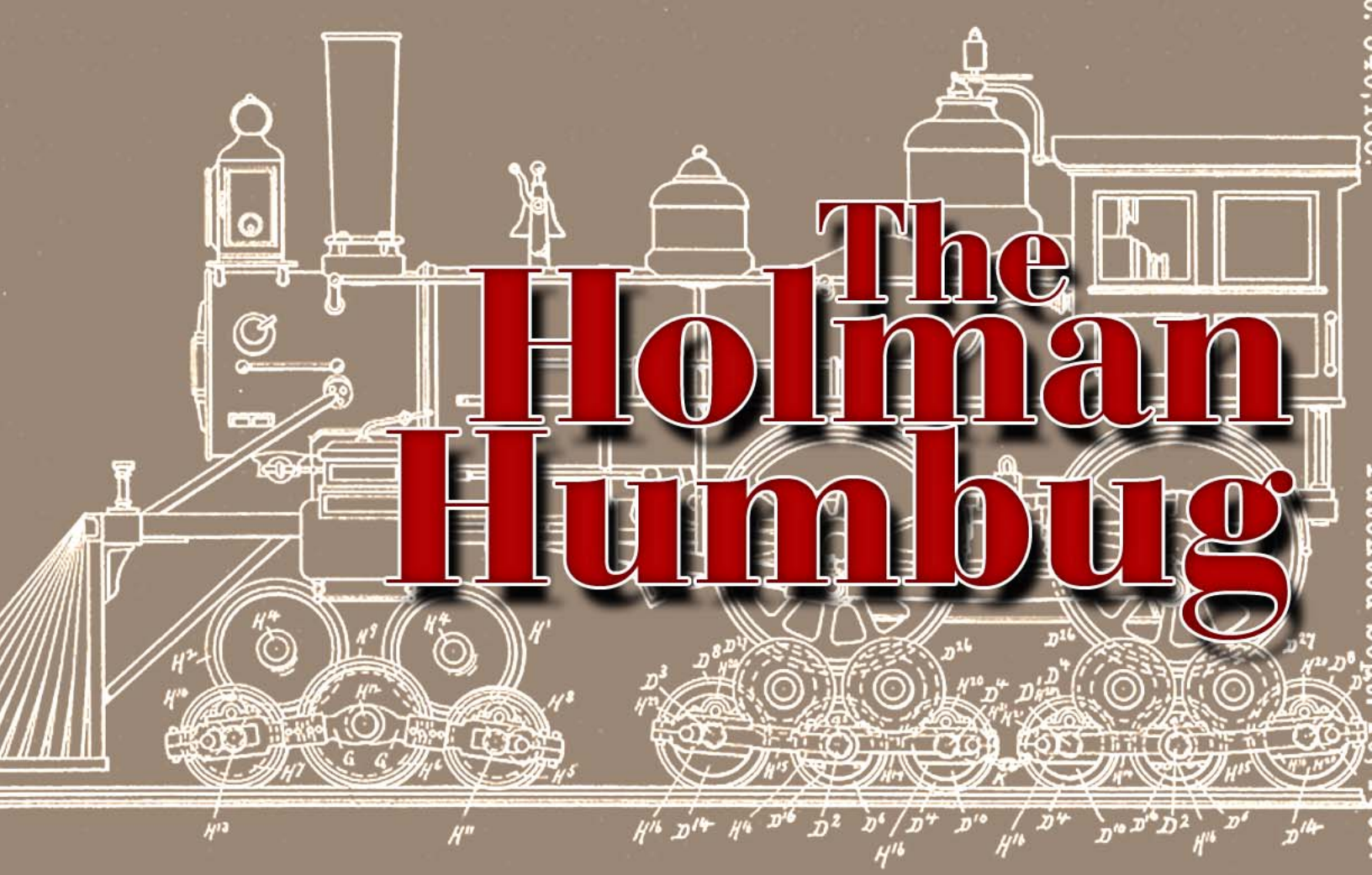


The Holman Humbug

In the long history of the railroad in New Jersey, the brief appearance of the Holman fraudulent contraption was one of the strangest sights witnessed on the Garden State's rails.

Gordon Bond

If you do a Google search on the phrase "strange locomotives," page after page of hits will come up, linking you to the amazing variety of forms inventors came up with do essentially all the same thing—pull a train on a railroad. Much of this ingenuity was born of specialized needs to pull certain kinds of trains over different specific territories. But all hoped to do it easier, faster, and cheaper than the nearest competition. A few oddballs were the product of amateur dreamers but one that made a brief appearance on a South New Jersey line in 1897 may have been *willfully* dubious.

