June 29, 1943. E. A. LARSSON 2,323,060

CAR AND ELECTRIC TRAIN LINE COUPLER

Filed Aug. 25, 1942 2 Sheets-Sheet 1

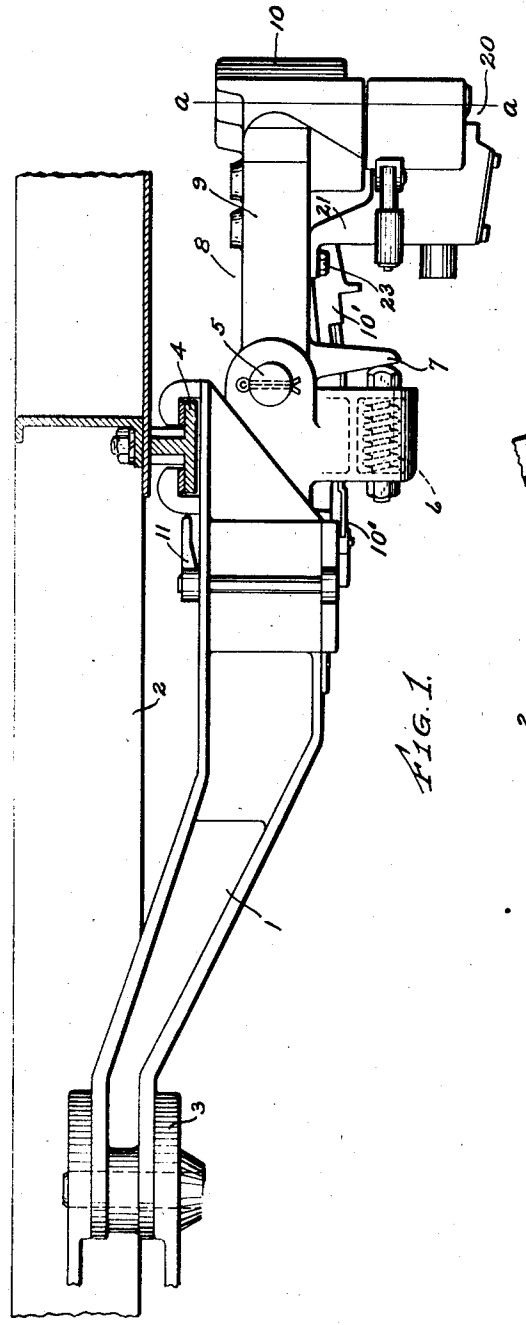


FIG. 1.

