Sept. 23, 1924. 1,509,222

G. G. BAYNE

SPRAYING APPARATUS

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FIG 1

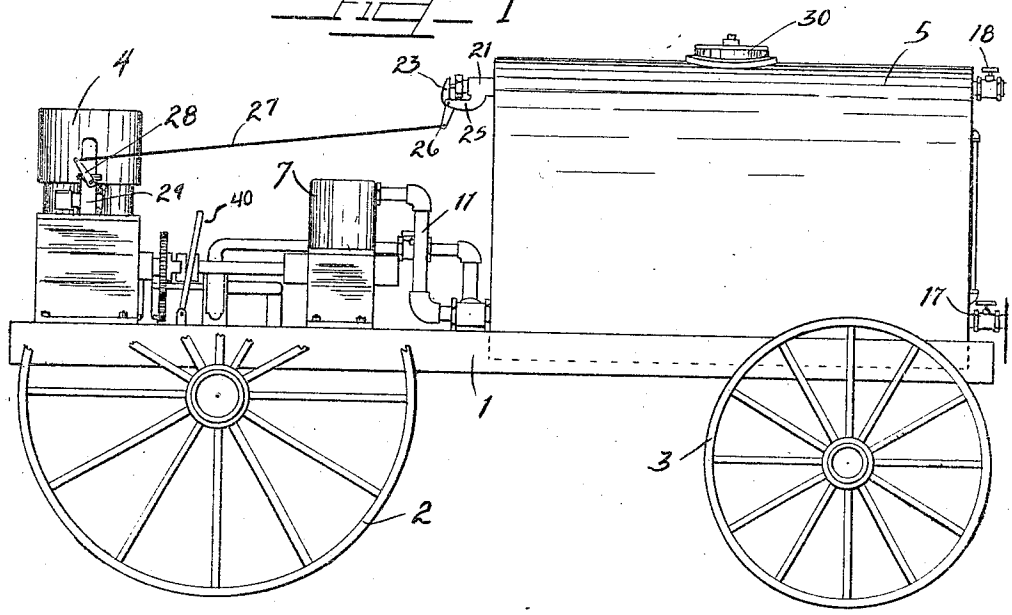
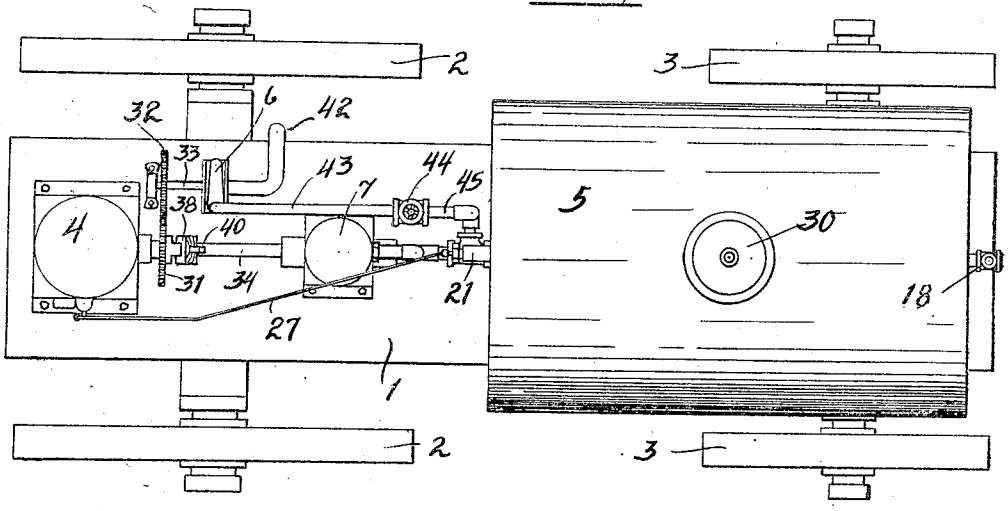


