April 7, 1931. G. SERAPIN 1,799,570

MARKING DEVICE

Filed March 16, 1927 3 Sheets-Sheet 1

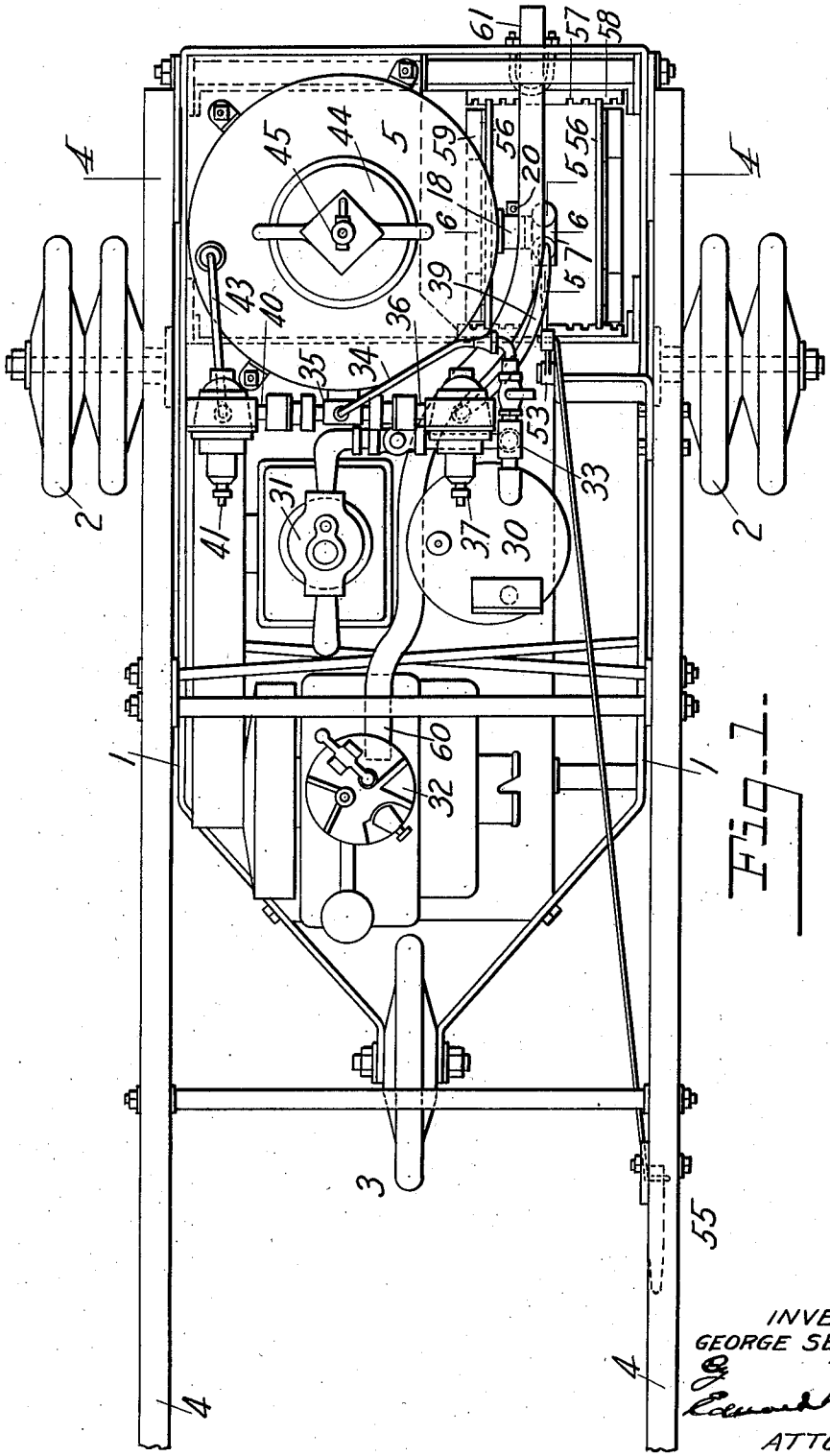


Fig. 1.

