

## FIRST LOCOMOTIVE IN AMERICA.

It is about 50 years since the locomotive was introduced in the U. S. There is now living in San Francisco one of the veteran railroad men of the country, who is absolutely familiar with the interesting incidents of the early history of the railroad and the locomotive engines in this country, "all of which he saw and part of which he was." The name of this veteran is David Matthew, now nearly three-score-and-ten. He is a worthy representative of the American mechanic, at once intelligent, alert and trustworthy. In the course of an entertaining conversation with Mr. Matthew recently, we learned that he was born in Scotland and arrived in this country at the tender age of seven, and that a few years later he was sent to the West Point foundry shops in New York City to learn the trade of machinist. It was at these West Point machine shops that the very first American locomotives were built, and where

chine, which were constructed after the English practice, sprung and got off the track; but they were replaced by cast iron wheels, and on December 14th and 15th the engine was again tried and ran at the rate of 16 to 21 miles an hour with five cars carrying about 80 passengers, and without the cars it attained a speed of 30 to 35 miles an hour. In the *Charleston Courier*, March 12, 1831, there is an account of a later trial of the speed of the "Best Friend," on which occasion, the writer remarks, "safety was assured by the introduction of a barrier car, on which cotton was piled up as a rampart between the locomotive and the passenger cars." The second locomotive for service built in this country was called the "West Point," and was for the same road. It was also constructed at the West Point machine shops.

The first locomotive built in America for a northern road was called the "De Witt Clinton," and was the third American locomotive. It was for actual service on the Mohawk and Hudson railroad. This engine, like the others,

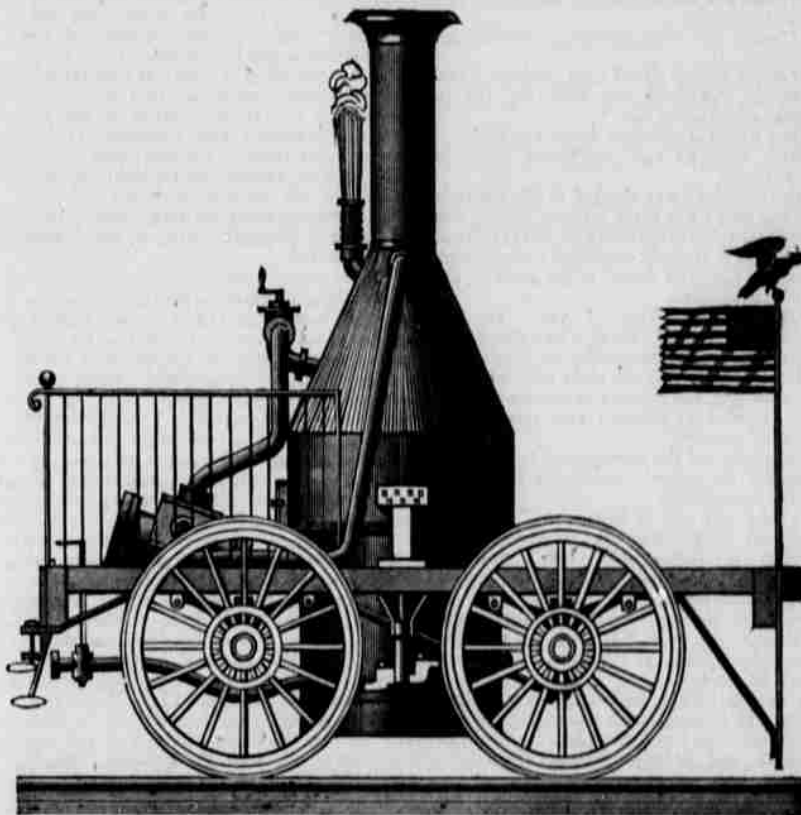
to enable it to turn sharp corners easily and safely. The machine so constructed was called the "boggy" engine. The first of these engines ever built was for the Mohawk and Hudson road, and was called the "Experiment." It was put on the road and ran by Matthew, who says it was as "fleet as a greyhound." The "Experiment" had been built to burn anthracite coal solely; after a while it was rebuilt and adapted to the use of any kind of coal, and its name was changed to the "Brother Jonathan." Shortly after these changes had been made the English locomotive "Robert Fulton," belonging to the same company was also rebuilt and furnished with the truck, and named the "John Bull." The "Brother Jonathan" was a remarkable machine for those pioneer days. Mr. Matthew says of it: "With this engine I have crossed the Mohawk and Hudson railroad from plane to plane, 14 miles, in 13 minutes, stopping once for water. I have tried her speed upon a level, straight line, and have run a mile in 45 seconds by the watch. She was the fastest and steadiest engine I have ever run or seen, and I worked her with the greatest ease." This is certainly wonderful speed, and may be, as Matthew earnestly maintains it is, the fastest time at least on the American railroad record.

