

May 31, 1932.

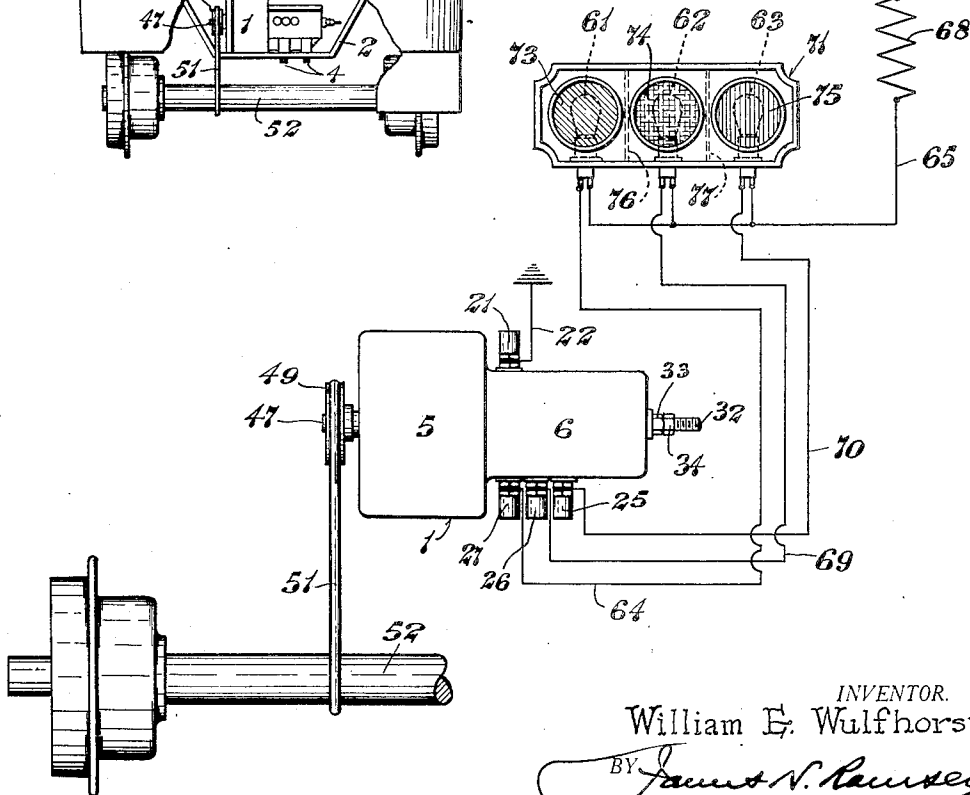
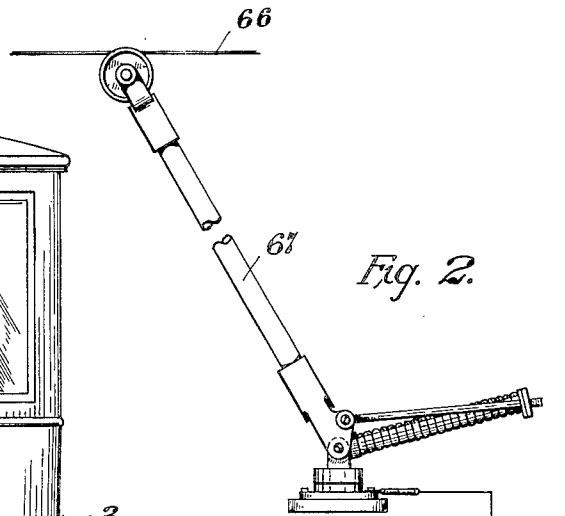
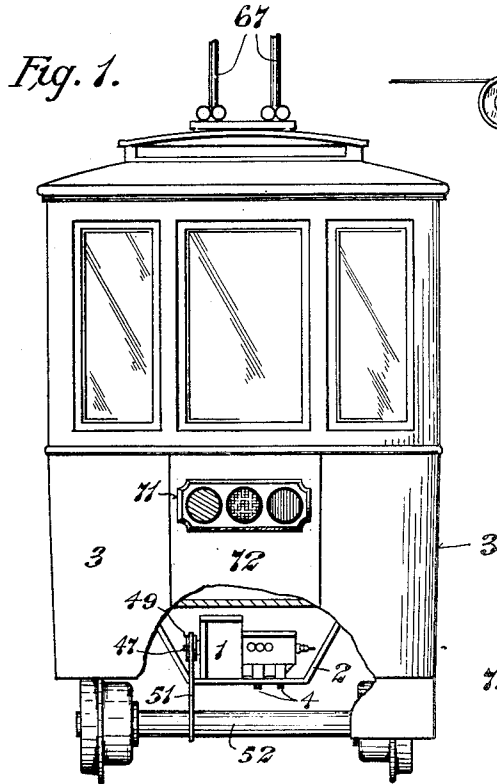
W. E. WULFHORST

1,860,972

AUTOMATIC SIGNAL SWITCH

Filed May 23, 1928

3 Sheets-Sheet 1



INVENTOR.
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ATTORNEY.

