March 31, 1953 F. M. NORDONE 2,633,345

HYDRAULICALLY ACTUATED ROOTING MACHINE

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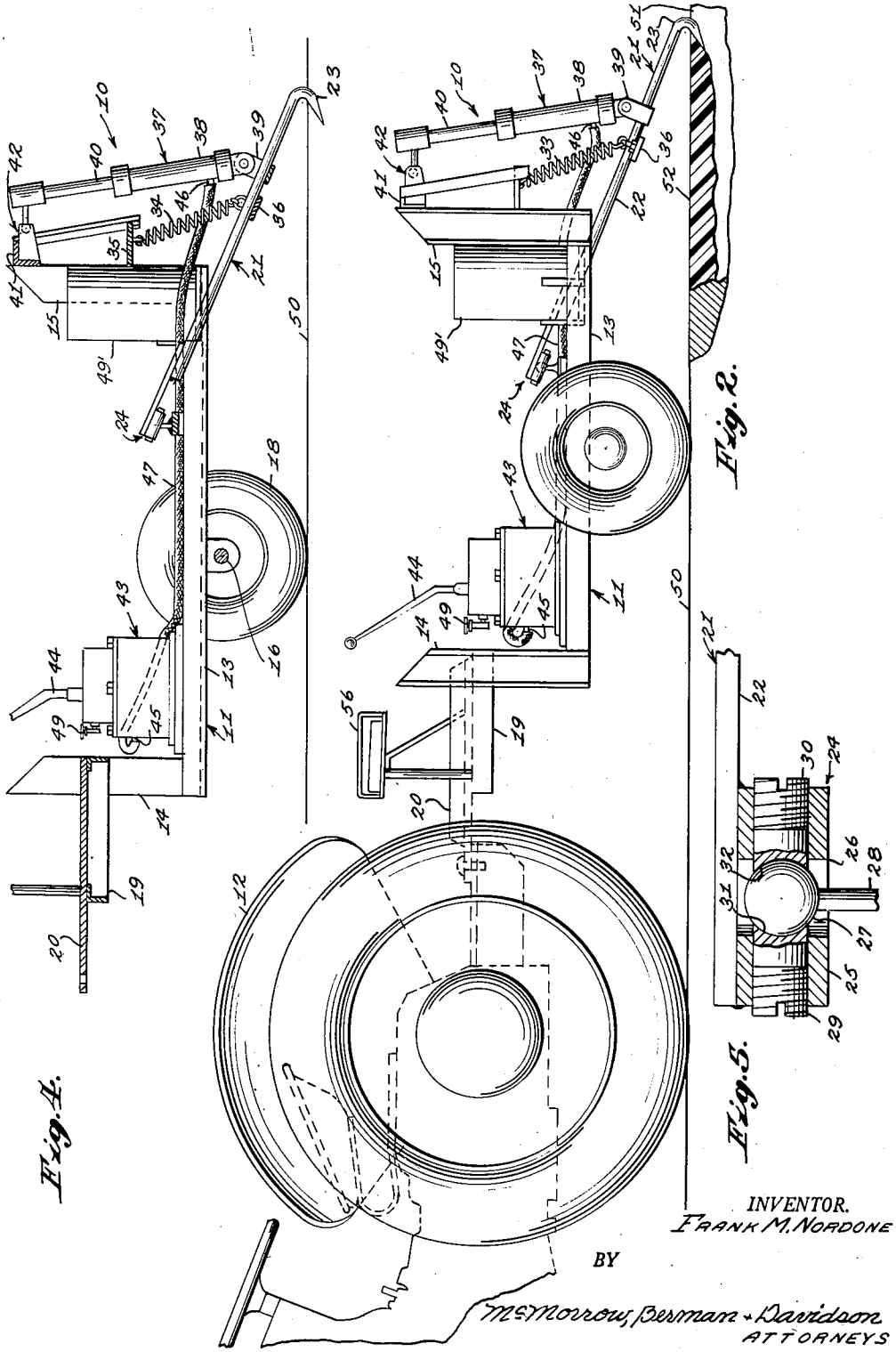


Fig. 4.

Fig. 2.

