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TRAFFIC MARKER APPARATUS

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FIG. 1

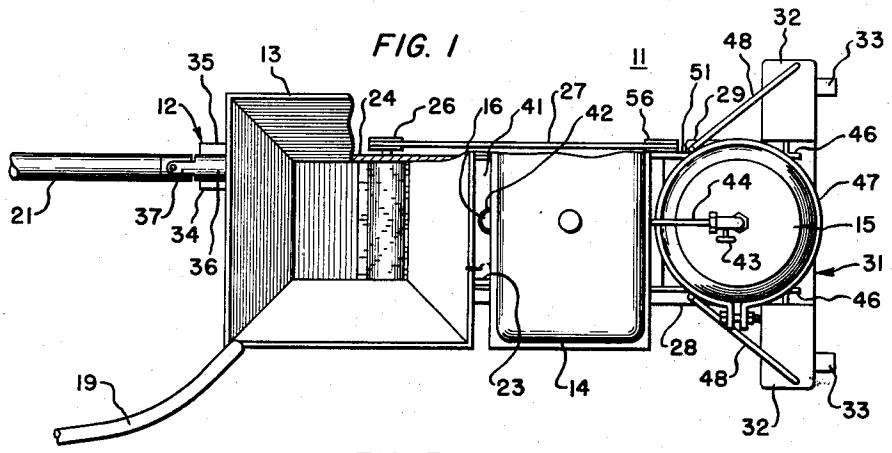
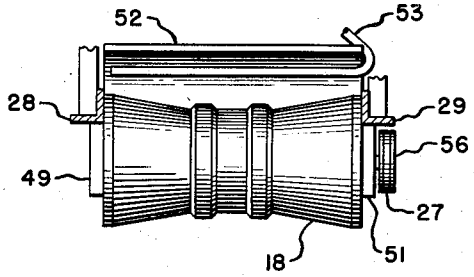


FIG. 3



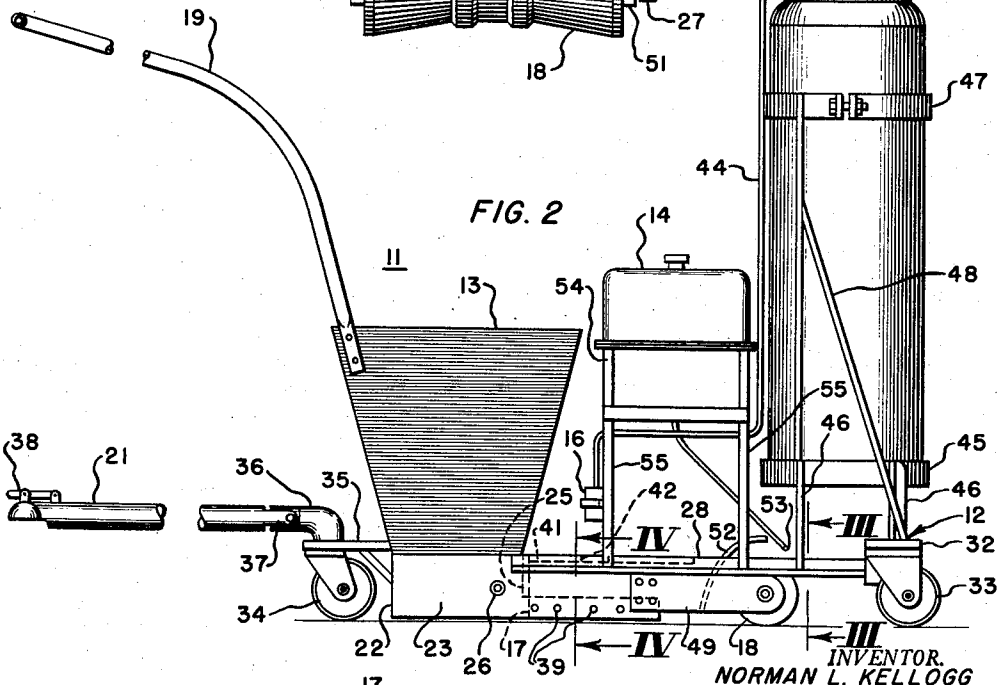


FIG. 2

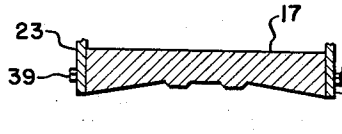


FIG. 4

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TRAFFIC MARKER APPARATUS

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2 Claims. (Cl. 94—46)

The present invention relates to traffic marker apparatus and more particularly to traffic marker apparatus which is adapted to install upon roads and highways a raised marker of predetermined configuration for the designation of traffic lanes or the like.