The so-called "Holman locomotive" wasn't an engine so much as an appliance attached to existing steam locomotives that made tall promises to potential investors. It was the brainchild of William J. Holman, a man of wide and adventurous interests. Born on June 2, 1819 in Richmond, Indiana, by the time of his obituary in 1904, it could be said he "had the distinction of being called the father of the first railway in Indiana, having been president

and chief constructor of the Peru & Indianapolis railway, said to be the first line built in the state . . . [had] discovered the South Park gold fields of Colorado about 1855 . . . [and had] established for the United States government the Mount Diablo meridian in California."[1]

"Of late years," his obituary concluded, "Mr. Holman has devoted most of his time to perfecting the Holman locomotive speeding truck." A truck, in railroad lingo, refers to the assembly of four wheels, axles, and suspension system, held in a pivoting frame on each end of a railcar. When one looks at the steam locomotives, the largest wheels are known as the "drivers." These are the ones turned by the steam-driven pistons that provide the tractive force against the rails to pull the train. It is quite remarkable to think that even a long and heavy train can be pulled only by the adhesion between the points where the driver wheels make contact with the rails. There are also smaller, articulated non-driven wheels at the front, known as "pilots" and sometimes sets at the rear under the cab of longer engines. What Holman's invention did was to set the drivers on top of complicated multi-wheel trucks, ostensibly creating more points of contact between the driven wheels and the rails—and promising multiple advantages to the railroad company.

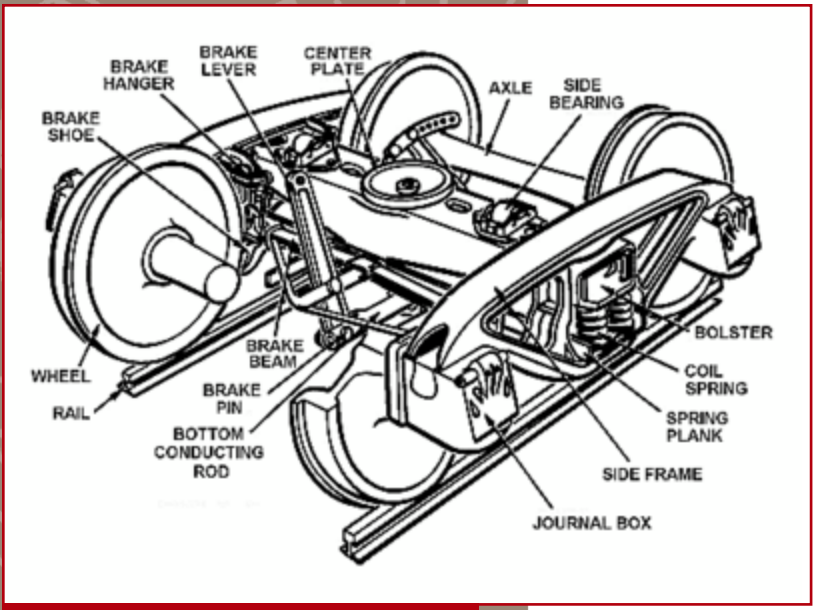


Diagram of a railcar "truck." There are trucks at either end of a car that pivot on pins extending from the car down into the center plate.

Wikipedia

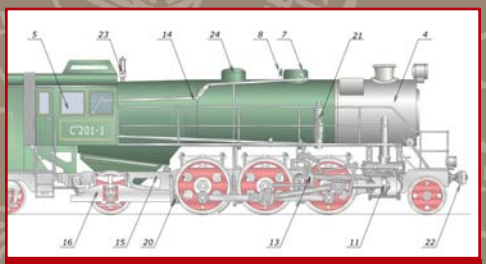


Diagram of an arrangement of wheels on a steam locomotive. The three large wheels at the center of this example are the "drivers" that provide traction. The "pilots" are at the front (right) and another set is under the cab. Different size locomotives had different numbers and arrangements.

Wikipedia

Technical writer W. Barnet Le Van described the concept for the November 1, 1897 issue of the journal *The Engineer* this way:

> *"The Holman truck is made up of five friction geared wheels, upon which the drivers of the ordinary locomotive rest; one revolution of which carried the truck and moving train one hundred and seventy-three hundreth [sic] as far as when made in direct contact with the rail, and so arranged as to divide equally into three parts the load carried by the rails at the one point of contact with the drivers."*[2]

