

M&PP Cog Engine No. 1



Bob Richardson (museum co-founder) stands beside M&PP No. 1 the day it arrived from the railroad in 1979.

Arguably the most well known mountain in Colorado, Pike's Peaks rises to an elevation of 14,110 feet a few miles west of Colorado Springs and is visible from Denver to Pueblo. Early pioneers would climb this majestic mountain, one of 53 "Fourteeners" in the state, and take in the incredible views from its windswept, rocky summit. But the trek was a difficult one and a burro trail soon became the popular route to the top. There were many schemes for building an easier way up the peak, culminating in 1888 when Zalmon G. Simmons, of mattress fame, and others organized and financed a railroad: the Manitou & Pike's Peak.

Ordinary locomotives (known as adhesion locomotives because their weight alone kept them on the tracks and gave their smooth steel wheels traction on the smooth steel rails) could not climb the steep grades required to reach the summit. This problem was solved by use of the rack system, widely used in the Swiss Alps and employed in the United States on the line up Mt. Washington in New Hampshire. The patented Abt system used by the M&PP employed heavy gears on the driving axles of the locomotive and a closely

spaced pair of similarly toothed rack rails spiked to the ties between the traditional pair of running rails. The gear teeth or cogs engaged the teeth of the rack and safely moved the locomotive up or down the steep grades as its driving wheels turned, driven in the usual way – by rods powered by steam.

The road's first three locomotives were built by the Baldwin Locomotive Works and delivered to Manitou in May 1890 with the names *John Hulbert* (after a Civil War Major who was the one who first conceived the railroad), *Manitou* and *Pike's Peak*. The three had an 0-4-2T wheel arrangement with side-mounted water tanks, rear coal bunker, outward sloping slide valve cylinders, and were inside-connected, that is, had their driving rods inside the main frame of the locomotive. Perhaps their most distinctive feature, their boilers were mounted at an angle so as to be level when climbing a 16 percent grade – the average on the M&PP, which featured a maximum grade of 25 percent.

They were supposed to be able to push two coaches up the mountain, this proved an impossibility, and in fact the engines could barely shove a single loaded

coach up the grade. So at the end of 1892 they were sent back to Baldwin and rebuilt with new frames, cylinders and running gear, returning in March 1893 as engines 1, 2 and 3, four-cylinder Vaucrain compounds with more conventional main and drive rods mounted outside the frames – though the drive wheels were now inside the frames. As Vaucrain compounds, they used the steam produced in the boiler two times, first at high pressure in a pair of small diameter cylinders, and then again at a lower pressure in larger diameter cylinders mounted above the high pressure ones. In this configuration they proved quite successful, though they were generally limited to handling just one coach at a time.

The Manitou & Pike's Peak bought four additional Vaucrain compound locomotives of similar design from Baldwin between 1892 and 1906, one of which was destroyed in an 1896 runaway down the mountain.

All six surviving locomotives were rebuilt by the railroad in the shops at Manitou during 1912 with new frames and a new rod arrangement, and in this configuration they lasted until replaced by diesel-powered cars beginning in 1938.

Engine No. 1, originally the *John Hulbert*, and the road's first locomotive, was retired in 1941 and subsequently placed on display at the Cheyenne Mountain Zoo in Colorado Springs. The Colorado Railroad Museum acquired locomotive No. 4 when it was retired in 1968. However, when it was realized that No. 4 could be restored to operating condition by the railroad for occasional use, it was returned to Manitou in 1979, with the No. 1 coming to the Museum in its place, prominently displayed near the front entrance.

Specifications:

- M&PP *John Hulbert* Baldwin 4/1890 #10835
0-4-2T 17x20" cylinders 22.4" drivers
53,600 lb. engine weight
- M&PP No. 1 Baldwin 3/1893 (reblt. from *John Hulbert*) #13318 0-4-2T 10&15x22" cylinders
22.4" drivers 52,680 lb. engine weight



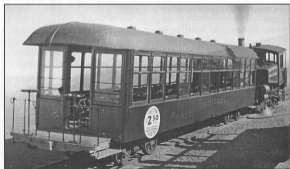
(above) The *John Hulbert*, will become No. 1 in 1893. To the right is No. 1 with a coach at the summit of Pike's Peak. (All Colorado Railroad Museum collection)

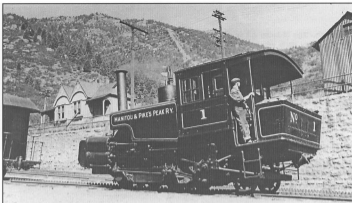


(right) There is no shortage of rocks in this view of the summit in its early years. The locomotive could be any one of the early cog engines. A train with cog engine No. 1 has just arrived at the summit of Pike's Peak. The stone summit house with observation tower is on the left. The bleachers beside the track were used for posing souvenir photographs of each train's passengers. (Colorado State Historical Society photo.)



Locomotive No. 1 is pushing one of the coaches to the top of the peak. Note the fare is only \$2.50!

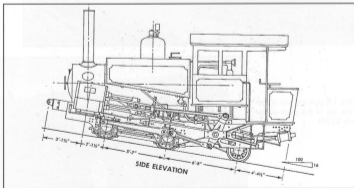
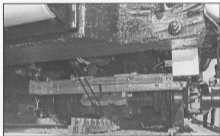




Reference

Abbott, Morris, *Pike's Peak Cog Road, The*,
Golden West Books, 1972

(above) No. 1 is navigating the Manitou Springs yard. The photo on the right shows the cog system located under the locomotive. The drawing below is of No. 2 which is similar to No. 1.



This sheet produced by Kenton Forrest, F. Hol Wagner, Jr., and Robert Jensen. Colorado Railroad Museum, Golden, Colorado. March 2011