Nov. 17, 1925. 1,561,553

P. K. LINDSAY

PNEUMATIC HIGHWAY MARKER

Filed Nov. 30, 1921 3 Sheets-Sheet 1

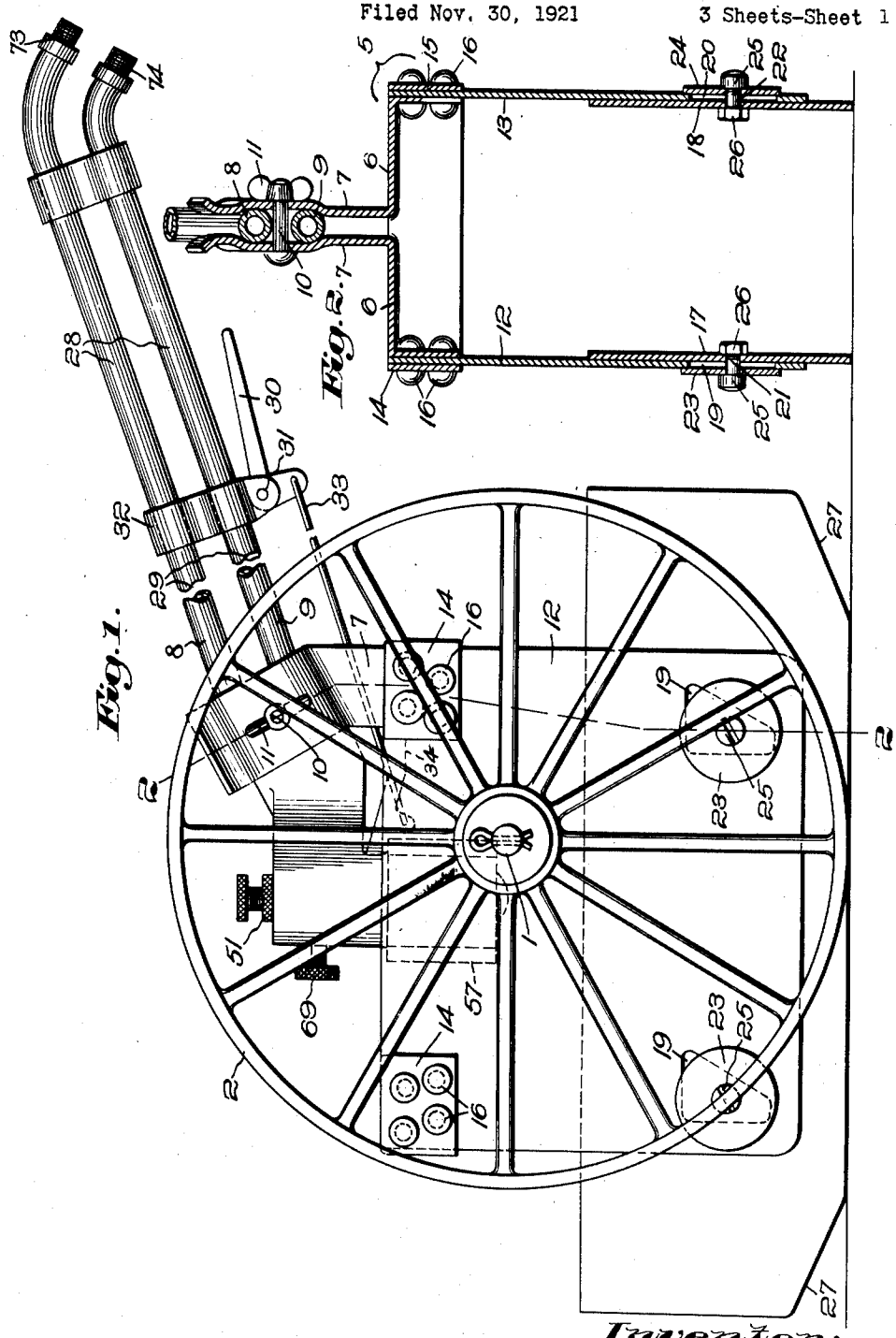


Fig. 1.

Fig. 2.

