

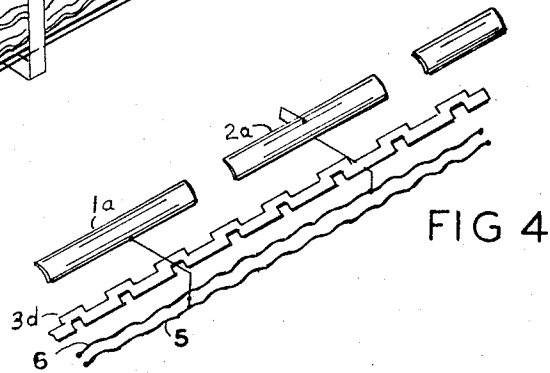
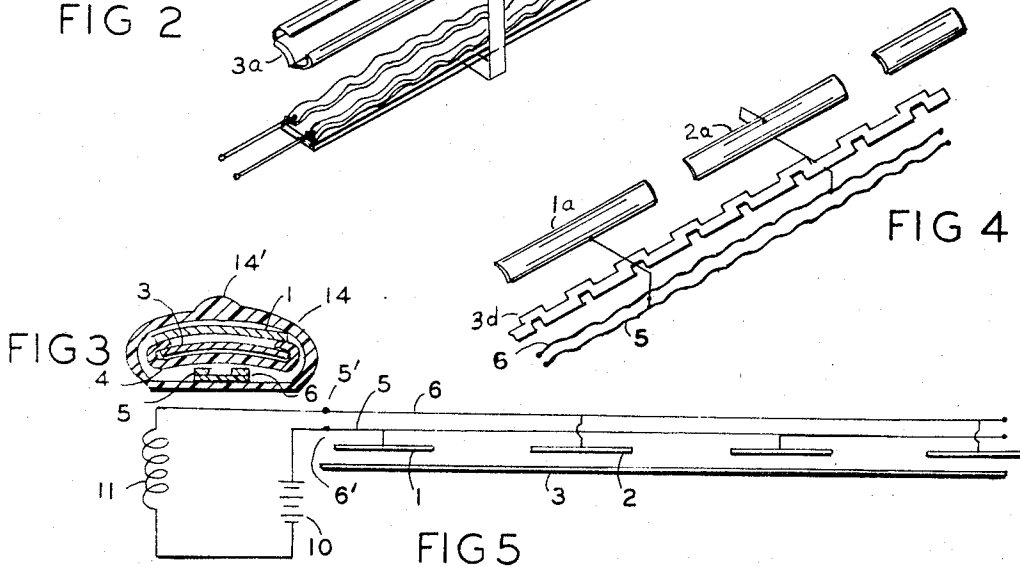
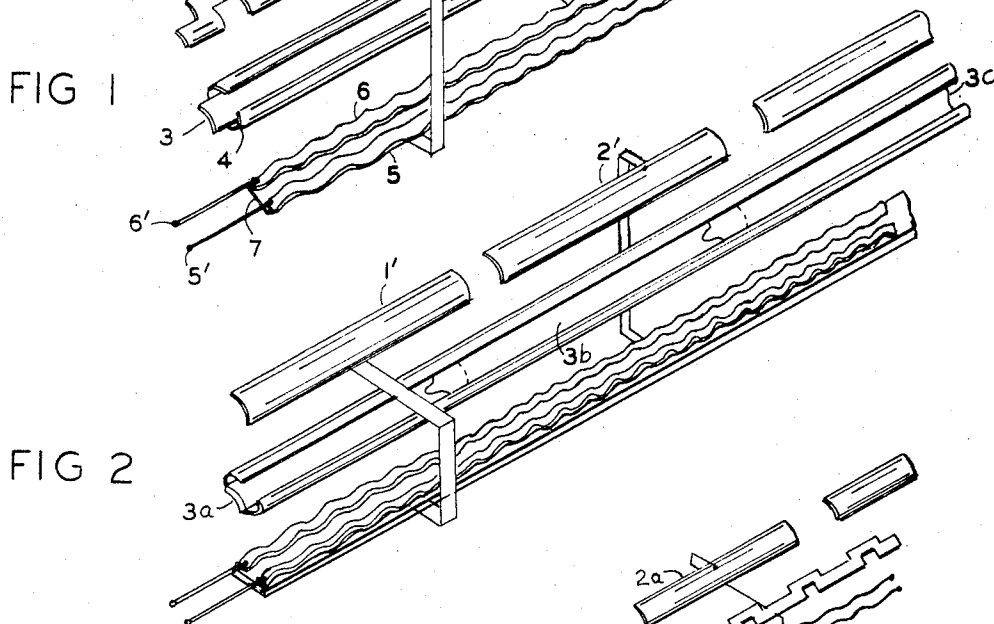
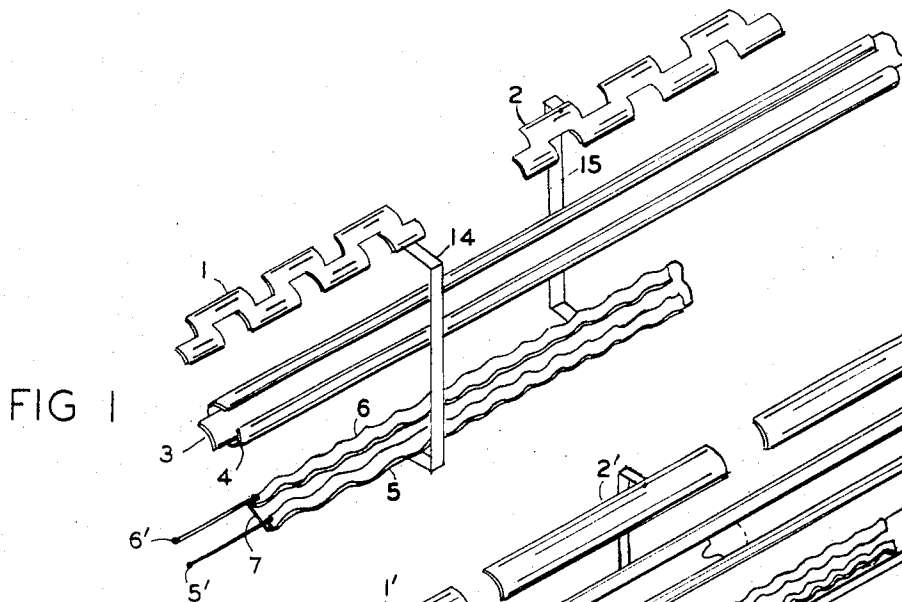
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3,412,224

