HUNDRED MILES AN HOUR

Wind-Splitting Train Tested and Adjudged a Success—True way of Making Speed.

The wind-splitting train, a curious invention with which the Baltimore and Ohio Railroad have been experimenting for some time, has been tested at last and adjudged to be a success.

Imagine a fast train, not roaring, rattling, plunging, jolting, and shrieking, but gliding like a ship of glass through a sea of oil.

That is the wind-splitter.

With a fifty-eight ton engine and drawing six heavy cars, it made the run of forty miles from Baltimore to Washington in thirty-seven minutes and thirty seconds. This is very near the best line ever recorded on any railway, although made with an engine not more than half the power of those that draw the great express trains.

One run of eight miles was made in six minutes. A mile was covered in forty-one seconds. During the greater part of the trip the speed was seventy-esght miles an hour.

This speed was made without a locomotive constructed on the same wind-splitting principle as the cars. When this is furnished, one hundred miles an hour will surely be reached. There is even a reasonable probability that it will be passed.

Many railroad men now believe that the true way of increasing speed has at last been found. For several years practically no advance has been made in this direction. A new and vital principle seems to have been discovered.

The wind-splitter is the invention of Fredrick Upham Adams. Its purpose is to reduce wind resistance to the lowest possible point. All the cars are vestibuled, and all projections, hollows and other features calculated to catch the wind are either abolished or minimized as far as possible. For instance, the hollow squares made by the windows in ordinary cars are done away with. The woodwork runs in lines the length of the car, and no pieces are laid up and down to catch the wind. The last car ends in a point, thus avoiding the suction which occurs ordinarily.

The run from Baltimore to the capital was made in exactly thirty seven minutes and thirty seconds, being the highest rate of speed ever made on the Baltimore & Ohio railroad between the two cities. The train included six coaches made according to the Adams patents and was drawn by engine No.857, driven by Engineer Nally and Fireman Metzger. Engine No. 857 is a Baldwin standard type, fifty-eight tons, with seventy-eight inch driving wheels. The run beat all records of speed on this road, some parts of the trip having been made at an average speed of seventy-eight miles an hour.

The distance from Baltimore to Washington is forty miles, and fast time is made more difficult by reason of the fact that for two miles out of Baltimore and two miles in Washington the speed of the train must be slackened in order to conform to the ordinances of the two cities. In addition to this a slow speed must be made past the Relay Viaduct and curves. In spite of these obstacles the Adams train made the distance from a standing start in the Camden Station at Baltimore to a full stop at the depot at Washington in record time.

When out of the Baltimore yards, past what is known as the Carroll switches, and from here to Trinidad the speed of the train was seventy-eight miles an hour, Individual miles were made in 41, 42 and 44 seconds; and a run of 8.01 miles was made in six minutes. This was the best run of the trip for an extended distance and compares favorably with the record-breaking run made between Bloody and Blue Mound, a distance of six miles, on the Wabash Railroad, in August, 1898, in four minutes seven seconds, or eighty-seven miles an hour.

When the wide-splitter reached Washington, Fireman Metzger stated that he used less than the ordinary amount of coal in a similar run with a train of three or four cars. He also said that he had not the slightest difficulty in carrying 165 pounds of steam, which is the full limit of the locomotive.

The test was witnessed by General Superintendent Spurrier, Train Master Hollister, and Travelling Engineer Cavey rode in the engine and kept a careful watch on its performance.

The excellence of this run will be appreciated when it is stated that the best previous run was made by the special train carrying Vice-President Hobart. This train consisted of four cars and was hauled by engine No. 1313, the most powerful engine owned by the Baltimore & Ohio Railroad Company. The weight of engine No. 1313 is nearly one hundred tons, as against fifty-eight tons, the weight of No. 857, which hauled the Adams train. The Adams consisted of six cars, as against four cars in the Hobart special. With a flying start the Hobart special made the run to Washington in thirty-eight minutes and a fraction.

