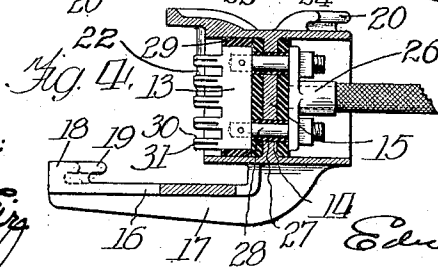
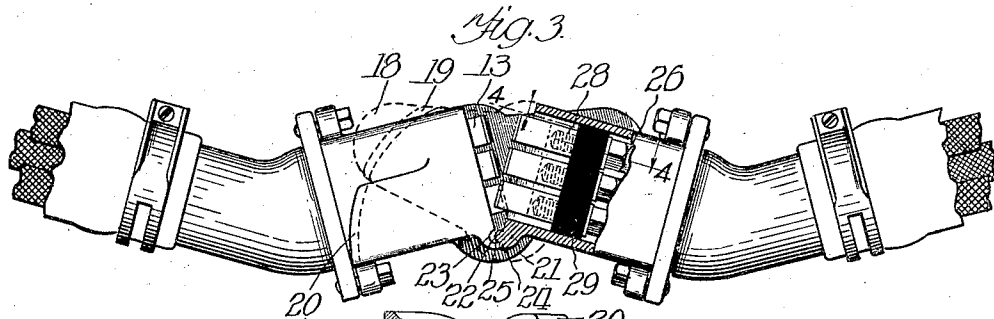
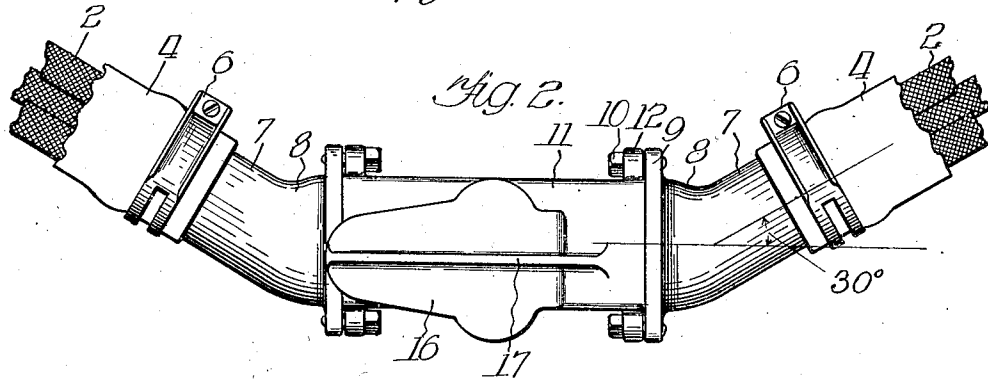
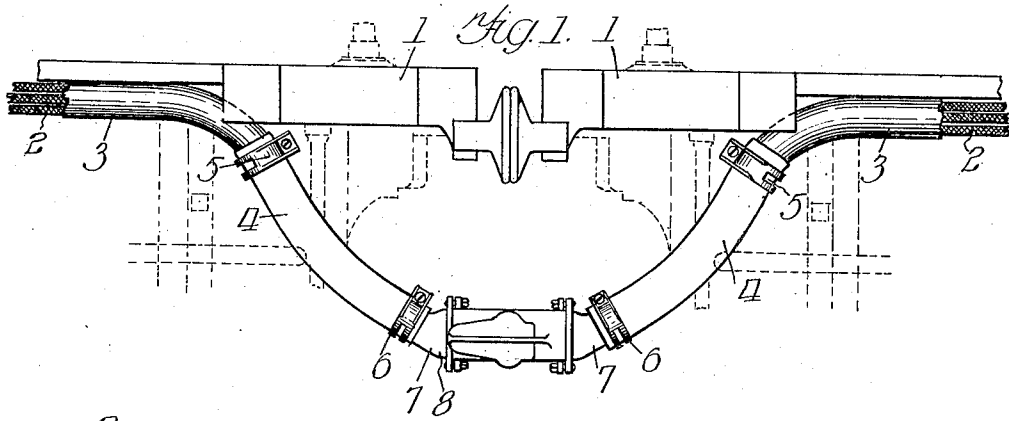


W. L. BLISS.
 COUPLING FOR ELECTRICAL CONDUCTORS.
 APPLICATION FILED JAN. 6, 1911.

1,123,074.

Patented Dec. 29, 1914.



WITNESSES:

Robert A. Weir
W. L. Bliss

INVENTOR

William L. Bliss

BY

Edwin B. Lawrence

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM L. BLISS, OF NIAGARA FALLS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CENTRAL TRUST COMPANY OF NEW YORK, A CORPORATION OF NEW YORK, TRUSTEE.