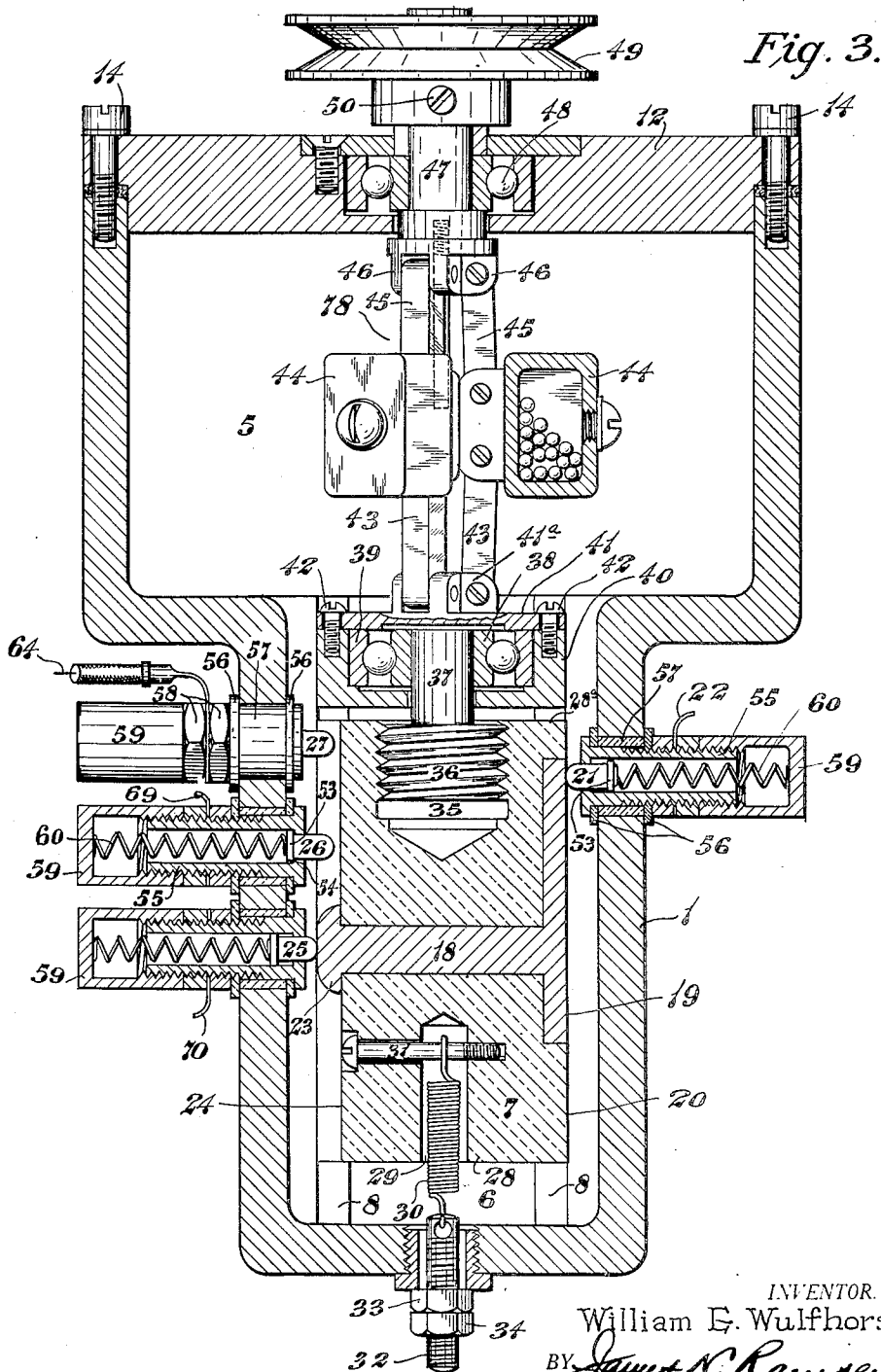
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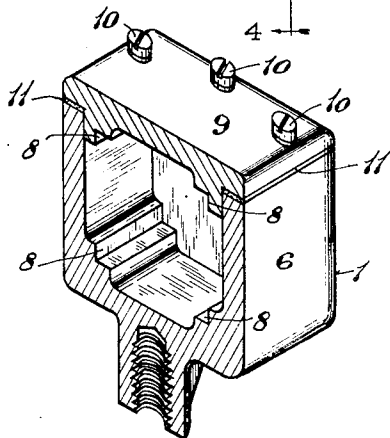
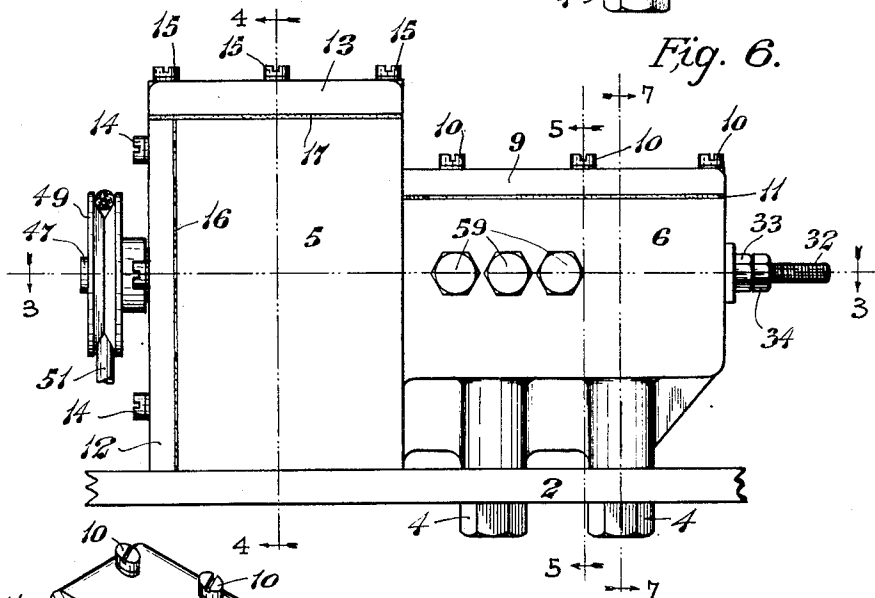
