

(No Model.)

J. R. DE MIER.

ELECTRIC SIGNAL FOR RAILROAD CARS.

No. 331,042.

Patented Nov. 24, 1885.

Fig 1.

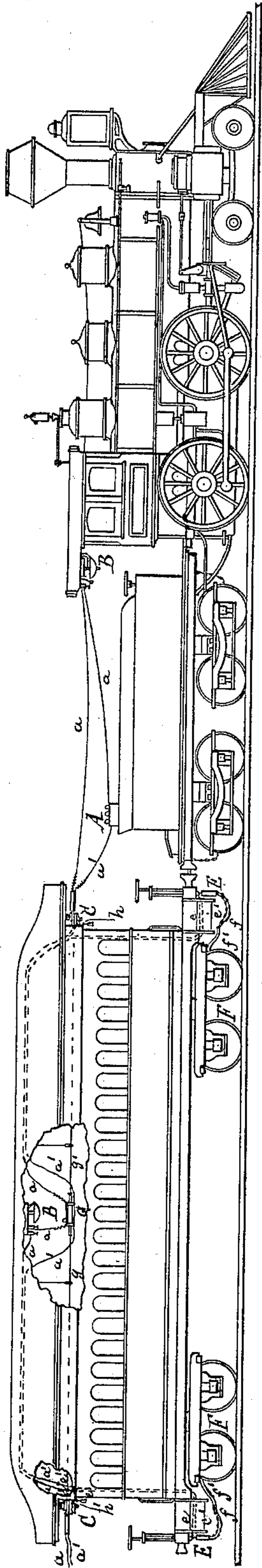


Fig 2.

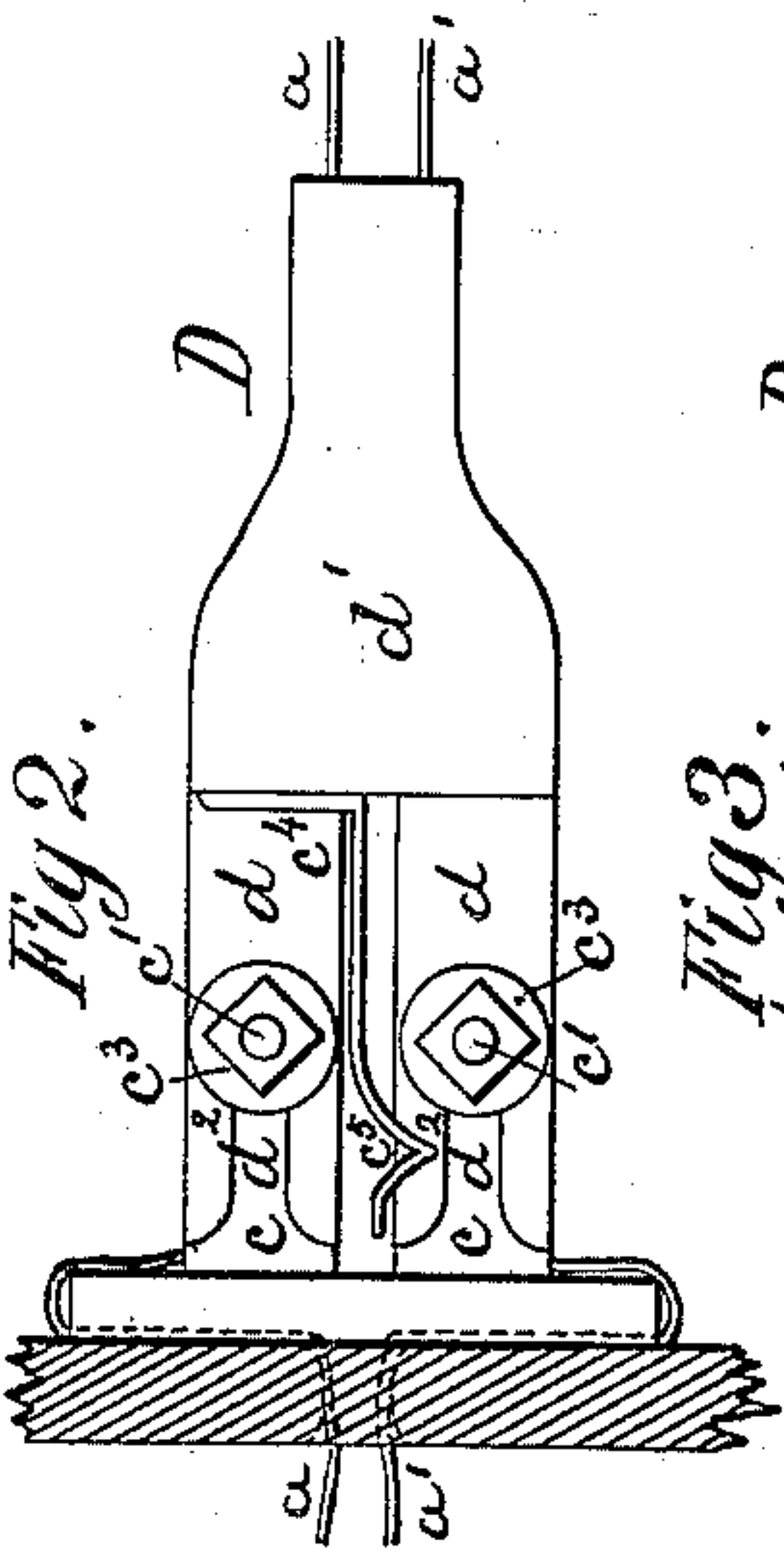


Fig 4.