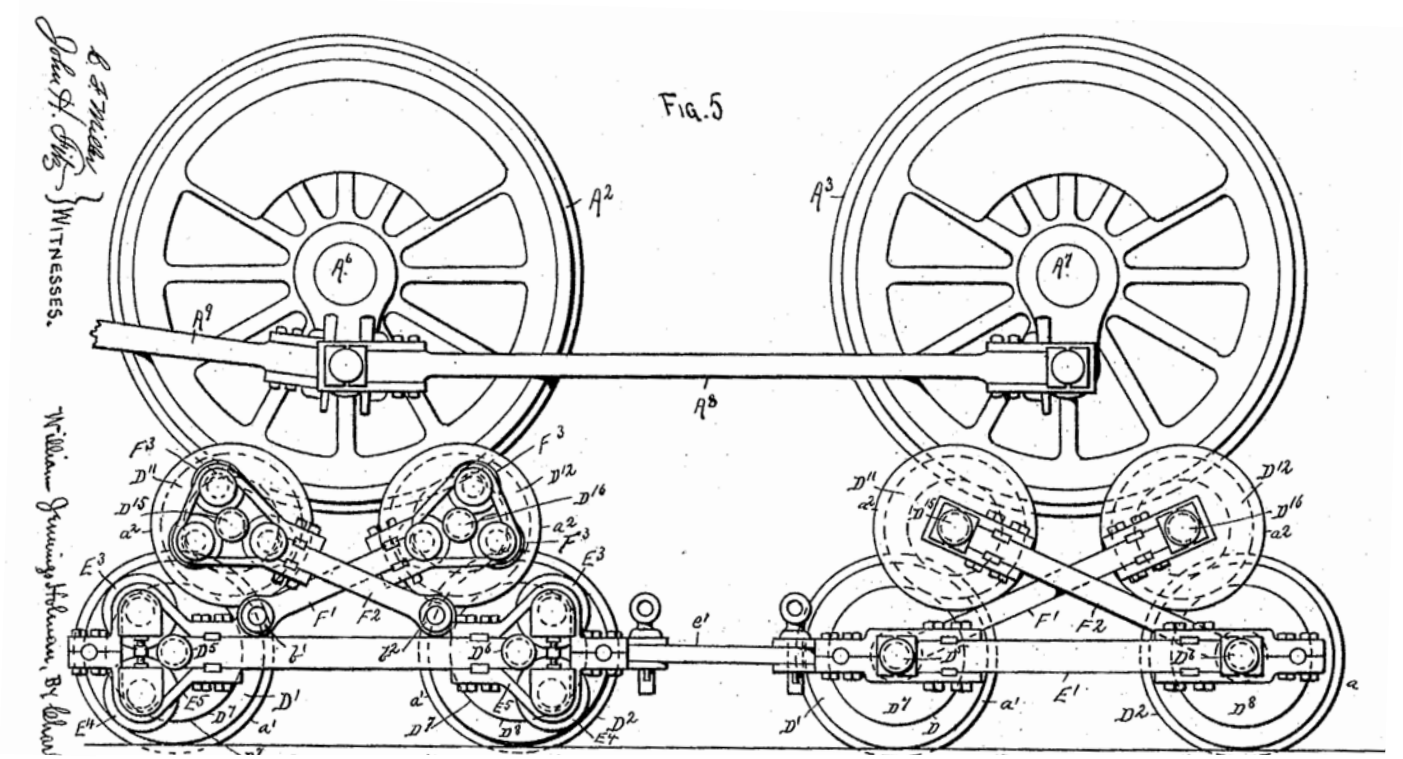


Diagram from a Holman patent showing how the locomotive's drivers (the two largest wheels at the top) rest on a complicated set of friction driven double-level trucks they designed. Most engineers understood that this would add unecessary friction, parts wear, and not deliver the many promised benefits.

