

No. 643,148.

Patented Feb. 13, 1900.

J. K. MILLER, J. W. WITT & D. A. JONES.

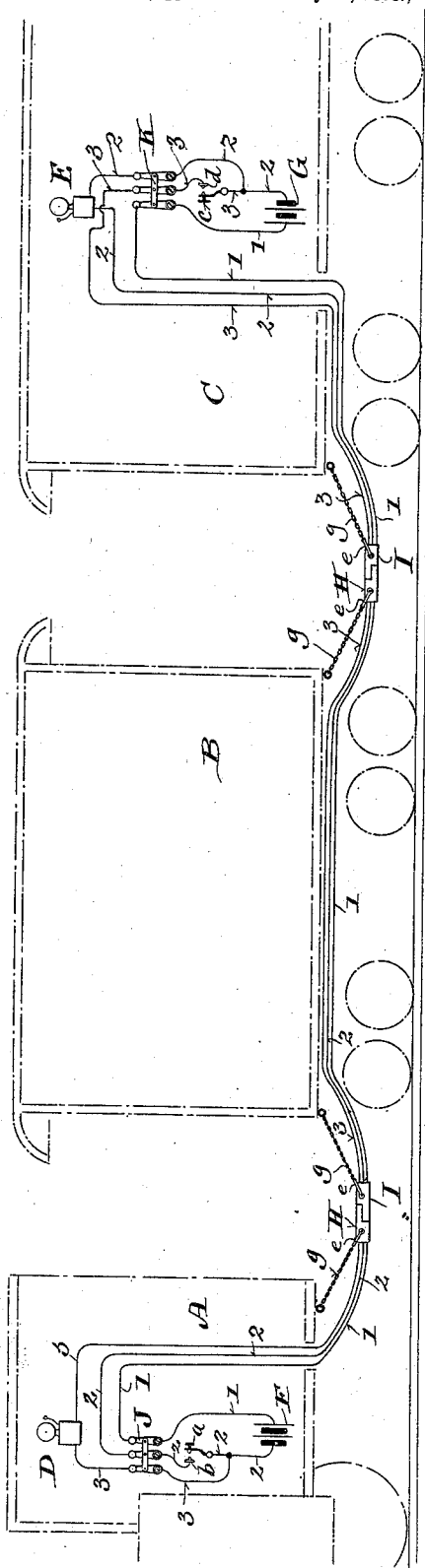
ELECTRIC SIGNAL AND AUTOMATIC ALARM FOR RAILWAY TRAINS.

(No Model.)

(Application filed July 13, 1899.)

2 Sheets—Sheet 1.

Fig. 1.