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3 Sheets-Sheet 2

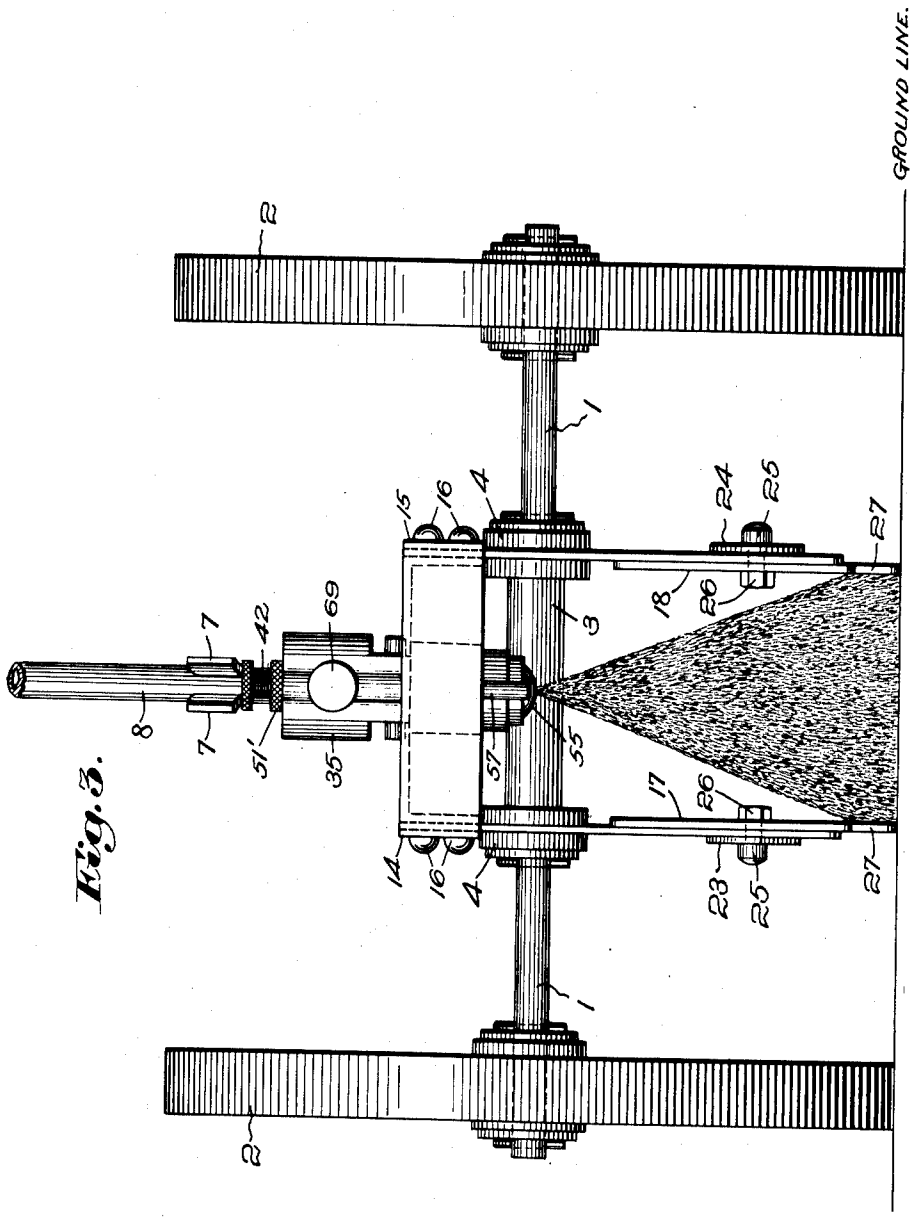


Fig. 3.

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Fig. 4.

