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(54) Traffic survey sensor.

(57) A traffic survey sensor suitable for being located in a position above the surface to be controlled, say, with the use of a gate (1), is constituted by a radiation transmitter (2) and by a radiation receiver (5) arranged and oriented so that a radiation (8) emitted by transmitter (2) arrives at a pre-set point (9) of the surface to be controlled and is from here partially reflected towards receiver (5) so as to obtain by the reflected radiation (14) an effect on receiver (5) which may cease with the passage of a vehicle.

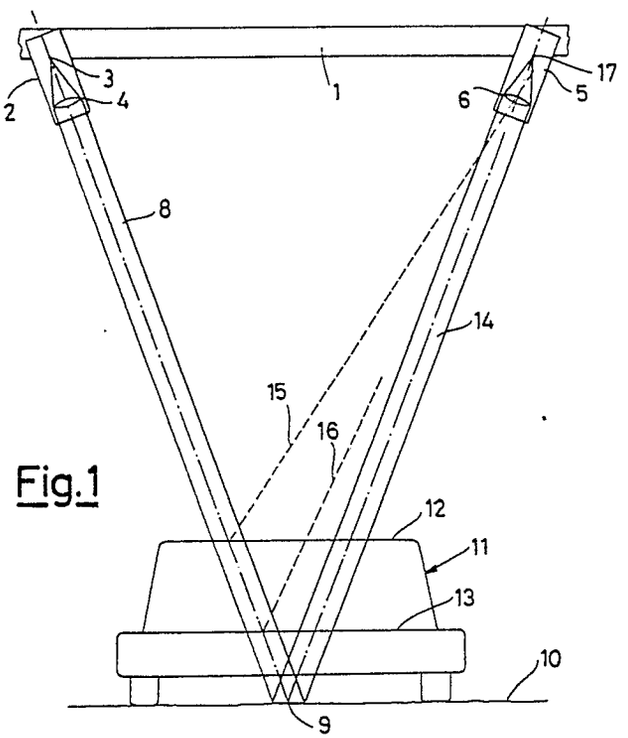

Fig.1

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Traffic survey sensor.

This invention relates to a traffic survey sensor, in particular for motor vehicle traffic.

Traffic survey sensors are known of the type having a magnetic turn or a coaxial cable.

These types of sensors must be located under the road surface, so that they require not indifferent installation and maintenance operations, also forcing the periodical relaying of the road surface.

This drawback leads organizations and companies engaged in road maintenance to be generally against the installation of sensors of this type.

The object of the present invention is to overcome this drawback by accomplishing a traffic sensor which does not require installation under the road surface.

According to the invention, such object is attained by means of a traffic survey sensor characterized in that in comprises a transmitter and a receiver suitable for being located in a position above the surface under control, said transmitter comprising a source of radiation and means for converting the radiation into a beam of substantially parallel rays and said receiver comprising means for focussing said beam at a point of the receiver itself, the transmitter being oriented so as to direct the radiation towards a pre-set point of the surface under control and the receiver being oriented so as to receive the radiation reflected by said pre-set point.

There will now be described an embodiment and application of the invention, given as a non-limiting example, with reference to the enclosed drawings wherein:

Fig. 1 shows schematically a sensor according to the present invention and its arrangement with respect to a road surface to be controlled;

Fig. 2 is a schematic view from above of a group of sensors accomplished according to the invention.

With reference to Fig. 1, there is indicated with 1 a gate which at one extremity supports a transmitter 2 which comprises a source of radiation 3 and a lens 4 and, in a position symmetrical with respect to the centre line of the surface be controlled, a receiver 5 which includes a focussing lens 6.

Radiation emitted by source 3 is converted by lens 4 into a beam of substantially parallel rays 8 which, in the absence of vehicles, reaches a pre-set point 9 of the road surface 10, wherefrom it is partially reflected towards the receiver 5, inside which a focussing lens 6 focusses the reflected beam 14 at a sensing point 17 suitably connected to electrical means for processing the signal received.