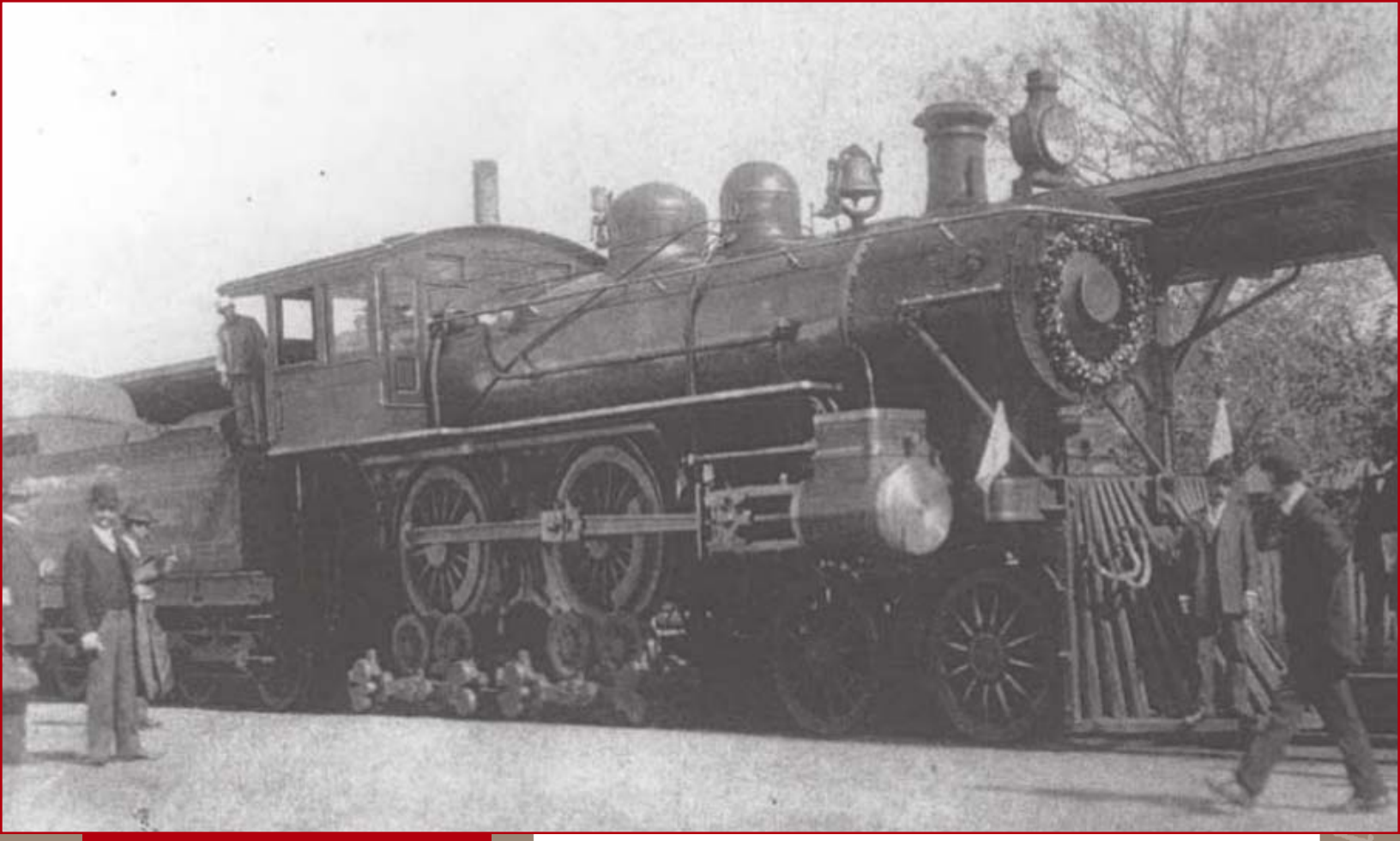
Google Patents

Holman claimed the arrangement would reduce track maintenance by better-distributing the locomotive's weight and piston forces, extend the lifespan of the engine itself because "only nearly one-half the number of revolutions are required to cover a given distance—whether made in slow or fast time," increase top speeds to 120 miles per hour, and save over a third on fuel.

A test had been conducted using a standard Baldwin steam locomotive leased to Holman for the purpose by the Soo Line in Indiana in 1894. Holman self-declared the trials a success and managed to generate enough positive popular press in the U.S. and even Europe to make it sound like this was the future of railroading—and to begin selling stock in the Holman Locomotive Speeding Truck Company.

Mechanical engineers and railroad men, however, recognized pretty quickly that the laws of physics made the claims dubious at best. "It would be a waste of space to criticise [*sic*] such a thing, but some comment is due on the publication and illustration of the locomotive and rig in the *Railway Review,*" editorialized the professional journal *Industry* after the 1894 claims. "The editor must know it is clotted nonsense, impossible on mechanical grounds, and a freak on all other grounds. A portrait of the inventor would have more interest."

Nevertheless, by 1897, Holman was preparing for another trial run to woo investors, this time in the southern



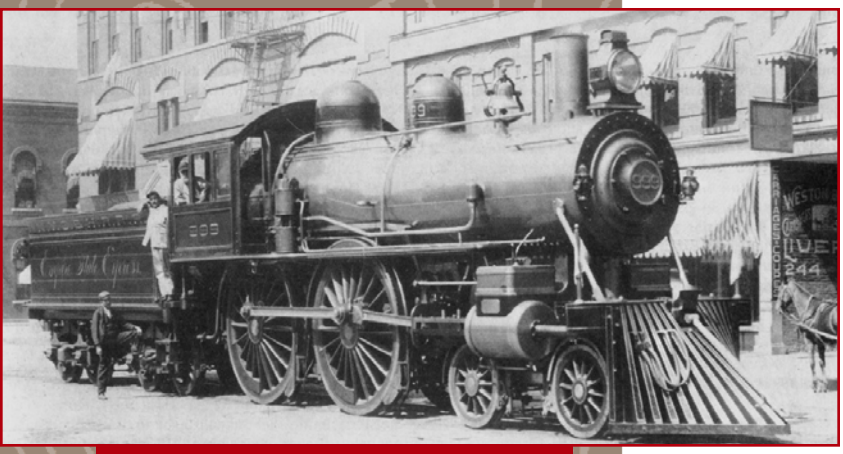
The Holman Locomotive on its arrival at Cape May.

From: "Iron Rails in the Garden State: Tales of New Jersey Railroading" by Anthony J. Bianculli, credited to the Robert L. Long Collection. Indiana University Press, 2008. Accessed via Google Books.

tip of New Jersey. They chose a branch of the Reading Railroad known in 1897 as the Atlantic City Railroad, heading from Winslow Junction to Cape May station. Le Van witnessed the "ordinary Baldwin class 8–34 C type [locomotive], raised thirty-five inches from the rails by the Holman friction truck under each pair of drivers" chugging through South Jersey and filed the following report:

> *"The writer can not [sic] endorse these claims from the performance of this locomotive on the exhibition run Thursday, October 14, 1987, over the South Jersey railroad to demonstrate the above. The run was made from Winslow Junction to Cape May. The train was made up of the Holman locomotive and three passenger cars containing guests of the Holman Company. The train left Winslow Junction at 9:09 A.M., and reached Cape May station at 10:051/2, covering the 54.1 miles in 56.5 minutes, or at the rate of 571/2 miles an hour. This includes slowing up at three*

railroad crossings and two trestles . . . On several short stretches of the line the speed was greater than the above average, probably 70 or 75 miles in my opinion, judging from the telegraph poles along the line, but some of the passengers who timed these spurts, claimed a speed of 120 miles per hour, which is very doubtful."



New York Central and Hudson River Railroad No. 999 that claimed to have broken the 100mph mark in 1893, though historian suspect it may have actually only reached 81mph. It is now preserved on static display at the Museum of Science and Industry in Chicago.

