lamps a synchroscope is mounted on top of the switchboard which enables the paralleling of the two machines more accurately than by the older method. Provision has been made for future extensions which are to include a Tirrell regulator and three feeder panels, as well as an additional generator panel similar to those already installed.

To facilitate the erection of the plants and repairs when necessary, a 10-ton travelling crane supplied by the Böving Company of Canada, was installed. The span is 56 ft. 5 in. from centre to centre of long traverse wheels. The bridge consists of two 24-inch Bethlehem steel I-beams fastened to channel iron and carriages on which are mounted the necessary steel spur pinions working in spur wheels which are cast in one piece with the travel wheels. All the gears are machine cut. The hoisting gear consists of a standard 10-ton trolley hoist with 2-speed worm gear and is operated by means of chain and cast sprocket wheel. The cross-travel is overated by means of chain and cast sprocket-wheel operating through machine-cut spur gearing to the trolley. The total weight of the crane is about 14,000 lbs. and is hand-operated throughout.

A Spencer boiler is installed in the basement of the office and store portion of the building for heating the entire building by steam and provision has been made for approximately 30 tons storage space for pea coal. The steam mains are run overhead with branches dropping therefrom to each radiator mounted on the floor. The wet returns from each radiator enter one return pipe which is run under the engine room floor back to the boiler in the basement. The fuel oil delivery pipes, from the motor-driven oil pump to the head tanks in the engine room, are run in the same trench as the wet return steam pipe, in order to take advantage of preheating the fuel oil before being used in the engine.

The total cost of the power house, 500-b.h.p. combined unit, cooling reservoir, fuel oil storage tanks and all accessories, has been approximately $90,800.

STEEL JOINTS BY A NEW METHOD.

A new material called "amalgaline" has been introduced in England for making joints between lead surfaces, and it is said to have been widely adopted by shipbuilders in Scotland and the north of England, as it is useful in flanging and the seaming of lead used in lining refrigerating chambers. The system is not confined to use on small pipes, but is used in an ordinary way on pipes varying in bore from 3 inches to 9 inches. It is an autogenous process, but instead of using an intense local heat the fusion is effected by the action of the amalgaline on the surfaces to be welded, forming an amalgamation between the lead of the flange and the lead pipe. The material is in the form of a metallic ribbon 0.002 inch thick, practically a pure metal, which, when placed between the surfaces of lead and subjected to heat, fuses at a temperature of 160 degrees—lower than the actual fusing point of lead—and in fusing it causes the lead surfaces to run together at a lower melting point than that of the body of the lead. This running together has an autogenous effect, and the minute particles of amalgaline are dissipated into the body of the lead, which, by reason of the absorption, becomes stronger at the junction than elsewhere.

The consulting civil engineering firm of Hazen and Whipple, New York City, announces a change of name to Hazen, Whipple and Fuller.

SEWAGE PURIFICATION AT THE EXPERIMENTAL STATION OF THE ONTARIO BOARD OF PUBLIC HEALTH.

THE recently issued annual report of the Ontario Board of Health has associated with it Bulletin No. 2 of the Board's experimental station. This bulletin gives the results of investigations relating to the disinfection of sewage, the behavior of mechanical filters (with special reference to operation and bacterial removal) and contains a summary of the results relating to the purification of sewage. The bulletin is transmitted by F. A. Dallyn, C.E., provincial sanitary engineer. It contains much interesting and useful information. We wish to refer particularly, however, to the results obtained in connection with the biologic disposal of sewage, examinations to determine which have been carried on since 1911. These results are presented by A. V. DeLaporte, B.A.Sc., who, in 1913, was put in charge of the experimental station. His results show very successful operation of the Imhoff tank which was put into operation at the station in April, 1912. As will be noted in the following, the tank is not a true Imhoff in that it is much shallower than that recommended by Dr. Imhoff. Its operation, however, is identical with that of the tanks which have been erected in Germany. The sludge obtained from it has a similar analysis to that of German sludge, and to that obtained from similar United States experimental units. The sludge dries rapidly in a few days and gives rise to no disagreeable odors. When disposed of in mounds, it does not appreciably take up water more than ordinary loam, and drains rapidly. For these reasons it is suggested that such sludge would make excellent fill, its moisture content after several weeks not being much higher than that of ordinary loam.

The following is extracted from Mr. DeLaporte's report on the purification of sewage:

Septic Action.—The septic tank and biological digestion of organic matter in sewage has received considerable attention in both Europe and America. All of the work done seems to have been with raw sewage, so that the improvement in character of the sewage has been due to sedimentation, as well as to the biological digestion. Both chemical and physical analyses of the effluents from such tanks, unfortunately, have been influenced by the effect of sedimentation and did not give a true measure of the efficiency of biological digestion. It therefore seemed advisable to do some work with septic tanks, precluding any improvement by sedimentation, by the use of a settled sewage. At first the effluent from a settling tank was used; later the work was done with an Imhoff effluent. Consequently, any improvement in character in the sewage was due to the septic digestion of the semi-colloidal and colloidal matter in the sewage—not to an improvement by sedimentation of solids in suspension. In connection with this work two batteries of tanks were operated to find the optimum length of storage for, and the effect of aeration on, septic sewage.

The four tanks used were of concrete, 25 ft. long by 1½ ft. wide and 6 ft. deep, and were so arranged that the effluent from the first two tanks would flow over aerators before entering the second pair of tanks. Baffles were fitted at suitable points to prevent currents and movements of scum or sludge. The sewage was fed through an orifice under constant head. The effluent overflowed from a foot below the surface through a pipe shaped like an inverted U with an air hole to prevent syphoning. The aerators are shown in section and plan in Fig. 3.