SELECTIVE TAPE SWITCH

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3,412,224

SELECTIVE TAPE SWITCH

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ABSTRACT OF THE DISCLOSURE

A tape switch having one continuous ribbon conductor and one segmented conductor, the segments being spaced so that a circuit is completed only when two spaced segments are pressed simultaneously, for instance by vehicle wheels so that the switch is responsive to vehicles and not to pedestrians.

This invention is an improvement to my prior Patents Nos. 2,896,042 and Re. 24,541.

This invention relates to tape switch means which are responsive only to vehicle wheels and not to pedestrians.

The present invention fulfills a need for a tape or ribbon switch which may be used to indicate vehicles but which will not be activated by pedestrians. This type switch is useful in vehicle counting, indicating, or warning systems, and vehicle gate or door opening systems.

The present invention is similar to my prior patents, except for one of the tape conductors which is electrically and physically segmented and the segments are separately connected to return conductors. These spaced segments, which may be approximately the width of the vehicle, may be connected to an indicator or other device.

Accordingly, a principal object of the invention is to provide new and improved tape switch means.

Another object of the invention is to provide a new and improved flexible tape switch which will operate only when more than one spaced segments are simultaneously pressed.

Another object of the invention is to provide a new and improved flexible ribbon electrical switch which will provide a closed circuit when vehicles pass but not when stepped on by a pedestrian.

Another object of the invention is to provide new and improved flexible electrical ribbon switch means which can operate individual circuits from particular segments along its length.

Another object of the invention is to provide new and improved tape switch adapted to be actuated by vehicle wheels comprising, a first conductor means comprising a plurality of spaced conductive elements, second continuous conductor means mounted parallel to said first conductor means, insulating means mounted along the edges of said second conductor means and separating said first and second conductor means, third continuous conductor means mounted parallel to said second conductor means and insulated therefrom, fourth continuous means mounted parallel to said second conductor means and insulated from said second and third conductor means, and means connecting said third and fourth conductor means to predetermined elements of said first conductor means whereby a circuit will be made between elements three and four only when two of said predetermined elements are pressed simultaneously.

These and other objects of the invention will be apparent from the following specification and drawings of which:

FIGURE 1 is an exploded view of an embodiment of the invention.

FIGURE 2 is an exploded view of another embodiment of the invention.

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FIGURE 3 is an end view of FIGURE 1 in normal open position.

FIGURE 4 is an exploded view of another embodiment of the invention.

FIGURE 5 is a circuit illustrative of the operation of the invention.