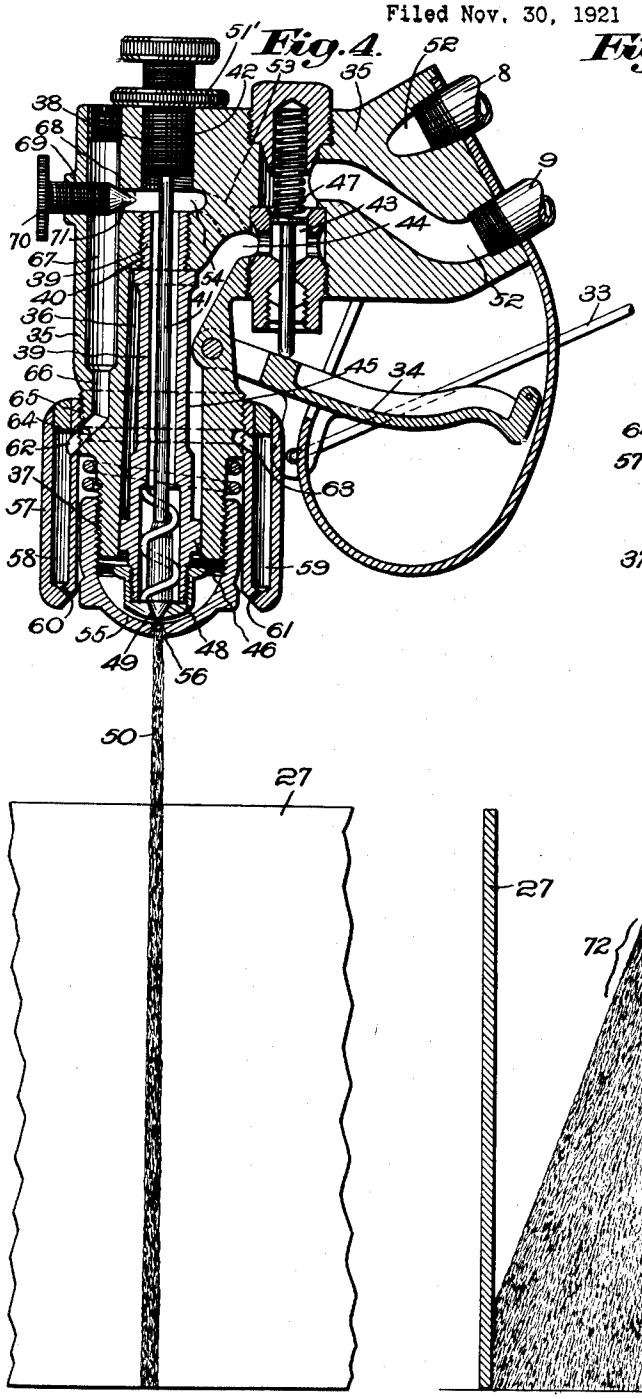
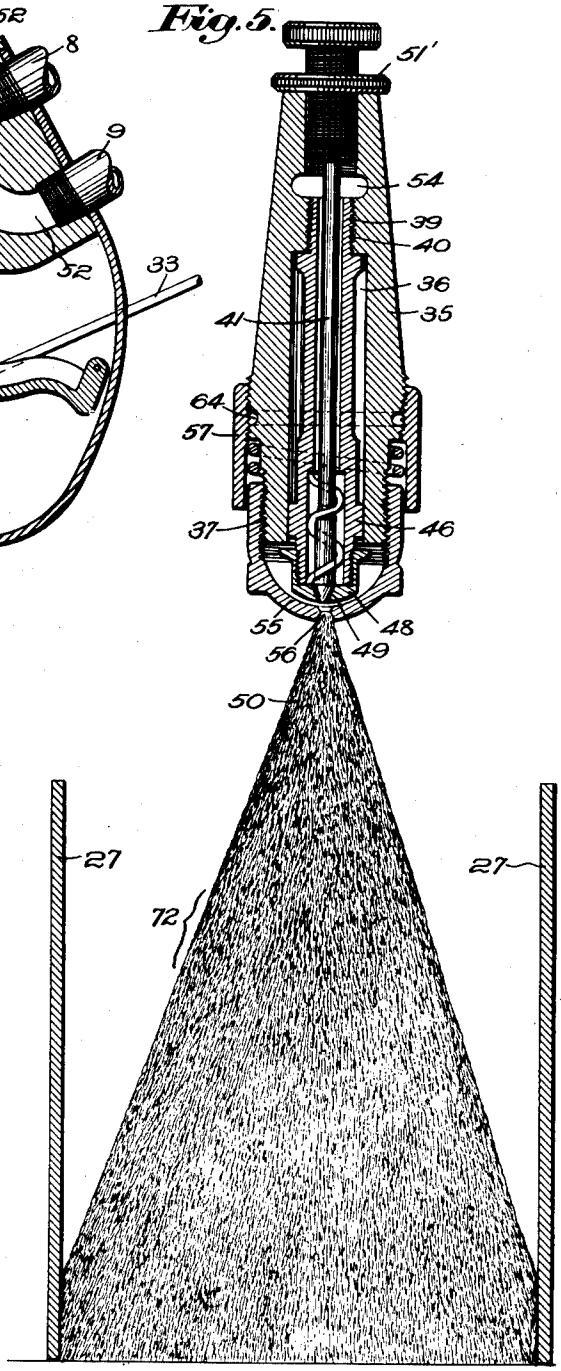


Fig. 5.



