

## STORIES of New Jersey

sented to him a silver medal for an exhibit of malleable cast iron articles. He could have become wealthy, but in 1835 he sold out again.

His next effort was with an invention which had only just begun to stir the imaginations of Americans. After the Camden and Amboy Railroad had been laid between Camden and South Amboy in the early 1830's promoters sought to build railroad lines all over the State. The Morris and Essex Railroad between Orange and Newark needed an engine to pull the train up the steep hill between the towns. Boyden, although he had never built a locomotive, promised to design one to do the job. In 1837 he produced the *Orange* and the following year the *Essex*, which remained in service for a long time.

Boyden attacked the problem of steep grades by substituting a straight axle for the crank, to which power was applied. He put the driving rod outside the engine and used the wheels as the crank. He also invented a "cut-off" to regulate the amount of steam injected into the cylinder of the steam engine. Among his other improvements was the "link motion," which enabled the engineer to reverse with greater ease. His fame as a locomotive builder reached Cuba, where he went in 1841 to build the *Cometa* for the Cardenas Railroad.

For the next few years Boyden restlessly turned from one idea to another, without developing anything genuinely significant. For the young astronomers of Newark he built a telescope, grinding the lenses himself. He studied air compression and air pumps and improved the photographic process of the Frenchman Daguerre by using a reflector to increase the power of the sunlight. Credited with having built the first camera in this country, he also made the first Daguerreotype in the United States. He helped Samuel F. B. Morse with the electric telegraph and constructed various electrical appliances for his home, such as a clock, a fountain and a barometer.

A clue to Boyden's working habits is provided by one of his inventions. Lest he lose valuable ideas that occurred to him after he had gone to bed, he contrived a slate on which he could write in the dark. His hand was guided by wires strung across the surface of the slate.

Boyden nearly always slept with his clothes on, boots and all. Every morning, winter and summer, he took a bath by plunging into a cold spring, without bothering to take off his clothes. When the bath had been put off until near the time for starting work he came into the shop with water dripping from his clothes. He claimed that the bath was as good for the clothes as for him.

Nothing in Seth Boyden's life indicates that he cared seriously for riches. Again and again he avoided detours leading to wealth and consistently traveled the highway of scientific inquiry. Yet in 1849 this man joined thousands of others in the stampede to California for gold. With his son Obadiah he took a ship to Panama, crossed the Isthmus on donkeys and then sailed up the Pacific coast in the second steamboat to navigate in those waters. The arduous trip was fruitless; no inventor's magical skill could extract gold from the earth. After twenty months, in which they mined enough only to meet their expenses, father and son dispiritedly returned to Newark.

Although his adopted city esteemed him as an eminent citizen and fired cannon upon his arrival, there seemed little opportunity for the man whose inventive mind had laid the foundation for several of the city's most profitable industries. Boyden showed no concern over his impoverished state, and when he discovered a process of making Russia sheet iron cheaply he sold it to a group of local manufacturers for a small sum. The picture of Boyden's want amidst the plenty he had helped to create finally impelled some businessmen, who had become rich from his inventions, to buy him a small farm at Hilton, a suburb of Newark. Here he lived for the last fifteen years of his life.