

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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PRESSURE TESTING

CYLINDER CHARGING APPARATUS

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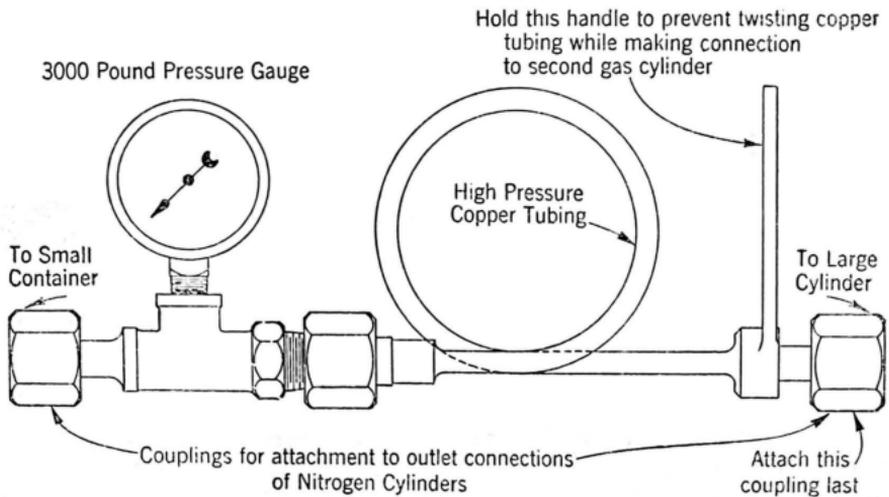
1. GENERAL

1.01 This section describes the apparatus for charging 24-cubic foot containers from 200-cubic foot cylinders in the field and also the method of using the apparatus.

2. CYLINDER CHARGING CONNECTOR

2.01 The cylinder charging connector provides means for charging the 24-cubic foot container from a 200-cubic foot cylinder in the field. It consists of a length of copper tubing equipped with couplings for attachment to the outlet valves of the cylinders, and includes a pressure gauge.

CHARGING CONNECTOR



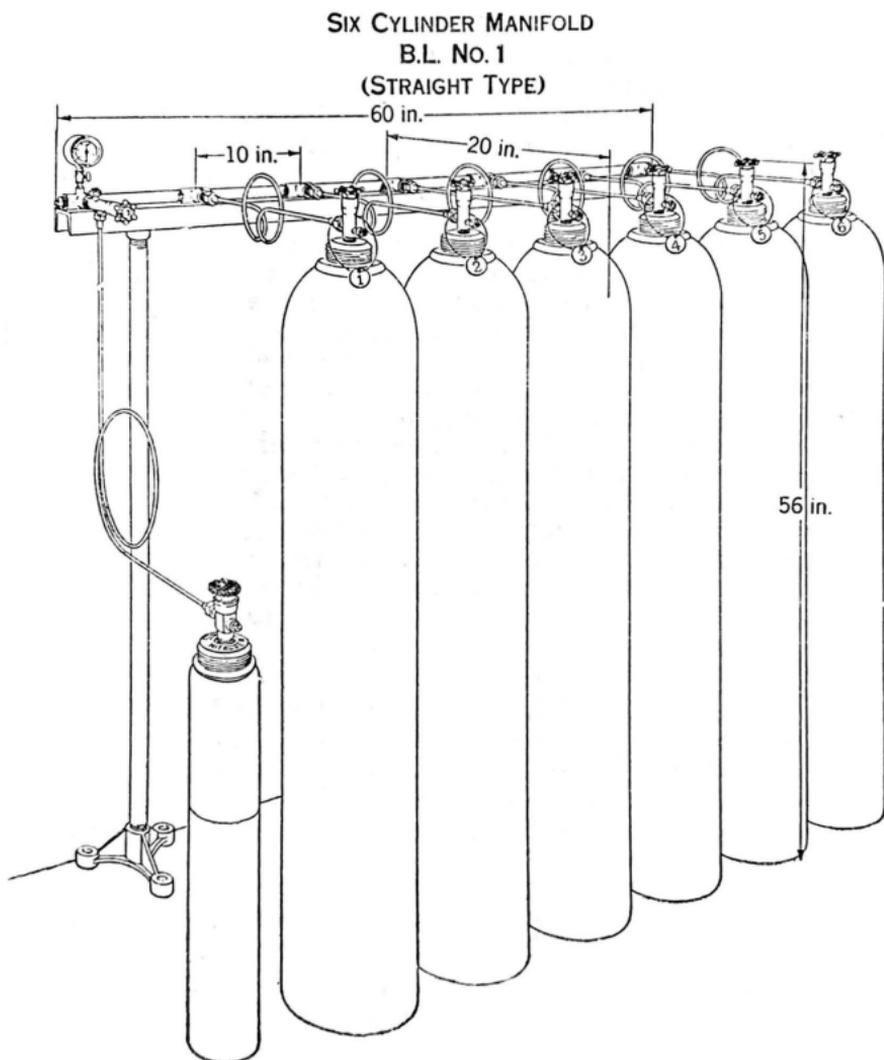
2.02 In charging a small container, both the large cylinder and the container are laid on their sides and the charging connector is attached to the outlet valves. The valves on both cylinders are then opened and the gas pressure allowed to equalize, which will require only a few minutes. When the needle of the gauge becomes stationary pressure in the two cylinders is equalized and the gauge of the connector will indicate the pressure and volume of gas in each of the two cylinders.

