Sept. 20, 1960 J. B. FRAGA 2,953,760

TRAFFIC COUNTING CABLE

Filed Sept. 29, 1958

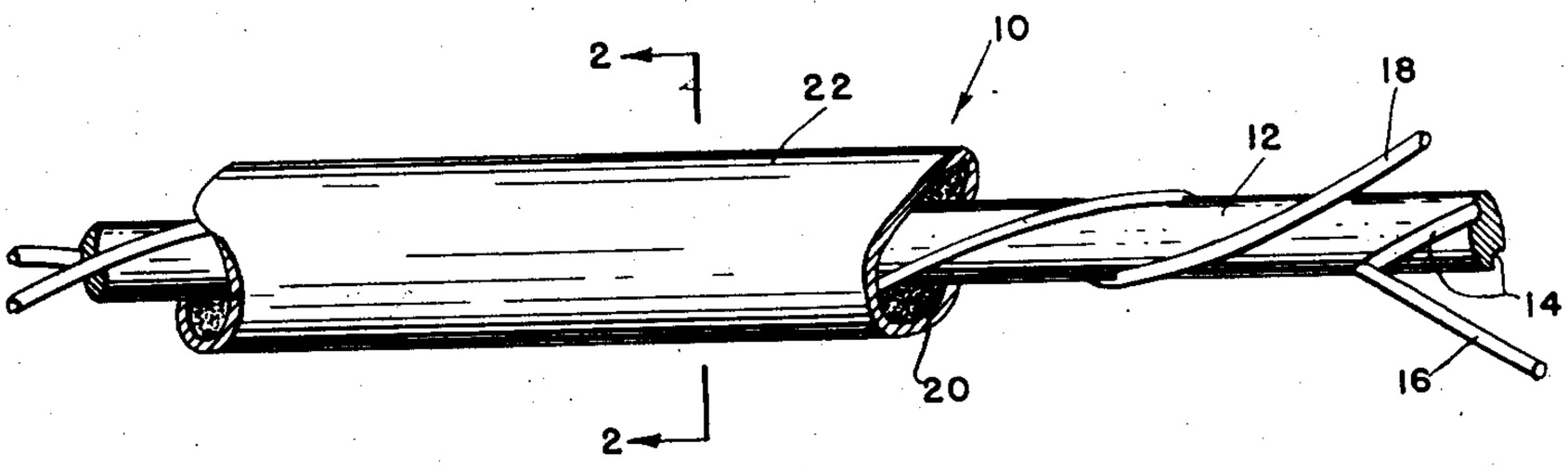

FIG. 1

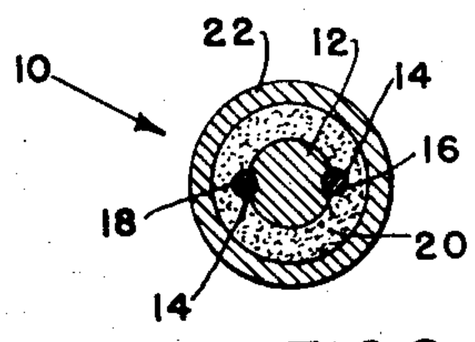

FIG. 2

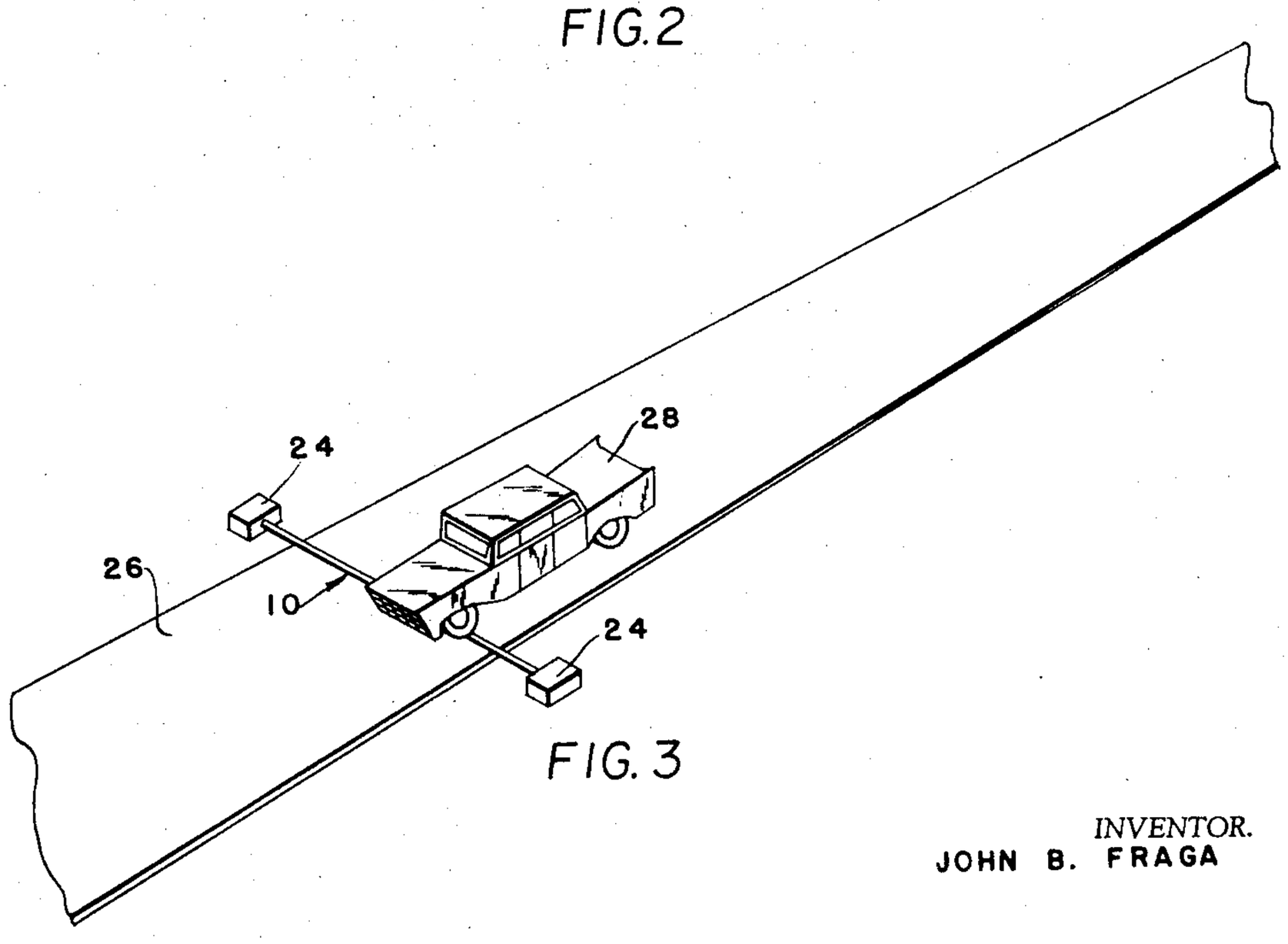

FIG. 3

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TRAFFIC COUNTING CABLE

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2 Claims. (Cl. 338—36)

This invention relates to traffic control apparatus and more particularly to a device for counting the number of vehicles passing a check point.

It is an object of the present invention to provide a substantially foolproof system for counting traffic passing a given check point by registering the impulses transmitted through the wires of a cable, while impulses are produced by an alteration of the resistance in the cable due to the pressure of the tire passing across it.

Another object of the present invention is to provide traffic counting cable apparatus of the above type that is of substantially longer life than pneumatic actuated systems and which can be used to provide adjustments for counting only certain types of vehicles depending upon the weight thereof.

Other objects of the invention are to provide a traffic counting cable bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawing, in which:

Figure 1 is a perspective view, partly in section, and partly exploded, of a section of cable made in accordance with the present invention;

Figure 2 is a transverse cross sectional view taken along line **2—2** of Figure 1; and

Figure 3 is a perspective view of a traffic counting cable made in accordance with the present invention in operative use.

Referring now more in detail to the drawing, and more particularly to Figures 1 and 2 thereof, a segment of a variable resistance cable **10** made in accordance with the present invention, to be used for counting vehicular traffic over a highway or avenue, is shown to include certain basic components.

The cable illustrated in Figures 1 and 2 includes a central core **12** that is substantially of circular cross section and is preferably constructed of an elastic material, such as rubber of durameter 50 to 75, with a pair of spiral grooves **14** of identical pitch on diametrically opposite sides of the exterior surface of the core. The elasticitiy of the core **12** is such that the cross section of the cable is restored to its normal shape after a vehicle tire has passed across it.

