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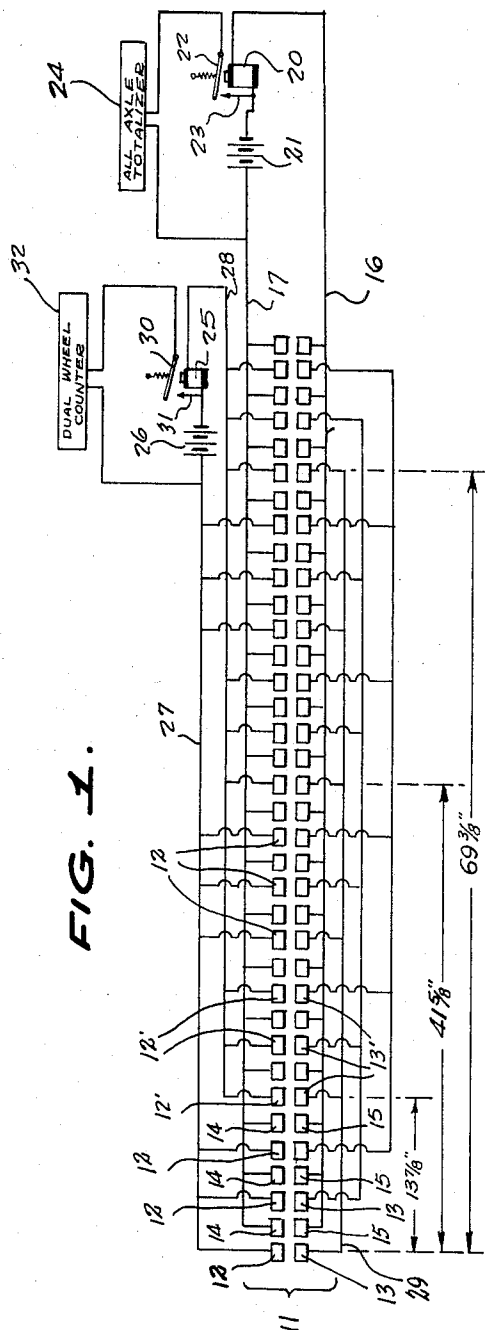
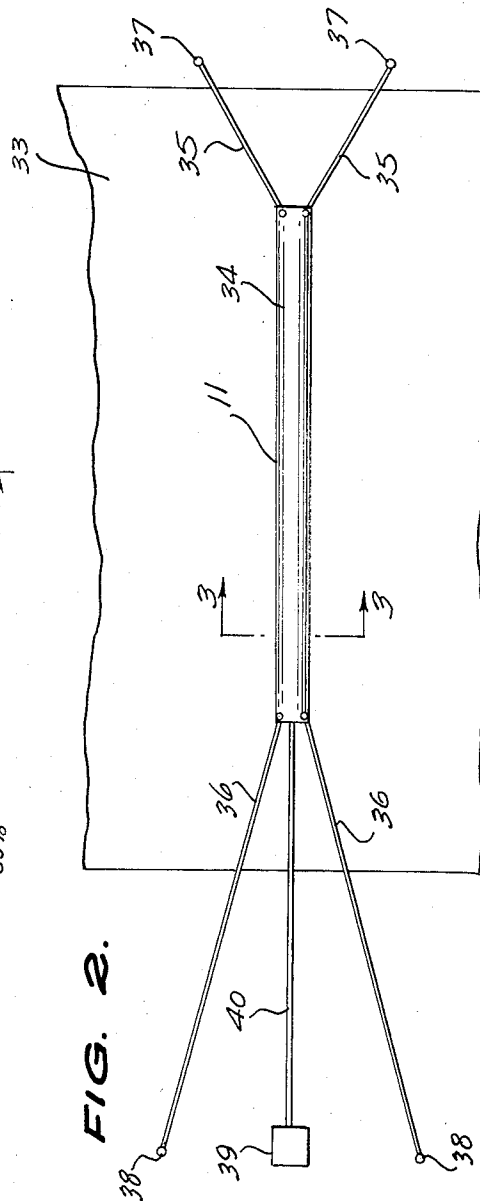
J. P. ROSCOE

2,922,003

ROADWAY SWITCH FOR TRAFFIC COUNTING SYSTEMS

Filed June 13, 1958

4 Sheets-Sheet 1



INVENTOR.
JOHN P. ROSCOE,
BY

McMorrow, Perman & Davidson
ATTORNEYS.

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J. P. ROSCOE

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4 Sheets-Sheet 2

FIG. 3.

