March 4, 1930. G. A. MEAD 1,749,149

ELECTRIC COUPLER SYSTEM

Filed July 30, 1925 2 Sheets-Sheet 1

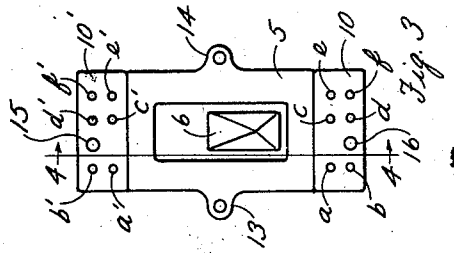


Fig. 3

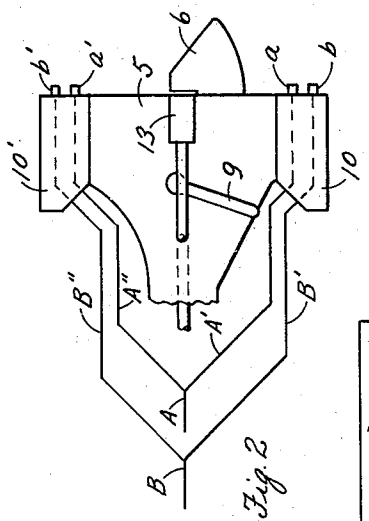


Fig. 2

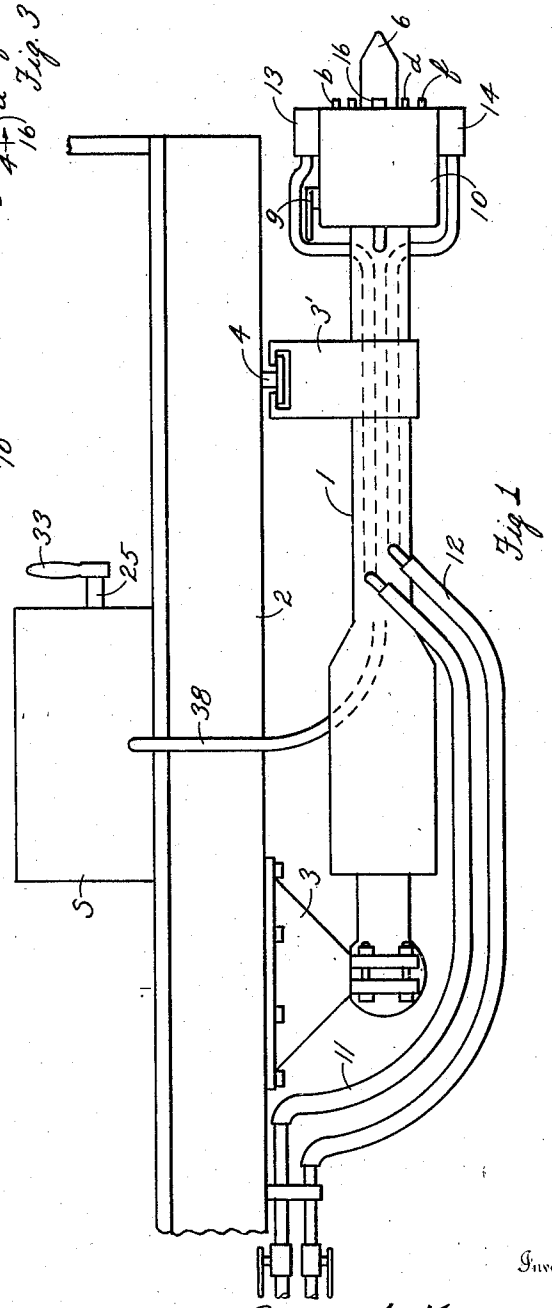


Fig. 1

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ELECTRIC COUPLER SYSTEM

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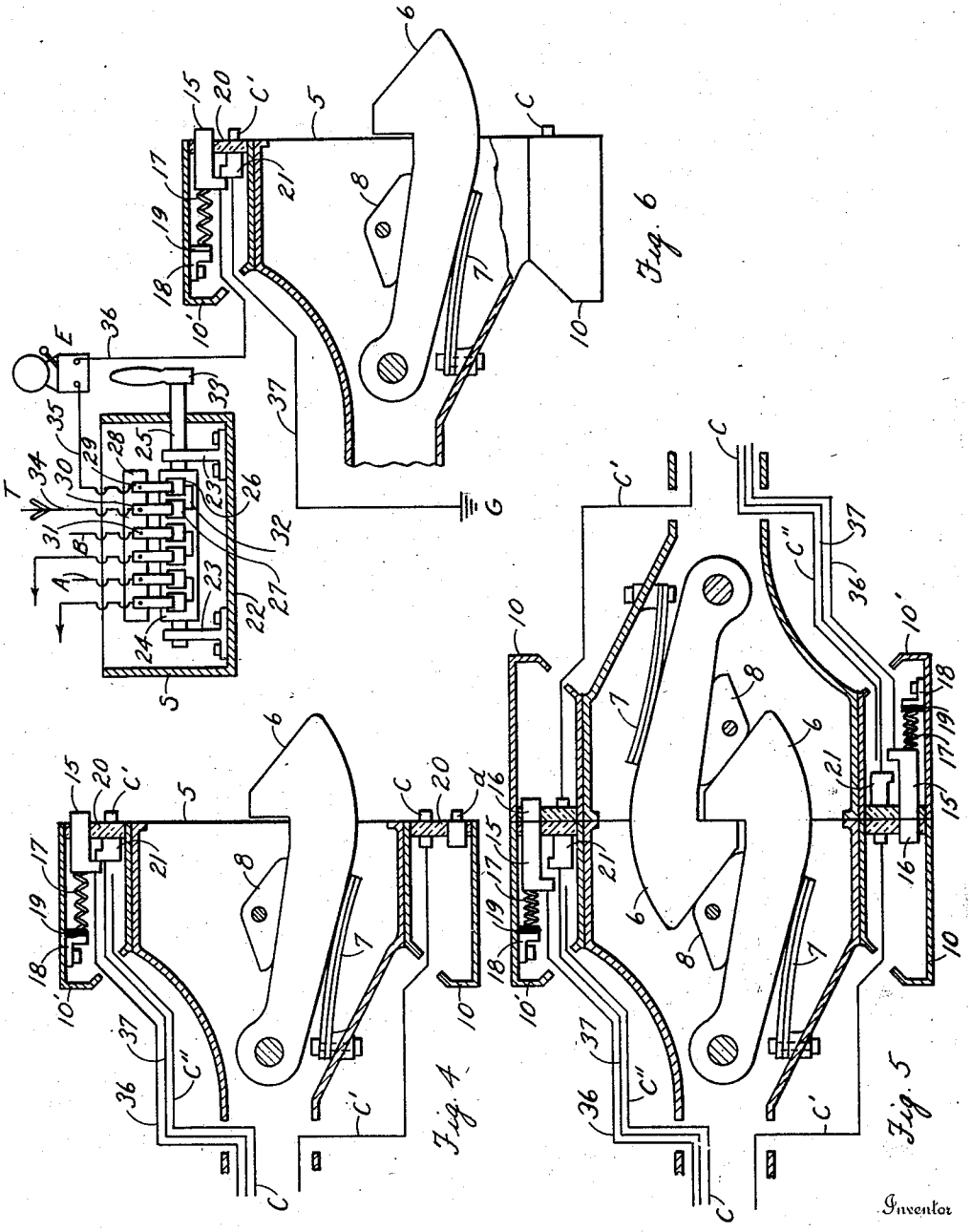


Fig. 6

Fig. 4

Fig. 5

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Patented Mar. 4, 1930 1,749,149

UNITED STATES PATENT OFFICE

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ELECTRIC COUPLER SYSTEM

Application filed July 30, 1925. Serial No. 47,078.

My invention relates to coupling systems for cars and has particular reference to a signal system to indicate to the operator, when the cars are uncoupled, whether they are in a safe condition or not. This relates particularly to electrically operated cars in which there are electric circuits passing through the car and terminating in the exposed contacts in the coupler and which might be dangerous both to operators, passengers or the equipment as such, if the circuits terminate in contacts which are alive while the cars are in an uncoupled condition.

It is found avisable in case of electrically operated cars in which there are circuits terminating in couplers to introduce a switch into the electric circuits passing through the car and terminating in the coupler and having exposed contacts, and such switch is introduced adjacent the end or ends of the car and so arranged that the circuits to the couplers may be opened or closed at the will of the operator.