COUPLING FOR ELECTRICAL CONDUCTORS.

1,123,074.

Specification of Letters Patent.

Patented Dec. 29, 1914.

Application filed January 6, 1911. Serial No. 601,085.

To all whom it may concern:

Be it known that I, WILLIAM L. BLISS, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented new and useful Improvements in Couplers for Electrical Conductors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to a coupler for electrical conductors.

It has for its object to provide an electrical coupling which, when closed, maintains an efficient electrical connection between the conducting parts; which is capable of universal attachment without danger of misconnecting the various leads; which is firmly locked until it is desirable or necessary to open the same; which is capable of being opened readily, quickly and without injurious sparking and which, when an excessive pull is applied to the conductors connected by it, is capable of being quickly and automatically unlocked to disconnect the conductors both mechanically and electrically.

In the accompanying drawings I have shown one embodiment of my invention. The views are as follows:—

Figure 1 shows a side elevation of my improved coupler connections as they appear when secured to the car bodies. Fig. 2 shows a larger side elevation of the coupler and connecting hose. Fig. 3 shows an elevation, partly in section, of my improved coupler in its opening position, so that the contacts are visible. Fig. 4 is a sectional view on line 4—4 of Fig. 3, showing one of the series of contacts on one of the coupler members and the mechanical locking parts.

For convenience of description, since the two cooperating coupler members and their connections are alike, we may refer to the parts of one by the same reference numerals as the parts of the other.

Suitably connected to the car bodies at a point beneath the platform 1, are the conductors 2, inclosed in suitable casings 3. Inclosing the conductors near their ends are flexible hose 4 which may be of rubber or any other suitable material. The upper ends of the hose 4 are preferably clamped to the conductor casings 3 by clamps 5. The lower

ends of the conductors 2 are passed through metal elbows 7 and the hose 4 are clamped to these elbows 7 by means of clamps 6. These elbows 7 are supported by the hose and are so formed as to have the portions inclosed by the hose 4 extend upward at an angle of approximately 30 degrees from the horizontal when the coupling is connected, although I do not limit myself to this angle of construction. The lower portions of these elbows 7 are enlarged as at 8 and when the couplings are connected as shown in Fig. 1, lie in a plane parallel to that of the car bodies. Flanges 9 are formed on these enlarged portions 8 and these flanges are adapted to receive bolts 10. To these flanges 9 are clamped by the bolts 10, coupler casings 11 which preferably carry perforated lugs 12 adapted to receive the bolts 10. These casings are adapted to house electric contact members 13 of the coupling and may be of any desired cross-section. In this embodiment of my invention, I have shown them of a rectangular cross-section and provided with centrally disposed transverse septa 15 having perforations 14 through which the connections with the contact members 13 are passed. Integral with the casings and extending beyond the outer ends of the same, in a plane parallel to one side thereof, are locking arms 16. Each of these arms 16 has, preferably, an integral stiffening or reinforcing rib 17 extending along its outer surface. Each of these reinforcing ribs 17, at its outer end and on the inner surface, has an integral locking projection 18. Each of these locking projections 18 is provided with a slightly eccentric but approximately arc-shaped metal lip 19 adapted to engage with an oppositely located lip 20 integral with the cooperating coupler member and located on the opposite side and near the back of the same. The lips 19 and 20 are adapted to interfit and securely lock the coupler casings when the same are closed, as shown in Fig. 2.

Integral with the coupler casings and extending nearly half way across the bottom of the free end of one of the same, is a lug 21 provided with a projecting curved surface 22, adapted to unite with a correspondingly curved socket 23 formed in a similarly located lug on the cooperating member, so as to form a socket joint which, on the separation of the parts through the raising of

their center portions, is adapted to be broken; the curved surface 22 using the socket 23 as a pivot through the engagement of its shoulder 24 with a shoulder 25 on the socket member, until the locking lips 19 and 20 on the cooperating coupler parts have disengaged, when the parts are able to be separated.

Inclosed within the coupler casings 11 and suitably insulated therefrom, are the terminals 26 of the conductors 2. Suitable means consisting of the septa 15, having perforations 14, suitably insulated as at 27, are provided to receive the connections between the terminals 26 and the contacts 13. In the form of my invention herein illustrated, these contacts 13 are attached to the terminals 26 by studs 28 and are shown to consist of a series of three contact clips of the knife switch type, one above the other, in each coupler member and suitably insulated therefrom as at 29. These contacts 13 are adapted to move successively into contact during the locking of the coupler members and to be successively opened as the outer coupler locking parts are released. By this arrangement of contacts in a vertical plane, I obtain a coupler in which the contacts are always brought into conducting relation in proper sequence, whatever ends of the conductors on the cars are connected, and I avoid the misconnections possible when the contacts are arranged in a horizontal plane and are therefore necessarily open to the objection that the positive and negative leads may be reversed when the car is turned around. It is to be noted that in the form of contact illustrated, as shown in Fig. 4, each of the three series of contacts has five contact clips 30 slotted as at 31 to yieldingly receive the cooperating contact members 13, but it is of course obvious that any desired construction of contacts may be adopted so long as it does not depart from the spirit of the invention.