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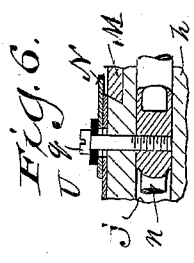
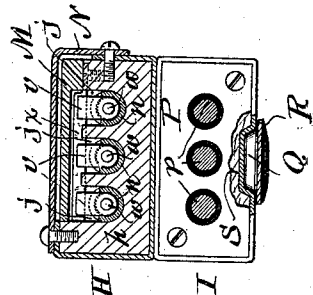
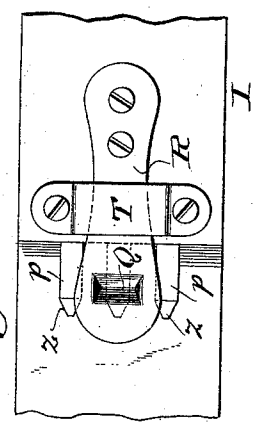
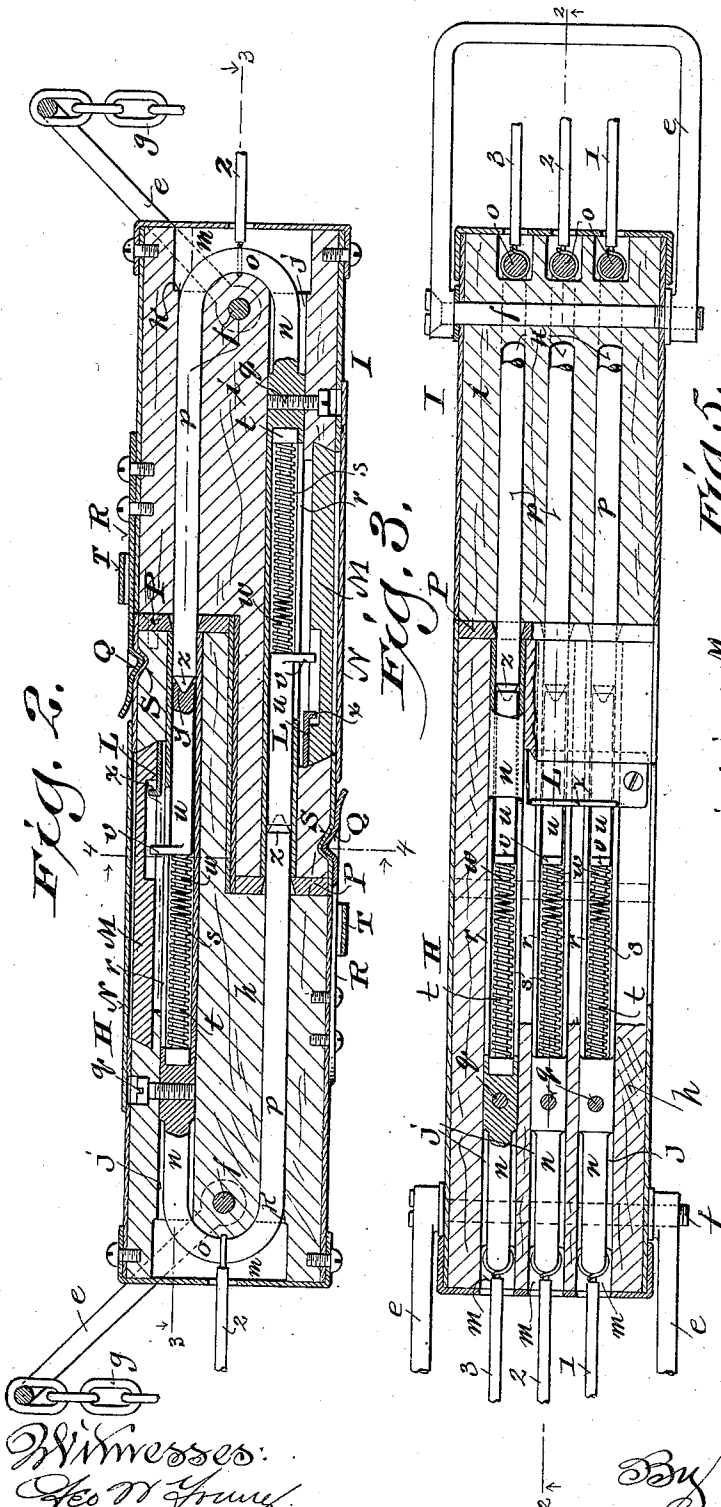
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGNAL AND AUTOMATIC ALARM FOR RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 643,148, dated February 13, 1900.

Application filed July 13, 1899. Serial No. 723,660. (No model.)

To all whom it may concern:

Be it known that we, JAMES K. MILLER, JULIUS W. WITT, and DANIEL A. JONES, citizens of the United States, and residents of Oshkosh, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Electric Signals and Automatic Alarms for Railway-Trains; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to devices for signaling from one end of a railway-train to the other and for sounding an alarm in the event of said train breaking in two; and it consists in certain peculiarities of construction and combination of parts, as will be more fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a diagrammatic representation of a railway-train equipped with our devices. Fig. 2 is a vertical longitudinal sectional view of our coupler on the line 2 2 of Fig. 3. Fig. 3 is a horizontal longitudinal sectional view of the same on the line 3 3 of Fig. 2. Fig. 4 is a vertical transverse sectional view of the same on the line 4 4 of Fig. 2. Fig. 5 is a detail view of a portion of the same. Fig. 6 illustrates a slight modification.

Referring to the drawings, Fig. 1, A indicates the engine, B an intermediate car or coach, and C the caboose or last car of a railway-train.

D indicates an electric bell in the engine, and E a like bell in the caboose.

F G indicate the respective engine and caboose batteries.

H I represent the pairs of electric couplers between each member of the train. There are three wires used, so as to get a return-current without waste, thus comprising a metallic circuit and a signaling-wire, as hereinafter explained.

It will be understood that beneath each car or coach the three wires, properly insulated, are secured, said wires terminating at each end by a proper connection to the adjacent members of the couplers H and I, so that when coupled up each one of said three wires extends independently of the others from one end of the train to the other, said wires be-

ing insulated from each other in the couplers when connected. Hence, as indicated in Fig. 1, wire 1 runs from one pole of the battery F to the opposite pole of battery G, wire 2 runs from the other pole of battery F to the push-button *a* in the engine and from the adjacent contact-point *b* to the bell E in the caboose and from said bell to the opposite pole of battery G, and wire 3 runs from wire 2 in the engine to the bell D and from said bell D to the contact-point *d* in the caboose and from the adjacent push-button *c* to wire 2 in the caboose. It will thus be seen that when our device is coupled up, as shown in Fig. 1, the circuit is open, but that the operator in the engine can signal the caboose and ring bell E in the latter by pressing push-button *a* against contact-point *b*, which closes that circuit, and that the operator in the caboose can signal the engine and ring the engine-bell D by pressing push-button *c* against contact-point *d*, thus closing the circuit, and it is obvious that any other signals can be used in place of or in addition to the electric bells indicated and that telephones may be employed at the points D E, if desired. J K indicate switches of any preferred construction, one in the engine and one in the caboose, so that all three wires at either point may be disconnected at any time, as desired—for example, when switching or making up the train, as hereinafter explained.

