May 7, 1968 W. J. METZGER 3,381,977

TRAIN LINE SERVICE CONNECTION MEANS

Filed June 30, 1965 4 Sheets-Sheet 1

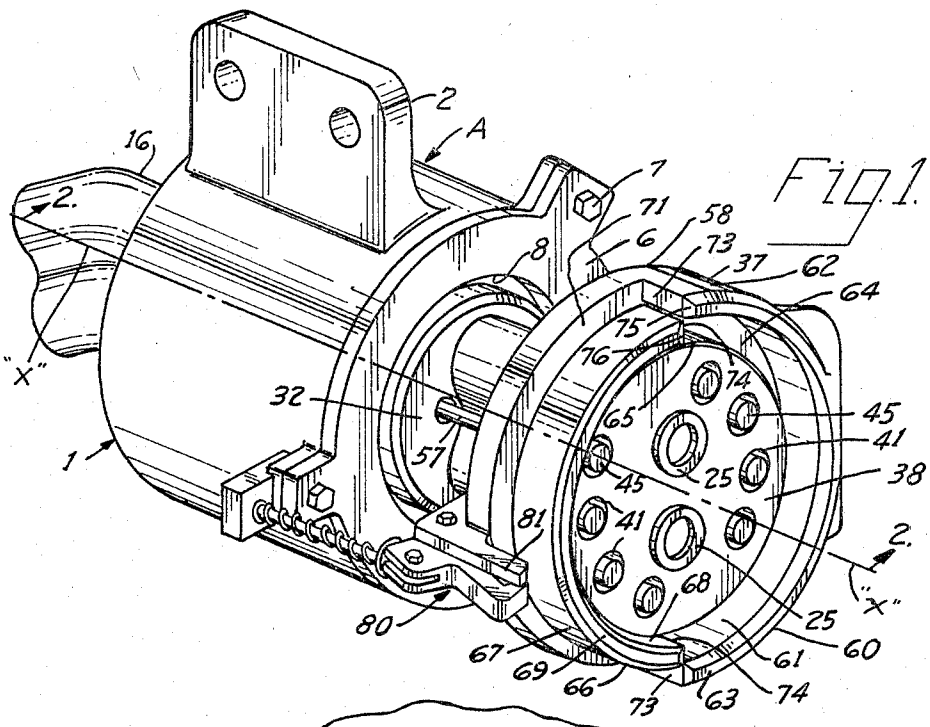


Fig. 1.

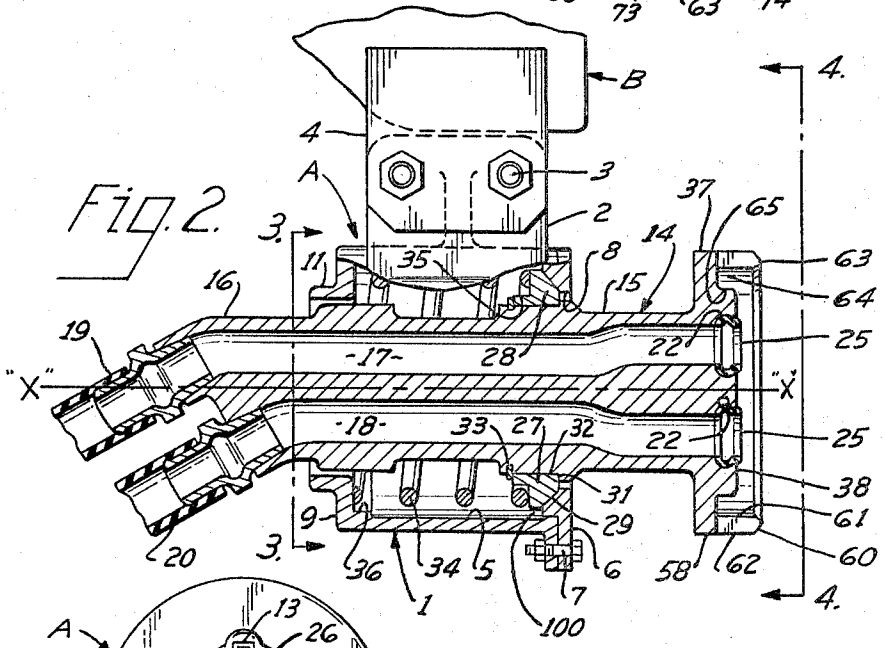


Fig. 2.

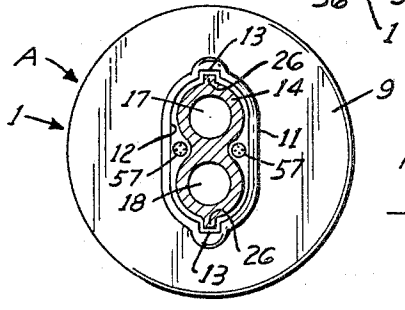


Fig. 3.

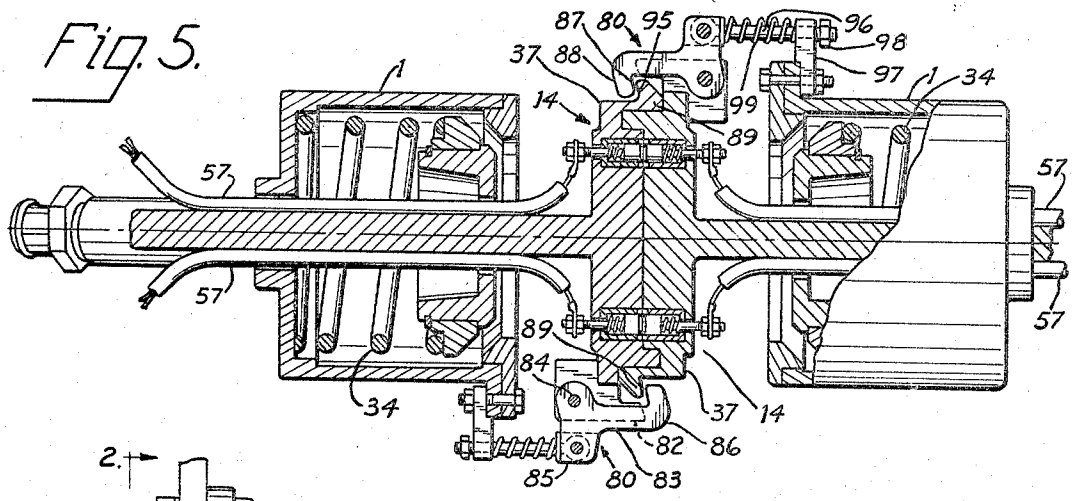
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Fig. 5.