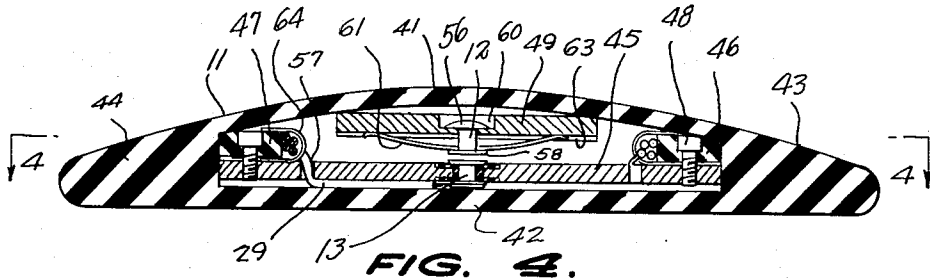
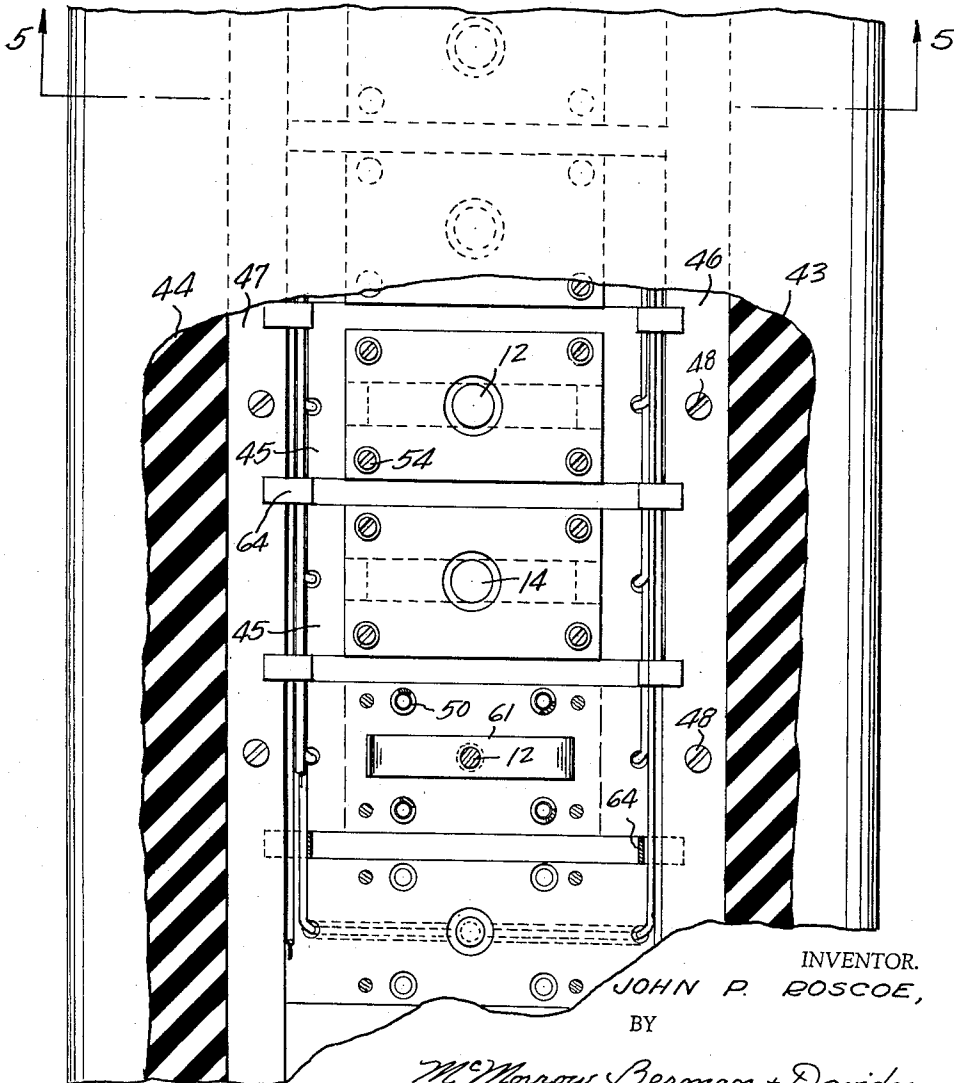


FIG. 4.



INVENTOR.
JOHN P. ROSCOE,
BY

McMorrow, Berman + Davidson
ATTORNEYS.

