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CIRCUIT CONTROLLING DEVICE

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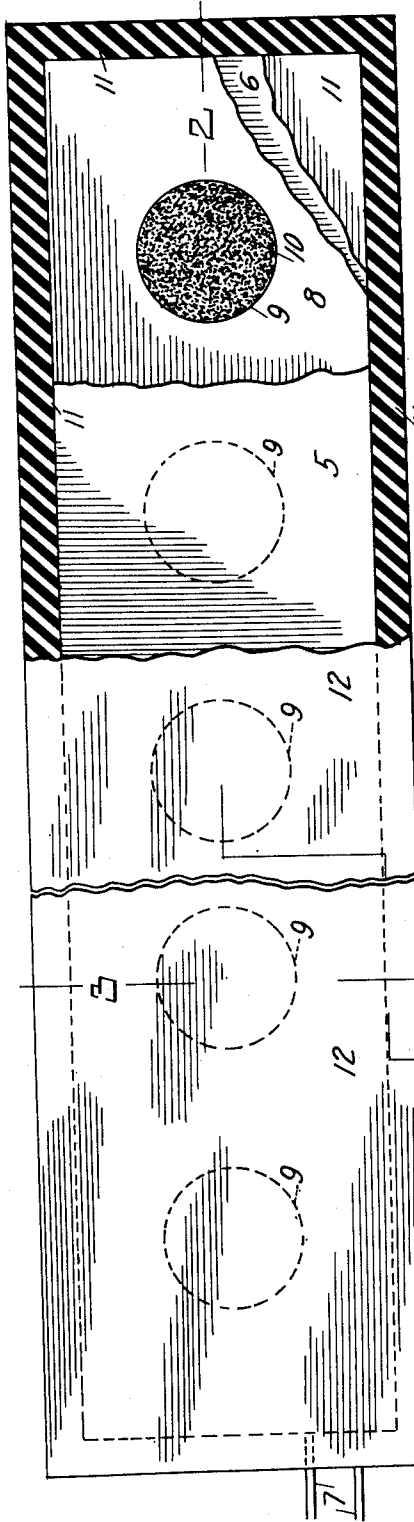


Fig. 2

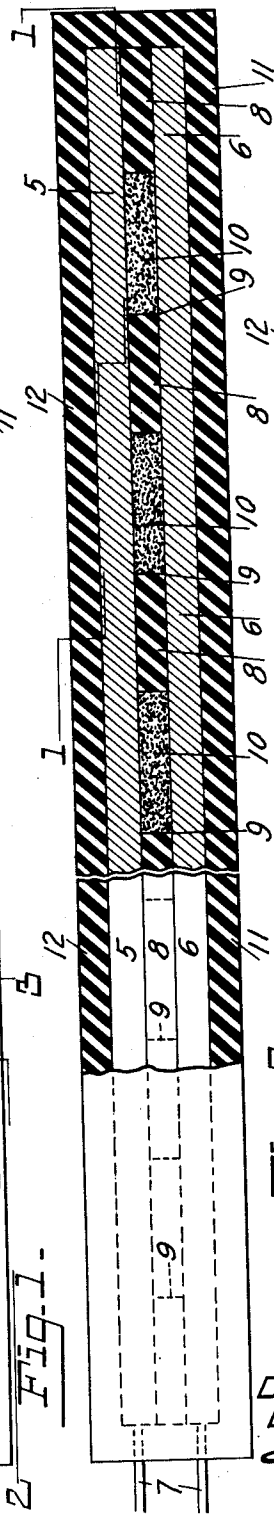
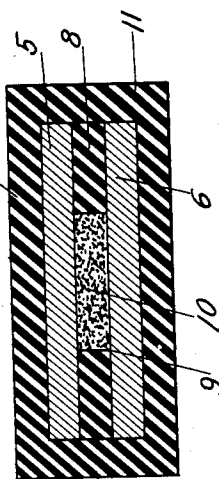


Fig. 2.



5-6-5-

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CIRCUIT CONTROLLING DEVICE

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11 Claims. (Cl. 201—50)

This invention relates to a circuit controlling device and is designed primarily for operation by pressure exerted thereon by the wheel of a vehicle moving over the same, by the foot of a person, or in other like manner.

One object of the invention is to provide a circuit controlling device which will have a small number of moving parts and in which said parts will have but little movement and will be of such a character that they will not be easily injured or disarranged.

A further object of the invention is to provide such a device which will be of a simple compact construction and may be easily installed in a roadway, floor or the like.