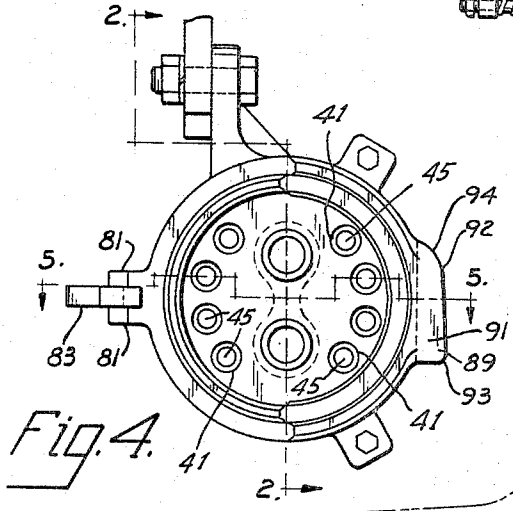
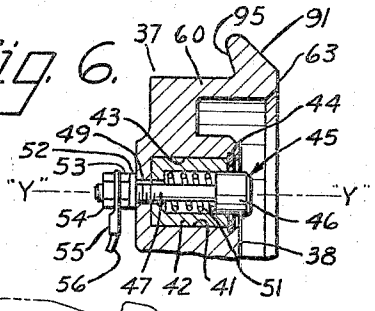


Fig. 4.

Fig. 6.



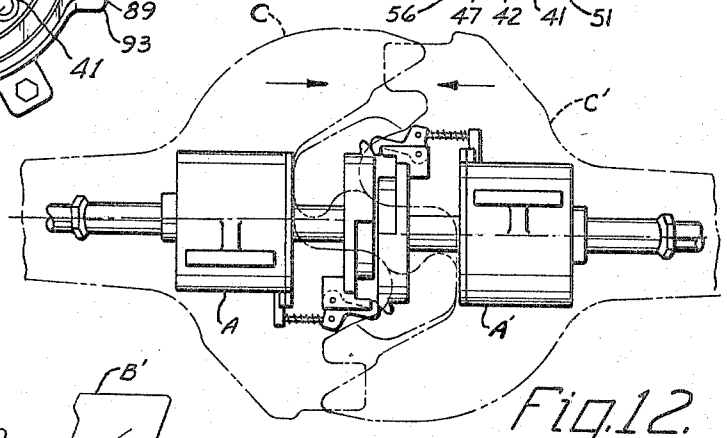


Fig. 12.

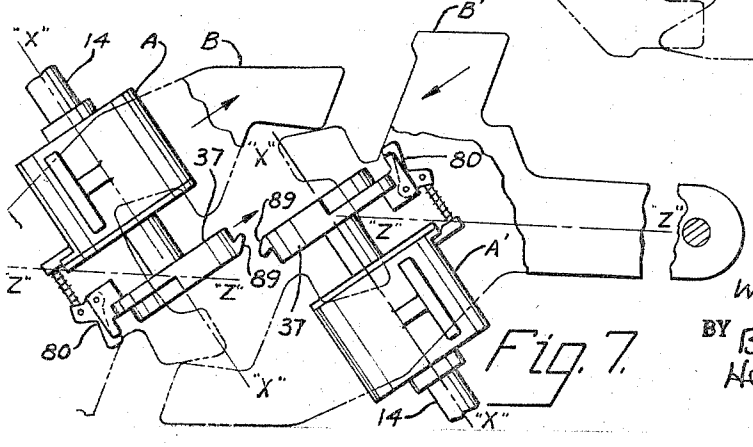


Fig. 7.

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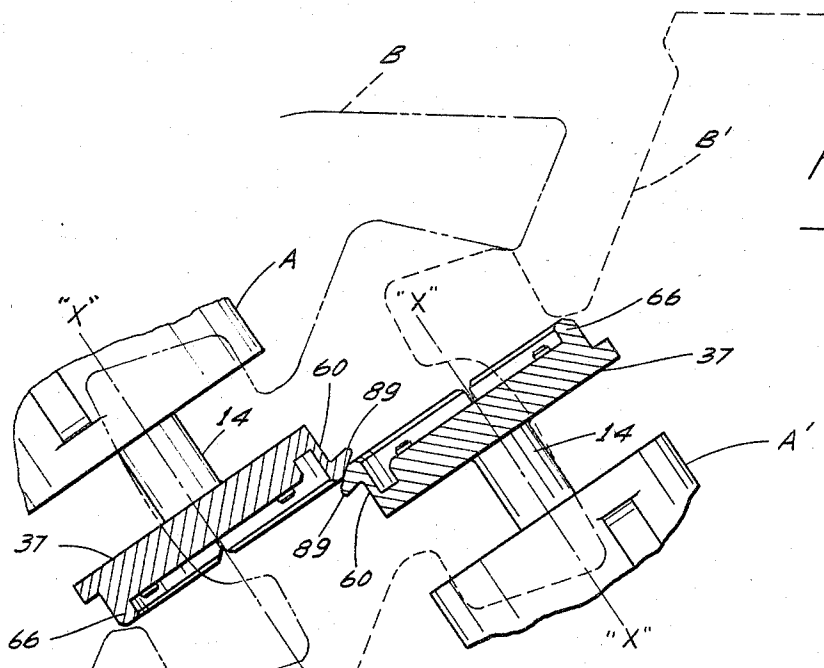


Fig. 8.