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Patented Nov. 17, 1925. 1,561,553

UNITED STATES PATENT OFFICE.

PHILIP K. LINDSAY, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO SPRAY PAINTING & FINISHING EQUIPMENT SALES CO., A CORPORATION OF MASSACHUSETTS.

PNEUMATIC HIGHWAY MARKER.

Application filed November 30, 1921. Serial No. 518,979.

To all whom it may concern:

Be it known that I, PHILIP K. LINDSAY, a citizen of the United States, and a resident of Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Pneumatic Highway Markers, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to markers for public highways and like purposes, and more particularly to pneumatic highway markers for automobile traffic.

In order that the principle of the invention may be readily understood, I have disclosed a single embodiment thereof in the accompanying drawings, wherein—

Fig. 1 is a side elevation in part broken away, of an apparatus embodying my invention;

Fig. 2 is a vertical section upon the irregular line 2—2 of Fig. 1;

Fig. 3 is a front elevation of the apparatus disclosed in Fig. 1; and

Figs. 4 and 5 are vertical longitudinal sections at right angles to each other taken through the spraying device preferably employed with and as a part of my apparatus and representing the preferred shape of stream issuing therefrom.

With the increase in automobile traffic and particularly upon narrow or curving highways, demand has come for a device to mark the highways in order to direct traffic upon the proper side of the highway and also to indicate intersecting roads or to give special warning or information. Within recent months highways have been marked extensively for this purpose, but so far as I am aware the markings have been placed thereon by hand brushes. An important object of my invention is to provide a device whereby markings of this character may be quickly placed upon the highway and may be of a substantially permanent character or needing renewal only at relatively long intervals.

I am aware that it has long been customary to employ wheeled devices for marking lawn tennis courts and for like purposes. These devices, however, are wholly inappropriate for the present purpose for various reasons and especially because a powdered substance such as lime has been mainly employed for that purpose. For marking public highways it is necessary that coating material be employed of such a nature that the marking will not be readily effaced in spite of the wear to which the marking is necessarily subjected by traffic.

I will set forth the preferred embodiment of my invention, it being one employing a coating material such as paint, under pressure, such coating material being desirably but not necessarily discharged as a relatively thin sheet transversely of the marking, the width of the sheet substantially corresponding to the width of the mark.

Referring more particularly to the drawings, a shaft is indicated at 1 in Figs. 1 and 3, it having mounted thereon, and preferably loosely, the wheels 2, 2 of suitable size. Any suitable number of wheels may be employed, but in practice I have found two to be sufficient. Upon said shaft about midlength thereof is mounted a sleeve 3 having hub like members 4 at its ends, supporting a housing indicated generally at 5 in Fig. 2 and which may be of any suitable shape. Desirably the housing which may be of sheet metal, is of general inverted U shape. It is shown as composed of a pair of top plates 6, 6 having outer horizontal portions and integral, inner, upstanding portions 7, 7 between which are adapted to be clamped or otherwise secured the pipes or tubes 8, 9 of the spraying device proper, as by means of a bolt 10 and a wing nut 11.

Secured to and depending from the plates 6 are vertical plates 12, 13 which may if desired be secured to the plate 6 by supplemental plates 14, 15 and bolts 16. The depending plates 12, 13 are spaced apart a distance slightly greater than the width of the mark that is to be placed upon the highway. Preferably I secure to said depending plates 12, 13 means adapted to contact or substantially to contact with the surface of the highway, but desirably yieldingly, so that the said means will serve to impart sharp or well defined lateral edges to the mark.

