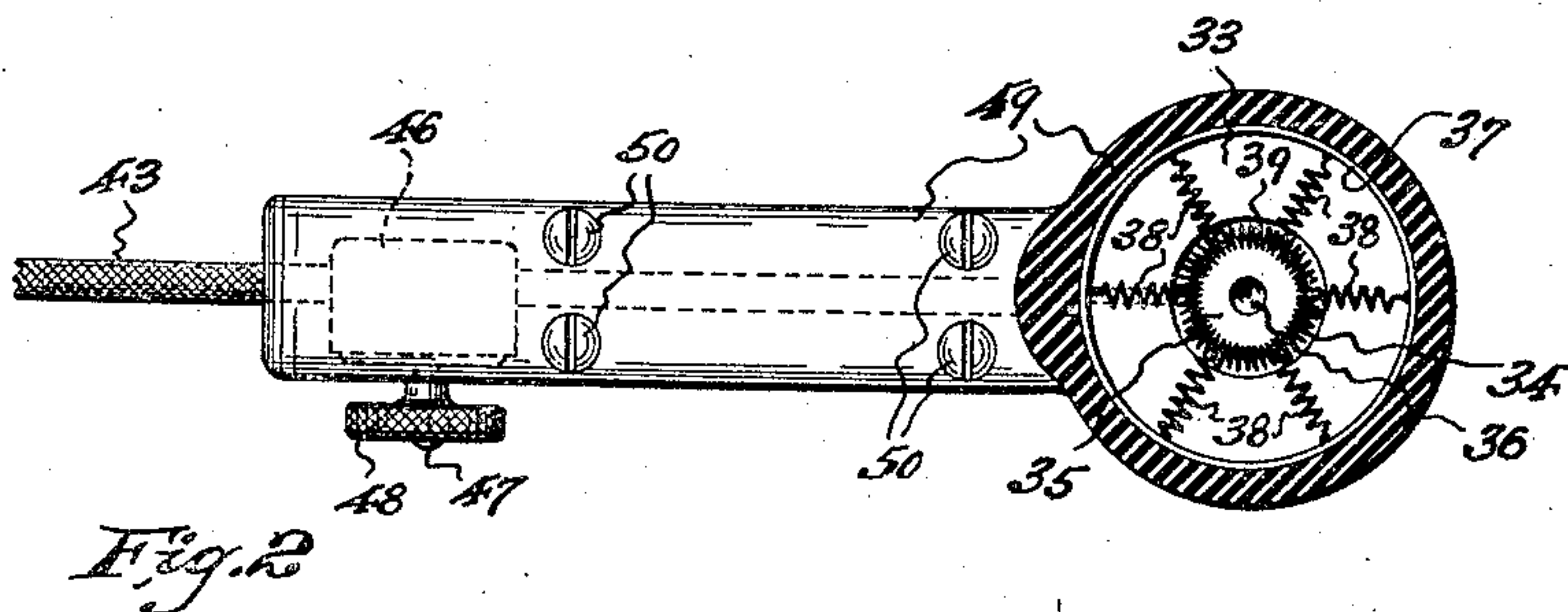
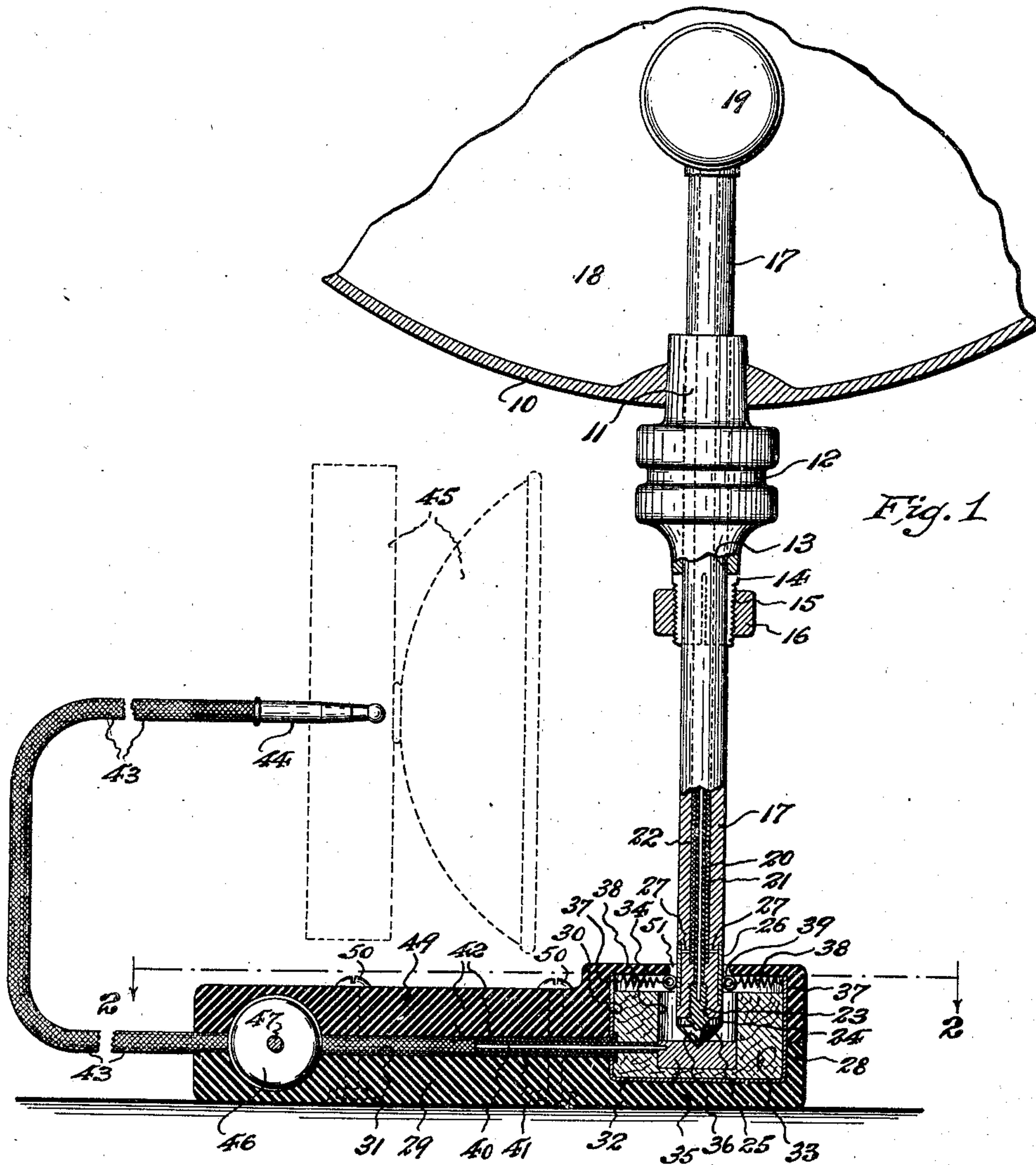