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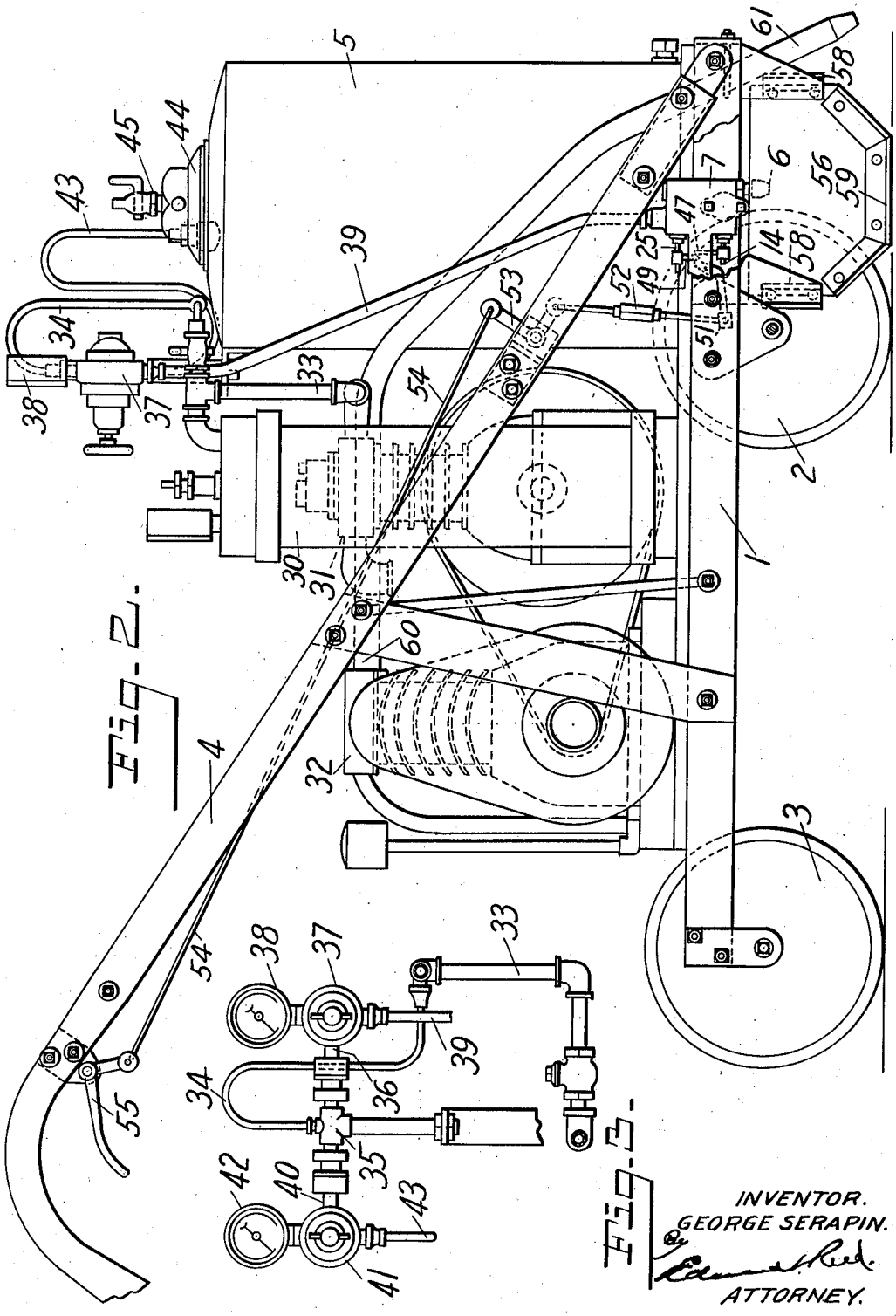


FIG. 2.

FIG. 3.