Fig. 5.

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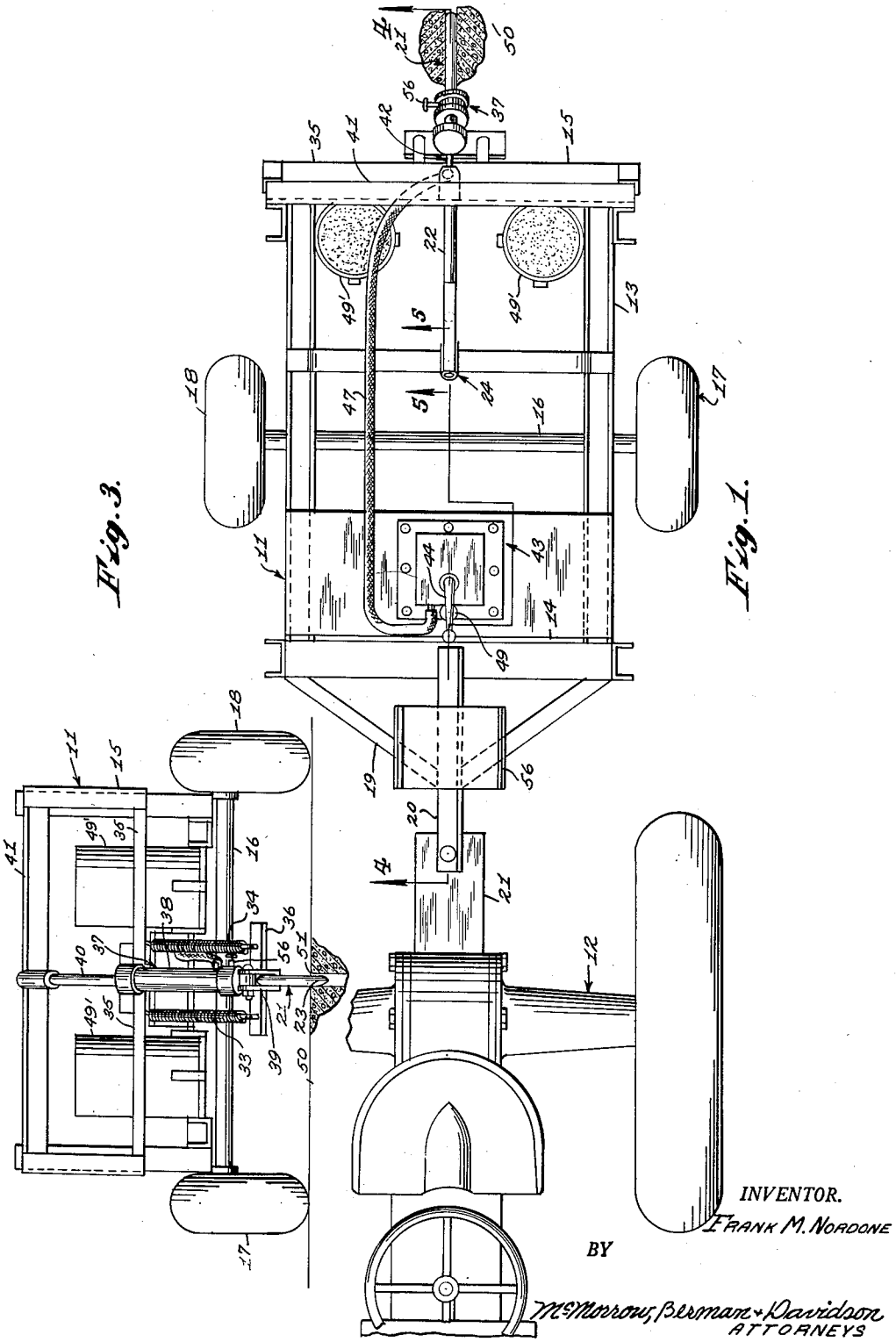


Fig. 3.

Fig. 1.

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HYDRAULICALLY ACTUATED ROOTING MACHINE

Frank M. Nordone, Mount Vernon, N. Y.

