staff to administer a regular inspection program for all their pressure vessels Such a program, coupled with good preventive maintenance, prolongs vessel life and prevents accidents

A log of the history of each vessel should be kept by the inspector or the maintenance department Included in it should be blueprints, manufacturer's data report and instructions, design data (including location of dimensional check points), installation information, and records of process changes, all repairs, and conditions found on inspections This log will prove valuable in operating the equipment, and in design, installation, and operation of new equipment

When corrosive, poisonous, or toxic materials are used in the plant, management should so advise the operating personnel and the inspectors When the inspection is carried out by a state, city, or insurance inspector, a plant chemical engineer or other competent person should accompany him on his inspection to describe the processes in detail so the inspector will know what conditions the vessel has been under

When new processes are developed, the inspectors and the operators should be advised in detail what these processes are and how they may affect the pressure vessels

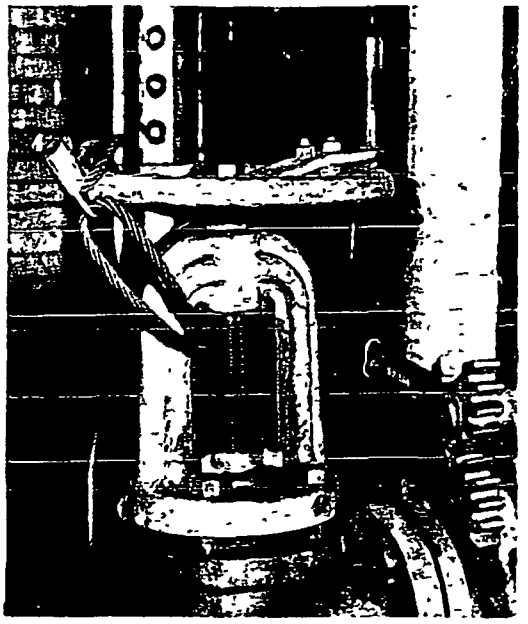

FIG 44-9 —Valves on lines leading to pressure vessels should be locked out when men are inside If contents of the line are very hazardous, the line should be disconnected and blanked off

Entry. A safe tank-entry procedure is absolutely necessary (and sometimes required by law) in order to eliminate the sizable number of fatalities that come from entering dangerous vessels and confined spaces The hazard arises when workmen or inspectors cannot get out of a vessel without help, difficulty in communication compounds the problem

Hazards to those in confined spaces include

1 Exposure to toxic materials already in the confined space or introduced later

2 Lack of sufficient oxygen

3 Heat—a fire might start, hot gases or liquids might enter, or vessels might be heated inadvertently

4 Agitators might be started or the vessel itself might be started revolving

Before being entered, a vessel must be properly prepared It must be drained, ventilated, and cleaned All connecting pipelines should be disconnected and blanked, or valves on the line should be closed, locked out, and tagged (Fig 44-9) All power-driven devices (such as agitators) must be positively disconnected and locked out

When purging a tank, the vent should be led outside to an area where no hazard will be created for persons In some instances, the vessels may be purged with an inert gas such as CO_2 (carbon dioxide) or nitrogen It must be remembered that this inert gas will not support life, so persons entering the vessel must wear air-supplied respirators or self-contained or self-generating breathing equipment

Using forced ventilation for confined spaces is usually safer than requiring men to wear respiratory protection (see Chapter 19, "Personal Protective Equipment") Air should be blown in until tests of the exhaust and of the interior of the enclosed vessel show that the space is safe for entry All areas of the vessel