

Sept. 19, 1939.

C. D. GEER ET AL

2,173,105

CONTROL

Original Filed April 8, 1930

Fig. 1.

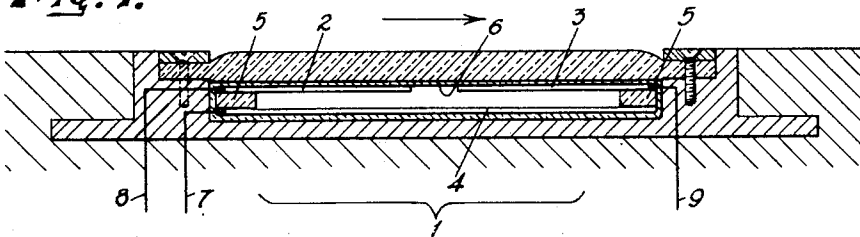
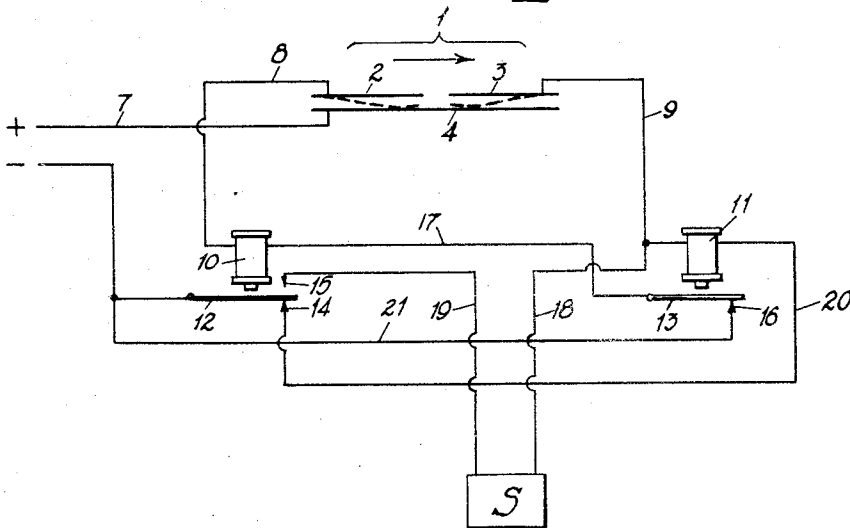


Fig. 2.



INVENTORS

Charles D. Geer and John L. Biach

BY *Edwards, Bower & Pool*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,173,105

CONTROL

Charles D. Geer and John L. Blach, New Haven, Conn., assignors to The Engineering & Research Corporation, a corporation of Connecticut

Original application April 8, 1930, Serial No. 442,560, now Patent No. 2,077,924, dated April 20, 1937. Divided and this application March 19, 1936, Serial No. 69,622

3 Claims. (Cl. 177-329)

This invention relates to a control having functionally and structurally improved characteristics.

This application is a division of application S. N. 442,560 filed April 8, 1930, and relates particularly to a control mechanism adapted to be employed with contact devices and arranged to be responsive only to operation of said devices in proper sequence, and more particularly relates to such a mechanism to cooperate with a vehicle actuated multiple contact device for use in road surfaces and the like so as to be responsive only to vehicles traversing such device in one direction. This application discloses the same material as that shown in Figs. 1 and 2 of the parent application S. N. 442,560 but the claims of the present application are restricted to the invention disclosed in Figs. 1 and 2 with particular reference to the structure of Fig. 2.

The present application discloses but does not claim subject matter on the structure of Figure 1, which is claimed specifically in application S. N. 69,623 filed March 19, 1936 and which application is also a division of the application S. N. 442,560 now Patent Number 2,077,924 patented April 20, 1937 wherein claims are made to the Fig. 3 structure.

It is an object of the invention to construct a mechanism of this character which will be capable of advantageous use in numerous different associations but which has been primarily developed to provide a vehicle actuated control and when utilized in this connection being of major value when associated with a traffic control system.

A further object of the invention is that of providing a mechanism operable by a control and whereby a predetermined functioning of this mechanism is achieved only in the case of the control being operated in a predetermined manner.

A still further object is that of providing structures of this character capable in certain respects of independent use but primarily adapted for cooperative functioning and which structures will involve relatively few parts individually simple and rugged in construction and capable of ready assemblage and set up to furnish mechanisms operating over long periods of time with freedom from electrical and mechanical difficulties.

Still another object is to provide a mechanism of the character indicated operable by a control which will perform a predetermined operation only upon the completion in a predetermined sequence of a succession of predetermined actions.

