

Nov. 29, 1966

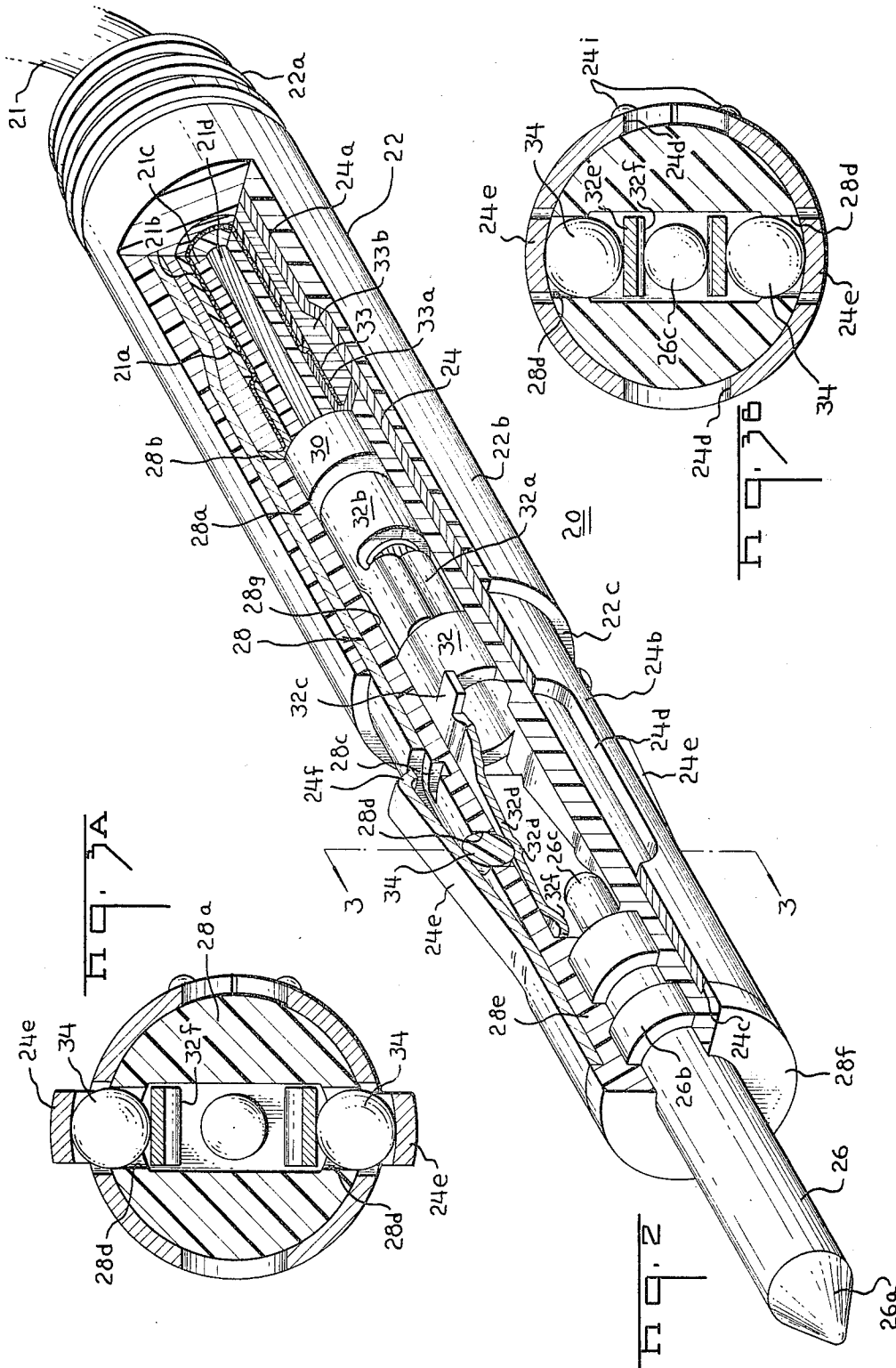
M. L. FRALEY

3,288,957

CONTACTOR HAVING NON-SHORT FEATURE

Filed June 15, 1964

5 Sheets-Sheet 2



Nov. 29, 1966

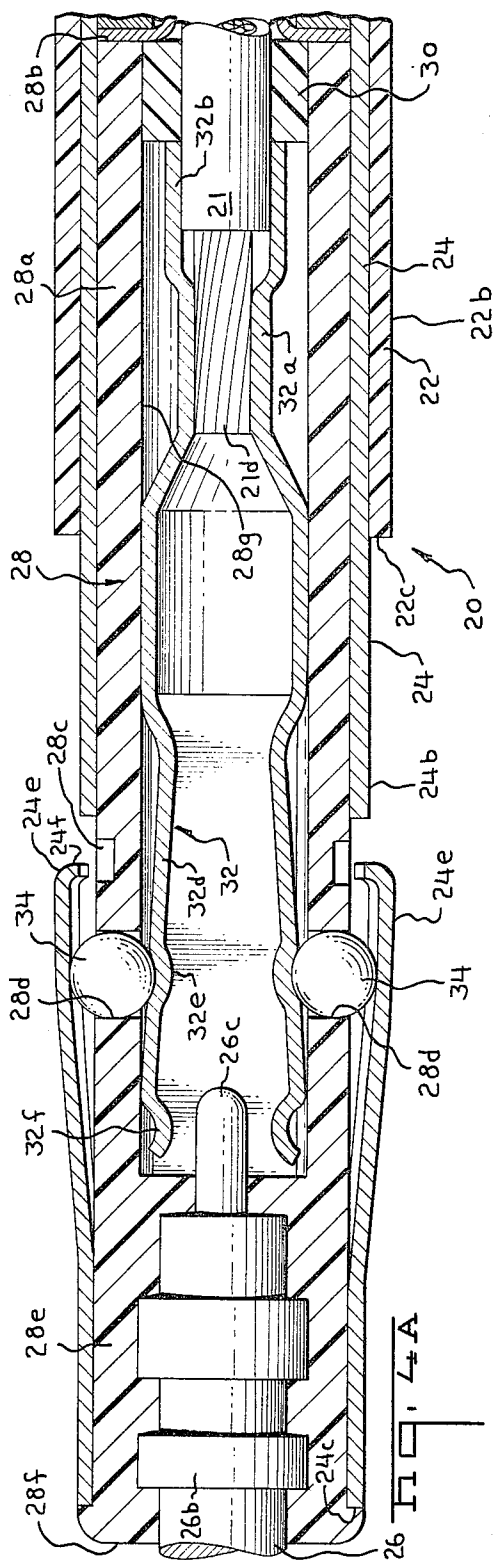
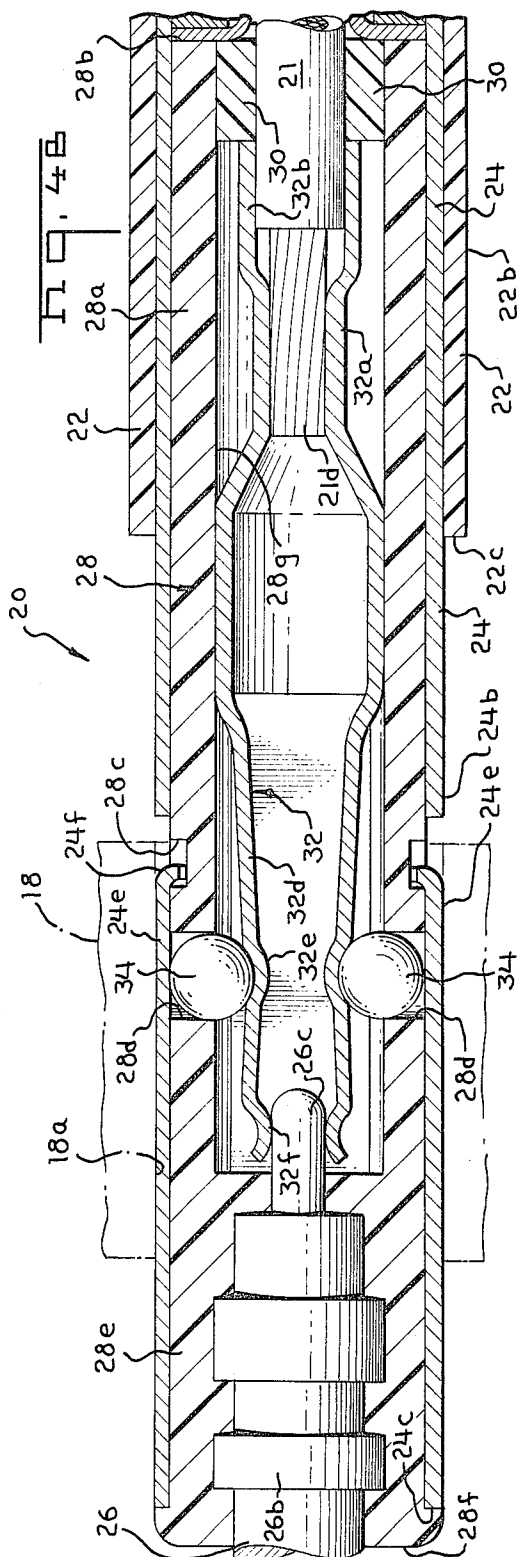