For this purpose I have herein represented two plates 17, 18 positioned respectively at the inner faces of the plates 12, 13, the latter having slots 19, 20 within which are received for vertical movements bolts 21, 22 extending through the plates 17, 18 and

through washers 23, 24. The latter are held in position by the heads 25 of the bolts and the nuts 26 thereon, but with sufficient play to permit the plates 17, 18 freely to yield to inequalities in the surface of the highway, while desirably touching the same at all times. Within the scope of my invention the walls of the housing including the plates 17, 18, if employed, may not actually touch the surface of the highway, but in the course of my experimentation, I have ascertained that the best results are obtained by having the parts actually contact with the surface of the highway as stated. The said plates 17, 18, are of sufficient length, as represented in Fig. 1, to prevent the coating from being blown away by the air blast or otherwise, and desirably the ends of said plates 17, 18 are beveled as indicated at 27 to permit them to ride more easily over obstructions.

The housing composed of the plates 6, 6, 12, 13, 17, 18, is mounted upon the sleeve 3, as most clearly indicated in Figs. 1 and 3, and in such a manner that the operator may move up and down the parts held in his hand independently of relative movement between the wheels 2, 2 and the shaft 1.

I will now describe one form of coating means employed as a part of the marking device, it being understood that any other suitable coating means may be provided, but that the best results are obtained not only by employing pneumatic or like means for spraying paint, but also by employing means whereby the paint is discharged from the coating means in a relatively thin sheet of the width of the mark.

The coating means is provided with two pipes 8, 9, desirably supported as described and of sufficient length so that the operator standing erect may grasp them as a handle, as indicated at 28 in Fig. 1, the said pipes being broken away as indicated at 29. In communication with the pipes 8, 9, are respectively a source of compressed air and a supply of coating material, such as paint, desirably under pressure from the compressed air supply. In practice I mount upon a truck an air compressor for providing air under pressure and also a receptacle desirably in communication therewith containing paint under air pressure, and I provide the said tanks or receptacles with suitable valves, gauges, etc., so that the pressure of the air and of the paint at the point of discharge may be independently controlled. Furthermore I provide means within ready access of the operator whereby the supply of paint and the supply of air may be cut off at or near the point of discharge. For this latter purpose I have represented a trigger 30 formed as a lever pivoted at 31 upon a suitable bracket 32 and connected by a rod 33 with the control means 34 for the coating means as shown most clearly in Figs. 1 and 4, as a trigger formed as a lever. The pipes 8 and 9 extend into and support in a depending position, as indicated in Figs. 1 and 3, the body 35 of the coating means proper, which I will now describe in sufficient detail without limiting my invention to the use of such means.

The body 35 is cored to provide a longitudinal passage 36 which is internally threaded at 37, 38, for the reception respectively of a tubular member 39, threaded at 40 and a needle valve 41 threaded at 42. The tubular member 39 at its forward end is preferably formed to permit the passage of the coating material issuing from a valve chamber 43 into the passage 44 and thence into the circumferential space 45, the forward end of the tubular member 39 being preferably squared as indicated at 46. Thus the coating material when the valve 47 is opened, is permitted to flow through the pipe 9, the valve casing 43, the passage 44, 45 and thence past the squared formation 46. Upon the forward end of the tubular member 39 is threaded or otherwise positioned a cap 48 and the needle valve 41 is seated at its outer end in said cap 48, the latter having a central orifice 49 for the issuance of the spray indicated at 50. The needle valve may be guided and positioned by any suitable means as for example by a coiled wire 51 encircling the head of the valve and maintaining it in central position when the valve is unseated. The rear end of the valve 41 is provided with a suitable lock nut 51'.

The air pipe 8 is in communication with a passage 52 in the body 35, itself being in communication with a valve chamber, not shown, but in lateral parallelism with the valve chamber 43 for the paint, and containing a valve from which extends a valve stem to be operated by the trigger or lever 34, and in such manner that the paint and the air may be controlled substantially simultaneously. Said valve chamber is in communication with an air passage 53 extending therefrom and indicated in dotted lines in Fig. 4. This passage communicates with the passage 54 of the tubular member 39. When the air valve (not shown) is opened the air flows through the passages 52, 53 past the valve into the passage 54, controlled by the needle valve 41.

