

Dec. 31, 1940.

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2,226,690

PLUG AND SOCKET FOR COAXIAL LINES

Filed July 24, 1937

Fig. 1

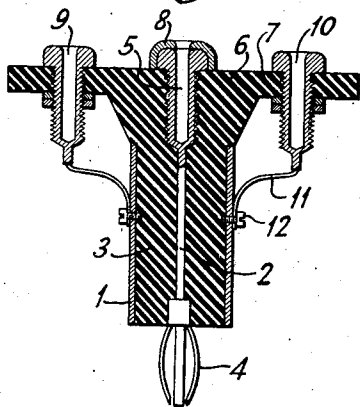


Fig. 3

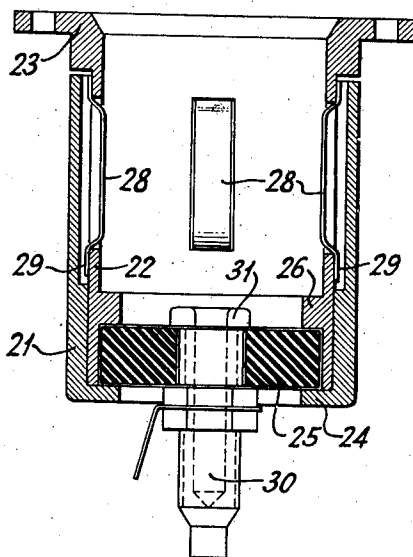


Fig. 2

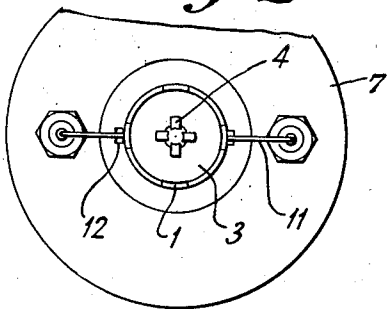
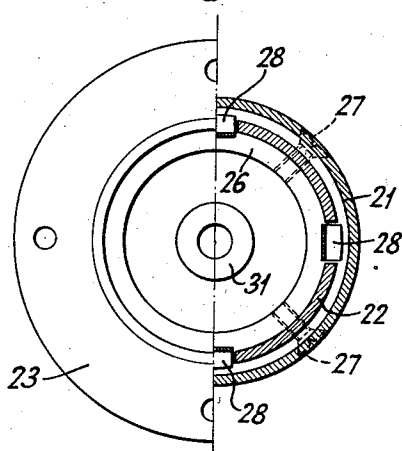


Fig. 4



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2,226,690

PLUG AND SOCKET FOR COAXIAL LINES

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Application July 24, 1937, Serial No. 155,401
In Germany July 27, 1936

5 Claims. (Cl. 173—332)

This invention relates to an improved system of providing coaxial lines with interchangeable plugs and sockets.

An object of this invention is an adapter plug for connecting a coaxial radio frequency line with standard plug sockets which at one end thereof is suited to be connected with a coaxial radio frequency cable bush, while at its opposite end it is furnished with a plurality of standard sockets.

A further object of this invention offers the advantage that by its aid a great number of connections may be established with the coaxial bush which is normally difficultly accessible. It may be used wherever special shielding of the lines is not necessary.

Another object of this invention is a plug socket for coaxial lines in which for the purpose of insulating the inner conductor against the outer conductor, disks consisting preferably of Polystyrol, or of another insulating material, are used. Polystyrol is an insulating material of special high quality, but it has the serious disadvantage that it is very brittle so that difficulties are encountered when it is to be worked. In the subject matter of the novelty, this fact is taken into consideration and a novel construction is shown by which the load of the Polystyrol disk is reduced to the farthest degree.

Still another object of this invention is a connection plug with an exchangeable center piece for coaxial lines for laboratory work. It consists of a cylindrical center piece and two tubular parts designed as plugs. The tubular parts are connected with the center piece by means of a connection piece formed as a rectangular box, or combined as a round body with the tubular part. This construction affords that during tests, the connection plug can be given quickly and conveniently the required length through insertion of a suitable center piece.

One phase of this invention is concerned with an adapter plug which is designed in a simple manner to establish connections from a coaxial radio frequency cable socket by means of standard plugs and sockets.

This invention will best be understood by referring to the accompanying drawing, in which:

Fig. 1 is a sectional view of the improved plug of this invention;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a longitudinal section of a socket of this invention; and

Fig. 4 is a cross-section of the socket of this invention partly in elevation.

Referring now in detail to Figs. 1 and 2 of the drawing, the plug portion consists of a cylindrical tubular member 1 in the axis of which a metal rod 2 is locked by the aid of a cylindrical insulating piece 3. The said metal rod at one end thereof which projects beyond the tubular member 1 has the shape of a banana type plug 4, while at its other end, which also protrudes beyond the tubular piece, it has the form of a banana type socket 5. The cylindrical insulation member 3 projects at one end beyond the tubular piece, 1; it terminates in a cone-shaped part 6 and a circular disk 7 which may be of any other suitable configuration. In the center of the said disk is disposed the above-mentioned banana plug socket 5. In symmetric relation to the said socket, in line with a diameter thereof are embedded in the disk two additional sockets 9 and 10, and these are united with the tubular metal member 1 by soldered lugs 11 and screws 12. The central bush is marked by a colored ring 8. Around the periphery of the disk there may be arranged any desired number of sockets, and these may be associated both with the inner as well as with the outer conductor. The insulating piece 3 is secured to the metal tube piece 1 by means of screws 12 projecting beyond the wall of tube 1.