In the case wherein a vehicle 11 is passing over the point of normal reflection 9, the latter is covered by the profile of the vehicle itself so that the beam 8 is reflected by a different surface, say, by the roof 12 or by the bonnet 13 of the vehicle, so that the angle of reflection is varied and with it the angle of incidence with which the reflected beam (15 or 16) arrives at collector 5, if it arrives at all. As a result, the reflected beam is focussed at a point other than the preset one and no signal shall be obtained at point 17. The absence of the signal is thus used as an indication of the passage of a vehicle.

In Fig. 2 there is shown the application of the system under examination for two-lane roads wherein there is one sensor for each lane. This number is considered sufficient for a good survey since, statistically, the vehicles which can cross the surface under control without being spotted by either of the two sensors are very few. It should be noted that the two sensors do not disturb and have no influence on one another.

If it is required to take readings of vehicle speed, it will be necessary to provide for two sensors for each lane, with some distance between them along the sense of direction of the vehicle.

Thanks to the proposed system it is also possible to carry out different surveys such as the determination of the length of the vehicle.

With a system according to the present invention a high accuracy of the survey is obtained, as it is possible to use a very small beam, say, 6-7 centimetres in diameter. This is obtainable by emitting radiation with a very small wavelength and a speed of propagation equal to that of light, say, an infrared radiation of the order of 900-950 nanometres.

Radiation is preferably emitted in constant-rate impulses so as to be able to use high power without causing any inconvenience to people. High power makes for good results which cannot be affected by noise caused, say, by solar radiation and radiation emitted by passing vehicles.

Claims

1. Traffic survey sensor, characterized in that in comprises a transmitter (2) and a receiver (5) suitable for being located in a position above the surface under control, said transmitter (2) comprising a source of radiation (3) and means (4) for converting the radiation (7) into a beam of substantially parallel rays (8) and said receiver (5) compris-

ing means (6) for focussing said beam (8) at a point (17) of the receiver itself, the transmitter (2) being oriented so as to direct the radiation (8) towards a pre-set point (9) of the surface under control, and the receiver (5) being oriented so as to receive the radiation reflected (14) by said pre-set point (9).

2. Sensor according to claim 1, characterized in that said radiation (7, 8, 14) is constituted by a beam of infrared rays.

3. Sensor according to claim 2, characterized in that said beam of infrared rays is emitted in impulses at a constant rate.

4. Sensor according to claim 2, characterized in that said beam of infrared rays has a very small wavelength, of the order of 900-950 nanometres, and a speed of propagation equal to that of light.