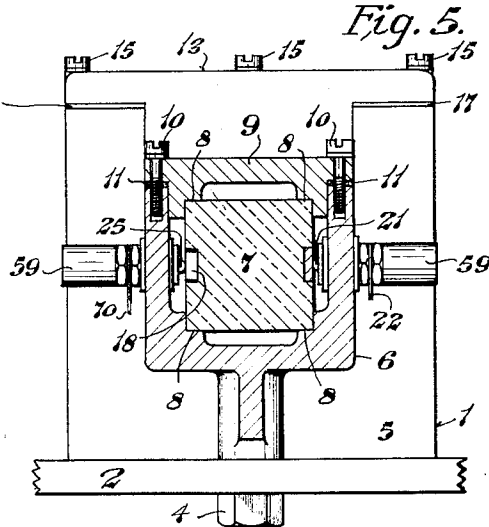
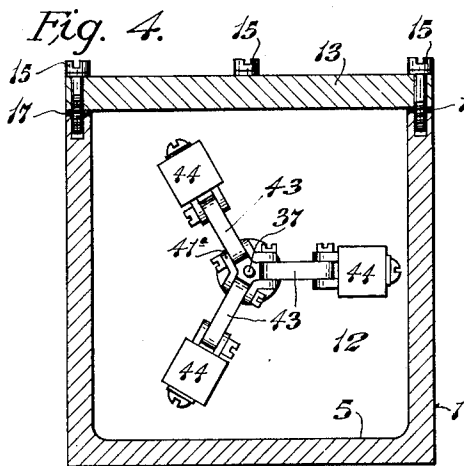
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UNITED STATES PATENT OFFICE