It sometimes happens that two coupled cars might separate and for some reason or other the same not become known to the motorman although this is quite a rare case if the cars are equipped with automatic air brakes, but it is not uncommon where cars are equipped with electric couplers and the switches referred to for an operator to become careless and leave the switch in a closed position when he places the car in storage for the night or this may occur in other circumstances.

In order to avoid all such conditions I provide means which will indicate to the operator or others that the car is not coupled and the switch controlling the circuits to the coupler is closed.

My invention resides in the new and novel construction, combination and arrangement of the various parts herein fully described and shown in the accompanying drawings.

In the drawings:

Fig. 1 is a side view of a car frame with a coupler mounted thereon adapted to electrically and mechanically connect the cars and with a switch mounted upon the car body.

Fig. 2 is a top view of the coupler head as such.

Fig. 3 is a face view of the coupler head shown in Figs. 1 and 2.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on the line 4—4 of Fig. 3 which shows two cooperating heads arranged to couple the cars electrically and mechanically.

Fig. 6 is diagrammatic and shows the arrangement and connection of the various parts.

In the preferred embodiment of my invention I employ a mechanical car coupler having a spring draft gear 1 which is connected to the sills 2 of a car body by means of an anchorage 3. The coupler is supported adjacent its outer end from the sills 2 by means of a carrier 3′ supported to the sills by means of the slide bar 4. The coupler may be pivotally mounted to the anchorage 3 or rigidly mounted as the case demands. The coupler is also provided with a coupler head 5 provided with a pivotally mounted hook 6 to engage with a corresponding hook on a cooperating head to mechanically hold the cars in coupled relation. The hooks are moved to a coupling position by means of the yielding springs 7 and I provide a cam 8 pivotally mounted to move the hooks 6 to their uncoupled position and provide a handle 9 for operating the cam.

On opposite sides of the coupler head 5 I have shown the electric couplers 10 and 10′ and have shown in Fig. 3 these couplers provided with a plurality of projecting and exposed contacts *a*—*a*′, *b*—*b*′, etc. To these contacts, which may be of any number required, are connected train line circuits as A and B, etc. Where it is possible I prefer to connect the contacts which are the same distance on each side of the vertical center line of the coupler and in the same vertical plane, as for instance, *a* and *a*′, or *b* and *b*′, together as by the branch circuits A′ and A″ and B′ and B″, as this makes it possible to employ a coupling system without the use of a reversing switch to straighten out the connected circuits. Connected as I have shown it will be apparent that there will be required

twice as many exposed contacts as there are train line circuits A and B. If a reversing switch is used to straighten out the circuits then there may be as many train line circuits as there are contacts. In other words, the contacts from opposite sides of the coupler will not be cross-connected.

The coupler is shown as supplied with fluid air pressure system for operating the brakes such as the fluid train lines 11 and 12 and these terminate in the coupler head 5 in the air connecting mechanisms 13 and 14.

It will be apparent to those skilled in the art that in place of positioning the electric couplers on opposite sides of the head that a single electric coupler containing the necessary contacts may be secured to the under surface or even the upper surface of the coupler head 5.

I have also shown as mounted in the electric couplers a special contact 15 which is adapted to engage with a dead metallic contact 16 on the cooperating coupler head. The contact 15 is held in an advanced position by means of a spring 17 held in position by a stop 18 insulated therefrom by the member 19. The projecting contacts a, a' and b, b' and also the special contact 15 are mounted in an insulating member 20 forming the front face of the electric coupler and the projecting contacts are arranged to reciprocate forward and back and are normally held in an advanced position by means of a spring with the exception of the contact 16 which is stationary and is for the purpose only of forming an impact member with which the contact 15 can engage, in place of engaging with the softer insulating member 20 and be forced to retract when two heads are brought together as shown in Fig. 5. Also mounted in one of the electric coupler heads and adjacent the contact 15 is a fixed contact 21 secured to the insulating member 20 and adapted to be engaged by the contact 15 when the couplers are in an uncoupled relation.