A pair of conductors **18** of low resistance material, such as copper or aluminum, are positioned within the guide grooves **14** of the core **12** at diametrically opposite sides thereof in spirally wound relationship. A sheath **22** encloses the entire cable and is designed to endure the wear and tear to which it is subjected in use and is therefore constructed of a wear resistant material. If necessary, a steel cable may be extended through the center of the core **12** in order to provide greater tensile strength and to further increase the wearability of the

cable and to enable the cable to be stretched tightly across the roadway without danger of breaking.

The space between the core **12** and casing **22**, and between the conductors **18**, is filled with a granulated carbon or other semi-conducting material **20** that will provide a variable resistance to the passage of current between the two wires **16**, **18** in response to the passage of a tire of a vehicle over the cable. Since the exact nature of the material **20** may be varied, depending upon the particular purposes and mode of operation desired, such can be varied at will so long as it will provide a variation in the resistance between the conductors **16**, **18** in response to a radial pressure exerted against the side wall of the cable.

This cable **10** may be used with any one of the three types of electronic circuits ordinarily used to measure variations of this type; namely, inductance, capacitance, and conductance (or resistance). However, when the cable is used in a capacitance circuit, it is not necessary for the fillere material **20** to be semi-conducting. When the cable is employed in an inductance, conductance, or resistance type circuit, the measuring equipment will detect a change in the resistance caused by a pressure upon the semi-conductor **20** anywhere along the length of the cable. When a capacitance type system is employed, the equipment will detect any difference in the distance between the conductors **16**, **18** caused by the application of pressure anywhere along the length of the cable. Since the sensitivity of the measuring equipment can be adjusted, it thus becomes a simple matter to make the equipment responsive only to vehicles of a certain weight category. For example, the cable may be used to detect the passage of only heavyweight vehicles, such as trucks and buses, or all vehicles regardless of weight. As a result, by using two or more such cable systems, any one roadway can be accurately checked for determining the passage of vehicles of all categories passing by a check point during any given period. As shown in Figure 3 of the drawing, the cable **10** is stretched across the roadway **26** in the path of movement of the vehicles **28**, either one or both ends of the cable **10** being connected to suitable measuring apparatus **24** that is responsive to the passage of the vehicles over the cable.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A pressure-responsive electrical cable for counting traffic traveling along a roadway comprising, in combination, a resilient core, a pair of conductors helically spacedly equi-distantly encircling said resilient core, guides similarly helically spacedly securing said conductors at diametrically opposite sides of said core, an electrically insulating and protective sheath enclosing said core and conductors, and a compressible pressure-sensitive, variable-resistance filler material filling the space between said core and said sheath and between said conductors and being in direct electrical contact with said conductors and effectively comprising a series electrical connection between said conductors of variable electrical resistance responsive to pressure effectively applied to said filler material between said conductors.

2. A pressure-responsive electrical cable for counting traffic traveling along a roadway comprising, in combination, an elastic substantially cylindrical core of electrical insulating material, a pair of electrical conductors of low resistance electrically conductive material helically equi-distantly spacedly encircling said elastic cylindrical core so as to be spaced from each other by a predeter-

mined minimum distance at all locations, guides for said pair of electrical helically equi-distantly spacedly encircling conductors comprising a pair of spaced helical grooves of identical pitch defined by uniformly diametrically opposite side portions of said elastic cylindrical core along the length thereof, with each of said conductors being helically spacedly separated seated in a corresponding different one of said helical grooves, an electrically insulating and protective sheath comprising a wear-resistant annular casing enclosing and securing said helically spaced conductors and said cylindrical elastic core in assembled relationship therein, and a compressible pressure-sensitive variable-resistance semi-conducting filler material of finely divided particulate form filling the annular space between said core and said sheath and the circumferential helically spirally disposed space between

said conductors and being in direct electrical contact with said conductors and effectively comprising a series electrical connection existing between said conductors along the entire lengths thereof of variable electrical resistance responsive to radial pressure applied upon the side of said cable anywhere throughout the entire length thereof upon the passage of a vehicle of predetermined weight thereover.

References Cited in the file of this patent

UNITED STATES PATENTS

1,940,917	Okazaki	Dec. 26, 1933
2,322,773	Peters	June 29, 1943

FOREIGN PATENTS

490,546	Great Britain	Aug. 17, 1938