Referring to FIGURE 1 the invention generally comprises a first conductive tape consisting of conductive segments 1, 2, etc. which may have a zig-zag form and a slight transverse curvature. Mounted below the first conductive segment is a continuous conductive ribbon 3 which preferably has a slight transverse curvature. The width of the continuous ribbon 3 is substantially equal to that of the conductors 1 and 2. An insulator 4 is mounted on the bottom of the conductor 3 and wrapped up over the top edges of the conductor 3 so as to insulate the conductor 3 from the segments 1 and 2 when they are sandwiched together. However, when the upper and lower conductors are pressed together for instance by someone stepping on them or a wheel passing over them, the upper and lower conductor will contact and complete a circuit. The transverse curvature provides improved operating characteristics.

Third and fourth continuous conductors 5 and 6 are mounted under the insulator 4. These conductors 5 and 6 may be sandwiched in a plastic insulated ribbon 7 so that the conductors 3 are insulated by insulator 4.

Conductors 5 and 6 are wavy or corrugated to permit expansion so that the tape switch may be coiled.

The conductor 5 is connected via first terminal 5' and the conductor 6 is connected via second terminal 6' to external circuit means. The conductor 5 is connected to one of the upper segments for instance segment number 1 by jumper wire 14 and the conductor 6 is connected to another segment spaced a predetermined amount, for instance segment number 2 by jumper wire 15. These jumper wires should be flat conductor wire.

If the segments 1 and 2 are both pressed simultaneously, for instance by the front wheels of a vehicle, then referring to FIGURE 5, a circuit will be completed between conductor 5, element 1, lower conductor 3, segment 2, back to the other conductor 6. Note that if only one of the segments is pressed, the circuit will be incomplete. Therefore, the switch is responsive to spaced means such as vehicle wheels and the spacing and size of the segments are chosen so that two segments would not be simultaneously pressed by a pedestrian, a motor cycle, or bicycle.

FIGURE 2 shows another embodiment of the invention which is the same as that of FIGURE 1 except that the upper segments 1' and 2' are shown as solid conductor ribbon and the lower conductor is shown as a plurality of overlapping leaves 3a, 3b, and 3c. The purpose of zig-zag construction and/or the overlapping leaf construction is that the tape switch is made more flexible and that it may be coiled without buckling as in my prior above mentioned patents.

FIGURE 5 shows terminals 5' and 6' connected to a battery 10 and warning or indicating device 11 which may be an alarm such as a horn or buzzer or it may be a relay operating a utilization means.

FIGURE 4 shows another embodiment of the invention where the lower conductor 3d is a continuous zig-zag conductor and the upper conductors 1a, 2a are solid segmented conductors.

FIGURE 3 shows a sectional view of an assembled switch illustrating the upper conductor 1, lower conductor 3 and insulating strip 4 which is wrapped around the bottom and over the top edges of conductor 3. Conductors 5 and 6 are also shown mounted on an insulating tape 7 and a whole assembly is covered with an insulating water proof cover 14. The insulating cover may have a raised projec-

tion 14' on top at the center in order to provide a more positive mechanical contact between the switch members when they are pressed.

Note that any number of top segments may be used, all connecting alternately to the return conductor.

More than two return conductors may be used for particular purposes. Each segment could have its own return conductor and each operate a separate utilization means.

Many modifications may be made by those who desire to practice the invention without departing from the scope thereof which is defined by the following claims.

I claim:

1. A tape switch adapted to be actuated by vehicle wheels comprising,
first conductor means comprising a plurality of spaced conductive elements,
second continuous conductor means mounted parallel to said first conductor means,
insulating means mounted along the bottom and the top edges of said second conductor means and separating said first and second conductor means,
third and fourth continuous conductor means mounted parallel to said second conductor means and insulated from said first and second conductor means, and means connecting said third and fourth conductor means to predetermined elements of said first con-

ductor means whereby a circuit will be made only when two of said predetermined elements are pressed simultaneously.

2. Tape switch as in claim 1 wherein one of said conductor means elements has a zig-zag shape.

3. Apparatus as in claim 1 wherein said first, second, third, and fourth conductor elements are sandwiched together by an insulating protective cover.

4. The tape switch as in claim 1 which is coilable without short circuiting.

5. Apparatus as in claim 1 wherein one of said conductor means comprises a plurality as overlapping leaves.

6. Apparatus as in claim 1 wherein at least one of said conductor means is bent into wavy or corrugated shape to permit stretch or compression longitudinally thus permitting coilability without buckling.

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