

A MAINTENANCE-FREE PUMP AND METER FOR INSECTICIDE CONCENTRATE

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The device shown in Figures 1 and 2 is a combination pump and meter with no moving parts except the valves that turn it on and off.

The material is pumped by a difference in atmospheric pressure, and the meter is simply a sight gauge commonly used on steam boilers. The difference in atmospheric pressure is created by the discharge of water from the tank which is located on the roof of the insecticide building. The tank is filled with water by opening the supply valve, and the decrease in atmospheric pressure is created by opening the discharge line after the tank is filled. Once the discharge is opened, it is not closed again until it is necessary to refill the tank with water.

Two check valves on the water tank serve the following purposes:

1. One serves as a vent while the tank is being filled, and automatically closes when the discharge valve is opened.
2. The other prevents the possibility of water going into the suction line while filling the tank.

The operating procedure of the pump and meter is as follows:

1. Determine that suction is in the line by checking the gauge. The gauge should read atmospheric pressure which is approximately 15 lbs/sq inch.
2. Open the suction valve to evacuate the cylinder.
3. Open the appropriate valve to load either dibrom or additive.
 - a. With the $\frac{3}{4}$ " wand, it will load 7.8 gallons of dibrom in 1 minute and 30 seconds.
 - b. With the $1\frac{1}{2}$ " wand, it will load 8 gallons of Ortho additive in 1 minute and ten seconds.

4. After the desired amount of material is measured, the suction line is closed and the vent is opened.
5. The final step is to open the discharge valve and the material feeds by gravity directly into the mixer.

This system is simple to make and install. This prototype was made out of a piece of 10" well pipe with the thought of having one made of stainless steel or fiberglass after determining exactly what was needed.

The pipe was sandblasted and painted inside and out with white epoxy paint, and the fittings were dipped in Bitumastic. Since no corrosion is evident so far, it looks as though it will not be necessary to use stainless steel or fiberglass.

The sight gauge was calibrated by pouring in one quart of diesel fuel at a time, and the board behind the tube was marked accordingly. The diesel fuel was measured in a 32-ounce graduated beaker. It was necessary to enlarge the openings in the brass fittings of the sight gauge to prevent a lag in reading.

ADVANTAGES OF THIS SYSTEM

1. The most important advantage of this system is that it is not necessary to move full containers. Since the source of energy is the atmospheric pressure exerted on the contents of the container, it is possible to use a very long wand. If the oldest material is in the rear, it can be drawn from the container in its present location without having to move the full container.
2. The material is visible in the meter. Therefore, no calculating is necessary. The meter is accurate and there is nothing mechanical to malfunction. Also,

