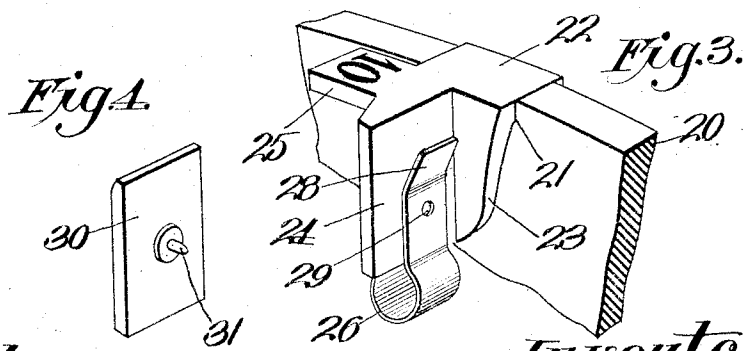
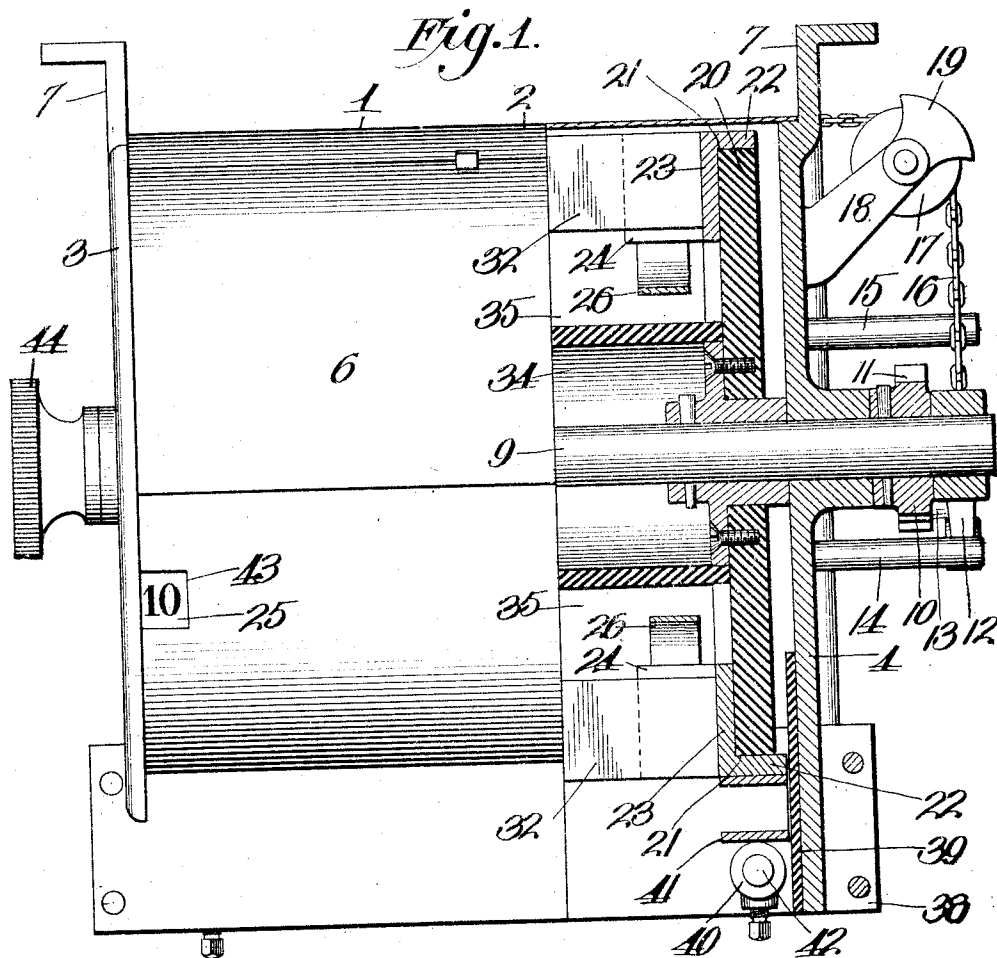


