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2 Sheets-Sheet 1

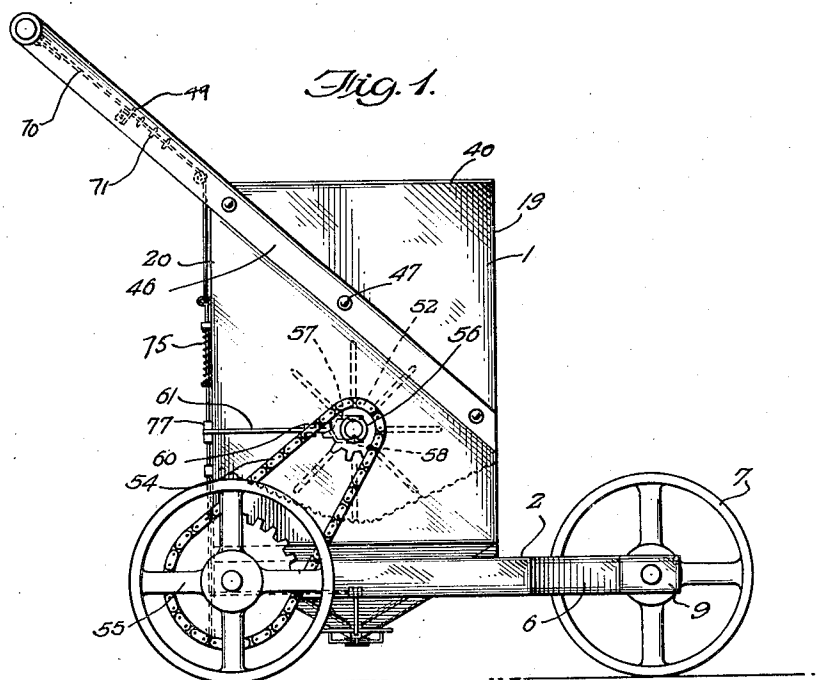
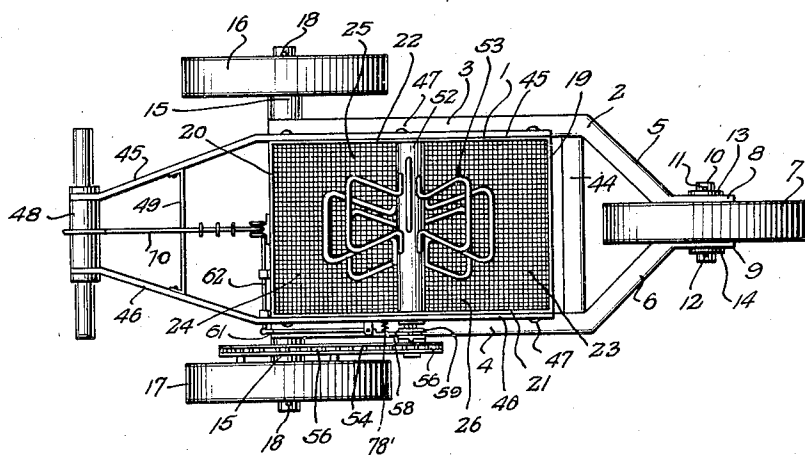


Fig. 2.

Inventor

Louis Murnahan

By

O'Boyle & Norton

Attorneys

July 14, 1931.