Jan. 19, 1960

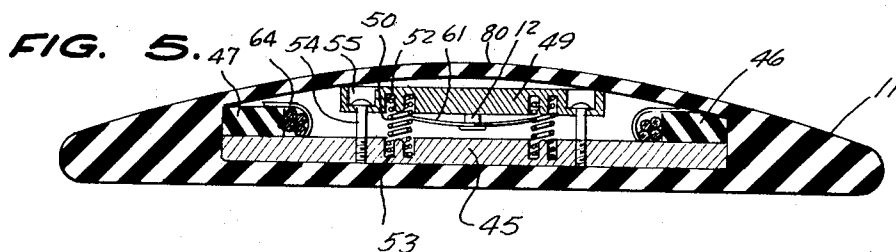
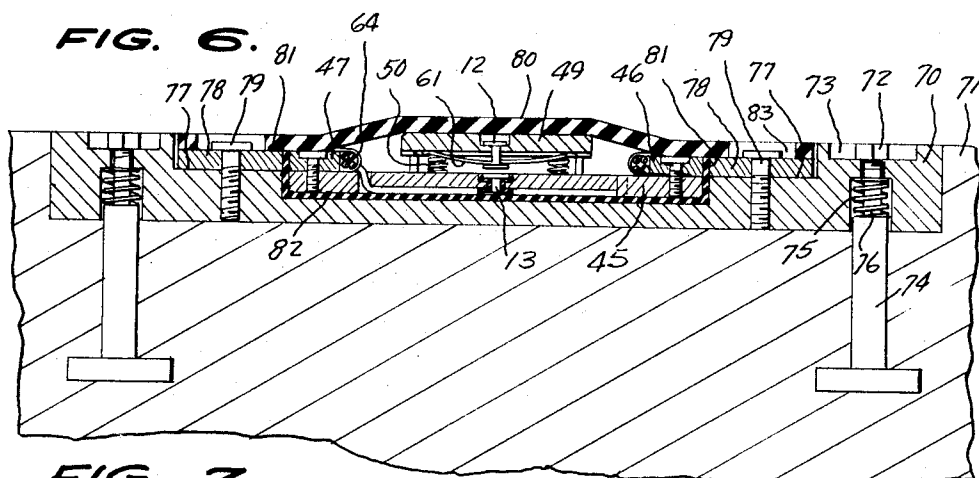
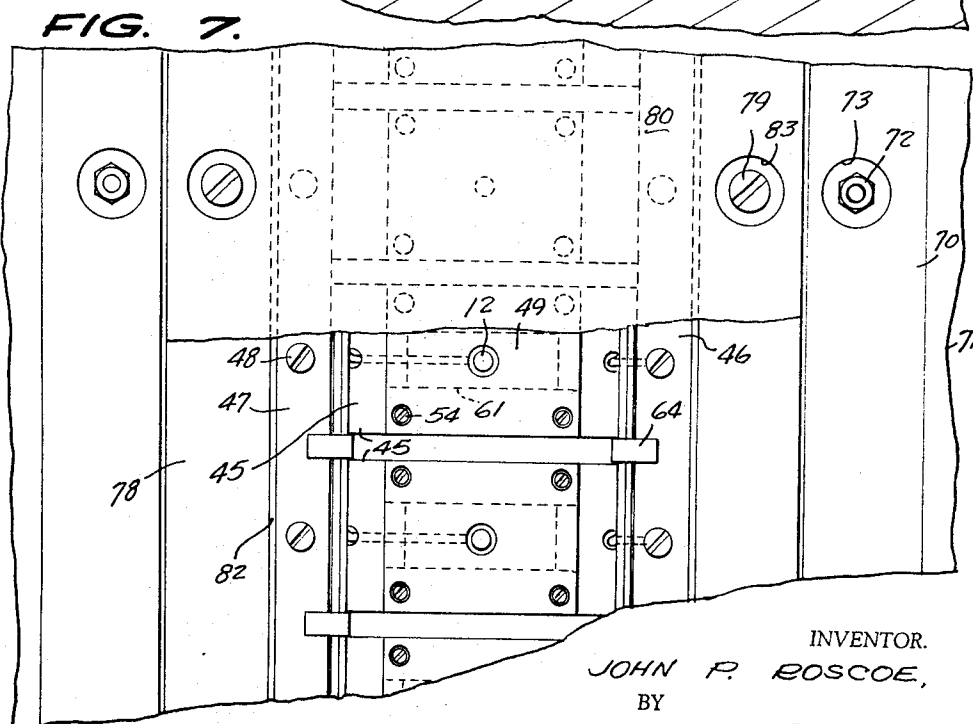
J. P. ROSCOE

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ROADWAY SWITCH FOR TRAFFIC COUNTING SYSTEMS

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4 Sheets-Sheet 3



INVENTOR.

JOHN P. ROSCOE,

BY

McMorrow, Berman + Davidson

ATTORNEYS

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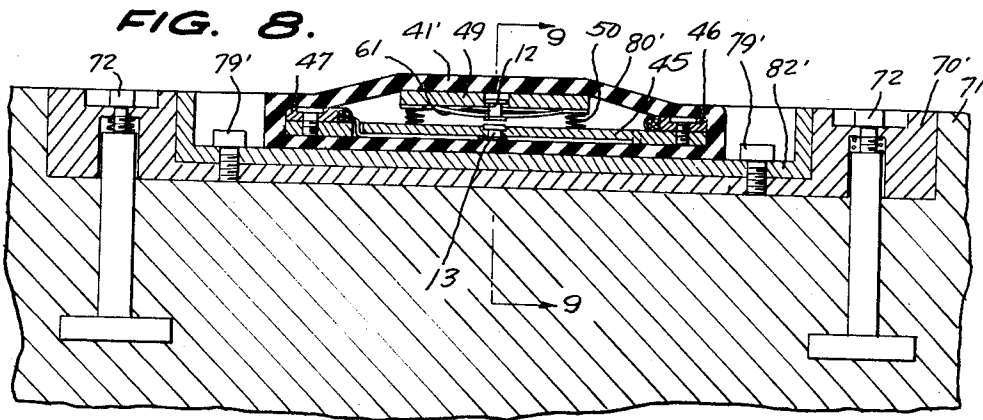
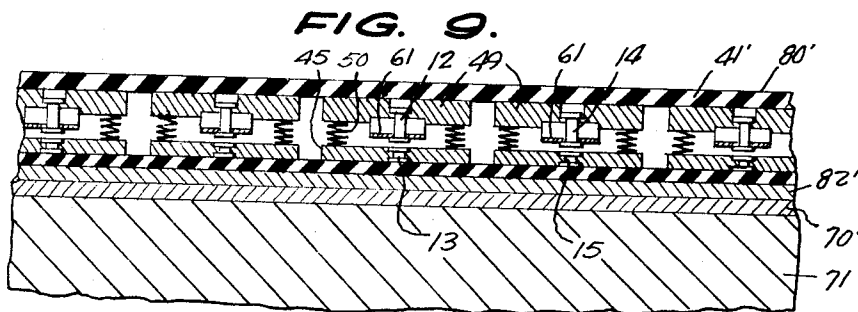
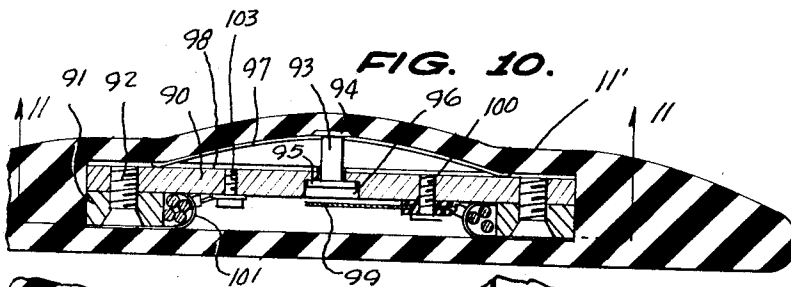
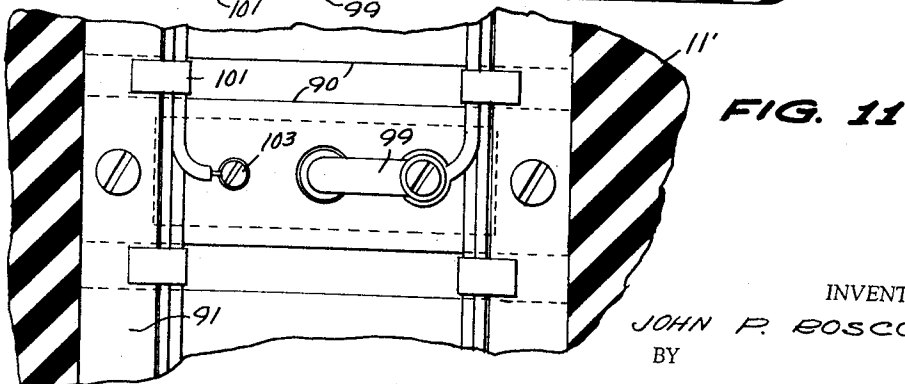
J. P. ROSCOE