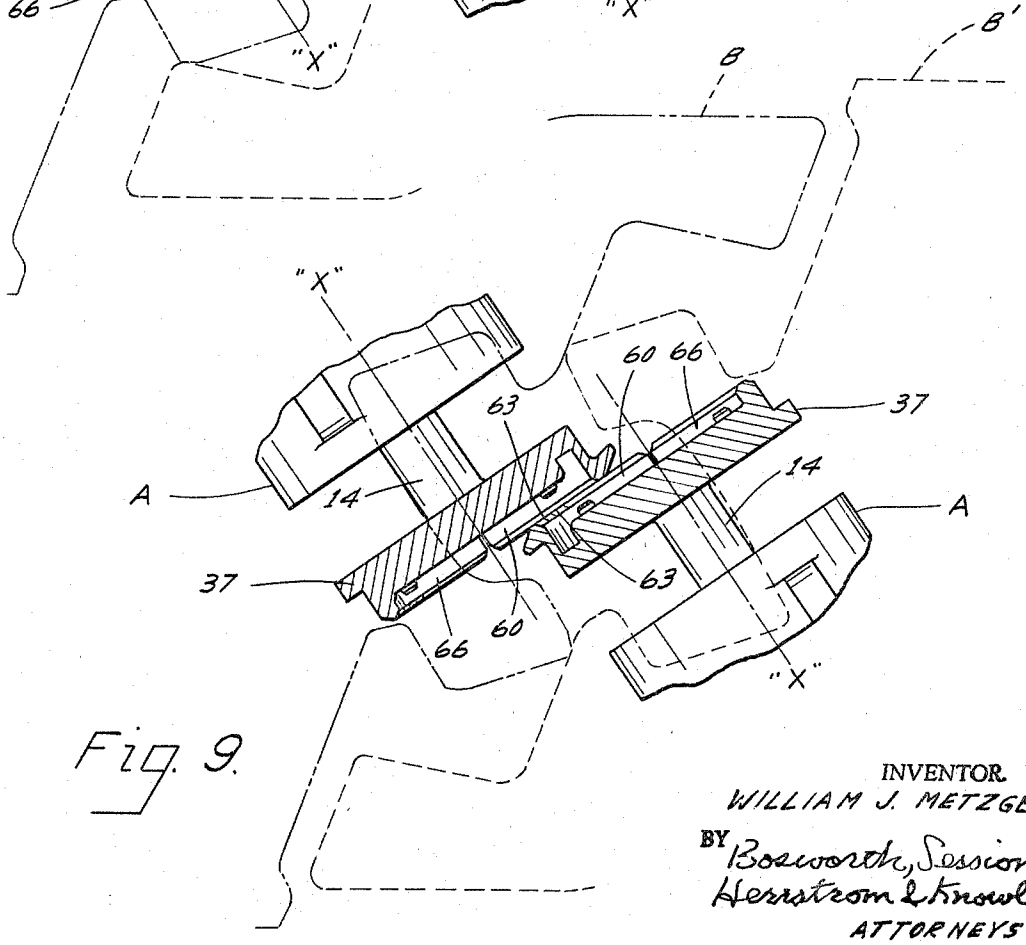


Fig. 9.

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TRAIN LINE SERVICE CONNECTION MEANS

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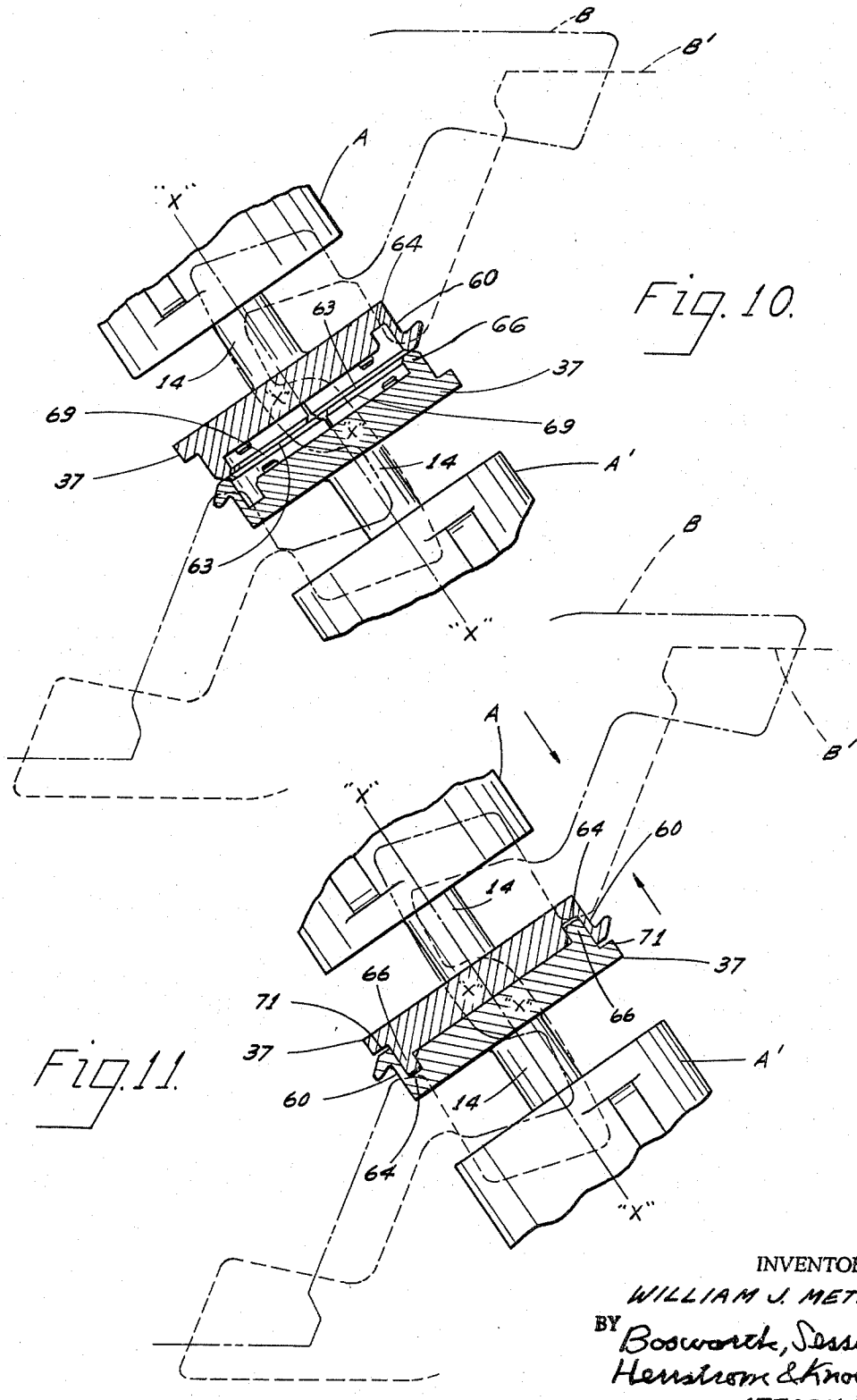