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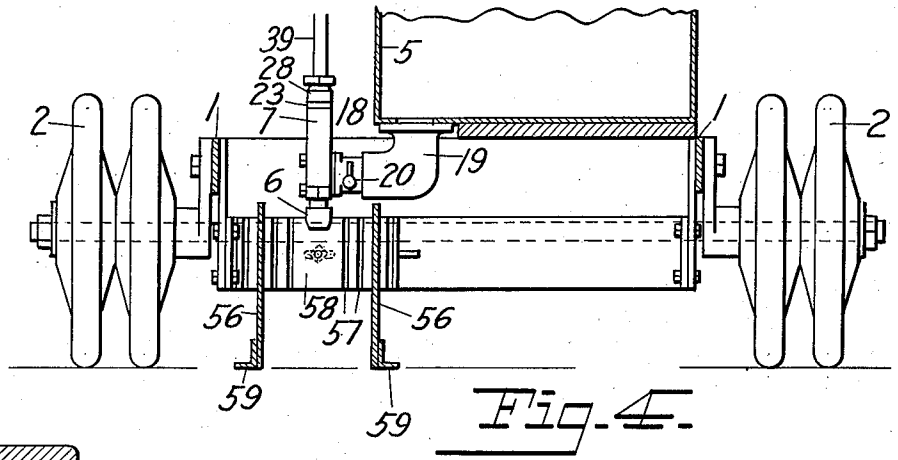


Fig. 4.

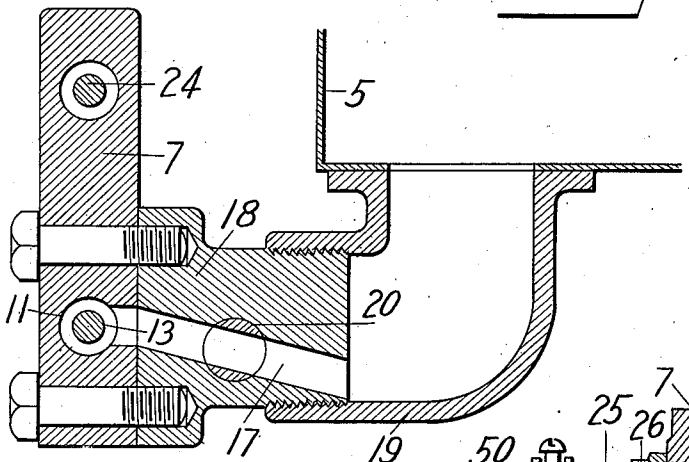


Fig. 6.

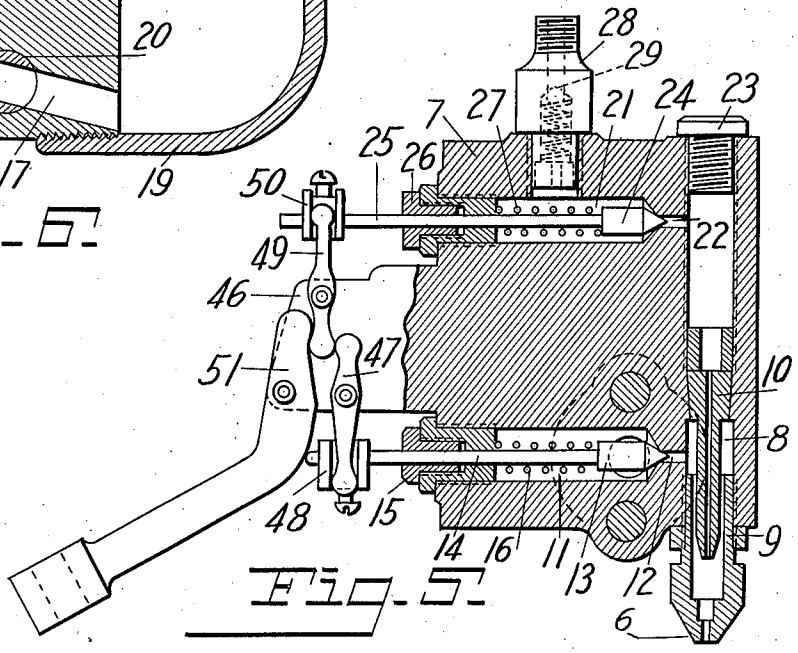


Fig. 5.

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Patented Apr. 7, 1931 1,799,570

UNITED STATES PATENT OFFICE

GEORGE SERAPIN, OF DAYTON, OHIO, ASSIGNOR TO THE NORTH SIDE TOOL WORKS, OF DAYTON, OHIO, A CORPORATION OF OHIO

MARKING DEVICE

Application filed March 16, 1927. Serial No. 175,672.