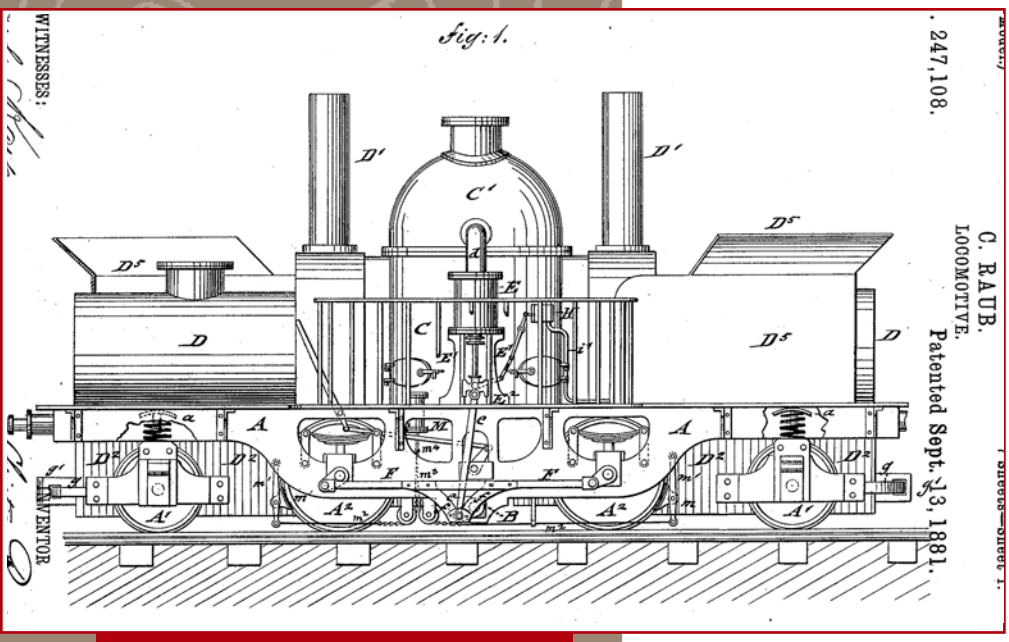
Wikipedia

A further mile run was next made between Cape May and Cape May Courthouse. With a two mile run-up to get up to speed, it covered the mile in 47 seconds. A second run made 41 seconds at a speed of 87.5 miles per hour. Le Van conceded that the type of track was "not an ideal track for high speed, and the locomotive was at a disadvantage, which, undoubtedly, prevented her from adding several miles to the above figure."

Nevertheless, he still found the overall proclamations of a further triumph dubious at best. "No means were provided to test the power required to overcome the friction of the added trucks, nor was there any attachment for indicating the horse power developed. The fuel used and the water evaporated was not noted."

The claims of achieving 120 miles per hour were especially hard to swallow, but absolute proof was naturally wanting as there were no speedometers in steam locomotives. Mechanisms for measuring speed were attempted, but none were yet robust enough to remain in reliable calibration under the harsh conditions found in such engines. Speed was measured by timing the passing of trackside mile-markers or telegraph poles with a pocket watch. Reaching the so-called "century" mark of a hundred-miles-per-hour was still a rare occurrence at the time, so any claims that the Holman contraption allowed a typical engine to go that fast would have been a big deal indeed. The first time a steam locomotive had topped 100 miles per hour in the U.S. happened just four years before Holman's Cape May test, in 1893, when the New York Central engine number 999 claimed it broke that speed barrier near Batavia, New York. The necessity of timing with a watch to

determine speed could only be so accurate, so there would be several "unofficial" claims at speed records that were unproven. The Pennsylvania Railroad's engine 7002, for instance, was claimed to have reached 127.1 miles per hour in Ohio in 1905. The inherent lack of a definitive and objective way of measuring speed left enough wiggle-room for stretched claims or even outright deception.



The Raub central power locomotive was another locomotive oddity that was not only tested in New Jersey, but was evidently built in Paterson.

Google Patents

Interestingly, this wasn't the first time New Jersey was the site of such an escapade. According to the journal *Railway and Locomotive Engineering*, "Something like what might be called a rival in high claims to the Holman appeared in New Jersey seven or eight years ago, and was called the Raub central power locomotive. The people who exploited this engine claimed it would run 100 miles an hour, although, on actual trial, a tenth of that speed was its limit." Invented by a New York City doctor, Christian Raub, this oddity sported a double-ended boiler and vertical cylinders, though mechanical engineers could see no obvious advantage to the arrangement. *Scientific American* for October 15, 1881 reported Raub's "object of this invention is to construct a perfectly balanced locomotive." It was evidently built in 1892 by the Grant Locomotive Works of Paterson, New Jersey, though it failed to achieve any success and faded into obscurity—though not without first blaming the failure on the prejudice of railroad men and the engineering press.[3]

Exaggerated claims of speed aside, the Holman trucks presented more than a few practical problems. Since the locomotive was sitting on top of the trucks, its total height was significantly raised. Tunnels, bridges, signal gantries, and other infrastructure along tracks were designed to accommodate equipment of a specific maximum height. Trains fitted with Holman engines would be limited to lines without tunnels or bridges, effectively ruling out their use on some of the main express lines in the region where the

alleged speed increase would be most advantageous. "Where would the Pennsylvania and New York Central express locomotives reach to, if present engines were mounted on the Holman trucks?" asked *Railway and Locomotive Engineering.*[4] Whatever financial savings the Holman theoretically offered would be eaten up several times over by having to redesign entire systems!