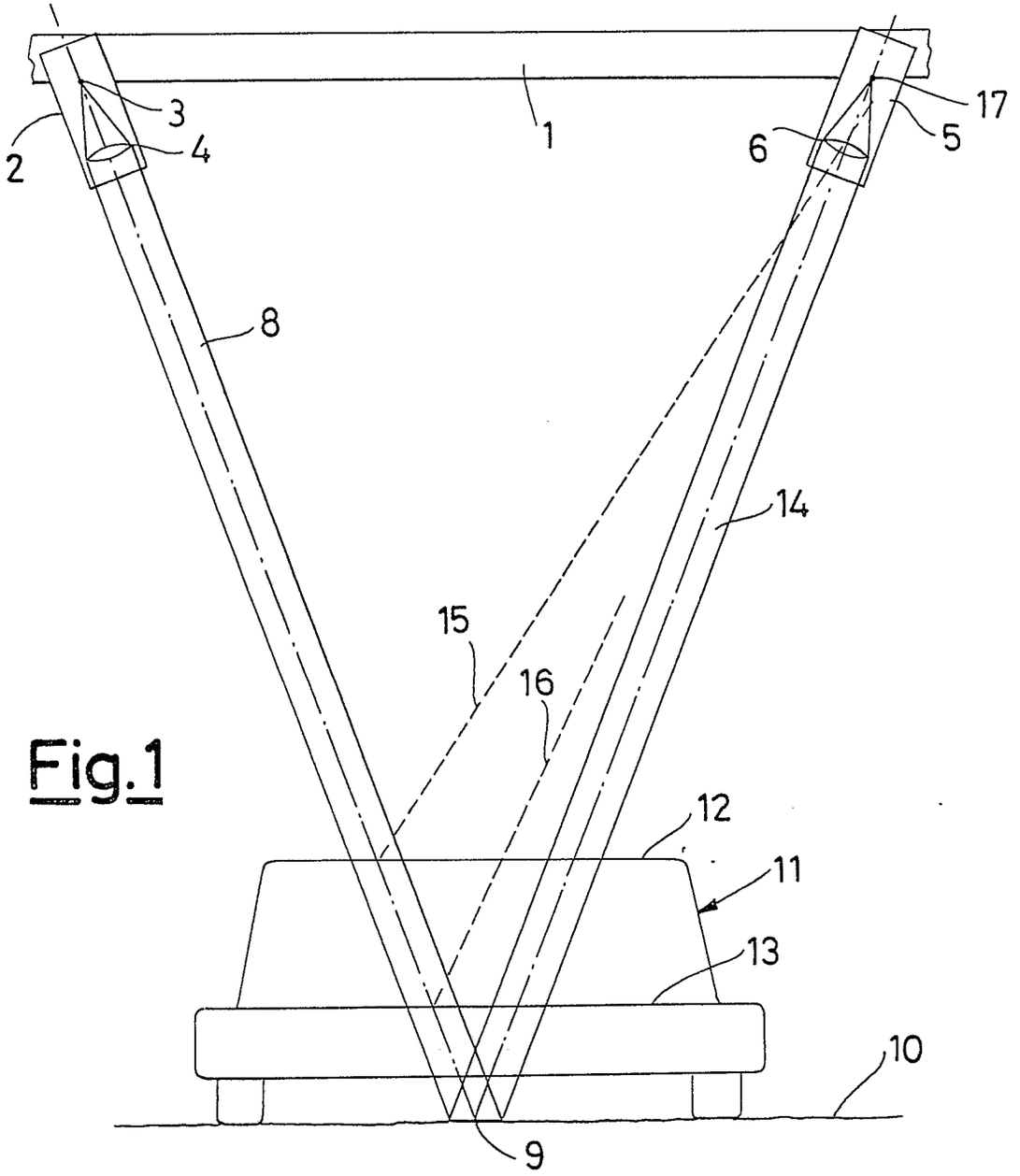

Fig.1

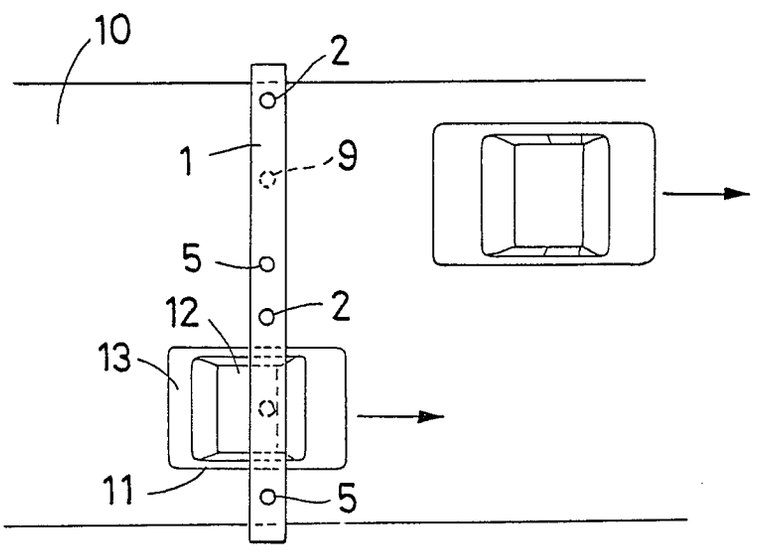

Fig.2