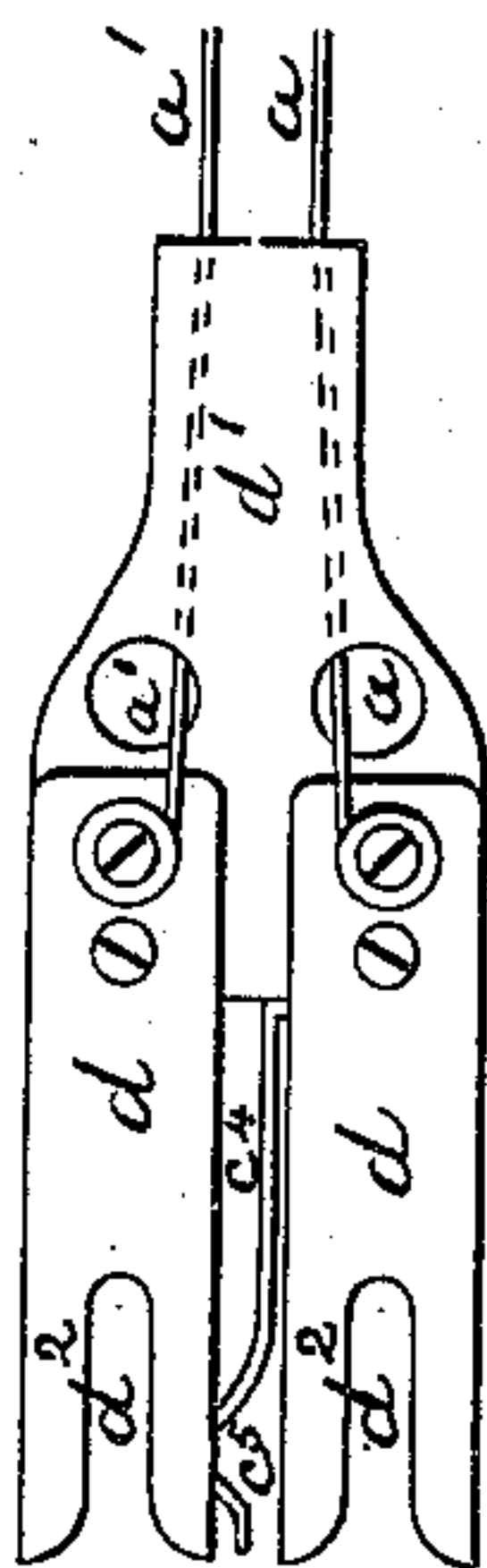


Fig 7.

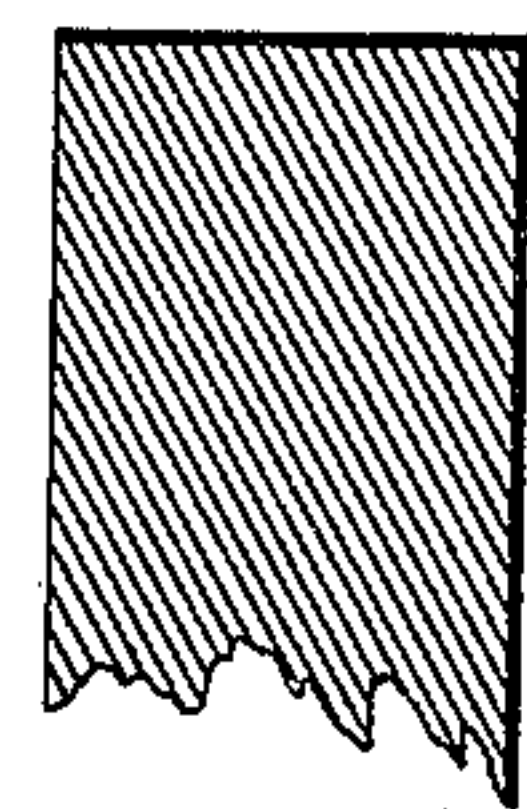


Fig 8.