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5 Sheets-Sheet 3



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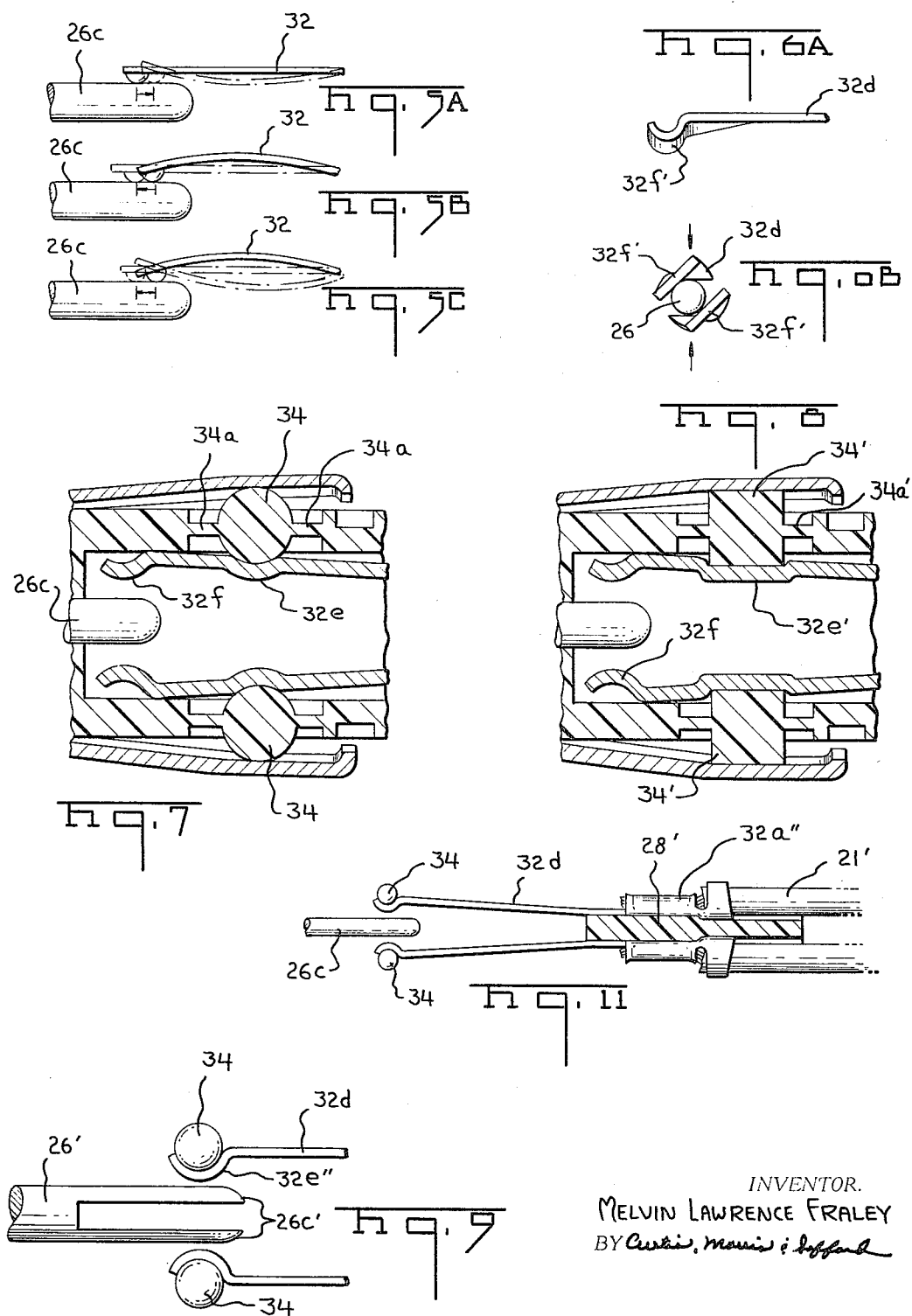
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CONTACTOR HAVING NON-SHORT FEATURE