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SOUND AMPLIFYING MEANS FOR STRINGED MUSICAL
INSTRUMENTS OF THE VIOLIN FAMILY
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SOUND AMPLIFYING MEANS FOR STRINGED
MUSICAL INSTRUMENTS OF THE VIOLIN
FAMILY

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This invention relates to a novel construction of microphone mounting and connecting means for amplifying the musical tones produced by stringed instruments, and especially by instruments of the violin family.

The invention has for an object to provide in connection with the tail pin and foot piece elements of a musical instrument, such as a base viol, violincello or the like, means for supporting a microphone within the instrument body so that it will respond to the sound waves produced by the playing of the instrument, said foot piece (sometimes referred to as the peg) being provided at its exterior end portion with terminal contacts to which cable conductors lead from the microphone, and a cable extension coupling means adapted to be detachably engaged by said foot piece for cooperation with said terminal contacts thereof, whereby to electrically connect the microphone with amplifier or other means desired to be served by said microphone.

The invention has for another object to provide the cable extension coupling means with novel coupling contact devices for cooperation with the microphone terminal contacts carried by the instrument foot piece, said coupling devices being so constructed and arranged as to permit lateral movement of the instrument foot piece and consequent free movement of the instrument itself under the manipulation thereof by the player.

Another object of the invention is to provide novel means for adjusting the foot piece relative to the tail pin and bottom end of the instrument, so as to desirably predetermine the extent of exterior projection of the foot piece from the instrument body whereby to suitably support the instrument in position best adapted to the individual convenience of the player thereof.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which—

Fig. 1 is a view, in part section and in part elevation, showing the combined microphone support and instrument foot piece as operatively engaged in microphone circuit completing relation to the cable extension coupling means; and Fig. 2 is a horizontal sectional view, taken on line 2—2 in Fig. 1.