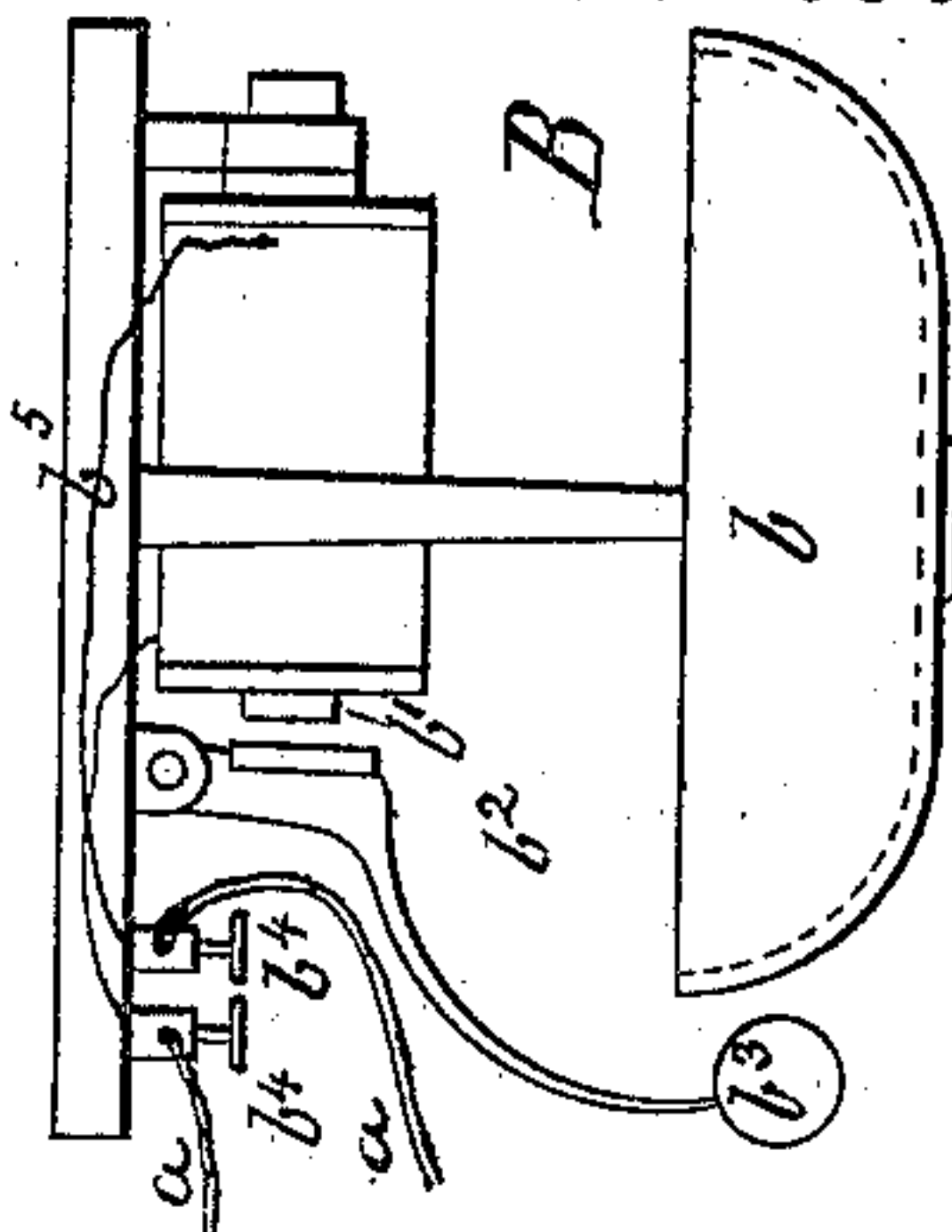


Fig 3.