Fig. 10.

Fig. 11.

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TRAIN LINE SERVICE CONNECTION MEANS

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Filed June 30, 1965, Ser. No. 468,316
9 Claims. (Cl. 285—26)

ABSTRACT OF THE DISCLOSURE

A connector adapted to be mounted on a coupler of a railway vehicle and carrying train line terminal means to be connected to train line terminal means of a like confronting connector, which connector has a forwardly-biased movable member having on its front end a forwardly-projecting first rib having an inner generally cylindrical surface and a forwardly-projecting second rib having an outer generally cylindrical surface, the radius of the outer surface of the second rib, being slightly less than the radius of the inner surface of the first rib, the ribs together extending over an arc of essentially 360°, to aid in aligning confronting connecting members of coupling couplers and to protect the terminal means by a shroud formed by the interfitting ribs of the confronting connected connecting members.

This invention relates to means for connecting train lines, such as conducting conduits or electrical circuits, between railway vehicles, and more particularly to connectors that make possible the automatic connection of train lines carried by railway vehicles as the couplers of such vehicles are coupled.

When railway vehicles, such as railway cars, are coupled together, it is often necessary to connect together conduits for fluids such as air or steam under pressure, and electrical circuit means carried by the vehicles, in order to permit the fluid under pressure to be conducted along the train of cars for braking or other purposes, or to permit electrical current to be conducted along the train for lighting, communication or other purposes. It is very desirable that the fluid-conducting conduits and electrical means be automatically connected together on coupling of the cars, and be disconnected on uncoupling, without the necessity of utilizing manual action with its attendant high labor cost and the possibility of hazards to personnel.

However, prior art connectors for automatically connecting fluid conduits and/or electrical circuit means in general are suitable for use only on railway vehicles equipped with so called "tight lock" couplers, such as the AAR (Association of American Railroads) approved type H coupler, that maintain a tight face engagement and prevent appreciable relative movement of the couplers in any direction transverse of the locks due to the pulling axis of the couplers. Such couplers, which are relatively expensive, generally are used only on passenger type equipment. The majority of railway vehicles are freight cars, however, and of these many are equipped with couplers such as the knuckle type AAR alternate standard type F interlocking coupler or the Willison fixed jaw coupler, both of which permit limited longitudinal, lateral, including vertical, and universal angling relative movements during train operation.

The fact that the couplers are capable of such relative movements causes problems in effecting automatic connection, and maintaining connection, of fluid conduits and electrical circuits of adjacent vehicles. If the connectors do not maintain proper connections between the fluid conduits and electrical circuits of adjacent vehicles during such relative movements of the couplers, there will be severe stresses or wear on the connectors, or chafing and breakage of fluid seals and electrical contacts.

The connectors should also form the desired fluid-tight

seals between fluid conduits and form desired electrical contacts between circuit elements of the vehicles being coupled as their couplers automatically couple, even though the couplers may move substantial distances transversely to the pulling axis during their final coupling movements; in doing this, the mating connector parts should not damage projecting fluid-sealing gaskets or electrical connectors, and should readily and accurately align themselves in order to effect the desired seals and the electrical connections. These requirements are quite difficult to satisfy when type F interlocking couplers couple since there is substantial relative lateral movement of the couplers as they engage because of the practical impossibility of perfectly aligning the couplers on separate railway vehicles that approach each other. The problem is considerably more difficult on coupling Willison fixed jaw couplers since, because of their design, they move angularly and laterally toward each other for relatively large distances in their coupling movements.

Since the only feasible location for a connector is below the coupler, it is also important that the connector be compact and located as close to the coupler as is possible, so it will not interfere with hoses or other parts of the railway vehicles and so it will not strike parts of the tracks as the vehicle moves along the track. The coupler should be rugged in construction, require little maintenance, and be capable of manufacture at reasonable cost.

The primary object of this invention is to provide means for automatically effecting satisfactory connections between train lines such as fluid conduits or electrical circuits on cars or other railway vehicles as they are coupled.

A further object is the provision of a connector adapted to be mounted on the coupler of a railway vehicle and carrying train line terminal means, which connector is capable of automatically effecting satisfactory connection between such train line terminal means and terminal means on a connector caught by the coupler of another vehicle without damaging terminal means such as projecting gaskets, electrical connectors or the like even though the couplers on which the connectors are mounted make substantial lateral movements as they automatically couple.

Another object is to provide such connectors that maintain fluid-tight seals and good electrically-conductive contacts without relative movement of the connected parts of connected connectors, even though there are appreciable lateral, longitudinal and angling movements of the coupled couplers as the vehicles travel.