WILLIAM E. WULFHORST, OF CINCINNATI, OHIO

AUTOMATIC SIGNAL SWITCH

Application filed May 23, 1928. Serial No. 280,018.

My invention relates to signals, particularly, though not exclusively, adapted for use on street cars.

The objects of my invention are to provide means adapted to automatically signal persons behind the street car that the car is reducing its speed or that the car is traveling forward without immediate prospects of stopping, or that the car is about to slacken its speed and stop.

My invention consists in providing means adapted to automatically connect and disconnect electric circuits for the purpose of illuminating signals intended to convey information regarding the immediate movement of the street car upon which said signals are displayed.

My invention further consists in the construction, combination, location and arrangement of parts, as herein set forth and claimed.

In the drawings:

Fig. 1 is a rear elevation of a street car partly broken away to show my invention embodied therein;

Fig. 2 is an elevational view of the wiring diagram with that portion of the street car involved therewith;

Fig. 3 is a horizontal section taken on a plane corresponding to line 3—3 of Fig. 6;

Fig. 4 is a vertical section taken on a plane corresponding to line 4—4 of Fig. 6;

Fig. 5 is a vertical section taken on a plane corresponding to line 5—5 of Fig. 6;

Fig. 6 is a side elevation of the casing embodying the means for automatically making and breaking the electrical connection to the signal lamp; and

Fig. 7 is a vertical section taken on the line 7—7 of Fig. 6.

In the embodiment of my inventions as illustrated and which shows a preferred construction I provide case or housing 1 suitably fixed to frame 2 of street car 3 by bolts 4. Said casing comprises governor compartment 5 and communicating runway 6. Sliding block 7 (preferably made of bakelite or other non-conductive material) is mounted for reciprocating movement upon track 8 formed integral with runway 6 and runway

cover 9. The cover 9 is suitably fixed to runway 6 by cap screws 10 and to insure a water-tight fit between said cover and runway I provide a gasket 11, as clearly shown in Figs. 5, 6 and 7, respectively.

The end of compartment 5 is closed by cover 12 and the top by lid 13. Said cover and lid are removably fixed to said compartment by cap screws 14 and 15 and to insure a water-tight construction between said cover, lid and compartment, I provide gaskets 16 and 17, respectively, as shown in Fig. 6.

Sliding block 7, as before stated, is preferably made of bakelite and is cast or molded in rectangular form around T-shaped core 18, as shown in Fig. 3. Elongated side 19 of said core 18 is flush with side 20 of sliding block 7 and is in engagement with brush 21 of conductor 22 at all times. Side 23 of core 18 extends beyond side 24 of sliding block 7 and is adapted to engage the spring actuated brushes 25, 26 and 27, respectively, one at a time, as will be more clearly described under operation. The outer end 28 of block 7 is provided with an elongated socket 29, which receives coil spring 30, one end of which is attached to block 7 by screw 31 and the other end of which is attached to stud 32. The tension of spring 30 may be varied by the positioning of nut 33 upon the threaded portion of stud 32. Nut 34 acts as a lock nut for nut 33. The inner end 28a of block 7 is provided with a threaded socket 35, which socket receives threaded member 36, as clearly shown in Fig. 3. Said member 36 has a reduced neck 37 which has a forced fit within the opening of inner ball race 38. The outer ball race 39 is received by cylindrical cup-shaped member 40 and is held therein by cap 41 fixed to said member by screws 42. Said cap 41 is provided with integral extensions 41a which serve as bearings for one end of bars 43. The other end of said bars are pivotally connected to weights 44. Bars 45 are pivotally connected to said weights 44 at one end and to the bearings 46 fixed upon shaft 47 at their other end. Shaft 47 is rotatably mounted in roller bearings 48 which bearing is mounted in cover 12, as shown in Fig. 3.

Grooved pulley 49 is suitably fixed upon the outer end of shaft 47 in any suitable manner, as for example by set-screw 50. As clearly illustrated in Figs. 1 and 2, respectively, 5
grooved pulley 49 is connected by a belt 51 to an axle 52 of street car 3, so as to rotate with said axle when said car is in motion. As all of the brushes 21, 25, 26 and 27, respectively, are mounted in identical brush holders the description of one will suffice for all. 10

Each of the said brushes have their outer end rounded and are provided with a shoulder or head 53, which limits the outward movement of said brush when it engages the 15
shoulder 54 of barrel 55. Each barrel 55 is insulated from casing 1 by washers 56 and sleeve 57, as clearly shown in Fig. 3. The outer periphery of each barrel 55 is threaded and receives nuts 58 and cap 59. Coil spring 20
60 seats within cap 59 and bears against head 53 of said brushes which insures a perfect spring actuated contact between the brushes 25, 26 and 27 and side 23 of core 18 and brush 21 with elongated side 19 of said core. As 25
shown in Fig. 1, I provide three lamps 61, 62 and 63, respectively. One terminal of lamp 61 is connected to brush 27 by conductor 64 and the other terminal is connected by conductor 65 to trolley line 66 through trolley 30
67. To reduce the usual current of approximately 600 volts in trolley line 66 to 110 volts for lamps 61, 62 and 63, I provide resistance coil 68 in said conductor 65. One terminal of lamp 62 is connected to brush 26 by conductor 35
69 and the other terminal of said lamp is connected to conductor 65. One terminal of lamp 63 is connected to brush 25 by conductor 70 and the other terminal of said lamp is connected to conductor 65. Brush 21 is grounded by conductor 22, as before stated. Said lamps 61, 62 and 63 are preferably mounted within lamp housing 71, which housing is suitably mounted on the rear panel 72 of street car 3. 40