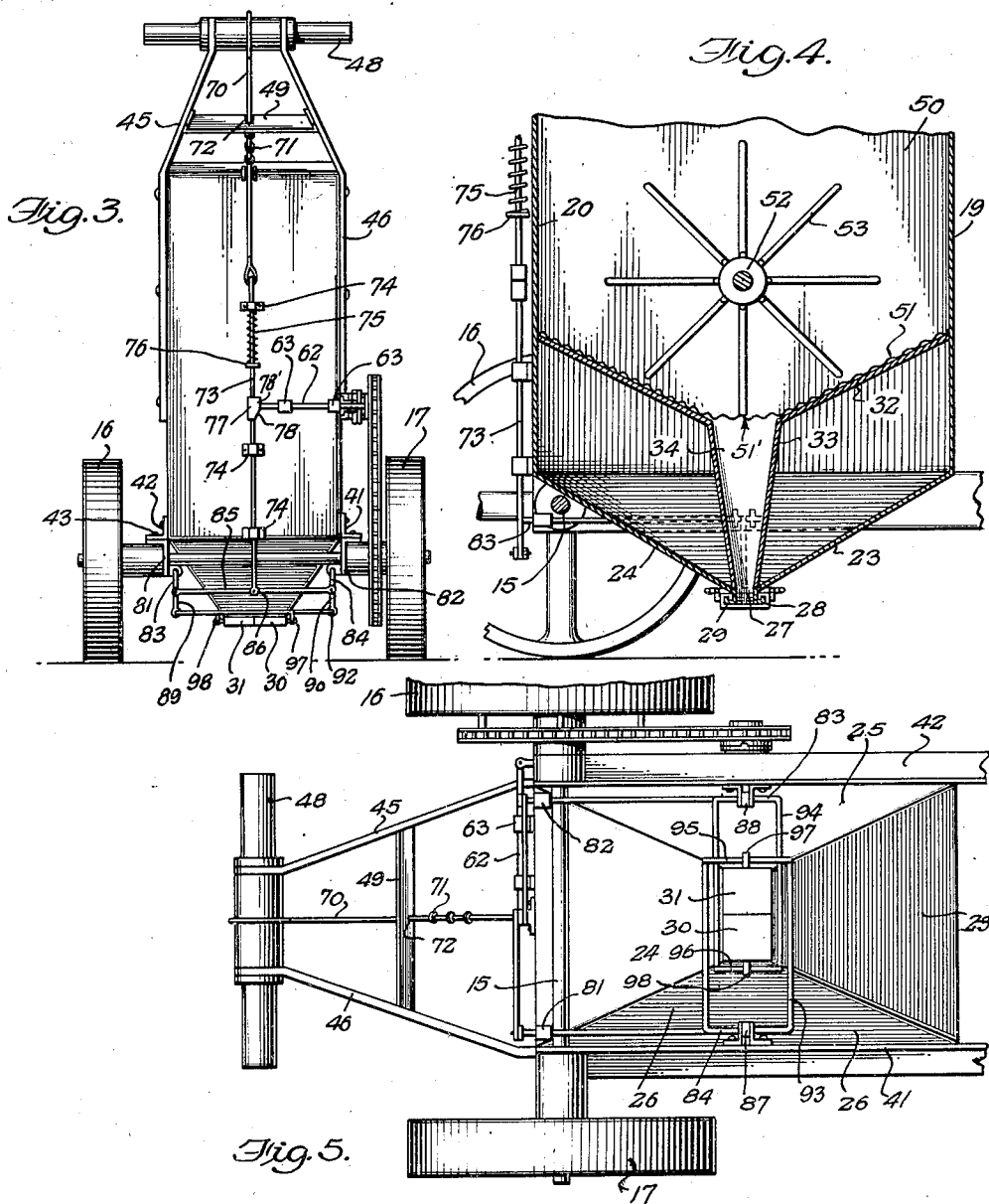
L. MURNAHAN

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MARKING DEVICE

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2 Sheets-Sheet 2



Inventor

Louis Murnahan

By *Osborne & Weston*

Attorneys

UNITED STATES PATENT OFFICE

LOUIS MURNAHAN, OF WASHINGTON, DISTRICT OF COLUMBIA

MARKING DEVICE

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This invention relates to improvements in marking devices and more particularly to a dry lime liner for marking athletic fields of various kinds such as for lining off the boundary lines of tennis courts.