Another concern was with how raising the locomotive also raised its center of gravity. A speeding locomotive with a higher center of gravity was more liable to topple over, especially in a curve. It might have been possible to give a greater banking angle by raising the outside rail higher than the inner on a curve—known as super-elevation or cant—but here again redesigning systems of tracks would only further erode any cost savings.

Actually, even a minor derailment would be made a major catastrophe with the Holman arrangement. *Engineering News* regarded this as so serious that shortly after the 1897 South Jersey tests they published, "we do consider it our duty, in the interest of safe railway travel, to call attention to the danger which will exist in running Holman locomotives at high speed to haul passenger trains . . . Quite apart from the merits or demerits of the Homan scheme from the financial point of view, is the question as to the safety of hauling trains of crowded passenger cars behind a locomotive with its driving wheels two stories high . . . The question which at once suggests itself is what would happen if any of the wheels . . . should leave the rail? Apparently but one thing could happen, the resistance of the derailed wheels would be such that the drivers would ride right over the trucks. These would swing back and up and the driver would drop down to the ground. Just what would then occur it would be difficult to prophesy in detail; but every one familiar with railway accidents knows that when a truck is stripped loose near the head of a train, it is likely to tear the trucks behind it from the car bodies and make a serious wreck from an ordinary derailment. In the Holman locomotive the 10 pairs of wheels on which the drivers rest appear to us to be admirably designed to form a stumbling block and make a bad smashup from any derailment of the locomotive."[5]

Many in the railroading and engineering world suspected those behind the Holman trucks were well-

"...the Holman locomotive... appears to us to be admirably designed to form a stumbling block and make a bad smashup from any derailment of the locomotive."

aware of all the manifest drawbacks to the design—that this was nothing more than an elaborate stunt in stock fraud. "The parties exploiting the Holman locomotive speeding truck are advertising the stock of their company in numerous newspapers and claiming that the invention is

This $10,000 certificate for 100 shares ofHolman Locomotive Speeding Truck Company stock was owned by William Holman himself. It was sold at auction by George H. LaBarre Galleries, Inc. The engraving appears to show the same locomotive as was used in the South Jersey test runs.

http://www.glabarre.com

certain to come rapidly into general use. The effect of this has been that we have received numerous letters asking our opinion of the thing," explained *Railway and Locomotive Engineering*. "When we first heard of the Holman locomotive speeding truck, we supposed that it was the invention of some harmless crank who did not understand the elementary principles of mechanics, but now believe that it has been, since its inception, an ostentatious machine designed to allure unwary capitalists into an investment that will be of as much real value as the throwing of cold coin over Niagara Falls. The Holman speeding truck is founded upon a fallacy, and does not have the meagre merit of novelty to recommend it. We do not believe that the Holman Locomotive Speeding Truck Company are anxious to push their device upon the attention of railroad men. It is capitalists they are after, and railroad men have seen too many monstrosities, called locomotives, which make a brief noise and then disappeared, to be taken in with this newest candidate for failure."[6]

"The Holman locomotive has not been taken seriously by railroad men;" asserted American Engineer and Railroad

"...and the prize freak in railroad lines, the Holman locomotive..."

Journal, adding that it "appears to sensible men as a joke. But evidently some people will consider it a poor joke before they get through with it. The advertisement of the stock of The Holman Locomotive Speeding Truck Company in the New York Sunday papers says that 1,000 shares of the stock are for sale at $50 per share. We learn from private sources that it is being bought in considerable quantities. The capital stock of the company is $10,000,000. Why is it that inventions of genuine merit are so often difficult to finance while absurdities like the Holman locomotive can find ready support? This mechanical monstrosity will be dangerous at high speed, will produce much friction, consume more coal than the common locomotive doing the same work, will be expensive in first cost and maintenance, and has not one redeeming feature that we can discover."[7]

That Holman chose New Jersey for his tests in not surprising. Aside from having a robust railroad industry dating to the first North American railroad in the 1830s, South Jersey wasn't far from Philadelphia, where the company had set up headquarters and was selling stocks. The location caused *Machinery* to quip, "Perhaps it is the atmosphere of Philadelphia, the Schuylkill water, or a combination of both, which causes that city to be selected by schemers for selling stock, but whatever the cause it has certainly been infested with more wild schemes than almost any city we know of . . . and the prize freak in railroad lines, the Holman locomotive, is again trying to sell stock there. As most of the readers know this is another attempt to 'gain power.' They mount the drivers on auxiliary trucks and imagine they fool the engine into running faster with the same power. When they attempted this a few years ago they refused admission to their exhibition to anyone who had expressed adverse opinions, and to some who hadn't but who probably looked skeptical. The dailies are being filled with 'stuff' regarding it, and it is asserted that the South Jersey R. R. has ordered two of engines. When it is considered that this is practically only a summer road (there being little or no traffic in the winter), that its trains run semi-occasionally—if on time—the importance of adoption by such a line can be readily seen, if you are enthusiastic enough. The latest report is that, despite the surplus power of the first engines, a larger one is to be built to do the work. This would be laughable if it were not so

"...what right have the managers of the South Jersey R.R. to subject their passengers to such danger?"

serious, for after capital has thrown itself away on such a scheme as this, which any mechanic knows is worse than useless, it is hard to induce it to go into legitimate enterprises. When capital learns that schemes which promise large dividends are generally unreliable, it will do more for honest industry at a fair profit. 'Something for nothing' never has worked and it never will."[8]

