1**;

FIG. **2** is a sectional view of the adaptor and shaft of the microphone stand taken on the same plane as FIG. **1**, the adaptor being in position for removal from the shaft;

FIG. **3** is a sectional view of the adaptor taken along the line **3**—**3** of FIG. **2**;

FIG. **4** is an elevational view of the adaptor taken along the line **4**—**4** of FIG. **2**;

FIG. **5** is a sectional view of a modified clevis taken in the same plane as FIGS. **1** and **2**;

FIG. **6** is a sectional view of the modified clevis taken along the line **6**—**6** of FIG. **5**; and

FIG. **7** is a front elevational view of an adaptor employing the clevis of FIGS. **5** and **6**.

In FIG. **1** a fragment of a shaft **10** of a microphone stand is illustrated supporting a microphone **12** by means of an adaptor **14** constructed according to the present invention. The adaptor **14** has a clevis **16** which is journalled on a split pin **18** supported by a housing **20**. The housing **20** has an opening **22** which accommodates the shaft **10**. The clevis **16** removably mounts the microphone **12** on the adaptor **14**.

The housing **20** is constructed of rigid material, such as die cast zinc, and provided with a cavity **24** at one end in communication with the opening **22** for receiving the shaft **10**. The cavity **24** is cylindrical and is formed by end wall **25***a*, cylindrical sidewall **25***b*, and end wall **25***c*, and the opening **22** is located centrally of one end wall **25***a*. The end of the housing **20** opposite the opening **22** is provided with a slot **26** which extends inwardly to the wall **25***c* which separates the cavity **24** from the slot **26**. The wall **25***c* has an aperture **30** extending between the cavity **24** and the slot **26**.

The slot **26** forms a pair of tongues **32** and **34** at the slotted end of the housing **20**, and each of these tongues is provided with one of the two mating portions of the split pin **18**, which are secured together, as by cement, to form the split pin **18**. The clevis **16** has a depending flat plate shaped cam **40** provided with a cylindrical channel **42** extending normally therethrough which is journalled about the pin **18**.

The cavity **24** within the housing accommodates a plunger **44** and a cylindrical block **46** of plastic yieldable material disposed between the plunger **44** and the opening **22**. The block **46** is provided with a recess **48** which extends inwardly from the opening **22** forming a surface **50** which is cylindrical and coaxial with the opening **22**. The recess **48** terminates at a distance from the plunger **44** to provide a wall **52** of yieldable material between the recess **48** and the plunger **44**. The exterior surface of the block **46**, designated **53**, abuts the interior surface of the walls of the housing forming the cavity **24**.

The plunger **44** has a flat plate portion **54** of circular cross section which extends across the cavity **24** between the wall **25***c* and the flat surface of the block **46** formed by the wall **52**, and the plate portion **54** is movable with respect to the wall **25***c* of the housing. The plunger **44** also has a protuberance **56** which extends through the aperture **30** in the wall **25***c*. The protuber-

ance 56 is semi-cylindrical with the axis of the protuberance parallel to the axis of the pin 18, thus forming a part cylindrical surface 58 abutting the cam 40.

The cam 40 also has a part cylindrical surface 60 extending from a substantially flat forward side 62 of the cam 40, the flat surface 62 being on the same side of the clevis 16 as the forward direction of the microphone 12. The cam 40 also has a part cylindrical recess 64 extending therein from the rearward side 66 thereof with an axis parallel to the axis of the pin 18, the rearward side 66 of the cam being generally parallel to and opposite the forward side 62. The recess 64 has the same radius of curvature as the protuberance 56 of the plunger 44 and is adapted to accommodate the protuberance 56.

In FIG. 2, the clevis 16, functioning as a lever, has been rotated on the pin 18 with respect to the stand shaft 10 to position the microphone 12 substantially in alignment with the shaft 10, and if the shaft 10 is vertically disposed, the microphone 12 will be pointing upwardly. In this position, the protuberance 56 of the plunger 44 is disposed within the recess 64 of the cam 40, thus permitting the plunger 44 to move toward the wall 25c of the housing 20 and releasing the stress on the block 46. The block 46 is constructed of a relatively dense but compressible elastomeric material, such as rubber or plastic foam, such as polyethylene or polyurethane, or the block 46 may be composed of an essentially incompressible elastomeric material which, when stressed by plunger 44, grips shaft 10 by elastic flow to conform to the stressed dimensions while maintaining an essentially constant volume, i.e., decreased axial length and increased wall thickness. Release of stress on the block 46 permits the shaft to be readily inserted or withdrawn from the recess 48 in the block 46 and through the opening 22, thereby removing the adaptor 14 and microphone 12 from the shaft 10 of the stand. The opening 22 is larger in diameter than the recess 48 and coaxial therewith, thus assuring removal of the shaft 10 from the adaptor 14 without contact of the metal shaft against the metal housing 20, which would tend to create a shock capable of detection by a live microphone.