A further object is the provision of such connectors that are compact and can be attached to existing couplers with little difficulty and little modification of the couplers.

Anther object is the provision of connectors of these types which can be manufactured from cast metal with a minimum of machining, at reasonable costs, and which are durable.

These and other objects will become apparent from the following description in connection with the drawings in which:

FIGURE 1 is a perspective view of a preferred form of connector embodying the invention;

FIGURE 2 is a longitudinal sectional elevation of the connector of FIGURE 1 to a reduced scale along line 2—2 of FIGURE 4, this connector being shown as rigidly fixed to and below a coupler but unconnected to another connector, so its movable member is in its extreme extended position;

FIGURE 3 is a section along line 3—3 of FIGURE 2;

FIGURE 4 is an end elevation from line 4—4 of FIGURE 2;

FIGURE 5 is a sectional elevation showing two identical connectors like that of FIGURES 1 to 4, connected with their movable members partially retracted and

aligned to form sealed joints between fluid conduits and electrical contacts between electrical circuit means, the section along each connector corresponding to line 5—5 of FIGURE 4;

FIGURE 6 is an enlarged sectional elevation of an electrical contact;

FIGURES 7 to 11, inclusive, show the positions assumed by the end portions of two opposing connectors embodying the invention during coupling movements of a Willison type coupler, the couplers being shown in broken lines and the clamping means on the connectors being omitted for the sake of clearness; and

FIGURE 12 is a plan showing two connectors of the invention mounted on two type F couplers shown in broken lines in their final coupling movements, as the connectors are about to become aligned and connected together as in FIGURE 5.

In FIGURES 1 to 11, inclusive, a connector A embodying the invention is rigidly mounted on a coupler B, which is a Willison fixed jaw type of coupler with which the connector provides exceptional advantages. The connector A comprises a housing, generally indicated by numeral 1, that is of generally circular cross section. The housing is fixed to a bracket 2 rigidly connected by bolts 3 to a downwardly-extending bracket 4 fixed to coupler B. Housing 1 has an interior cavity 5 of generally circular cross section. At its front end, which extends in the same direction as the coupling end of coupler B, the housing has a removable front wall 6 that is removably and demountably held in place by bolts 7. Wall member 6 has therethrough a circular opening 8 symmetrical about an axis coaxial with the interior cavity 5 of the housing. At its rear end, housing 1 has an integral wall 9 carrying an outwardly-extending boss 11. An oblong opening 12 (FIGURE 3) symmertical about an axis coaxial with opening 8 of the front wall, extends through rear wall 9 and its boss 11; opening 12 has in its end two oppositely-disposed, longitudinally-extending keyways 13.

A movable conduit member, generally designated by reference numeral 14, has a front portion 15 extending forwardly out of a circular opening 8 of front wall 6 of housing 1. Member 14 also has a rear portion 16 extending rearwardly out of the housing through opening 12. Member 14 also has two passages or conduits 17 and 18 that extend through the member and have open rear ends that communicate with the interiors of flexible hoses 19 and 20 fixed conventionally to the rear of member 14. These hoses are connected to sources of air or steam under pressure, as required.

At the front end of member 14 each passage 17, 18 terminates in a circular front opening 22. Each opening 22 is shaped to permit a sealing gasket 25, of resilient material such as rubber, to be snapped into the opening 22 and to be firmly but removably held in place in the opening.

As shown in FIGURE 3, the rear portion 16 of conduit member 14 is of oblong cross-section that fits loosely in rear opening 12 of housing 1 and has two oppositely exteriorly-projecting, longitudinally-extending ridges 26 that fit loosely in keyways of opening 12 to act as keys preventing rotaiton or binding of member 14 in the rear wall of housing 1. The rear portion 16 thus is capable of substantial but limited transverse movement in all directions.

Near its front portion, but within housing 1, member 14 rigidly carries a radially-extending circular collar 27 having a forwardly-facing frusto-conical surface 28, the axis X—X of which is concentric with the axis of the oblong cross sectioned rear portion 16 of member 14. This frusto-conical surface 28 can seat against a mating frusto-conical surface 29 on the inside of front wall 6 of housing 1 when member 14 is in its extreme froward position. The illustrated collar 27 is separately formed and suitably fixed on member 14 between a shoulder 31 formed on circular radial portion 32 of member 14 and retaining ring 33 snapped into portion 32. Member 14 is biased toward its extreme forward position in which its collar 27 seats against the front wall 6 of the housing 1 by a compression type spring 34 of suitable strength that surrounds member 14 within cavity and bears against the housing rear wall 9 and against the collar 27. Shoulder 35 on collar 27 and shoulder 36 on the rear wall locate the spring transversely. When movable member 14 is retracted so its collar surface 28 is free of surface 29 of the housing, the front portion 15 of member 14 can move in all transverse directions by amounts limited by contact of collar 27 with the cylindrical wall of cavity 5.

The front end portion 15 of member 14 includes a radially-extending flange portion 37. This flange portion has a front face 38 that is normal to axis X—X. Each resilient gasket 25 projects a substantial distance from this front face 38 as shown in FIGURES 1 and 2, so it can seal tightly with a projecting corresponding gasket of an opposing connector. As is apparent from FIGURES 1, 4, 5 and 6, flange portion 37 also has several recesses 41 extending inwardly from its face 38; in the illustrated connector there are eight such recesses 41, four being spaced along a circular arc at each side of the central openings 22 of the front of the member 14, both arcs being symmetrical about axis X—X. Each of these recesses contains an insulating liner 42, preferably formed of molded phenolic resin material, that has therein a recess 43 circular about an axis Y—Y extending parallel to axis X—X of member 14. Each liner 42 is locked by retaining ring 44 snapped into a groove near the front of recess 41.