From the foregoing, it is obvious that in the operation of my improved coupler in the form herein described, whatever ends of the cars are to be connected, the two cooperating coupler members may be joined manually by first placing the same in approximately the position shown in Fig. 3, that is, so that the curved projection 22 enters the socket 23, and then swinging the coupler members to the position shown in Fig. 2. It is obvious that the parts 22, 23 act as a pivot when the members are rotated in passing from the position shown in Fig. 3 to the position shown in Fig. 2; that the contacts 13 successively assume a conducting relation with their cooperating contacts in proper sequence, no matter what ends of the cars are joined, and that the locking lip 19 on each member engages at the same time with the cooperating locking lip 20 on the other. Further, it is

obvious that the manual separation of the parts from the position shown in Fig. 2 to that shown in Fig. 3, is but a reversal of the operation just described. The socket joint 22—23 acts as a pivot for the parts when the center of the coupler is raised, so that the locking lips 19 and 20 disengage and the contacts 13 are successively broken during this movement until, when the locking lip 19 passes beyond its cooperating locking lip 20, only the lower contacts are made. By continuing the movement, the parts may be readily separated. Further, it is obvious that any excessively strong longitudinal pull applied to the conductors would have the effect, on account of the construction of the elbows 7, of forcing the parts to pivot about the socket joint 22—23, as shown in Fig. 3, and thereby unlock the engaging lips to allow the disconnection of the coupler. Such a longitudinal pull would occur, for example, if two cars, connected as described above, were pulled apart.

From the above it is apparent that when the contacts 13 are separated by any means, either manually, or automatically on the separation of the cars, the contacts are broken very quickly since the cooperating members would drop apart rapidly, due to the action of gravity. The break between the contact members is, however, of course quicker when the coupler casings are broken automatically as by the separation of the cars, since in this case there is present not only the usual pull of gravity on the heavy coupler casings, but there is also present a longitudinal pull acting in opposite directions on each member, which would cause the parts to separate almost instantly on the unlocking of the engaging lips on the casings.

I have provided a simple form of electrical coupler in which the parts are so arranged that the coupler may be readily connected or disconnected. Further, it is apparent that the weight of the coupler casings and their adjoining sleeve is sufficient to hold the parts in locked relation as shown in Fig. 2, against any accidental unlocking, as for instance by the swinging of the parts, etc. However, at all times the coupler is capable of being separated quickly and without injurious sparking, either manually by lifting the casings, or automatically by an excessive pull on the conductors.

In the embodiment of my invention herein illustrated, I have shown this coupler as applied to a three-wire system such as is commonly used to supply the lights on cars, but it is of course obvious that I may, if desired, apply it to a system of any other type, and I wish it to be distinctly understood that in this application I wish to cover broadly the adaptation of my improved coupler to any and all forms of connecting devices

which fall within the scope of my invention as defined in the appended claims.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A coupler for electrical conductors comprising cooperating coupling members, said members having a plurality of contacts carried by one coupler member, a corresponding number of cooperating contacts carried by the other member, casings inclosing the contacts of each member, one of said casings being provided with a projection and the other casing being provided with a corresponding socket, said projection and socket serving as a hinge in operating said coupler, and cooperating members on each casing automatically brought into locking engagement by rotation of said members about said hinge and adapted to be disengaged only by rotation of said members in the reverse direction.

2. A coupler comprising a pair of cooperating coupler members including inclosing casings therefor, one of said casings provided with a projection and the other casing provided with a recess forming, with said projection, a hinge whereby the casings may be rotated into engaging position, interlocking projections on said casings adapted to be automatically brought into interlocking engagement by rotation of said cas-

ings about said hinge and adapted to be disengaged solely by rotation of said casings in the reverse direction, flexible hose connected to each casing, and means whereby a longitudinal pull on said hose will cause said casings to be rotated about said hinge in a direction to disengage said coupler.

3. A coupler for electrical conductors comprising a pair of cooperating casings, a detachable hinge connection between said casings, interlocking projections on said casings adapted to be automatically brought into engagement by the rotation of said casings about said hinge and adapted to be disengaged only by rotation of said casings about said hinge in the opposite direction, flexible conductors connected to each casing, and a sleeve projecting at an angle from each casing, to which the ends of said conductors are connected, whereby a longitudinal pull on said flexible conductors will rotate said casing about said hinge in a direction to disengage said interlocking projections.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM L. BLISS.

Witnesses:

LAUREN A. PETTEBONE,
EDW. E. FRANCHOT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."