

A Simple Bulk Plant

Designed for Fast Transfer and Safety

By R. STANLEY SMITH

Manager, Smith Precision Products Co., South Pasadena, Calif.

BUTANE-PROPANE News

AUGUST—1947

THE accompanying sketch (Fig. 1) shows a very simple and compact layout for a bulk plant where only loading of tank trucks and unloading from transports is to be handled.

The plant illustrated includes a 100 GPM reversible, direct electric driven pump (A), with a reversing switch (B), for both directions of operation. At least 3" piping (C-C) for liquid flow should be provided from both pump outlets so as to afford the least possible flow resistance to intake from either direction.

A large capacity strainer (D-D) on each outlet protects the pump from the entrance of weld shot, pipe scale, or other foreign matter. Two by-pass valves (E-E) are also

required. Both are connected to discharge into a common vapor return line (F-F). This line should be of ample capacity and may be placed above ground or underground, as shown.

The layout as indicated permits of a rising line from the pump to the tanks as at (G). This has the advantage of allowing any gas formed in the pump to pass back into the tanks. This vapor formation is then being continuously replaced by new liquid from the tank.

Consideration of this item insures that the pump will always be completely filled with solid liquid before it is started. It also provides for natural refrigeration of the pump, since it can never (by sun heat or otherwise) reach a temperature higher than the

temperature of the liquid in the tank, even during long periods of pump inactivity.

This is a most effective method of increasing the delivery rate, and shows a worthwhile time saving for expensive truck and trailer equipment.

In this sketch, a single vapor line (F-F) is shown as serving for both vapor and by-pass return.

Fencing is Safeguard

This layout also incorporates a plan followed in many recent installations, which includes the protection of the yard by complete fencing (H-H), in addition to providing a concrete wall (J-J), to safeguard against mechanical injury to equipment at the point where transports are unloaded and tank trucks are filled. The necessary valves (K-K) and electric motor switch (B) are shown located in a wall recess protected by steel gates (L-L) which may be locked. Hose lines are also made available from this position.

Through the use of Y fittings at the valves, double liquid and vapor hose connections may be used and these are very desirable, permitting both truck and trailer units to be unloaded simultaneously.

Where this combination is made for the sake of simplicity, it is well to insure ample capacity by specifying this line to be 2" pipe size. The vapor connections are shown in the three tanks at (M-M), and in cross section at M'. Internal tubes (N) lead to the vapor space in each tank. This permits passage of vapor in either direction as may be necessary for loading or unloading operations.

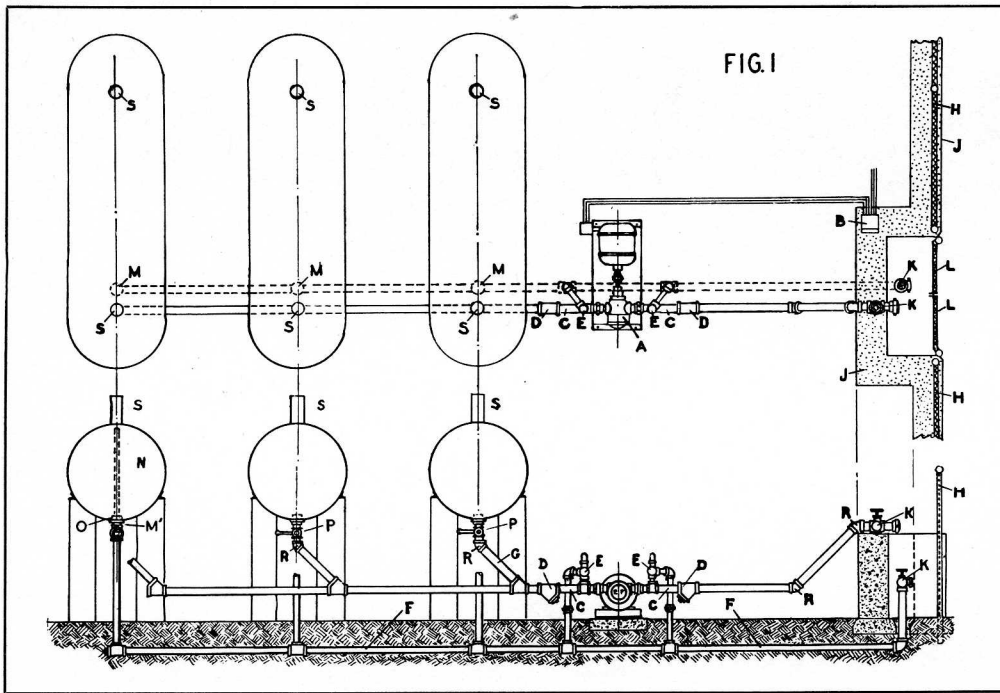
Where fast flow is of paramount importance, plug valves as shown at (P-P) in the liquid line are to be preferred over globe valves. These valves are usually found somewhat difficult to keep tight, but lubrication after each use will do much to remedy this trouble. When globe valves are to be used, a type should be selected having valve passage-ways somewhat conforming in flow area to that of the pipe line. These valves too frequently are seriously restricted and ruin all hope of fast delivery.

How Vapor Forms

In the sketch, 45° ells (R-R) are shown in place of 90° ells. These very materially assist in free flow to the pump. This is important because the pump inlet flow must be effected by gravity alone. Dependence on pump suction to draw these liquids into the pump invariably results in the formation of a large percentage of vapor content in the liquid intake. If your object is fast delivery, watch your intake line capacity.

The by-pass valves (E-E) may be of the simple spring-loaded check valve type, and a by-pass setting of 35-40 pounds has proven very satisfactory for transfer service. A by-pass valve and by-pass lines of 1½" size are entirely adequate for a 100 GPM pump, since the by-pass flow is always under the 35 or 40 pound pressure differential.

It is now considered a most important safety feature that the two pressure relief valves usually applied to each tank, be placed on the top of the tank, so that any emergency discharge will be directed upward. At least short stacks (S-S) are also very desirable for relief valve exhaust. This will permit of firing the discharge should occasion arise, and thereby prevent the possibility of a flare-back from any adjacent flame hazard.



SMITH Precision Products COMPANY

MANUFACTURERS OF

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FOR TANK TRUCK MOUNTING OR DIRECT ELECTRIC DRIVE

1135 MISSION STREET • SOUTH PASADENA, CALIFORNIA