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G. THOMPSON.
BRIDGING CIRCUITS FOR ELECTRIC CIRCUITS.
APPLICATION FILED AUG. 2, 1902.

Fig. 1.

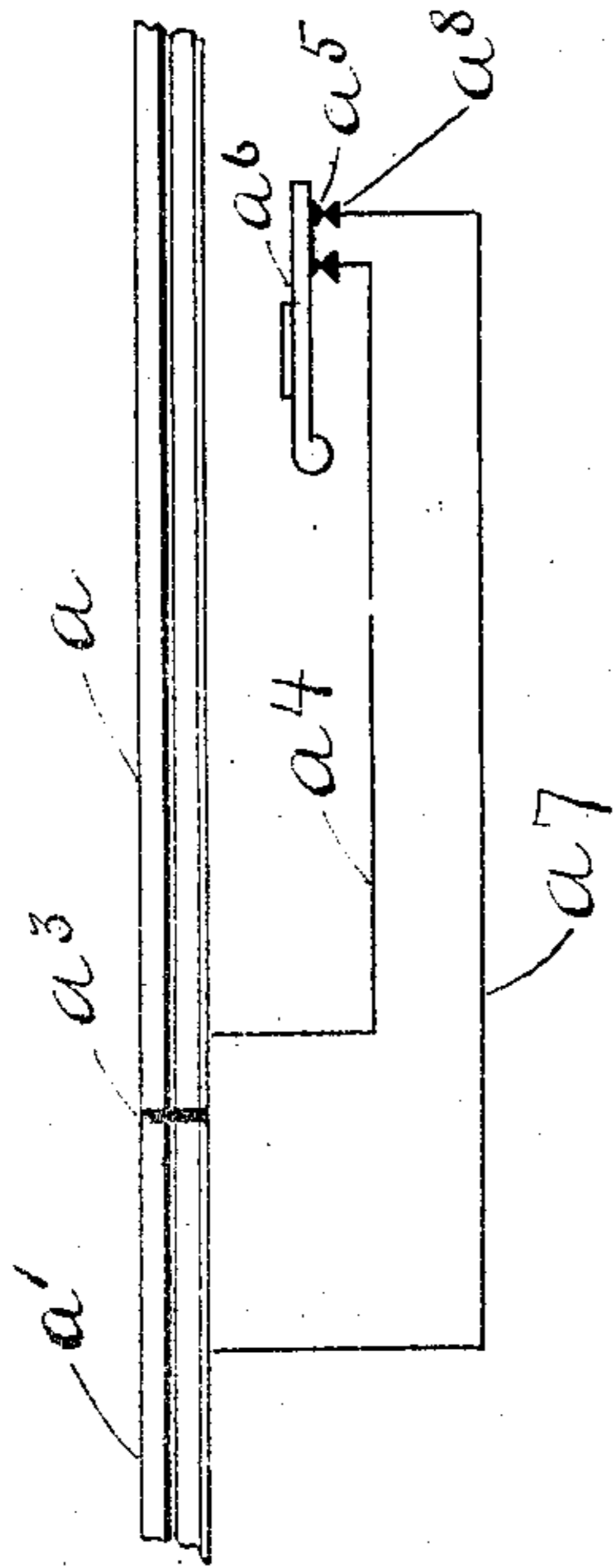
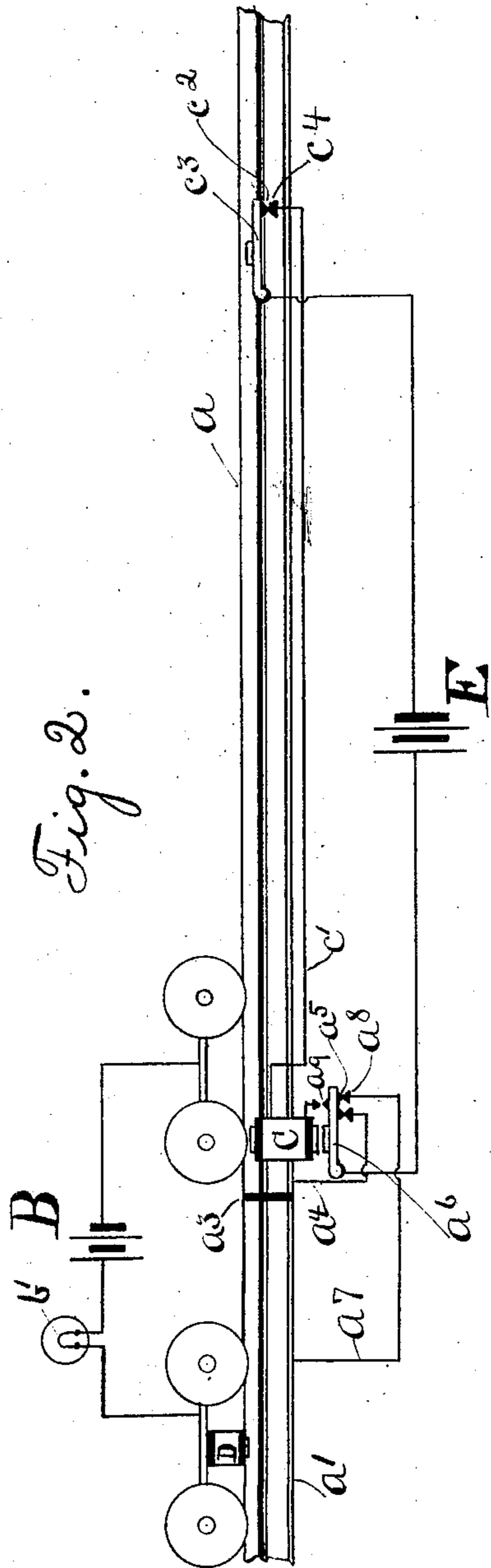