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5 Sheets-Sheet 4



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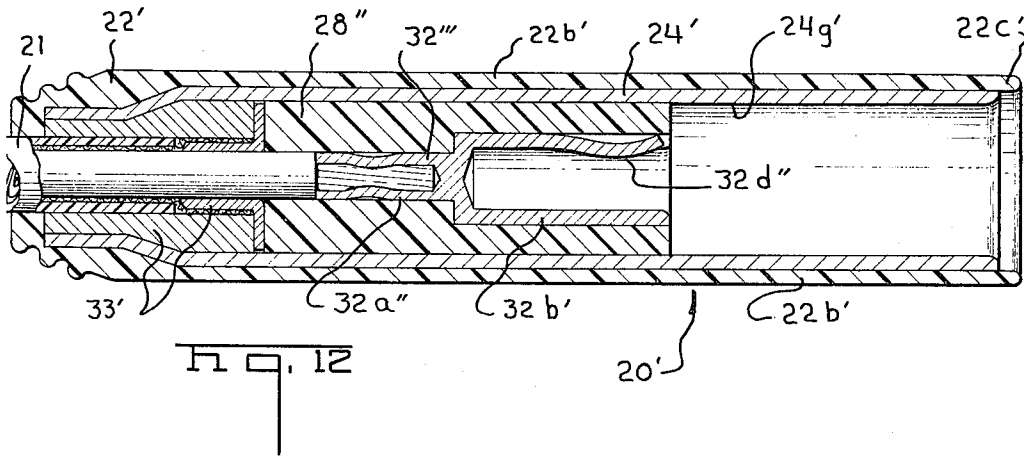
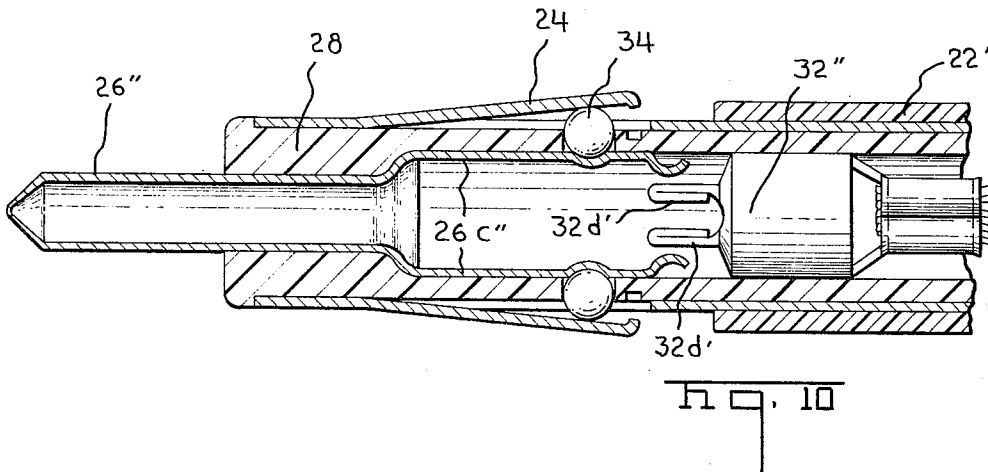
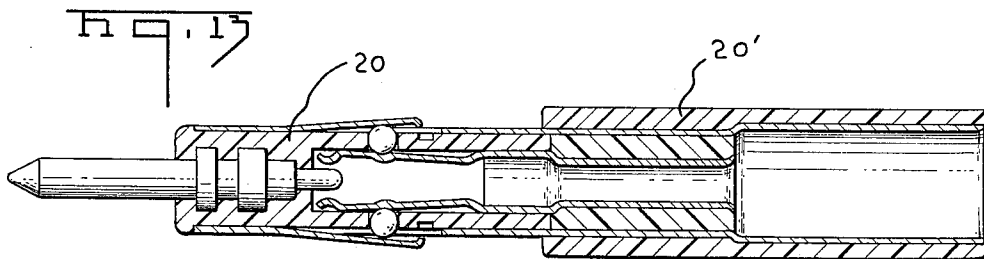
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CONTACTOR HAVING NON-SHORT FEATURE

Filed June 15, 1964

5 Sheets-Sheet 5



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3,288,957

CONTACTOR HAVING NON-SHORT FEATURE
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Filed June 15, 1964, Ser. No. 375,390
31 Claims. (Cl. 200—51.09)

This invention relates to a non-shorting contactor of the type employed to connect electrical circuit paths.