Lamp housing 71 is so constructed and arranged that green lens 73 is mounted in front of lamp 61, yellow lens 74 in front of lamp 62 and red lens 75 in front of lamp 63, respectively. As the lamps 61, 62 and 63 burn at 50
different times, I provide partitions 76 and 77 within said lamp housing 71 to insure against one lamp illuminating more than its intended lens. Bars 43, weights 44 and bars 45 constitute a governor 78 which operates by the well-known principle of centrifugal force, thereby 55
exerting an outward pulling force on block 7 when pulley 49 is rotated.

Operation.—The operation of my improved signal system is as follows: 60

When the street car 3 is at a standstill the tension of coil springs 30 holds sliding block 7 in the outer end of runway 6, as shown in Fig. 3. When the block 7 is in this position the electric current from trolley wire 66 will 65
flow through trolley 67, resistance coil 68,

through lamp 63, conductor 70, brush 25, core 18, brush 21 and conductor 22, thereby completing the 110-volt electrical circuit to lamp 63 and cause the red lens to be illuminated upon which a warning indicia may be printed, as for example, the words "Stop" or "Danger". It will be noticed, therefore, that lamp 63 burns whenever the car is not in motion or traveling at a very low speed. 70

Let us suppose now that the car starts to move forward, and as its velocity increases the governor 78 gradually opens, which, in turn, partially overcomes the tension of spring 30 and draws block 7 towards brush 26, and disconnects brush 25 from core 18, 80
which breaks the electrical circuit of lamp 63. As brush 26 engages core 18 the electric circuit to lamp 62 is completed, thereby causing the amber or yellow lens 74 to be illuminated upon which lens a warning indicia may be printed, as for example, the words "Slow" or "Caution". As the velocity of the car increases, block 7 is caused to slide towards brush 27, due to the centrifugal force of weights 44, and disconnect brush 26 from core 18, thereby extinguishing lamp 62. As the car reaches a maximum speed forward the core 18 is brought into contact with brush 27, thereby completing the 110-volt circuit to lamp 61 which, in turn, illuminates green 85
lens 73 upon which the words "Clear" or "Go" may be printed. Some one of the three lamps will be burning at all times. In other words, when the car is at a standstill the red lamp burns, when the car is moving forward slowly, the yellow lamp burns, and when the car is moving forward without immediate prospects of stopping, the green lamp burns. 90

An advantage of my invention is in the provision of an automatic signal device adapted to impart knowledge to persons behind the moving street car or automobile having my invention embodied therein, that the vehicle is moving forward without immediate prospects of slacking its velocity or that it is slackening its velocity for the purpose of stopping, or that it is almost stopped, or that it is at a complete standstill. At this day and age of modern achievement, and when the streets of our cities are overcrowded with rapidly moving vehicles, my automatic signalling device is adapted to greatly facilitate the movement of traffic, as well as greatly reduce the chances of collision and accidents as the result of vehicles suddenly stopping without warning to persons in the rear. 105

While I have chosen to illustrate the form and construction of my invention, as herein set forth, I do not include the various forms of modifications in which my invention may be incorporated. The illustrations and explanations herein are made merely for the purpose of showing a form of construction by 125
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which my invention may be carried into effect.

What I claim as new and desire to secure by Letters Patent is:

- 5 1. In a switch for speed responsive mechanism (having a housing provided with a shaft journaled therein, and means for rotating the shaft), comprising a contact block formed of insulating material and slidably mounted in
10 said housing, a contact carried by said block and extending therethrough, a spring actuated contact member carried by one wall of said housing and in permanent touching engagement with one end of said contact carried by the block, a plurality of spring actuated contact members carried by another wall
15 of said housing, the sliding movement of said block successively engaging said plurality of spring actuated contact members with the single contact member carried by the block.
20 2. In a switch for speed responsive mechanism (having a housing provided with a shaft journaled therein and means for rotating the shaft), a contact block formed of insulating
25 material and slidably mounted in said housing, a contact extending through said block and having an integrally formed elongated side, a spring actuated contact member carried by one wall of said housing and in permanent touching engagement with said elongated side, a plurality of spring actuated
30 contact members carried by another wall of said housing whereby different pairs of said spring actuated contact members are connected as said block is moved within the housing.

WILLIAM E. WULFHORST.

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