No. 709,746.

Patented Sept. 23, 1902.

W. D. CLOPTON.

TRAIN SIGNALING APPARATUS.

(Application filed Jan. 23, 1902.)

(No Model.)

3 Sheets—Sheet 1.

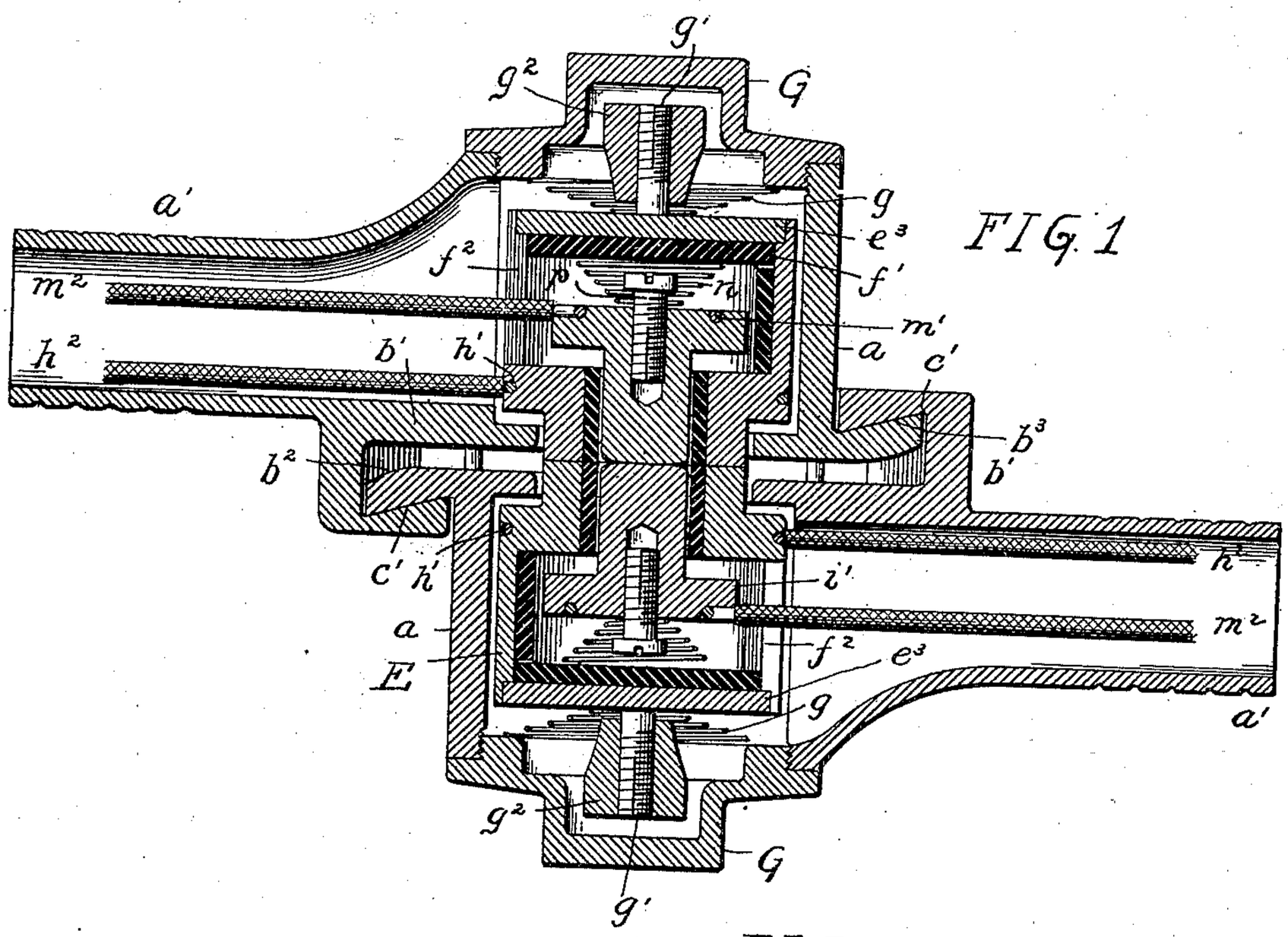

FIG. 1

FIG. 2

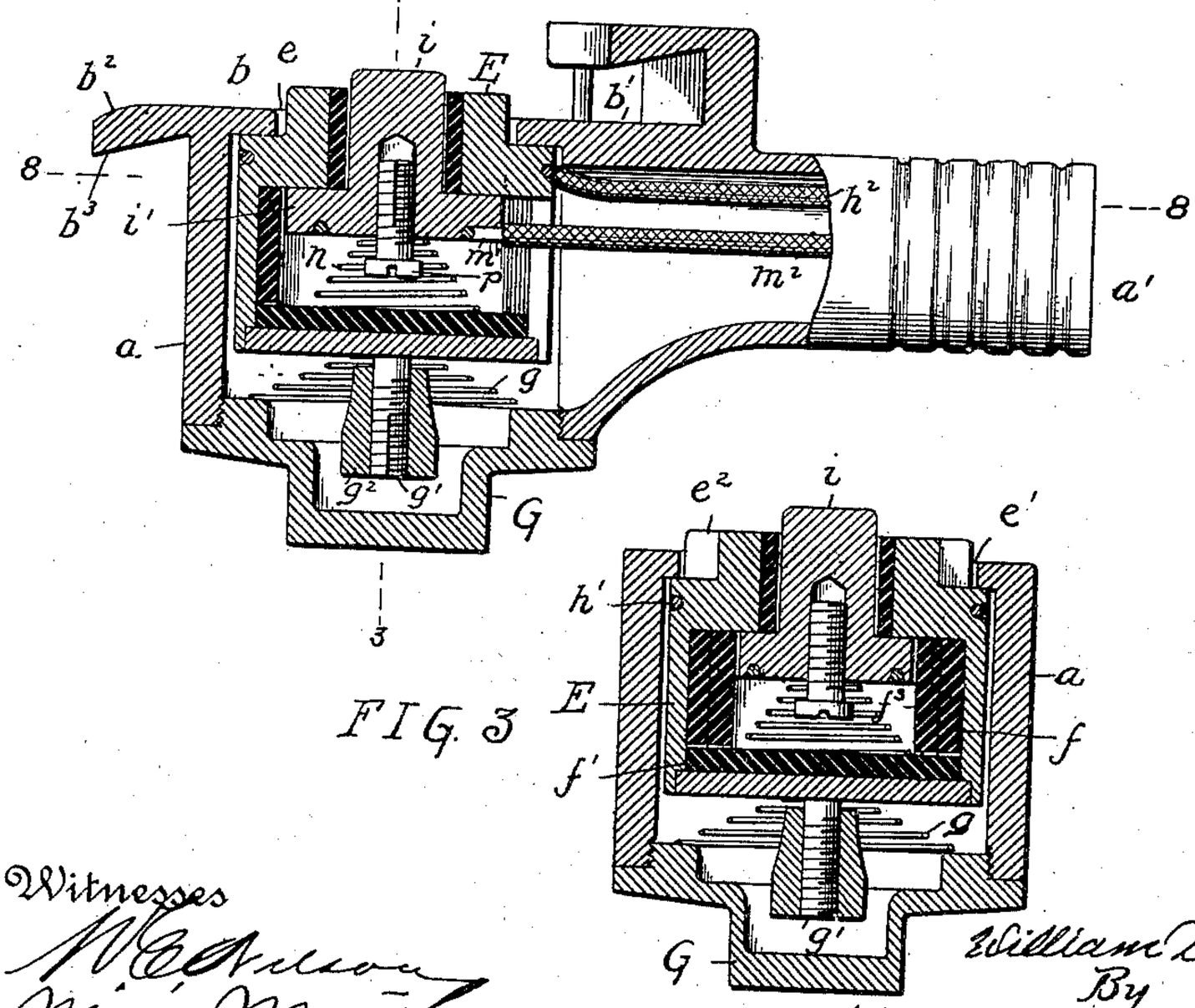