With many electrical circuits there is a need to provide a plugable type connector or contactor into and out of a suitable receptacle while the lead terminated by the contactor is left energized. One such use is in analog computers wherein a given analog signal is inserted from circuit to circuit by manual patching of a plugboard in which the circuits are terminated. Another such use is in test equipment wherein a given supply signal available from a common source is utilized for several different instruments without the source being switched off each time the contactor carrying the signal is unplugged and replugged into another instrument.

In many instances it is important that the signal path carried in the contactor not be grounded or shorted out. If this happens with certain circuits, an overload may be developed which will burn out components of such circuits. In other circuits, and particularly in analog computers a false signal may be generated which will be read by the computer.

The foregoing problems are present in noncoaxial leads and to a greater extent in coaxial leads where it is necessary to shield the inner signal conductor against RFI and against any other source of energy which may disturb the signal and destroy the intelligence content thereof.

It is one object of the invention to provide a contactor having features wherein a portion thereof is exposed for connection with a receptacle member but is de-energized until engagement of the contactor in such receptacle.

It is another object of the invention to provide a novel contactor construction wherein the signal bearing portion of the device which is exposed for connection with complementary connector members is de-energized until use.

It is a further object of the invention to provide a novel coaxial contactor which incorporates a non-shorting feature so that the device may be handled outside of its receptacle without danger of shorting the signal bearing path thereof.

It is a further object of the invention to provide a non-shorting plug contactor having an improved wiping feature to provide an electrical connection therewithin having good characteristics.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention, but are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

FIGURE 1 is a perspective showing in a fragmentary view a portion of a patchcord system of the type utilized with analog computers, the contactor of the invention being generally shown proximate to such system;

FIGURE 2 is an enlarged perspective view partially sectioned of the contactor of the invention in one embodiment;

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FIGURES 3A and 3B are sections through lines 3—3 of FIGURE 2 showing the open and closed electrical circuit positions of the contactor;

FIGURES 4A and 4B are longitudinal sections of the contactor construction of FIGURE 2 showing respectively the open and closed positions for electrical connection;

FIGURES 5A—5C represent respectively three embodiments of the invention which pertain to types of contact circuit wipe contemplated by the invention;

FIGURES 6A and 6B show yet a further embodiment of the contact spring member of the invention;

FIGURE 7 is a partial longitudinal view in section of a further embodiment of the contact spring driving mechanism of the invention;

FIGURE 8 is a partial longitudinal view in section of a still further embodiment of the spring driving mechanism of the invention;

FIGURE 9 is a schematic view showing an alternative embodiment of the forward part of the contact system of the invention;

FIGURE 10 is an enlarged longitudinal view in section showing a further alternative embodiment of the contact system of the invention;

FIGURE 11 is a schematic view showing an embodiment of the invention adapted to operate as a switch for at least three separate electrical signal leads;

FIGURE 12 is an enlarged longitudinal view in section of a receptacle which may be utilized with the contactor of the invention and which forms with the embodiments of the other figures yet a further embodiment of the invention; and

FIGURE 13 is a view of an embodiment permitting the invention assembly to be piggy-backed in use.

Referring now to FIGURE 1 the numeral 10 represents an analog patchcord system which is included to reference the types of uses in which the invention is frequently employed. The system includes a back bay 12 which carries a number of fixed contacts terminated to leads such as 17 which may go to various electronic or electrical subcomponents, and a front bay or board 18 housing patchcord contactors 20 which are connected to coaxial leads 21. In the particular system shown the back bay is comprised of a number of modules 14 each having a series of cavities such as 14a which individually mount and position back bay contact springs 16 which are terminated to the inner signal conductor of a cable 17. The front board 18 is in a well known commercially available version which may be of metal drilled or formed with a series of apertures 18a which are positioned relative to the spring 16 of the back bay such that the center pin of the contactors 20 in a forward portion engage the springs 16 and the outer portion of the contactors engage the metallic surface of the board 18. If the construction of the modules 14 and the boards 18 are metal, the center conductive path formed by the springs 16 and the center pin of contactors 20 is substantially shielded throughout the path of connection. With this arrangement various subcomponents connected to leads 17 may be interconnected by patching the board 18 with contactors 20. In certain instances externally generated signals may be brought into the board 18 through a separate lead 21 connected to a contactor 20 which may serve as a test probe or signal input means. In many instances with the system 10 in use it is desirable to have a number of the contactors 20 out of board 18 and therefore out of circuit but proximate thereto for use. It is in such cases quite helpful to have such contactors "hot" with the circuit signals carried thereby on such that upon the contactor being plugged into a given aperture the signal carried by the lead 21 thereof will immediately be input to the rear bay contact spring 16.

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FIGURE 1 shows two of the contactors 20 with the forward end portions touching to demonstrate one of the problems which must be overcome; namely, that in such position the leads are not electrically connected. As a further problem to be overcome it is important that when plugging one of the contactors in a given aperture the forward portion of the contactor pin 26 not be permitted to short against the board 18 if such is of metal. As a further problem with the leads out of the board in the position shown in FIGURE 1 it is important that the signal path be shielded over its entire energized length. As will be hereinafter explained this is accomplished by the construction of the present invention.

The above description relative to an analog computer system should be sufficient to set forth the problem solved by the invention and it should be kept in mind that the invention has immediate utility with other applications wherein the problems are the same or similar.