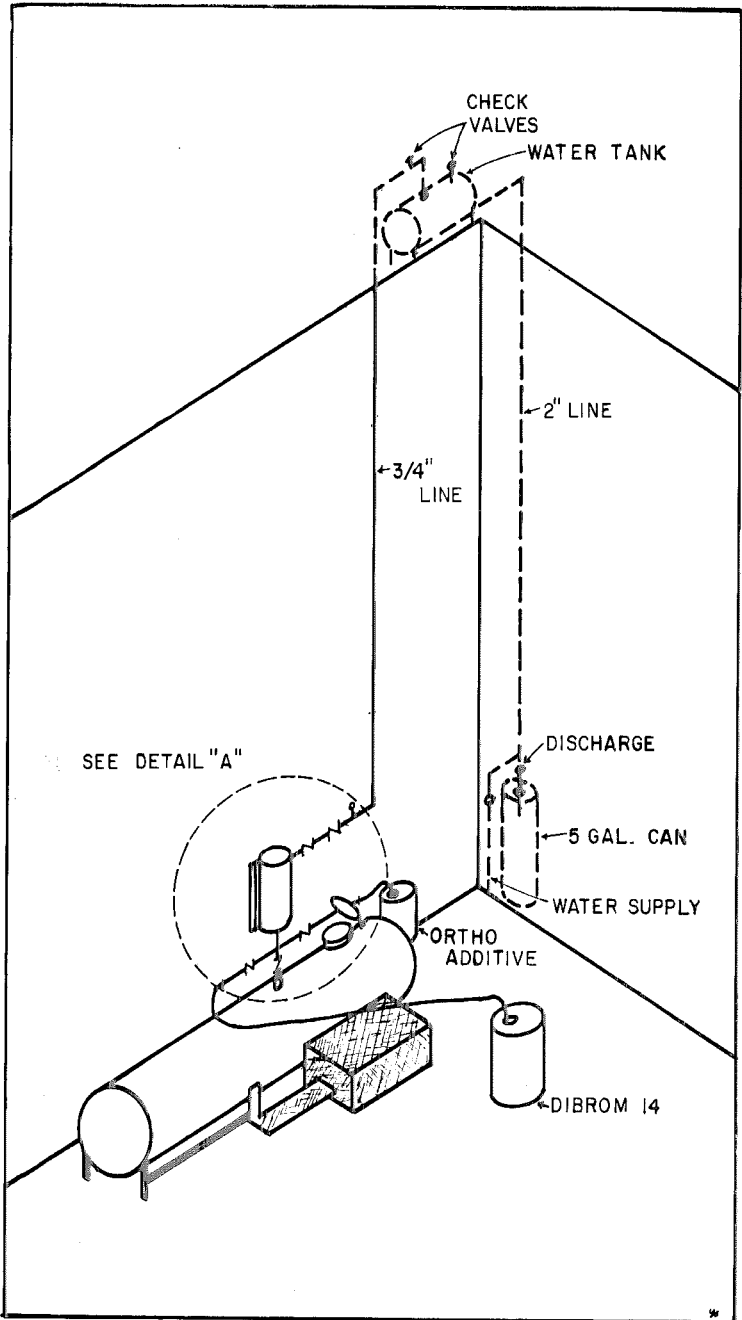


FIG. 1.—Diagram showing installation of pump and meter (Detail "A").