Upon the outer end of the body 35 is threaded or otherwise suitably secured a preferably cap-like member 55 herein shown as having a concaved inner surface and a small central opening 56 in line with the axis of the needle valve 41. Desirably the length of the threaded portion of the cap 55 is sufficient to permit adjustment of said cap so as to provide for the effective formation of a film and for a variation of the

thickness thereof. It is not, however, essential that a film be formed, since the paint or other coating material may be supplied in any suitable manner.

By reason of the construction of parts thus far described, the formation of a mass or spray of generally conical form issuing through the orifice 49 is effected. While for certain purposes this is sufficient, I desirably provide means for discharging one or more supplemental air jets upon the discharged paint or other coating material and in such a manner as to change or transform the issuing spray from a conical formation circular in cross section into a sheet. For this purpose I provide a generally cylindrical member 57 herein shown as having two tubular extensions 58, 59 preferably diametrically opposed to each other and terminating in the discharge passages 60, 61 inclined toward each other as clearly represented in Fig. 4.

The two or other number of supplemental air passages 58, 59 are desirably in constant communication at their inner ends through passages or ports 62, 63 with a completely annular passage or groove 64 shown as formed upon the outer surface of the forward end of the body 35. I have represented the body 35 as provided with a thread 65 desirably in advance of and also in the rear of the annular passage 64, so that a substantial longitudinal adjustment is permitted of the member 57, whereby I may vary the point of application of the supplemental air jet upon the coating material as discharged through the orifice 49, thereby varying to some extent the shape of the discharged mass of coating material and the degree of fineness of such coating material. The annular passage 64 and hence the passages 58, 59 are in communication with the longitudinally extending passage 66 and the communicating passage 67 of the body 35. The passage 67 is in communication with the main air passage 53 by means of a port 68 controlled by the valve 69 threaded into an opening in the body 35 and preferably having a knurled head 70 by which it may be readily turned manually. The inner tapered end 71 of said valve is adapted to be seated so as to close the port 68 or to be opened fully or to any desired extent, thus regulating the air supply through the passage 68. This valve is in effect a reducing valve whereby the supplemental air pressure can be regulated and whereby any desired degree of fineness of the discharged coating material may be obtained. It will be observed that the member 57 is capable not only of longitudinal adjustment but is mounted for circumferential or rotary movement upon the body 35, so as to secure any desired plane of the sheet of coating material and to maintain such plane thereof, it being evident that the discharge of the supplemental air jets upon the body of coating material issuing from the orifice 49 transforms the same into a sheet, as indicated at 72 in Fig. 4. Desirably the parts are so proportioned that the issuing sheet 72 of coating material contacts with the plates 17, 18 of the housing slightly above the lower ends or edges of said plates, as indicated in Fig. 3, and in such manner that the coating material will run down the remaining distance and form sharp edges of the mark on the roadway.

It will be evident from the foregoing description that the device may be readily and quickly moved along the highway as far as the hose connections to the pipes 8, 9 permit. Desirably said pipes have connected at their outer ends at 73, 74, flexible hosing itself in communication with the tanks or reservoirs hereinbefore referred to. Obviously the truck carrying such supply may as desired be moved along the highway and thus the mark may be placed speedily yet accurately. The operator by reason of the hand control can at any time through the rod 33 operate the trigger 34, so as to cut off both the air and the paint supply or vary the same as required, and the pressures of the paint and air may be controlled from the supply upon the truck.

Having thus described one illustrative embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims:

1. A highway marker comprising in combination, a wheeled support, a housing mounted thereon, and having a mark-defining portion yieldable substantially vertically, spraying means carried by the parts, and means to supply coating material under pressure and a motive agent to the spraying means.

2. A highway marker comprising in combination, a wheeled support having an axle, a housing mounted upon the axle and angularly movable with respect thereto, said housing having a yieldable mark-defining portion, spraying means carried by the parts, and means to supply coating under pressure and a motive agent to said spraying means.

3. A highway marker comprising in combination a wheeled support, a housing extending into proximity to the highway, handle means for propelling the marker connected to said housing, said housing being angularly movable by said handle means relatively to said support, to adjust said housing to the plane of the highway, at least the lower portion of said housing be-

ing yieldable substantially vertically to conform to irregularities in the surface to be marked, spraying means carried by the parts intermediate the sides of said housing, means to supply coating and a motive agent to said spraying means, and manually operable means for controlling the supply of coating and motive agent positioned within ready access to the operator propelling the marker.