FIG. 3

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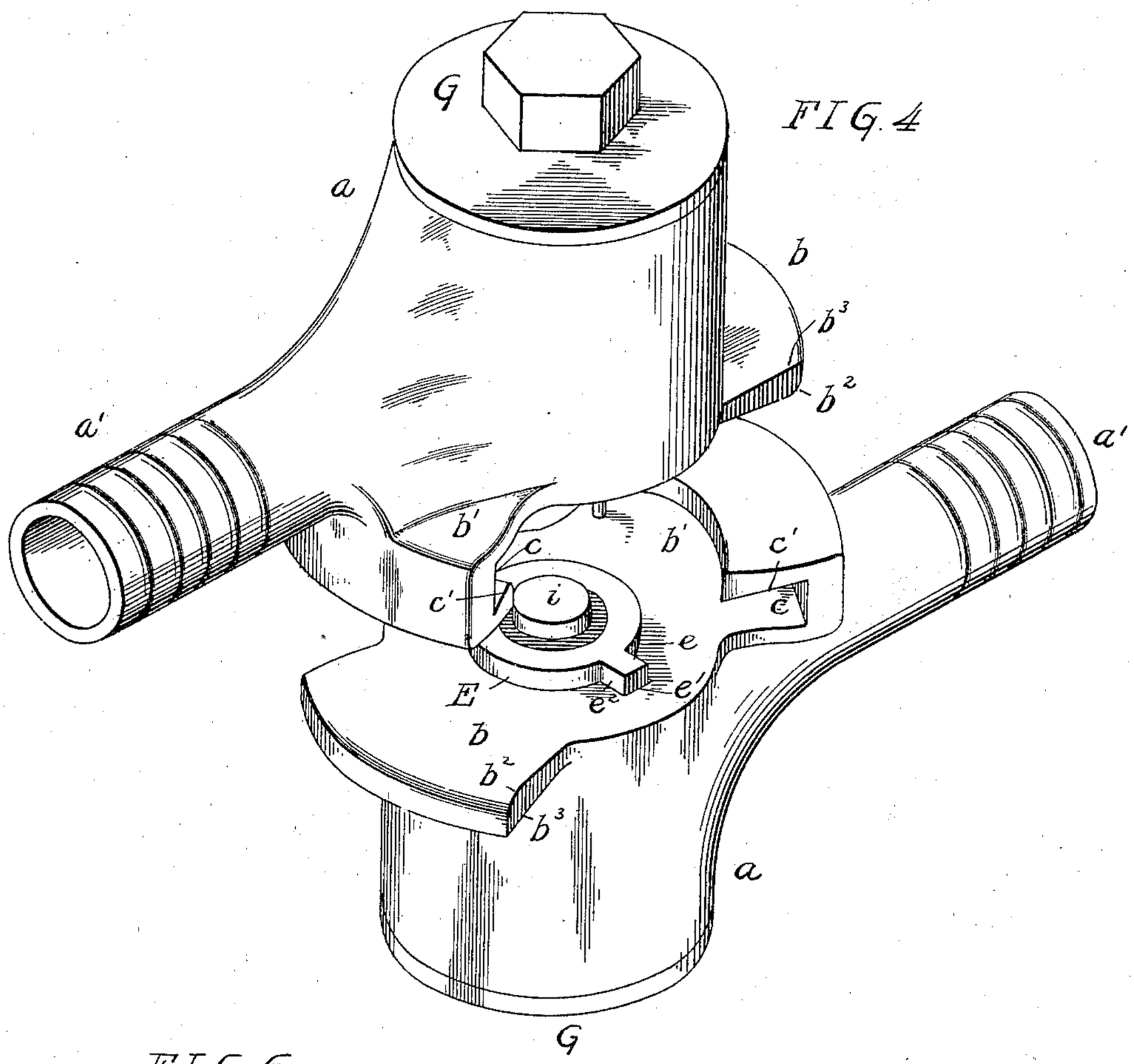