Similar characters of reference are employed in the aforesaid views, to indicate corresponding parts.

Referring to said drawings, the reference char-

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acter 10 indicates the bottom end of a stringed instrument of the violin family, and, more particularly, a bass viol, violincello or the like, which, in use, is supported from the floor by a foot piece.

Suitably connected with said bottom end 10 of the instrument is a tail pin 11 which is provided with an annular externally grooved or channeled portion 12 to receive attachment of the anchoring loop of the instrument tail piece (not shown). Said tail pin 11 is provided with an axial bore 13 extending therethrough, and said tail pin is further provided at its lower free end with a longitudinally split tapered end portion 14. Said tapered end portion 14 is provided with external screw-threads 15. Threaded onto the tail pin end portion 14 is a clamp nut 16.

Extending through the bore 13 of said tail pin 11 is a combined foot piece and microphone support provided by a tubular rod 17 of suitable length, which is made of wood or other suitable electrically non-conductive material. The upper end of said tubular rod 17 extends into the interior 18 of the instrument body, and affixed to the extremity thereof is a microphone 19 of any suitable type. The microphone 19, as thus disposed within the interior of the instrument body, is adapted to receive and respond to the sound waves produced by the playing of the instrument. The lower exteriorly projecting end portion of said rod 17 serves as the foot piece for supporting the instrument when the same is played by the user.

Connected with and extending from the microphone 19 through the bore of the tubular rod 17 is a section of conductive cable electrically connected with said microphone. Said conductive cable may be of any suitable kind, but preferably comprises an inner metallic conductor 20 enclosed in a sleeve 21 of suitable insulating material, concentric to which is formed an outer ground conductor 22 of braided wire. Threaded or otherwise secured by its shank 23 to the free end of the foot piece forming portion of the rod 17 is a metallic terminal contact button 24, the external end or tip portion 25 of which is preferably of inverted conical shape. The lower end of said inner metallic conductor 20 is suitably secured to said contact button 24 in electrical engagement therewith. Also affixed to the free end portion of the foot piece forming portion of the rod 17 is an external metallic contact sleeve or ferrule 26, which is disposed adjacently above but spaced from the contact button 24 so as to be electrically segregated therefrom. The lower end of said ground conductor 22 terminates within the

tubular rod 17 short of the contact button 24, and is electrically connected with said contact sleeve or ferrule 26 by suitable means, such, e. g., as radial electrically conductive connector elements 27 which extend laterally through the wall of said tubular rod 17 from said ground conductor 22 to said contact sleeve or ferrule 26.

The cable extension coupling means with which the foot piece forming portion of the rod 17 is adapted to cooperate, whereby to electrically couple the conductor of its aforesaid contained cable section with those of a flexible cable extension adapted to lead to an amplifier means or the like desired to be served by the microphone 19, comprises a body member made of any suitable electrical insulation material, but preferably, for reasons hereinafter mentioned, one of resilient character, such as soft rubber. Said body member of the coupling means may be made of any suitable shape, but preferably comprises a chambered end section 28 having a lateral extension 29. Said chambered end section 28 is provided with an upwardly open chamber 30 leading from which, to extend outwardly and longitudinally through said lateral extension 29, is a cable seating channel or way 31. Seated in said chamber 30 is an upwardly open, electrically conductive metallic cup member 32. Fitted into said cup member 32 is an insulator block 33, which may be made of wood or other suitable material of electrical insulating character. Said insulator block 33 is provided with a central upwardly open socket 34 of a diameter substantially exceeding that of the foot piece forming portion of the rod 17, and to which the side walls of said cup member 32 are concentric. Fixed in the bottom of said socket 34 is a metallic contact element 35 having in its upper face a depressed seat 36. Said insulator block 33 is of less height than the height of said cup member 32 so that the upper marginal portions 37 of the side walls of the latter project freely above the top of said insulator block. Supported from said upper marginal portions 37 of the cup member side walls by a plurality of metallic radial suspension springs 38 is a resilient metallic contact ring 39 formed by an annular coiled spring. Said contact ring 39 is axially aligned with and spaced above the mouth of said insulator block socket 34, and said contact ring is of an internal diameter somewhat less than the external diameter of the contact sleeve or ferrule 26 with which the foot piece forming portion of the rod 17 is provided. Said suspension springs 38 not only resiliently support said contact ring 39, but, as soldered or otherwise contacted and joined to the cup member wall portions 37 by their outer anchoring ends, also provide electrically conductive connections between said contact ring 39 and cup member 32.