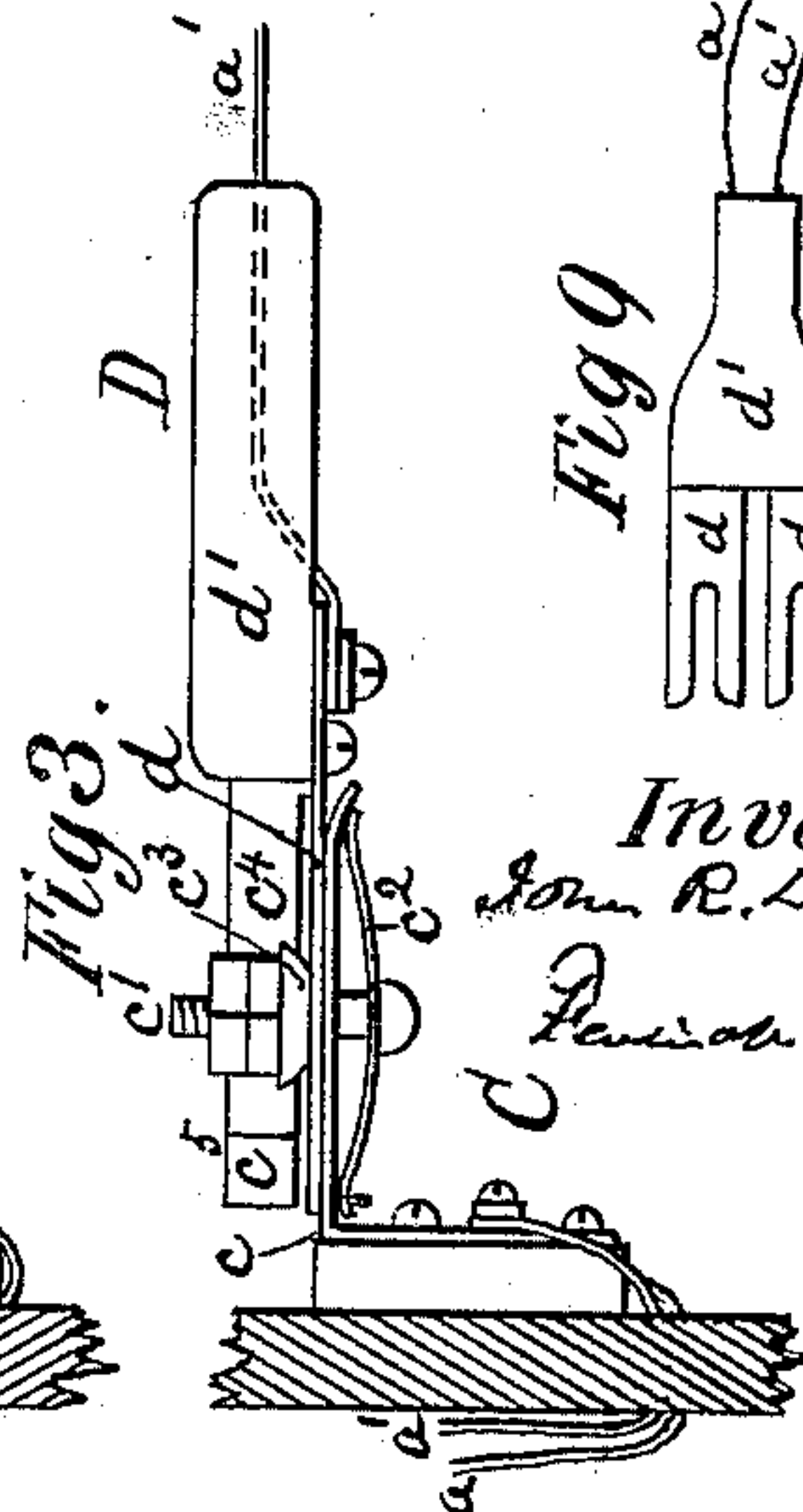


Fig 5.

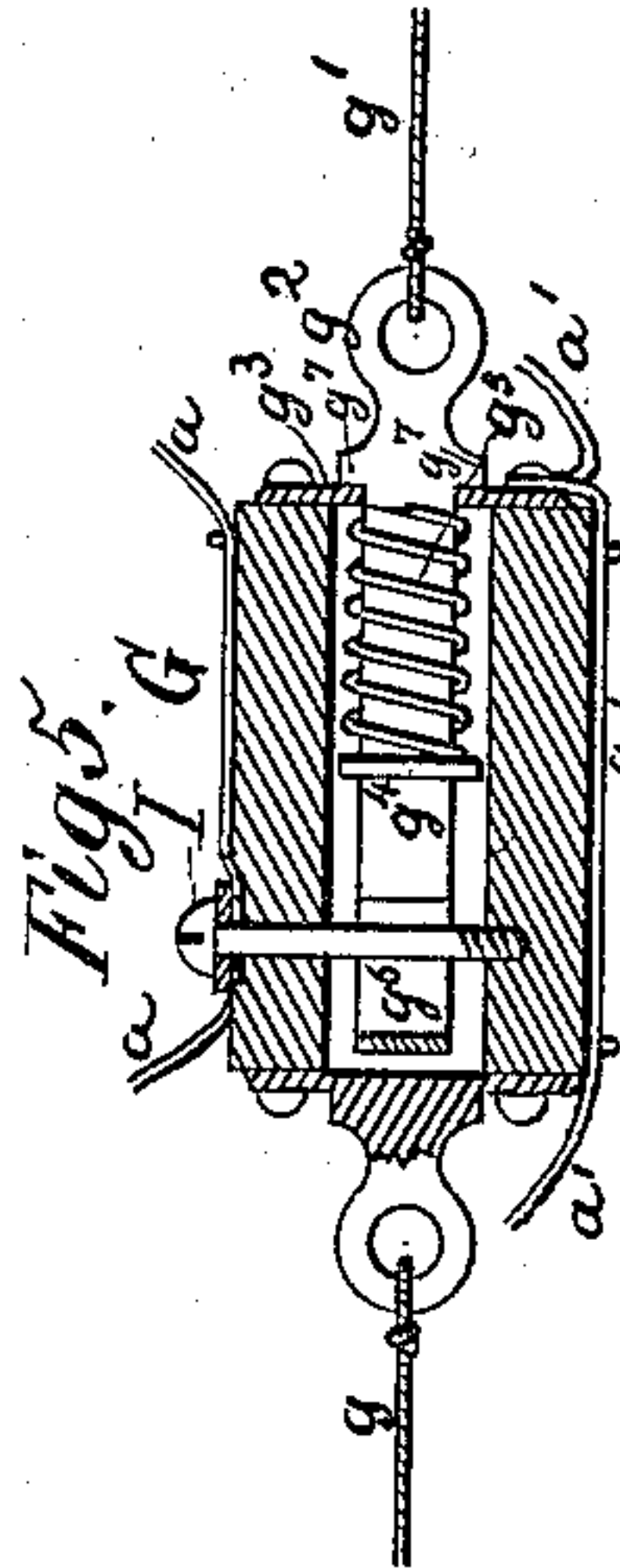


Fig 6.