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ROADWAY SWITCH FOR TRAFFIC COUNTING SYSTEMS

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4 Sheets-Sheet 4



INVENTOR.

JOHN P. ROSCOE,
BY

McMorrow, Berman & Davidson
ATTORNEYS.

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2,922,003

ROADWAY SWITCH FOR TRAFFIC COUNTING SYSTEMS

John P. Roscoe, Cutten, Calif.

Application June 13, 1958, Serial No. 741,799

13 Claims. (Cl. 200—86)

This invention relates to traffic counting systems, and more particularly to novel and improved roadway switch structures for use in such systems.

A main object of the invention is to provide a novel and improved roadway switch for use in a traffic counting system, the switch being simple in construction, being easy to install in a roadway, and being provided with means to maintain the contact elements of the switch closed for a substantial period of time when the switch is actuated by the passage thereover of a vehicle wheel.

A further object of the invention is to provide an improved roadway switch especially useful in traffic counting systems, the switch being relatively inexpensive to fabricate, being durable in construction, and having high sensitivity to the passage of a vehicle wheel thereover.

A still further object of the invention is to provide an improved roadway switch especially suitable for use in traffic counting systems, the switch assembly being relatively compact in size, requiring a minimum number of parts, and operating to close its contacts responsive to the passage thereover of a vehicle wheel and to maintain the contacts closed for a substantial period of time to thereby insure accurate operation of the counter mechanisms associated with the switch.

A still further object of the invention is to provide an improved roadway switch for use in traffic counting systems, said switch being reliable in operation, offering relatively small obstruction to the passage of a vehicle wheel thereover, and being provided with means for securing and retaining the associated wiring of the switch in a manner whereby the wiring cannot interfere with the operation of the switch while at the same time allowing required electrical connections to the switch contacts and to the external counter mechanisms.

A still further object of the invention is to provide a simple and accurate mechanism for registering in one circuit all axles that pass thereover, and registering in a separate circuit only dual-tired axles that pass thereover.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a schematic wiring diagram illustrating a typical roadway switch assembly connected to vehicle wheel counting devices, and illustrating a system in which an improved roadway switch according to the present invention may be employed to great advantage.

Figure 2 is a top plan view of a roadway lane over which is installed a vehicle counting switch according to the present invention.

Figure 3 is an enlarged transverse vertical cross sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a horizontal cross sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a transverse vertical cross sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a transverse vertical cross sectional view, similar to Figure 3, but illustrating a modified form of

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roadway switch according to the present invention, intended as a permanently installed switch.

Figure 7 is a fragmentary top plan view, with parts broken away, of the roadway switch assembly illustrated in Figure 6.

Figure 8 is a transverse vertical cross sectional view, similar to Figure 6, but showing a further modified form of a permanently installed roadway switch according to this invention.

Figure 9 is a vertical cross sectional view taken on the line 9—9 of Figure 8.

Figure 10 is a transverse vertical cross sectional view, generally similar to Figure 3, but showing a still further modified form of roadway switch according to the present invention.

Figure 11 is a horizontal cross sectional view taken on the line 11—11 of Figure 10.

Referring to the drawings, and more particularly to Figure 1, in a typical vehicle counting system, a roadway switch assembly, designated generally at 11 is provided, said assembly being suitably supported by means such as that presently to be described, and being arranged on a traffic lane of a highway substantially transverse thereto and in a position such that the wheels of vehicles traveling on the highway lane will pass over the roadway switch. In the particular arrangement schematically illustrated in Figure 1, provision is made for distinguishing between ordinary passenger vehicles and vehicles of the dual-wheeled type. Thus, the system includes a first relay 20 whose winding is connected through a battery 21 to longitudinally spaced contacts 14 of the roadway switch, said contacts 14 being engageable with cooperating contacts 15 located therebelow responsive to the passage of a wheel of any type over the switch. As shown, the contacts 15 are connected through a wire 16 connected to one terminal of the winding of relay 20. The other terminal of the relay is connected through the battery 21 to a wire 17 which is in turn connected to the spaced contacts 14.

