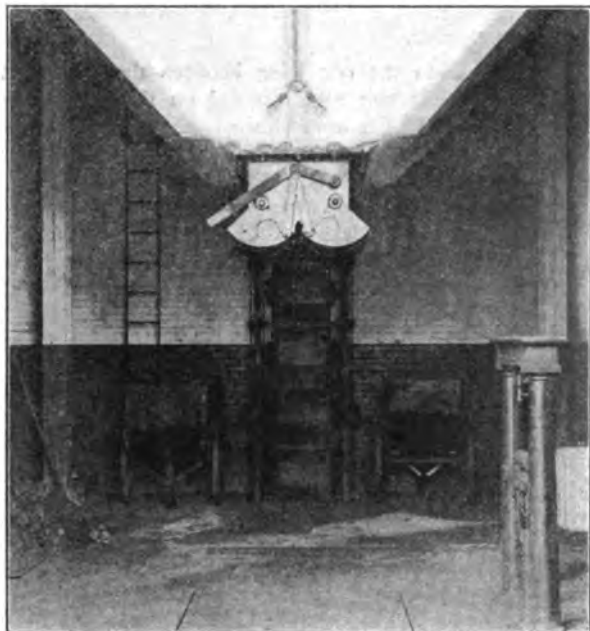


## LOCOMOTIVE TESTING PLANT.

PENNSYLVANIA RAILROAD.

The locomotive testing plant, on which so large an amount of valuable data was obtained at the St. Louis Exposition, is, as was mentioned in our February issue, now in operation at Altoona. The plant is housed in a steel and brick building, specially constructed for the purpose, an exterior view of which



BOTTOM OF COAL SUPPLY BIN.

is shown in one of the illustrations. Advantage has been taken of the experience gained from the operation at St. Louis and a few minor changes have been made in the installation at Altoona, with the result that the plant now operates without any of the difficulties which caused so much delay and trouble during the former tests.

The construction of the testing plant, its dynamometer and other apparatus, was illustrated and described in detail in the April, 1905, issue of this journal, page 127. There have been practically no changes made in the apparatus described at that time and reference can be made to that article for the general features and details of the plant.

The accompanying illustrations show several views of the present arrangement and it will be seen that ample provision has been made for good light, ventilation, convenient location of instruments, special facilities for handling and weighing coal and ashes, protection of the recording mechanism from any disturbing conditions, etc.

It will be remembered that one of the most troublesome features of the operation at St. Louis was the difficulty in obtaining a supply of water for the friction brakes at a constant pressure. In the present installation this difficulty has been entirely removed by the use of a two-stage centrifugal pump driven by a 75 h.p. electric motor, which is fitted with an automatic control and delivers water at a constant pressure of 75 lbs. to the main header, from which the branch pipes for the individual brakes are led. The pump draws its supply from one of the large water tanks nearby, the temperature of which is sufficiently low for this purpose. The discharge from the brakes empties into an iron trough, which is shown in one of the illustrations. From this it runs by gravity into a tank located beneath the floor of the building, from which it is again forced back into the outside tank by another centrifugal pump driven by a 20 h.p. electric motor. This apparatus is capable of delivering a large volume of water at low pressure, which is needed for high speed tests, and it has a capacity of 900 gallons per minute. The automatic features for maintaining a constant pressure have proved to be

a success and there has been no difficulty with sudden fluctuations of water pressure.

The dynamometer has been placed somewhat farther away from the locomotive than was the case at St. Louis, thus allowing more room for the firing platform. It has also been enclosed in a small steel and concrete housing, which protects it from the dust and dirt occasioned by the handling of coal and ashes in the immediate vicinity.

For handling the coal for the locomotive a very complete plant has been installed. The loaded coal cars are run in on the track alongside the building and dumped into a hopper below the track level. From this hopper the coal is carried by a bucket conveyor to two elevated reinforced concrete pockets, each of which has a capacity of 50 tons. These pockets are located over the larger of the two rooms directly back of the testing laboratory and each is provided with a bottom cut-off gate, of a type shown in one of the illustrations. The coal is discharged from the bins into wagons holding 1,000 lbs. each, which are run over the weighing scales and then pushed along a passage way beneath the laboratory floor to a hydraulic elevator, which raises them to the firing platform, where the cars are dumped. The ashes are discharged from the locomotive into the bottom of the pit, from which they are shoveled into a wagon and after being weighed are raised in the hydraulic elevator to the level of the main floor and emptied into a chute leading to a conveyor, which delivers them to an ash bin on the outside track. From this they can be discharged into cars and hauled away.

The water for boiler use is taken from a supply tank in the corner of the laboratory, which is filled from one of the large outside tanks, the water being passed through the weighing tanks, from which it is discharged into the supply tank. It also passes through a meter on its way to the injector, the reading of which is used as a check upon the weighing tanks. The overflow from the injectors is collected and returned to the supply tanks by a small motor driven centrifugal pump.

The spark collecting apparatus has been greatly improved over the one originally used in St. Louis, and after much experimenting an arrangement has been devised which collects as large a proportion of the sparks as it is possible to get without seriously obstructing the draft. This entire apparatus is carried from a truck supported on run-ways above the roof of the building and is adjustable over a distance of 16 ft. 6 in. The opening in the roof is protected by a hood, which keeps it closed to the weather at all times.

The smaller of the two rooms located back of the laboratory proper is arranged for the computers and here the tests are worked up as soon as completed.

Some changes have been made in the foundations of the plant, which provides better drainage than it was possible to obtain at St. Louis. The system of piping has also been more carefully worked out and arranged, but in other respects the plant remains practically as originally built.

Tests have been completed on a Pennsylvania simple Atlantic type locomotive, and it is stated that the plant is at present turned over to the United States government for use in connection with the testing of briquettes as locomotive fuel.

**COST OF LOCOMOTIVES.**—The following table gives the weights and prices of locomotives in 1885 and 1905. As the only available weight in many cases is with the locomotive in working order, the price per pound is figured from the total weight of the engine with three gauges of water in the boiler, but excluding the tender.

WEIGHTS AND PRICES OF LOCOMOTIVES 1885 AND 1905.			
1885.	Weights.	Price.	Price per lb.
American Type .....	80,857	\$6,695	\$0.0828
Mogul Type .....	72,800	6,662	.0912
Ten Wheel Type .....	85,000	7,588	.0892
Consolidation Type .....	92,400	7,888	.0854
1905.	Weights.	Price.	Price per lb.
American Type .....	102,000	\$9,410	\$0.092
Atlantic Type .....	187,200	15,750	.083
Pacific Type .....	227,000	15,830	.070
Ten Wheel Type .....	156,000	13,690	.088
Consolidation Type .....	192,460	14,500	.075

—William Penn Evans before the Pacific Coast Railway Club.