In playground work it is often desirable to mark off various types of fields such as tennis courts, basket-ball courts, football and soccer playing fields and the like. Where these fields are in constant use, the lines become obliterated in a relatively short time and often require daily remarking. While markings of 2" in width are common, it is often desirable to provide markings of other widths, say 1". With the devices at present available, it is not possible to vary the width of a mark.

It is an object of the present invention to provide a marking machine having an adjustable material delivering aperture.

It is another object of this invention to provide an improved marking machine of the dry lime type having an adjustable aperture directly controlled by the operator of the machine.

Yet another object of this invention is the provision of an improved marking machine having an adjustable orifice and in which is incorporated a material mixing device.

It is also an object of this invention to provide a marking machine having a common control for the mixing device and the adjustable orifice.

A further object of this invention is the provision of an improved material delivery and mixing device.

These and other desirable objects and advantages of the present invention will be described in the accompanying specification and illustrated in the drawings. A certain preferred embodiment being disclosed by way of illustration only, for, since the underlying principles may be incorporated in other specific mechanical devices, it is not intended to be limited to the one here shown, except as such limitations are clearly imposed by the appended claims.

In the drawings, like numerals refer to similar parts throughout the several views, of which

Fig. 1 is a side elevation, partly in section, of a marking device;

Fig. 2 is a top plan view thereof;

Fig. 3 is a rear elevation of the machine;

Fig. 4 is a central vertical section through the lower portion of the device, and

Fig. 5 is a bottom plan view of the device.

Referring to the drawings, the novel device of the present invention is shown as comprising a hopper, 1, of any suitable shape mounted on a support 2, comprising lateral members 3, 4, converging forwardly at 5, 6. A guide wheel, 7, is mounted for rotation between the parallel extensions 8, 9, of members 5, 6, and is provided with a suitable axle 10. The wheel 7 is held in position by any suitable means such as cotter pins passing through apertures 11, 12, in the axle, washers 13, 14 of suitable thickness being provided to prevent side motion of the wheel. A rear axle 15 is suitably secured to the rear of the members 3 and 4 in any desired manner. A pair of wheels 16, 17, are mounted for rotation on the rear axle and are secured thereto in any suitable manner, such as by nuts or cotter pins indicated generally at 18.

As indicated previously, the hopper or container 1 may be made of any suitable shape and capacity and as shown herein, comprises front and back walls 19, 20, side walls, 21, 22 and converging bottom having front and rear portions 23, 24 and inwardly extending side portions 25, 26, converging toward the bottom and defining a bottom aperture 27. The walls of the container 1 may be formed of separate pieces suitably joined, as by welding or riveting, or the several sides and associated hopper portions may be formed integrally. The members, 23, 24, are prolonged at their bottom and bent backwardly upon themselves to form tracks 28, 29, for gate members 30, 31, of the closure.

The container is also provided with a sloping false bottom, 32, having a spout-like member 33 depending therefrom into engagement with the members 23, 24 and preferably secured thereto. It will be noted that the sides of member 33 form a hopper 34 having an open bottom adapted to be closed by members 30, 31. The container 1 may be pro-

vided with a suitable cover, 40 and with bottom support members 41, 42, secured to the supports 3, 4, in any suitable manner, as by means of bolts or rivets, 43.

5 The cross bar 44, of angle iron or the like is secured to the members 3, 4, forwardly of the container 1 and in such a manner as to provide a base or stiffening member for the front wheel supports 5, 6.

10 For propelling the machine, a pair of handle bar supports 45, 46, are secured to the sides of the container as by means of bolts, 47, and converged rearwardly to form a support for the handle bar, 48. A stiffening strap, 49, may be interposed between the converging rear portions of the supports.

The bottom of the compartment 50 formed by the walls of the container 1 and the false bottom 32 is provided with a foraminous covering 51 of wire mesh or perforated metal. This member may be secured to the inner walls of the container at its edges but is preferably left free in its central portion for a purpose now to be described. A rotatable member 52 is mounted between the side walls of the container in any suitable manner and is provided with a plurality of wire loops 53, which are staggered with respect to each other and so disposed on the member 52 as to traverse the top of the chamber 34.

