

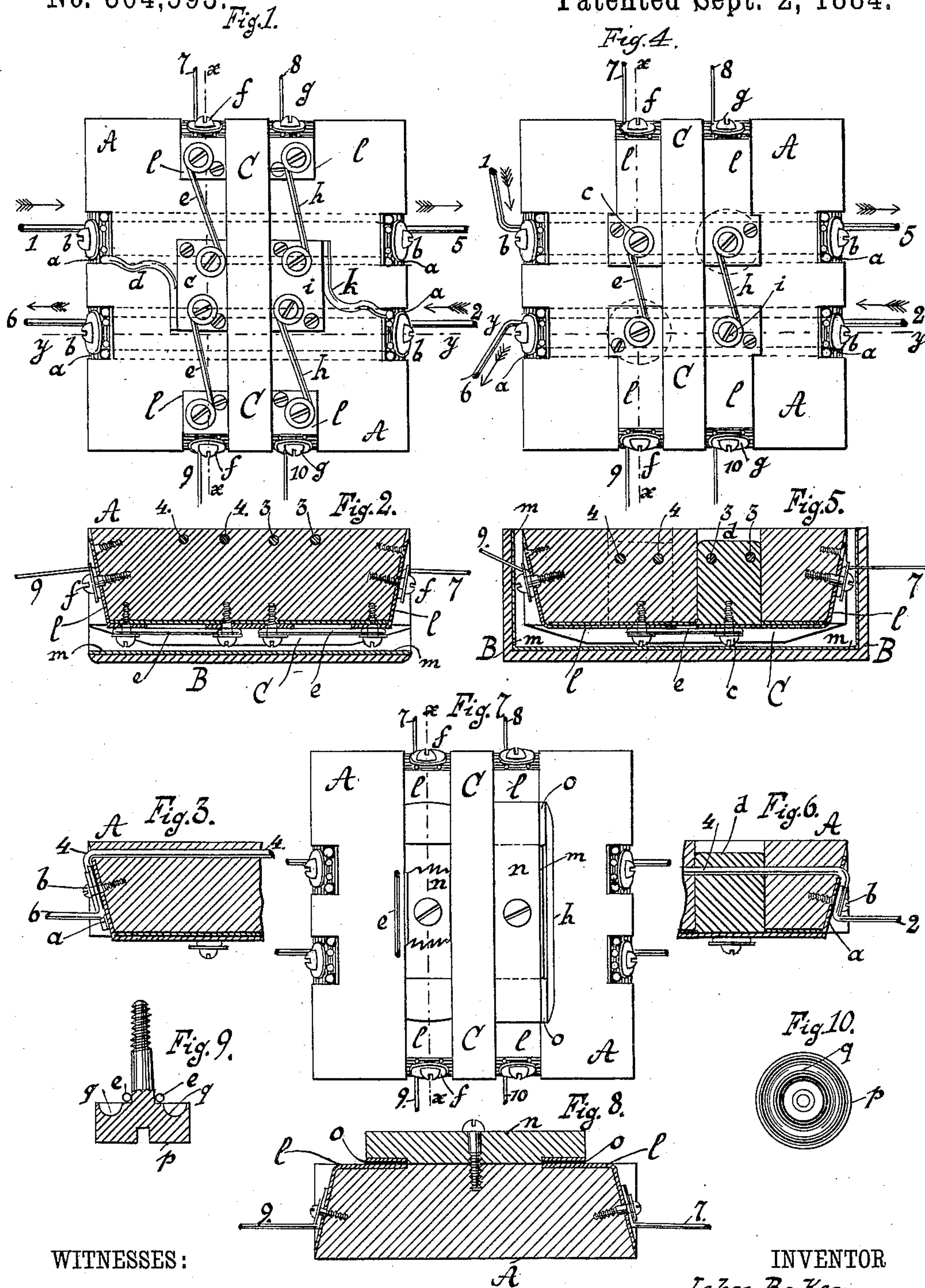
(No Model.)

J. BAKER.

CONNECTION FOR ELECTRIC CIRCUITS.

No. 304,593.

Patented Sept. 2, 1884.



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CONNECTION FOR ELECTRIC CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 304,593, dated September 2,

Application filed February 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN BAKER, a citizen of the United States, residing at Brooklyn, E. D., in the county of Kings and State of New York, have invented new and useful Improvements in Connections for Electric Circuits, of which the following is a specification.

This invention consists in a connection for electric circuits, by which electrical conductors may be made to cross one another without danger of improper electrical connections. The positive and negative conductors of the several circuits are connected, respectively, and may be provided with safety-catches, all as hereinafter more fully described. The device may be provided with a cover or shell.

This invention is illustrated in the accompanying drawings, in which Figure 1 is a plan view of my device. Fig. 2 is a section in the plane $x x$, Fig. 1. Fig. 3 is a section in the plane $y y$, Fig. 1. Fig. 4 shows a plan view of a modification. Fig. 5 is a section in the plane $x x$, Fig. 4. Fig. 6 is a section in the plane $y y$, Fig. 4. Fig. 7 is a plan view of a further modification, parts being broken away. Fig. 8 is a section in the plane $x x$, Fig. 7. The remaining figures will be hereinafter referred to.

