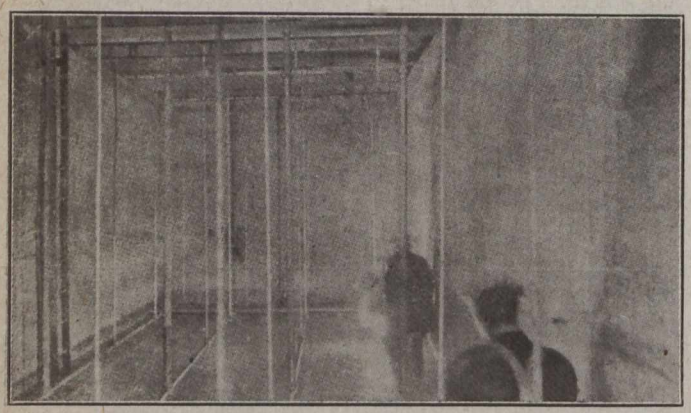
and making tight connections for the down pipes. The tank under experiment has four 1½-inch down pipes, with a valve and a Dart union below the valve on each pipe. They are placed at 30-inch centres and branch into two 1-inch pipes at the bottom of the tank, one running towards each end, where they are plugged. Each down pipe with its two branches is an independent unit, and by unscrewing the Dart union, it can be lifted for examination without interfering with the blowing on the other three pipes. The two branches are supported from channel-irons by means of six ⅜-inch hollow rods (pipe) which, by means of a thread and nut give a slow-motion control of the air pipe. We find that after the air pipes have been set dead level that we have both to raise and to lower them by means of this nut to obtain perfect air distribution. We cannot give any reason for this. The air pipes have ⅛-inch holes drilled on the under side at 3-inch centres. We find this gives better distribution than drilling on the top or on the sides. So far the resulting air distribution is excellent. However, no sludge is yet accumulated, but we have taken precautions to obviate trouble from this source. Each down pipe is connected below the valve and above the Dart union to a branch from a 3-inch high-pressure water main (100 lbs. per sq. in.) for flushing purposes. These four water branches are controlled by a single valve. In addition, the water can be shut off by a main valve, and steam admitted through the same piping. Provision is made for expansion on this account. Then, as already stated, each air-line can be lifted independently and cleaned if the water and steam are not sufficient. A check valve is introduced on the main air feed near the blower to prevent water getting into the blower in case of carelessness in operating the valves.



Activating Tank Showing Air Supply Grid.

General.—The whole plant is housed in on account of the low temperatures experienced in winter; 10 to 20 degrees below zero is not uncommon, and we sometimes have it as low as 40 degrees below zero, usually at night. The machinery hall at least will have to be heated in winter, and we are inclined to think that this will prove a considerable added expense, on top of others necessitated by the aerating process. The North Saskatchewan River, into which all our sewage discharges, has a dry-weather flow of about 1,000 cu. ft. per second, and is rich in free oxygen. In summer the flow is very much larger.

The United States Consul at Barcelona states that careful estimates place the quantity of unmined iron ore in Spain at 700,000,000 tons, with an average content of about 50 per cent. of metal.

CONSTRUCTION AND MAINTENANCE OF CATCH BASINS.

SOME few weeks ago a discussion on the subject of catch basins, their construction and maintenance, took place before the Sanitary Section of the Boston Society of Civil Engineers. The discussion was opened by Mr. George A. Carpenter, city engineer of Pawtucket, R.I.

Mr. Carpenter's introductory paper dealt largely with the method of cleaning catch basins. For several years he endeavored to discover some form of basin construction that would lend itself to better and more economical cleaning methods, or some more satisfactory way of cleaning the type of basin already in use. About four years ago employees of Pawtucket developed the idea of a power hoist on an automobile truck for lifting the material from catch basins. This has been improved upon, and the contrivance now used consists of a Standard chassis with a 32-horse-power engine, carrying a steel body, 9 feet by 4¼ by 2⅓ feet high. Cover plates two feet wide are placed over each end to prevent the load slopping out. The capacity is 3.4 cubic yards, and the average load carried has measured about 2.6 cubic yards and weighed about 3.4 tons. The tail board is hinged at the top to facilitate dumping and is provided with a rubber gasket so that it can be clamped tight against the body. Dumping is effected by a hydraulic lift.

Back of the driver's seat are mounted two 6-inch "I" beams, and on these is a 2-horse-power Fairbanks-Morse gasoline engine, cable drum and control mechanism. The cable runs to an outrigger, which can be swung over the catch basin and back over the cart. (The 2 horse-power engine is to be changed to a 4-horse-power, as the former is found lacking in power for the heaviest work.)

The bucket first used was a plain cylindrical one, 14 inches in diameter and 17 inches deep, and was filled by hand by a man in the basin. Since November, 1913, an orange-peel bucket has been used. This was operated by oil under a pressure of about 100 pounds per square inch, but recent experiments have indicated that by using compressed air in place of oil the time of loading can be materially reduced. Under the old method of cleaning basins, before the truck was used, the average time of loading was 40 minutes per cubic yard and the average time of hauling 3,500 feet was 35 minutes. When the truck was first put in operation with a bucket loaded by hand, the average output was 13 cubic yards per day of nine hours, which was increased to 23.4 cubic yards per day; and experiments with compressed air indicate that this can be increased to 31.2 cubic yards. In hauling the load, the truck has averaged eight miles or more per hour. Mr. Carpenter believes that with air in use the city will be able to average 2.6 cubic yards every 45 minutes delivered to a dump 1¼ miles distant, or an average hourly output of 3.455 cubic yards. Allowing interest at 4 per cent. on the cost of the truck ($4,200), with depreciation and repairs at 20 per cent. and a new set of rear tires every year and of front tires every two years, with labor at $12 a week, gives a cost per cubic yard of 75 cents, as compared to $1.80 under the old method.

As to the form of catch basin, the one used in Pawtucket has its bottom half practically the same as that used in most of the other cities, consisting of a circular well with a concrete or stone slab bottom, the well being