25 The staggering of the loops permits alternating contact of their loop ends with that portion of foraminous covering 51 which overlies the chamber or hopper 34. The loops are so constructed as to contact the member 51 at about the center of the opening, above referred to, and indicated at 51', thus imparting a snapping or vibratory action to the screen 51 with each contact of the several loops therewith. This continued and alternating action of the staggered loops not only provides for a thorough mixing of the material, but also assures a positive feed of loose material into the hopper.

45 The rotatable member 52, as indicated above, is mounted for rotation in the container and is adapted to be driven from either of the rear wheels by means of a suitable drive such as a chain or belt 54 engaging sprockets 55, 56, associated respectively with wheel 17, and member 52. The sifter mechanism 52 is adapted to be thrown out of engagement with member 56 by means of a suitable clutch mechanism 57 comprising the usual yoke, 58, and throw-out collar 59. The yoke 59 is pivoted at 60 and provided with an actuating arm 61, this latter in turn is connected to a linkage member 62 slidably secured to the back wall of the container by supports 63.

The combined clutch operating and closure actuating mechanism comprises a control member 70, which may be made of cord and provided with a plurality of adjustable buttons or knots, 71, which are adapted to engage

a slot 72 in the cross bar 49. Member 70 is looped around the center of the handle 48 and at its other end passes through a loop in the upper end of actuating rod 73. This member is secured in sliding relation to the back of the container by means of straps 74 which may be riveted or brazed to the container or welded thereto. A spring member 75 is fitted on the actuating rod and is held against one of the bushings 74 by means of a washer 76 fixed to the rod and movable therewith. By this means the rod 73 is always maintained under a downward tension for a purpose to be described hereinafter. A cam member 77 provided with a cam surface 78 is secured to the rod 73 at any desired position and in such a manner that when the clutch is to be thrown out of action the flat surface 78' of the cam surface bears against the end of member 62 pushing the rotating yoke arm 61 about member 60 as a pivot and thus actuating the clutch 58.

At its lower end the rod 73 is connected to the pivot 80 of the aperture control linkage. This linkage mechanism comprises a pair of supports 81, 82, secured to the members 41, 42, and provided with inturned lugs through which pass rocker arms 83, 84, fixed to links 85, 86 and adapted to be moved thereby. At their other ends members 83, 84 pass through supports 87, 88 and are bent downwardly at 89, 90 respectively terminating in eyes 91, 92. Passing through the eyes 91, 92 are yokes 93, 94 secured at their opposite ends to cross arms 95, 96, connected respectively to the aperture members 31, and 30 by means of studs 97, 98.

When the control member or cord 70 is pulled upwardly and one of the locking members 71 engages in slot 72 the arm 73 will be actuated, being raised upwardly and moving the linkage mechanism, just described, thus forcing the members 30, 31 away from each other and forming an aperture therebetween. As intimated previously, the members 71 are adjusted on the member 70 so as to correspond to any desired aperture width to be formed by the members 30 and 31. The spring 75 imparts to the rod 73 a downward tension which tends to operate the closure mechanism in such a manner as to maintain the gates 30, 31 in juxtaposition and thus prevent the egress of material from the hopper 34. When the cam, 77, is raised upwardly the end of member 62 is permitted to move inwardly being urged against the slanting cam surface by spring 58' acting on arm 61. It will be seen that at any position of member 62 in engagement with cam surface 78 the clutch mechanism will be thrown into engagement with the stirrer, 52, causing the latter to rotate when the device is moved, rotation being imparted thereto by wheel 17 acting through sprocket 55 and chain 54.

