Dec. 9, 1969 J. A. ANGELLO 3,482,820

TRAVELING BARRICADE

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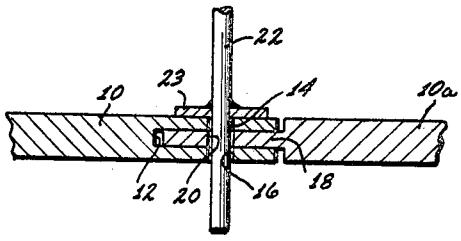


FIG. 2

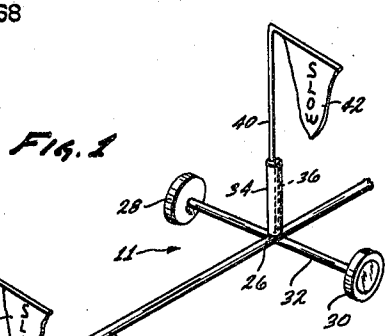


FIG. 1

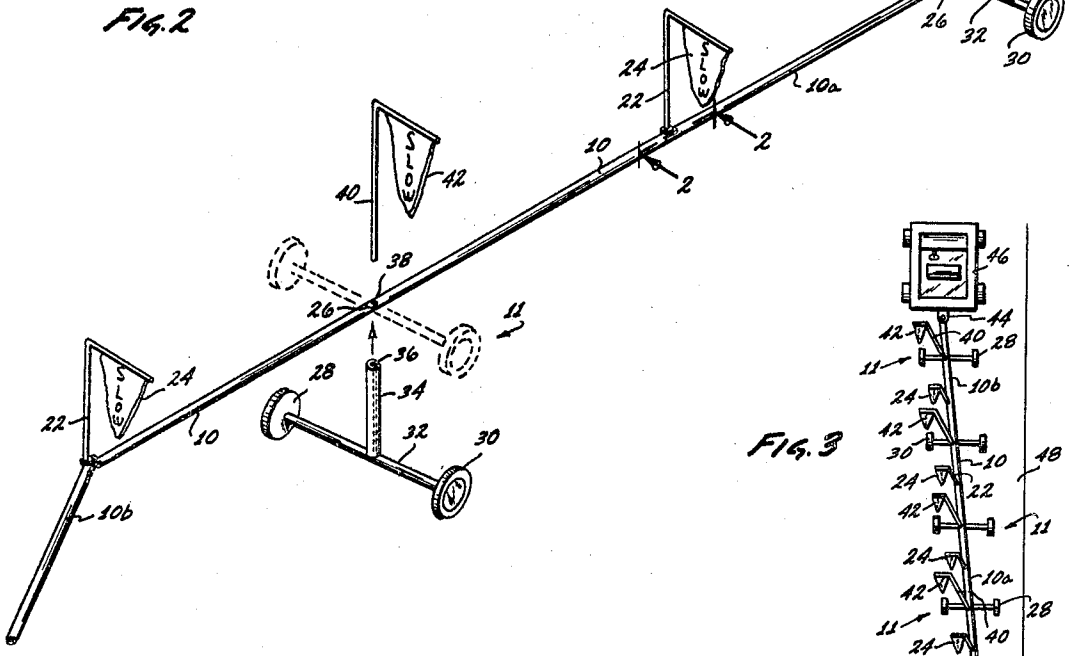
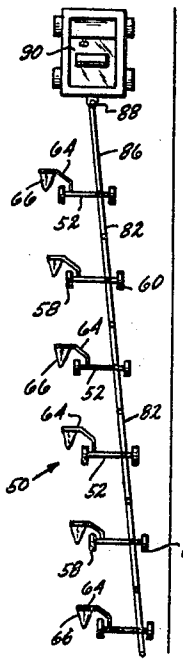


