Jan. 23, 1951 F. B. VAN HORN 2,539,288

SPRAYING APPARATUS WITH ADJUSTABLE BOOMS

Filed May 27, 1947 3 Sheets-Sheet 1

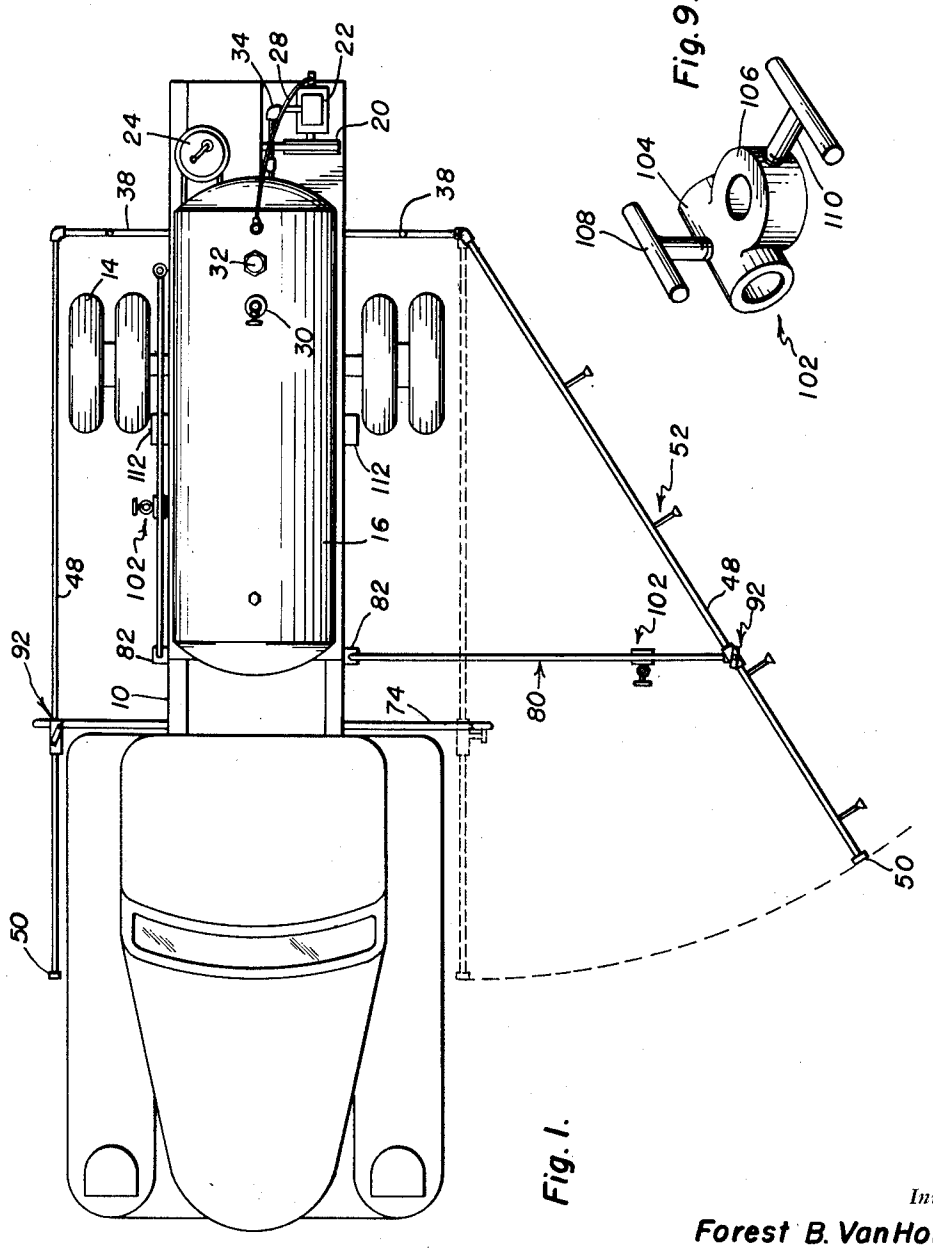


Fig. 1.

Fig. 9.