Fig. 2.



Witnesses

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BRIDGING CIRCUITS FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 785,445, dated March 21, 1905.

Application filed August 2, 1902. Serial No. 118,069.

To all whom it may concern:

Be it known that I, GUION THOMPSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented new and useful Interruptible Bridging Circuits for Electric Circuits, of which the following is a specification.

My invention relates to interruptible bridging circuits for electric currents, and has for its object the provision of relatively stationary means located upon the route of a movable conveyance which will normally be adapted to complete a circuit partially established upon said moving conveyance and including a source of electricity carried thereby when said conveyance brings the partial circuit established thereon into communication with said relatively stationary partial circuit.

It also has for a further object the provision of means whereby under predetermined conditions said stationary partial circuit may be temporarily interrupted.

With these and other objects in view it consists in the combination of two alined stationary conductors of electricity separated or insulated from each other at their abutting ends, a series of intermediate conductors of electricity extending from one of said alined conductors to the other and including a relatively movable element, and means for controlling the position of such movable element.

It also consists of certain other constructions, combinations, and arrangements of parts as will be hereinafter described and claimed.

In the drawings, Figure 1 is a diagram of my said invention. Fig. 2 is a diagram of my said invention, showing for the purpose of illustrating one of the utilities of the same a conveyance and a partial circuit established thereon and showing, further, a suitable means, partly on said conveyance and partly stationary on said route, for operating the relatively movable element forming part of my said invention.

In the drawings, a and a' are alined conductors of electricity, preferably constituting sections of a railway-track rail separated at their abutting ends, preferably by an insulator a^3 .

Extending from said conductor a to said conductor a' is a series of conductors of electricity, including a conductor a^4 , connected at one end to said conductor a and at its opposite end connected to or contacting with a double contact a^5 , carried by a movable support a^6 , preferably constituting an armature, which support may itself, if desired, form an electricity-conducting element of said series intervening between and connected with said conductor a^4 and said contact a^5 , respectively. Extending from said conductor a' to the vicinity of said contact a^5 is a conductor a^7 , connected at one end to said conductor a' and provided at its free end with a suitable contact a^8 , normally contacting with said contact a^5 .

The operation of my said invention is as follows: When one of the poles of a source of electricity is brought by intermediate electricity-conducting means into communication with one of said stationary conductors and the other pole thereof has been brought by relatively individual intermediate electricity-conducting means into communication with the other of said stationary conductors, my invention will normally complete a circuit from one to the other of said poles, and under predetermined conditions, including the breaking of the contactual relation normally existing between said contacts a^5 and a^7 , will interrupt such interpolar circuit.

The utilities of my said invention are manifold. It will, however, be sufficient to give but one illustration, for which purpose I have shown in Fig. 2 of said drawings my invention incorporated in a railway signal system comprising track-rail sections a and a' and insulator a^3 , a conveyance moving thereon and in part forming a partial circuit, including a source of electricity B , and a safety signal-lamp b' , carried thereby, the opposite poles of which source communicate, respectively, through intermediate means, including said lamp, with the fore and aft relatively insulated trucks forming part of said conveyance, and in cooperation with any single metallic section of said track with which the wheels of said respective trucks mutually contact form a

complete circuit, which will, subject to the operations of my said invention, be interrupted, causing the extinction of said signal-light when said forward truck rests upon a section a of said track and said rear truck rests upon another section, a' , thereof, separated by said insulator a^3 , which system further comprises a means for operating said movable element or contact, which may consist, as shown in said Fig. 2, of a stationary electromagnet C, located on said route in a position in which it is adapted when energized to attract the armature constituting said support, and thereby to break the contact between said movable contact a^5 and said contact a^8 and included in a normally open stationary circuit located on said route, including a local source of electricity E, the coil of said magnet C, a contact upon the free end of said coil c' , a contact a^9 upon said armature, a contact c^2 , supported by an armature c^3 farther along said route, a contact c^4 , adapted to normally contact with said contact c^2 , and a transient magnet or electromagnet D, adapted to pass over said magnet C to temporarily energize the same, the operation of which system, including my said invention, is as follows: First, when a conveyance equipped as shown in said diagram stands or moves wholly on either of said sections a or a' or on any other single metallic section of said track the partial circuit established thereon is closed by said section. Second, when the forward truck of said conveyance rests on said section a and the rear truck thereof rests on said section a' the partial circuit established on said conveyance is normally closed by my said invention. Third, when said conveyance passes over said electromagnet C the magnet D upon said conveyance temporarily energizes the core of said magnet C, which attracts said armature a^6 , and thereby breaks the contact between the contact a^5 , carried thereby, and said contact a^8 , thus temporarily interrupting the bridging circuit comprising my said invention, at the same time making contact of said contact a^9 with said contact c' , thereby closing said local circuit, including the coil of said electromagnet C, and maintaining the magnetic energy of the coil thereof and continuing the condition thus established. If now a following and similarly-equipped conveyance arrive in a position with its forward truck resting on said section a and its rear truck resting on said section a' , the circuit partially established thereon will be interrupted and the light of said signal-lamp extinguished, warning the engineer that another train has passed. When, however, said preceding conveyance reaches said armature c^3 , said magnet D on said conveyance attracts said armature c^3 , breaking the contact of said contact c^2 with said contact c^4 and interrupting the local circuit, including the coil of said