In comparison to the splendid and efficient engine of to-day, our first locomotives, built after the English model mainly, were clumsy and crude machines. Since then our improvements have been manifold and extraordinary, and the American locomotive is now pronounced the most "perfect railroad tool in the world." Its exquisite symmetry and flexibility, and its extraordinary power must fill the mind of a veteran like Matthew—who has watched its growth from its infancy in this country—with feelings of generous admiration and pride.—*Mining and Scientific Press.*

## PROGRESS IN UTILIZATION OF SOLAR HEAT.—

Since May last year, M. Mouchot has been carrying on experiments near Algiers with his solar receivers. The smaller mirrors (0.80 m. diameter) have been used successfully for various operations in glass, not requiring more than 400° to 500°. Among these are the fusion and calcination of alum, preparation of benzoic acid, purification of linseed oil, concentration of syrups, sublimation of sulphur, distillation of sulphuric acid, and carbonization of wood in closed vessels. The large solar receiver (with mirror of 3.80 m.) has been improved by addition of a sufficient vapor chamber and of an interior arrangement which keeps the liquid to be vaporized constantly in contact with the whole surface of heating. This apparatus on November 18th, last year, raised 35 liters of cold water to the boiling point in 80 minutes, and an hour and a half later showed a pressure of eight atmospheres. On December 24th M. Mouchot with it distilled directly 25 liters of wine in 80 minutes, producing four liters of brandy. Steam distillation was also successfully done, but perhaps the most interesting results are those relating to mechanical utilization of solar heat. Since March the receiver has been working a horizontal engine (without expansion or condensation) at a rate of 120 revolutions a minute, under a constant pressure of 3.5 atmospheres. The disposable work has been utilized in driving a pump which yields six liters a minute at 3.50 m. or 1,200 liters an hour at 1 m., and in throwing a water-jet 12 m. This result, which M. Mouchot says could be easily improved, is obtained in a constant manner from 8 a. m. to 4 p. m., neither strong winds nor passing clouds sensibly affecting it.

IMPORTANT TO FISHERMEN.—The *Scientific American* says it is a well-known fact that fish always return to the same ground each year to spawn, but that it has recently been discovered that they always follow the left-hand side of the river on their trips to the spawning grounds, and returning take the right-hand side of the river. Our fishermen should remember this.



THE "BEST FRIEND"—FIRST AMERICAN BUILT LOCOMOTIVE.

the first English locomotive brought to the country was received and set up and exhibited.

The first locomotive engine built in America for actual service on a railroad was called the "Best Friend," and was constructed for the Charleston and Augusta railroad company. This pioneer locomotive (which is the subject of our accurate and handsome illustration) was built at the West Point foundry machine shops in New York City, and the work of fitting it up fell to the lot of Mr. Matthew. Immediately after the engine was completed it was placed on the company's road, and the first experiment with a train was made November 2, 1830, N. W. Darrell acting as engineer.

Some few days previous to the above date, or about the 20th of October, in accordance with a notice given in the *Charleston papers*, a public trial was made with this locomotive, without any cars attached, at which trial Mr. W. B. Ewer, one of the proprietors of this paper, was present. It was on this occasion that the first American built locomotive turned its wheels for the first time on a railroad track. At the trial on November 2d the wooden wheels of the ma-

chine was built at the West Point machine shops, and was also fitted up by Mr. Matthew; and when it was completed he took it to Albany, June 25, 1831, and made the first excursion with a train of cars over the road August 9, 1831. According to Mr. Matthew's statement, the "De Witt Clinton" weighed 3½ tons, and hauled a train of 3 to 5 cars at the speed of 30 miles an hour. It is especially noteworthy that both the cab and the tender of the "De Witt Clinton" were covered to protect the engineer from the weather—a "happy thought" of honest David Matthew, for which all American engineers at least ought to hold him in kind remembrance. About the middle of August the English locomotive, "Robert Fulton," built by the younger Stephenson, arrived and was placed on the Mohawk and Hudson road for service in the middle of the following September.

These locomotives had been used and fairly tested both on the southern and northern railroads, and the necessity for a radical change in their construction had become evident. Very soon John B. Jervis devised the plan of putting the truck under the forward part of the engine