2.03 When a fully charged 200-cubic foot cylinder and an empty 24-cubic foot container are connected together and allowed to equalize, the resulting pressure will be about 2,000 pounds per square inch. In charging a second empty container from this cylinder, the pressure will equalize at about 1,800 pounds, and the third, at about 1,650 pounds per square inch. To make most effective use of 200-cubic foot cylinders in charging the 24-cubic foot containers it is necessary to charge by means of a manifold and several cylinders, as outlined in Part 3.

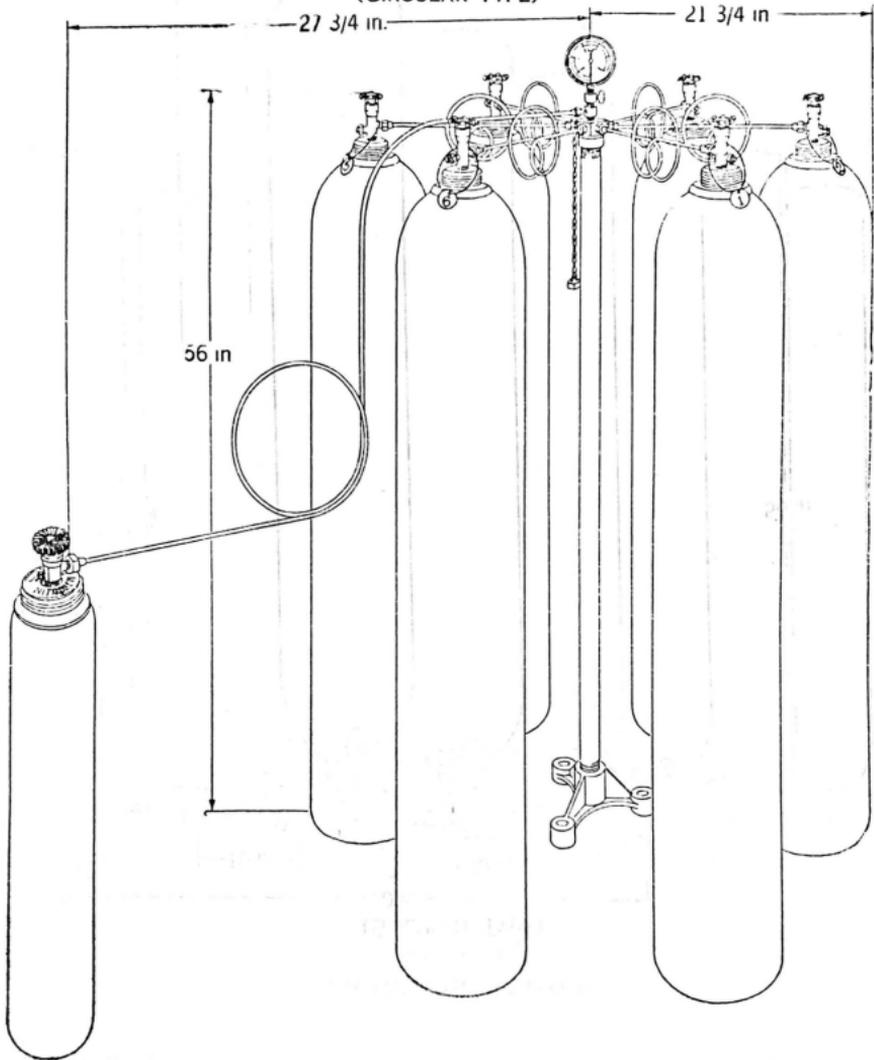
3. MANIFOLDS

3.01 **General:** Manifolds are employed to transfer gas from 200-cubic foot nitrogen cylinders to 24-cubic gas containers and are intended for use at some central point.

3.02 **Description:** There are two types of manifolds, designated as Six Cylinder Nitrogen Manifolds, B. L. No. 1 and B. L. No. 3, respectively. They are illustrated in the following figures.



SIX CYLINDER MANIFOLD
 B.L. NO. 3
 (CIRCULAR TYPE)



3.03 Each type of manifold is equipped with a single 3000-pound pressure gauge and with a plug and chain assembly by means of which any one of the 200-cubic foot cylinder outlets can be plugged if necessary. The B. L. No. 1 manifold is equipped with a shut-off valve at the outlet connection so that the gas in the pipes of the manifold need not be lost when a small container is disconnected from the manifold.

3.04 The B. L. No. 1 manifold can be placed against a wall of a storeroom while the B. L. No. 3 manifold requires a clear space all around it. To allow for mounting the B. L. No. 1 manifold in the corner of a storeroom, the design is such that the pressure gauge, shut-off valve and outlet connection can be mounted at either end of the manifold. Interchange of these end fittings to suit a particular installation can be made locally.

