

No. 725,006.

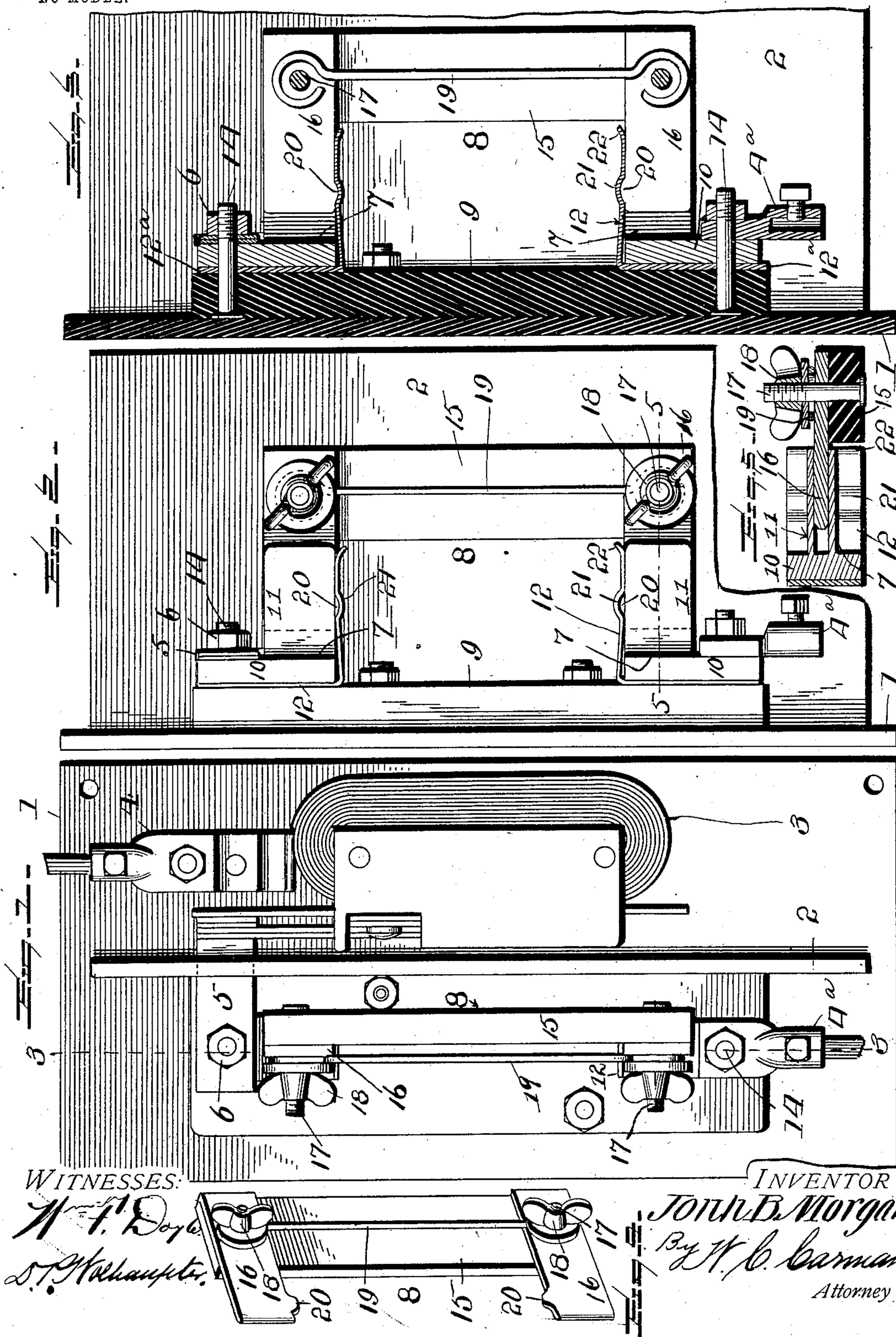
PATENTED APR. 7, 1903.

J. B. MORGAN.

FUSE BLOCK.

APPLICATION FILED AUG. 7, 1902.

NO MODEL.





# UNITED STATES PATENT OFFICE.

JOHN B. MORGAN, OF YOUNGSTOWN, OHIO, ASSIGNOR TO WILLIAM  
D. PROBST, OF YOUNGSTOWN, OHIO.

## FUSE-BLOCK.

**SPECIFICATION** forming part of Letters Patent No. 725,006, dated April 7, 1903.

Application filed August 7, 1902. Serial No. 118,792. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN B. MORGAN, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Fuse-Blocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electrical thermal cut-outs of the type commonly known as a "fuse-block" and embodying a safety-fuse or safety device whose fusible element "blows out" or is broken by an excessive current of abnormal strength, thus automatically opening or breaking the working circuit within which the fuse-block is included.