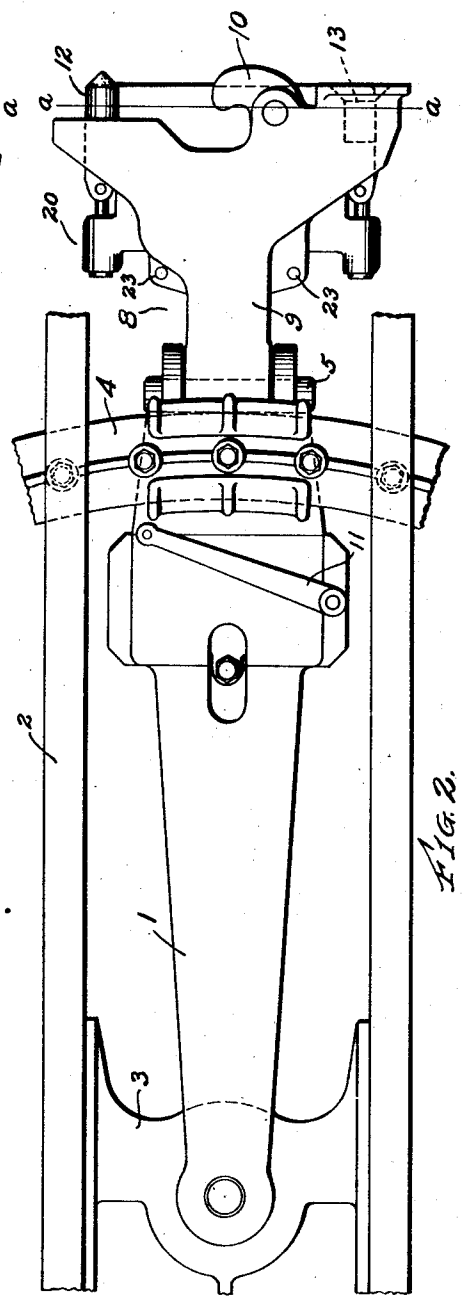


FIG. 2.

Inventor

ERNST A. LARSSON

By

Attorney

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CAR AND ELECTRIC TRAIN LINE COUPLER

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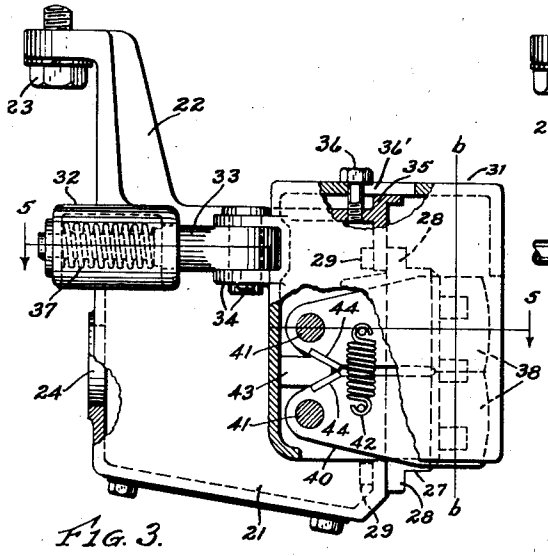


FIG. 3.

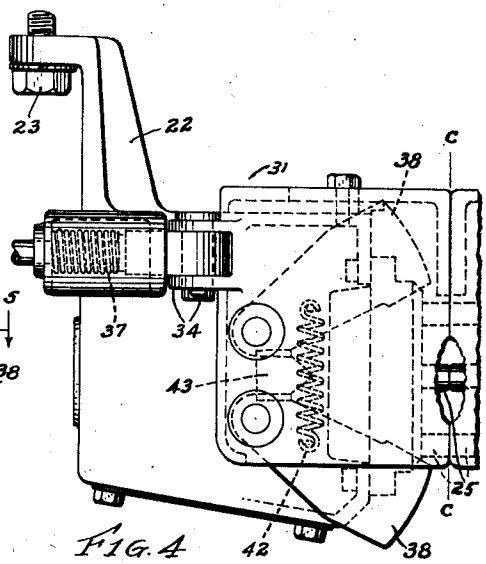


FIG. 4.

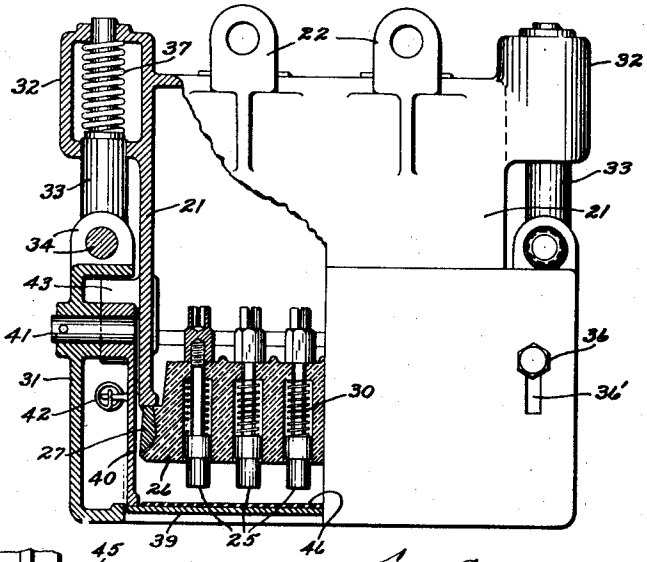


FIG. 5.