A number of years ago two flat cars, containing fire engines were run from Washington to Baltimore, on the occasion of a big fire in Baltimore, in a fraction over thirty-eight minutes. Neither of these runs in any way compares with the performance made by the cigar-shaped train.

An idea of the rapid rate of speed of the Adams, train can be gained from a comparison with the fastest regular trains in the United States. The Empire State Express between New York and Albany, a distance of 143 miles, on the New York Central Railroad, makes the run in 160 minutes, an average of 54 miles an hour. The regular time of the Royal Blue trains on the Baltimore & Ohio, which are the fastest trains in the country, between Baltimore and Washington, is forty-five minutes for the forty-miles. The London & Northwest Railroad runs a train from London to Crewe, a distance of 158 miles, without a stop, at the rate of 52.6 miles an hour. On July 2, 1897, a train from Camden, N. J., to Altantic City, on the Philadelphia & Reading Railroad, a distance of 55.5 miles, in forty-eight minutes, an average speed of 69.35 miles an hour.

Mr. Adams says that wind resistance is the one thing that designers of American railroad trains have neglected. In order to attain speed they have gone on increasing the power of the locomotive, oblivious of the fact that the wind resistance increases more rapidly than the velocity.

It is a well known mechanical law that the resistance of the air to a moving body increases with the square of the velocity. "Every one knows," said Mr. Adams, that a wind blowing with a volocity of seventy miles an hour will blow down or unroof buildings. Everyone knows that a wind with a velocity of twenty-five or thirty miles is more dreaded by bicycle riders than heavy grades, and yet the designers of railroad trains have absolutely overlooked the enormous resistance offered by a train when it attempts to attain a speed of more than thirty miles an hour."

At ten miles an hour the air pressure is insignificant, amounting to about half a pound to the square foot of resisting surface. At twenty miles an hour it increases to two pounds a square foot; at thirty miles to four and a half pounds; at sixty miles to eighteen pounds; at seventy miles to twenty-four and a half pounds; at eighty miles to thirty-two pounds; at ninety miles to forty and a half pounds, and at one hundred miles to fifty pounds a square foot.

Very high rates of speed—a hundred miles or more—will only be possible, according to Mr. Adams, by reducing the air resistance. He believes that if this could be reduced almost to nothing the present locomotives would draw trains at a speed now only dreamed of.

He seems to have proved the value of his theory by this Baltimore experiment. If the theory is all that he claims it will work a revolution in the science or railroading. Speed will be enormously increased with a diminution of cost—an alluring combination.

Another advance of the instance is that it insures perfect ventilation. The air is taken in at the front car and gently distributed throughout the train.

Mr. Adams was formerly a reporter in Chicago, with a natural mechanical genius. He was at once assigned to interview a hare-brained inventor, who claimed to be able to construct a train that would make one thousand miles an hour. The report of the interview was one of the funniest newspaper articles that ever made the railway world laugh. Mr. Adams went into figures to show that the train would pass the station long before the sound of the whistle a half mile back had reached that spot. In other words the velocity of the train would be greater than that of sound. He then gave calculations so as to the atmospheric resistance to be overcome by a train travelling at the rate of 960 miles an hour, or 1,400 feet a second. He applied Smeaton's well-known formula, viz: "Resistance equals the square of the velocity in miles per hour, divided by 200." The result gave a pressure of 35,560 pounds a square foot, or 240 pounds a square inch.

This humorous newspaper story, the result of an interview with a crazed inventor, gave to Mr. Adams his first suggestion that in the effort to attain great speed all inventors were working at the wrong end of the problem—to wit, the locomotive. He believed that the construction of the cars was what needed attention.

"I found that the railway train," said Mr. Adams recently, "was the one thing in nature and mechanics that was constructed in absolute defiance of everything else that was built for speed. The bird, the greyhound or ship if built on the lines of a train, would become snails or coal barges, so to speak."

The inventor and his backers, one of whom is James R. Keene, of New York, believe that the Adams idea will rule the train construction on the future.

'Saint' Bobs.

(London Mail.)