The cooperating pairs of contacts 14 and 15 are spaced along the switch by distances such that any type of vehicle wheel passing over the switch will cause closure of at least one set of contacts 14 and 15 and will thereby energize the relay 20. Relay 20 is provided with an armature 22 engageable with a stationary contact 23, responsive to energization of the relay winding, the contacts 23 and armature 22 being connected in circuit battery 21 and a conventional electrically operated counter 24 which registers each time that the circuit is closed at contacts 22 and 23.

A second relay 25 has its winding connected through a battery 26 to a wire 27 which is connected to additional sets of contacts 12 alternating with the contacts 14 at portions of the switch. At adjacent portions of the switch further contacts 12' alternate with the contacts 14 and are connected to a wire 28 which is in turn connected to one terminal of the winding of relay 25. Cooperating with the contacts 12' and located therebelow in the switch assembly are bottom contacts 13' and cooperating with the contacts 12 and located therebelow in the switch assembly are bottom contacts 13. The contacts 13 are connected to respective contacts 13', as by wires 29, whereby a pair of contacts 12 and 12' will be bridged by the engagement of their cooperating lower contacts 13 and 13' when a dual-tired wheel passes over the roadway switch, since the pairs of contacts are so spaced that the spacing between a bottom contact 13 and the successive bottom contact 13' to which it is connected by wire 29 is substantially the same as the distance between the center lines of the tires of a dual-

tired wheel, for example, a distance of approximately 13 $\frac{3}{8}$ inches.

Furthermore, the cooperating detecting switch contacts are spaced so that the single wheels on opposite sides of a passenger car or other single-tired vehicle will not cause false registration as dual tires. Thus Figure 1 shows the numerical values of certain of the spacings between recurrent detecting switch pairs which may be employed to prevent such false registration.

Thus, when a dual-tired wheel passes over the roadway switch assembly, the wire 27 will be connected to the wire 28 by the closure of respective pairs of contacts 12, 13 and 12', 13'. This energizes the relay 25 and causes its armature 30 to engage the stationary contact 31. Armature 30 and stationary contact 31 are connected in circuit with battery 26 and a conventional counter 32 which registers each time that the armature 30 engages a stationary contact 31, providing registration of the dual-tired wheels.

Thus, the switch assembly comprises a spaced arrangement of pairs of contacts such as that illustrated in Figure 1 which is incorporated in a unitary assembly and which is arranged transversely on the highway lane on which traffic counting is desired.

Thus, as shown in Figure 2, a switch assembly 11 is disposed transversely over a highway lane 33, the switch assembly being encased in a relatively flat resilient sleeve-like container 34 to the corners of which are secured respective flexible anchoring cables 35, 35 and 36, 36, as shown. The cables 35, 35 are relatively short and are provided at their ends with suitable stakes 37 or other post elements which may be embedded in the ground. Similarly, the relatively long cable elements 36, 36 are provided at their ends with stakes or posts 38, 38 which may be similarly embedded in the ground, whereby the switch assembly 11 will be secured substantially in the position illustrated in Figure 2, namely, in a position whereby traffic using the lane 33 will pass over the switch assembly.

The counters, relays, batteries, and the like, are disposed in a suitable container 39 disposed at one side of the highway lane 33 and electrically connected to the respective switch pairs of the switch assembly 11 by conductors housed in a suitable cable 40.

Referring now to Figures 3, 4 and 5, it will be seen that the housing 11 comprises an elongated, relatively flat, sleeve-like member of resilient material, such as rubber, or the like, the housing being closed at its ends and being of sufficient length to accommodate the spaced pairs of contacts schematically illustrated in Figure 1 with the indicated spacings therebetween. The elongated flat resilient housing 11 has the upwardly convex top wall 41 which is readily yieldable responsive to downward force exerted thereon, the flat bottom wall 42, and the outwardly tapering marginal portions 43 and 44 which are rounded at their edges, as shown.

Each set of cooperating contact elements 12 and 13, 14 and 15, etc., is diagrammatically illustrated in Figure 1 and comprises a stationary rigid bottom plate 45 disposed in the housing 11 and being substantially closely fitted transversely therein, as shown in Figure 3. The plate 45 may be made of any suitable rigid material, such as metal of substantial thickness. Secured on the respective side marginal portions of the bottom plate 45 are rigid insulating strips 46 and 47 which are fastened to the plate by means of suitable screws 48, as shown, whereby the strips and the plates 45 define a channel-shaped configuration. Spaced above and associated with each base plate 45 is a movable plate member 49 which is normally urged against the bottom surface of top wall 41 and supported in this position by respective coiled springs 50 provided beneath the opposite transverse margins of the plate member 49 and having their end portions received in respective vertically aligned sets of counter-

sunk annular recesses 52, 53 provided in the cooperating plates 49 and 45, as is clearly shown in Figure 5. Upward movement of the plate 49 is limited by the provision of corner retaining screws 54 which engaged through counterbored recesses 55 provided in the corner portions of the plates 49 and which are threadedly engaged in the bottom plates 45, the recesses 55 being of substantial depth, allowing substantial downward movement of the plates 49 relative to the heads of the retaining screws 54.

Centrally mounted in each bottom plate 45 is a contact element 13 which is suitably insulated from the main portion of the associated plates 45 by bushings of insulating material; as shown in Figure 3, which insulate the contact elements 13 completely from the bottom plates 45. Respective conductors are connected to the stationary bottom contact 13, said conductors passing through apertures 57 provided in the plates 45 and being disposed along the inside edges of the insulating strips 46 and 47, as shown in Figure 3, wherein the conductor 29 is thus illustrated.