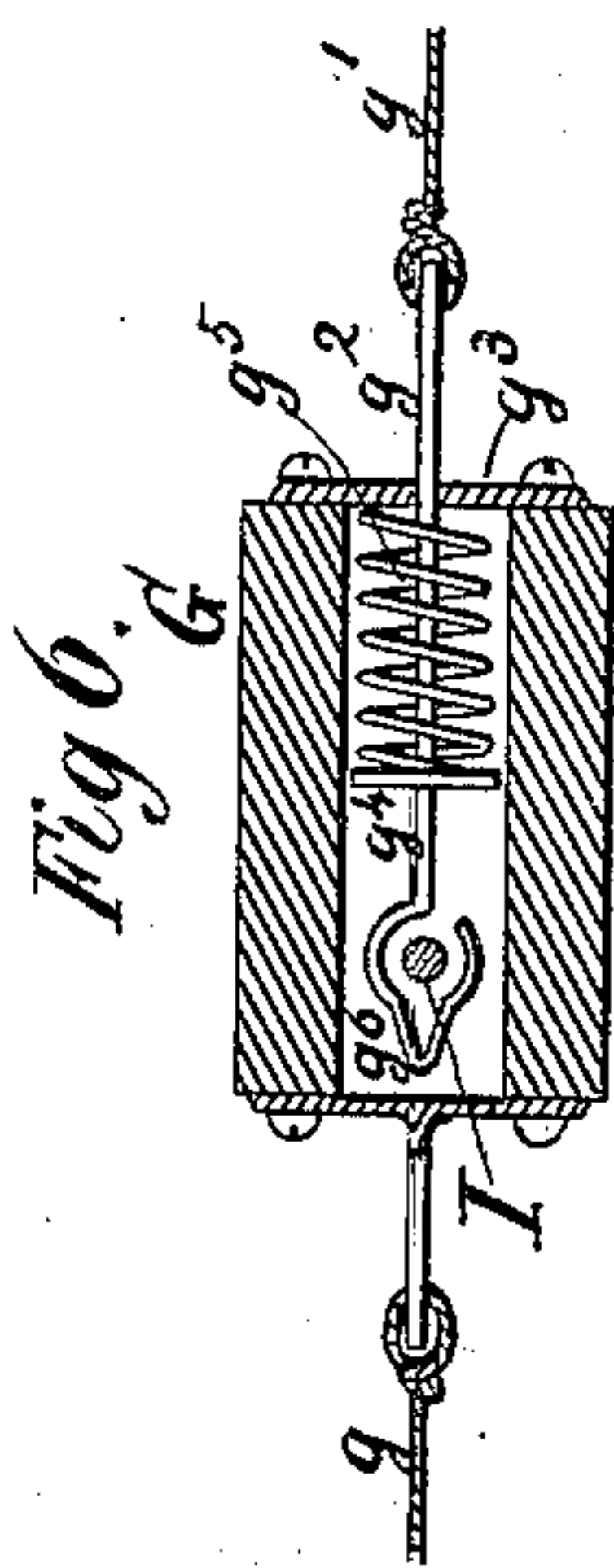


Fig 9.

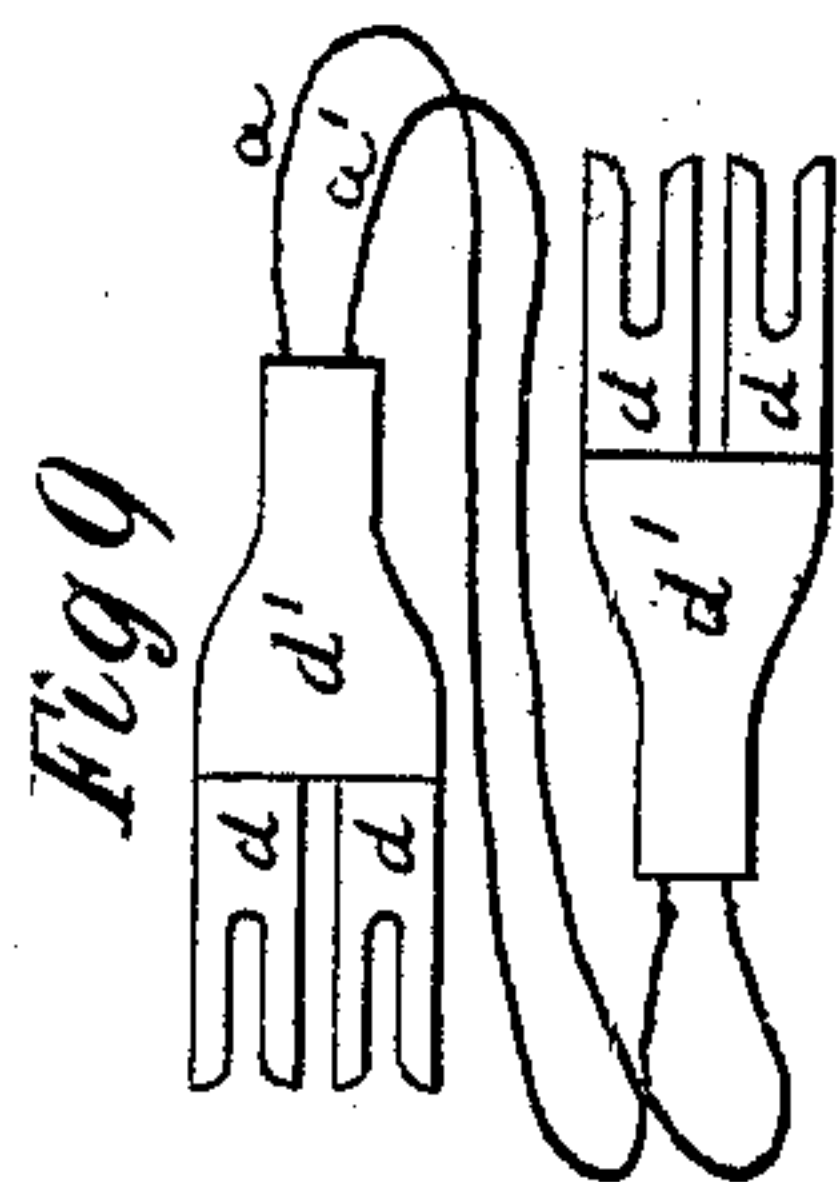
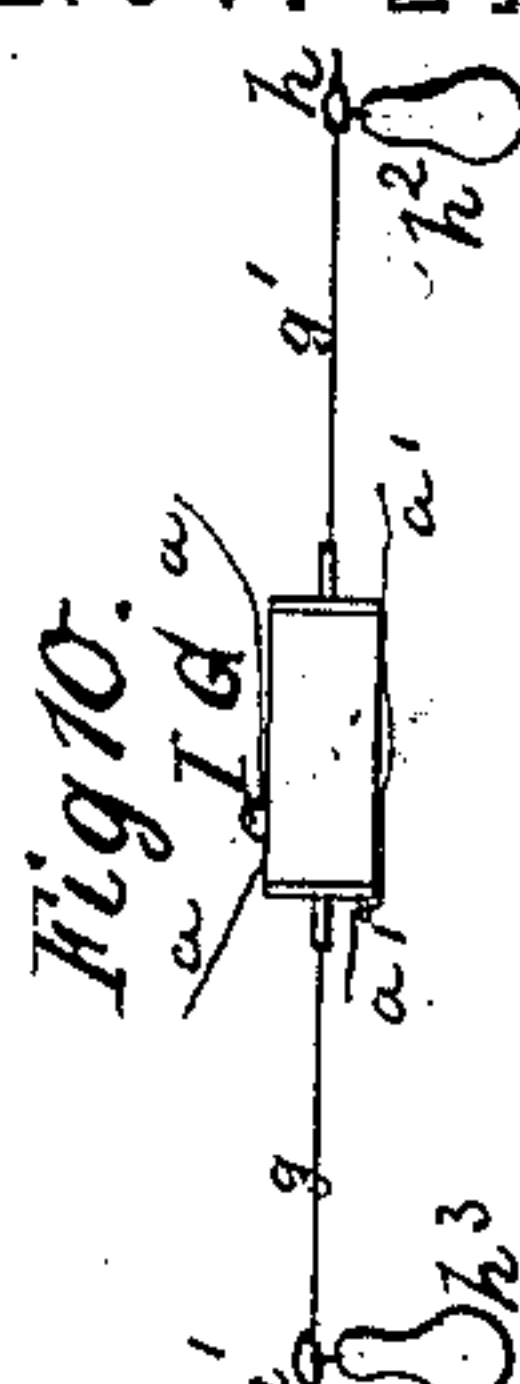