The clevis 16 may be rotated counterclockwise on the pin 18 from the position shown in FIG. 2, to position the protuberance 56 in abutment with the surface 60 of the cam 40, as illustrated in FIG. 1. When the protuberance 56 abuts any portion of the surface 60 of the cam 40, the plunger 44 is forced from the wall 25c of the housing against the block 46 of compliant material, thus placing the compliant material of the block 46 in compression between the surface of the shaft 10 and the surface 55 of the cavity 24. When the block 46 is under compression, the shaft 10 is locked within the cavity 24 and cannot be removed. As illustrated, the end of the shaft 10 is threaded at 68, since microphone stand shafts are generally threaded at their end, but it should be understood that it is not necessary to thread the shaft 10 for use with the adaptor 14 of the present invention.

The cam 40 is provided with a protruding nipple 70 between the cylindrical surface 60 and the recess 64. The nipple 70 acts as a detent when the protuberance 56 is abutting the part cylindrical surface 60, thus locking the adaptor 14 on the shaft 10, to prevent accidental rotation of the clevis 16 on the pin 18 to release the adaptor 14 from the shaft 10.

As illustrated in FIGS. 3 and 4, the housing 20 is fabricated in two parts, 20A and 20B. The two parts, 20A and 20B, are mating and substantially identical. The two parts, 20A and 20B, are secured together by the split pin 18, one portion of which is integral with the tongue 32 and the other portion of which is integral with the tongue 34, and mating flanges, including flanges 72 and 74 at the interfaces of the two parts, 20A and 20B. The two portions of the split pin 18 are secured together in the particular construction described by cement.

The clevis 16 functions as means to hold the microphone 12 in position, and while the conventional clevis structures of the prior art may be utilized, a preferred and novel clevis is illustrated in FIGS. 1, 2 and 4. The clevis 16 has a generally U-shaped portion 76 which extends from the cam 40 and is open on its side opposite the cam 40 to form a slot 78 for receiving the microphone 12. The slot is slightly wider at its forward end than the rearward end to accommodate the slightly truncated casing of the microphone 12. The interior surface of the U-shaped portion 76 of the clevis is a segment of a slightly truncated cone and a layer 80 of compliant material, such as a solid foam of rubber or plastic including polyethylene or polyurethane, is disposed on this surface. The U-shaped portion 76 of the clevis 16 extends beyond the ends of the layer 80 of compliant material to protect the compliant material when the microphone is snapped in through slot 78, but a microphone positioned in the clevis abuts only the compliant layer 80.

The body 46 of compliant material and the layer 80 of compliant material both function to isolate the microphone from vibrations or shock impressed upon the shaft 10 from the structure upon which the microphone stand rests. In this manner the sensitivity of the microphone to shock or vibrations is materially reduced.

Further, the adaptor 14 provides extreme versatility for a performer utilizing the microphone 12. A live microphone may be removed from the stand by simply rotating the clevis 16 to the position of FIG. 2 and withdrawing the shaft 10 of the stand from the adaptor 14. This may be accomplished without introducing undue noise into the electrical reproduction of the microphone, since the microphone is protected against shock and vibration by the compliant layer 80 and since the shaft 10 of the stand is being withdrawn from a compliant body 46. If the performer chooses, he may simply slip the microphone from the clevis 16 with the shaft 10 locked to the adaptor 14, as shown in FIG. 1 and carry the microphone without the stand.

FIGS. 5 and 6 illustrate an alternate construction for the clevis which may be used in place of the clevis 16 of FIGS. 1 through 4. The cam 40 of the clevis is identical to that described in FIGS. 1 through 4 and will not be further described. Further, the clevis of FIGS. 5 and 6, designated 16A, has a U-shaped portion 76A substantially identical to the U-shaped portion 76 of FIGS. 1 through 4, and only the differences therein will be described.

