

Butterworth of Trenton, New Jersey: The Rest of the Story

By Robert T. Rhode and Mike McKnight

From Bob

Pages 19 through 26 of *Engineers and Engines Magazine* for August and September of 2013 carried my article entitled "Why Watertown, Wheeler & Melick, and Butterworth Engines Look Alike." I wrote, "Brothers John Butterworth, Jr. (1833–1916), and William H. Butterworth (1846–1930) of Trenton, New Jersey, announced their portable engine in the *Altamont* (N.Y.) *Enterprise* of September 25, 1896, although a Butterworth pamphlet said that the engine was developed in 1895." Recently, Dan Dorece sent me an advertisement from his collection. The ad depicts the Butterworth portable engine. On the steam chest are the words TANNER DELANEY RICHMOND VA. Dan asked me to explain the connection between Butterworth and Tanner & Delaney. To help tell the rest of the story, I turned to my friend Mike McKnight, who has researched the Virginia firm.

From Mike

In 1836, the Tredegar Iron Works was organized. The company struggled with financial difficulties until 1841, when a twenty-eight-year-old engineer, Joseph R. Anderson, was brought into the firm. Under Anderson's capable leadership, the company grew and prospered into the largest iron works in the American South, helping establish Richmond as the manufacturing center of the South. This position also made Richmond a logical choice for the capital of the

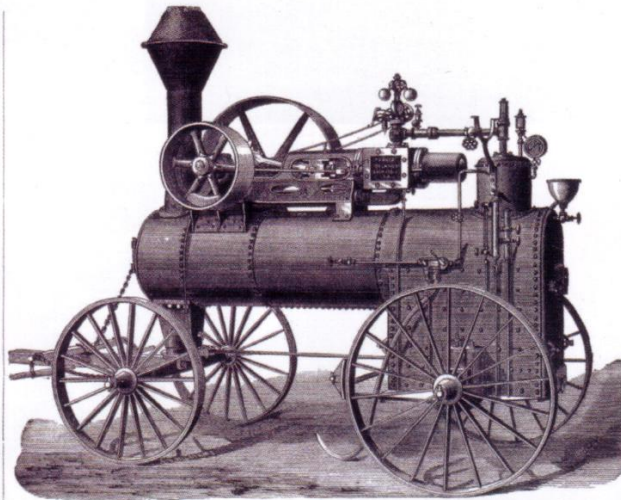
Confederacy during the Civil War.

Tredegar built steam locomotives during the

1850s but decided to halt production of locomotives in 1860 after two boilers exploded

The Butterworth Tandem Compound Portable Engine.

This engine, first introduced in 1895, is beyond doubt the greatest success since the introduction of steam for threshing. By its use at least twenty-five per cent. is saved in coal and water over the common simple engine, and a gain in power equally as great, with only an additional weight of about 200 pounds over a simple engine of three-quarters its power, thus making it possible for a team of horses to haul a Butterworth eight or ten



sure, while in the Butterworth Compound Engine the steam is always used twice in the cylinders before it is exhausted. The boilers of these engines are made of very best selected homogeneous steel plates, having a tensile strength of 55,000 pounds per square inch. The stack is fitted with our improved spark arrester.

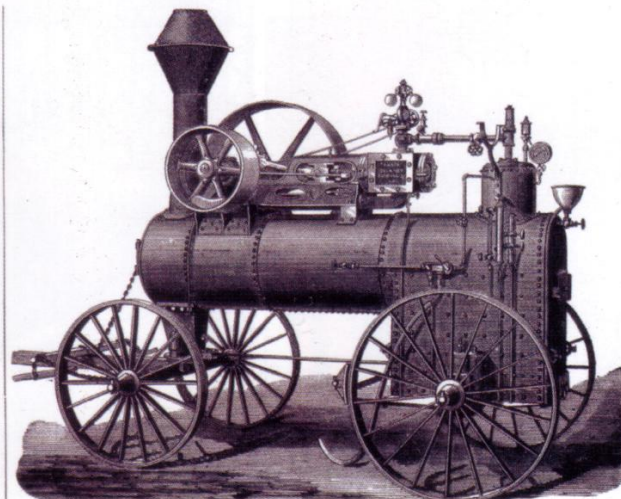
The engine is well and strongly made, all wearing parts being extra large. The frame is cast in one piece, the cylinders being bolted to end of same. The guides being bored on a line with the cylinders insure perfect line between cylinders and guide.

horse-power Compound Engine over the road as easily as they do a ton of hay on an ordinary farm wagon. This great gain in power and saving in fuel and water over simple engines is due to the fact that the steam in all simple engines is used but once in the cylinder and then exhausted and wasted into the air, at a high pres-

sure. The guides being bored on a line with the cylinders insure perfect line between cylinders and guide. The axles and wheels of the trucks are all made of steel. The boiler is mounted on the trucks on springs, both front and rear, which permits the engine to be drawn over rough roads without jar to its parts.