News that "the South Jersey R. R. has ordered two of engines" came as quite the shock to the more sober-minded. After outlining the dangers of the Holman trucks in event of derailment, *Engineering News* asked, "If this statement is correct, what right have the managers of the South Jersey R.R. to subject their passengers to such danger? What legitimate reason have they for this action . . . what reason had the South Jersey officials for purchasing two Holman locomotives at a price which if the Holman company's circulars can be believed, warrants that concern in capitalizing its patent rights at $10,000,000."[9]

The Railway Age and Northwestern Railroader, however, exonerated the railroad, reporting "the 'adoption' of the Holman locomotive on the South Jersey railroad, of which so much advertising capital has been made and which has aroused some suspicion as to the sanity of general superintendent, C. A. Beach, has a rather unsubstantial basis. It is now stated that Mr. Holman bought the locomotives himself. It would save a good deal of trouble in changing engines if he could also buy of the corporation of the city of Camden the privilege of running his machine within the city limits from which I am told he is now debarred."[10]

The Holman Company evidently disappeared not long after the South Jersey tests. A reader from York, Pennsylvania sent a query to *United States Investor and Promoter of American Enterprises* magazine the following year, in 1898, asking, "Will you please give us some information concerning the Holman Locomotive Speeding Truck Company, Room 614 Guaranty Building, Minneapolis, Minn., also what is the value of its stock, etc.?"

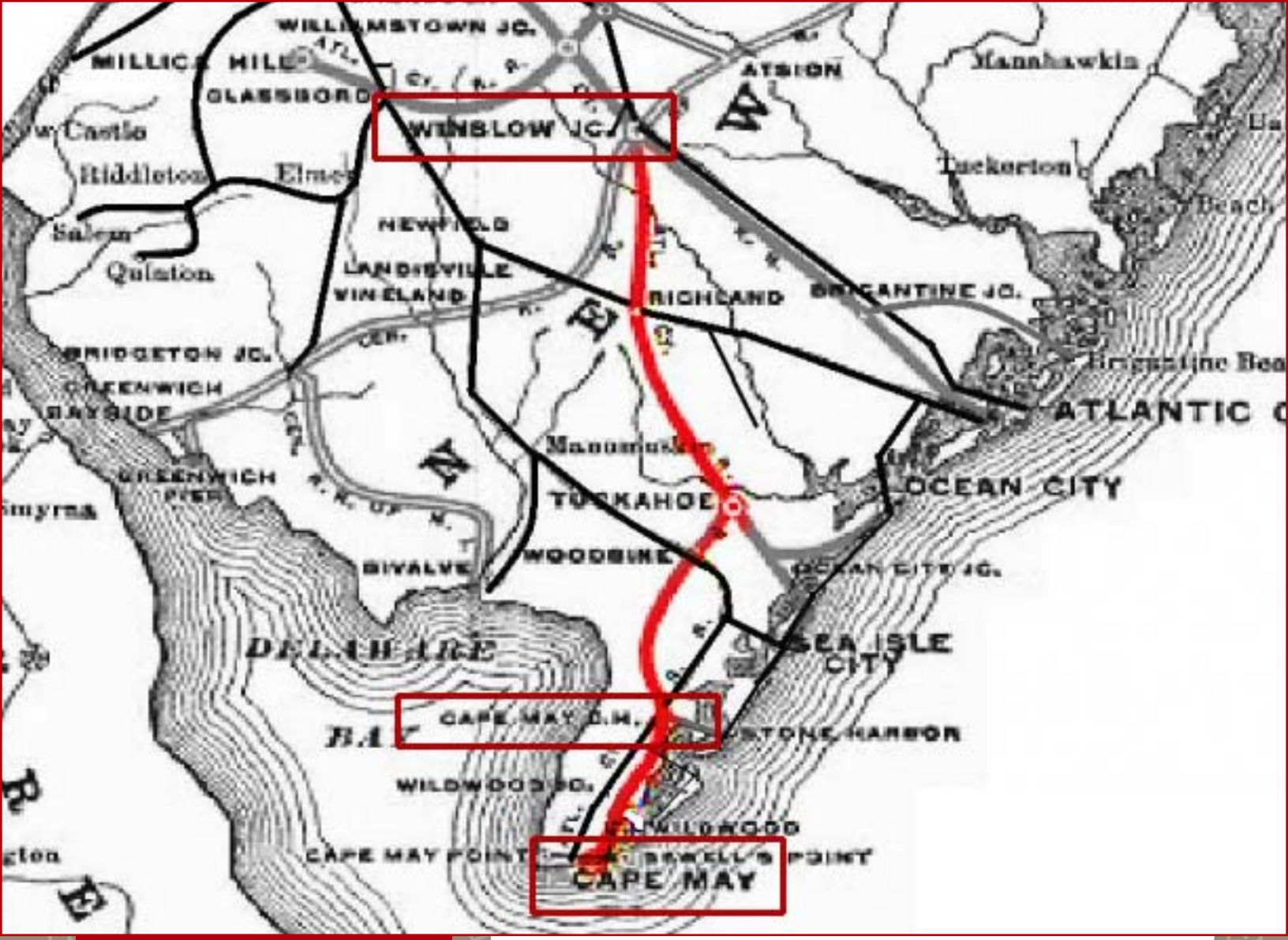
"We cannot find out anything about the Holman Locomotive Speeding Truck Co.," they replied, "as Mr. H. D. Holman [William Holman's son], who represented the company in Minneapolis, and who occupied an office in the Guaranty Loan Building, has vacated his office lately, and

