

F. L. DODGSON.  
SAFETY RELAY.  
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934,896.

Patented Sept. 21, 1909.

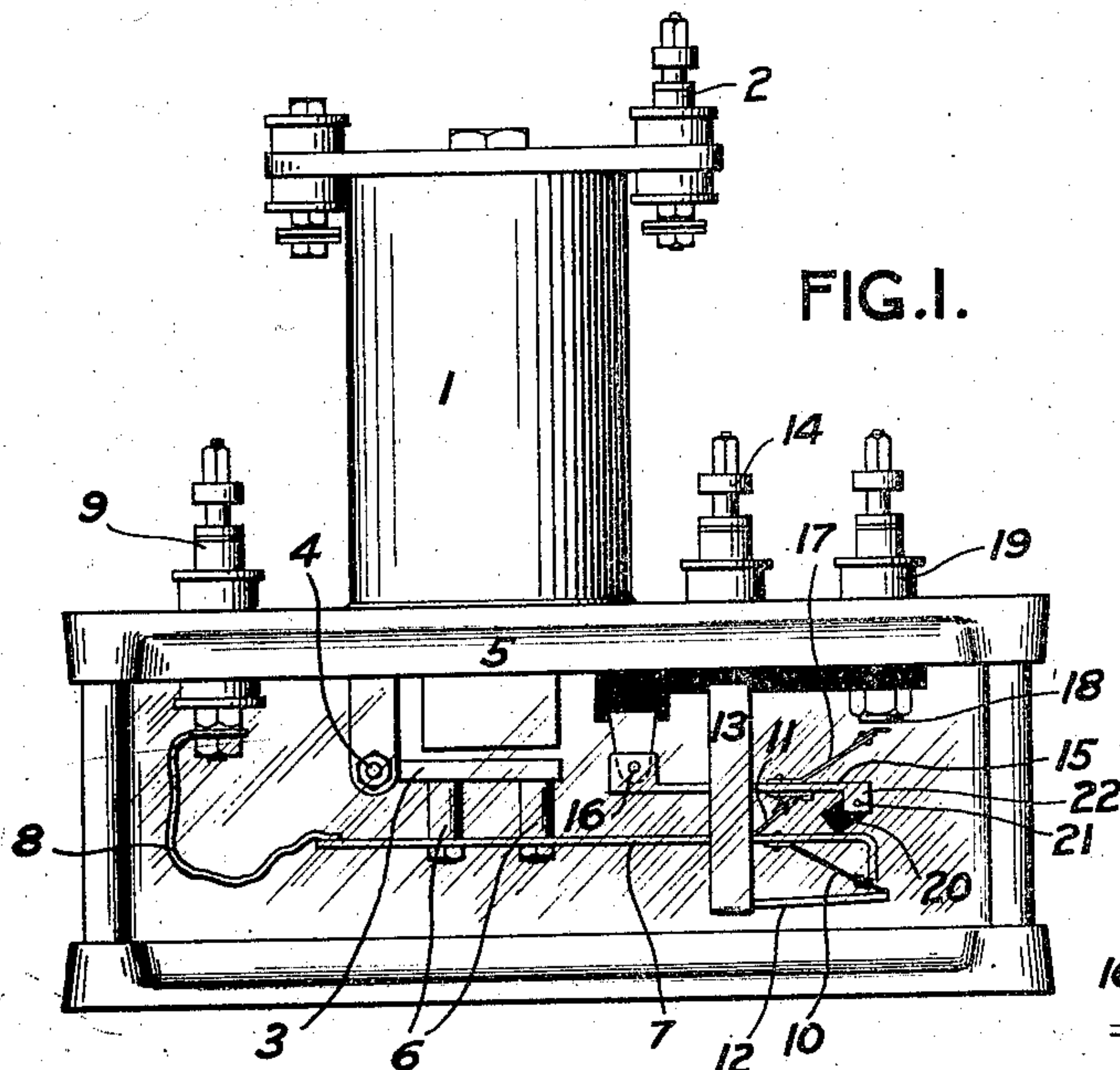


FIG. 2.