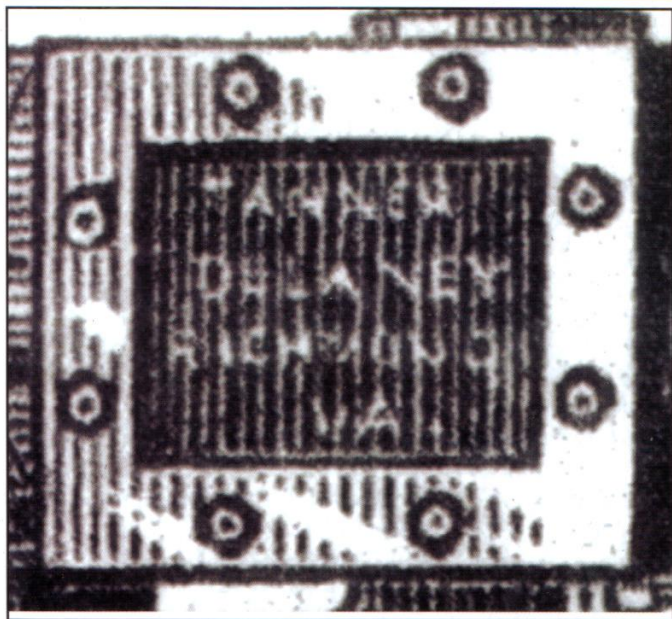
The Butterworth Single Expansion Engine.

This engine is in every respect as thoroughly made and well braced as the Compound, above described, and is superior to any other make of simple engine on the market. It is mounted on the same steel trucks as the Compound, and has springs both front and rear. We have the past year thoroughly remodeled it and used the up-to-date bicycle principles in its construction throughout; we have



adopted the finest quality of steel in all parts, to obtain the greatest strength with least weight, and thus brought it up fully to the demands of the times, so that this engine to-day stands alone as the lightest weight and strongest made in the world. Purchasers who do not require over six horse-power engine will find this engine the very best that can be obtained.

Dan Dorece sent Bob Rhode a copy of this advertisement for Butterworth portables with Tanner & Delaney engines. Dan asked Bob to explain the connection between the companies. Courtesy Dan Dorece



Left: Here is a close-up of the steam chest in Dan Dorece's advertisement. Cast into the cover are the words TANNER DELANEY RICHMOND VA. Courtesy Dan Dorece

from defects in the iron. Obtaining suitable iron without defects was a problem that plagued the Tredegar Works before and during the Civil War.

The company was valuable to the Confederacy as approximately ninety percent of the South's cannons were built by the Tredegar Works. Charles B. Dew in his excellent book *Ironmaker to the Confederacy* presents an in-depth study of the hardships encountered by Anderson and his company and the ingenious ways Anderson kept the factory open and profitable during and after the Civil War.

One of Anderson's partners in the Tredegar Works was John Tanner. During 1861, John Tanner's son William was brought in as a partner. In 1865, William Tanner left the Tredegar Works and bought another local machine shop known as the Metropolitan Iron Works. Tanner was soon joined by Alexander Delaney, who had been foreman of Tredegar's locomotive department from 1854 until 1860.

The firm known as Tanner & Delaney Engine Works began building an extensive line of woodworking and agricultural equipment. Portable and stationary steam engines, sawmills and other woodworking machinery, and threshing machines made a large percentage of the firm's production. During 1881, the company suffered a fire that destroyed the works, but the factory was rebuilt and expanded.

Tanner & Delaney introduced pole road locomotives into the product line during the 1880s, making Tanner & Delaney one of several companies that used Cole's patent. In 1882, W. E. Cole of Montgomery, Alabama, patented a small logging locomotive that used a system of gears, sprockets, and chains for the drive system. The wheels used on these locomotives were concave and straddled "poles" laid down for track. These poles were simply trees with their limbs stripped off. This type of track was known as a "pole road" and proved to be popular with southern loggers from the 1880s to 1900 as an inexpensive way to build tracks into the woods to harvest timber. Tanner & Delaney produced two sizes of pole locomotives: a double cylinder 7" x 12" locomotive and a single cylinder 8 1/2" x 10" locomotive. It is curious that Tanner & Delaney manufactured a single cylinder locomotive with the inherent difficulty in starting a single cylinder steam engine on top dead center.