FIG 2



Witnesses

D. L. Ingram

Charles W. Phillips

Inventor

George G. Bayne

By Charles W. Tillis Atty

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Fig. 3

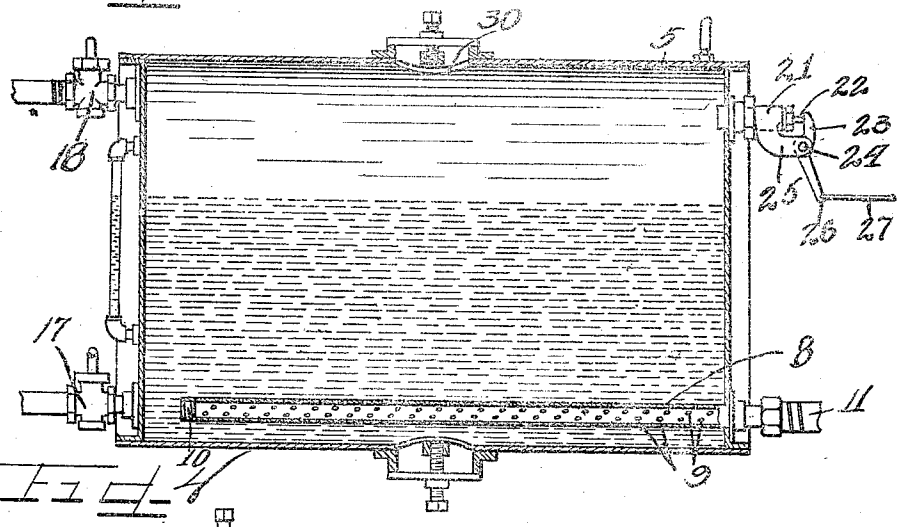


Fig. 4

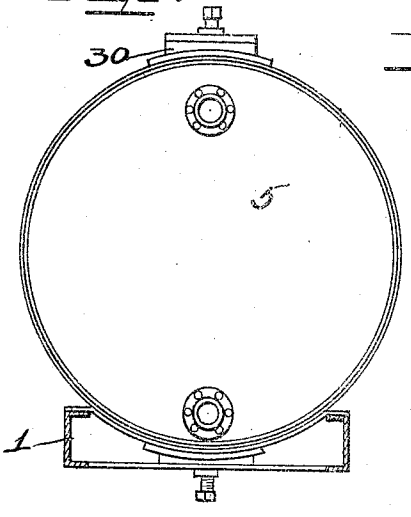


Fig. 6

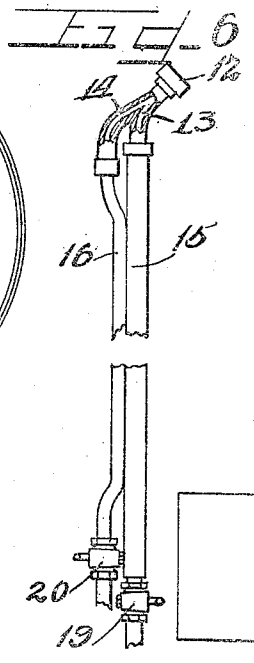
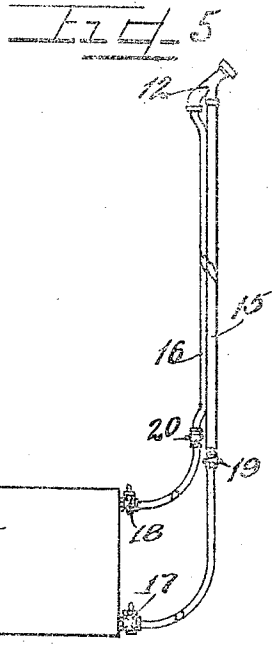


Fig. 5



Witnesses

J. W. Angell

Charles Wells Jr.

Inventor

George G. Bayne

by Charles Wells Atty.

Patented Sept. 23, 1924. 1,509,222

UNITED STATES PATENT OFFICE.

GEORGE G. BAYNE, OF BUSHNELL, ILLINOIS.

SPRAYING APPARATUS.

Application filed February 24, 1920. Serial No. 360,555.

To all whom it may concern:

Be it known that I, GEORGE G. BAYNE, a citizen of the United States, and a resident of the city of Bushnell, in the county of McDonough and State of Illinois, have invented certain new and useful Improvements in a Spraying Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to improvements in spraying apparatus and although not restricted to such use is particularly designed for spraying liquids, containing solids in suspension, such as insecticides.

Hitherto it has been customary to pump the liquid from the bottom of the tank and to force it through a fine orifice to produce a spray. In such cases when the liquid contained solids in suspension mechanical agitators have been employed to keep such material in suspension. The spray produced by such apparatus is not as fine as might be desired and further the use of mechanical agitators complicates the construction very considerably.

My invention is designed to remove these defects.

It is an object therefore of my invention to provide means for more completely atomizing these liquids.

A further object of my invention is to provide pneumatic means for agitating the liquid to keep the solids in suspension.

Another object of my invention is to provide means whereby the air employed for agitating is also used for spraying the liquids.

My invention also has other important objects which will be apparent from the specification and drawings.

The invention in a preferred form is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevation of a tank cart embodying my invention.

Figure 2 is a plan view of the same.

Figure 3 is a longitudinal vertical section through the tank.

Figure 4 is an end view of the tank, taken in the direction of the arrow shown in Figure 3.

Figure 5 is a diagrammatic view of the tank, the spraying nozzle and the connections therebetween.

Figure 6 is a side elevation of the spraying nozzle.