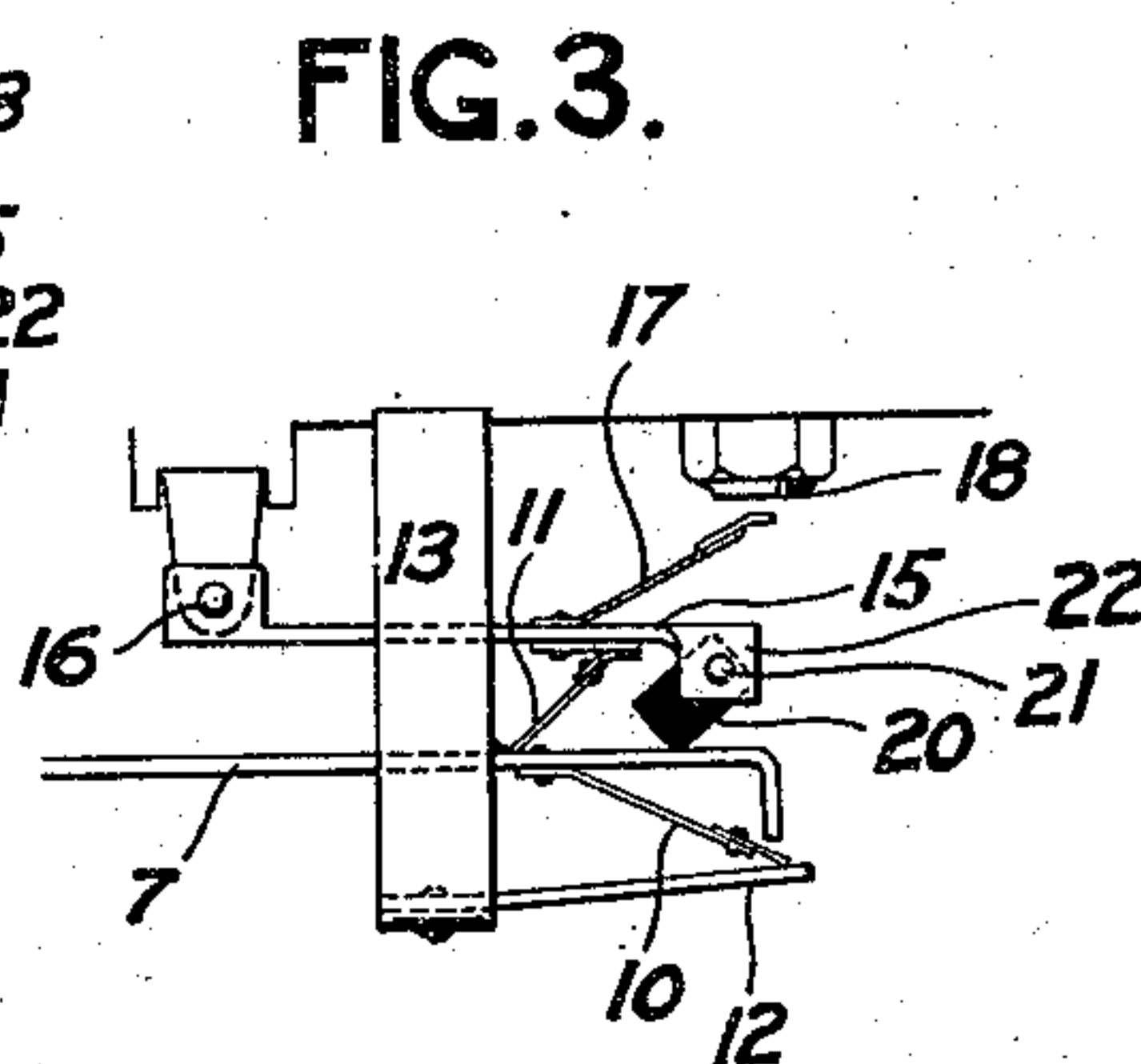