electromagnet C, thus deenergizing the same and permitting said armature a^6 to drop and restore the contact between said contacts a^5 and a^8 , closing the partial circuit comprising my said invention. When said preceding conveyance has passed beyond said armature c^3 , it falls back to its normal position and makes contact between contacts c^2 and c^4 , thus restoring the system to its normal condition. It is obvious that the partial circuit on said conveyance may be modified or extended and may include other lights to be operated or secondary circuits or governing means or other constructions and that said local circuit may also be enlarged, modified, or extended without impairing in any manner or degree the operation and utility of my said invention, which may also be arranged to govern other circuits or within its scope be wholly or partly incorporated therein.

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

1. The combination of a normally open circuit, comprising a source of electricity, an electromagnet and a normally open contact; an armature for said magnet adapted when operated to close said contact; a partial circuit comprising a normally closed contact governed by said armature, and normally open contacts including adjoining sections of a railway-rail insulated from each other at their opposing ends, substantially as described.

2. The combination of a normally open electric circuit, comprising a source of electricity, an electromagnet and a normally open contact; an armature for said magnet adapted when operated to close said contact; a partial circuit comprising a normally closed contact, governed by said armature, and normally open contacts comprising two adjoining and aligned sections of a railway-rail insulated from each other at their opposing ends; a conveyance; a partial circuit carried by said conveyance and comprising a source of electricity and conductors of electricity connected with the opposite poles thereof and adapted to be brought by said conveyance into temporary circuitual communication with the rail-contacts of the first said partial circuit, substantially as described.

3. The combination of a normally open electric circuit, comprising a source of electricity, an electromagnet and a normally open contact; an armature for said magnet adapted when operated to close said contact; a partial circuit comprising a normally closed contact, governed by said armature, and normally open contacts comprising two adjoining and aligned sections of a railway-rail insulated from each other at their opposing ends; a conveyance; a partial circuit carried by said conveyance and comprising a source of electricity and conductors of electricity connected with

the opposite poles thereof and adapted to be brought by said conveyance into temporary circuital communication with the rail-contacts of the first said partial circuit; means carried
5 by said conveyance adapted to momentarily operate said armature after the circuital communication established between the partial circuit carried by said conveyance and the first said partial circuit has been terminated,
10 substantially as described.

4. The combination of a normally open electric circuit, comprising a source of electricity, an electromagnet, a normally open contact and a distant normally closed contact; a lever adapted
15 in operation to open said normally closed contact; an armature for said electromagnet adapted when operated to close said normally open contact; a partial circuit, comprising a normally closed contact, governed by said
20 armature, and normally open contacts including two adjoining sections of a railway-rail, electrically insulated from each other at their opposing ends; a conveyance; a partial circuit carried by said conveyance and including
25 a source of electricity and conductors of electricity connected to the opposite poles thereof and adapted to be brought by said conveyance into temporary circuital communication with the normally open contacts of the first said
30 partial circuit; means carried by said conveyance adapted to momentarily operate said armature after the circuital communication between the first said partial circuit and the second said partial circuit has ceased, and

means carried by said conveyance adapted to
35 subsequently operate said lever, substantially as described.

5. The combination of a normally open electric circuit, comprising a source of electricity, the coil of an electromagnet and a normally
40 open circuit-controlling contact; an armature for said magnet adapted when operated to close said contact; a partial circuit, comprising a normally closed circuit-controlling contact, governed by said armature, and normally
45 open circuit-controlling contacts, substantially as described.

6. The combination of a normally open electric circuit comprising a source of electricity, a normally closed circuit-controlling contact,
50 the coil of an electromagnet and a normally open circuit-controlling contact; a lever adapted when operated to open said normally closed contact; an armature for said magnet adapted when operated to close said normally open
55 contact; a partial circuit comprising a normally closed circuit-controlling contact, governed by said armature, and normally open circuit-controlling contacts, substantially as
60 described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUION THOMPSON.

Witnesses:

JAMES T. WATSON,
JNO. D. WATSON.