Heretofore there have been developed various types of apparatus for applying center-line or traffic lane markings to highways. For the most part such apparatus has been concerned with the application of painted stripes and the like to highways, and few machines, if any, exist which are capable of economically and expeditiously providing continuous raised traffic markers, such as that described in my copending application, Serial No. 587,010, filed May 24, 1956. Raised markers of distinctive shape have been found to be advantageous in that they give not only a visual indication of their presence but also, as when run over by the tires of a vehicle, an audible and sensory indication, which is important to rouse inattentive automobile drivers. In addition, the markers exhibit an unmistakable shadow pattern during both day and night, and are preferably made so as to incorporate reflective material for identification at night. To best integrally accommodate such reflective material, and also to exhibit the above-mentioned distinctive and easily identifiable appearance, the markers have to be provided with a combination of grooves, indentations, and angled sides, or the like, by a suitable machine or apparatus.

Accordingly, the traffic marker apparatus of the present invention is designed to quickly and inexpensively lay down a raised and longitudinally extending traffic marker of distinctive shape, and in a manner whereby the traffic marker becomes integrally associated with the pavement surface. The marker apparatus may be self-propelled, if desired, but for reasons of economy of operation it is preferably constructed so as to be towable by a truck or other vehicle which is loaded with the substance, such as asphalt, of which the marker is to be made. The asphalt is transferred from the truck to a hopper of the present apparatus and an agitation and distribution mechanism evenly lays the asphalt along the pavement. Next, a heated forming means preliminarily shapes the asphalt into the desired marker configuration, and this is followed by a finishing operation which firmly packs and forms the marker upon the pavement in substantially bonded relationship.

The apparatus of the invention is relatively inexpensive, uncomplicated, and particularly practical for use by the smaller highway departments. It provides a straightforward, simplified piece of road equipment which is easy to operate and inexpensive to maintain, and which, in circumstances wherein a raised traffic marker is desirable, may be readily attached to a truck or other vehicle to lay the marker with a minimum interruption of highway traffic.

It is therefore an object of the present invention to provide an improved traffic marker apparatus for installing upon roads and highways a raised marker of a particular configuration.

Another object of the invention is to provide a novel form of mobile traffic marker apparatus which is adapted to install a traffic marker of a predetermined shape upon pavement, and which includes means for evenly distributing the marker material on the pavement, and which also includes forming means for imparting to the marker material the said predetermined shape.

It is another object of the invention to provide a unique machine and apparatus for forming a raised and longitudinally extending asphalt road marker upon already constructed pavement, the machine and apparatus being adapted to maintain the asphalt of the marker in heated, workable condition until the formation of the road marker is completed, so that a good bond will be effected between the road and the marker and so that more complicated shapes may be imparted to the marker during its formation.

An additional object of the invention resides in the provision of a mobile and steerable highway marker apparatus which is adapted for attachment to a vehicle for towing thereby, the apparatus being characterized by a storage and distribution portion for storing and spreading asphalt upon highway pavement, and by a forming portion for imparting a predetermined shape to the asphalt, the weight of the highway apparatus being so arranged that it is substantially concentrated at the area of the forming portion to thereby increase the density of the shaped asphalt.

A still further object of the invention is to provide a novel traffic marker apparatus for forming a raised traffic marker having longitudinally extending grooves therein, which apparatus is relatively compact, inexpensive, uncomplicated, and easy to operate and maintain.

Other objects and features of the present invention will be readily apparent to those skilled in the art from the following specification and appended drawings wherein is illustrated a preferred form of the invention, and in which:

Figure 1 is a plan view of a preferred embodiment of the traffic marker apparatus of the present invention, portions of the steering handle and two bars being omitted, and portions of the hopper and water tank being broken away for clarity;

Figure 2 is a side elevational view of the traffic marker apparatus;

Figure 3 is an enlarged view taken along line III—III of Figure 2; and

Figure 4 is a view taken along line IV—IV of Figure 2 and illustrating the cross-sectional configuration of the forming foot of the present apparatus.

Referring to the drawings, and more particularly to Figures 1 and 2, there is illustrated a traffic marker apparatus 11 which comprises, generally, a frame 12; a hopper 13, a water tank 14, and a fuel tank 15 supported by frame 12; a burner 16; a "hot foot" or forming foot 17; a finish roller 18; a steering handle 19; and a tow bar 21.