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SPRAYING APPARATUS WITH ADJUSTABLE BOOMS

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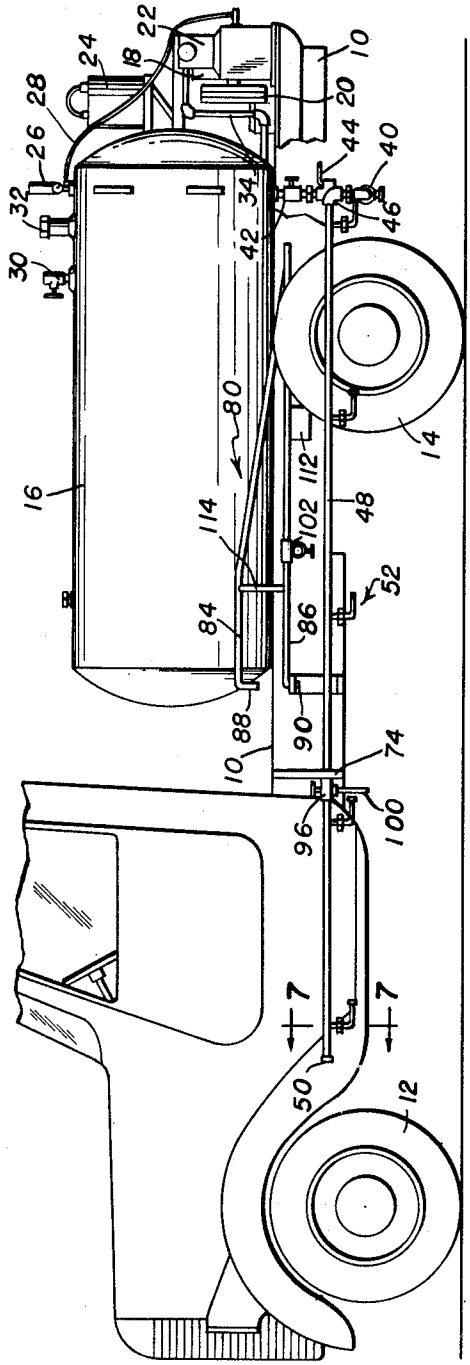

Fig. 2.

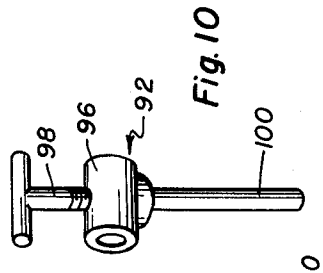

Fig. 10

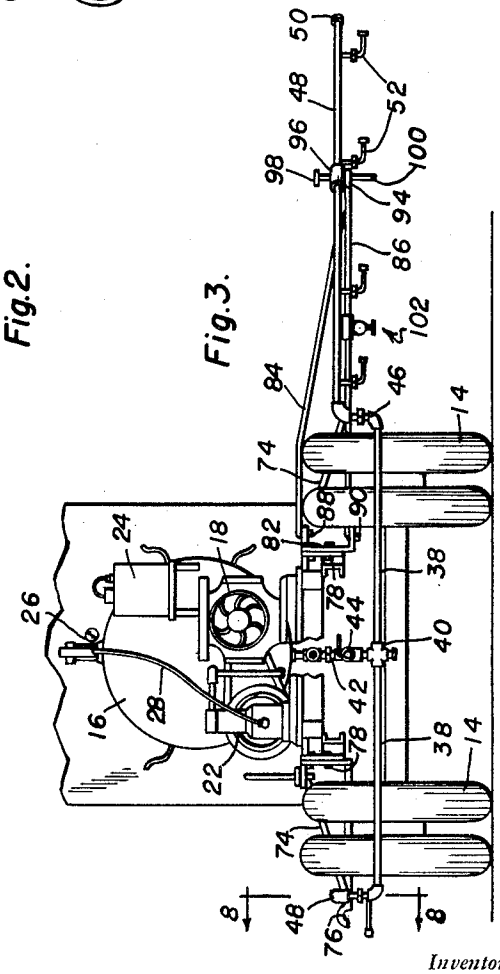

Fig. 3.