4. A highway marker comprising in combination, a wheeled support, a housing mounted thereon and adapted to define the lateral limits of the mark upon the highway, spraying means carried by the parts, and means whereby said spraying means is caused to discharge the coating material in a sheet extending transversely of the mark.

5. A highway marker comprising in combination, a support adapted to be moved along the highway, a housing mounted upon said support and adapted to define the lateral limits of the mark upon the highway, spraying means carried by the parts and having means whereby the spray is discharged in a relatively thin sheet extending transversely of the mark and of a width substantially coinciding with the width of the said mark.

6. A highway marker comprising in combination, a support adapted to be moved along the highway, a housing mounted upon said support and having a plurality of spaced members adapted substantially to contact with the surface to be marked and to define the lateral limits of the mark, spraying means carried by the housing intermediate said members and having means whereby the spray is discharged in a sheet extending transversely of the mark of a width substantially coinciding with the width of the said mark, and means to supply coating under pressure and a motive agent to said spraying means.

7. A highway marker comprising in combination a wheeled support, a housing adapted substantially to contact the highway and having a width conforming to that of the mark, said housing being adjustable to the plane of the highway by angular movement upon and relatively to said support, at least that portion of said housing which substantially contacts the highway being yieldable substantially vertically, spraying means carried by the parts between the sides of the housing, and a pair of supply pipes extending from said spraying means and adapted to conduct to said spraying means coating material and a motive agent respectively.

8. A highway marker comprising in combination, a wheeled support, a housing having a width conforming to that of the mark and elongated to prevent the wind from blowing the coating material, spraying means carried by the parts between the sides of the housing, and supply pipes extending from said spraying means and constituting a handle for the operator.

9. A highway marker comprising in combination, a support adapted to be moved along the highway, a housing of general inverted U form in cross section and carried by said support, each upright part of said housing having a yielding plate adapted to rest at its lower edge on the roadway and to yield to inequalities thereof, spraying means carried by the parts, and means to supply coating material to said spraying means.

10. A highway marker comprising in combination, a wheeled support, a housing mounted thereon and in general inverted U form in cross section, a vertically yielding plate carried by each upright part of the housing and adapted to rest at their lower edges on the roadway and to yield to inequalities thereof, said yielding plates being spaced apart the width of the mark, spraying means carried by the housing, supply pipes extending therefrom and constituting a handle for the operator, and adapted respectively to conduct to said spraying means coating material under pressure and a motive agent.

11. A highway marker comprising in combination, a support adapted to be moved along the surface to be marked, a housing mounted upon said support and having a mark-defining portion, at least said portion being vertically movable relatively to said support to permit the parts to conform to a non-horizontal surface to be marked, spraying means carried by said housing, and means to supply coating and a motive agent to said spraying means.

12. A highway marker comprising in combination a wheeled support, a housing mounted thereon and angularly movable relatively thereto in a vertical plane, spraying means carried by said housing, and means whereby said spraying means is caused to discharge the coating material in a sheet extending transversely of the mark and of a width approximating the width of said mark.

13. A highway marker comprising in combination, a wheeled shaft, a housing supported upon said shaft and including a plurality of spaced members adapted substantially to contact with the surface to be marked, means for spraying a coating material carried by said housing intermediate said members and means for forming the spray of coating material into a relatively thin sheet extending transversely of the marking.

14. A highway marker comprising in combination, a wheeled shaft, a housing supported upon said shaft for angular movement relatively thereto in a vertical plane to permit said housing to conform to an in-

clined surface to be marked, said housing including a plurality of spaced depending members adapted yieldably to contact with the surface to be marked, spraying means carried by the housing, supply pipes extending therefrom and adapted to supply to said spraying means coating material under pressure and a motive agent.

15. A highway marker comprising in combination a wheeled support, a spray nozzle mounted on said support, means on said support adapted to contact the highway at opposite sides of said nozzle to define the lateral edges of the mark, said means being movable with respect to said support to effect adjustment of said means relative to the surface to be marked, a pair of supply pipes extending from said spray nozzle for conducting thereto coating material and a motive agent respectively.

In testimony whereof, I have signed my name to this specification.

PHILIP K. LINDSAY.