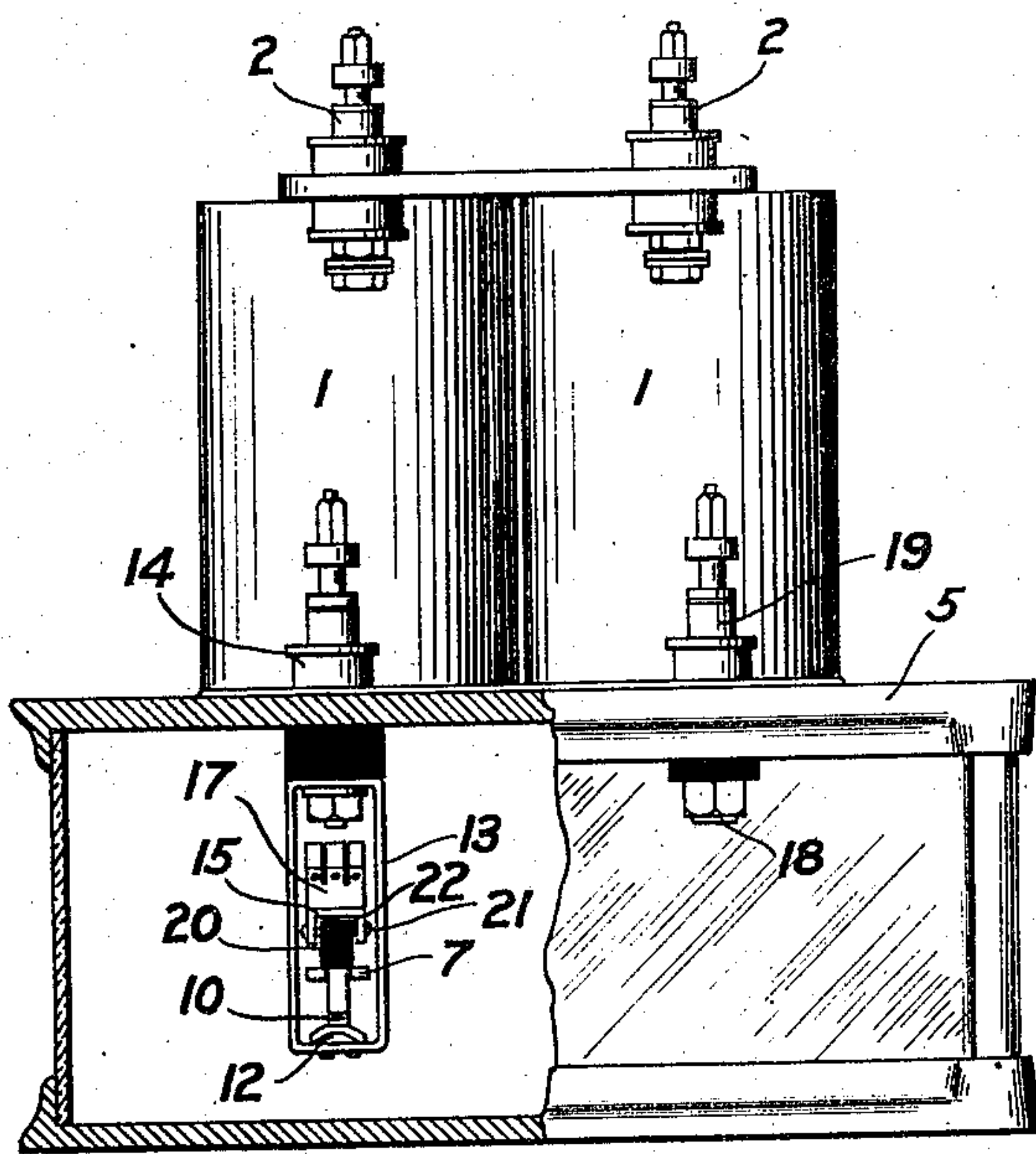