"…the Holman scheme is about as flagrant a piece of nonsense as ever pretended to be a locomotive."

was said to have gone to Philadelphia, to the Bingham House. Our Philadelphia representative called at the Bingham House and was informed by the clerk that Mr. Holman had only stopped there one day, and that he did not know his present address. We are told that the Holman locomotive speeding truck was on trial for some months on the Seashore line of the Philadelphia & Reading railroad, and that it was given up by them. We have made inquiries among other truck companies, but cannot find anyone who knows anything about the company, so that we judge the truck has not yet been proven a success."[11]

If this was little more than a stock scam stunt, those behind Holman were nothing if not persistent in their schemes. In 1899, *Railroad Gazette* announced, "The Holman 'speeding truck,' or Holman locomotive, seems to have as much vitality as a cat. We supposed that it was dead a year ago, but a reader of the Railroad Gazette writes to us to say that an agent of the company is trying to sell its stock in his town and to ask advice as to buying it. It is not necessary to say a word about the matter to those who are accustomed to the analysis of machines, or even to those who are reasonably familiar with the locomotive engine without having much knowledge of mechanical principles in general. But for the benefit of those who may possibly be hankering around this investment and who are not qualified to judge of the efficiency of the mounting of a grindstone, it is perhaps worth while [*sic*] to say that the Holman scheme is about as flagrant a piece of nonsense as ever pretended to be a locomotive. That which the inventor aims to accomplish can be easily accomplished by changes in proportions of the ordinary details of ordinary locomotives. He introduces something like 20 additional wheels, with all their bearings and journals, and consequent friction and cost of maintenance, and makes a remarkably wasteful engine. He also makes a remarkably dangerous one."[12]

Even after William Holman had died in 1904, his son, H. D. Holman, evidently kept the family business going. in 1905, *Railway Age* reported, "The Holman locomotive, of speeding truck fame, whose performances on the Southern Railroad of New Jersey were so widely heralded a few years ago, and which was so adversely criticized in the Railroad Gazette at the time (April 9, 1897), has recently had another trial on the Buffalo Rochester & Pittsburg. Its prestige has



The route the Holman test train took from Winslow Junction to Cape May Court House and then to Cape May.

http://www.sjrail.com/wiki/index.php?title=Image:SNJ_RR_map_1.JPG

not been enhanced by its late performance. It is now resting or "at liberty," as the actor would say, and roundhouse speculation is rife as to what investor will be induced to lock up capital in the absurd scheme."[13]

The whole of the Holman affair remains murky—no doubt an intentional result. But physical evidence of its connection to New Jersey can still be found. The line the 1897 Holman experiment ran along between Winslow Junction and Cape May is still there. At the time, as mentioned, it was a branch of the Reading Railroad known as the Atlantic City Railroad. This was combined into the Pennsylvania-Reading Seashore Lines in the early 1930s and then absorbed into Conrail in 1976. The tracks were since acquired by New Jersey Transit and have been leased to the current Cape May Seashore Lines since 1984. The CMSL operates public excursion train trips on vintage equipment they work to restore as well as providing short line freight service to the area.

The route the Holman test train took is now part of the Cape May Seashore Lines, who offer passenger rail excurions and freight service.

For information, see: http://www.capemayseashorelines.org

The Holman has gone down as a "humbug" and even a "horror," but whatever adjectives one uses, it remains one of the stranger things seen on the rails in the Garden State's long railroad history!

1. *Improvement Bulletin,* Volume 28. Chapin Publishing Company, April 23, 1904, p. 15.
2. Le Van, W. Barnet. *The Engineer: With which is Incorporated Steam Engineering,* November 1, 1897, Volumes 33–34, p. 1–2.
3. http://www.douglas-self.com/MUSEUM/LOCOLOCO/centralpower/central.htm
4. "Product of the Amateur Locomotive Designer." *Railway and Locomotive Engineering: A Practical Journal of Motive Power, Rolling Stock and Appliances,* Volume 10, Angus Sinclair Company, 1897.
5. *Engineering News,* Volume 37 G.H. Frost, 1897, Vol XXXVII, No. 17. p. 264
6. "Product of the Amateur Locomotive Designer." *Railway and Locomotive Engineering: A Practical Journal of Motive Power, Rolling Stock and Appliances,* Volume 10, Angus Sinclair Company, 1897.
7. *American Engineer and Railroad Journal,* Volume 71, M.N. Forney, May 1897. p 166.
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11. *United States Investor and Promoter of American Enterprises,* Volume 9, Part 2, Issues 27–52. Investor Publishing Company, July 16, 1898, p. 1007
12. *Railroad Gazette,* Volume 31, 1899, Vol XXXI, p. 614.
13. *Railway Age,* Volume 38, Simmons-Boardman Publishing Company, 1905, vol. XXXVIII. No. 9. p. 188.

LOCOMOTIVE SPEEDING TRUCK.