Application December 15, 1950, Serial No. 200,926

2 Claims. (Cl. 262—8)

1

This invention relates to road working equipment, and more particularly to a hydraulically actuated rooting machine.

An object of this invention is to provide a rooting machine which is particularly adapted to root out the worn tar or compounds used in the expansion joints of concrete pavements in order to facilitate the weather proofing of the pavements for winter months.

Another object of this invention is to provide a hydraulically actuated rooting machine which can be used in various phases of road maintenance, such as removing ice, scarifying old roads, and rooting out worn tar or compounds from the expansion joints of a concrete pavement.

A further object of this invention is to provide a hydraulically actuated rooting machine including a road engaging tool which can be readily raised and lowered with respect to a road surface.

A still further object of this invention is to provide a hydraulically actuated rooting machine which is relatively simple in structure and cheap to manufacture.

The above and still further objects and advantages of the present invention will become apparent upon consideration of the following detail description of the invention when taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a top plan view of the hydraulically actuated rooting machine of the present invention shown connected to a traction device;

Figure 2 is a side elevational view of the hydraulically actuated rooting machine shown attached to a traction device;

Figure 3 is an end elevational view of the hydraulically actuated rooting machine of the present invention taken from the right of Figure 1;

Figure 4 is a sectional view taken substantially along the line 4—4 of Figure 1; and

Figure 5 is an enlarged fragmentary sectional view taken along the line 5—5 of Figure 1.

Referring now with particularity to the drawings there is shown the rooting machine of the present invention, generally designated by the reference numeral 10 which includes a mobile frame 11 having one end adapted to be connected to a traction device 12.

The mobile frame 11 includes a horizontally disposed base 13 which has upstanding end frames 14, 15 secured to the ends thereof. Disposed transversely of the base 13 intermediate the ends thereof is an axle 16 which is secured to the base 13 and carries ground engaging wheels 17, 18. Projecting forwardly of the upstanding

2

end frame 14 is a horizontally disposed extension frame 19 which includes a forwardly projecting hitch bar 20 for attachment to the rearwardly extending support 21 of the traction device 12.

Disposed longitudinally of and contiguous to the rearward end of the mobile frame 11 is a road engaging tool 21 which includes an elongated shank 22 and a depending turn-back tooth 23. Suitable universal means designated by the reference numeral 24 and illustrated in Figure 5 are carried by the frame 11 and connected to the free end of the shank 22 of the tool 21 for universally mounting the tool on the frame for movement into and out of engagement with the concrete pavement 50 having the expansion joint 51 containing the tar or compound 52 to be rooted therefrom. The universal means 24 includes an open ended sleeve 25 which is secured longitudinally of the shank 22 of the tool 21 and is provided with a transversely extending opening 26 intermediate the ends thereof. Received within the opening 26 of the sleeve 25 is a ball 27 which is supported on the base 13 of the mobile frame 11 by means of an upstanding arm 28. Disposed in confronting relation with respect to each other are a pair of abutments 29, 30 which are threadedly supported within the sleeve 25 for movement longitudinally thereof toward and away from each other. The confronting end faces 31, 32 of the abutments 29, 30 are shaped complementary to the ball 27 and engage the latter for maintaining the ball within the sleeve to form the universal mount.

Operatively connected to the tool 21 are the springs 33, 34 which normally bias the tool out of engagement with the concrete pavement 50. One end of each of the springs 33, 34 is connected to a cross brace 35 carried by the upstanding end frame 15 and the other ends of the springs 33, 34 are connected to an abutment plate 36 which is supported transversely of and beneath the tool 21.

A suitable hydraulic system is operatively connected to the tool 21 and universally mounted on the frame 11 for selectively urging the tool into various positions with respect to the concrete pavement 50. The hydraulic system comprises a jack 37 including a hydraulic cylinder 38 having one end carried by the tool shank 22 by means of the bracket 39. Slidably supported within the hydraulic cylinder 37 is a reciprocable head, not shown, which is movable longitudinally of the cylinder. Arranged longitudinally of the cylinder 38 is a piston 40 which has one end extending into the cylinder and connected to the

reciprocable head and has the other end mounted on a cross brace 41 carried by the upstanding end frame 15 by means of a universal joint 42 of the ball and socket type. The cylinder 38 is provided with a bleeding plug 56 for removing the contents thereof.