Turning now to more detailed description of the contactor of the invention and referring again to FIGURE 1 the construction shown as 20 serves to terminate a lead 21 and includes an insulating boot 22 having a rear portion 22a having grooves therein to facilitate insertion and withdrawal of the contactor and a forward barrel portion 22b in which is housed a ferrule assembly terminating lead 21 to the separate coaxial paths of the contactor. Boot 22 includes at its forward end a face 22c which by stop means is held to be slightly displaced from the face of the board 18 when the contactor is inserted in an aperture 18a. Extending substantially the length of the boot 22 and forwardly thereof for a good portion is an outer shell member 24 of relatively thin metal having spring characteristics and preferably formed as by stamping and rolling to the configuration shown. Shell 24 includes a rear portion 24a which houses a ferrule assembly within boot 22 as best shown in FIGURE 2 and a forward portion 24b ending in a face 24c. Included in the forward portion 24b are at least two axially extending slots 24d and struck-out spring portions 24e. The metal between the portions 24d and the slots left by 24e form resilient spring members and are embossed outwardly to define an axial ridge 24j which serves to frictionally engage the apertures 18a and make contact with the board 18. The diameter of 24 as measured from the outside portions of 24j is slightly larger than the apertures 18a such that the portions of 24 beneath the embossments are driven inwardly under the spring pressure of the metallic portion between slots 24d. On the forward portion of 24 in a preferred embodiment is included a slotting shown as 24k which includes an axial slot left from the stamping of the shell 24 and a slot extending transversely for the portion of circuits of 24. The transverse slot forms with slot 24 a spring member which carries a series of dimples struck outwardly to a radius beyond the diameter of an aperture 18a and adapted to be driven inwardly during insertion of the contactor within board 18 and to snap outwardly on the opposite side of the board member to latch the contactor within the board. Spaced from dimples 24i are further dimples 24b which cooperate with the front face of board 18 to limit the engagement of contactor 20 within aperture 18a. In use the contactor 20 is then inserted within an aperture 18a and pushed forwardly until the dimples 24b are engaged. At this point then the embossments 24j are held inwardly as well as the spring members 24e to frictionally hold the contactor within and in electrical contact with board 18. Also, the dimples 24i are in engagement with the front face of the board 18 to further hold the contactors 20 against accidental dislodgement from the board.

Within shell 24 is an insulating member 28 which holds in its forward end a contactor pin 26 carrying the circuit which is to be commoed to the spring 16 of the back bay 14. With contactor 20 inserted in 18 an outer coaxial or shielded path is formed between sleeve 24

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through the surfaces of springs 24e and the board itself if it be of metal and a center coaxial path is formed between pin 26 and springs 16 in turn surrounded by the portions of 14.

Referring now to FIGURES 2-4B and to the contactor construction in greater detail and in operation, the insulating member 28 briefly mentioned above will be seen from FIGURE 2 to include a sleeve portion 28a extending down within shell 24 beneath boot 22 and ended in a face 28b against a ferrule assembly shown as 33. In a forward portion of 28 is a slot 28c in the outer surface thereof beneath the shell spring 24e adapted to receive a turned down portion of spring 24e shown as 24f when the spring 24e is driven inwardly by insertion of the contactor within an aperture 18a. There is of course a further slot 28c disposed 180° from that shown in FIGURE 2 to accommodate the bottom spring 24e and its end 24f. This can be seen in FIGURE 4A and in use in FIGURE 4B. The length of the slot 24c should be sufficient relative to the thickness of the metal forming shell 24 such that practical production tolerances will leave clearance for the ends 24e. Similarly, the depth of the slots 28c should be sufficient to permit practical production tolerances to be achieved with the springs 24e being driven inwardly with some expected variation.

Forwardly of slots 28c in the sleeve 24 are apertures 28d which have a purpose to be described hereinafter. Forwardly of these apertures is a section 28e which is interiorly formed to captivate pin 26. The forward end of 28 is flared outwardly to form a flange 28f which bears against 24c of shell 24. Along the major length of 28 is a bore or cavity 28g adapted to house the contact mechanism of the invention.

The central pin member 26 includes a beveled nose 26a adapted to assist insertion of the contactor within spring members 16. On the body of 26 is included a flange or flanges 26b which cooperate with the insulating member 28 to hold the pin against axial movement in the contactor and at the end opposite 26a is a further round end 26c which extends into the cavity 28g of 28.

At the end opposite 26 and within the cavity 28g is positioned an insulating insert 30 having an aperture, not shown, through which passes the center conductor 21b of cable 21. The insert 30 serves to insulate a terminal 32 disposed forwardly thereof from the outer coaxial path of the cable, particularly the ferrule assembly 33.

Within 28g is a terminal assembly 32 which includes a portion 32a crimped to the cable center conductor 21d and a sleeve portion 32b which operates to stabilize the center conductor relative to the crimp. Forwardly of portion 32a is a portion including a flange member 32c which engages internal recesses within 28 to lock the terminal assembly against axial movement relative to 28 and relative to 24. Extending from the region of 32c is a resilient contact spring arm 32d having an inwardly formed portion 32e near the center thereof and at the end thereof an inwardly formed and curved contact portion 32f. The preferred embodiment under discussion includes two spring arms 32d to form dual contact springs with both arms having a relaxed position outwardly against the inner surface of 28g and overlapping 26c. This position is shown in FIGURES 2, 3A and 4B. Fitted within the apertures 28d of insulating member 28 are contact spring driving members shown in the embodiments of FIGURES 2-4A as balls which are preferably of insulating material in uses of the contactor wherein distinct electrical paths must be maintained. The members 34 are of a dimension, in the case of balls, a diameter, such as to fit between the contact springs 32 and the spring members 24e with a slight residual wedging pressure to hold such in place against being accidentally dislodged. The width dimension or diameter is held such that the members 34 leaves the contact spring arms 32 outwardly disposed as shown in FIGURE 4A to define a substantial air gap between the

with the forward pin member 26 being shown as relatively rigid structure. With the versions previously described 26 has little "give" because, although mounted in a resilient, flexible insulating member 28 it is driven by opposing arms 180° apart. In FIGURE 9, the pin 26' is split to define spring like ends 26c' which provide a further spring action to that of the system defined. With this arrangement, and previously described versions, the arms 32d are driven inwardly until contact is made and then the portions 26c' are further driven inwardly to provide additional resilient spring pressure with the wiping action on the contact surfaces determined by the difference of deflection between the members. Also indicated in FIGURE 9 is an alternative arrangement of the spring arm 32d' wherein the ends 32e'' have lower surfaces curved to define contact surfaces and the upper surfaces are shaped to house members 34. Not shown but also included would be an arm driving structure having parts as described.