Fig 10.



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UNITED STATES PATENT OFFICE.

JOHN R. DE MIER, OF CHESTER, ILLINOIS.

ELECTRIC SIGNAL FOR RAILROAD-CARS.

SPECIFICATION forming part of Letters Patent No. 331,042, dated November 24, 1885.

Application filed March 17, 1885. Serial No. 159,197. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. DE MIER, a citizen of the United States, residing at Chester, in the county of Randolph and State of Illinois, have invented a new and useful Electric Alarm-Signal for Railroad Cars or Trains, of which the following is a specification.

My invention relates to improvements in electric railroad-car signals; and it comprises electric battery with two conducting-wires running through the cars of a train to the locomotive, said wires being charged by the battery and forming an open circuit; also, alarm bells or gongs on the locomotive and on each car; also, suitable circuit-closers to be operated by the conductor; also, circuit-closers operated by the disconnecting of cars, and circuit-closers operated by the car-trucks, and all of said circuit-closers operating the said gongs and giving notice to the engineer upon the locomotive whenever required.

The object of my invention is to enable the conductor of a train to instantly and surely communicate with the engineer at any time during a trip; and to automatically notify the engineer and conductor of any accident that may happen to any of the cars during the trip—as, for instance, the uncoupling of a car or the derailing of a truck.

In the accompanying drawings, forming a part of this specification, Figure 1 is an elevation of a train, consisting of a locomotive, tender, and a car, provided with my invention, certain portions of the car being broken away in order to more clearly show the invention. Fig. 2 is a top view of one of my car binding-posts and circuit-closers. Fig. 3 is an elevation of the same. Fig. 4 is a bottom view of the removable part of the same. Fig. 5 is a vertical longitudinal central section of the circuit-closer of the train-conductor. Fig. 6 is a central horizontal section of the same. Fig. 7 is a central vertical section of a truck circuit-closer. Fig. 8 is an elevation of one of the electric gongs. Fig. 9 is a diagram of an electric conductor used between the cars, and Fig. 10 is a diagram of the alarm mechanism used by the train-conductor.

The letter A in the drawings represents an ordinary electric battery securely fastened to

the tender or the locomotive. From this battery the positive conducting-wire *a* runs to the engineer's gong B of the locomotive, from there to the next car, through the gong B of this car, and so on. The negative wire *a'* of the said battery runs from it through the several cars of the train.

The electric gong B is of ordinary construction, and consists of a gong-bell, *b*, horseshoe-magnet *b'*, armature-arm *b''*, carrying a bell-hammer, *b'''*, and two binding-posts, *b''''*, connected by a wire, *b''''''*, with the coils of the horseshoe-magnet.

At each end of the car suitable binding-posts, C, are provided, which consist of two angular conducting-plates, *c*, suitably insulated, which plates are provided with bolts *c'*, spring-washers *c''*, and unyielding washers *c'''*, with conical rims.