FIG. 4.



WITNESSES:

L. Thon.  
Clarence W. Carroll

INVENTOR:

Frank L. Dodgson  
by O. J. O'Connell  
his attorney



# UNITED STATES PATENT OFFICE.

FRANK L. DODGSON, OF ROCHESTER, NEW YORK, ASSIGNOR TO GENERAL RAILWAY SIGNAL COMPANY, OF GATES, NEW YORK, A CORPORATION OF NEW YORK.

## SAFETY-RELAY.

934,896.

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*To all whom it may concern:*

Be it known that I, FRANK L. DODGSON, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Safety-Relays, of which the following is a specification.

This invention relates to safety relays, and consists in the apparatus hereinafter described and claimed.

The object of the invention is to provide an efficient relay for use on exposed circuits where there is danger, from abnormal currents in the circuit, of fusing, or otherwise holding the relay contacts, and thus maintaining a circuit.

In the drawings: Figure 1 is a side elevation of a relay embodying this invention; Fig. 2 is a front elevation of the same, part of the casing being removed in order to exhibit the interior construction; Fig. 3 is a view showing the relay contacts in one position; and Fig. 4 is a like view showing the relay contacts in another position.

In the drawings, 1, 1 are the coils of the relay. 2, 2 are the binding posts of the circuit through said coils. The armature 3 of the relay is pivoted at 4 beneath the table 5. The coils 1, 1 are set vertically upon said table. The armature 3 bears insulating posts 6, 6, carrying what may be called an armature-bar 7 that is connected by a flexible conducting connection 8 with a binding post 9 on said table. The armature bar 7 carries flexible contacts 10 and 11. The flexible contact 10 is the back contact of the relay, and makes electrical connection, when the coils 1 are deenergized, with a contact plate 12 connected through the hanger 13 with a suitable binding post 14. The flexible contact 11 is a part of the front-contact mechanism of the relay. A supplementary contact bar 15 is pivoted at 16 beneath the table 5 over the flexible contact 11, and said bar 15 bears a supplementary flexible contact 17 adapted to make electrical connection with the front contact 18 of the relay to which is connected the binding post 19.

Upon the supplementary contact bar 15 is pivoted a block 20 on the pivot 21 passing through ears 22 on said bar. The block is made of such length that when it is at right angles to the supplementary bar 15,

as shown in Fig. 4, the contact 11 cannot touch the bar 15, and thus the circuit of the front contact of the relay is broken. But when the block 20 is tilted and rests upon the top of the armature bar 7, as shown in Fig. 3, the contact 11 can touch the supplementary bar 15, and thus current may pass from the armature bar 7 through the flexible contact 11, the bar 15, the flexible contact 17 to the front contact 18 of the relay.

In the ordinary operation of the relay, the attraction and release of the armature 3 vibrate the bar 7, and the contact 17 makes and breaks the electrical connection with the front contact 18, and current passes from the armature bar 7 to the front contact 18, as is usual with relays. But if, when the armature is attracted and the contact 17 is against the front contact 18, an excessive current passes so as to fuse the contact spring 17 to the front contact 18, then, as soon as the magnets 1 are deenergized and the armature 3 falls back, the supplementary bar 15 remains in its higher position, while the armature bar 7 returns to its lowest position, as shown in Figs. 1 and 3. Thereupon the block 20 falls into the position shown in Fig. 4, and so maintains the separation of the bars 7 and 15 that no electrical connection can occur through the contact spring 11 until a repair man has broken the fused contacts and has restored the block 20 to its tilted position, as shown in Figs. 1 and 3. Thus, if the front contacts of the relay are fused, or otherwise fastened together, the secondary circuit through the armature bar 7 is broken until the device is repaired.

The means for separating the armature bars 7 and 15, or of maintaining the break between the contact spring 11 and the bar 15, must of course embody an insulating means. One mode of obtaining this result is to make the block 20 of an insulating material.

What I claim is:

1. In a relay, a circuit controlled thereby, two contacts in said circuit, one of which is movable by the relay, and automatic means for producing and maintaining a break in said circuit when one of the contacts is maintained abnormally against the other.