FIG. 4

FIG. 6

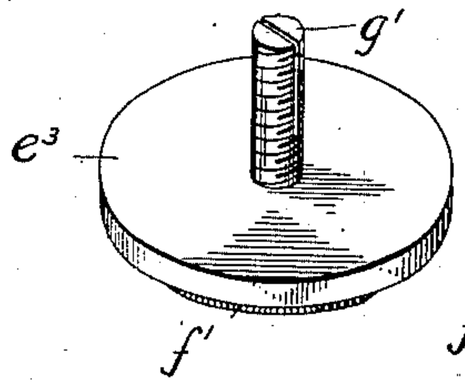

FIG. 7

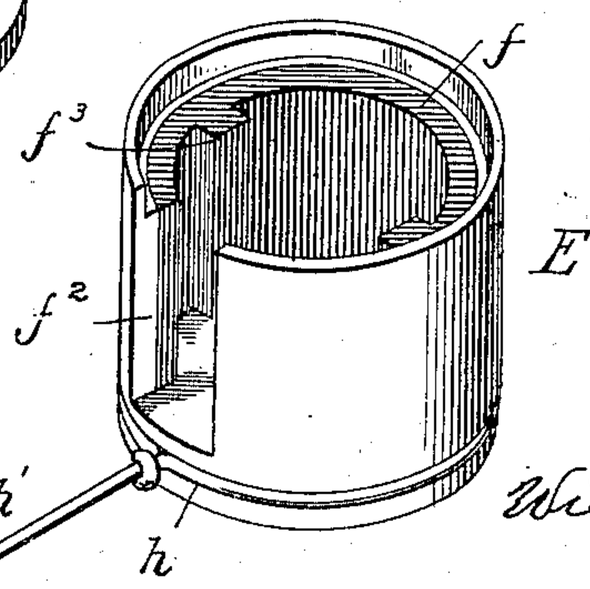

FIG. 5

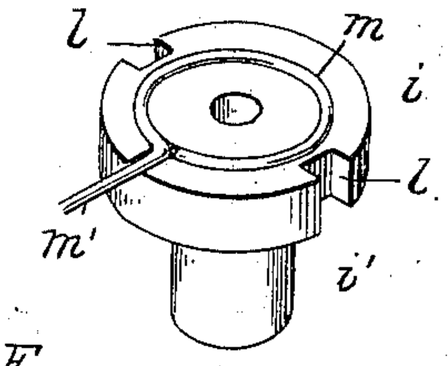

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FIG. 9

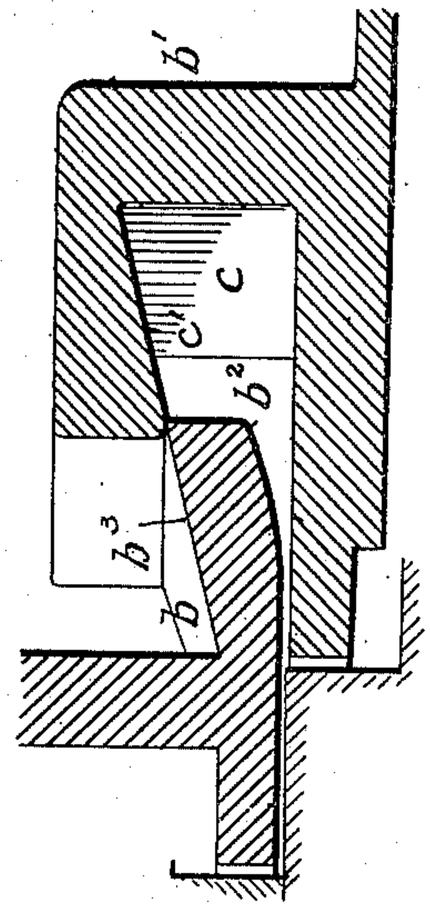


FIG. 8

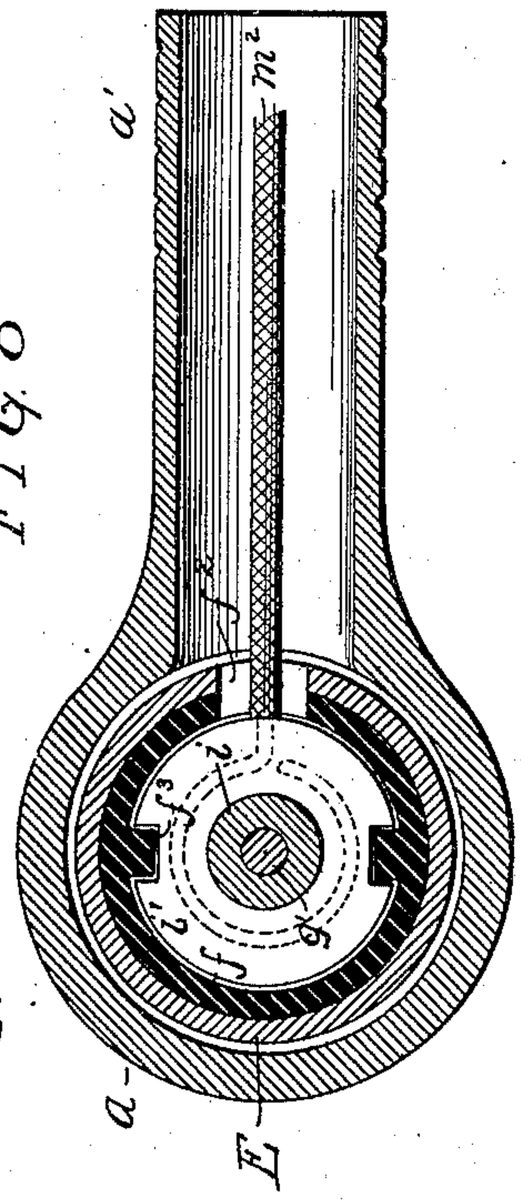
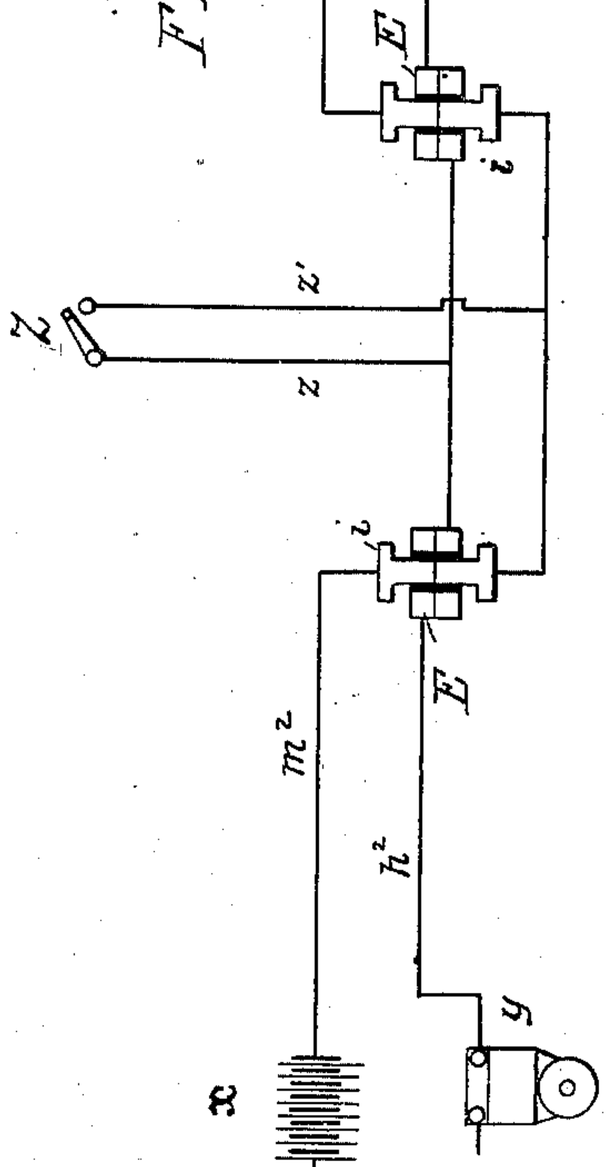


FIG. 10



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UNITED STATES PATENT OFFICE.

WILLIAM D. CLOPTON, OF LEWISBURG, WEST VIRGINIA.

TRAIN SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 709,746, dated September 23, 1902.

Application filed January 23, 1902. Serial No. 90,879. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. CLOPTON, a citizen of the United States, residing at Lewisburg, in the county of Greenbrier and State of West Virginia, have invented certain Improvements in Signaling Apparatus for Trains, of which the accompanying drawings and description are a specification.

The object of my invention is to provide for a thorough and complete system of electrical signaling from either end of a railway-train to the opposite end, electric bells being provided at the engine-cab and at the caboose, which may be rung by either the engineer or conductor in accordance with any predetermined code or, on passenger trains, from any car on a train.

A further object is to provide for automatically closing the circuits and ringing the bells at both ends of the train in case the train parts, the circuits remaining closed until the train is again connected or the current is shut off.