Each liner 42 carries an electrical contact member 45 which, as shown, comprises a cylindrical head 46 fixed to a rearwardly-extending shaft 47. Head 46 is slidably mounted in the recess 43 of liner 42, while shaft 47 is slidably mounted in the rear of liner 42 and extends through a clearance opening 49 in the rear of portion 37. A compression spring 51 is located around shaft 47 between head 46 of member 45 and the rear of recess 43 resiliently to bias the electrical contact member forwardly so it protrudes substantially beyond the face 38 of flange portion 37 to make good electrical contact with a corresponding contact member of an opposing connector. The protruding front surface is flat for good electrical contact but has beveled or rounded edges to prevent binding of member 45 or its mating member in recess 43. Forward travel of contact member 45 is limited by insulating washer 52 that bears against the rear of flange portion 37 and is located on shaft 47 by nuts 53 and 54 that clamp a terminal 55 of an insulated conductor 56 forming part of the circuit means to be connected by the connector. As shown in FIGURE 5, these conductors are assembled in cables 57 that are supported at recessed central portions of the sides of member 14 and extend out of the rear opening 12 of housing 1.

The flange portion 37 has an outer periphery 58 that is generally circular about the axis X—X of member 14. Over an arc of slightly less than 180°, the flange portion has a forwardly-projecting generally cylindrical first rib 60 that has inner and outer surfaces 61 and 62 (FIGURE 1) preferably forming parts of cylindrical surfaces, and that also has tapered forward edge 63. Immediately adjacent the inner surface 61 of the rib is a groove 64 that is defined by the inner surface 61 of the rib 60 and a shoulder 65 bonding the central circular front face 38 of the flange portion.

In its remaining 180°, the flange portion 37 has a forwardly-projecting generally cylindrical second rib 66 that extends over an arc of slightly less than 180°, having exterior surface 67 and interior surface 68 that are portions of cylindrical surfaces. The diameter of outer surface 67 of rib 66 is slightly less than the diameter of the inner surface 61 of rib 60, and the diameter of inner surface 68 of rib 66 is slightly larger than the diameter of shoulder 65 defining groove 64. The forward edge 69 of second rib 66 is also tapered as shown and lies

essentially in a plane normal to axis X—X defined by the front edge of the first rib **60**. There is also an external shoulder **71** at the base of second rib **66**, which in the illustrated embodiment lies essentially in the same plane normal to axis X—X as does the bottom **72** of groove **64**.

The first rib **60** terminates in end surfaces **73** and the second rib **66** terminates in surfaces **74**. Surfaces **73** of the first rib lie slightly to one side of and are parallel to an essentially vertical plane passing through axis X—X of member **14**, while surfaces **74** of the second rib lie slightly to the other side of and are parallel to the same plane. The outer edge portions of the end surfaces **73** and **74** are respectively tapered at **75** and **76**.

Because of the above described arrangement and proportions of the ribs **60** and **66** and the groove **64**, the thus ribbed and grooved flange portion **37** of movable element **14** of one connector can engage and interfit closely but readily with flange portion **37** of an oppositely extending connector of an opposing coupled coupler, with the outer surface **67** of each second rib **66** closely adjacent the inner surface **61** of first rib **60** and with front edge **69** of each rib fitting in groove **64** of the other flange portion **37**. The ribs **60** of both flange members also interfit with each other at their end surfaces **73**, and with shoulders **71**, to form in effect a shroud that extends essentially completely around and encloses the parts within such ribs. The corresponding gaskets **25** of both connectors are held in sealing engagement so they prevent escape of fluid between the gaskets, and the movable members **45** of corresponding electrical connectors are pressed into electrical contact by their springs **51** to connect the corresponding circuit cables **57** of one connector to those of the other.

Preferably, as shown in FIGURES 1 and 5, the movable member **14** of each connector carries clamping means **80** that engages the flange portion **37** of the other connector to clamp the flange portions **37** together so long as the car couplers are engaged and the members **14** are partially retracted and urged in contact with each other by their partially compressed springs **34**.

Each clamping means **80** comprises a pair of spaced lugs **81** fixed to the outer periphery of the flange portion **37** and having inwardly-tapered, forwardly-projecting guide portions **82**. A bell-crank shaped hook member **83** is pivotally mounted near its rear end on a stud **84** in lugs **81**; member **83** has an outwardly-projecting arm **85** and a forwardly-projecting hook portion **86**. This hook portion has an inner engaging surface **87** that is tapered inwardly, as shown, and an outer surface **88** that is also curved inwardly. Hook portion **86** is adapted to engage a generally radially-projecting lug **89** on the flange portion **37** of an opposed connector. Each flange portion **37** of the two opposing connectors has a hook member and an engaging lug **89** on its opposite sides, so that when opposing flange members are aligned the hook member of one flange member will engage the lug **89** of the other flange member.

Each lug **89** of the illustrated connector is shaped as shown in FIGURES 1, 4 and 6 to have a front surface **91** that sweeps rearwardly at a substantial angle (FIGURE 6) from the forwrd edge **63** of first rib **60** and terminates in an essentially straight outermost edge **92** that preferably is normal to a line that is normal to the axis X—X but inclined slightly to another line normal to axis X—X and passing through the longitudinal axis of hook member **83**. This front surface **91** of lug **89** is also inclined slightly rearwardly from its outermost projecting corner **93** to its curved other end **94**, as shown in FIGURE 4. Such a shape of the front surface **91** and its edge **92** are advantageous since, as will be later apparent, the lugs **89** of flange portions **37** of the opposing connector first contact each other upon coupling of Willison type couplers and facilitate alignment and final interfitting of such flange portions.

The rear surface **95** of each lug **89** is also inclined from its outermost edge **92** inwardly toward the front of the flange portion, as shown in FIGURE 6, to provide firm hooking engagement with the correspondingly inclined surface **87** of the hook member **83** on the opposing connector.

