

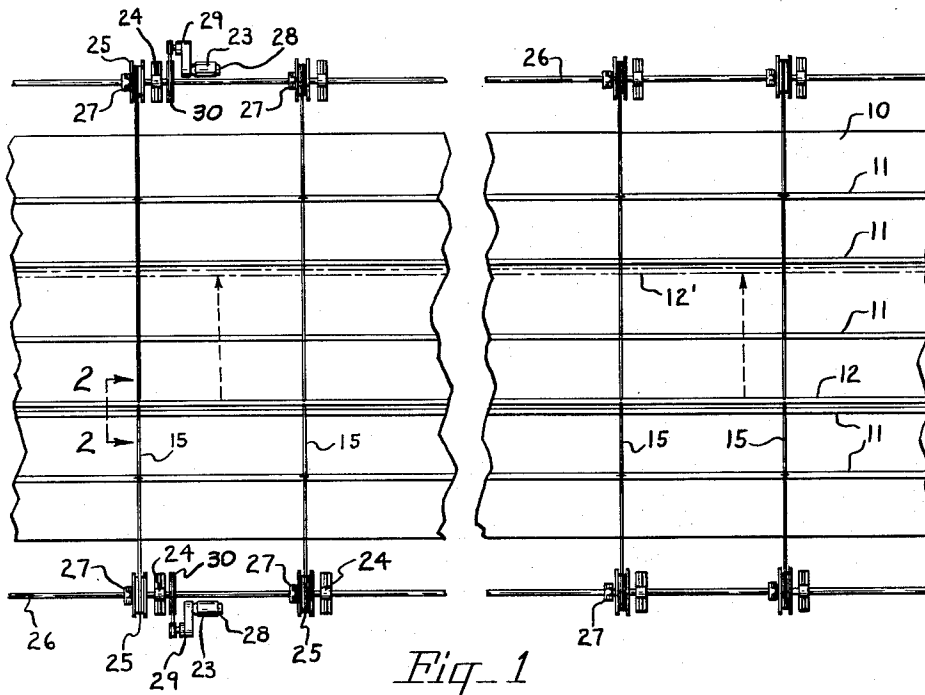
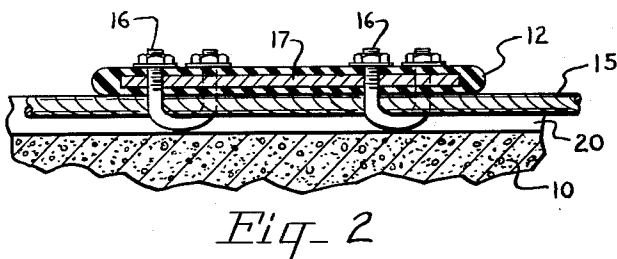
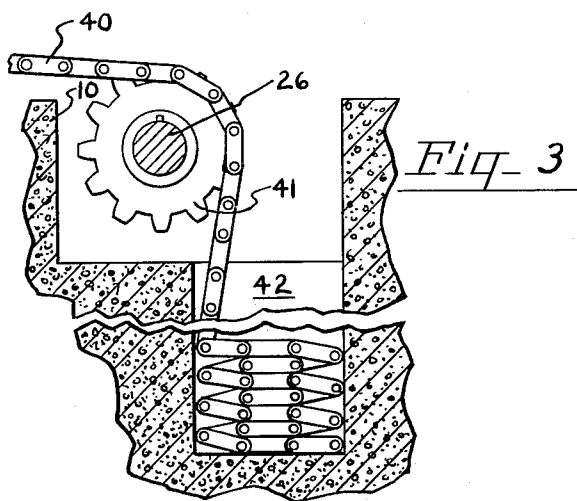
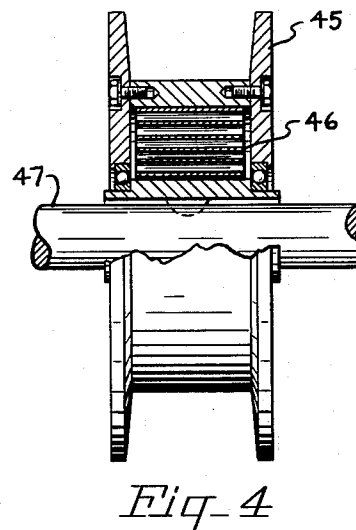
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MOVABLE TRAFFIC LINE

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## MOVABLE TRAFFIC LINE

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1 Claim. (Cl. 94-1.5)

This invention relates to a movable traffic line for shifting the center line on a roadway to change the number of lanes for traffic going in the opposite directions.

