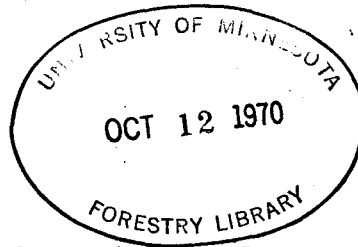


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A SMALL VACUUM TREATING PLANT

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Most wood preservatives are applied in commercial plants involving large investments. These are equipped to apply preservatives under conditions of pressure, temperature and vacuum recognized as necessary to assure long service life of the product. In contrast to the thorough preservative treatment given wood in these commercial plants, many manufacturers of wood products treat by dipping or cold soaking. Such treatment is recognized as providing less protection but generally increases the service life of the product.

There is an evident need to fill the gap between the large commercial treating plant and the dip or cold-soak processes with an operation which will provide relatively good treatment at a lower plant investment. The development of such a plant has been an objective of the School of Forestry since 1947.^{2/} The pilot plant constructed and operated at the School's Cloquet Experimental Forest incorporates the principles of the vacuum process in a relatively inexpensive unit.

A general plan of the plant is shown in the accompanying schematic drawing. The treating tank and cover are of arc-welded 12-gauge steel with interior wood framing. The outside dimensions are 4 ft. x 4 ft. x 18 ft. The tank will accommodate 100 3-inch fence posts or 1,000 board feet of lumber per charge. The cover is sealed to the tank by a sponge rubber gasket attached to the contacting flange. Although limited by engineering considerations, change in design and construction would permit some increase in tank size. The electrically driven vacuum pump and the hoist are the only pieces of mechanical operating equipment. The cost of a plant similar to the installation described should not exceed \$6,000 at 1952 prices.

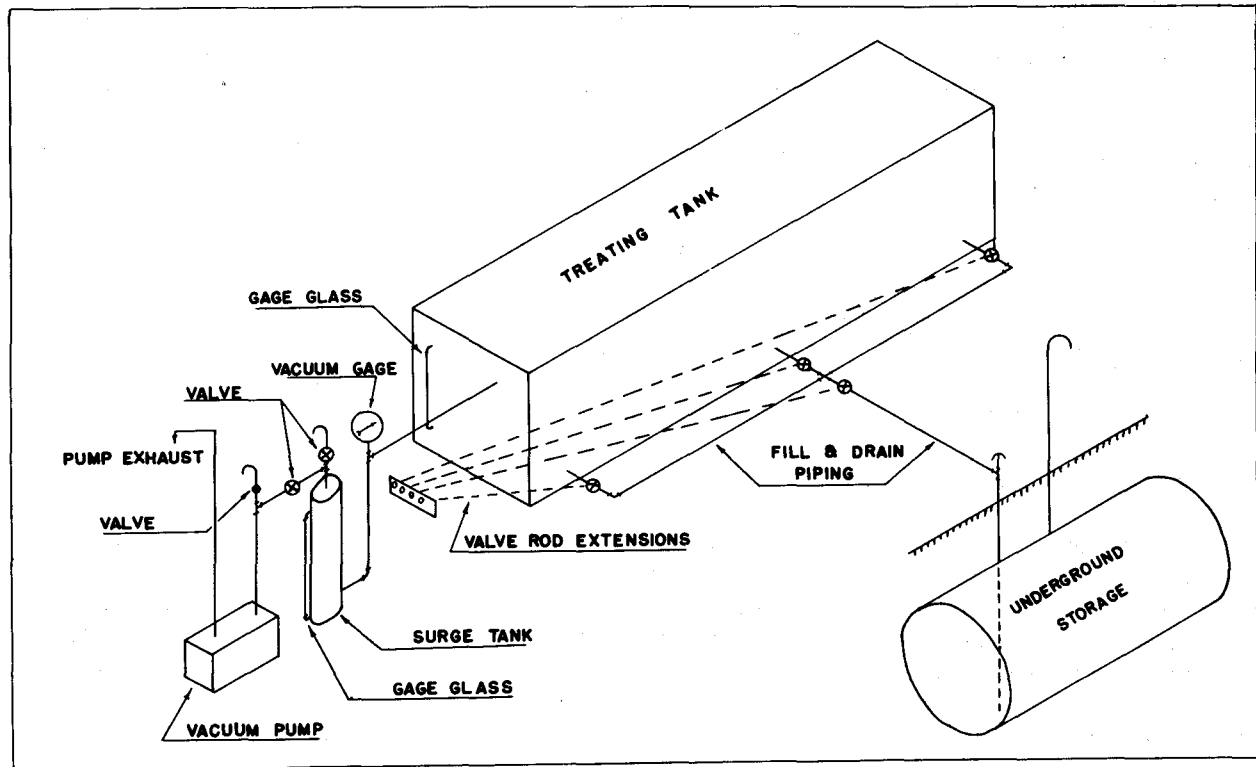
For best results wood to be treated should have a moisture content of not over 25 per cent. Operation of the treating plant is simple. A treating cycle consists of: (1) loading the tank and lowering the cover with an overhead chain hoist; (2) drawing the desired vacuum (up to 25 inches of mercury) and holding it for the period necessary to remove air from the wood; (3) while still maintaining the vacuum, allowing

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 - ^{2/} Design suggestions from many sources, particularly those from Protection Products Company, Kalamazoo, Michigan, are acknowledged.