Outwardly-projecting arm **85** of hook member **83** is pivotally connected to a linking rod **96** that extends slidably through a lug **97** fixed to the housing **1** of the connector. A nut **98** on the outer end of rod **96** prevents it from pulling through the lug and adjustably determines the effective length of rod between lug **97** and arm **85** of the hook member **83**. A compression type spring **99** between lug **97** and arm **83** biases hook member **83** so its hook portion **86** is normally urged inwardly toward the axis X—X. The two hook members **83** of engaging opposing connectors can thus clamp the flange portions **37** firmly together in interfitting relation, as shown in FIGURE 5, so long as the couplers are coupled, and the movable members **14** of the connectors are partially retracted in their housings **1**, and the lugs **97** cannot pull the rods **96**.

When the couplers disengage, and each movable member **14** moves forwardly in its housing **1**, the distance between the flange portion **37** and the front portion of its housing increases. Since the effective length of rod **96** linking the housing to the arm **85** of hook member does not increase, the rod causes the hook member **83** to swing outwardly about its pivot stud **84** to disengage its hook portion **86** from the lug **89** of the flange portion **37** of the opposing connector member; this unlocks the two flange portions **37** and permits them to disengage. It is thus apparent that when the flange portions of two opposing connectors contact and interfit, they are clamped together by the hook members so long as the members **14** are sufficiently retracted in their housings; but that forward movement of the movable members **14** of the connectors in their housings as the couplers uncouple the hook members from the flange portions and permit them to separate. The length of each rod **96** effective to facilitate such operation can be readily determined.

The advantages of the above structure during coupling of Willison type couplers will be apparent from FIGURES 7 to 12, inclusive.

FIGURE 7 diagrammatically shows, in broken lines, a plan view of two Willison type couplers B and B′ at the beginning of their coupling movement. Each of these couplers rigidly carries below it a connector like that described above respectively identified as A and A′, so that the axis X—X of the movable member **14** of each connector is disposed angularly to the axis Z—Z of the coupler. The axes X—X of both connectors lie essentially in the same generally horizontal plane that is essentially parallel to the axes of the couplers and to the pulling axis of the couplers when they are coupled and under tension, with which pulling axis the axes Z—Z of the couplers are then essentially coincident.

The connectors are mounted so that the axis X—X of each movable member **14** of each connector extends substantially at right angles to the initial coupling movement of the couplers, shown by the arrows in FIGURE 7, and substantially parallel to the final coupling movement of the couplers as shown by the arrows in FIGURE 11. Each connector is thus angularly disposed relative to the axis of the coupler to facilitate automatic engagement and interfitting of the connector parts despite the substantial lateral movements characteristic of Willison couplers on coupling.

As is apparent from FIGURES 7 to 12, inclusive, the movable members **14** of the connectors A and A′ are fully extended by their springs **34** before the couplers B and B′ initially engage. As the couplers further move laterally while engaging, as shown in FIGURE 8, the lugs **89** at the sides of the flange portions **37** of the movable members of the connectors are the first portions of the connectors that contact. As previously indicated, the front

surfaces 91 of these lugs are adapted to facilitate sliding of these surfaces over each other and to facilitate engagement of the outer ribs 60 of flange portions 37, as shown in FIGURE 9; the movable members 14 move axially of their housings as required to facilitate this.

Further lateral movement of couplers B and B' causes the forward edge 63 of the rib 60 of each of the connectors to slide transversely across the edge 69 of the inner rib 66 of the other connector, as shown in FIGURE 10. The axes X—X of both connectors are then only slightly offset.

Continued lateral coupling movement of the two couplers aligns the second rib 66 of each connector with the groove 64 of the other connector so that the rib can slide into such groove, while the first rib 60 of each connector fits outside rib 66 and close to shoulder 71 of the other connector, as shown in FIGURE 11. The front faces 38 of the connectors then can abut. The electrical connections are made, and corresponding gaskets 25 form the desired seals between the conduits 17 and 18 of the two connectors, as shown in FIGURE 5. The axes X—X of both connectors then are coincident.

It is apparent that in the lateral coupling movements, in which the opposing flange portions of the connectors move laterally, the projecting portions 46 of the electrical contacts and the projecting gaskets 25 of both connectors A and A' are kept entirely separate from each other, and cannot engage until the ribs of the flange portions of the connectors are aligned and engage, as shown in FIGURES 5 and 11; the final movements of the flange portions are essentially axial along the axes X—X of each member 14 so that there is no lateral wiping or scraping which can damage either the electrical connectors or the projecting gaskets.

Furthermore, it is apparent that the fitting of each inner rib 66 of one connector in the groove 64 of the other connector, fitting of each outer rib outside a rib 66 and near a shoulder 71, as well as the interfitting of ribs 60 together and ribs 66 together, prevents lateral movement of the flange portions 37 which could disrupt the fluid seals or electrical contacts. The tortuous joints provided by the interfitting parts protect the gaskets and electrical connectors from ingress of dirt or moisture. Such protection also increases the efficiency of the seals and electrical contacts, particularly the latter, since moisture could cause current leakages.

It is further apparent that the movable members 14 and the flange portions 37 thereof of opposing connectors can be made identical so that there is no need to manufacture and stock different kinds of connectors.

It is apparent that connectors embodying the invention may also be used on other types of couplers, such as the AAR alternate type standard F interlocking coupler identified as C and C' in FIGURE 12. In such case, however, it is desirable that each of the connectors A and A' be mounted with its axis X—X parallel to the axis of the coupler below which the coupler is mounted, since the motions of such couplers on coupling are essentially along their axes. The connectors of the invention provide similar advantages with these couplers as they do when employed on Willison type couplers, although lateral movements of these couplers are considerably less during coupling, as shown in FIGURE 12. The sealing gaskets and any contact electrical parts are similarly protected from damage from scraping or wiping during connecting, since during the final movements of the couplers and connectors the gaskets and electrical contact parts are not brought together except when the axes X—X of the two connectors are essentially coincident. Moreover, the gaskets and contacts are shielded from dirt, dust and moisture after the connection is effected, as in the previous embodiment.