As shown on the drawings:

The tank cart comprises a frame 1, supported by wheels 2 and 3. On the frame 1, is mounted a tank 5, for the reception of the liquid to be sprayed. At the other end of the frame is mounted an internal combustion engine 4 for driving a centrifugal pump 6, by which the tank 5 may be filled, and also for driving an air compressor 7, adapted to force air under pressure into the tank to accomplish first the agitation of the contents of the tank, and secondly the production of a spray of such liquid. The tank 5 is provided with suitable means for introducing air from the air compressor 7 such as a perforated pipe 8 arranged adjacent the bottom of the tank and extending substantially its entire length. In this pipe 8, are formed small holes 9, for the passage of the air while its end is closed by a threaded plug 10. A suitable connection is provided between this pipe and the compressor such as the pipe 11. The air passing through the liquid agitates the latter and thereby keeps the solid matter in suspension. The air then accumulates in the upper part of the tank and creates a pressure on the upper surface of the liquid.

The spraying nozzle 12 is shown more particularly in Figures 5 and 6. In the nozzle are provided passages 13 and 14 therein for the water and air respectively. These two passages 13 and 14 converge at the outer end of the nozzle into a single passage so that a fine atomized mixture of air and liquid issues therefrom. At its rear end, the nozzle is coupled to hose pipes 15 and 16, connected to valves 17 and 18, at the bottom and top respectively of the tank. Controlling valves may also be provided if desired between the nozzle and the valves 17 and 18, as at 19 and 20. When the valves 17, 18, 19 and 20 are open and air is forced into the tank 5, through the pipe 8, air under pressure will pass through the pipe 16, and at the same time the pressure of the air in the tank on the surface of the liquid

therein will force the latter simultaneously through the pipe 15, into the nozzle. It will be seen therefore that air and water pass simultaneously into the nozzle at substantially the same pressure. As the effectiveness of the spraying depends upon the pressure employed means are preferably provided for controlling the pressure in the tank 5, produced by forcing air thereinto by the air compressor 7. This may conveniently be carried out by providing a spring held valve 21 arranged to communicate with the upper part of the tank. This valve is provided with a spindle 22, normally retracted by springs not shown, but adapted to move outwardly as the pressure in the tank rises, to engage a rocker 23, pivotally connected at 24 to an arm or lug 25 on the valve 21. This rocker is conveniently connected to the throttle lever 28 of the carbureter 29 of the engine 4 by means of a link 27 pivotally connected to the rocker 23 at 26. With this arrangement as the pressure in the tank falls the throttle is opened to speed up the engine and as the pressure rises the throttle is closed to check the speed.

Ordinarily the tank is filled by the centrifugal pump 6, which is preferably designed to be able to force liquid into the tank 5 against the customary operating air pressure therein. For this purpose a hose 42 is provided, connected to the inlet side of the pump and adapted to be inserted into a barrel or supply tank containing the liquid to be sprayed. The discharge side of the pump is connected to the tank by pipe 43, valve 44 and pipe 45. In some cases, it may be desirable to fill the tank independently of the pump 6, in which case the manhole 30 may be used.

As it is desirable that the engine be able both to drive the centrifugal pump 6 and the air compressor 7, or to drive the air compressor alone, suitable gear and clutch connections are provided for the pump 6. The gearing comprises gears 31 and 32, the latter gear being rigidly mounted on the pump shaft 33. The gear 31 is loosely mounted on the engine shaft 34, which also acts as the shaft of the air compressor and clutch 38 operated by suitable means, as the lever 40, is splined on the engine shaft for coupling the engine shaft 34 to the gear 31 when it is desired to drive the pump 6.

The operation is as follows:

The tank is filled by inserting the hose 42, connected to the inlet pipe of the centrifugal pump into a barrel or tank containing the material to be sprayed. The engine is then started and the clutch 38 thrown into operation to drive the centrifugal pump 6 and thereby force liquid through pipe 43, valve 44 and pipes 45 into the tank 5. When the latter is filled the clutch 38 is disconnected and the engine allowed to continue driving the air compressor 7. The valves 17 and 18, controlling the connection to the nozzle 12 are closed until the pressure in the tank has reached its desired amount. These valves are then opened and spraying commenced. During the spraying operation, the pressure in the tanks is then automatically controlled by the valve 21 and its connection with the carbureter 29 of the engine.

I am aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

A spraying apparatus including a tank, separate pumps for introducing both air and liquid into the tank, a motor for driving said pumps, a spraying nozzle, connections to the nozzle from the top and bottom of the tank, means for maintaining substantially constant air pressure in the tank, said means including a pressure actuated valve having a connection to the speed governor of the motor whereby as the pressure within the tank increases, the speed of the motor is decreased and vice versa, and clutch and gear connections from the motor to the liquid pump whereby the same may be operated simultaneously with the air pump at will.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

GEORGE G. BAYNE.

Witnesses:
EARL M. HARDINE,
OSCAR HARTMANN.