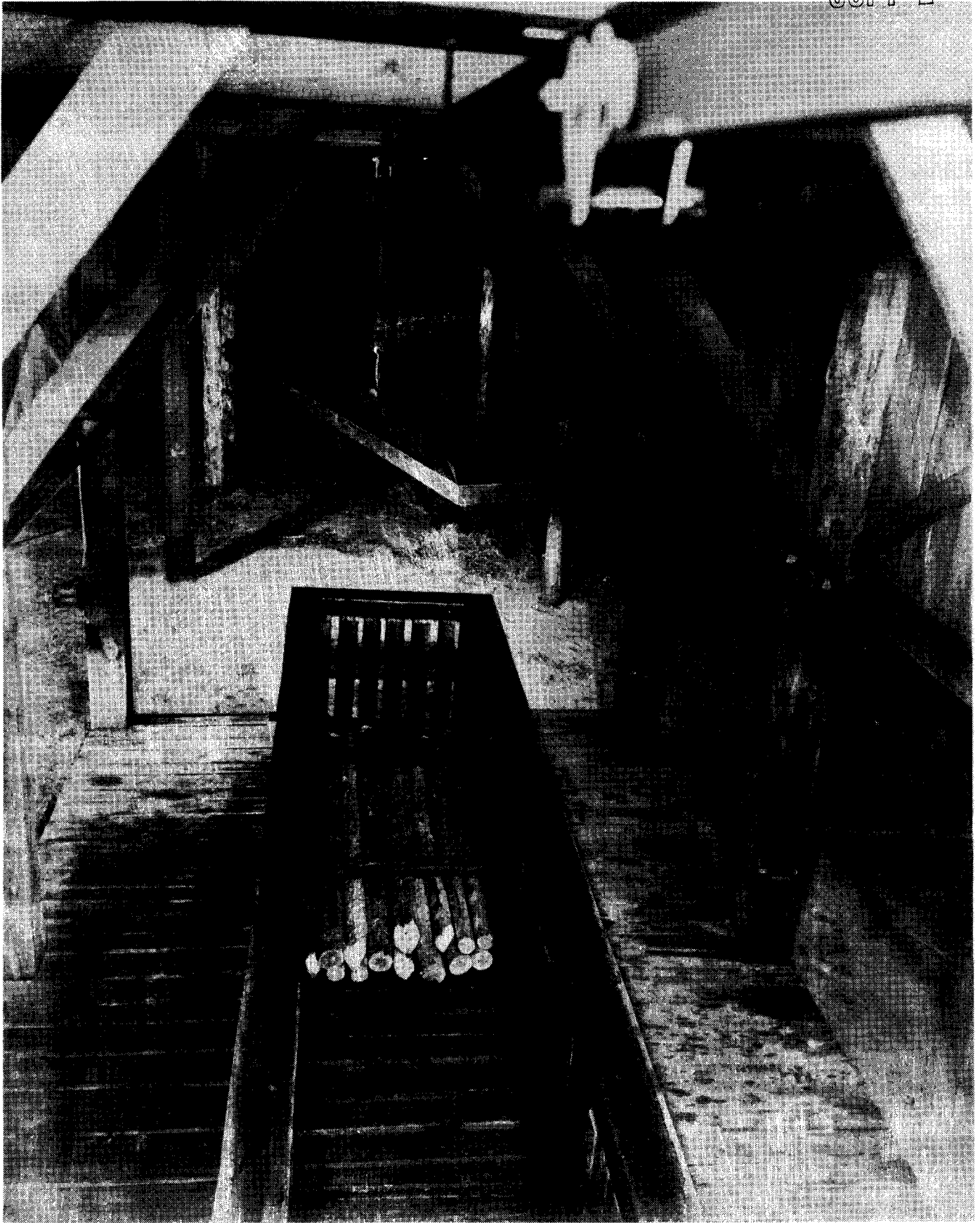
the preservative solution to be drawn into the tank from underground storage tanks; (4) releasing the vacuum and if necessary allowing a soaking period; (5) draining the preservative by gravity back to storage; and (6) drawing a final vacuum to remove excess preservative from the treated material. Full sapwood penetration of dry jack pine fence posts has been obtained using a 5 per cent solution of pentachlorophenol in No. 2 fuel oil and an operating cycle of less than one hour.