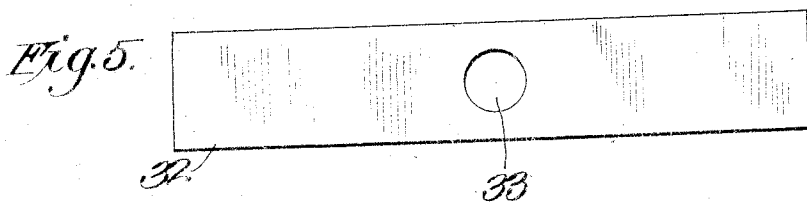
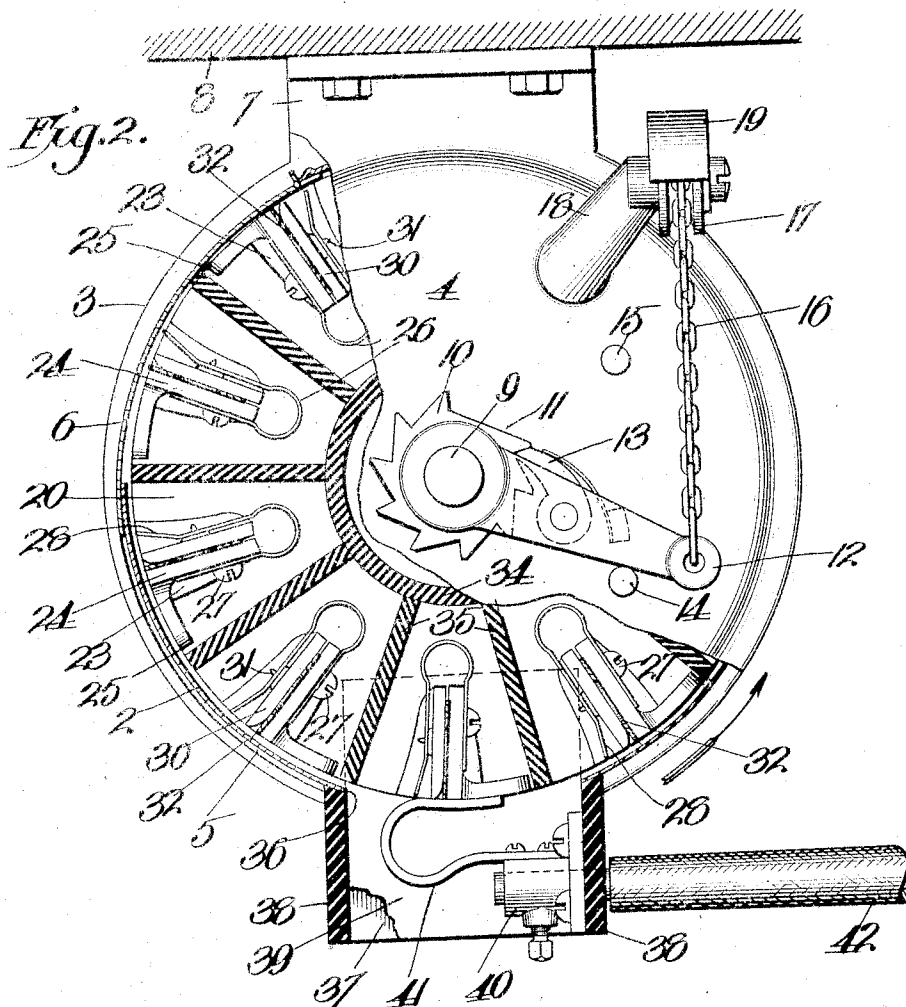
1,023,929.



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UNITED STATES PATENT OFFICE.

LANDY D. EPPERSON, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-THIRD TO
CHARLES H. ABBETT, OF KANSAS CITY, MISSOURI.

ROTARY-MAGAZINE FUSE-BOX.

1,023,929.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed September 25, 1911. Serial No. 651,270.