As the member 52 rotates carrying the spring arms 53 therewith the latter contact with the foraminous bottom 51, causing it to be vibrated, due to the snapping of the arms 53 as they engage and are moved out of contact therewith. As indicated previously the loops or beater arms 53 may be made of any suitable material such as spring wire, of any suitable thickness, and due to the positive snap contact with member 51 they not only serve to stir up the pulverulent material in the hopper 50 but also to force it through the apertures in member 51. Due to the fact that the stirring mechanism is only in operation while the bottom closure of chamber 34 is open, it is impossible for any material to collect in the chamber and become caked therein while the machine is not in use. As the material passes through the chamber 34 it is in a free flowing condition at all times and the width of the material as defined by the distance between the closure members 30 and 31 is substantially uniform and an even deposit is secured, being remarkably free from irregularities.

The width of the aperture can be readily varied to suit, and merely requires adjustment of the members 71 to secure substantial uniformity at any time thereafter. The members 71 may be spaced apart a sufficient distance and be provided in sufficient number to give any desired aperture variation in inches or fractions of an inch, so that the exact width of the line to be deposited may be obtained by merely engaging the proper knob in the notch 72.

It will now be appreciated that there has been provided an improved mechanism for marking lines of various widths which mechanism is particularly adapted for use with pulverulent material such as dry lime, air-slaked or otherwise and which is characterized by a variable aperture which can be controlled by the operator of the machine from the handle without having to calibrate the opening or actuate control mechanisms, and which is characterized further by the fact that the marking material is positively fed through the aperture while the latter is open and the feeding means is rendered inoperative when the aperture is closed.

What is claimed is:

1. A marker comprising a supporting frame, a container mounted on the frame and terminating in a hopper having its outlet near the ground, and a bipartite adjustable closure having a unitary control, said closure being disposed transversely of the hopper outlet and adapted to define an aperture of variable width.

2. A marker comprising a frame having parallel side bars converging at its forward end, a guide wheel rotatably mounted in said forward end and between said converging bars, a rear axle mounted at the other end of

the frame, wheels mounted for rotation on said axle, at least one of the wheels being provided with a sprocket; a container carried by the frame and having a laterally adjustable outlet substantially in alignment with said guide wheel; means for controlling the aperture width of the outlet comprising a pair of abutting closure members, yokes on the said members, linkage members for actuating the closure members; a combined stirrer and vibrator rotatably mounted in the container; a clutch mounted on one end of the stirrer axle; a sprocket mounted for free rotation on the stirrer axle and adapted to be forced into engagement therewith by the clutch; a power transmitting means engaging the several sprockets; a clutch operating linkage mounted on the container; and a common control for the clutch mechanism and aperture closures.

3. In a marker having a controllable bipartite discharge aperture for the marking material and a rotary vibrating mechanism for supplying the said material in free flowing condition to the said aperture, the combination of control means for the stirrer and a variable control for the bipartite means defining the discharge aperture, and a common control mechanism for actuating both the stirrer control and the aperture control.

4. A control mechanism for a marker of the dry lime type having a variable discharge opening and a rotatable stirrer, comprising mutually adjustable closure members for the discharge opening, yokes for the said closure members and an interacting linkage connecting the yokes and adapted to move them in opposite directions, a clutch mechanism for controlling the movement of the rotatable stirrer, and a spring actuated common control mechanism adapted to maintain the closure members normally in the closed position and the stirrer in a non-operating position.

5. A marker of the type described, comprising, in combination, a container for pulverulent marking material, a wheeled support for the container, a guiding handle secured to the container, a discharge hopper at the bottom of the container and separated from the body of the container; an adjustable closure mechanism at the bottom of the discharge hopper comprising a pair of opposed gates, means for normally urging the gates together in the closed position; a stirrer in the container normally in a position of rest; means for actuating the stirrer; and a common actuating means for the gate controlling means and the stirrer actuating means.

In testimony whereof I hereunto affix my signature.

LOUIS MURNAHAN.