3.05 **Operation:** The operation of either type of manifold is as follows:

(a) Attach six 200-cubic foot cylinders to the manifold. The cylinders should be marked 1 to 6 by means of cable tags attached to wire loops adapted to fit over the valves of the cylinders and rest on the manifold pipes. The tag marked 1 should be placed on the cylinder having the lowest pressure, the tag marked 2 on the cylinder having next to the lowest pressure, and so on.

(b) Attach a 24-cubic foot gas container to the outlet connection of the manifold. Open the valve of the container and the manifold. Then slowly open the valve of cylinder No. 1 and admit gas to the small container until the pressures in the container and cylinder No. 1 are equalized, as indicated by the gauge on the manifold. When this occurs, close the valve of cylinder No. 1 and admit gas to the container from cylinder No. 2 until the pressures are equalized. Repeat these operations, using the cylinders in the order of their numbers, until the pressure in the container is about 1,800 or 1,900 pounds. This corresponds to about 22 cubic feet of gas at atmospheric pressure. When sufficient pressure is obtained in the small container, close the manifold valve and the valve of the small container. Then remove the small container. Other containers are filled by the same procedure always starting with the cylinder having the lowest pressure.

(c) A 200-cubic foot cylinder should be removed from the manifold when the pressure in the cylinder falls to about 100 pounds, since at low pressures the amount of gas transferred is small. When a cylinder is removed because of low pressure, a fully charged cylinder should be substituted for it and the tags shifted so that the cylinder having the lowest pressure is designated No. 1.