With these and further objects in mind, reference is had to the attached sheet of drawings illus-

trating practical embodiments of the invention, and in which:

Fig. 1 is a diagrammatic illustration of a vehicle actuated control; and

Fig. 2 is a similar view of the control in association with the mechanism to be operated thereby.

Referring to Figs. 1 and 2 of the drawing there is shown a schematic embodiment of an impulse relay mechanism constructed in accordance with our invention and connected to a mechanism to be controlled. For the purpose of illustrating a practical embodiment of the invention, a mechanism to be controlled is indicated by the letter "S" and may be for example a timer or an automatic traffic counter constructed and arranged to count vehicles moving along a highway.

The road unit 1 conveniently includes a body located in the street so as to be actuated by a vehicle passing over the device and causing contacts to be made in a predetermined manner. One novel feature of the invention is that these contacts may be connected to be effective to control the circuits only when the vehicle moves over the unit in a certain direction.

In the illustrated embodiment of our invention this unit includes three separate contact numbers 2, 3 and 4 insulated from each other by spacer members 5. These contact members are preferably yieldable plates which may readily be flexed into contact with each other as the vehicle passes over the device. The entire assemblage is located within a resilient moisture and waterproof envelope or casing indicated by the numeral 6. The contact plates 2, 3 and 4 are connected in circuit to a suitable source of electrical energy by means of lead wires 7, 8 and 9 respectively.

Connected in circuit with the switch members are electro-magnets 10 and 11 provided with armatures 12 and 13 respectively for opening and closing circuits as hereinafter described. Disposed adjacent the armature 12 are double contacts 14 and 15, a single contact 16 being provided adjacent the armature 13. Magnet 10 and armature 13 are connected in circuit with plate 2 by means of leads 8 and 17, and magnet 11 is connected in circuit with plate 3 and armature 12 by means of leads 9 and 20 and contact 14. The designated unit "S" to be controlled by the operation of the several switch members may, as shown in Fig. 2, be connected in circuit therewith by means of lead wires 18 and 19.

Having thus described one embodiment of a relay mechanism constructed in accordance with our invention, the operation thereof is as follows: Assuming that the switch mechanism 1 is located

in a street pavement wherein it is desired to record the presence of vehicles passing only in the direction indicated by the arrow, the circuits for operating the counter or timer will be completed in the following manner. A passing vehicle wheel engages plate 2 and deflects it as indicated by the dotted line, Fig. 2, so as to contact with plate 4 thereby energizing relay 10 and causing armature 12 to engage contact 15 and thus connect one terminal of the power supply to unit "S" by lead wire 19. When the vehicle proceeds further over the road unit, the gap is closed between plates 2 and 3 by the engagement of the latter with plate 4, and the other terminal of the power supply also is connected to "S" via plate 3, and leads 9 and 10, thus causing "S" to operate and register the impulse created by the passing vehicle. As the vehicle continues along the unit, contact between plates 2 and 4 is broken and magnet 10 is de-energized, thereby causing armature 12 to interrupt the circuit 19, so that current is cut off from the unit "S". The armature 12 now engages with contact 14 and establishes a circuit over wire 20 to energize magnet 11 while a vehicle is continuing further over plate 3 alone. The energization of magnet 11 causes its armature 13 to disengage from contact 16 to interrupt the circuit through magnet 10 but this has no effect since the circuit has already been interrupted through the breaking of contacts 2 and 4 as the vehicle wheel left contact 2. As the vehicle leaves contact 3 in the direction of the arrow the circuit via wire 9 from magnet 11 becomes interrupted deenergizing this magnet and causing its armature 13 to resume engagement with contact 16. Now the mechanism is again at its normal condition of rest. It will be observed that the contact plates 2 and 4 together serve as one switch or contact maker and the contacts 3 and 4 together serve as another switch or contact maker.

From the foregoing, it will be noted that the impulse for operating the unit "S" is effected by the predetermined order in which contact is made between the plates 2, 4 and 3. To further illustrate the operation of the device: If a vehicle should approach in a direction opposite to that indicated by the arrow, plate 3 first makes contact with plate 4 and thereby energizes relay 11 which causes armature 13 to interrupt the circuit 17 to magnet 10. As the vehicle proceeds and causes plate 2 to also engage plate 4, the circuit to magnet 10 remains unchanged and thereby prevents relay 10 from becoming energized while plates 3 and 4 are in contact and thus the circuit 19 to the counter cannot be completed so as to produce an operative impulse. After the vehicle has passed off the unit 1, the circuit conditions return to normal without producing any effects on the mechanism "S". As the vehicle proceeds further and the plates 3 and 4 separate, the relay 11 becomes deenergized, and as its armature 13 reengages contact 16 the relay 10 is energized, and remains energized as long as plate 2 is in contact with plate 4. However, at this time, the plates 3 and 4 being separated, the circuit over wire 9 through the unit S is open and remains open as the vehicle continues over plate 2 alone.