The invention possesses special utility as an improvement in fuse-blocks of the type usually associated with electric motors of street-railway systems and is designed to overcome the objections which exist to many of the ordinary forms of fuse-blocks, which are at times very troublesome and frequently are so difficult to handle and re-fuse as to often-times entirely cripple an electric car. In this special use of the invention or in any other use to which it may be applied the same has in view a simple and practical construction of safety device involving the greatest economy in the use thereof, besides providing for perfect safety in handling and enabling a blown fuse to be replaced with facility, thus saving the time and annoyance usually incident to replacing a blown fuse in many forms of fuse-blocks or service-boxes in every-day use.

In carrying out the invention the same contemplates a construction which readily admits of a motorman carrying an extra block or fuse-holder at all times, so that if a fuse "blows" it is simply necessary to remove the old block or fuse-holder and put in its place the extra one, after which the removed block or holder may be re-fused at a convenient time.

With these and many other objects in view, which will more readily appear as the nature

of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts which will be hereinafter more fully described, illustrated, and claimed.

The essential feature of the invention involved in the elements cooperating to provide for the detachable mounting of the fuse holder or block is necessarily susceptible to some change from a structural standpoint without departing from the spirit or scope of the invention; but a preferred embodiment of the latter is shown in the accompanying drawings, in which—

Figure 1 is a plan view of a fuse-block embodying the improvements contemplated by the present invention. Fig. 2 is an elevation thereof. Fig. 3 is a longitudinal sectional view on the line 3 3 of Fig. 1. Fig. 4 is a detail in perspective of the detachable fuse-holder which carries the fusible element and consists of an insulating carrying-bar and the contact-plugs associated therewith. Fig. 5 is a detail sectional view on the line 5 5 of Fig. 2, showing more plainly the contacting engagement between one of the contact-plugs and the keeper-socket for receiving the same.

Like reference-numerals designate corresponding parts throughout the several figures of the drawings.

As a safety-fuse or thermal cut-out the invention is capable of general application to working circuits for different purposes wherever it is desired to protect an apparatus or instrument from an excessive or abnormal current; but as the device forming the subject-matter of the present application is of special utility as a part of a fuse-block for electrical motor-circuits such use of the invention is shown for illustrative purposes in the drawings.

In the construction shown the device is illustrated as coupled up for use in a one-wire circuit, although it is obvious to those familiar with the art that when a complete metallic circuit is employed, as in stationary motors, a fuse may be used in connection with each pole.

In the adaptation illustrated the numeral 1 designates the main base-board for the fuse-

55

60

65

70

75

80

85

90

95

100



block supporting the working parts of the device and adapted to be mounted in the usual way within the ordinary service box or casing, such as employed for housing devices of this character. The main base-board has arranged thereon in the usual way the offstanding shield board or slab 2, which, like the base or base-board, is of fiber or equivalent insulating material, and at one side of the shield board or slab 2 is located the resistance coil or card 3, to one of the terminals of which is fitted the binding-post connection 4 for one section of the main circuit-wire, while to the other terminal of the said resistance coil or card 3 is suitably connected the metallic conductor-link 5, extending through the central shield or slab 2 to the side thereof opposite the location of the coil or card 3 and having a binding-post or equivalent connection 6 with one of the metallic keeper-sockets 7, with which coöperates the detachable fuse-holder 8. The metallic keeper-sockets constitute a part of the safety-fuse or thermal cut-out proper, and there is employed in connection with the detachable fuse a pair of the said keeper-sockets arranged in opposite spaced relation and alined within the same longitudinal plane at one side of the center shield or slab 2. A supplemental base-piece 9 may be employed in the mounting of the keeper-sockets upon the main base-board, although this is a mere structural detail that may be varied at will; but irrespective of the manner of supporting the keeper-sockets upon their base the same maintain the relation indicated. The said sockets 7 are duplicates in construction, and each of the same essentially consists of a base member 10, having a pair of offstanding cheek-plates 11, arranged in spaced parallel relation to provide an open socket for receiving a plug member of the fuse-holder in the manner to be presently explained. The cheek-plates 11 of each keeper-socket are preferably disconnected to provide an open slot or socket throughout, and associated with the same is a leaf locking-spring 12, arranged at what may be properly termed the "inner" edge of the cheek plates or pieces and whose tension is normally exerted in a direction against the said cheek-plates. The locking-spring 12, which is thus associated with the cheek-plates of each keeper-socket, is located at the inner side of said socket and acts as a spring-closure for such side of the socket, and while the locking-springs may be secured permanently in the position indicated by any suitable means the preferable arrangement is shown in the drawings and consists in making the springs of a substantial L form, thus providing the same with holding-arms 12<sup>a</sup>, which are clamped between the base-piece 9 and the under side of the base-plate 10 of the keeper-sockets. In this connection the fastening devices 14 for the keeper-sockets serve to

clamp together the several elements permanently associated therewith.