A plug socket portion according to the novel feature is shown by Fig. 3 and Fig. 4 of the drawing. The metallic sleeve 21 serves as outer conductor. In this sleeve 21 a further metal tube 22 is inserted whose upper end has the shape of a flange designated by 23. The sleeve 1 has at its lower end an annular attachment 24 on which the Polystyrol disk 25 rests. The ring-shaped collar 26 of the tubular part 22 presses the disk 25 slightly against the ring 24. At the place of the collar 26 the sleeve 21 and the tube 22 are connected together by screws 27. Furthermore, the tube 22 and the sleeve 21 have opposite apertures in which the springs 28 are arranged. At the place 29 these springs are joined with the tube 22 by means of spot welding. In the axial bore of the disk 25 the prong socket 30 is situated provided in the usual manner with screws and soldering ears. The head 31 of the prong socket 30 has a smaller height than the collar-like ring 26 of the tube 22, so that the prong appertaining to this socket rests with its outer conductor on the collar 26, but does not touch the head 31 with any abutment of the

inner conductor. The Polystyrol disk 25 in this manner is freed to a wide degree from any pressure stress. The entire plug socket is lowered into the front plate at the assembling, and only at flange 23 is it fastened with screws.

What is claimed is:

1. An adapter connection plug for connecting a radio frequency concentric cable having an inner and an outer conductor comprising a central insulation core having an upper conical portion and disc portion, a metallic member for said inner conductor passing through the center of said core the lower end of which projects beyond said insulation core forming a plug having a plurality of spring members, the upper end of said conductor having a socket which projects within said central insulation core and adapted to receive a spring plug member, a tubular metallic member covering a major portion of the outside of said insulation core and extending up to said conical portion, a plurality of sockets located on the disc portion of said central insulation core and adjacent said first mentioned socket, said second mentioned sockets being connected to said tubular metallic member for cooperating with said first mentioned socket to form an outer connection with the outer conductor of said high frequency concentric cable.
2. An adapter connection plug for connecting a radio frequency concentric cable having an inner and an outer conductor comprising a central insulation core the upper portion of which is cone-shaped, a metallic member for said inner conductor passing through the center of said core the lower end of which projects beyond said insulation core forming a plug having a plurality of spring members, the upper end of said conductor having a socket which projects within said central insulation core and adapted to receive a spring plug member, a tubular metallic member covering a major portion of the outside portion of said insulation core and extending upward to said cone-shaped upper portion, two sockets located on the upper portion of said central insulation core and adjacent said first mentioned socket, said second mentioned sockets being connected to said tubular metallic member for cooperating with said first mentioned socket to form an outer connection with the outer conductor of said high frequency concentric cable.
3. An adapter plug and socket portion for connecting a radio frequency concentric cable having an inner and an outer conductor comprising a central insulation core, a metallic member for said inner conductor passing through the center of said insulation core, the lower end of said conductor projecting beyond said insulation core and forming a plug having a plurality of spring members, the upper end of said conductor having at least one socket member which projects within

said central insulation core and adapted to receive a spring plug member, a tubular metallic member covering a major portion of the outside of said insulation core, said plug cooperating with two metallic sleeves telescoping within each other to form said socket portion, an insulation disc secured to said socket portion by said sleeves, a socket member secured to said insulation disc, and a flange for securing said socket portion formed from the upper portion of the innermost sleeve.

4. An adapter plug and socket portion for connecting a radio frequency concentric cable having an inner and an outer conductor comprising a central insulation core, a metallic member for said inner conductor passing through the center of said insulation core, the lower end of said conductor projecting beyond said insulation core and forming a plug having a plurality of spring members, the upper end of said conductor having at least one socket member which projects within said central insulation core and adapted to receive a spring plug member, a tubular metallic member covering a major portion of the outside of said insulation core, two other socket members located each side of said first mentioned socket member and connected to said tubular metallic member, said plug cooperating with two metallic sleeves telescoping within each other to form said socket portion, an insulation disc secured to said socket portion by said sleeves, a socket member secured to said insulation disc, and a flange for securing said socket portion formed from the upper portion of the innermost sleeve.

5. An adapter plug and socket portion for connecting a radio frequency concentric cable having an inner and an outer conductor comprising a central insulation core, a metallic member for said inner conductor passing through the center of said insulation core, the lower end of said conductor projecting beyond said insulation core and forming a plug having a plurality of spring members, the upper end of said conductor having at least one socket member which projects within said central insulation core and adapted to receive a spring plug member, a tubular metallic member covering a major portion of the outside of said insulation core, and at least one other socket member adjacent said first mentioned socket member and connected to said tubular metallic member, said plug cooperating with two metallic sleeves telescoping within each other to form said socket portion, an insulation disc secured to said socket portion by said sleeves, a socket member secured to said insulation disc, and a flange for securing said socket portion formed from the upper portion of the innermost sleeve.