From the above description, it will be noted that it is necessary that the relays 10 and 11 be successively energized in a predetermined order so as to permit an electrical impulse to operate the counter mechanism. Thus we have provided a simple and efficient mechanism which shall accurately register vehicles passing over the device in only one direction.

From examination of the mechanism it will be observed that it will not be responsive to and will not send out an impulse to unit "S" upon single actuations of either plate 3 or plate 2, and that only sequential operation of both plates in the predetermined order will cause transmission of an impulse to the control unit "S".

The value of the present construction will be apparent when it is considered that by means of the same, a vehicle moving over a highway in a direction contrary to that in which control is to be exercised will not effect operation of the present mechanism. In other words, a vehicle which for example is on the wrong side of the road or overlaps the center thereof and has passed the intersection will not cause an actuation of the control mechanism even although it may traverse the control unit. Accordingly no operation of the timer and/or counter connected to this unit will follow, but the passage of the vehicle in a proper direction will immediately result in such operation.

In this connection it will be understood that the present control has been illustrated as a road unit. According to the present invention, this is preferably the case. However, it will be appreciated that in certain aspects the control might be of another construction and conversely that the mechanism operated thereby might be of different type without effecting detrimentally the results to be obtained.

It will moreover be appreciated that numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

We claim:

1. A control system including power supply leads, a pair of circuit makers, a pair of relays, an operating circuit for the first of said relays extending from one power lead through the first of said circuit makers through the coil of said first relay and including a break contact of the second of said relays to the other power lead, an operating circuit for the second relay extending from said one power lead through the second of said circuit makers through the coil of said second relay and including a break contact of said first relay to said other power lead, and a circuit including a register and extending from said one power lead through said second circuit maker, and including a make contact of said first relay to said other power lead.

2. A control system including, in combination, a pair of circuit makers, a pair of electro-magnets, a pair of armatures controlled one by each of said magnets, and contacts cooperating with said armatures, one of the circuit makers being connected to one terminal of a source of electric current supply and being arranged in series between said terminal, the winding of one electro-magnet, the armature and a break contact of the second electro-magnet and the second terminal of the electric current supply, the second of said circuit makers being connected to the same one terminal of the electric current supply, and a registering circuit connected in series between the second circuit maker and a make contact and armature of the first electro-magnet to the second terminal of said source of current supply by energization of said first electro-magnet, whereby, when the first circuit maker is primarily closed alone said first electro-magnet will be energized to connect the armature thereof in series with the second terminal of the electric current supply and said reg-

istering circuit and when the second circuit maker is thereafter closed while the first is still closed the registering circuit will be completed to the first supply terminal; the armature of the first electro-magnet during deenergization of the latter being connected through a cooperating break contact in series with the winding of said second electro-magnet and with said second circuit maker whereby, if the second circuit maker is primarily closed alone, said second electro-magnet will be energized to attract the armature controlled thereby to prevent connection of said first electro-magnet with the electric current supply before the registering circuit will be connected to the armature of the first electro-magnet, and a subsequent closure of the first circuit maker while said second circuit maker is closed will not energize said first electro-magnet due to interruption of the circuit by the armature controlled by the second electro-magnet.

3. A control system including in combination a pair of switches placed in a path of traffic and closely spaced therein so as to be operated in a sequential order in which both switches are closed

concurrently between closure of the two switches separately by a wheel rolling thereover; a pair of relays, one having a make contact, and both having break contacts; an operating circuit for the first of said relays extending from one power lead through the first switch, the coil of said first relay and the break contact of the second of said relays in series to another power lead; an operating circuit for the second relay extending from said one power lead through the second switch, the coil of said second relay and the break contact of said first relay in series to said other power lead; and a circuit including a register and extending from said one power lead through said second switch and the make contact of said first relay in series to said other power lead whereby said register circuit will be completed by a wheel rolling over said switches from the direction of the first switch and the register circuit will not be completed by a wheel rolling over the said switches from the direction of said second switch.

CHARLES D. GEER.
JOHN L. BLACH.

CERTIFICATE OF CORRECTION.

Patent No. 2,173,105.

September 19, 1939.

CHARLES D. GEER, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, lines 56 to 59, strike out the sentence "After the vehicle has passed off the unit 1, the circuit conditions return to normal without producing any effects on the mechanism "S"." and insert the same after the word and period "alone." in line 67; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of December, A. D. 1939.

(Seal)

Henry Van Arsedale,
Acting Commissioner of Patents.