Referring now especially to Figs. 2 to 5, we will next describe our electric coupler, which forms a most important part of our present invention. This coupler consists of two members H and I, one member being the counterpart of the other, and each member comprises a block *h* or *i*, of suitable insulating material, such as fiber, recessed or bored out to receive the operative parts and inclosed in a suitable casing, preferably of metal. At their meeting ends each member is reduced one-half in thickness, so that when coupled their upper and lower surfaces will be flush with each other, and at their outer ends each member is provided with a bail *l*, mounted on a journal *f*, extending transversely through said member, whereby each member may be suspended from a relief-chain *g*, secured to the end of the car, coach, engine, or caboose to take

the strain off the wires 1 2 3 in the coupler, making said chains *g* do the pulling in place of the wires in uncoupling, as hereinafter explained. In practice the couplers extend diagonally between adjacent ends of cars just beneath and parallel with the air-brake couplings for greater convenience, and hence the said relief-chains would be similarly attached at diagonally opposite points.

Each fiber block *h* and *i* is provided with an upper and lower set of three holes longitudinally therethrough, the upper holes in block *h* being lettered *j j j* in Fig. 3 and one of the lower holes being shown in Fig. 2 and marked *k*, said two sets of holes being connected at the outer end of said block by vertical holes *m m m*, said connected holes being for the reception of the double pins *n o p*, the part *n*, which extends nearly through the hole *j*, being secured in place by a screw *q*, whose head in the form shown in Fig. 2 is below the metallic casing of the block *h* to secure insulation therefrom. Beyond this point the part *n* is tubular and centrally open on its top or outer surface, as shown at *r*, for the reception of a spiral spring *s*, said spring surrounding a spindle *t*, projecting from the end of the tube nearest the screw *q*, while beyond this open part the tube *n* carries a sliding rod *u*, having an upward projection *v* at the end next the spring *s* and preferably a short spindle *w* projecting within said spring toward the other spindle *t*. The upper part of the block *h* is cut away above the three holes *j j j*, and a transverse metallic plate *L* is secured across the block at one end of said cut-away portion, said plate having an inner angular flange *x*, against which the described projections *v* of the sliding rods *u* make contact at certain times, as hereinafter explained, and the described cut-away space is filled in by a plate *M*, of fiber or other insulating material, which is cut out on its under side to afford room for a limited play of the said projections *v*. The opposite ends of the sliding rods *u* are formed with recesses *y* therein. The parts *p* of the described double pins are received in the described holes *k* and terminate in pointed ends *z*. The parts *p* are shorter than the tubular parts *n*, and the connecting parts *o* have secured thereto the non-insulated ends of the wires 1 2 3. This description of the block *h* and its attachments, holes, double pins, &c., applies equally to the block *i*, except that as this latter block is in a reversed position the relative terms of "upper" and "lower" or "above" and "below" should be necessarily reversed; but the parts just described are marked with the same reference-letters in block *i* as in block *h*.

As shown in the drawings, the described metallic casings of the blocks are secured thereto by suitable screws, and for convenience of access the said casings may be cut away at the points where the plates *M* are inserted, cover-pieces *N* being applied to complete the exterior casings here and secured

by screws, as shown, and similarly end pieces *O*, perforated for the passage therethrough of the insulated wires 1 2 3, are slipped to place over the ends of the members *H I* and screwed thereto. The details of the casing are unimportant, and, if desired, pieces of fiber or other insulating material may be applied at each end of the blocks *h i*, said pieces being properly perforated to match the perforations in the ends of the blocks, as indicated by the inner end pieces *P P*. When the two members *H I* are coupled together, they are held by the engagement of an inward projection *Q* on the free end of a spring-tongue *R* on one member within a depression *S* formed in the casing of the other member, each member carrying one tongue and each member having one depression, the said tongue *R* passing through guard-loops *T*, as shown.