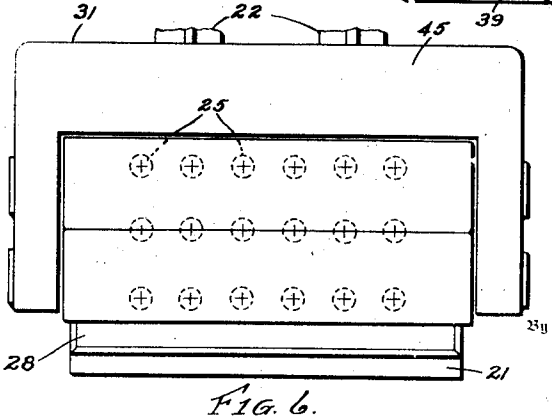


FIG. 6.

Inventor

ERNST A. LARSSON

By

Attorney

Patented June 29, 1943 2,323,060

UNITED STATES PATENT OFFICE

2,323,060

CAR AND ELECTRIC TRAIN LINE COUPLER

Ernst A. Larsson, Mansfield, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio, a corporation of New Jersey

Application August 25, 1942, Serial No. 456,294

9 Claims. (Cl. 173—332)

My invention relates to car and electric train line couplers and more particularly to electric train line couplers.

One object of my invention is to provide an electric coupler in which the coupling is made mechanically upon impact of the couplers. In some types of electric couplers the connection is made by pneumatic operating means which requires more complicated mechanism than in my invention.

Another object of my invention is to provide an electric coupler in which the electric contacts are protected when the couplers are separated. This protects the public from contacting with the contacts and possible injury if the contacts should be alive and also protects the contacts from the elements.

Another object of my invention is to automatically and mechanically uncover the contacts as two couplers move together in making a coupling.

My invention resides in the new and novel construction, combination and relation of the parts herein described and shown in the drawings accompanying the specification.

In the drawings:

Fig. 1 is a side elevation view of my invention as supported by a car.

Fig. 2 is a top plan view of my invention shown in Fig. 1.

Fig. 3 is a side elevation view in partial section of my electric coupler head with the contactors protected.

Fig. 4 is a side view in elevation and partial section of my electric coupler head shown coupled to the front end portion of a companion head.

Fig. 5 is a top plan view of my electric coupler head in partial section taken on the line 5—5 of Fig. 3 and showing the contacts to which train line circuits are attached.

Fig. 6 is a front view of my coupler head with the contacts protected.

My electric coupler head may be used with various types of car coupler heads. I have shown it in combination with a car coupler head of the knuckle type which will permit of tight locking the heads together in order to better maintain the engagement of the electrical contacts and reduce wear, between the heads.

I am not describing in great detail the car coupler head and its component parts and support therefor, as the same are old in the coupler art as disclosed in Tomlinson Patent 1,660,733.

The car coupler as shown comprises a draft gear 1 attached to a car body 2 by the horizontal pivotal anchorage 3. The draft gear is further supported from the car body by the sector bar 4.

The coupler head is attached to the draft gear by the pivotal connection 5 which permits the head to pivot vertically.

The head is yieldingly held in a horizontal position by the spring 6 engaging the tongue 7 on the head.

The head 8 comprises the body 9 and the usual pivotally mounted knuckle 10. The pulling face of the coupler head is along the line *a*—*a* of Fig. 2.

The coupler head is equipped as usual with uncoupling mechanism 10' operated through the medium of the lever 11.

To maintain a pair of coupled heads against relative lateral or vertical movement, I employ cooperating projections 12 and intersections 13.

If desired, the car coupler head may be equipped with air connections as set forth in Larsson 1,663,802.