The keeper-socket 7 opposite the one to which the conductor-link 5 is connected has suitably fitted thereto a binding-post device 4<sup>a</sup> for the other section of the main circuit-wire, with which the fuse-block is connected.

The detachable fuse-holder is readily removable and replaceable with reference to the oppositely-located keeper-sockets 7. In the preferable construction the said fuse-holder essentially comprises a carrying-bar 15, preferably of insulating material, and the oppositely-located terminal contact-plugs 16. The terminal contact-plugs 16 are usually in the form of short flat plates arranged in parallel relation and projecting beyond the same side of the carrying-bar 15, and at one end the said contact-plugs 16 are fastened to the ends of the carrying-bar 15 through the medium of the securing-bolts or equivalent fastenings 17. These securing-bolts are preferably provided with the binding-nuts 18, which serve to fasten the opposite extremities of the fusible element 19 upon the metallic plugs 16. The said fusible element 19 preferably consists of a fusible wire link of any suitable character and which extends longitudinally alongside of the insulated carrying-bar 15, but has metallic connection with the contact-plugs 16. The binding-nuts 18 provide simple and convenient means whereby the ends of the blown fuse may be readily removed and a new fusible element secured in position. The end portions of the terminal contact-plugs 16, which project beyond the insulated carrying-bar 15, are adapted to have a detachable interlocked registering engagement within the metallic keeper-sockets 7. Each plug 16 fits snugly within each keeper-socket and contacts with the cheek-plates 11 thereof, thus providing a firm metallic contact between these elements of the safety device. To provide for securely locking the plugs of the fuse-holder within their keepers, while at the same time permitting of the ready removal of the fuse-holder, an interlocking slip engagement is provided for between the plugs and the locking-springs 12. This engagement is preferably effected by forming at the inner edges of the contact-plugs 16 the catch-lugs or projections 20, which have a snapping engagement with the holding-notches 21, formed in the springs 12, said springs also being preferably provided with flared outer terminals 22 to facilitate the ready entrance of the plugs 16 into the keepers.

When a fuse is blown out and it is desired to remove the holder 8, it is simply necessary to place the fingers beneath the inner edge of the carrying-bar 15 and rest the ball of the hand on the center board 2. An upward pressure of the fingers on the carrying-bar 15 will then cause a disengagement of the plugs from



contact with the keepers and the locking-springs. This operation permits of the removal of a blown-out fuse and the insertion of a new one with the greatest facility and safety.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described fuse-block will be readily apparent, and it will also be understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a safety-fuse block, the combination of a pair of oppositely-located keeper-sockets for the terminal connections, a detachable fuse-carrying holder consisting of an insulating carrying-bar, and offstanding terminal contact-plugs slidably registering in the keeper-sockets, and a separate locking device engaging with each of the terminal plugs and serving to detachably fasten the same within the keeper-sockets, substantially as set forth.

2. In a fuse-block, the combination with a pair of oppositely-located keeper-sockets for the terminal connections, of a locking-spring associated with each socket, and a detachable fuse-carrying holder having metallic plugs engaging said sockets and having an interlocking connection with the springs, substantially as set forth.

3. In a fuse-block, the combination of a pair of oppositely-located keeper-sockets for the terminal connections, locking-springs arranged at one side of said sockets, and a fuse-

carrying holder having terminal contact-plugs detachably fitting in the socket-keepers and having a slip interlocking connection with the springs.

4. In a fuse-block, the combination of a pair of oppositely-located keeper-sockets for the terminal connections, locking-springs arranged at the inner sides of the sockets and extending along the same, and a detachable fuse-carrying holder having terminal contact-plugs fitting in the keeper-sockets, said plugs and springs having coacting interlocking elements.

5. In a fuse-block, the combination of oppositely-located keeper-sockets for the terminal connections, locking-springs arranged along the inner sides of the keeper-sockets and provided with holding-notches, and a detachable fuse-carrying holder consisting of an insulating carrying-bar, and offstanding terminal contact-plugs having catch-lugs interlocking with the notches of said springs.

6. In a fuse-block, the combination with a support, of keeper-sockets mounted on the support and each consisting of a base member having offstanding parallel cheek-plates, a locking-spring arranged alongside of each keeper-socket and having a holding-arm extending beneath the base member thereof, and a detachable fuse-carrying holder having metallic plugs engaging in said keeper-sockets and interlocked with said springs.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. MORGAN.

Witnesses:

W. B. REWART,  
H. C. CORBETT.