Similar letters indicate corresponding parts.

In the drawings, the numbers 1 and 5 indicate the positive or service wires, and the numbers 2 and 6 the negative or return wires.

A is a block of wood or other suitable insulating material. Through the interior of this block pass conductors or wires 3 and 4, the ends of which are shown as being soldered or secured to conductors or plates a , Figs. 3 and 6, which are screwed or attached to the edges of the block A. The wires or conductors 1 and 5 are connected to the wires or conductors 3 by binding-screws b , and by washers, or by any other suitable means, and the wires 2 and 6 are similarly connected to the wires or conductors 4. By this means the current is caused to flow in the direction of the arrows from the wires 1 into the wires 3 and out into the wires or conductors 5, and, returning through the conductors 2, the current flows into the conductors 4, thence into the conductors 6, thus passing through the block A.

The letter c represents a binding-post or other suitable electrical connection, which

rests on the insulating-block A, and is shown as being electrically connected to the wires 3 by a wire, d , or other suitable means, Fig. 1. From this binding-post c the current flows through the wires e into the binding-posts f , (which are formed by screws and washers or other suitable means,) to which are connected positive conductors 7 and 9 of derived or branch circuits. The negative conductors 8 and 10 of the derived or branch circuits are connected to the binding-posts g , (of a similar construction to the binding-posts f .) From these binding-posts g the negative branch currents flow through the conductors h to the binding-post i , which is in electrical connection by a wire or conductor, k , with the conductors or wires 4, which connect with the negative main conductor 6, and which binding-post i resembles in its features and manner of application the binding-post c , connected to the positive main conductors through the conductors 3. The connections between the posts c and f , and between the posts g and i , over the edge of the insulating block A may be made by plates l , of metal or conducting material, which can be readily bent over the edge of the block A.

The conductors e and h may constitute safety-catches, since they can be made of such a degree of conductivity as to readily allow the passage of the amount of current designed for the particular branch 7 and 8, or 9 and 10, but no more. If from any cause an abnormal amount of current large enough to do injury or to cause a waste of energy is diverted through any of the safety wires—as, for example, one of the conductors e —such conductor becomes heated and melts away, breaking the overloaded branch circuit.

When the apparatus is in the position indicated in Fig. 1, the few drops of hot molten metal fall on the block A; and if said block is of wood I prefer to cover the same with some suitable non-combustible material—as, for instance, asbestos—to prevent injury or ignition of the block A and possible damages to the locality in which the connection is situated. The wires e h may also be surrounded or insulated by a non-combustible material, for example, asbestos, thus further guarding against accidents.

When the apparatus is in the position indi-

cated in Fig. 2, so that the safety-catches *e h*, when broken, would be liable to fall, thus doing damage to carpets or furniture in case the device is in a room, I provide a cover or receiver, B, onto which or into which the hot or molten metal of the safety-catch may fall, thus preventing damage.

The receiver B may be made of non-combustible material; or it may be made of wood, pasteboard, or other material, covered or lined with asbestos, *m*, Fig. 2, or other non-combustible substance, to prevent ignition. The cover or receiver B may be made in the shape of an inclosing case or shell lined with asbestos, *m*, or other non-combustible material, as shown in Fig. 5, which case B receives the entire block A. Said case B also serves as a safeguard to the screw-posts. Instead of being directly attached to the block A, the case or cover B may be attached to the wall or ceiling of a building in proximity to the block A.

To insure against any improper electrical connection between the posts *c i* or the plates *l*, a bridge, C, consisting of wood or other non-conducting material, is attached to the block A, to separate said parts. The bridge C, like the block A, may be covered with asbestos or other non-combustible material. It will be noticed that in the construction just described, and shown in Figs. 1, 2, and 3, the connections are entirely outside of the block, the only current flowing through the interior of the block being the main current through the conductors 3 3 and 4 4. The conductors 3 3 are supplemental to one another, and may be replaced by a single larger wire or conductor, as may also the conductors 4 4, if desired.

In the modification of construction shown in Figs. 4, 5, and 6 some of the connections pass through the block A. The figures 1 and 5 and 2 and 6 indicate, respectively, the positive and negative main conductors, and 3 and 4 the positive and negative main conductors within the block, and the Figs. 7 and 9 and 8 and 10 indicate, respectively, positive and negative branch conductors, as described, in connection with Fig. 1. The conductor *d* in this case passes from the conductors 3, through the block A, to the post or connection *e*, Fig. 5, instead of lying outside the block, as in the case of A, Fig. 1. From the post *e* the current passes to the binding-posts *f*, through the conductors 7 and 8 and 9 and 10, to the post or connection *i*, which is electrically connected through the block with the conductors 4, as shown by dotted lines in Fig. 5, thus completing the circuit. The branch currents traverse the safety-catches *e* and *h* in Fig. 4 in the same manner and for the same purpose as already described in connection with Fig. 1. These safety-catches *e* and *h*, Figs. 1 and 4, may be formed by lead wire or other fusible conducting material, and said wires may be clamped in place by screws and washers or other suitable means, so as to be readily removed and replaced. The screws for clamping the safety-wires *e h* in place may be pro-

vided with a head or washer, *p*, having a groove, *q*, into which the end of the safety-wire *e*, (or *h*), which passes around the shank of the screw, may fall when the safety-wire is broken. Said construction of fastening device is shown in Fig. 9 partly in section, and in Fig. 10 in plan view.