Mounted below the car coupler head 8 and secured thereto is the electric train line coupler head 20.

The head 20 comprises a box-like member 21 provided with supports 22 which are attached to the coupler head 8 by means of the bolt 23. This member 21 is closed on the sides and on the back except for the opening 24 for cables and is also open on the front to receive the contacts 25.

The contacts 25 may be of any number and of any arrangement to meet requirements and are mounted in a block of moulded insulating material 26. The block 26 is moulded with a metal frame 27 which surrounds the block 26 and is provided with lugs 28 to receive the bolts 29 by means of which the frame 27 and block 26 and contacts 25 are secured to the front face of the member 21.

The member 21 is immovably attached to the car coupler head 8 and the insulating member 26 is immovably attached to the member 21, while the contacts 25 are spring held in their advanced position when uncoupled and movable longitudinally relative to the insulating block 26 and coupler head 8 sufficiently to assure engagement of the cooperating contacts of two coupled heads 20; the springs 30 tend constantly to advance the contacts.

Partially enclosing the front end of the member 21 is the member 31 which has closed sides and top and partially closed front and bottom, the rear face being open and through which the member 21 extends.

The member 31 is mounted on the member 21 to move longitudinally relative thereto when two heads are brought into coupling relation and to return to its uncoupled position when the coupling is broken and it is through such movement the doors which protect the contacts 25 are operated.

The mounting of the member 31 is effected by the spring cases 32 which are integral with the

member 21 and orificed at each end to receive the reciprocating studs 33 which are attached to the members 31 by the tongue and clevis joint and pin 34. To further support the member 31, the member 21 has at each side thereof an upstanding lug or rib 35 upon which the member 31 slidably rests and is held in more stable relation to the member 21 by means of the bolts 36 which extend through slots 36' in the top face of the member 31 but do not bind the parts 21 and 31 together.

The mounting just described permits the member 31 to slide back and forward under coupling and uncoupling conditions respectively and the springs 37 effect such forward movement and the engagement of two cooperating members 31 effect such backward movement which further compresses the spring 37.

When the head is in an uncoupled condition the member 31 is in its forward position and the doors 38 are closed over the contacts 25 and when the member 31 is in its retracted position, the doors are open and a coupling with a cooperating head is effected. The doors each consist of a front panel 39 and rearwardly projecting side arms 40 (Fig. 5). Each arm is pivotally mounted to the side wall of the member 31 by a pin 41. The doors 38 are held in their closed position by a spring 42 secured to each arm 40 at each end of the doors.

It will be understood that the doors move forward and back with the movement of the member 31.

In order to effect a movement of the doors to their open position, a lug or cam member 43 is secured to each end face of the stationary member 21 and projecting into the plane of the side arms 40, which are provided with contact members 44 which in turn engage with the forward obliquely disposed faces of the cam 43.

It will be evident that as the member 31 moves backward relative to the member 21 and carrying the doors 38 with it that the cam 43 will force the doors to their open position shown in dotted lines in Fig. 4 and that such movement of the doors will start immediately with the movement of the member 31 and that the opening will be rapid since the members 44 are positioned close to the pivotal point 41 of the doors.

As previously pointed out when two couplers are brought together, the faces 45 of the members 31 of the cooperating heads will engage and the member 21 will advance towards each other and relative to the member 31 thus forcing the cams 43 against the members 44 of the doors and effect a quick opening of the doors and as the member 21 further advances the contacts of the cooperating heads will engage, and still further advancement of the heads will effect a further compressing of the springs 30 whereby the contacts 25 will be held in firm engagement.

In Figs. 1 and 2 the lines *a*—*a* represent the pulling face of the coupler head 8. In Fig. 3 the equivalent of the plane of this pulling face *a*—*a* is represented by the line *b*—*b* and it will be seen that the contacts 25 project partly forward of this line when the heads are uncoupled. When two heads are coupled the contacts are compressed the amount of the forward projection of the contacts from this line *b*—*b* and the faces of the contacts 25 will coincide with the line *c*—*c* in Fig. 4 which corresponds to the lines *a*—*a* and *b*—*b*.