Mounted in the car at some convenient position is an electrical switch S arranged to control the train line circuits leading to the electric coupler contacts. This switch may be of the knife blade type or it may be of a reciprocating type, or it may be of the drum type as I have shown in the drawings. This switch comprises a box member 22 in which are secured standards 23 and to which are rotatably secured the drum 24 by means of a shaft 25. The drum 24 usually of insulating material has secured thereto the contacts 26, 27, etc. Mounted in the box is an insulating panel 28 to which are secured contact brushes 29, 30, 31, etc. The operation of the switch is such that when rotated to one position the contacts 26 and 27 etc. will be in engagement with the contacts 29, 30 and 31, etc. and when the drum is rotated to its other position these parts will be disconnected and the connection therebetween broken. I have shown each adjacent pair of contacts connected as by means of the member 32 which connects the contacts 26 and 27. The drum may be operated by means of the handle 33 or it may be arranged to be operated by a fluid pressure cylinder.

In the particular arrangement disclosed I show the contact brush 30 as connected to a conductor 34 and the contact brush 29 is connected to a bell or buzzer E by means of the conductor 35. The bell E is connected to the reciprocating contact 15 by means of the conductor 36 and the fixed contact 21 is shown as connected to the ground by means of the conductor 37. The train line circuits A and B shown as leading from the contacts in Fig. 2 may be of corresponding lines A and B shown as connected to the switch S in Fig. 6 and from there they lead out of the switch and are connected to such apparatus as necessary.

It will be noted in Fig. 6 that if the train line circuits A and B leading from the contacts are connected to the circuits A and B at the switch S that if the train line circuits leading to the switch S are alive then the contacts in the face of the coupler connected to the train line circuits A and B would be alive for the reason that the switch S is shown in its closed position, but it will also be observed that there will be a complete circuit from the trolley T which is invariably a grounded source of electrical supply to the ground G through the bell E and the contacts 15 and 21 and the connecting conductors and, therefore, with the switch S in the closed position as shown and with the coupler in an uncoupled relation the bell E will signal. If, however, the coupler is in an uncoupled relation and the switch S is in the open position then it will be noted that the bell will not ring and also there will be no connection between the train line circuits leading into the switch S and the train line circuits leading from the switch to the coupler contacts. It will also be noted that if two coupler heads are brought together in a coupled relation as shown in Fig. 5 and the switch S is in a closed position as shown in Fig. 6 that the bell E will not signal for the reason that the circuit through the bell will be open at the contacts 15 and 21, but the train line circuits will be complete through the switch S and through the coupled heads of the electric couplers.

Where two coupled cars receive their energy direct from the trolley or have separate sources of current it will be apparent that having both cars equipped with the electrical contacts 15 and 21, as shown in Fig. 5, that a signal will be given on each car should the cars be separated with the switch S in a closed position.

I have shown a conduit 38 as leading from the coupler to the switch S and this conduit may contain the various cables leading from the switch to the coupler heads 10 and 10'.

Modifications will be apparent to those skilled in the art, therefore I wish to be limited only by my claims.

I claim:

1. The combination in a car and electric coupler secured to the end of a car of a head, a coupling hook arranged to connect with a cooperating device upon impact, exposed electrical contacts upon the coupling face of said head and insulated therefrom, conductors leading from the contacts, a current supply circuit to said car from a source of power, a movable contact upon the coupler head cooperating with a fixed contact forming a circuit controller and arranged to open an auxiliary circuit connected thereto when the head is coupled and to close the auxiliary circuit when the head is uncoupled, a manually operated switch to open and close and control the circuits to the contacts and connect some of the conductors and the auxiliary circuit to the current supply circuit, an electrically controlled signal connected to the auxiliary circuit and in series circuit with the circuit controller and the manually operated switch to indicate when the switch is closed and the coupler in an uncoupled relation to a cooperating coupler.

2. The combination of a car coupler and an electric coupler mounted thereon and arranged to couple with cooperating couplers, contacts exposed on the face of the electric coupler, train circuits connected to the contacts, switch means associated with the electric coupler arranged to automatically operate the switch to open position when two couplers engage and to automatically close the switch when the couplers disengage, an auxiliary circuit connected to and partially controlled by said switch, a second switch connected to the train and auxiliary circuits and to a source of power to connect and disconnect the circuits relative to the source of power at will of an operator, the second switch closing the auxiliary circuit when it closes the train line circuits to their contacts and a signal operated by current in the auxiliary circuit to warn the operator that the second switch is closed and the cars are not connected.

In testimony whereof I affix my signature.

GEORGE A. MEAD.