To all whom it may concern:

Be it known that I, LANDY D. EPPERSON, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Rotary-Magazine Fuse-Boxes, of which the following is a specification.

This invention relates to rotary magazine fuse boxes and has for its object to produce a device whereby in the event of a "blow-out" the melted fuse can be instantly shifted to an inoperative position and a new fuse caused to assume the position formerly occupied by the destroyed one without necessitating—if used on a trolley car—the disconnection of the trolley wheel from the trolley wire or the absence of the motorman or conductor from his proper station in the car.

A further object is to produce a rotary magazine fuse box of simple, strong, durable and inexpensive construction.

With these and other objects in view, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is a view partly in side elevation and partly in central vertical section of a rotary magazine fuse box embodying my invention. Fig. 2, is a view of one end of the box and also shows the same partly in central vertical section. Fig. 3, is a fragmentary perspective view of a part of the fuse-carrying magazine of the device. Fig. 4, is a detail perspective view of one of the detachable contacts of the magazine. Fig. 5, is a side view of the fuse.

In the said drawings, 1 indicates a cylindrical fuse-box consisting of a cylindrical body 2 and circular ends 3 and 4, and said ends are provided with arcuate grooves 5 wherein an arcuate door 6 is adapted to slide when it is desired to obtain access to the interior of the box, the door normally constituting a portion of the body of the box as shown, and to secure the box in position, the ends are provided with upwardly projecting angle portions 7, by which they are

bolted to a suitable part 8, of the car or analogous vehicle.

The rotary fuse-carrying magazine is constructed as follows: Arranged axially of the box and journaled in the ends thereof is a shaft 9, and secured rigidly on said shaft is a ratchet wheel 10, provided preferably with nine teeth, one tooth, 11, of which is twice as long as two of the remaining teeth, for a purpose which hereinafter appears. Pivoted on the shaft adjacent to the ratchet wheel is a lever 12, equipped with a spring-actuated pawl 13, engaging the ratchet wheel and below and above the lever are stop pins 14 and 15, for limiting the movement of the lever so that the same shall be incapable of rotating the shaft more than one-tenth of a revolution at a time.

16 is a chain or cable attached to the free end of the lever and extending to a point within convenient reach of the motorman or conductor, the said cable or chain at an intermediate point extending over a guide sheave 17 journaled in an arm 18, projecting from the adjacent end 4 of the box, the sheave being equipped with the customary shield 19 to prevent disengagement of the chain or cable from the sheave.

Mounted rigidly on the shaft within and near each end of the box is a disk 20 of insulating material, provided with ten peripheral notches 21, and fitting in said notches are the outwardly projecting arms 22, of angle brackets 23, said angle brackets having inwardly projecting radially extending lugs 24. The brackets of one of the disks are also provided with lugs 25, at the outer ends of lugs 24, and bearing on their outer faces numbers from 1 to 10 inclusive, arranged progressively in the reverse direction to the direction in which the magazine turns. Each of the brackets also carries a U-shaped spring 26 arranged radially of lugs 24 with one arm of each secured to the juxtaposed lug by a screw 27 and the other arm spaced from the opposite side of the lug and bent outward therefrom at 28, and said last-named arms of the springs are provided with perforations 29 to receive pins 31 projecting outward from contact plates 30 adapted to

be slipped between lugs 24 and the perforated arms of said springs until the pins 31 engage the perforations of said spring. the plates 30 and the adjacent sides of the lugs 24 constitute contacts pressed yieldingly together for the purpose of holding them between the fuse strips 32, the fuse strips extending from the angle brackets 23 of one disk 20 to the angle brackets of the other disk 20. These fuse strips are of a type in common use, that is to say are provided centrally with holes 32 which so weaken them that when in circuit, as hereinafter explained, they will melt or blow out under certain conditions, at such perforated points.

To guard against the production of an arc between the spring 26 in circuit with the circuit terminals hereinafter identified, and the shaft 9, or between adjacent contact brackets or fuses, a cylinder 34 of insulation material is interposed between the springs 26 and shaft 9, and extends from one disk 20 to the other, and insulation plates or partitions 25 radiate from cylinder 34 to the periphery of the magazine between adjacent sets of contact brackets.