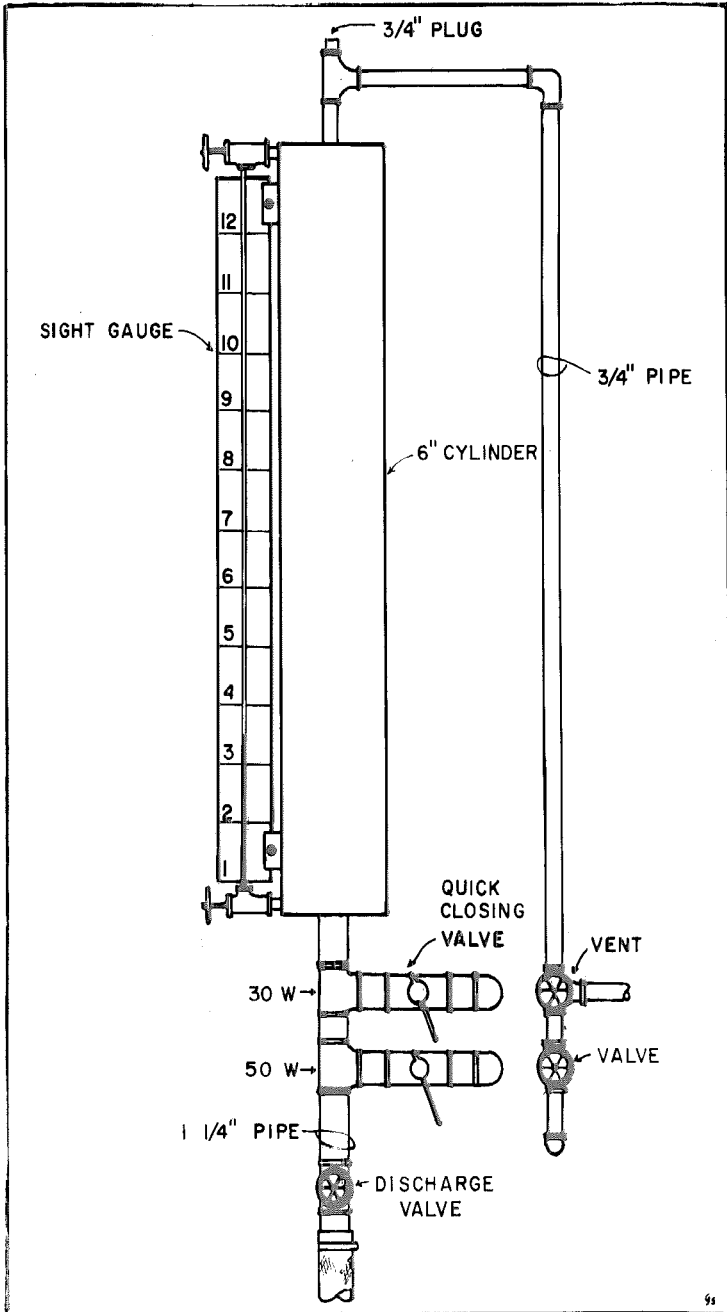


FIG. 2.—Detail "A" from Fig. 1: meter, valves, and connections.

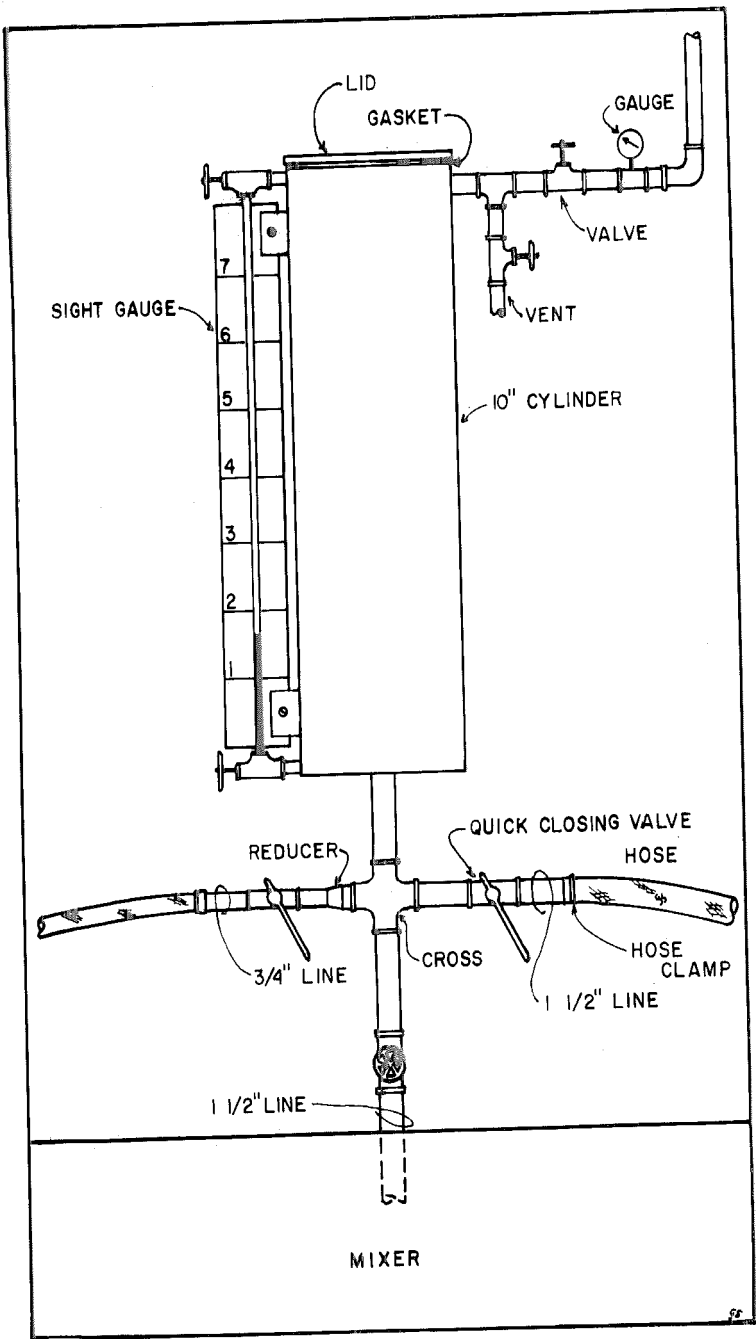


FIG. 3.—Oil measuring device.

the material is never under pressure. There is no way for a line to burst and spray the material on the operator, and of course, it is explosion-proof, because there are no electrical components.

3. This same principle works well for handling bulk motor oil, also. See Figure 3.
4. This system handles a viscous material like Ortho additive very well.