When the doors 38 are fully open, the contact plates 44 ride flat upon the upper and lower surfaces of the cam 43 as shown in Fig. 4.

The inner face of each door 38 is provided with an insulating lining 46 as assurance that the contacts will not ground through engagement or other causes upon the frame of the coupler.

The engagement of the rear wall of the member 31 with the lug or cam 43 checks the forward movement of the member 31 under action of the spring 37.

The construction of my electric coupler is simple and the operation is positive and dependable. The car coupler will hold the electric couplers of two cars in securely coupled relation.

Having disclosed my invention, what I claim is:

1. An electric car coupler comprising a frame-like member, means to support the member from a car coupler, means on the car coupler to couple with a companion car coupler to hold the electric coupler in coupled relation with a companion electric coupler, a plurality of spring-held contacts mounted on the front end of the frame member, the contacts biased to their forward position, a box-like member substantially enclosing the frame-like member and movable backward and forward relative to the frame-like member, means interposed between the said members whereby the box-like member is supported in said movable relation, the interposed means, including springs for biasing the box-like member to its forward position, the forward end face of the box-like member extends forward of the forward ends of the contacts, a pair of doors hinged to the side walls of the box-like member and having front walls covering the contacts when the box-like member is in its advanced position, cam means on the side face of the frame-like member, contact means on the doors adjacent their points of hinging, the cam means so positioned as to be engaged by the contact means and the doors forced open as the box-like member moves backward under pressure of the box-like member on a companion head when coupling thereby exposing the contacts for engagement by the contacts of a companion coupler.

2. An electric train line coupler for connecting train line circuits comprising a fixed contact carrier provided with movable contacts, means to attach the carrier to a car coupler head, a movable door carrier provided with a pair of doors separately hinged to the door carrier, the doors movable relative to each other only in opposite directions to either cover the contacts when the coupler is in its uncoupled condition or to expose the contacts for engagement with a companion coupler, the door carrier arranged to move forward and back relative to the fixed carrier, a spring to yieldingly hold the door carrier in its forward position and engage with a companion carrier in making a coupling whereby the movable carrier is moved backward and the doors separated to expose the contacts for engagement with those of the companion coupler, and means on the fixed carrier adjacent the points of hinging to cooperate with means on the doors to move the doors to their open position as the movable carrier moves backward.

3. An electric coupler provided with spring held contacts mounted on a fixed carrier and normally advanced with respect to the front end of the carrier, a movable carrier mounted on the fixed carrier, a pair of doors mounted on the movable carrier for simultaneously swinging in opposite directions between a closed position in front of the contacts and an open position exposing the

contacts, the movable carrier projecting forward of the fixed carrier and the doors, a spring biased to move the movable carrier to its advanced position but to retract under pressure from a companion coupler when engaged by the movable carrier of the companion coupler, a cam member on the fixed carrier arranged to cooperate with a cam face on each door to open the doors as the movable carrier moves backward, a spring constantly acting on the doors tending to move them to their closed positions, and means to prevent the closing of the doors while the movable carrier is in its retracted position.

4. An electric coupler having a plurality of contacts normally out of engagement with the contacts on a companion head, but engageable by the contacts on the companion head when the two heads are brought into coupled relation, a fixed carrier upon which the contacts are mounted, a movable carrier mounted on the coupler and movable longitudinal of the coupler, a pair of doors mounted on the movable carrier for movement toward and away from each other in front of the contacts from a closed to an open position and vice versa, means positioned between said carriers and cooperating with means on the said doors whereby the said doors are moved to their open position when the carrier is moved rearwardly during the coupling operation with a companion coupler, a spring interposed between the carriers to yieldably hold the movable carrier in its advanced position, spring means biased to move the said doors toward each other when the movable carrier is in its advanced position and means to hold the coupler in coupled relation with a companion coupler and its contacts in engagement with those on the companion coupler.