At a suitable point the body of the box is provided with an opening 36 and depending from the ends 3 and 4 at opposite ends of said opening are lugs 37 connected by cross pieces 38 of insulation material by preference, insulation lining plates being also secured to lugs 37 and extending upward therefrom above the plane of the adjacent contact brackets to prevent arcing between the latter and the ends of the box.

Secured to one of the cross pieces 38 is a pair of tubular brackets 40, equipped with a spring contact 41 adapted for successive engagement by the angle brackets 23, the arrangement of the mechanism being such that an opposite pair of the said brackets are always in contact with the two spring contact terminals 41, when the parts are in operative position, that is, at all times except when the contact carrying wheel is being turned or adjusted. Connected to the tubular brackets 40 are the terminals 42 of the circuit in which the fuse box is located, it being understood that the circuit is from one of the terminals 42, its connected bracket 40, contact 41, one of the angle brackets 23, and through the fuse strip 32 thereof to the opposite angle bracket 23, and from the latter through the other contact terminal 41 and bracket 40, to the other terminal 42, and that at such time, one of the number lugs 25 is observable through an opening 43 in the body of the box, as shown clearly in Fig. 1.

Assuming that a set of fuses has been blown out and removed, the motorman or other person in charge opens the door 6, and

turns the magazine step by step by turning shaft 9 through the instrumentality of hand wheel 44, on the opposite end of said shaft from the ratchet mechanism, so as to bring the different contact-carrying brackets successively opposite the door opening, and as each set of said brackets is thus disposed, he secures a fuse thereto by forcing it radially between brackets 23 and the contacts 30.

When the magazine is fully charged, the bracket lug 25 containing the number 10, appears through opening 43. The door is then closed and the car is ready for operation, and at such time the pawl 13 is in engagement with the radial or operative face of the long tooth of the ratchet wheel. Should a fuse blow out the motorman or conductor, through the instrumentality of the pawl and the ratchet mechanism, turns the magazine one step in the direction indicated by the arrow (Fig. 2) and as this occurs the burned out fuse is moved out of engagement with the contact terminals 41 and a new fuse is disposed in engagement with said terminals and at the same time bracket lug 25 numbered "9" appears through opening 43, and thus indicates that nine intact fuses are in the magazine. Each time a fuse blows out this operation is repeated and the numbers 8, 7, 6, 5, 4, 3, 2, and 1 successively appear through opening 43, and as number 1 is thus disposed the pawl assumes a position upon the blank tooth 11, of the ratchet wheel, so that it will be impossible for the magazine to be turned an additional step through the instrumentality of the ratchet mechanism, it being understood that when the magazine has been turned nine steps the tenth or only fuse remaining intact is brought into circuit with the contacts 41, and should this fuse blow out it will be impossible to operate the car until the motorman or conductor recharges the magazine with one or more fuses. It is obvious that, in the construction shown, it would be necessary for him to start the loading operation through the door opening and to turn the magazine at least the first step through the instrumentality of hand wheel 44, as after the magazine is turned the last step the pawl and ratchet mechanism is again disposed in the relation shown in Fig. 2, and may be utilized to effect further rotation of the magazine.

From the above description it will be apparent that one step of each revolution of the magazine must be effected through the instrumentality of the handwheel or its equivalent and that because of this the motorman or conductor will be immediately apprised of the fact that the supply of fuses is exhausted should he attempt to turn the magazine the final or tenth step through the

instrumentality of the pawl and ratchet mechanism.

It is obvious that the fuses can be easily and quickly placed in the magazine and that the lugs 24 and removable contact plates 30 can be readily cleaned by scraping or otherwise when necessary.

From the above description it will be apparent that I have produced a rotary magazine fuse box embodying the features of advantage enumerated as desirable in the statement of the object of invention and I wish it to be understood that while I have illustrated and described the preferred embodiment of the invention, I do not desire to be restricted to the exact details of construction shown and described, as obvious modifications will suggest themselves to one skilled in the art.