Between the washers *c'''* and plates *c* the connecting-plates *d* of the wire connections D are inserted and securely screwed down with the bolts *c'*, as seen in Fig. 3. These connections D consist of a non-conducting handle, *d'*, through which the wires *a a'* pass lengthwise, and the two connecting-plates *d*, to which the said wires are secured in a suitable manner. The ends of the connecting-plates *d* are forked by means of longitudinal slots *d''*, into which slots the bolts *c'* of the angular plates *c* enter when the connection with the wires *a a'* and the car is made, and whereby any lateral displacement of the connections is prevented. One of the plates *c* is provided with an elastic tongue, *c''''*, having a curved or V-shaped end, *c''''''*, and this V-shaped end, in its normal position, is held behind and in range of the conducting-washer *c'''* of the contiguous plate *c* without touching either the said plate or washer.

If by accident or purposely the car is detached from its train, the connections D and binding-posts C become detached; but before being quite separated the V-shaped ends *c''''''* touch the washers *c'''* of the said contiguous binding-posts and establish a momentary closed circuit, whereby the magnet of the gong of every car between said closed connection and the battery, including the magnet of the locomotive gong, become momentarily charged

and attract their armatures, to which the bell-hammers are attached and cause them to strike one blow, and thus give the alarm to the engineer, and to the conductor, if the latter is in a car connected with the train. When the aforesaid V-shaped ends c^5 leave their respective washers c^3 , the electric circuit is again broken, so the conductor's circuit-closers G can be operated ahead of the detached car.

In establishing the electric connection of a car coupled to a train the wires a a' are provided with one connection D at each end, and one of these connections is inserted into the binding-post C of the forward car by pushing the forked plates d between the washers c^3 and plates c and then drawing tight the bolts c' . The same operation is repeated with the rearward car, and the two cars are then electrically connected. In practice these electric connections or couplings D will be kept in a suitable store-room ready for use, and are only attached to cars when a train is formed, and a surplus number of them, wherewith to meet emergencies, are also kept in the store-room.

The entrance of the plates d between the washers c^3 and plates c is facilitated by the conical form of the washer-rims, and the use of bolts c' and spring-washers c^2 insures a better hold on the connections than the ordinary binding-post without the spring-washers, inasmuch as the loosening effects of the jolts of a running car upon the screws are counteracted by the constant tension of said spring-washers, and the screws remain undisturbed.

To provide an alarm in cases of accident to a car-truck, I attach a circuit-closer, E, between the bottom of the car and the truck, and connect the same by means of two conducting-wires, e e' , with the wires a a' , respectively. This circuit-closer E consists of a serrated conducting-blade, e^2 , suitably suspended from the bottom of the car, and connected by means of wire e to wire a , and also of a block, e^3 , firmly inclosing the blade e^2 , attached by means of a chain, f , to an arm, f' , of the truck F, said block e^3 having a conducting-spring, e^4 , attached to one of its sides, which spring is, by means of the conducting-wire e' , connected to the wire a' . The end of the spring e^4 is in range of the serrations e^5 of the blade e^2 , and, by means of a sufficiently large notch, e^6 , in the blade, is prevented from touching it under ordinary circumstances, the friction between the blade e^2 and block e^3 being sufficient to prevent their separation while the truck is running on the track. When the truck becomes derailed, or accidentally moved sidewise from its track, the wheels at one side of the truck run upon the ground outside of the track on diagonal or curved lines, while the wheels at the other side of the truck run over or upon the sleepers of the track, whereby the truck is caused to oscillate about its center pin to an extraordinary extent, and thus the chain f is jerked from its

normal position and the block e^3 becomes detached from the blade e^2 , and as this takes place the spring e^4 is pulled over the serrations of the blade e^2 , and every time it passes over and touches one of its points it establishes a closed circuit, the effect of which is one blow of every bell-hammer against its gong from said truck to the locomotive. By the number of blows given the engineer knows the nature of the accident, and accordingly stops the train in order to avoid greater damage. The train-conductor's circuit-closer consists of a non-conducting barrel or cylinder, G, suspended between two cords, g g' , in the middle of the car. These cords pass through the ends of the car, and through two eyebolts, h h' , suitably fastened above the doorways. Below these eyebolts pendent handles h^2 h^3 are fastened to said cords, whereby the cords are pulled, and whereby they are prevented from being pulled out of the eyebolts. The cord g is fastened directly to the barrel G, and the cord g' is fastened to a conducting spring-bolt, g^2 , in the barrel. This spring-bolt g^2 passes through a head-plate, g^3 , of the barrel, and is provided with a disk, g^4 , therein, and between said head-plate and disk a tension-spring, g^5 , is inserted, which keeps the curved end g^6 of the spring-bolt g^2 away from a transverse conducting pin or screw, I, in the barrel. An outer shoulder, g^7 , on the spring-bolt g^2 rests against the head-plate g^3 , and thus limits the forward stroke of the bolt. The wire a is connected with the conducting-screw I and the wire a' with the bolt g^2 by being fastened to the conducting-plate g^3 . From the screw I the wire a passes through the gong B and then to the end of the car, as before stated. When the conductor pulls one of the cords either inside or outside of the car, the bolt g^2 is pulled from the barrel until its curved end comes in contact with the conducting-screw I, whereby a closed circuit is established, causing the usual alarm or blow on the electric gong in the car whose circuit is closed, and all cars forward, and on the locomotive, and as the conductor releases the cord the circuit is broken again, preventing wastage of battery. The conductor by a variety of signals—i. e., different numbers of blows—can communicate his orders to the engineer; but he should not use the alarm-signals of the connections D and E.