During rush hour traffic in the morning it is often desired to make a greater number of lanes available for traffic coming into a city and to diminish the number of lanes available for outgoing traffic. Similarly, during the evening rush hour, it is desired to increase the number of lanes available for outgoing traffic and decrease the number of lanes of incoming traffic. Such a method of traffic control is particularly advantageous at bridges and other bottlenecks where for a distance the total number of lanes may not be as great as in the boulevards or freeways approaching from the opposite ends of the restriction.

Various devices heretofore proposed for this purpose have not been practical. Some have involved an exorbitant cost of construction, others have created traffic hazards during change-over, and in still other cases the change-over has involved excessive operational expense.

The objects of the present invention are, therefore, to provide a movable traffic line which is relatively simple and inexpensive to construct and install, to provide a movable traffic line which may be installed on existing roadways and bridges with a relatively small alteration, to provide a movable traffic line which is durable and reliable in operation, and to provide a movable traffic line which does not involve excessive expense, supervision or manual control for the change-over several times a day.

The invention will be better understood and the foregoing and other objects will become apparent from the following description of certain preferred embodiments illustrated on the accompanying drawing. Various changes may be made, however, in details of construction, and all such modifications within the scope of the appended claim are included in the invention.

In the drawing:

FIGURE 1 is a top plan view of a section of roadway having a movable traffic line according to the present invention;

FIGURE 2 is an enlarged sectional view on the line 2-2 of FIGURE 1;

FIGURE 3 is a fragmentary sectional view of a modified form of construction; and

FIGURE 4 is an elevation, partly in section, of another modification.

In FIGURE 1 the roadway 10 has a plurality of single line traffic stripes 11 painted on its surface. These stripes are conventional except that no double stripe is provided to separate the eastbound traffic from the westbound traffic. For this purpose a flat rubber or plastic strip 12 is provided which may be shifted laterally into positions adjacent one of the painted lines. The strip 12 should be of the same width and bear the same color as the stripes 11 which are usually either yellow or white. An appropriate pigment may be incorporated in the material or which the strip 12 is molded or extruded to give it the desired color. The strip should be tough, flexible and resilient in order to withstand traffic wear, and should be adapted to lie flat on the pavement as shown in FIGURE 2. Of course, the strip 12 is not subject to traffic wear except when an occasional vehicle illegally runs over the center line.

In order to shift the strip 12 it is connected at intervals with flexible cables 15 by means of U-bolts 16 or the like. In order to strengthen this connection a metal plate

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17 may be incorporated in the strip 12 at such points of connection. Each cable 15 lies in a transverse groove 20 in the pavement, this groove being of sufficient depth and width to contain the cable and the lower portion of U-bolt clamp 16 with the strip 12 lying flat on the surface of the pavement. In concrete pavements, the grooves 20 may conveniently be formed in most cases by enlarging the upper portions of existing transverse expansion joints.

In FIGURE 1 the cables are moved simultaneously by means of drums 25 on longitudinal shafts 26 on opposite sides of the roadway. The shafts 26 are supported in bearings 24 on suitable foundation members and may be connected together at their ends by universal joints 27.

Each line of shafting need not extend the full length of the strip 12 but may be divided into separate sections with each section driven by a synchronous electric motor 23 so that all the motors will turn in unison. Each motor is geared down to appropriate speed through reduction gearing at 29 for driving a sprocket wheel 30 on its shaft section. The motors are each preferably provided with a spring actuated, electro-magnetically releasable brake 28 which is operative to hold the motor shaft stationary when the motor is deenergized.

The motors 23 are reversible and are arranged to rotate the shafts 26 on opposite sides of the roadway in opposite directions so that the cable drums 25 on one side of the roadway will wind in cable while the opposite drums are paying it out. The drums 25 are large enough to wind the necessary length of cable in a single layer whereby each paying out drum will always deliver cable at the same rate that the opposite winding in drum is taking it in to keep the cables taut and prevent looseness or slack in the cables. When the motors are stopped, their automatic brakes 28 prevent back up of the tensioning drum or overrunning of the paying out drum to prevent slackening of the cables.