I claim:—

1. A rotary magazine fuse box, comprising a box, a rotary magazine therein, provided with a series of fuses spaced at regular distances around the magazine, contact brackets secured to the magazine and engaging the opposite ends of said fuses, contact terminals carried by the box and adapted for simultaneous engagement by the contact brackets of each fuse, a ratchet wheel rotatable with the magazine and provided with one less tooth than there are fuses in the magazine, one of said teeth being of double length, a lever having a range of movement sufficient to turn the ratchet wheel a distance equal to half the length of its long tooth, and a pawl carried by the lever for engagement with the ratchet wheel to turn the magazine step by step and bring the fuses successively in circuit with the said contact terminals.

2. A rotary magazine fuse box comprising a box, a rotary magazine therein, provided with a series of fuses spaced at regular distances around the magazine, contact brackets secured to the magazine and engaging the opposite ends of said fuses, contact terminals carried by the box and adapted for simultaneous engagement by the contact brackets of each fuse, a ratchet wheel rotatable with the magazine and provided with one less tooth than there are fuses in the magazine, one of said teeth being of double length, a lever having a range of movement sufficient to turn the ratchet wheel a distance equal to half the length of its long tooth, a pawl carried by the lever for engagement with the ratchet wheel to turn the magazine step by step and bring the fuses successively in circuit with the said contact terminals, and suitably guided means for operating said lever to effect rotation of the magazine.

3. A rotary magazine fuse box, comprising a box having an opening, a rotary mag-

azine in said box provided with a series of fuses spaced at regular distances around the magazine, contact brackets secured to the magazine and engaging the opposite ends of said fuses, a lug projecting from one of each set of said contact brackets and adapted for successive exposure through said opening of the box, contact terminals carried by the box and adapted for simultaneous engagement by the contact brackets of each fuse, a ratchet wheel rotatable with the magazine and provided with one less tooth than there are fuses in the magazine, one of said teeth being of double length, a lever having a range of movement sufficient to turn the ratchet wheel a distance equal to half the length of its long tooth, and a pawl carried by the lever for engagement with the ratchet wheel to turn the magazine step by step and bring the fuses successively in circuit with the said circuit terminals.

4. A magazine fuse box comprising a box having a door controlled opening and a second opening a rotary magazine therein provided with a series of fuses spaced at regular intervals around the magazine, contact brackets secured to the magazine and engaging the opposite ends of said fuses, contact terminals carried by the box and projecting therein through the said second opening, and adapted for simultaneous engagement by the contact brackets of each fuse, a ratchet wheel rotatable with the magazine and provided with one less tooth than there are fuses in the magazine, one of said teeth being of double length, a lever having a range of movement sufficient to turn the ratchet wheel a distance equal to half the length of its long tooth, a pawl carried by the lever for engagement with the ratchet wheel to turn the magazine step by step and bring the fuses successively in circuit with the said contact terminals, and a handle rotatable with the magazine and turning the same when the pawl is in engagement with the long tooth of the ratchet wheel.

5. The combination with a rotary magazine, of a pair of oppositely disposed contact brackets carried by the magazine provided with radial lugs, springs carried by said brackets and comprising perforated portions substantially paralleling and spaced from said radial lugs, and plates arranged in the spaces between said lugs and springs and provided with pins engaging the perforations of said springs.

6. The combination with a rotary magazine, of a pair of oppositely disposed contact brackets carried by the magazine provided with radial lugs, springs carried by said brackets and comprising perforated portions substantially paralleling and spaced from said radial lugs, plates arranged in the

spaces between said lugs and springs and provided with pins engaging the perforations of said springs, a fuse strip bridging the space between said contact brackets and
5 interposed at its ends between said lugs, and contact plates, a pair of contact terminals in the path of said contact brackets, and means for rotating the magazine to

cause the said contact brackets to engage the contact terminals.

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

LANDY D. EPPERSON.

Witnesses:

HELEN C. RODGERS,
G. Y. THORPE.