A further object of the invention is to provide such a device the several parts of which may be produced and assembled with very little labor and at a low material cost.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawing Fig. 1 is a plan view of a device embodying my invention, partly broken away transversely and along the staggered line 1—1 of Fig. 2; Fig. 2 is an edge view of such a device, partly in elevation and partly in section on the line 2—2 of Fig. 1; and Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

In the drawing I have, for the purpose of illustration, shown one form of circuit controlling device or switch embodying my invention, this particular device being adapted to be mounted in a floor, roadway or the like with its upper surface substantially flush with the surface of the roadway or floor so as to be subjected to pressure by the wheel of the vehicle or the foot of a person passing over the same. It will be understood, however, that the device may be mounted in any suitable location and in any suitable position, the position being determined, in part at least by the character and source of the pressure by means of which it is to be operated.

The device as shown comprises two contact members 5 and 6 spaced one from the other and adapted to be connected with the respective sides of a circuit 7 which is to be controlled thereby. One of the contact members is movable toward and from the other and interposed between these contact members is a yieldable device 8 which serves both to space the two contact members one from the other and to insulate the same one from the other. This yieldable device is of such a character as to provide between the contact members one or more pockets 9 adapted to receive finely divided conducting material 10, such as granu-

lated carbon, and to support that material in engagement with the two contact members. When the contact members are in their normal fully separated positions the conducting material will be loosely confined in the pocket, or pockets, and will have a resistance sufficiently high to prevent the flow of current from one contact member to the other or to reduce the flow of current to the desired extent. When the movable contact member is moved toward the other contact member the spacing device will yield and the conducting material in the pocket or pockets will be compressed, thereby increasing its conductivity sufficiently to permit of the free flow of current from one contact member to the other. The two contact members may be insulated from the supporting structure and from exterior objects in any suitable manner, as by enclosing the same in a casing 11, that portion of the casing adjacent to the movable contact member being yieldable to permit pressure to be applied to the movable contact member.

The several parts of the device may take various forms and may be of various kinds of material, depending in part upon the particular purpose for which the device is to be used. In the preferred construction the contact members 5 and 6 are in the form of metal plates, here shown as elongate, and are arranged face to face one above the other. In the ordinary mounting of the device the lower plate 6 will be stationary or substantially stationary and the upper plate 5 will be movable toward and from the lower plate. The spacing element 8 may be of any suitable construction which will yieldably support the movable plate and will insulate the two plates one from the other. Preferably it comprises a section of soft rubber of a length and width approximately equal to the length and width of the contact plates and it is provided with a plurality of openings which form the pockets 9, each of which is closed at its ends by the respective contact plates, so that the finely divided conducting material 10 will be retained therein. Soft rubber is particularly desirable for this purpose not only because of its resiliency and of its insulating qualities but because the rubber is non-compressible and when distorted by the pressure of the movable contact plate those portions of the rubber between adjacent pockets will be extended to reduce the width of the pockets and thus exert transverse pressure on the conducting material in addition to the vertical pressure which is exerted thereon by the movable contact plate.

The casing in which the contact members and

enclosed may be of any shape which will protect the interior and will insulate the same from the contact members. Preferably the casing is of such a character that it will in itself retain the contact plates and spacing element in their relative positions. Further, the casing may be formed of one or more parts but, in the present construction, I have shown the casing as a whole formed of rubber and fitting snugly about the contact plates and spacing element. That wall, 12, of the casing which lies above the upper or movable contact plate 5 is yieldable and, in the preferred construction, the whole casing is formed of yieldable rubber. The casing may be formed and mounted about the contact plates and spacing element in any suitable manner, as by molding the rubber about the interior elements after the latter have been assembled. In this construction the lower contact plate 6 is substantially stationary, having only such movement as may be permitted by the yieldability of the lower wall of the rubber casing, but the less movement it has the better. The upper contact member 5 is capable of vertical movement within the casing and when pressure is exerted upon the upper wall 12 of the casing this pressure will be transmitted to the upper or movable contact plate and the latter forced downwardly against the resistance of the yieldable spacing element, thereby compressing the conducting material and establishing a free flow of current through the circuit. When the pressure is relieved the resiliency of the spacing element and of the casing will cause the parts to be restored to their normal positions, thereby relieving the pressure on the conducting material and again reducing the conductivity thereof.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a circuit controlling device, a pair of contact members spaced one from the other and adapted to be connected with the circuit to be controlled, one of said contact members being movable toward and from the other member, yieldable and non-conducting spacing means interposed between said members and arranged to form a pocket, the ends of which are closed by said contact members, and finely divided conducting material confined in said pocket and adapted to be compressed by the movement of said movable contact member and to engage both contact members.