FIGURE 10 shows a further embodiment wherein the forward pin member shown as 26'' has a bifurcated rear section forming contact portions similar to the system described with respect to 32d above. The alternative contact system includes arms 26c'' which each have a curved portion to accommodate members 34 and forward portions to serve as contact surfaces which are adapted to be driven inwardly to effect contact with the rear portion shown as 32'' crimped to a conductor 21. The portion 32'' includes portions 32d' extending axially to define the contact surfaces thereof adapted to engage the portions 26c'', there being in effect a double spring system formed thereby.

FIGURE 11 shows an alternative embodiment of the invention which includes members 22, 24 and 33 as above and wherein the forward pin portion shown as 26c is adapted to be contacted by a pair of spring arms 32d. Each of the springs 32d is terminated via a crimp as at 32a'' to a lead 21'; the two leads being insulated each from the other by a transverse wall section 28'. With the device as shown in FIGURE 11 two input signals may be commoned each to the other and to a third output path connected to 26c.

In FIGURE 12 a separate receptacle 20' for use with the contactor 20 above described is shown. Thus a lead 21 having a ferrule assembly identical to that above described but here shown as 33' is secured with a boot 22' having a body portion 22b' and an end 22c'. Within the boot is a sleeve member 24' having a forward internal bore 24g' adapted to receive the forward end of contactor 20. Secured within the rear portion of 24' is an insulating member shown as 28'' housing a center contact assembly shown as 32'''. The rear portion thereof includes a crimp 32a'' and the forward portion includes a receptacle 32b' having a spring member 32d'' adapted to engage and contact a pin member 26. Thus then a contactor such as 20 above described may be plugged into the receptacle 20' and provide an interconnection of a center path which was formally not energized.

It is contemplated that a contactor 20 may have at the opposite end thereof via lead 21 one of the receptacles 20' as shown in FIGURE 12 whereby the contactor may be left within the board and, apart from the patchcord system, energized by another contactor 20 inserted in the receptacle.

FIGURE 13 shows an embodiment wherein the receptacle features of the embodiment of FIGURE 12 are incorporated in the rear portion of a contactor 20. This arrangement permits the device to function without the need for separate lead portions. This feature embodiment may be found useful in instances where it is desired to leave the contactor 20 within the board and patch into it with a further contactor.

It is contemplated that the principle of the invention may be employed with non-coaxial leads. In such use the member 24 merely becomes an actuating member and

as such serves to common the single electrical path formed by a contact system similar to that described.

It should be apparent that the invention has uses broader than the plugboard environment in which it has been presented.

In an actual embodiment the balls 34 were of Teflon which was found to be sufficiently firm to drive the spring members into engagement and to hold against relaxation in the presence of simulated aging. The use of flexible members for 34 further has an advantage in that slight tolerance deviations in the assembly can be readily accommodated by having the balls sufficiently large to assure contact variance. With the embodiments of FIGURES 9 and 11, flexible balls are particularly desirable. The arrangement of the spring system also is helpful in this regard since any oversize will be taken up by an additional deflection with the contact wipe being extended. It is also contemplated that the ball structure may be of glass or hard plastic with the spring characteristics of the systems of FIGURES 2-8, 10 and 13 operating to achieve the mentioned advantage in assembly and use.

Changes in construction will occur to those skilled in the art and various apparently different modifications and embodiments may be made without departing from the scope of the invention. The matter set forth in the foregoing description and accompanying drawings is offered by way of illustration only. The actual scope of the invention is intended to be defined in the following claims when viewed in their proper perspective against the prior art.

What is claimed is:

1. A plug contactor adapted to connect an electrical current path upon being engaged in a receptacle including a body having an insulating sleeve, first and second conductive members fixed in said sleeve against relative axial movement and having overlapping contact surfaces normally spaced apart, the said first member extending from said sleeve and the said second member terminated to a lead, means secured to said body and actuated by the body being inserted in a receptacle to drive one of the said members in a radial sense to effect a connection between the contact surfaces of the first and second members and thereby connect said lead to the first member extending from said sleeve.

2. The contactor of claim 1 wherein the one member includes a spring arm adapted to be driven inwardly and said means driving the one member has a path of travel sufficient to drive said one member after initial contact with the other member and effect an axial wiping movement between the contact surface thereof and the contact surface of the other member.

3. The contactor of claim 2 wherein said spring arm is positioned relative to said means to have a point of engagement therewith between the arm end and a support portion of said one member.

4. The contactor of claim 2 wherein said spring arm is positioned relative to said means to have a point of engagement therewith at the end of said arm.

5. A plug contactor adapted to be energized upon insertion in a receptacle and de-energized by withdrawal therefrom including an insulating sleeve housing a first member terminated to a lead and a second member extending axially outward of such sleeve, the members including end portions within said sleeve and free therefrom, the said portions carrying contact surfaces in an overlapping relationship normally spaced apart to define an open circuit therebetween, first means secured to said sleeve and adapted to engage the receptacle and be driven thereby in a radial sense, second means interposed between said first means and one of said members and adapted to be driven by said first means in a radial sense to drive the one member inwardly into engagement with the other member and electrically connect said lead to the second member.

6. The contactor of claim 5 wherein the second means is of material which is substantially resilient.

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ends 32f and the pin portion 26c; thus, in a defined open electrical circuit.

The characteristics of the spring system formed by the springs 24e, arms 32d and members 34 is preferably such that the engagement of 32f with 26c will be accomplished only through operation of the system during insertion of a contactor within the board member and not accidentally if the contactor is dropped or subjected to vibration. This can be accomplished practically by controlling the stiffness of the spring members 24e and/or 32b.

