

Tom Marshall's Weekly News, October 28, 2013

Not Inventions but Innovations: My father, T. Clarence Marshall, enjoyed the decades in which he lived and often said he had seen more changes in his time (1885–1969) than had members of earlier generations. While he did hold a couple of patents, his many innovations, several involving Auburn Heights, were probably his greatest contributions.

My grandfather, Israel Marshall, who suffered from kidney trouble most of his life (at age 18, he fell off some scaffolding at the Homestead Mill at Marshall's Bridge and supposedly injured his kidneys), recognized the value of good drinking water and as early as 1905 had springs near the Delaware-Pennsylvania state line tested for the purity and softness of the water. These springs were on Marshall-owned property but were at least one-half mile from any of the family dwellings, so water was often bottled where it came out of the ground and carried for drinking purposes. In 1928, my father decided to make this process easier and to provide spring water in all the taps at Auburn Heights.

Determining that three springs discharged high in the woods above Route 82, with their overflow going directly into Red Clay Creek, a concrete cistern about 5 feet square and 4 feet deep was built at the spring's location, planned to catch the discharge of the three springs. An old cart road, quite steep in places, connected the public road with the new location, and cement, sand, and I assume rebar were hauled up the hill and mixed to make concrete where it would be used. I don't know whether mule-drawn or motorized vehicles were used on this cart road in 1928. In the cistern, with a manhole on top, was a valve connected to a two-inch delivery pipe about 18 inches off the bottom and a second overflow pipe at least one foot above that.

A total of 2,600 feet of two-inch galvanized pipe was run from the cistern to the carriage house of Auburn Heights, and despite the hills and valleys in the pipe line, a full flow was siphoned through it. The cistern was level with the top of the chimneys on the mansion, so once the air pockets were pumped out of the line, the siphon worked very well. A water pump in the carriage house boosted the water pressure to at least 50 p.s.i., enough to supply the bathroom on the third floor of the big house and everything else below. My father was proud of how well his innovation had worked and during the first 10 years or so would walk to the cistern several times each year to inspect the overflow. I tagged along and often had to get a second breath to climb the steep hill to the "spring." With minimal maintenance, our water supply came through this 2-inch pipe for 75 years! While a new well was dug near the mansion in 2003, spring water still feeds the pond on the property.

Although Auburn Heights had a Roberts coal-fired boiler in the basement to supply steam heat, it is unclear whether this was used in the first years after 1897 or whether a steam pipe was run underground from the Marshall Brothers Paper Mill. In any event, the latter was the case from the early 20th century until 1971. Steam at about 100 p.s.i. pressure came through this pipe, first into the basement of the big house and then to branches heating the carriage house and shop and finally the museum building. It was desirable to lower this pressure to the 10-15 p.s.i. range for the radiators, and many automatic devices were tried, along with their steam traps to get rid of the condensate. Finally, my father turned to a Stanley throttle, activated by linkage from an electric motor, so that the thermostat opened and closed the throttle as required. When open, steam went to the radiators all over the house. This worked better than any control built for the purpose.

My father, who seemed to like Stanleys and their various parts, decided we could heat the big house on a temporary basis from a Stanley car. Since steam was supplied from the mill, and the big boilers needed to be shut down occasionally for a repair in cold weather, our buildings would get quite cold before the steam came back on. With my help, he ran a copper line from the boiler of our Mountain Wagon, parked at the side door, through a basement window and hooked it into the steam heating system. Although this operation required continuous attention, for eight hours it kept the temperature inside at 72 degrees on a 35-degree day. The car was jacked up, so by running the engine, water could be pumped continuously into the boiler and the burner modulated as required. We used about 15 gallons of kerosene and an unknown quantity of water. Likewise, he

ran his 3/4-inch-scale 4-8-4 locomotive in place at several hobby shows with steam from a Stanley car parked outside. These operations were not practical, but they were innovative.