2. In a relay, a circuit controlled thereby, two contacts movable by the relay and arranged in series in said circuit, a third contact with which one movable contact co-operates, and automatically movable insulat-



ing means whereby when one movable contact is maintained abnormally against the third contact, the circuit is broken between the two movable contacts.

5 3. In a relay, a circuit controlled thereby, two contacts movable by the relay and arranged in series in said circuit and provided with means for simultaneous movement of both and independent movement of one of  
10 them, a third contact with which one movable contact coöperates, and automatic means for preventing circuit-making action of one movable contact upon abnormal maintenance of the other contact against the third contact.

15 4. In a relay, a circuit controlled thereby, two contacts movable by the relay and arranged in series in said circuit and provided with means for simultaneous movement of both and independent movement of one of  
20 them, a third contact with which one movable contact coöperates, and an automatically movable insulator for preventing circuit-making action through one contact after fusion or sticking of the other contact to the  
25 third contact.

5. In a relay, a circuit controlled thereby, two contacts movable by the relay and arranged in series in said circuit and provided with means for simultaneous movement of  
30 both and independent movement of one of them, a third contact with which one movable contact coöperates, and an automatic separator for preventing simultaneous circuit-making action between the movable con-  
35 tacts upon abnormal maintenance of one movable contact against the third contact.

6. In a relay, a circuit controlled thereby, two contacts movable by the relay and arranged in series in said circuit and provided  
40 with means for simultaneous movement of both and independent movement of one of them, a third contact with which one movable contact coöperates, and automatic means for preventing simultaneous circuit-making  
45 action of the movable contacts upon abnormal maintenance of one movable contact against the third contact.

7. In a relay, a circuit controlled thereby, two independently movable contacts actu-  
50 ated by the relay and arranged in series in said circuit, a third contact with which one movable contact coöperates, and a tilting block carried by one movable contact and adapted to tilt and to prevent closing of the  
5 two movable contacts when the movable contact is maintained against the third contact.

8. In a relay, a circuit controlled thereby, two tilting contact bars actuated by the re-

lay having contacts arranged in series in said circuit, one of which bars operates the sec- 60 ond, a third contact with which one of said contacts coöperates, and automatic means for preventing circuit-making action of the contacts on the two bars if the contact on a bar is maintained against the third contact. 65

9. In a relay, a circuit controlled thereby, two tilting contact bars actuated by the re- lay and having contacts arranged in series in said circuit, one of which bars operates the second, a third contact with which one of 70 the said contacts coöperates, and a tilting insulating block for maintaining separation of the contacts on the two bars when the said contact on one of the bars is maintained against the third. 75

10. In a relay, a secondary circuit controlled thereby, an armature, a first contact in the secondary circuit and movable with said armature, a second contact in series with the first contact in said circuit and movable 80 with the armature on a separate support, a third contact with which the second contact coöperates, and automatic means for preventing completion of the first contact with the second after abnormal maintenance of 85 the second contact against the third.

11. In a relay, a circuit controlled thereby, an armature, an armature bar movable therewith, a first contact carried by said armature bar, a supplementary bar independently 90 supported and having a second contact in series with the first mentioned contact and in the said circuit and moved by the armature bar, a third contact with which the second contact coöperates, and automatic means for 95 breaking and maintaining a break between the first and second contacts if the second contact is maintained against the third.

12. In a relay, a circuit controlled thereby, an armature, an armature bar movable 100 therewith, a contact carried by said armature bar, a supplementary bar independently supported and having a second contact in series with the first mentioned contact and in the said circuit and moved by the arma- 105 ture bar, a third contact with which the second contact coöperates, and an automatically tilting block carried by one of said bars and adapted to tilt upon separation of said bars to maintain the separation of the first men- 110 tioned contact when the second mentioned contact is maintained against the third.

FRANK L. DODGSON.

Witnesses:

L. THON,  
D. GURNEE.