This invention relates to marking devices and is designed more particularly for marking pavements, floors and the like with lines or stripes of paint. It is customary to paint on streets or hard surfaced highways lines or stripes of bright colored paint to assist in controlling traffic, and the painting of these stripes when done by hand, is a tedious laborious operation and is correspondingly expensive.

One object of the invention is to provide a machine which will paint upon the pavement or other supporting surface a stripe of desired width and location by simply moving the machine over the surface to be painted.

A further object of the invention is to provide such a machine with means for controlling the width of the stripe and for providing the stripe with substantially straight parallel edges.

A further object of the invention is to provide such a machine with means for removing dirt from the supporting surface in advance of the paint applying device.

A further object of the invention is to provide a marking machine comprising an air brush and means for supplying air and paint to that brush.

Other objects of the invention will appear as the apparatus is described in detail.

In the accompanying drawings Fig. 1 is a top plan view of a machine embodying my invention, with the handles partly broken away; Fig. 2 is a side elevation of such a machine; Fig. 3 is a detail elevation showing the pressure controlling devices and gages; Fig. 4 is a transverse section taken on the line 4—4 of Fig. 1; Fig. 5 is a section taken through the valve housing on the line 5—5 of Fig. 1; and Fig. 6 is a section taken on the line 6—6 of Fig. 1, and showing the connection between the valve housing and the paint reservoir.

In these drawings I have illustrated one embodiment of my invention but it will be understood that this particular embodiment has been chosen for the purpose of illustration only and that the apparatus may take various forms without departing from the spirit of the invention.

In that form here illustrated the apparatus comprises a portable supporting structure or truck 1 which, in the present instance, is mounted upon wheels 2 and 3, there being a single rear wheel 3 to facilitate the steering of the truck. The truck may be moved in any suitable manner and the present truck is adapted to be pushed or pulled over the surface to be marked. It is provided with upwardly and rearwardly extending handles 4 by means of which it may be pushed or by means of which it may be steered when it is pulled by the truck or tractor.

Mounted on the truck, preferably near the forward end thereof, is a container or reservoir 5 for paint, the term "paint" being here used to include any substance with which the marks are to be made, liquid paint being preferably employed for this purpose. Connected with the reservoir 5, in the manner to be hereinafter described, is a paint applying device which is preferably in the form of a nozzle or air brush 6 mounted on the truck and arranged to discharge downwardly against the surface on which the truck is supported. This paint applying device will be hereinafter referred to as an air brush, that term being used as meaning any device by means of which the paint may be discharged against the supporting surface. Interposed between the paint reservoir and the air brush is a controlling mechanism, here shown as comprising a valve housing 7 having in its forward portion a vertical conduit with the lower portion of which the air brush 6 is connected. In the present arrangement, the air brush comprises a tubular upper portion 9 which extends into the lower end of the conduit 8 and the conduit is divided into upper and lower portions by a nozzle 10, the lower portion of which is of an external diameter somewhat less than the internal diameter of the tubular portion of the air brush and which extends into said portion of the air brush but is spaced from the walls thereof to provide a passageway about the same. In the lower portion of the housing 7 is a valve chamber 11 which is connected with the lower portion of the conduit 8 by means of a port 12. The port 12 is controlled by a needle valve 13 the

stem 14 of which extends rearwardly through a stuffing box 15. A spring 16 is coiled about the stem 14 and confined between the stuffing box and the valve member 13 and serves to hold the valve member normally against its seat, and thus close the port 12. The valve chamber 11 is connected with the paint reservoir by means of a conduit 17 formed in a connecting member 18 one end of which is secured to the valve housing 7, the other end of which is connected with an elbow 19 carried by and communicating with the paint reservoir. The flow of paint through the conduit 17 may be regulated or interrupted by a valve 20, here shown as a turn plug valve. Paint may flow from the reservoir 5 to the valve chamber by gravity but, when desired, the paint may be subjected to air pressure to secure a uniform and constant flow thereof to the valve chamber, this being particularly desirable when heavy paints are employed.

In the upper portion of the valve housing is a second valve chamber 21 which is connected by a port 22 with the upper portion of the conduit 8, the upper end of this conduit being closed by a plug 23. The port 22 is controlled by a needle valve 24, the stem 25 of which extends rearwardly through a stuffing box 26 and which is held normally against its seat by a spring 27. This upper valve is connected with a source of supply for air under pressure and is here shown as provided with a nipple or fitting 28 by means of which it may be connected with a conduit leading to such source of supply. If desired, this fitting may be provided with a check valve, as shown at 29.