The flexible cable extension which leads from the coupling means is preferably of the same type as that of the conductive cable which extends through the rod 17 to the microphone 19, and, as shown, comprises an inner metallic conductor 40 enclosed in a sleeve 41 of suitable insulating material, concentric to which is formed an outer ground conductor 42 of braided wire.

An inner end portion of said flexible cable extension is laid in the cable seating channel or way 31 of the lateral section 28 of the coupling means body member. The inner end of the conductor 40, including the contiguous portion of its insulating sleeve 41, is entered through the side wall of the cup member 32 and through an aligned lateral passage with which the insulator block 33 is

provided, whereby the extremity of said conductor 40 may be electrically and mechanically joined to the contact element 35 which is fixed within the socket 34 of said insulator block 33. The inner end of the ground conductor 42 is suitably electrically and mechanically joined to the metallic side wall of the cup member 32, so as to be electrically connected to the contact ring 39 through said cup member and the radial suspension springs 38.

The exterior portion 43 of the flexible cable extension extends from the outer end of the lateral extension 29 of the coupling means body member, and may be of any desirable length. Said exterior portion 43 of the flexible cable extension terminates in a suitable contact jack 44 by which it may be operatively connected with amplifier means 45 (schematically shown by broken lines in Fig. 1), or to any other apparatus desired to be served by the microphone 19.

If desired, a manipulatable volume control means 46, of suitable type, may be housed in the extension 29 of the coupling means body member and suitably connected in the circuit of said cable extension. The operating shaft 47 of said volume control means is disposed to project exteriorly from a side of said extension 29, and affixed to the exterior end of said shaft 47 is a finger piece or knob 48 for rotating said shaft, whereby to desirably adjust said volume control means.

Said cable means body member is provided with a removable cover member 49 which conforms to the shape thereof. Said cover member may be secured in closed relation to the body member by any suitable form of fastening means, such, e. g., as bolts 50. That portion of said cover member 49 which overlies and envelops the cup member 32 of the coupling means is provided with an access opening 51 which is axially aligned with the contact ring 39 and the socket 34 of the insulator block 33.

The rod 17 may be longitudinally adjusted relative to the bottom end 10 of the instrument whereby to shorten or lengthen the distances of projection of the foot piece forming portion of said rod for support of the instrument in position best adapted to the convenience of the particular player thereof. To make such adjustment, the clamp nut 16 is loosened on the tapered split end portion 14 of the tail pin 11, whereby to free the rod 17 for slidable adjusting movement. After such adjustment has been attained, said rod is secured against longitudinal displacement by tightening said clamp nut 16 so as to contract the tapered split end portion 14 of the tail pin 11 in gripping and binding relation to said rod 17.

In the use of the apparatus of this invention, the user of the instrument, when ready to play, inserts the extremity of the foot piece forming portion of the rod 17 through the access opening 51 of the coupling means so as to pass the end portion thereof through the circumferentially expandible contact ring 39 and into the socket 34 of the insulator block 33, whereby to engage the contact button 24 with the contact element 35 and the sleeve or ferrule 26 with the contact ring 39. By such engagement of the parts, the conical tip 25 of the contact button 24 will press into the seat 36 of the contact element 35, thus assuring good coupling contact between the conductors 20 and 40 of the microphone cable sections, while at the same time the expanded contact ring will tightly hug the sleeve or ferrule 26, thus equally assuring good coupling contact be-

tween the ground conductors 21 and 41 of said microphone cable sections. It will therefore be obvious that the microphone 19 within the instrument will be properly electrically connected in circuit, through the thus coupled cable sections, with the amplifier means 45 or other means to which said microphone 19 is desired to transmit electrical impulses induced therein by the impact thereon of the sound waves produced by the playing of the instrument, so that the resultant music produced by the instrument will be amplified to the desired degree.

By reason of the conical formation of the tip 25 of the contact button 24 as engaged in the seat 35 of the contact element 35, the rod 17 may freely oscillate or sway laterally, under the movements imparted to the instrument by the manipulation of the latter by the player, without risk of making and breaking coupling contact or otherwise losing good and effective contact between the conductors 20 and 40 of the microphone cable sections, and consequently without risk of interference with effective and smooth transmission of the microphone output. Such oscillation or swaying of the rod 17 will not interfere with effectively maintained coupling contact between the ground conductors 21 and 41 of the microphone cable sections, since the contact ring 39 is floatingly supported by the radial suspension springs 38, so as to readily yield to lateral movement in any direction.