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SPRAYING APPARATUS WITH ADJUSTABLE BOOMS

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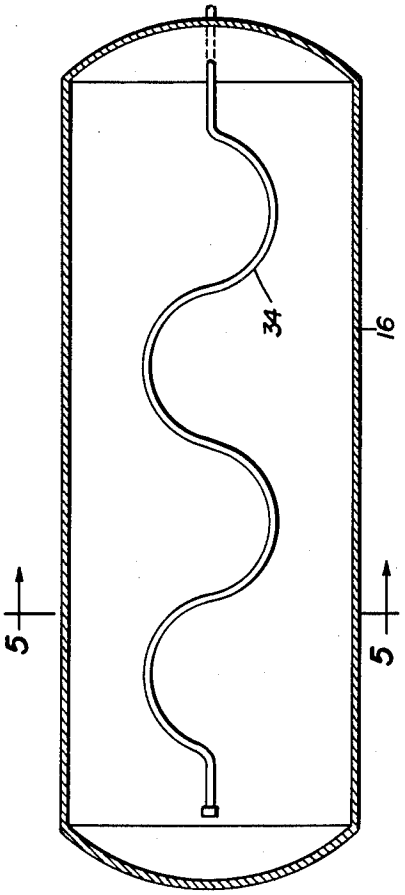


Fig. 4.

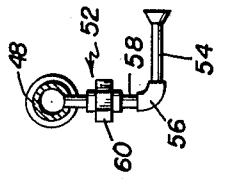


Fig. 7.

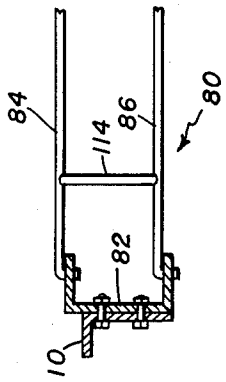


Fig. 6.

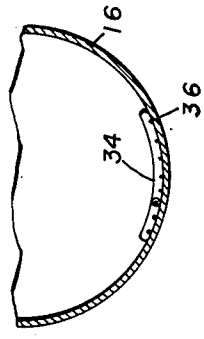


Fig. 5.

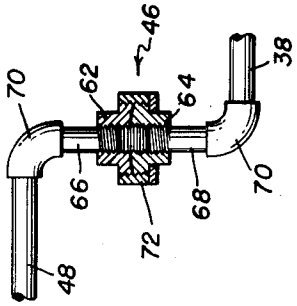


Fig. 8.

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Patented Jan. 23, 1951

2,539,288

# UNITED STATES PATENT OFFICE

2,539,288

## SPRAYING APPARATUS WITH ADJUSTABLE BOOMS

Forest B. Van Horn, Stockton, Kans.

Application May 27, 1947, Serial No. 750,677

2 Claims. (Cl. 299—40)

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This invention relates to ambulant spraying apparatus, and more particularly to ambulant pressure spraying machines comprising a tractor with a pressure tank and an air compressor thereon, together with novel means for agitating fluid to be sprayed and other novel means for adjustably supporting the distributor pipes.

It is well understood that machines of the same general type as this invention have been invented and used and a patent covering the construction of such machines generally is not sought, but what is sought to be protected includes the improved means for agitating the fluid to be sprayed and the improved means for adjustably supporting the fluid distributor pipes, that is, the portions of the pipes extending outwardly beyond joints therein adjacent the sides of the tractor.

The primary object of this invention is, therefore, to improve the general efficiency of such spraying apparatus by better insuring the homogenity of the liquid within the tank and to make the distributor pipes more readily adjustable and generally more convenient and more efficient in use.

Another salient object of this invention is to provide means which will positively hold the distributor pipes against sagging and undue vibration while the sprayer is being used.

Still another object of this invention is to provide an ambulant sprayer in which the distributor pipes may be folded against the sides of the tractor, without any considerable labor when the sprayer is to be moved as along a highway or from one field to another.

Still another object of this invention is to provide a sprayer which is ideally suited for a variety of uses including the broadcast spraying of fields, as well as the spraying of roads and row crops, and this sprayer is, of course, not limited to use with sprays in which water is the chief component by volume, the sprayer being equally well adapted for use with various types of oil and other emulsified sprays.