Frame 12 is preferably made of heavy metal plate which is, for the most part, integrally welded together to form a strong and durable structure to support the weight of the other components of apparatus 11. Frame 12 includes a vertical front plate 22, a pair of rearwardly extending side plates 23 and 24 welded thereto, and a transverse plate 25 which is welded at its ends to sides 23 and 24, respectively, to define a rectangular opening into which the lower end of hopper 13 opens. Hopper 13 nests of its own weight within the upper portions of plates 22, 23, 24 and 25 so that the plates support and carry hopper 13 and form an extension thereof opening to the pavement below.

Transversely disposed between and rotatably mounted to side plates 23 and 24 is a toothed or tined feed roller 26 which serves to accept asphalt or other material carried within hopper 13, feeding or distributing it at a uniform rate and density to the pavement below. As illustrated, feed roller 26 is driven by finish roller 18 through a pulley drive 27, as will become more fully apparent hereinafter.

Frame 12 also includes angle irons or elements 28 and 29 which are welded at their forward ends to the rear of plates 23 and 24, respectively, and extend rearwardly where they are welded to a transversely disposed rear plate 31. As will be subsequently described, these elements 28 and 29 support the water tank 14 and the fuel tank 15.

A pair of lateral extensions 32 of plate 31 serve to pivotally carry a pair of wheels 33 which act to support the rear end of apparatus 11 and space it above the pavement just enough to provide clearance between finish roller 18 and the pavement. The forward end of apparatus 11 is similarly supported by a third or forward wheel 34 which is pivotally carried by a forward extension 35 of frame 12, extension 35 being suitably welded to front plate 22 and the front end of side plate 24.

The use of a single wheel 34 at the forward end of apparatus 11 permits easier steering of mobile apparatus 11 by means of the steering handle 19, which is rigidly secured to the near side of hopper 13. It will be seen that the handle 19 extends forwardly to the truck or other towing vehicle (not shown) so that it may be operated by personnel on the truck.

Apparatus 11 is connected by tow bar 21 to the towing vehicle through an upper wheel fitting 36, which is integrally pivotable with wheel 34 and connected to tow bar 21 by a universal joint 37. By this means a flexible connection with the towing vehicle is provided. In addition, a usual bail fitting 38 is provided for connecting two bars 21 to the towing vehicle, although any of various towing fittings will operate satisfactorily.

The asphalt, concerete, or other material laid upon the pavement by feed roller 26 during the operation of apparatus 11 next undergoes a primary forming by forming foot 17, which is transversely disposed between and bolted to side plates 23 and 24 by bolts 39. Referring now to Figure 4, it will be seen that forming foot 17 is carried at the lower edges of plates 23 and 24, just slightly above the pavement, and by reason of the configuration of its underface will, in the illustrated embodiment, form the material into a traffic marker having gradually inclined sides with a pair of longitudinally extending grooves at its mid portion. It will be apparent that bolts 39 may be removed to permit substitution, if desired, of a different forming foot 17 having an underface of another configuration whereby a differently shaped traffic marker may be produced.

In the event that the traffic arker is to be made of asphalt, which it is well known should be shaped while hot, the present apparatus is adapted to provide heat to forming foot 17 by means of burner 16, which is rigidly secured in a position to direct its flame downwardly upon the upper surface of forming foot 17. To entrap the heat of burner 16 and define an oven-like compartment above foot 17, there is provided a flat, transverse plate 41 which is welded at its front edge to transverse plate 25 and at its side edges to side plates 23 and 24. This plate 41 has an opening 42, best illustrated in Figures 1 and 2, through which the flame of burner 16 may pass whereby heat may be concentrated within the semi-closed area above forming foot 17. It is also to be noted that a rod, not shown, is welded to plate 41 and serves to support burner 16 in operative position above plate 41.

Any suitable fuel may be used for burner 16, but the use of propane is preferred since it is convenient and generally readily available. The propane is stored within tank 15, fed through a valve 43, and carried by a fuel line 44 to burner 16, valve 43 being operable to adjust the flow of propane as desired to thereby adjust the temperature of forming foot 17.

Fuel tank 15 is removably supported in position by a shelf 45 which is spaced above the rear end of frame 12 by four legs 46 which are welded to angle irons 28 and 29 and rear plate 31 of frame 12. To keep tank 15 from tipping, there is provided a clamping band 47 which is held in position by welded attachment to tubular supports 48 which are in turn welded to shelf 45 and rear plate 31 of frame 12.