When the members *H I* are coupled together, as shown best in Fig. 2, the pointed ends *z* of the parts *p* of the double pins in one member enter the recesses *y* in the ends of the sliding rods *u* in the tubular parts *n* of the double pins in the other member and push said sliding rods *u* back within the tubular portions of the parts *n* against the force of the spiral springs *s*, thus forcing back the upward projections *v* on said sliding rods away from contact with the flange *x* of the metallic plate *L*. Thus, as heretofore stated, each wire 1, 2, and 3 is independently and continuously connected from one end of the train to the other, and each wire when the members *H I* are thus coupled together is completely insulated from the other wires, the double pins *n o p* and sliding rods *u* forming the metallic links between the ends of the wires. In this connected condition the operator at either end of the train can signal the operator at the opposite end of the train at any time in the manner already described.

As clearly stated, the two members *H I* of each of the electric couplers are held together by the engagement of the tongues *R Q* on each member within the depressions *S* in the casings of the other member, and this will hold said members firmly together in the ordinary travel of the train; but should said train break in two at any point, then as the two parts of the train separate the described relief-chains *g g* on the adjacent ends of the cars or coaches thus separated (which chains are shorter than the adjacent ends of the wires 1 2 3) will pull each on its attached member of the coupler and draw said member apart, so that each will simply hang down on its relief-chain *g* without any disturbance of the wires 1 2 3 connected to each member, and the moment that the said members *H I* separate the springs *s s s* will force the sliding rods *u u u* forward, so that the projections *v v v* on said rods will make contact with the flange *x* of the metallic plate *L* in each member, thus closing the circuit and simultaneously ringing the bells at each end of the train, (which bells will continue to ring

until the circuit is broken by the switches J and K,) and this ringing will at once notify those in the engine and caboose that the train has broken in two. In making up trains, switching, and coupling and uncoupling cars this ringing of the bells would be of course a nuisance; but this is readily obviated by means of the described switches J K, which are moved to disconnect the wires in the engine and caboose until the train is completely made up or when a car is to be uncoupled, after which the switches are reversed and the wires on the entire train are connected, as first described, ready for signaling from end to end of the train and for sounding an alarm in the event of the accidental breaking in two of said train. It is obvious that, if desired, each or any coach or car may be similarly provided with the batteries and bells or other signals or telephones by making the proper connections to the three wires secured to the said coach or car; but in the case of freight-trains it would be only necessary to thus equip the engine and caboose, as already stated.

In Fig. 6 we have shown a slight modification, whereby the screws *q* may be utilized for testing the coupler H I. In said figure it will be noticed that the said screw *q*, instead of having its head below the metallic casing of the block *h*, is outside and above the same, the said casing and cover-piece N being perforated to allow the shank of said screw to pass therethrough without contact, and beneath the head of the screw there is a washer U of insulating material. The screw *q* in the block *i* of member I would be similarly arranged. By this arrangement the heads of the screws *q q* may be utilized as testing-plugs, and in order to ascertain if the coupler is in order it is only necessary to connect an electric bell in circuit with the two screw-heads and then if the bell rings the coupler is in perfect order; but otherwise this test would show that the coupler was out of order.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an electric signal and alarm device, the combination of two separable electric coupler members, each containing a transverse contact-plate, a series of double pins, connected with the signal-wires, and having

arms of unequal length, and a spring-controlled slide connected to the longer arm of each double pin and provided with a contact-lug, whereby when the two coupler members are brought together, the shorter arm of each double pin in one member will push back the slide connected to the longer arm of the adjacent double pin in the other member, and carry the contact-lug in said slide away from engagement with the adjacent contact-plate, against the force of the slide-spring, and whereby the said lugs and plates are forced into contact by the said springs, whenever the two members of the coupler are separated.

2. In an electric signal and alarm device for railway-trains, the combination of two separable electric coupler members, each comprising a block of insulating material and enclosing casing with catches for holding said two members together, said members being shouldered or offset at their meeting edges, and provided with upper and lower series of holes extending longitudinally therethrough; series of double pins, connected with the signal-wires, and having arms of unequal length fitting in said holes, the longer arm of each pin comprising a slotted tube; spring-controlled sliding rods in each tube, the inner ends of said rods having contact-lugs projecting therefrom through said slots; transverse metallic contact-plates arranged above said tubes; and the shorter arm of each double pin engaging with the outer ends of said sliding rods, whereby, when the two members are brought together, the said sliding rods are pushed back, against the force of the springs, and the contact-lugs carried away from engagement with the said transverse contact-plates, and whereby the said lugs and plates are forced into contact by the said springs, whenever the two members of the coupler are separated.

In testimony that we claim the foregoing we have hereunto set our hands, at Oshkosh, in the county of Winnebago and State of Wisconsin, in the presence of two witnesses.

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