And a last object to be specifically mentioned is to provide an ambulant sprayer of this general character which is relatively inexpensive and practicable to manufacture, extremely simple and convenient to adjust and use having particular reference to the angular adjustability of the nozzles on the distributor pipes, and which is generally efficient and durable in service.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of parts

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and portions as will be hereinafter described in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a top plan view of the assembled sprayer, the distributor pipe on the right hand side of the sprayer being folded adjacent the side of the truck, and the distributor pipe on the left hand side of the sprayer being secured to the hook fastening means on the outer end of what is hereinafter referred to as one of the braces used to support the distributor pipes;

Figure 2 is a side elevational view of the ambulant sprayer with the distributor pipe on the left hand side of the sprayer folded adjacent to the side of the tractor, the brace concerned also being folded inwardly;

Figure 3 is a rear end elevational view of this invention, with the left hand distributor pipe swung inwardly to the side of the tractor and the right hand distributor pipe extended fully;

Figure 4 is a horizontal longitudinal sectional view of the tank, showing the sinuous air delivery pipe which is disposed on the bottom of the tank;

Figure 5 is a transverse vertical sectional view of the structure shown in Figure 4;

Figure 6 is a fragmentary detail sectional view of the inner end of a brace and the supporting structure therefor;

Figure 7 is an enlarged detail elevational view of one of the adjustable nozzles on the distributor pipe, which pipe is shown in transverse vertical section;

Figure 8 is an enlarged vertical sectional view of the joint structure provided in each of the fluid distributor pipes;

Figure 9 is an enlarged detail perspective view of the fastening means which is slidably adjustably mounted on each of the said braces; and,

Figure 10 is an enlarged detail perspective view of the fastening means which are slidably mounted on each of the distributor pipes intermediate the ends thereof.

Throughout the specification and claims, the term "tractor" is used generically to include motorized or drawn vehicles of the general nature of trucks, trailers and a combination of a truck and a trailer.

Similar characters of reference designate similar or identical parts and portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, the structure wherewith this invention is adapted

to be used in combination includes a truck having a frame 10, front wheels 12, rear drive wheels 14 and a normal truck complement. Obviously the type of truck and the mode of propelling the same is not material in this application. The arrangement of the pressure tank 16 and the frame 10 will be a matter of mechanical expediency and individual preferment, the drawings illustrating an elongated cylindrical tank longitudinally disposed on the frame 10 of the tractor and the frame of the tractor is extended rearwardly of the tank to provide support for a power plant 18 which will ordinarily comprise a gasoline motor and belt pulleys and belt 20 whereby an air compressor 22 is operatively connected with the power plant 18. The drawings also represent a fuel tank 24, a pressure gauge 26 and a line leading from the pressure gauge to the compressor, indicated at 28, together with a pressure release valve 30 and a filling vent 32. It will be understood that no claim towards novelty in the elements immediately above recited is made and that the same are included in the drawings in order to represent a completed assembly which may be used to implement this invention.

An air delivery pipe 34 leads from the compressor 22 through the adjacent end of the tank 16 and extends along the base of the tank throughout a major portion of the length of the tank. This air delivery pipe is sinuous and conforms with the shape of the interior of a tank, as is illustrated in Figures 4 and 5. A plurality of spaced outlets 36 are provided in the lower one-third of this air delivery pipe and these outlets are disposed so that the air emitted under pressure therefrom constantly stirs the material within the tank in order to maintain this material in homogeneous condition. This structure has been found to be very effective and completely satisfactory even when the liquid within the tank is heavily burdened with chemicals of only slightly soluble character. It should be carefully noted that the convolutions and the outlets referred to above coact in directing the emission of air in a large plurality of directions along the bottom of the tank, setting up more effective currents in the fluid contained in the tank than the substantially unidirectional currents set up by agitator devices now employed.

A pair of similar liquid distributor pipes 38 are connected by means of a T-coupling 40 and a vertical pipe 42 having a control valve 44 therein, to the tank 16. These distributor pipes 38 extend transversely of the truck and are provided with joints 46 connecting outwardly extending portions of the pipes, represented at 48. These extending portions 48 are capped as at 50 and are provided with a plurality of regularly spaced nozzle assemblies 52. It should be carefully noted that the outlet pipe portions of each of these nozzles 52 is rotatably adjustable. The preferred construction for the nozzles 52 is illustrated in Figure 7 wherein it will be noted at the outlet pipe portions 54 are provided with elbows 56 connected to vertically disposed short pipes 58 which are rotatably mounted within a packed gland assembly 60. This adjustability of the nozzles 52 is used to adapt the sprayer for use in spraying row crops, broadcast spraying, and the like. Since each of the nozzles 52 may be independently adjusted the concentration of fluid may be directed to two or more rows when this device is used in connection with the angular adjustment of the elongated portion 48 of the pivot joint 46, the detail of construction of which joint 46 is shown in Figure 8 and comprises a conventional type union in which the parts 62 and 64 are threadedly secured on the end portions of pipes 66 and 68 which are connected by means of elbows 70 to the pipe portions 48 and 38 respectively, the union including an internally collared and threaded locking sleeve 72 which is secured to the parts 62 and 64 to retain the same in abutting relation.