Thus then, with the contactor out of the board the system assumes the positions shown in FIGURES 3A and 4B with the pin 26 not in circuit with the center conductive path of the cable 21; i.e., lead 21d and the contact assembly 32. The spacing between portions 32f and 26c is important to maintain this open circuit and of course defines the practical voltage levels with which the contactor may be used. In an actual unit, the open space between 32f and the point of first contact with 26c is approximately 18-thousandths of an inch with approximately 10-thousandths further travel to provide a wipe of 5 or 6-thousandths. A unit having such spacing has been found to be usable with voltage levels beyond 400 millivolts.

Referring now to FIGURES 2A-4B, as the contactor 20 is plugged into a board aperture 18a the aperture surfaces contact the spring members 24e and begin to force such members inwardly. The inner surface of members 26e in turn contact the members 34 and with some elastic deformation thereof begin to force such inwardly through the apertures 28d driving with the movement the spring arms 32d inwardly. The relative dimensions of shell 24 including the arms 24e are such that when the contactor is inserted about half way in board 18 the ends 32f of the contact springs first strike the contact surfaces of 26c. Thereafter with further insertion of the contactor in board 18 the contact spring arms 32d are driven under increasing pressure such that the ends 32f bear against the surfaces of pin 26c. Since the spring members deflect, wiping occurs to provide a contact between 32 and 26 which is under substantial pressure and is wiped to free the contact surface of particle contamination or oxides.

By the time that the contactor is fully inserted such that the dimples 24b engage the rear surface of board 18 and the dimples 24i have snapped outwardly against the front surface of the board the contact system is as shown in FIGURE 4B with the contact held under substantial residual pressure. With the embodiment of FIGURES 2-4B and with two oppositely opposed contact spring arms being driven inwardly there is no tendency for the pin member 26 to be displaced under such pressure because the spring members grip the pin substantially 180° apart and the forces are directed inwardly.

The double contact system above shown is advantageous to better assure contact since even if one of the spring members were inadvertently broken or damaged the other spring member would operate to effect the desired circuit closure. The provision of insulating material surrounding the contact system and separating such from the outer circuit path formed by shell 24 is also advantageous since even if one of the members were broken off at least no short could occur to the outside path.

While the dual contact system above described is advantageous and is preferred for general useage, as part of the invention it is also contemplated that a single contact path could be established by using only a single contact spring arm 32d rather than two as shown. In this simplified embodiment only a single member 34d and a single spring member 24e would be used to thus simplify and cheapen the assembly with an incident reduction in quality and reliability.

It is further contemplated as part of the invention that the spring system may be altered to provide different

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types of wipe as the need arises. The type of wipe shown in FIGURES 4A and B is generally represented in FIGURE 5A wherein the spring arm 32d is driven from a first relatively straight position down until the contact surface of end 32f engages the surface of 26c and then as the contact spring arm is driven inwardly to the position shown in FIGURE 4B or the position dotted in 5A, the contact surface 32f wipes back along the surface of 26c as indicated by the small arrow. When the contactor 20 is pulled from the board the spring will return over the path travelled to open the circuit. The amount of bow beyond the center line of the spring 32d in conjunction with the curvature of 32f thus may be made to determine the extent of the wipe.

FIGURE 5B shows an alternative version wherein the spring arm 32d is given an outward bow as shown by the solid line and is driven inwardly to the flat position to provide a wipe in the direction of the arrow shown or inwardly along the surface of 26c. FIGURE 5C shows yet a further embodiment wherein the arm 32d normally has an outward bow and is driven inwardly past the center line in the opposite direction. With this version the contact surface 32f will first wipe inwardly and then outwardly along 26c as indicated by the arrow diagramed in the figure. This will provide a pre-wipe wherein the contact surface will travel first in one direction and then over the direction previously wiped to rest in the pre-wiped area.

The choice of the above versions of contact spring action is best controlled by the spring characteristics of the member 32 with the characteristics of the members 34 being taken into consideration. The actual use of one embodiment over the other is determined in accordance with the voltage level of the circuit in which the contactor is used or the environment in which the contactor is used in conjunction with the choice of materials of which the spring portions or shell or member 32 are manufactured.

FIGURES 6A and 6B show yet a further embodiment wherein the ends of the spring member 32 are twisted to form substantially a 45° angle with respect to the line of travel imparted by the member 34, such line being shown by the arrows in FIGURE 6B. With this arrangement then the contact surfaces 32f will engage 26 and wipe under increasing spring pressure, the spring offering both a rotational or torsional force holding the contact surfaces together as well as the force developed in the remainder of the spring length. The various embodiments discussed in FIGURES 5A-C may be incorporated in this embodiment shown in FIGURE 6A and 6B to obtain a wipe in two or three directions.

Turning now to an embodiment of the invention wherein it is desirable to effectively seal the contact system within the cavity shown as 28g in FIGURE 2, FIGURE 7 shows an embodiment wherein the members 34 are integrally formed with the insulating member 28 to include a web extending substantially around 34, such web being shown as 34a in FIGURE 7. The web 34a is made to be sufficiently thin so that the member 34 can be driven inwardly or forced outwardly by the spring system acting upon such member without unduly affecting the spring system. At the same time the web 34a is made to be sufficiently thick so as to provide an effective vapor or gas seal of the contact system disposed within 28 to thus prevent the entry of dust, moisture or other contaminants. FIGURE 8 shows yet a further embodiment of the invention wherein the members 34 as shown as 34' and are made square or rectangular. With this embodiment the arms shown as 32d above have the portions 32e' formed to better engage the configuration of the members 24'. Again, as part of the invention, webs such as 34a' are added to hold the members 34' in position and to seal the cavity of 28 against entry of contaminants.