A great deal of added experimentation is needed to fully evaluate the potentialities of such a vacuum treating plant, especially in the preservation of woods more difficult to treat, such as tamarack and Douglas fir. However, results obtained to date with pine have far exceeded expectations. Small, low-cost plants of this type should prove of real value in providing preservative treatment for many wood products now used untreated or inadequately treated.

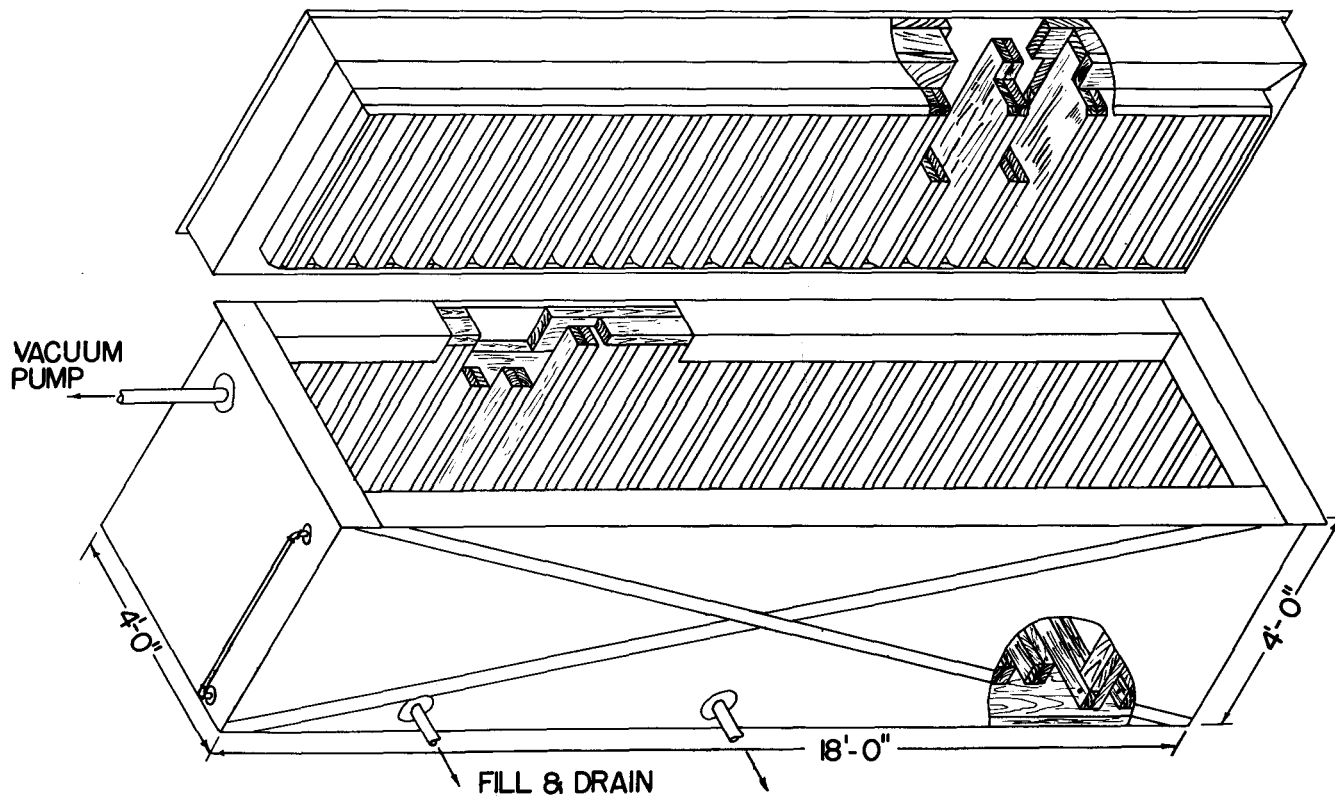
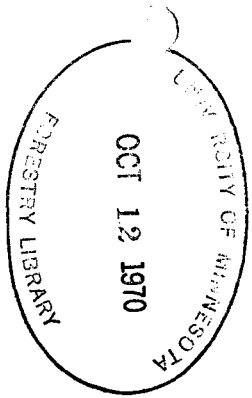
Prints showing the detailed construction of this plant can be obtained from the School of Forestry.



Diagrammatic Sketch of Treating Plant.



Vacuum Treating Plant in Operation



Pictorial Drawing of Treating Tank and Cover Showing Construction Details