In the illustrated connector, when the member 14 is in its retracted position, its lateral movements relative to the housing 1 are limited because the diameter of the cavity 5 of housing 1 is so related to the diameter of the peripheral surface of the collar 27 of member 14 that a clearance 100 is provided which is of uniform magnitude when member 14 is in its extreme forward position in which it is centered with respect to the housing, and which when member 14 is retracted permits lateral movement of member 14 relative to its housing 1 sufficient to compensate for movement of the coupled couplers without contact of collar 27 with housing 1, which contact could cause destructive action in the connector. The diameters of cavity 5 and collar 27 are selected, however, so as to impose limitations on lateral movements of the retracted movable members 14 of opposed connectors relative to their housings 1, during lateral movements of the flange portions relative to each other on coupling, so as to facilitate final alignment and interfitting of the flange portions.

While connectors embodying the invention may be employed on other types of couplers than those indicated, they provide particular advantages when employed in connection with couplers that have substantial longitudinal, lateral and angling movements when coupled, and have substantial lateral movements during coupling, because of the features described above that permit the flange portions 37 of movable members 14 to engage and to slide laterally relatively to each other without scraping or otherwise engaging any projecting parts such as gasket seals or electrical connector parts. After members 14 are aligned, they are urged axially into engagement as described above but each is pushed backward relative to its housing to a position where it can properly adjust laterally relatively to the other member 14. The member 14 is also laterally, as well as longitudinally, movable in its housing during operation of the train and hence can accommodate itself to the relative movement of the couplers, whether these motions be longitudinal, lateral or angling, to maintain sealing engagement of gaskets and good electrical contacts.

It is apparent that the construction of the illustrated connectors is such that the parts can be readily assembled together, readily mounted on a coupler and readily disassembled for inspection, cleaning or repair, if required.

The compact design of the connector minimizes possibility of the connector striking or being struck by parts of cars or the track system. The fact that the gaskets and electrical parts are shielded by the connectors even while the connectors are disconnected also protects them from parts of the cars or track system.

The illustrated connectors are of such strong construction that they will withstand the shocks and impacts of connecting and disconnecting during coupling and uncoupling as well as shocks and wear incident to over-the-rail service.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty reside in the invention. The terms and expressions which have been employed are used as terms of description and not of limitation and there is no intention of excluding such equivalents of the invention described or of portions thereof as fall within the purview of the claims.

I claim:

1. In combination, two confronting railway vehicle couplers adapted to be coupled along a first axis during pulling, means mounting said couplers for movement laterally of said axis during coupling, a train line connector on each coupler adapted to form with a confronting cooperating train line connector on the coupled cooperating coupler a connection for a train line, each of said connectors comprising a hollow housing having a second axis, means within said housing mounting a connecting member movable essentially along said second axis and carrying on the front portion thereof train line terminal means for connection with similar means on the front portion of the connecting member of the confront-

ing cooperating coupler, means for mounting each housing on the coupler on which it is mounted so that said second axis is disposed at an acute angle to the said first axis, resilient means within said housing biasing said connecting member essentially along said second axis toward the front end of said coupler on which it is mounted, said mounting means being so constructed and arranged that said connecting member is essentially limited to longitudinal movement along said second axis but partaking of all movement of its supporting coupler, and engaging means on the front portion of each of said connecting members adapted to engage mating identical half engaging means on the front portion of the connecting member of the confronting cooperating connector comprising diametrically opposite axially forwardly projecting first and second ribs each having an inner and outer surface, each rib extending over an arc of substantially 180°, said first rib having the radius of its inner surface substantially equal to the radius of the outer surface of said second rib, the forward edges of both ribs lying essentially in the same plane, said plane being located forwardly of said trainline terminal means, said ribs together extending over an arc of substantially 360°, guide means on each of said first ribs having a front surface sloping forwardly toward said second axis, the terminal ends of said ribs forming axially directed shoulders located on substantially the same diameter, said ribs on confronting connecting members being supported and arranged relative to each other so that during lateral engaging movements of said connectors during lateral coupling movements of said couplers the forward edges of said first ribs are in axial overlying relation, said guide means then engage at their forward surfaces to bring the forward edges of said first ribs into engagement, and said forward edges of said ribs of confronting connecting members slide laterally and protect said terminal means on said connecting members until said connecting members are in substantial alignment, after which the first rib of each connecting member moves axially outside of the second rib of the other connecting member so said ribs telescopingly engage and remain in interfitting relation and said terminal means are engaged and held in connected relation under the forces exerted by said biasing means of said connectors so long as said couplers remain coupled.

2. The combination of claim 1 in which in each engaging means the axially directed shoulders at the terminal ends of said ribs are substantially located in a plane that is substantially perpendicular to a plane in which the coupler on which the connector embodying said engaging means is mounted moves laterally during coupling.

3. The combination of claim 1 in which in each engaging means said inner surface of said first rib is of generally cylindrical configuration and in which said outer surface of said second rib is of generally cylindrical configuration.

4. The combination of claim 1 in which said interfitting ribs of said confronting engaged connectors define a shroud essentially surrounding said trainline terminal means.

5. The combination of claim 1 in which in each engaging means there is adjacent the inner side of said first rib a groove of at least the width and length of said second rib.

6. The combination of claim 1 comprising on at least one connecting member means carried by said connecting member for locking said connecting member to the confronting aligned interfitting connecting member

7. The combination of claim 1 comprising on at least one connecting member locking means mounted at the side of said connecting member opposite the side on which said guiding means is located.

8. The combination of claim 1 comprising means carried by at least one of said connecting members acting when said connecting member is in a retracted position relative to said coupler on which it is mounted to lock said connecting member to the aligned interfitted connecting member of the confronting connector and acting when said connecting member moves forwardly relative to its coupler to unlock said connecting members.

9. The combination of claim 8 in which said locking means is mounted on its associated connecting member at the side of said connecting member opposite the side in which said guiding means is disposed, and which combination comprises means associated with the guiding means on the confronting connecting member and constructed and arranged so that it can be engaged by said locking means when said connecting members are interfitted.

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