In the accompanying drawings, Figure 1 is a sectional elevation of a coupling made in accordance with my invention and employed between the cars of the train to establish the necessary electrical connections. Fig. 2 is a similar view of one of the coupling-sections with the parts in the position which they assume when the coupling-sections are detached. Fig. 3 is a transverse sectional elevation of the same on the line 3 3, Fig. 2. Fig. 4 is a perspective view of the coupling members detached. Figs. 5, 6, and 7 are perspective views of some of the parts of the coupling. Fig. 8 is a sectional plan view of one of the coupling members on the line 8 8, Fig. 2. Fig. 9 is an enlarged view illustrating the movement of the parts of the coupling in separating under strain, and Fig. 10 is a diagram of the signaling system.

Referring first to the coupling structure, each section is an exact counterpart of the other, so that a detailed description of one will suffice.

The casing A is made of cast or malleable iron and comprises a cylindrical portion a, from one side of which extends a tubular shank a' for attachment to a rubber hose, of any desired character, leading from end to end of each car. At one end of the cylindrical portion a is a plate b b', the ends of which are curved in lines concentric with the cylinder and approximately segmental in form. The plate b at its outer end has a rounded face b^2 and an inclined face b^3. The plate b' at its outer end is so shaped as to form a segmental groove c, having an upper inclined face c', which engages with and holds the inclined face b^2 of a mating coupling-section. It will be noted that the width of the groove is greater than the thickness of the end of the plate b, so that the two sections of a coupling may part without damage to either under undue longitudinal strain, such as might be exerted by the parting of a train of cars, as shown, for instance, in Fig. 9. To prevent the sections from twisting or turning apart from their own weight, pins d are placed at the ends of the grooves for the sides of the plates b to rest against, or the ends of the grooves may be entirely filled by the casting metal.

The casing A is provided with an opening e and slots e', and within said casing is a cup E, of copper or other conducting material, having a reduced end portion adapted to said opening and provided also with small ribs e^2, which fit within the slots e' and prevent the turning of said cup. The cup is lined on its circular face with insulation f, and its top is closed by a cap-piece e^3, having an insulating-disk f' on its lower surface, so that the inner face of the cup, save only the bottom, is covered with insulating material. In one side of the cup, facing the tubular shank a', is an opening f^2 for the passage of a current-conducting wire. The top of the casing is closed by a screw-cap G, and between this cap and the cup-lid e^3 is a spiral spring g, which at all times tends to thrust the cup out through the opening e, the strength of this spring being sufficient to keep the end of the cup in contact when two coupling members are joined with the end of the similar cup in the opposite member and also to force the inclined faces b^3 and c' into intimate contact, and so hold the members together. On the top of the cap e^3 is a screw-threaded stud g', split at its threaded end in order to bind more closely in the threads of a nut g^2, which it carries, the nut

being adjustable to prevent by its contact with the cap G any undue inward movement of the cup E.

Extending around the cup E is a groove h, in which is embedded a copper wire h', connected to a flexible covered conductor h^2, leading through the shank a' to the rubber connecting-hose and thence to the coupling at the opposite end of the car, where it is connected in similar manner. Extending through an opening in the bottom of the cup is a copper pin i, having an enlarged head or disk i' within the cup, contact between the sides of the pin and opening being prevented by the insulating material k, with which said opening is lined. The head i' is provided with notches or grooves l at each side, and into these fit vertical ribs f^3, formed of the insulating material with which the cup is lined, so that the pin will be prevented from turning.

In the head i' is a groove m, in which is embedded a copper wire m', connected to a flexible covered conductor m^2, leading out through the shank a' to the rubber hose and connected in similar manner to the similar head in the coupling member at the opposite end of the car.

Between the head i' and the disk f' is a spiral spring n, which acts to force the pin i out through the opening in the cup, its complete projection when the coupling members are separated, as in Fig. 2, causing the lower face of the head i' and the bottom of the cup to come into contact and complete a circuit through the conductors h^2 m^2. The movement of the pin is regulated by a screw p, preferably split at its threaded end, which comes into contact with disk f' and prevents undue inward movement of said pin.