After the hot asphalt has been preliminarily formed by forming foot 17, the forward motion of apparatus 11 brings finishing roller 18 into contact with the formed asphalt. Roller 18 is rotatably secured in position between a pair of mounting members 49 and 41, Figure 3, which are removably bolted, respectively, to the rear end portions of side plates 23 and 24. The bolted mounting of roller 18 permits its ready removal in the event that a traffic marker configuration is desired which is different than that which would be imparted by the illustrated holler 18. Roller 18 provides a finishing operation upon the formed traffic marker, compacting and smoothing the marker into final form. To prevent asphalt from sticking to roller 18 during this finishing operation it should be kept cool, and the present apparatus does this by guarding roller 18 from the heat of burner 16 by means of a heat shield 52 which is welded to the rear edge of plate 41 and at its sides to angle irons 28 and 29. In addition, cooling water is dripped or sprayed upon roller 18 by means of a gravity fed drip tube 53 which is located above roller 18, as illustrated, and which obtains water from water tank 14. Tank 14 rests of its own weight within a welded framework 54 which is secured to and supported by legs 55 welded to angle irons 28 and 29 of frame 12.

The rotation of roller 18 as apparatus 11 moves over the pavement is transmitted through a pulley 56, which is secured to roller 18, to pulley drive 27 to thereby drive feed roller 26 at a suitable ratio, as, for example, approximately four to one

In operation, the marker material, such as hot mix asphalt, is shoveled from the towing vehicle into hopper 13, and feed roller 26 spreads a uniform trail of asphalt along the pavement upon which the marker is to be formed. Next forming foot 17 roughly molds the marker into the desired shape, and finishing roller 18 compacts and smooths the asphalt into substantially integral association with the pavement, the weight of the components of apparatus 11 being so arranged that their weight is centered or concentrated upon roller 18 to improve the efficiency thereof.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims:

I claim:

1. An apparatus for applying heated traffic marker material to a highway for service as a raised traffic marker, said apparatus comprising a mobile frame, a hopper mounted on said frame for carrying traffic marker material, said hopper having an open lower end, a tined feed roller mounted on said frame adjacent said lower end of said hopper and rotatable to evenly distribute marker material from said hopper to said highway, a forming element mounted on said frame in position to contact and form said marker material upon said highway, the transverse cross section of said forming element being substantially concave downwardly to thereby impart a raised and substantially convex configuration to said marker material upon said highway, means for heating said forming element to enable easier formation of said marker material, said last-mentioned means including a burner

means directed toward said forming element, a finish roller rotatably carried by said frame rearwardly of said forming element and in position to roll upon said marker material and firmly pack it in position upon said highway, means coupling said finish roller to said feed roller whereby said feed roller is rotated in accordance with rotation of said finish roller, said finish roller being adapted by its configuration to retain the configuration of said marker material imparted thereto by said forming element while firmly packing said marker material upon said highway, means for cooling said finish roller to reduce adherence of marker material thereto, said last-mentioned means including means mounted over said finish roller for directing a cooling fluid thereagainst, and a shield for protecting said finish roller from the heat of said burner means.

2. An apparatus for applying heated traffic marker material to a highway for service as a raised traffic marker, said apparatus comprising a mobile frame having a front transverse plate, a pair of longitudinally extending side plates secured to said front transverse plate, and a rear transverse plate spaced from said front transverse plate and secured between said side plates, an open-ended hopper for carrying traffic marker material, said hopper resting of its own weight upon said frame with its lower open end disposed within the opening defined by said front and rear transverse plates and said pair of side plates, a tined feed roller rotatably mounted to said side plates at said lower end of said hopper and rotatable to evenly distribute marker material from said hopper to said highway, a forming element mounted on said frame in position to contact and form said marker material upon said highway, a heating plate secured to said side plates and to said front transverse plate at a position above said forming element, said heating plate having an opening therethrough, means for heating said forming element to enable easier formation of said marker material, said means including a burner directed through said opening in said heating plate toward said forming element, a finish roller rotatably mounted to said frame rearwardly of said forming element and in position to roll upon said marker material and firmly pack it in position upon said highway, means coupling said finish roller to said feed roller whereby said feed roller is rotated in accordance with rotation of said finish roller, means for cooling said finish roller to reduce adherence of marker material thereto, said last-mentioned means including an apertured tube mounted over said finish roller for directing a cooling fluid thereagainst, and a shield disposed between said burner means and said finish roller to protect said finish roller from the heat of said burner means.

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