5. An electric coupling device for a pair of coupled vehicles, comprising a pair of electric couplers, one coupler associated with each vehicle, means to hold the couplers in coupled relation, each coupler provided with a plurality of movable contacts mounted on a fixed carrier and a movable carrier to substantially enclose the fixed carrier and its contacts and movable to its retracted position through engagement with the movable carrier of the cooperating coupler whereby the contacts of the two couplers engage, a pair of doors pivotally associated with each movable carrier and the doors of each pair movable simultaneously toward and away from each other, each coupler provided with means to cooperate with means on its doors to move the doors away from each other to their open position when the contacts on the two couplers are moved into coupling relation, means to move the doors of each pair toward each other to their closed position when the movable carrier moves to its advanced position and spring means on each coupler to move the movable carrier to its advanced position as the companion coupler moves away from its coupled position.

6. An electric coupler for the train line circuits of a vehicle comprising a coupling head provided with a fixed contact carrier, yieldably held contacts mounted on the fixed carrier, a movable carrier, a pair of normally closed doors movable toward and away from each other and associated with the movable carrier protecting the contacts when the coupler is uncoupled and also arranged to automatically open by the movement of the movable carrier to its retracted position, means biased to hold the movable carrier in its advanced position and means biased to hold each door in its closed position when the coupler head is in its uncoupled position.

7. An electric coupler for train line circuits comprising, a fixed carrier, yielding contacts associated with the fixed carrier, a longitudinally movable carrier mounted on the fixed carrier and projecting ahead of the contacts, spring means constantly urging the movable carrier forward, a pair of doors movable toward and away from each other mounted on the movable carrier and extending over the front face of the contacts when the doors are in their closed position, means constantly urging each door to its closed position, the doors arranged to move to their open positions when moved away from each other and to move to their closed positions when moved toward each other, means attached to the fixed carrier and projecting between the doors to engage both doors and cause them to move away from each other to open when the movable carrier is retracted.

8. An electric coupling device comprising a fixed carrier, a car coupler, means to secure the fixed carrier to the car coupler beneath the same, a plurality of movable contacts mounted on the fixed carrier with their exposed portions projecting partly ahead of the vertical plane of the pulling face of the car coupler and retractable to a point where the face of the contacts coincide with said plane, a movable carrier mounted for longitudinal movement on the fixed carrier and projecting ahead of the contacts and the said plane, spring means constantly urging the movable carrier forward to a position engageable by the movable carrier on a companion coupler to retract the movable carrier to a point where the face of the contacts will be retracted by the contacts on a companion coupler into a position coinciding with the said vertical plane of the coupler pulling face, doors biased to their closed position extending in front of the contacts to protect the same and enclosed means engageable by the doors as the movable carrier is retracted to move the doors in opposite directions to effect an opening of the doors when the movable carrier is retracted.

9. An electric coupler for train line circuits comprising a fixed carrier arranged to be attached to a car coupler, a plurality of contacts associated with the fixed carrier, a longitudinally movable carrier associated with the fixed carrier, a spring biased to move the movable carrier to its forward position, a pair of doors positioned within the movable carrier and arranged to cover the forward ends of the contacts when the coupler is uncoupled, each door having a face wall protecting substantially one-half of the contacts and movable upwardly and downwardly respectively, each door having rearwardly projecting arms hinged to the side walls of the movable member, cam means projecting from the side walls of the fixed carrier into the path of movement of the arms and engageable with the arms at points adjacent to their point of attachment to the movable carrier to rapidly move each door to its open position as the movable carrier moves rearwardly under pressure of the movable carrier of a companion coupler.

ERNST A. LARSSON.