In the above embodiments, the contact spring system has been carried by a terminal crimped to the conductor

7. The contactor of claim 5 wherein the second means is of a material which is substantially non-resilient.

8. The contactor of claim 5 wherein the first means is of a relatively hard material and the second means is of a resilient material.

9. A plug contactor adapted to be energized upon insertion into a receptacle and de-energized upon withdrawal therefrom including a sleeve housing contact members fixed against relative axial movement, one of said members having a cantilevered spring arm overlapping a portion of the other member by a given amount and spaced therefrom in the relaxed state of the spring, means on said sleeve adapted to be driven radially inward to drive said arm into contact with the said portion of the other member, the said means having an inward travel limited by the diameter of said sleeve to drive said arm to move axially less than said given amount.

10. A plug contactor adapted to be energized upon being inserted into a receptacle and de-energized upon withdrawal including a body member having a first cantilevered spring arm adapted to be deflected inwardly by the receptacle walls, first and second contact members carried by said body, the first contact member being terminated to a lead and the second contact member extending from said body member, the contact members including ends positioned within the body member in a normally spaced and overlapping relationship, one of said contact members having a cantilevered spring arm adapted to be driven by said first cantilevered spring arm radially to engage the other contact member and connect said lead thereto.

11. The contactor of claim 10 wherein the other of said contact members also includes a cantilevered spring arm whereby said first cantilevered spring arm deflects the arm of the one member which deflects the arm of the other member in making contact between the lead and the second contact member.

12. A contactor for separately connecting coaxial cable signal paths into a coaxial system including a body member having an outer conductive sleeve terminated to a coaxial cable outer conductor, an insulating sleeve housing a first conductive member terminated to the cable inner conductor and a second conductive member extending out of said conductive sleeve, the said member including, positioned within said conductive and insulating sleeves, contact surfaces normally spaced apart to define an open circuit, means for driving said contact surfaces into contact to connect said cable inner conductor to the second member responsive to said contactor being plugged into a receptacle.

13. The contactor of claim 12 wherein said means includes a spring portion of said conductive sleeve and an insulating member driven to bear upon one of said conductive members.

14. The contactor of claim 12 wherein one of said conductive members includes a spring portion carrying the contact surface thereon.

15. The contactor of claim 12 wherein both of the said conductive members include spring portions each carrying the contact surface of the associated member.

16. The contactor of claim 12 wherein the said means includes a spring portion of the said conductive sleeve and an insulating member driven to bear upon one of said conductive members which includes a spring portion adapted to be deflected thereby to close contact with the surface of the other conductive member.

17. A plug contactor for terminating coaxial signal paths, including a body housing an outer metallic member for an outer signal path and a center conductive member for an inner signal path, an insulating sleeve disposed between the outer and center members to electrically isolate such, a further conductive member affixed in said sleeve in a spaced and overlapping relationship to said center member, and means adapted to be driven by radial deflection of said outer member to cause one of said center

and further members to engage the other member and form a connection therebetween.

18. The contactor of claim 17 wherein there is further included joined to said outer member a metallic receptacle and an inner conductive member joined to said center member and spaced from said receptacle by a further insulating sleeve whereby to receive a further coaxial contactor.

19. The contactor of claim 17 wherein said outer member is terminated to the outer conductor of a coaxial cable and serves as a shield against stray radiation and the center and further members are positioned within said outer member with the portion thereof forming the connection shielded by said outer member.

20. The contactor of claim 19 wherein the said further member includes a portion extending out of said shield to engage spring members of a connector.

21. A plug contactor having a first center conductive member terminated to a lead, a second center conductive member positioned apart from but relative to said first member to be driven to engage such member and form contact therewith, a body member holding said conductive members including a bore surrounding and free from portions of said members where contact engagement is made, means positioned by said body member and adapted to drive through said bore one of said conductive members to effect the engagement between such members.

22. The contactor of claim 21 wherein said means includes a member separate from the body member fitted within a slot in said body member to protrude into said bore and engage said one of said conductive members.

23. The contactor of claim 21 wherein said body member includes a sleeve of resilient material and said means is a member of a thickness to extend outwardly of said body member outer diameter and inwardly of said bore to engage said one of said conductive member.

24. The contactor of claim 23 wherein said means is formed integrally with said sleeve.

25. The contactor of claim 23 wherein said sleeve is continuous about the said bore and said conductive members to seal the contact engagement portions within the said bore.

26. The contact system including an insulating sleeve having first and second conductive members anchored therein against relative axial movement, each of said members having a contact surface at one end thereof, one of said members having a beam section free at the end thereof proximate the other member, means supported on said sleeve having a travel to drive said beam radially inwardly to effect a first contact between the surfaces of said members and then further deflect said beam to cause a relative wiping movement between said surfaces.

27. The contact system of claim 26 wherein said means travel is such that the beam is driven from a relatively straight position to a bowed position to effect said wipe in a direction toward the base of said beam.

28. The contact system of claim 26 wherein said means travel is such that the beam is driven from a relatively bowed position to a straight position to effect said wipe in a direction away from the base of the beam.

29. The contact system of claim 26 wherein said means travel is such that the beam is driven from a bowed position to effect an initial contact of the members and then to straight position and thereafter to an oppositely bowed position to effect a wipe toward and away from the base of said beam.

30. The system of claim 26 wherein the contact surface of the said one member is disposed at an angle to the principle axis of beam deflection whereby said wipe occurs in at least two directions substantially perpendicular to each other.

31. A contact system for providing a relative wiping movement of contact surfaces including a member adapted to be driven radially inwardly by the wall portions of a receptacle into which the member is engaged, first and second contact carrying portions, at least one of said por-

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tions having a beam section supported at one end with its contact surface proximate to the other end, the supported end being fixed against axial movement relative to the other portion and the contact surface spaced radially from the other portion with the beam in its relaxed condition; the said member engaging said beam section upon being driven inwardly and having a radial travel sufficient to cause said beam to move axially after engagement of the contact surface to provide a wipe between said members.

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