As above mentioned, it is preferable that the body member of the coupling means be made of resilient material, such, e. g., as soft rubber, for the reason that such material will act as a cushioning support for the instrument operative to damp extraneous mechanical vibrations incident to use thereof, while at the same time such material offers good frictional contact with the floor or platform, on which the instrument stands during playing thereof, so that risk of accidental shifting or displacement of the coupling means is also reduced to a minimum.

While the invention is of particular advantage for connecting the instrument microphone to amplifier means adapted to broadcast the amplified music through a loud speaker, it will be understood that the microphone may be connected by its coupled cable sections to and so as to serve recording apparatus, or any other apparatus in connection with which the use of the microphone may be desired.

Having now described my invention, I claim:

1. Apparatus for the purposes described comprising a rod extending through a wall of a musical instrument to provide an interior portion and an exterior portion, a microphone supported by said interior portion of the rod within the body of the instrument, conductors extending from the microphone, a pair of spaced apart terminal contact means exposed at the free end part of said exterior portion of the rod to which said conductors are respectively connected, a coupling device with which said free end part of the exterior portion of the rod can be separably engaged, a flexible microphone cable extending from said coupling device, said coupling device having separate coupling contact means to which the conductors of said cable are respectively connected, and said coupling contact means being respectively contacted by the respective terminal contact means of said rod when the latter is engaged with said coupling device.

2. Apparatus for the purposes described comprising a rod extending through the bottom end

of a musical instrument of the violin family to provide an interior portion and a foot piece forming exterior portion, a microphone supported by said interior portion of the rod within the body of the instrument, conductors extending from the microphone, a pair of spaced apart terminal contact means exposed at the free end part of said exterior portion of the rod to which said conductors are respectively connected, a coupling device with which said free end part of the exterior portion of the rod can be separably engaged, a flexible microphone cable extending from said coupling device and adapted to be connected with means desired to be served by the microphone, said coupling device having separate coupling contact means to which the conductors of said cable are respectively connected, and said coupling contact means being adapted to be respectively contacted by the respective terminal contact means of said rod when the latter is engaged with said coupling device.

3. Apparatus for the purposes described as defined in claim 2, including a tail pin mounted on said bottom end of the instrument through which said rod adjustably extends, said tail pin having an externally threaded, longitudinally split, tapered free end portion, and a clamp nut threaded on said latter portion.

4. Apparatus for the purposes described comprising a rod extending through the bottom end of a musical instrument of the violin family to provide an interior portion and a foot piece forming exterior portion, a microphone supported by said interior portion of the rod within the body of the instrument, a pair of conductors extending through said rod from the microphone, a contact button affixed to the extremity of said exterior portion of the rod to which one conductor is connected, an external contact ferrule around said exterior portion of the rod, and spaced from said contact button, to which the other said conductor is connected, a coupling device with which the free end of the exterior portion of the rod can be separably engaged, said coupling device containing an upwardly open metallic cup, an insulator block having an upwardly open socket housed in said cup, a contact element fixed in the bottom of said socket, a contact ring electrically connected and floatingly supported by radial suspension springs extending between the same and said cup walls, whereby to be disposed above and in axial alignment with said socket, a flexible microphone cable extending from said coupling device and adapted to be connected with means desired to be served by the microphone, said cable including a pair of conductors respectively connected with said contact element and with said cup, said contact element being adapted to be contacted by the contact button and said contact ring by the contact ferrule of the exterior portion of said rod when the latter is entered in said coupling device.

5. Apparatus for the purposes described as defined in claim 4 including an adjustable volume control member also housed in said coupling device and connected in the line of said cable, said volume control member having manipulating means projecting exteriorly from said coupling device.

6. Apparatus for the purposes described as defined in claim 4 including a tail pin mounted on said bottom end of the instrument through which said rod adjustably extends, said tail pin having an externally threaded, longitudinally split, ta-

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pered free end portion, and a clamp nut threaded on said latter portion.

7. Apparatus for the purposes described as defined in claim 4 including an adjustable volume control member also housed in said coupling device and connected in the line of said cable, said volume control member having manipulating means projecting exteriorly from said coupling

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device, and said apparatus further including a tail pin mounted on said bottom end of the instrument through which said rod adjustably extends, said tail pin having an externally threaded, longitudinally split tapered free end portion, and a clamp nut threaded on said latter portion.

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