It will be understood that the various additional stationary bottom contact elements included in the roadway switch 11, such as the bottom contact elements 15 and 13' are similarly centrally secured in their associated base plates 45.

As specifically illustrated in Figure 3, the movable upper contact element 12 comprises a double-headed member having the top head 56 and the enlarged bottom head 58, the shank of the member 12 extending through a central aperture provided in the associated plate member 49, the head 56 being received in a counterbore 60 provided around the aperture whereby to allow the plate 49 to move a substantial distance downwardly relative to head 56 without causing the head to engage the flexible top wall 41 of housing 11. The contact element 12 is biased downwardly by a leaf spring 61 which is centrally apertured and which is downwardly convex, as shown in Figure 3, the central portion of the leaf spring bearing downwardly on the bottom head 58 and the end portions of the leaf spring being retained in the end portions of a shallow transverse groove 63 formed in the bottom of plate member 49. The upper contact elements 12 are electrically connected through the leaf springs 61, the upper plates 49 and the biasing springs 50 to the bottom plates 45, the respective bottom plates being electrically connected to the respective conductors 27, 17, etc., of the circuit shown in Figure 1, said conductors being disposed against the inside edges of the insulating strips 46 and 47 and retained against said strips along with the previously mentioned conductors by resilient spring clips 64 engaged around the edges of the insulating strips 46 and 47 and located between the successive base plates 45, as is clearly shown in Figure 4.

In operation, when a vehicle wheel passes over the yieldable top wall of housing 11, the subjacent plate elements 49 are depressed, causing their associated contact elements 12 to almost immediately engage the subjacent stationary contact elements 13 and to remain in engagement therewith for a substantial period of time, namely, until the wheel has almost completely passed over the housing 11 so that the coiled springs 50, acting in conjunction with the leaf springs 61 can elevate the plate members sufficiently to disengage the bottom heads 58 from their subjacent associated stationary contact elements 13. Because of the lost motion allowed between the movable contact elements 12 and their associated carrier plates 49, the contact elements 12 remain in engagement with the stationary contact elements 13 over substantial periods of time, as compared with the periods of contact time which would be provided if the elements 12 were positively connected to the movable upper plates 49. Thus, in the circuit of Figure 1, the relay members 20 and 25 are assured of positive energization when a vehicle passes over the roadway switch assembly 11, since the

windings of the relays are maintained energized for substantial periods of time.

As shown in Figure 3, the bottom heads 58 of the contact elements 12 are normally spaced by very short distances from the top flanges of the stationary bottom contact elements 13, whereby contact is made between element 12 and bottom contact 13 almost immediately when a vehicle wheel engages on the flexible top walls 41 of the housing 11. This contact is maintained until the wheel rolls over said top wall and moves off of the housing 11, whereby the plates 49 are elevated by their biasing springs 50, the contact elements 12 being held downwardly by their leaf springs 61 until the springs 50 have lifted the plate elements 49 a sufficient distance so that the bottom heads 58 of the contact elements 12 clear the top surfaces of the contact elements 13.

The form of the invention illustrated in Figures 2 to 5 represents a temporary installation wherein the switch assembly 11 may be placed at any desired location on a roadway and will be secured thereon by the flexible and preferably elastic retaining cords 35, 35 and 36, 36.

Referring now to the form of the invention illustrated in Figures 6 to 9, a more permanent installation is shown. Thus, the apparatus comprises a generally channel-shaped main base plate 70 which is embedded in the roadway 71 and which is preferably retained therein by anchor bolts 72 provided in countersunk openings 73 formed in the side marginal portions of base plate 70. The anchor bolts 72 threadably engage in anchor sleeves 74 embedded in the roadway, as shown in Figure 6, the anchor sleeves extending upwardly into counterbores 75 provided in the bottom of base plate 70, coiled springs 76 being provided on the bolts 72 and engaging between the top rim portions of the anchor sleeves 74 and the upper wall surfaces of the counterbores 75, as is clearly shown in Figure 6.

In the form of the invention shown in Figures 6 and 7, the base plate 70 is formed with the respective side recesses 77, 77 in which are received the respective side strips 78, 78, as shown in Figure 6. The side strips 78, 78 are rigidly secured to base plate 70 by fastening screws 79. Designated at 80 is a generally channeled longitudinally extending top plate which may be formed of suitable flexible metal, the top plate being coextensive in length with the base plate 70 and having the side marginal portions of its bottom surface rigidly secured by welding, or the like, to the inside margins of the strips 78, as shown at 81, 81 in Figure 6, whereby the flexible plate 80 is secured at its side margins to the base plate 70.

A suitable liner 82 of insulating material is provided inside the main channel of base plate 70 and disposed thereon is a plate member 45 similar to that employed in the previously described embodiment of the invention. Plate member 45 is provided centrally thereof with a stationary contact, for example, a contact element 13, which is suitably insulated from the plate member but which is connected to a suitable conductor disposed adjacent the inside edge of an insulating strip 47 or 46, as in the previously described form of the invention.

Movable upper plate elements 49, spaced in the same manner as indicated in Figure 1, are provided subjacent the relatively flexible central portion of the cover plate 80, the plate members 49 being biased upwardly by coiled springs 50, as already described. Movable contact elements, such as the contact elements 12 are provided centrally in the movable plate members 49, in vertical alignment with the associated subjacent stationary contact elements, such as the contact elements 13, the contact elements 12 being yieldable upwardly relative to the movable plate members 49 and being biased downwardly by the leaf springs 61, as previously described.