The U-shaped portion 76A has a part conical truncated interior surface 82, but this surface is provided with a pair of elongated grooves 84 and 86 adjacent to the slot 78. Each of the grooves contain an elongated strip 88 of circular cross section of elastomeric material, such as rubber or plastic including polyurethane or polyethylene, and the strip 88 protrudes slightly inwardly from the surface 82 of the U-shaped portion

76A. A layer 80A of compliant material, similar to the layer 80 of the embodiment of FIGS. 1 through 4 extends along the surface 82 from the slot 84 to the slot 86. This construction has the advantage of providing additional cushioning between the clevis and the microphone when inserting the microphone through the slot 78, since the elastomer strips 88 may be made of larger cross section, and may be inserted in slots 84 and 86 of greater depth than the elastomeric strip, thereby providing a gap illustrated at 90 for accommodation of the compressed strip during insertion of the microphone. Further, the strips 88 will absorb the wear from repeated insertions of a microphone into the clevis, and may be replaced, thereby protecting the layer 80A from wear at its ends. The strips 88 are formed integral with the layer 80A to facilitate mounting the strips in the grooves 84 and 86 and securing the strip in proper position.

Those skilled in the art will readily devise many constructions and uses for the present invention beyond that here disclosed and described. It is therefore intended that the scope of the present invention be not limited by the foregoing specification, but rather only by the intended claims.

The invention claimed is:

1. An adaptor for removably mounting a hand held type microphone on the end of a shaft comprising a housing having a first portion and a second portion disposed adjacent thereto, said first portion having a cavity therein with a wall between the first and second portion of the housing and an orifice in the wall between the first and the second portion of the housing, said first portion of the housing also having an opening in the wall thereof communicating with the cavity and adapted to receive the end of the shaft, a cam, means operatively associated with the second portion of the housing for rotatably mounting the cam directly confronting the orifice in the wall of the first portion of the housing, a plunger disposed within the cavity of the first portion of the housing and having a protuberance extending outwardly from the cavity into slidable abutment with the cam, said cam having a first segment of greater diameter and a second segment of lesser diameter in slidable engagement with the protrusion on the plunger, a block of compliant material disposed within the cavity between the plunger and the opening, said block having a recess aligned with and confronting the opening adapted to receive the end of the shaft, a lever mounted on the cam for positioning the cam with the first or second segment thereof in abutment with the plunger, said block being compressed by the plunger when the first segment of the cam engages the plunger and being released from compression when the second segment of the cam engages the plunger, and means mounted on the housing for mounting a hand held type microphone to the housing.

2. An adaptor comprising the combination of claim 1 wherein the second portion of the housing includes a pair of parallel tongues extending outwardly from the wall of the first portion on opposite sides of the opening therein, and the means for rotatably mounting the cam comprises a pin mounted at opposite ends on the tongues, the cam being provided with a channel journalled about the pin.

3. An adaptor comprising the combination of claim 2 wherein the cam comprises a flat plate having opposite surfaces confronting opposite tongues respectively, the channel extending normal to the plane of the plate, said cam having a first cylindrical surface coaxial with the pin adapted to slidably abut the protuberance, and said cam having a second surface adjacent to the first surface extending inwardly from the radius of the first surface and adapted to accommodate the protuberance.

4. An adaptor comprising the combination of claim 3 wherein the protuberance is part cylindrical with the cylindrical axis thereof disposed parallel to the pin, and the second surface of the cam is part cylindrical with the cylindrical axis parallel to and spaced from the axis of the pin.

5. An adaptor comprising the combination of claim 3 wherein the cam is provided with nipple disposed between the first and second surfaces and extending radially outwardly from the first and second surfaces.

6. An adaptor comprising the combination of claim 1 wherein the cavity within the first portion of the housing is symmetrical about the axis traversing the center of the aperture and opening and the plunger and unstressed block substantially fill the cavity.

7. An adaptor comprising the combination of claim 6 wherein the plunger has a flat plate portion of larger cross section than the aperture and the protuberance extends from the plate portion through the aperture.

8. An adaptor comprising the combination of claim 1 where a clevis for holding a microphone is mounted on the cam, whereby the clevis functions as a lever for positioning the cam.

9. An adaptor comprising the combination of claim 8 wherein the clevis comprises a part conical portion with a slot disposed on the side opposite the cam for receiving a microphone, the interior surface of said portion having a layer of compliant material of substantially uniform thickness extending toward both sides of the slot.

10. An adaptor comprising the combination of claim 9 wherein the interior surface of the clevis is provided with a pair of straight grooves, one of said grooves being adjacent to each side of the slot, the layer of compliant material on the interior surface of the clevis extending between the grooves, and a strip of compliant material is disposed within each of the grooves.

* * * * *