FIG. 3



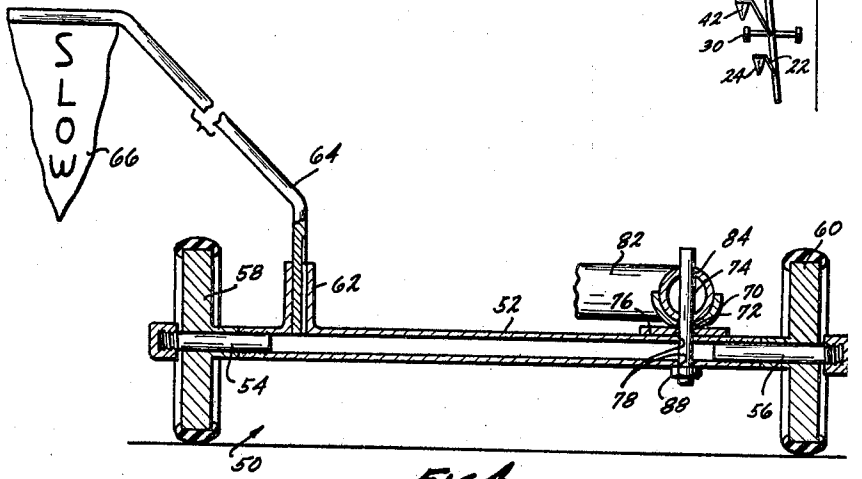


FIG. 4

FIG. 5

INVENTOR
JOHN A. ANGELLO

BY Nilsson & Robbins
ATTORNEYS

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TRAVELING BARRICADE

John A. Angello, 10 Candy Lane, Mission Hills, Calif. 91340

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ABSTRACT OF THE DISCLOSURE

A traveling barricade in which a plurality of elongated tubular units are pivotally coupled end-to-end and supported at spaced intervals on wheeled carriage means. The longitudinal axis of the units, when formed to a line, is canted with respect to the rotational axes of the wheels by setting the longitudinal axis of each supported unit obliquely with respect to the rotational wheel axis of the carriage supporting it, thereby gradually directing traffic from one lane to another. Flags are supported in extension from the carriage means and/or from the elongated units and can serve as pivots for the couplings between adjacent units.

BACKGROUND OF THE INVENTION

Field of the invention

The field of art to which the invention pertains includes the field of traffic guides and street markers.

Description of the prior art

In the maintenance and repair of highways, it is often necessary to park a repair vehicle or other equipment on the roadway in interference with traffic. Safety requires that appropriate warning devices be placed on the highway a sufficient distance from the work site to timely warn motorists of the danger and to guide them in avoiding it. Such devices are also required by the Vehicle Code Regulations of most of the states, the distance of warning required ranging from 50 ft. to 550 ft. or more depending upon conditions. When the repair is to be made or maintenance is such that progressive movement along the highway is required, e.g., when repairing the cracks in the roadway or when painting traffic guide lines, the warning devices must also be moved forward and this generally involves repeated and tedious manual movement of the devices.

SUMMARY OF THE INVENTION

The present invention provides a warning device that can be utilized when making progressive repairs or maintenance along a highway and which does not require manual movement of individual sections but which can follow the contours of the road. A movable barricade is provided comprising a plurality of elongated units, means providing articulation between the units, and a plurality of wheeled carriage means supporting the units at spaced intervals. The longitudinal axis of the units, when formed to a line, is canted with respect to the rotational axis of the carriage wheels. Each supported unit is set obliquely with respect to the rotational wheel axis of the carriage supporting it. Each carriage means can comprise a frame having supporting wheels at opposite ends thereof and means can be included on the frame for supporting a warning flag in extension therefrom.

Articulation is provided by pivotal couplings between ends of adjacent units, the coupling permitting horizontal flexure thereof with the wheeled carriage means spaced from the unit ends. The pivotal couplings can each comprise overlapping ends of adjacent units, the ends defining aligned apertures, and a pivot through the apertures. The pivot can support a flag in extension from the coupling.

In specific embodiments, the barricade units comprise tubular members pivotally coupled end-to-end.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of one embodiment of the invention and illustrates a complete barricade unit coupled to portions of adjacent units;

FIGURE 2 is an enlarged plan view of a pivotal coupling utilized in this invention;

FIGURE 3 is a schematic view of the barricade of FIGURE 1 being towed by a vehicle along a highway;

FIGURE 4 is a cross-sectional view of a wheeled carriage utilized in an alternative embodiment of this invention; and

FIGURE 5 is a schematic view of the barricade of FIGURE 4 being towed by a vehicle along a highway.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGURES 1 and 2, the barricade is constructed of a plurality of elongated units **10**, **10***a*, **10***b*, etc., which can be aluminum tubing, or other such pipe, approximately 1¼" in diameter and about 20 ft. long. Each unit **10** is supported on a wheeled carriage **11** and has opposite male and female coupling portions which can be seen in beter detail in FIGURE 2. One end of the tubular unit **10** has a slot **12** cut therethrough and apertures **14** and **16** through the slot edges. The adjacent end of the next succeeding unit **10***a* (as is) the opposite end of that unit **10** is pressed flat into a tenon **18** for pivotal insertion within the slot **12**. An aperture **20** is provided in the tenon **18** in alignment with the slot edge apertures **14** and **16**. A support shaft **22** for a warning flag **24** can be inserted through the aligned apertures **14**, **16** and **20** to act as a pivot for the coupling. A retaining ring **24** welded a few inches from the bottom of the flag shaft **22** prevents the flag shaft **22** from falling through the apertures **14**, **16** and **20**.

A pair of wheels **28** and **30** are rotatably secured on an axle **32** disposed beneath an opening **26** defined at the center of the tubular unit **10**. A hollow tube **34** extends upwardly from the axle **32** and through the opening **26**. The hollow tube has a depression **36** running along its length which is keyed to a corresponding projecting portion **38** from the tubular unit **10**. Such keying allows the carriage axle **32** to be accurately positioned with respect to the longitudinal axis of the tubular unit **10**. The support shaft **40** for a warning flag **42** can be inserted within the hollow tube **34**.

The tube **34** is attached to the axle **32** in such manner that when it is inserted properly keyed in the unit opening **26**, the wheels are canted with respect to the longitudinal axis of the unit **10**. The extent of canting can be fixed by welding the tube **34** to the axle **32** or, alternatively, means can be provided for adjustably securing the tube **34** to the axle **32** to provide any desired cant angle. Canting can alternatively be obtained by setting the wheels **28** and **30** obliquely on the axle **32**, in which case the hollow tube **34** can be keyed so that the axle **32** is normal to the longitudinal axis of the tubular unit **10**. Means can be provided to adjust the oblique setting of the wheels **28** and **30**.