As in the previously described form of the invention, the bottom plates 45 are connected to suitable conductors, and the various conductors associated with the cooperating switch contact elements are retained against the in-

side edges of the insulating strips 46 and 47 by spring clips 64, as is clearly shown in Figures 6 and 7.

As shown in Figure 6, the side margins of the cover plates 80 are formed with relatively large apertures 83 receiving the heads of the bolts 79 and providing ample clearance for engaging the bolt heads with a suitable wrench.

In operation, when a wheel passes over the flexible cover element 80, the element 80 is locally distorted and is bent downwardly, acting on the subjacent plate members 49, providing the contact-closing action previously described in connection with the switch assembly 11 of Figures 2 to 5.

Obviously, the top plate member 80 may be made of any readily yieldable material, such as metal, flexible plastic material, rubber, or the like. While flexible metal has been disclosed and described, obviously if the cover member 80 were made of flexible plastic sheet material, the side strips 78 would likewise be made of plastic material and the connections 81 would be made in any conventional manner for providing a rigid connection between the side portions of the cover plate 80 and the anchoring strips 78.

In the form of the invention illustrated in Figures 8 and 9, the main base plate is designated at 70' and comprises a relatively flat, channeled plate of metal or other suitable material whose side portions are secured in the roadway 71 by anchor bolts 72 in the same manner as described in connection with the embodiment illustrated in Figures 6 and 7. A channel-shaped metal liner member 82' is disposed in the main plate 70' and is detachably secured thereto by suitable fastening bolts 79'. As shown, the bolts 79' are located adjacent the opposite side margins of the removable metal liner plate 82'.

Designated at 80' is a relatively flat, elongated housing member of any suitable flexible material which is rigidly secured in any suitable manner to the intermediate portion of the liner plate 82', the housing member 80' having the flexible top wall 41'. Mounted in the flexible housing 80' is a base plate 45 provided with the side strips 46 and 47 of insulating material, as in the previously described forms of the invention. The base plate 45 is provided with the central, stationary contact element, such as the contact element 13 previously described. Disposed in the housing 80' beneath the flexible top wall portion 41' are the spaced downwardly movable plate members 49 provided with the central contact elements, such as the contact elements 12 which are vertically movable relative to their associated carrier plates 49, as in the previously described forms of the invention and which are biased downwardly by leaf springs 61 in the same manner as already described. The plate members 49 are biased upwardly by coiled springs 50 and are movable downwardly when a wheel passes over the flexible top wall 41', whereby to cause the associated subjacent contact element 12 (or other corresponding contact element such as the contact element 14 shown in Figure 1) to engage its associated subjacent stationary contact element.

As explained in connection with the cover plate 80 of Figures 6 and 7, the top wall 41' of housing 80' is locally deformable so that it will transmit downward movement to the plate members 49 located subjacent the wheel passing over the switch assembly.

Referring now to the form of the invention illustrated in Figures 10 and 11, 11' designates a relatively flat elongated housing of resilient deformable material, such as rubber or the like, similar to the housing 11 employed in the first described form of the invention. Spaced rigid plate elements 90 are provided in the housing 11', said plate elements extending transversely of the housing and being spaced in the manner indicated for the spacing of the respective pairs of contact elements shown in Figure 1. The plate elements 90 are supported on longitudinal strips 91 of insulating material, the ends of the plate ele-

ments 90 being secured to said strips by suitable fastening screws 92, as shown in Figure 10. Each plate element 90 is provided centrally with a vertically movable contact element 93 having top and bottom head portions 94 and 95 and an intervening shank portion, as shown in Figure 10. The bottom head portions 95 are received in counterbores 96 formed in the bottom surfaces of the plate members 90. Upwardly convex leaf springs 97 extend transversely, each leaf spring being centrally apertured and receiving the associated contact element 93 therethrough, the top head 94 of the contact element bearing on the uppermost portion of the leaf spring, as shown in Figure 10. The end portions of the leaf springs 97 are received in shallow transverse grooves 98 provided in the respective plate members 90, preventing the leaf springs from rotating.

Secured beneath each plate member 90 and insulated therefrom is a horizontally extending resilient contact arm 99, the contact arm being secured to the associated plate member by a fastening screw 100 which is suitably insulated from the plate member. Each spring member 99 is connected to a suitable conductor which is disposed adjacent the inside edge of one of the insulating supporting strips 91 and retained thereagainst by U-shaped resilient retaining clips 101 located between successive plate members 90, as is clearly shown in Figure 11.

As will be well understood, the plate members 90 are connected to other conductors which are likewise received adjacent the inside edges of the insulating strips 91 and retained thereagainst by the clips 101, for example, by being connected to terminal screws 103 threadably engaged beneath the plate members 90.

In operation, when a vehicle wheel passes over the flexible top wall of the housing 11', the downward force is transmitted to the subjacent leaf springs 97 and the contact elements 93 carried thereby, causing the contact elements 93 to move downwardly and engage the subjacent spring arms 99, thus closing the switch contacts. As in the previously described form of the invention, substantial downward movement of the bottom head elements 95 relative to the plate elements 90 is allowed, whereby the period of contact of the head elements 95 with the spring arms 99 is substantially long and continues until the wheel has traveled substantially over the major portion of the transverse width of the housing member 11'.

If so desired, the spring arms 99 may be made of sufficient width so that rotation thereof relative to its fastening screw 100 is prevented by the engagement of the side edges of the spring arm 99 with suitable depending abutment elements of insulating material which may be provided on the plate members 90. Such depending abutment elements will of course be provided adjacent the opposite side edges of the spring arms 99, whereby to prevent horizontal rotation of the spring arms.