A six lane roadway is shown in FIGURE 1. When the westbound traffic is heavier than the eastbound traffic, the movable strip 12 is set to the position shown in full lines, spaced a few inches from one of the painted stripes 11 to form a double line traffic divider for separating the eastbound and westbound traffic. In the position shown the strip 12 provides two eastbound lanes and four westbound lanes.

During the day and night, when the eastbound and westbound traffic are about equal, the movable strip 12 is shifted across one lane to a position alongside the center stripe 11 to provide three eastbound lanes and three westbound lanes. When the eastbound traffic is heavier than the westbound traffic, the strip 12 may be shifted across another lane to the broken line position shown at 12' to provide four eastbound lanes and two westbound lanes. Thus, on such a roadway, the maximum movement would be the width of two lanes which does not create a serious problem of accommodating the length of cable which must be wound in and paid out at a uniform rate from the cable drums.

With suitable gearing in the reduction gears 29 it is not necessary to drive the paying out drums and in some cases it may not be necessary to employ the brakes 28. In such cases only the motor of the winding in drum is energized in each direction of movement, pulling the cable against the frictional drag of the unenergized motor and reduction gearing on the opposite side of the road. Gear and motor friction is then relied upon to keep slack out of the cable without the necessity for brakes on the motors.

A small link belt chain 40, similar to a bicycle chain, may be used instead of the cable 15 as shown in FIGURE 3. The chain is not wound on a drum but merely passes over the top of a sprocket wheel 41 with the

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free end dropping into a well 42. The well may be made as deep as necessary to accommodate the length of chain to be deposited therein.

Still another modification is shown in FIGURE 4 where cable reels 45 tensioned by a coil spring 46 are used in lieu of the electric motor driven cable drums 25 on one side of the roadway. This arrangement eliminates the motors 23 and shafting 26 on one side of the road. When the cable is wound on a motor driven drum 25 on one side of the road, it is drawn off from a spring actuated drum 45 on the opposite side of the road with consequent tensioning of the spring 46. When the strip 12 is properly positioned, the motor is deenergized and its brake 28 is automatically engaged to hold the cable stationary. Spring 46 then holds the cable under tension. When it is desired to shift the strip 12 in the opposite direction the motor is reversed to pay out cable from its drum 25 and allow the spring 46 to take in cable on the opposite drum 45. The shaft 47 is then merely a short length of shaft sufficient to support the drum 45 and does not extend along the side of the roadway.

When it is desired to shift the center line, an operator stops the traffic approaching the present length of roadway from both directions by means of traffic lights. When the whole section of road equipped with the movable traffic line is cleared of traffic, the entire length of strip 12 through the controlled zone is shifted simultaneously as desired and then the traffic movement is allowed to continue. Essentially, it is only necessary to stop oncoming traffic in the lane or lanes where the direction of traffic is to be reversed but it may be desirable to stop all traffic during the changeover.

Suitable diversion means may be provided at the ends of the controlled roadway to divert approaching vehicles away from center lanes on the narrowing side of the roadway. This may involve an appropriate electric signal or sign and/or a portable barrier to warn the motorists approaching in the lane or lanes nearest the center to move into one of the outer lanes. The invention may be applied in an obvious manner to three-lane roads and eight-lane roads and the motors may be started and stopped by any suitable manual or semi-automatic control means.

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The motors, drums and shafts are preferably mounted below the level of the roadway and covered to keep out dirt and water. Where there is not space below the roadway level, the equipment may be mounted above the road level and protected by a suitable curb or wall.

The present equipment and mechanism are thus readily adaptable to existing roads, viaducts and bridges without extensive alteration or reconstruction, since the cables or chains are not required to pass under the roadway, If the movable strip 12 becomes damaged, there is no great expense, time or labor involved in replacing a damaged section of the strip since it is not substantially different from conventional rubber belting.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

In a roadway, a plurality of single lines painted on the surface of the roadway to define traffic lanes, a movable longitudinal marker strip having the same width as said lines lying flat on said roadway, shallow transverse grooves of less depth than the roadway extending across the full width of the roadway surface, cables connected with said strip and extending to opposite sides of the roadway in said grooves, and motor means beyond the opposite sides of the roadway operatively connected to the opposite ends of said cables for sliding said cables in said grooves and moving said strip laterally in opposite directions to position the strip in spaced parallel relation with different ones of said painted lines and form a double line traffic separator in different positions on the roadway.

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