I am aware that a circuit-breaker of cylindrical form suspended or stretched about the center of the car, between and by the train-conductor's bell-rope, is not new. My circuit-closer differs from such known circuit-breaker, first, in its not being supported by one of the main conducting-wires, which is pulled by the manager in order to operate the alarm, and therefore is not subjected to strains, such as would tend to stretch and lengthen the conducting-wire and lower it to within reach of unauthorized persons, and which wire, if

covered with fibrous material, is liable to be affected by the influence of the atmosphere, and in very damp weather may become conducting instead of non-conducting, and cause the current to pass into the hand of the conductor; or if of rubber or similar substance is liable to become sulphurated or oxidized by frequent contact with the warm or perspiring hands of the conductor or manager; and, further, may by incidental jerks or jolts be involuntarily broken by the conductor or manager while he is trying to operate it, and thus, the main conducting-wire being severed, all means of communication is destroyed and the train exposed to great danger. I have met these objectionable features of construction by providing the described circuit-closer of cylindrical or other suitable shape, and suspending it by a non-conducting pull-rope, while the positive and negative line wires or conductors are suspended independently of the pull-rope from the ceiling of the car, and connected directly to the operating parts of the circuit-closer, thereby placing it sufficiently out of the way of unauthorized persons, and if the pull-rope should accidentally be broken, in my construction the electric connection of the train would not be affected thereby, as the circuit-closer would remain suspended by the conducting-wires, and the bell-rope could be reunited at leisure.

It will be seen that the aforesaid ordinary circuit-breaker could not be used as a circuit-closer if applied in accordance with my invention, no matter in what manner it should be connected to the conducting-wires; nor could my circuit-closer ever be substituted for such circuit-breaker in the organization usually employed. My wire-couplers C between the cars are not below the platforms of the cars, as in other constructions, but above the doorway, and within sight and reach of the manager or conductor of the train, who thus can easily discover any deficiency in the operation or safe condition of the same; and in order to enable the manager or conductor, upon such discovery, to make proper repairs, I provide interchangeable connections, such as hereinbefore described, and the manager, who has a small store-room on the train, can in a very short time procure another connection and substitute it for the faulty one while the train is running. This, with connections located below the platforms of the cars, would be almost impossible, and if any accident should happen to such connections it could only be remedied at the next railroad-station, and while the train is at rest.

For electric conductors I use two wires—one positive and one negative—throughout the whole train of cars, and the permanent portions are fastened to the least exposed parts of the cars—i. e., the ceilings and end walls above the doorways—thereby avoiding moisture, unnecessary motion, and other inter-

ference, and securing a circuit which is reliable under all circumstances. The connections between the said conducting-wires and the manager's or conductor's circuit-closers and the truck-alarm are made by means of separate secondary conducting-wires, as shown, and thus repairs can be made on those alarms, without interfering with the open circuit of the train, while the train is running.

As it sometimes happens that a truck in a running train is thrown from the rails and runs partly over the sleepers of the road, damaging the car, and perhaps injuring passengers, without throwing any one of the cars completely from the track, I provide my truck-alarm, which notifies the engineer immediately of the danger; otherwise the engineer would remain ignorant of such fact, unless the train conductor or manager happened to be in the car thus endangered, and could himself give the danger-signal to the engineer.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an electric railroad-train signal, the combination of an electric battery stationed on the locomotive-tender, a positive and a negative conducting-wire fastened to the ceiling of each car, two interchangeable and removable automatic circuit-closers, D, between the cars, fastened above the doorways of the cars, an alarm-bell on the ceiling of each car and in the engineer's cab, a suitable circuit-closer, G, provided with suitable pull-ropes, $g g'$, whereby the breaking of trains and orders of the train conductor or manager are immediately communicated to the engineer, substantially as and for the purpose described.

2. In an electric railroad-train signal having an open-circuit-alarm mechanism, the binding mechanism C, consisting of the angular plate c , having bolts c' , washers c^3 , spring-washers c^2 , and the connection D, having handle d' , forked conducting-plates d , and circuit-closing tongue c^4 , and the alarm-gong B, substantially as and for the purpose described.

3. In an electric railroad-train signal, having an open-circuit-alarm mechanism, the combination of a truck circuit-closer, E, consisting of serrated blade e^2 , block e , having spring-conductor e^4 , and the gong B, substantially as and for the purpose described.

4. In an electric railroad-train signal operated by means of an open circuit, the combination of circuit-closers consisting of the non-conducting pull-ropes $g g'$, barrel G, spring-bolt g^2 , conducting-screw I, and conducting-wires $a a'$, substantially as and for the purpose described.

5. In an electric railroad-train signal, the combination of an electric battery stationed on the locomotive-tender, a positive and a negative conducting-wire fastened to the ceiling of each car, two interchangeable and removable automatic circuit-closers, D, between

the cars, fastened above the doorways of the cars, an alarm-bell on the ceiling of each car and in the engineer's cab, a suitable circuit-closer, G, provided with suitable pull-ropes,
5 *g g'*, and an automatic circuit-closer, E, between each truck and its car, whereby the breaking of trains, displacement of trucks,

and orders of the train conductor or manager are immediately communicated to the engineer, substantially as described.

JOHN R. DE MIER.

Witnesses:

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JAMES E. GASTON.