The pipe portion 48 is supported at the forward end thereof by a bracket 74, when this pipe portion is folded or swung inwardly close to the side of the tractor. The bracket 74 is formed with a curved terminal portion 76 which functions as a hook to retain the pipe portion 48 thereon, the bracket being pivotally secured to the frame 10 of the tractor, as at 78, in Figure 3. When the pipe portion 48 is extended outwardly from the truck body, the same is supported by what is herein referred to as braces 80, there being a brace 80 on each side of the truck to support the two distributor pipes. Each of these braces is pivotally secured to brackets 82 secured to the side of the truck frame, each brace comprising an upper bar 84 and a lower bar 86 which are both provided with terminal depending pivot pin portions 88 and 90. When both the pivot pin portions are secured in the bracket 82 and the brace swung outwardly to the position illustrated in Figure 1, the pipe portion 48 is secured terminally to the brace 80 by means of the clamp illustrated in Figure 10 and generally indicated by the numeral 92 which coacts with a simple loop 94 on the end of the brace 80. The clamp 92 comprises a sleeve 96 which is fitted over an intermediate portion of the pipe 48 together with a clamping screw 98 and a depending pin portion 100. It will be understood that the pin 100 pivots freely within the loop portions 94 of the brace 80 and that the sleeve 96 is adjustable along the pipe 48 within limits determined by the positioning of the adjacent nozzles 52.

An alternative method of attaching the pipe 48 to the brace 80 is provided with a second clamp unit 102. This clamp 102 is detailed in Figure 9 and will be seen to comprise a sleeve portion 104, a transversely disposed bored portion 106 and two screws clamping units 108 and 110. It will be of course clear that the sleeve portion 104 is longitudinally slidably mounted on the brace 80 and securable thereon at any predetermined position by tightening the member 108, while the pin 100 is insertable into the bored portion 106. The above described construction will be seen to allow for wide variations of the angular disposition of the pipes 48. The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, taken in connection with the above recitation of the objects sought to be achieved by this invention and it will now be clear how the sinuous air delivery pipe 34 is combined with this invention to secure proper agitation of the fluid within the tank, and how the distributor pipes are widely adjustably mounted by the novel construction of the braces 80 together with the clamps 52 and 102.

It should be noted that the braces 80 are folded along the sides of the truck when not in use and that the depending pin portions 88 and 90 of the braces are removed from the brackets 82 and the pin portion 90 is inserted into the upper end portion of the bracket 82, as illustrated in Figure 2. The rear ends of the braces 80 are supported, when in this position, on transversely disposed

bracket members 112 provided on the sides of the frame of the truck. It will be understood that the braces 80 are rigidly constructed and that cross braces 114 may be used to rigidly connect the upper and lower bar portions 84 and 86 to increase the rigidity of this construction. When the braces 80 are stored in the position indicated in Figure 2, the pipe portion 48 will also be supported on the brackets 74.

Though there has been shown a particular embodiment of this invention, this application is not limited to this particular embodiment, but it is desired to include in the scope of this invention, the construction, combination and arrangement of parts and portions substantially as set forth in the appended claims.

Having described the invention, what is claimed as new is:

1. Pressure spraying apparatus comprising a tractor, a pressure tank with an air compressor on said tractor, distributor pipes leading from said tank, said pipes having joints adjacent the sides of said tractor and outwardly extending horizontally swinging portions, longitudinally adjustable fastening means mounted on said outwardly extending portions, and braces pivotally secured on said tractor for horizontal swinging movement and having means for engagement with said fastening means, whereby the extending portions are adjustably supported laterally of the tractor.

2. Pressure spraying apparatus comprising a tractor, a pressure tank with an air compressor



on said tractor, distributor pipes leading from said tank, said pipes having joints adjacent the sides of said tractor and outwardly extending horizontally swinging portions, longitudinally adjustable fastening means mounted on said extending portions and having pins, and braces pivotally secured on said tractor and having fastening members longitudinally slidably adjustable on said braces and having sockets to receive said pins, whereby the extending portions are adjustably supported laterally of the tractor.

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