Various modifications will suggest themselves to those skilled in the art. For example, within the spirit of the present invention, the flexible top wall member of the switch may be suitably insulated on two opposite edges from the base plate thereof and may be made of conductive material. The flexible top wall member may thus comprise the upper movable contact and the base plate may thus comprise the bottom stationary contact. The flexible top wall member may be suitably and accurately formed and may be of sufficient flexibility to locally deform when a wheel passes thereover, or alternately, spaced sets of flexible top wall elements and base plates may be provided in a switch assembly, the spacing being such as that indicated in the schematic drawing of Figure 1, whereby each set of plate members operates as a wheel-responsive switch. The above described structure may include respective side strips against which the associated conductors are retained, as in the

forms of the invention specifically illustrated and described above.

Another modification, within the spirit of the present invention, can be applied to the forms of the invention as shown in Figures 3, 5, 6 and 8. Referring to Figure 5 as an example, a collar can be placed around the movable upper plate 49 in such a way that it works in conjunction with the pins 55 to hold upper plate 49 in close lateral control against any side thrust from a tire. The collar may go completely around plate 49 or it may be replaced by two metal straps between plate 49 and the two channels. Such collar or metal straps are attached to lower plate 45 by screws or other suitable means, and are arranged to fit snugly against upper plate 49, but in no way to interfere with the vertical movement of upper plate 49. Such a collar will also keep the channel wires in place even without the use of the metal clips 64, and will make it impossible for them to enter between plates 49 and 45.

While certain specific embodiments of an improved roadway switch for use in traffic counting systems have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a traffic counting system of the character described, a roadway switch comprising a base member adapted to be mounted substantially transversely in a highway, a plate member disposed above and substantially parallel to said base member, spring means biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally extending below said plate member, said plate member being movable downwardly relative to said second contact element, and means on said second contact element engageable with said plate member to limit downward movement of said second contact element.

2. In a traffic counting system of the character described, a roadway switch comprising a base member adapted to be mounted in a highway in a position to be engaged by the wheels of vehicles moving on the highway, a plate member disposed above and substantially parallel to said base member, spring means biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally depending below said plate member, said plate member being movable downwardly relative to said second contact element, spring means biasing said second contact element downwardly relative to said plate member, and means on said second contact element engageable with said plate member to limit downward movement of said second contact element.

3. In a traffic counting system of the character described, a roadway switch comprising a base member adapted to be mounted in a highway in a position to be engaged by the wheels of vehicles traveling thereover, a plate member disposed above and substantially parallel to said base member, spring means biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally depending below said plate member, said plate member being movable downwardly relative to said second contact element, spring means biasing said second con-

7. In a traffic counting system of the character described, a roadway switch comprising a relatively flat channelled base member adapted to be mounted in a highway in a position to be engaged by the wheels of vehicles traveling thereover, a plate member disposed above and substantially parallel to said base member and being downwardly movable therein, spring means in said chan-

10. In a traffic counting system of the character described, a rotary switch comprising a relatively flat channeled base member adapted to be mounted in a highway in a position to be engaged by the wheels of vehicles passing thereover, a plate member disposed above and substantially parallel to said base member and being downwardly movable therein, spring means in said channeled base member acting between the bottom of said base member and said plate member, biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally depending below said plate member, said plate member being movable downwardly relative to said second

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contact element, a bowed leaf spring engaging beneath said plate member, said second contact element extending slidably through the intermediate portion of said leaf spring, an enlarged bottom head element on said second contact element engaging said leaf spring, and an enlarged top head element on said second contact element engageable with said plate member to limit downward movement of said second contact element, said plate member being formed in its top surface with a recess of substantial depth receiving said enlarged top element.

11. In a traffic counting system of the character described, a roadway switch comprising an elongated relatively flat sleeve member of resilient material adapted to be mounted substantially transversely in a highway, a rigid flat base member mounted in the sleeve member, a plate member disposed above and substantially parallel to said base member, spring means biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally depending below said plate member, said plate member being movable downwardly relative to said second contact element, and means on said second contact element engageable with said plate member to limit downward movement of said second contact element.

12. In a traffic counting system of the character described, a roadway switch comprising an elongated relatively flat sleeve member of resilient material adapted to be mounted substantially transversely in a highway, a rigid channeled base member mounted in the sleeve member, a plate member disposed above and substantially parallel to said base member and being downwardly movable therein, spring means in said channeled base member acting between the bottom of said base member and said plate member, biasing said plate member upwardly relative to said base member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element

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and normally depending below said plate member, said plate member being movable downwardly relative to said second contact element, and means on said second contact element engageable with said plate member to limit downward movement of said second contact element.

13. In a traffic counting system of the character described, an elongated relatively flat sleeve member of resilient material adapted to be mounted substantially transversely in a highway, a rigid channeled base member mounted in the sleeve member, a plate member disposed above and substantially parallel to said base member and being downwardly movable therein, spring means in said channeled base member acting between the bottom of the base member and said plate member, biasing said plate member upwardly relative to said base member, a fixed first contact element mounted in said base member beneath said plate member, a second contact element movably mounted in said plate member above and in vertical alignment with said first contact element and normally depending below said plate member, said plate member being movable downwardly relative to said second contact element, a bowed leaf spring engaging beneath said plate member, said second contact element extending slidably through the intermediate portion of said leaf spring, an enlarged bottom head element on said second contact element engaging said leaf spring, and an enlarged top head element on said second contact element engageable with said plate member to limit downward movement of said second contact element, said plate member being formed in its top surface with a recess of substantial depth receiving said enlarged top head element.

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