There is a stained glass window at Woolwich which contains a remarkable portrait in glass of Lord Roberts. 'Bobs' is humorously alluded to in this connection as 'Saint' Roberts, because saints are supposed to have the monopoly of figuring in stained glass.

The window in question is to be seen at the Royal Military Academy, Woolwich, and is one of eight placed in the institution as a memorial of the Jubilee. All the eight windows have figures of living people.

'Bobs' appears in his full dress as Field Marshal, and as a background the window has a view of Kandahar.

Lobster Industry in Newfoundland.

The Star published at the Bay of Islands, Newfoundland, in discussing the lobster industry is pleased to record much improved conditions along the West Coast, and a gradual improvement in all the bays of the Island. This, after years of such rapid decline that a closing down of all trapping operations for a period of three years was under consideration, is very encouraging, and shows the value of the interest the Government has taken in lobster catching. The Star contends that this improvement comes from one of two reasons; either the artificial hatching of lobsters in the incubators of the department, of Mraine and Fisheries and their subsequent plantation in suitable localities, or the department's protective rules and regulations providing for close seasons etc.; though it is admitted that an inexplicable law of nature, which multiplies the catch at one place at times at the expense of others may have something to do with the matter.

The law now allows all lobsters over eight inches in length to be taken, and The Star is emphatic in its opinion that the length should be increased to ten inches. No fish under ten inches, it says, is mature, and the taking of immature fish is the cause of a great decline in the fishery. Lobsters spawn but once in two years, taking on a new shell the other year, and though an eleven inch lobster carries 15,000 ova the process of spawning is necessarily slow, and with "the catching of immature lobsters which the law ignorantly permits it is only a matter of time when the complete extermination of the crustacean will occur."

WONDERFUL GOING.

A Torpedo-Boat Destroyer Steams Forty Miles an Hour.

Engineering had a representative on board H. M. S. Viper on her trials, when she ran for some hours at a speed of 40 miles an hour. The Viper is similar to the later class of torpedo-boat destroyers built for Her Majesty's Navy; but differs in this respect that she is driven by Parsons's steam turbines. She is 210 ft. long, 21 ft. wide, and 12 ft. 9 in. deep. The displacement on trial was 370 tons, with all coal on board. The contract load was 40 tons, but, as a matter of fact, the vessel had on board on trial 60 tons. There ars four shafts, each having two propellers, or eight in all. The propelling machinery consists of two sets of compound steam turbines for driving the vessel ahead. As the steam turbine cannot be reversed, special turbines are provided for going astern; the speed in that direction being stated to be 15½ knots. According to Engineering, ten runs were made over the measured mile off the North-East Coast, and taking the best six consecutive runs—alternately with and against tide—a speed of 34.28 knots was reached. The best two runs gave a mean speed of 34-75 knots; while the mean speed on a three hours run was 33.96 knots. This highest speed equals 40 miles per hour. The mean revolutions were 1050 per minute, and the mean steam pressure was 165 lb. to the sqnare inch, the maximum being 175 lb. In regard to this point, it should be stated that a great deal of steam was lost at the relief valves, which had not been sufficently screwed down before starting, and began to blow heavily soon after going on, the mile. The total heating surface in the four Yarrow boilers is 15,000 square feet, and the grate surface is 275 square feet. The air pressure for draught averaged 3 in. on the water gauge. The indicated horse-power reckoned by the steam pressure and revolutions is estimated at 11,000, which shows an excellent performance, even allowing for the efficiency of the engine. The boat had been in the water for some time, and her bottom was said to be by no means clean. The officials of the Parsons' Company expressed themselves confident that the boat will steam 36 knots with a clean hull and favored with fine weather, provision being made, of course, for using all the steam and not allowing any to pass away at the relief valves. The weight of the steam turbine as compared with ordinary engines is as 35 to 53: whilst in regard to space occupied it may be said that the engine-room of the Viper is the same size as that of the other vessels of her class; but, of course, there is the additional power developed by the machinery of this boat to take into account.