It will be noted on reference to Figs. 2 and 3 that when the coupling members are separated the pin i projects much farther than the end of the cup E, this being for the purpose of insuring good metallic and electrical contact between the pins of coupled sections, so that a continuous current may flow through the various wire sections m^2 from end to end of the train. In similar manner the contact of similar cups E on coupled sections insures the continuity of the conductor h^2 from end to end of the train.

When the couplings are all connected, there are two independent lines extending through them, one line connected with batteries x, Fig. 10, and the other with signal-bells y. The section of the coupling at the rear end of the train is prevented from connecting the two lines by being hooked up with face side against a plate of rubber or other dielectric material, so that the two copper contacts E and i are pressed back and apart in the same manner as when two sections of a coupling are together. When the train parts, a longitudinal strain is exerted on the members of the coupling to an extent sufficient to slide the inclined faces b^3 c' on each other and depress the springs g n until the members separate. The springs then act to project the cup E and the pin i, the latter being forced into electrical contact with the bottom of the cup and connecting the line-wires h^2 m^2, causing a current to flow through them and act on the electromagnetic bells or other alarms y at both the engine-cab and the caboose, the bells continuing to ring until the coupling is again established or the current turned off. In passenger-trains wires z z' may be run from the line-wires to push-buttons or switches z in the various cars, so that the conductor of the train through a prearranged code may signal to the engineer, or, if desired, the cars or one of them and the cab may be provided with telephone instruments connected to the line-wires. The brakes of a train may be operated by and through these couplings by electric power and operated from either end of the train or when the train is parted from either the engine-cab or caboose or arranged to operate automatically as soon as the sections of the couplings part. To operate the brakes will of course require a storage battery or other source of electrical energy of greater power than is used for mere signaling purposes.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the class specified, a pair of coupling members each having two contact-blocks connected to line-wires and separated from each other when the coupling members are connected, and means for automatically moving said blocks into contact with each other to complete a circuit between the line-wires when the coupling members are separated.

2. A slip-coupling for connecting the wires of an electric circuit between the cars of a train, said coupling comprising two similarly-shaped, interfitting sections, each having two contact-blocks forming the terminals of an electric circuit and springs carried by each section tending to cause the parts to lock together laterally, and when so locked to separate the two blocks of each section, the two said sections being free to separate longitudinally under a tensional strain and the springs serving to connect said blocks and establish a circuit when the sections are separated, substantially as specified.

3. A coupling for connecting the wires of an electric circuit between the cars of a train said coupling comprising two similarly-shaped interfitting sections, each section having an outer shell or casing, two metallic contacts situated within said casing and electrically connected to the line-wires of the circuit, and springs acting in said contacts and tending to connect the same when the coupling-sections are separated, substantially as specified.

4. A coupling-section comprising a casing, having an integral ribbed and grooved portion for connection with the similar portions

of the mating section, metallic contact-plates within and insulated from said casing, and springs acting on said plates to effect the lateral locking of the sections and tending to connect said plates when the sections are separated, substantially as specified.

5. A coupling member comprising an outer shell or casing having an opening at one end, a cup fitting in said casing and partly projecting through said opening, a spring tending to thrust said cup outwardly, a pin located within said cup and having its end projecting through an opening in the same, a spring tending to force said pin through said opening, and insulating material within the cup to prevent contact between the sides of the same and the pin, substantially as specified.

6. The combination in a coupling member, of the casing, an insulated cup within the casing and forming part of an electric circuit, a spring-projected pin within and partly insulated from said cup, and forming part of an electric circuit, said cup and pin being both projected through an opening in the casing, but at different distances from the surface of the same, substantially as specified.

7. A coupling member comprising a casing, having an end opening, a cup fitting within the casing and partly projecting through the opening, and electrical conductor connected to said cup, a pin within and insulated from said cup, an electrical conductor connected to said pin, and a spring tending to force the pin and cup into contact to complete a circuit between said conductors, substantially as specified.

8. A coupling member comprising a casing *a*, a cup E within the same, a spring tending to force said cup through an opening in the casing, insulation *f*, *f'* in said cup, a headed pin *i*, *i'* within the cup and projecting partly through an insulated opening in the same, a spring *n* between the top of the pin and the cup, and electrical conductors connected to said cup and pin, substantially as specified.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses, this 1st day of June, 1901.

WILLIAM D. CLOPTON.

Witnesses:
M. E. NELSON,
MASON MATHEWS.