Positioned contiguous to the upstanding end frame 14 is a hydraulic pump 43 which is secured to the horizontally disposed base 13 of the mobile frame 11. The hydraulic pump 43 includes an actuating arm 44 and a quick action relief valve 49 and is of the type which can be manually actuated to pump hydraulic fluid therefrom. Connected between the outlet 45 of the pump 43 and the inlet 46 of the hydraulic cylinder 38 is a flexible fluid carrying conduit 47 for carrying hydraulic fluid from the pump 43 to the cylinder 38 of the jack 37 upon movement of the actuating arm 44. Accordingly upon manual actuation of the actuating arm 44 of the pump 43, pressure is built up and the tool 21 can be urged into any position with respect to the pavement 50 against the oppositely directed force of the springs 33, 34. Upon manual actuation of the relief valve, the pressure is released and the tool can be restored to its normal position due to the springs 33, 34.

Carried by the mobile frame 11 contiguous to the rearward end thereof are the weights 49', 49', for maintaining the pneumatic tires of the wheels 17, 18 in contact with the pavement surface against the lifting force of the tool 21.

Supported on the extension frame 19 contiguous to the actuating arm 44 of the pump 43 is a suitable seat 56 permitting the operator to assume a comfortable position while manually manipulating the pump 43.

In actual use the rooting machine of the present invention simplifies and shortens the task of rooting out the worn tar or compound 52 of the expansion joint 51 of concrete roads in order to facilitate the weather proofing of the pavement for the winter months. To operate the rooting machine 10, the tool 21 is lined up over the joint 51 to be cleaned, as illustrated in Figures 2 and 3, whereupon the tool is jacked down to the required cutting depth by means of the jack 37 of the hydraulic system. Upon movement of the mobile frame 11 in response to the movement of the traction device 12, the tooth 23 of the tool 21 effectively removes the worn tar 52, and when necessary, it removes the chipped concrete along the joints. Due to the universal mounting of the tool the device can be used in other phases of road maintenance such as removing ice and scarifying old roads. Furthermore, when rooting out a joint 51 the universal mounting permits the tool to be maintained within the expansion joint 51 even when the machine is inadvertently or intentionally brought out of line with the joint being cleaned.

Although the embodiment illustrated includes only one rooting tool 21 it is readily apparent that the number of rooting tools can be increased in accordance with the type of road maintenance.

Although only one embodiment of the present

invention has been described, it is readily apparent that numerous modifications can be made without departing from the spirit of the invention as set forth in the appended claims.

What I claim is:

1. A rooting machine for road maintenance comprising a mobile frame adapted to traverse a road and having one end adapted to be connected to a traction device, a road engaging tool disposed contiguous to the other end of said frame, universal means carried by said frame and connected to said tool for mounting the latter for movement into and out of engagement with said road, spring means operatively connected to said tool for normally biasing the latter out of engagement with said road, hydraulically actuated means operatively connected to said tool and universally connected to said frame for selectively urging said tool into various positions with respect to said road, said universal means comprising an open ended sleeve provided with a transversely extending opening intermediate the ends thereof and secured to said tool, a ball received within the opening of said sleeve and supported on said frame, a pair of abutments disposed in confronting relation with respect to each other and supported within said sleeve for movement longitudinally thereof, the confronting end faces of said abutments being shaped complementary to said ball and engaging the latter.

2. A rooting machine for road maintenance comprising a mobile frame adapted to traverse a road and having one end adapted to be connected to a traction device, a road engaging tool disposed contiguous to the other end of said frame, universal means carried by said frame and connected to said tool for mounting the latter for movement into and out of engagement with said road, spring means operatively connected to said tool for normally biasing the latter out of engagement with said road, hydraulically actuated means operatively connected to said tool and universally connected to said frame for selectively urging said tool into various positions with respect to said road, said universal means comprising an open ended sleeve secured to said tool, socket forming means positioned in said sleeve intermediate the ends thereof and movable longitudinally of said sleeve, and a ball supported on said frame received within said socket means.

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