The effect of canting can be seen with reference to FIGURE 3. The traveling barricade is pivotally attached, at **44**, to the rear of a truck **46** which pulls the barricade along the edge of a highway **48**. The canting of the wheeled carriages **11** with respect to the longitudinal axis of the aligned tubular units **10** results in the barrier gradually guiding traffic toward the left-hand side of the road. The greater the degree of canting, the less gradual the displacement of traffic. The desirable extent of canting depends upon several factors including the speed of

traffic and the number of lanes to be closed. On roads with low posted speeds, only two or three units may be required and canting would then be relatively large, e.g., 20–25 degrees from perpendicular. On high speed roadways where up to 500 or more feet of approach are required, 25–30 or more, units may be required and the angle of cant can be low as 1–3 degrees from the perpendicular. With the lowest cant angles, accurate alignment is required, but is readily achievable with modern manufacturing methods. If the canting angle is adjustable, an appropriate adjustment can be made after the units have been coupled to obtain the desired inclination.

Referring to FIGURE 4, an alternative wheeled carriage **50** is illustrated and includes a tubular transverse frame **52** having its ends shaped into axles **54** and **56** for a pair of wheels **58** and **60** supporting the frame **62** at its opposite ends. A portion on the left-hand side of the tubular frame **52** is extended upwardly to form a hollow tube **62** which is adapted to receive a flag staff **64** therein. The flag staff **64** is angled to sit within the tube **62** to extend a flag **66** thereon outboard of the left-hand wheel **58**.

On the right-hand side of the tubular frame **52**, a U-shaped retainer member **70** is welded, at **72**, to a bolt **74** therethrough. The bolt **74** extends through a bearing plate **76** on one side of the tubular frame **52**, through a hole **78** in the frame **52** and is securely fastened to the frame **52** by means of a nut **80** thereat.

The bolt **74** extends several inches upwardly from the retainer member **70**. When it is desired to use the apparatus, a length of pipe **82** having an aperture **84** therethrough can be placed on the retainer member **70** with the bolt **74** extending through the aperture **84**. The pipe **82** can be identical to the tubular units **10** described with reference to FIGURES 1 and 2, retention being through the center openings **26** in those units **10**. As noted, the retainer member **70** can be welded, as at **72**, to the bearing plate **76**. The bearing plate **76** can be semi-cylindrical to securely fit over the tubular frame **52** to thereby define the angle of cant. Alternatively, the retainer member **70** can be adjustably secured to the bearing plate **76** to allow a change in cant angle. The extent of canting is determined as previously described.

Referring to FIGURE 5, a plurality of the wheeled carriages **50** of FIGURE 4 are shown supporting a plurality of pipe units **82**. The pipe units **82** are pivotally coupled end-to-end in the manner described with reference to FIGURE 2 and are pulled, through a flexible coupling **88**, by a moving vehicle **90** to provide a traveling barricade that gradually directs traffic from one lane to another.

With each of the described embodiments, flexure at the couplings permits the barricade to follow the curvature of the road and the cant angle assures the maintenance of the appropriate inclination.

What is claimed is:

1. A movable barricade, comprising:

a plurality of elongated units disposed one after the other in tandem fashion;

means for providing articulation between said units;

a plurality of wheeled carriage means for supporting said units at spaced intervals; and

means setting the longitudinal axis of each supported unit obliquely with respect to the rotational wheel axis of the carriage supporting it.

2. The barricade of claim **1** wherein each carriage means comprises a frame having supporting wheels at opposite ends thereof and said setting means comprises means on each frame for supporting one of said units obliquely with respect to the rotational axis of said supporting wheels.

3. The barricade of claim **2** including means on said frame for supporting a flag in extension therefrom.

4. The barricade of claim **1** wherein said means providing articulation comprises pivotal couplings between ends of adjacent units, said couplings permitting horizontal flexure of said line.

5. The barricade of claim **4** wherein each pivotal coupling comprises overlapping ends of adjacent units, said ends defining aligned apertures, and a pivot through said apertures said pivot supporting a flag in extension from said coupling.

6. The barricade of claim **4** wherein said carriage means are spaced from said ends.

7. The barricade of claim **1** wherein said units comprise tubular members pivotally coupled end-to-end.

8. The barricade of claim **1** including means on said units for supporting a flag in extension therefrom.

9. The barricade of claim **1** wherein said setting means are formed to set the longitudinal axis of each supported unit from about 1 to about 25 degrees from a line drawn perpendicularly to said rotational wheel axis.

10. The barricade of claim **1** including motive means for moving said barricade along a roadway, said setting means being formed so that as said motive means travels in a path parallel to an edge of said roadway, said barricade travels at a constant obtuse angle to said path to thereby present a gradual traffic guide away from said roadway edge in the direction of said travel.

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DENNIS L. TAYLOR, Primary Examiner

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