2. In a circuit controlling device, a pair of contact members spaced one from the other and adapted to be connected with the circuit to be controlled, one of said contact members being movable toward and from the other member, yieldable and non-conducting spacing means interposed between said members and arranged to form a pocket, the ends of which are closed by said contact members, and finely divided conducting material confined in said pocket and adapted to engage both contact members, and a yieldable cover for said movable contact member.

3. In a circuit controlling device, a pair of contact members spaced one from the other and adapted to be connected with the circuit to be controlled, one of said contact members being

movable toward and from the other member, yieldable and non-conducting spacing means interposed between said members and arranged to form a pocket, the ends of which are closed by said contact members, finely divided conducting material confined in said pocket and adapted to engage both contact members, and a casing enclosing said contact members and said spacing means and having a yieldable part to actuate said movable contact member.

4. In circuit controlling device, a casing having a movable part adapted to be arranged in the path of and to be subjected to pressure by a traveling member, a pair of contact members mounted in said casing, spaced one from the other and adapted to be connected in the circuit to be controlled, one of said members being movable toward the other member by pressure exerted on the movable part of said casing, a yieldable device interposed between said contact members to space and insulate the same one from the other and having a pocket, the ends of which are closed by said contact members, and finely divided conducting material loosely confined in said pocket and adapted to be compressed by the movement of said movable contact member.

5. In a circuit controlling device, a pair of contact plates arranged one above the other and adapted to be connected in the circuit to be controlled, one of said plates being movable toward and from the other plate, a layer of yieldable and non-conducting material interposed between said plates to maintain the same normally in spaced and insulated relation one to the other and having an opening, the ends of which are closed by the respective plates, finely divided conducting material loosely confined in said opening and adapted to be compressed by the movement of said movable plate, and a yieldable element arranged to transmit pressure to said movable plate.

6. In a circuit controlling device, a pair of contact plates arranged one above the other and adapted to be connected in the circuit to be controlled, one of said plates being movable toward and from the other plate, a layer of yieldable and non-conducting material interposed between said plates to maintain the same normally in spaced and insulated relation one to the other and having an opening, the ends of which are closed by the respective plates, finely divided conducting material loosely confined in said opening and adapted to be compressed by the movement of said movable plate, and an insulating casing extending about said plates and said spacing element and having a yieldable wall adjacent to said movable plate.

7. In a circuit controlling device, a pair of contact members spaced one from the other and adapted to be connected in a circuit to be controlled, one of said members being movable toward and from the other member, a soft rubber spacing element interposed between said members and having an opening the ends of which are closed by the respective contact members, finely divided conducting material loosely confined in said opening and adapted to be compressed by the movement of said movable contact member, and an element arranged adjacent to said movable contact member to transmit pressure thereto.

8. In a circuit controlling device, a pair of contact members spaced one from the other and adapted to be connected in a circuit to be con-

5 trolled, one of said members being movable toward and from the other member, a soft rubber spacing element interposed between said members and having an opening the ends of which
10 are closed by the respective contact members, finely divided conducting material loosely confined in said opening and adapted to be compressed by the movement of said movable contact member, and a casing of yieldable material enclosing said contact members and spacing element.

15 9. In a circuit controlling device, a pair of contact plates spaced one from the other and adapted to be connected in the circuit to be controlled, one of said plates being movable toward and from the other plate, a soft rubber spacing element interposed between said plates and having a plurality of openings therethrough, the ends of each opening being closed by the respective plates,
20 finely divided conducting material loosely confined in each opening and adapted to be compressed by the movement of said movable plate, and a casing of yieldable rubber enclosing said plates and said spacing element.

25 10. In a circuit controlling device, two elongate metallic plates arranged face to face, spaced one from the other and adapted to be connected in the circuit to be controlled, a soft rubber spacing

element interposed between said plates, extending for substantially the full length and width thereof and having a longitudinal series of openings, the ends of each opening being closed by the respective plates, finely divided conducting material loosely confined in each opening and adapted to contact with both plates, and an insulating casing extending about said plates and said spacing element to hold the same against displacement and to permit one plate to move toward and from the other plate, said casing having a yieldable part to transmit pressure to said movable plate.

11. In a circuit controlling device, a casing comprising top and bottom walls, and a partition substantially parallel with and spaced from said top and bottom walls, said partition being formed of yieldable insulating material and having an opening through the same, contact plates interposed between said partition and said top and bottom plates respectively, closing the ends of said opening and adapted to be connected in the circuit to be controlled, and finely divided conducting material loosely confined in said opening, said top wall of said casing being yieldable to permit pressure to be applied to the adjacent contact plate to distort said partition and compress said conducting material in said opening.

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