Any suitable source of air supply may be utilized but in order that the apparatus may be self-contained I have mounted on the truck 1 an air compressing apparatus which comprises an air storage tank 30, a compressor 31 and an internal combustion engine 32 for operating the compressor. The compressor 31 is provided with a discharge pipe 33 which is connected at its outer end with the air tank 30 and with distributing pipes. In the present construction, a conduit 34 leads from the pipe 33 to a distributor or T-coupling 35. With one end of this distributor is connected a pipe 36 which leads to a pressure controlling valve 37, having a gage 38, and from the valve 37 a pipe 39 leads to the valve housing 7, the lower end of this pipe being connected with the fitting 28. The pressure regulating valve 37 may be of the usual or any suitable type and is adapted to automatically control the pressure of the air which is delivered to the air brush. A pipe 40 leads from the other end of the distributor 35 to a second pressure regulating valve 41, having a gage 42, and from the pressure regulating valve 41 the pipe 43 leads into the upper end of the paint reservoir 5, so that when desired the paint in that reservoir may be placed under air pressure. The filling opening in the top of the paint tank is closed by a cap or plug 44 and this cap is provided with a vent cock 45 to relieve the pressure within the tank when desired. The paint and air controlling valves 13 and 24 may be actuated in any suitable manner but preferably they are operated simultaneously so that air and paint will always be admitted to the air brush at the same time. As here shown, the valve housing has a rearwardly extending portion or integral bracket 46 on which is pivotally mounted a lever 47, the outer end of which is arranged in a groove in a collar 48 on the stem 14 of the valve 13. Also mounted on the bracket 36 is a lever 49 the outer end of which is arranged in a groove in a collar 50 on the stem 25 of the valve 24. The inner ends of the levers 47 and 49 overlap and the rear lever, 49, is acted upon by an actuating lever 51, pivotally mounted on the bracket 46, so that the manipulation of the lever 51 will cause both levers 47 and 49 to be actuated and both the paint valve and the air valve moved to their open positions. When these valves are opened the paint will flow into the lower portion of the conduit 8 of the valve housing and the air entering the upper portion of that housing will be discharged under pressure through the nozzle 10 and through the air brush and will carry with it the paint which has entered the air brush and will cause this paint to be discharged from the air brush in a jet or spray. The actuating lever 51 is here shown as connected by means of a link 42 with one arm of a bell crank lever 53 pivotally mounted on one of the handles 4. The other arm of the bell crank lever 53 is connected by a rod 54 with a hand lever 55 mounted on the same handle 4 and arranged adjacent to the hand grip thereof so that it can be readily manipulated by the operator who is controlling the movement of the truck. In order to control the distribution of the paint which is discharged from the air brush, I have provided suitable guards which are so arranged with relation to the air brush that they will confine the paint discharged from the nozzle to the space between the guards. As here shown, these guards comprise plates 56 carried by the truck and having their lower ends arranged close to the supporting surface, on opposite sides of the air nozzle. Preferably the guard plates rest upon the supporting surface and are freely adjustable vertically to enable them to accommodate themselves to irregularities in or minor obstructions on the supporting surface. To this end these guards are slidably mounted in slots or guideways 57 formed in brackets 58 carried by the truck. There are a plurality of these guideways and the width of the stripe which is painted on the supporting surface may be varied by shifting the guard plates to different slots and thus varying the distance between the same. Prefer-

ably the guard plates are provided with relatively broad bases so that they will not enter cracks in the supporting surface and, in the present construction, each plate has secured to its lower edge one or more angle irons 59 which rest upon the supporting surface and not only prevent the guards from entering the cracks or openings in the surface but also provide a broad contact between the plates and the surface, which more effectually prevents paint from passing beneath the plates. In order that the plates may ride over the minor obstructions on the supporting surface the forward ends thereof are preferably inclined and, as shown in Fig. 2 of the drawings, the lower edge of each guard plate is beveled or inclined at both its front and rear edges so that either edge of the plate may extend forwardly, thus making the plates interchangeable.