In the modification shown in Figs. 7 and 8 the safety-conductors *e* and *h* are carried by strips or blocks *n*, of wood or other non-conducting material, which blocks *n* may be protected by asbestos or other non-combustible material, *m*, as already set forth, in connection with the block A. The strip *n* may be fastened to the block A by a screw or other suitable means, and when thus in place the contact-plates *o* on the strip *n*, to which contact-plates the safety-catches *e h* are connected, come into contact with the plates *l*, leading to the branch conductors. The strips *n* form a ready means for attaching or detaching the safety-wires *e h* to the block A.

The remainder of the device need not be specifically described, as it may be formed similar to that of Fig. 1 or Fig. 4.

By my device grooves or indentations in the block A may be avoided, such grooves being objectionable, as moisture or impurities are liable to settle therein, and an improper electrical contact may be created.

I would also call attention to the fact that by my arrangement of safety-catches some of the branch currents may be thrown out of connection while others still remain in operation. Thus, for example, in Fig. 4, if the safety-conductor *e* is out of operation, the branch current through the conductors 9 and 10 is interrupted, while the branch current through the conductors 7 and 8 still flows from the connection *e* to the post *f*, through the conductors 7 and 8, connection or post *g*, safety-conductor *h*, and connection *i*, to the conductors 4. So if, in the case of Fig. 1, only the safety-wire *e*, nearer the branch conductor 9, is thrown out of operation, the branch current through the conductors 9 and 10 will alone be broken, the current through the branch conductors 7 and 8 being uninterrupted.

I am aware that it is not new to furnish means for enabling a pair of electrical conductors in a house-circuit of an electric-lighting system to cross another pair without danger of improper electrical contact between them, such being set forth in Letters Patent No. 264,299, of September 12, 1882.

I am also aware that it is not new to have in combination with a safety wire or device an inclosing case or shell, such being set forth in United States Letters Patent No. 227,226, of May 4, 1880. By my construction of device I am enabled to avoid having grooves in the surface of the block, the conductors of the main circuit being made to pass through the interior of the block A, as already set forth, and not laid in grooves in the surface of the block, as in the construction of said Patent No. 264,299, where grooves are provided for receiving the

wires of the circuits. I am also enabled by my construction to avoid having connections between the circuits within the block A, as set forth in said Patent No. 264,299, for, as shown in Fig. 1 of this application, the connections between the circuits may be placed without or on the exterior of the block.

I would also call attention to the fact that the wires of the derived circuits, when simply held to the block A by screw-posts *f g* or similar fastenings, may be readily detached and replaced by other wires when it is desired to have wires of different conductivity from those first applied, or when such first wires have become broken or disordered. The wires 1, 5 and 2, 6 of the main current may also be readily detached from the block A and others attached in their places, and in all such attachments and removals of main or branch wires the block A need not be disturbed in its position, thus avoiding damage to the locality where the block A is attached. This is an advantage of having all the attachments on the exterior of the block. This block A may be made of glass, porcelain, steatite, or any other substance which is non-combustible and insulating.

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

1. The combination of crossing electrical circuits, a block of insulating material through the interior of which the wires of the main circuit are passed, and electrical connections between such circuits, substantially as set forth.
2. The combination, with the wires of a main circuit passing through the interior of a block of insulating material and the wires of a derived circuit or circuits therefrom, of means for connecting said main circuit with said derived circuits, substantially as set forth.

3. The combination of crossing electrical circuits, a block of insulating material through the interior of which the wires of the main circuit are passed, and electrical connections between such circuits without the block, substantially as set forth.

4. The combination, with the wires of a main circuit passing through the interior of a block of insulating material and the wires of a derived circuit or circuits therefrom attached to the exterior of said block, of means for connecting said main circuit with said derived circuit, substantially as set forth.

5. The combination, with the wires of a main circuit passing through the interior of a block of insulating material and the wires of derived circuits therefrom, of means for connecting said main circuit with said derived circuits, and removable circuit-breakers controlling the circuits, substantially as set forth.

6. The combination of crossing electrical circuits, a block of insulating material through the interior of which the wires of the main circuit are passed, a case or cover, B, and electrical connections between such circuits, substantially as described.

7. In combination with a safety wire or device, a screw or fastening device provided with a head or washer, *p*, having a groove or recess, *q*, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

JOHN BAKER. [L. S.]

Witnesses:

D. VAN SANTVOORD,
WM. C. HAUFF.