It is important that the surface to which the paint is applied should be free from dirt and I have provided the present apparatus with means to remove loose dirt from the supporting surface in advance of the air brush and have utilized the exhaust of the internal combustion engine 32 for this purpose. As there shown, the exhaust pipe 60 of the engine is carried forwardly and downwardly and has its discharge end 61 located close to the supporting surface in advance of the air nozzle. The engine being of a high speed type an almost continuous flow of gases or products of combustion will be discharged with considerable force against the supporting surface and will displace and blow away all loose dirt, thereby providing a clean surface to which the paint is applied.

The construction and operation of the apparatus will be readily understood from the foregoing description of the several parts thereof and it will be apparent that the portable supporting structure or truck may be moved over the pavement or floor which is to be marked and by manipulating the hand lever 55 the paint may be applied in a broad even stripe along a line determined by the line of movement of the truck. The application of paint may be continuous or may be interrupted at desired intervals so that a long continuous stripe may be provided or a succession of short stripes may be had. The dirt having been cleared away by the exhaust the paint is applied directly to the supporting surface, and the lateral distribution of the paint is so controlled by the guards 56 as to provide a stripe of the desired width having substantially straight parallel edges. The apparatus as a whole is self-contained, every part thereof being mounted upon the truck and being under the direct control of the operator. The apparatus is simple in its character and in its operation so that it does not require highly skilled labor for its operation.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a self-contained surface marking apparatus comprising a truck having a handle to guide it over the surface to be marked, and an air brush arranged to discharge against the surface to be marked, a container for paint carried by said truck and having a conduit to connect the same with said air brush, a source of supply for air under pressure carried by said truck and having a conduit to connect the same with said air brush, valves to control the connections between said container and said source of air supply, respectively, and said air brush, means mounted on said handle to actuate said valves, guards arranged on opposite sides of said air brush to limit the lateral distribution of the paint discharged from said air brush, said truck having a plurality of guideways on each side of said air brush and each guard having a part adapted to enter any one of the guideways on the corresponding side of said air brush.

2. In a self-contained surface marking apparatus comprising a truck having a handle to guide it over the surface to be marked, an air brush carried by said truck and arranged to discharge against the surface to be marked, a container for paint mounted on said truck and having a conduit connecting the same with said air brush, a valve to control the delivery of paint from said conduit to said air brush, an air compressor mounted on said truck and connected with said paint container and said air brush, a valve to control the delivery of air to said air brush, means mounted on said handle to control said valves, and means to limit the lateral distribution of the paint discharged from said air brush.

3. In a self-contained surface marking apparatus comprising a truck having a handle to guide it over the surface to be marked, an air brush carried by said truck and arranged to discharge against the surface to be marked, a container for paint mounted on said truck and having a conduit connecting the same with said air brush, a valve to control the delivery of paint from said conduit to said air brush, an air storage tank mounted on said truck and connected with said paint container and said air brush, a valve to control the delivery of air to said air brush, an air compressor mounted on said truck and connected with said air tank, an internal combustion engine mounted on said truck to drive said air compressor, an exhaust pipe leading from said engine and arranged to discharge against the surface to be marked in front of said air brush, guards to limit the lateral

distribution of the paint discharged from said air brush, and a single device mounted on said handle to control both of said valves.

4. In a surface marking apparatus comprising a truck having a handle to guide the same over a surface to be marked, a container for paint carried by said truck, a source of supply for air under pressure carried by said truck, a housing carried by said truck and having a passageway connected at separated points with said container and said source of air supply, valves to control said connections, a discharge nozzle at one end of said passageway having a tubular inner portion, a second nozzle arranged in said passageway between said points of connection and having an end portion of reduced diameter extending into said discharge nozzle, and means mounted adjacent to said handle to actuate said valves.

5. In a surface marking apparatus comprising a truck, an air brush carried by said truck and arranged to discharge against the surface to be marked, a source of supply for paint connected with said air brush, means for controlling the discharge of paint from said air brush, said truck having a plurality of guideways on each side of said brush, and guards interchangeably mounted in the guideways on the respective sides of said air brush to limit the lateral distribution of the paint discharged by said air brush and control the width of the mark.

In testimony whereof, I affix my signature hereto.

GEORGE SERAPIN.