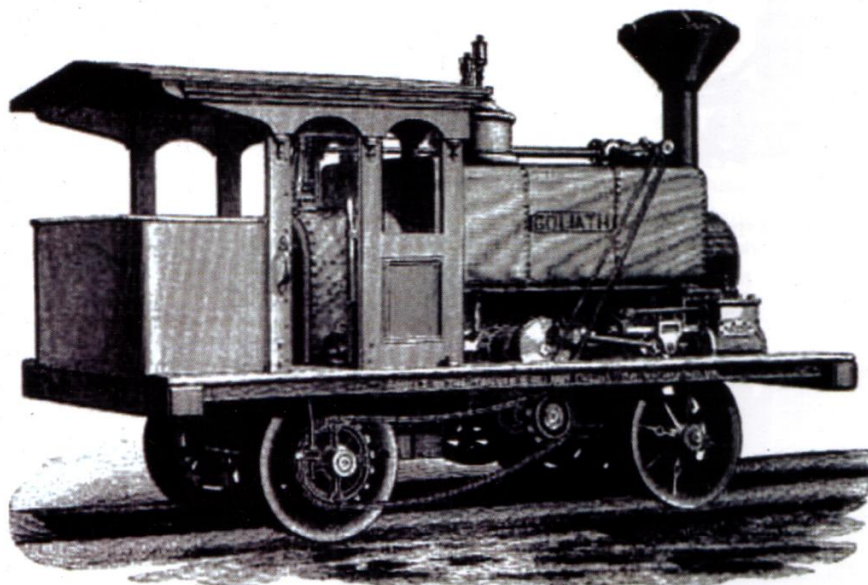
Another curious feature of Tanner &

Left: Tanner & Delaney produced pole road locomotives such as the one depicted in this catalog illustration.

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THE TANNER & DELANEY ENGINE COMPANY.

Pole Road Locomotives.



Above Cut represents the Pole Road Locomotive as constructed by us under Letters Patent granted to W. E. Cole.

Pole Road Locomotives, of the pattern constructed by us, are the only ones that are of any practical value, or designed on proper principles for the work in which they are to be employed. They are built under an arrangement with the patentee, W. E. Cole. The accompanying cut of the locomotive will give a very good idea of its general design and appearance. The Boiler is made of the best selected homogeneous steel plates, and is thoroughly tested to carry a high pressure. The frame work is of wrought iron and steel, and is very substantial and heavy. The driving wheels are thirty inches diameter on the tread, and are massive and strong. The wheels are each driven separately by a chain having a breaking strain of over twelve tons. Motive power is transmitted from the Crank Shaft of the Engine to the Master Shaft on which the driving sprocket or chain-wheels are keyed, through a spur and pinion of large pitch and face, properly proportioned to resist all strains. The Engine Shaft, Master Shaft and Axles are all of the best steel. The Axles are mounted on a double spiral spring, and are so arranged in the axle-box bearings that they can be adjusted for any stretching in the chain. A first-class Governor controls the speed of the Engine, which is about five

Delaney steam engines was the lack of cylinder drain cocks. Most steam engine builders by this time were building engines with drain cocks on their cylinders to enable the engineer to drain condensed water from the cylinders before reaching operating temperatures. Early steam engines did not have drain cocks; the engineers had to be more careful when warming the engine up, or damage could occur to the engine from a "water slug" in the cylinder. Tanner & Delaney touted their lack of drain cocks as allowing more water into the exhaust, therefore reducing the risk of sparks! More than likely, the company tried to make the feature sound attractive so as to make their engines a few dollars cheaper and more competitive in the marketplace of econo-

my-minded sawmill operators.

One other amazing feature of Tanner & Delaney pole locomotives was the use of a governor, which was mounted horizontally in the steam pipe over the saddle tank. This makes Tanner & Delaney one of the few manufacturers to use a governor to limit the engine speed. The later catalogs of Tanner & Delaney featured a large section on their pole road locomotives and included two pages devoted to the construction and care of a pole road. A typical catalog offered a section of testimonials from users of Tanner & Delaney products over the entire South. At least two pictures have survived that show the company's locomotives at work in the swamps of Mississippi and Alabama.

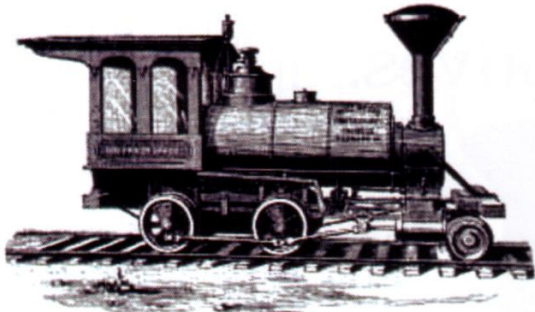
By 1886, Tanner & Delaney was offering—in addition to the firm's popular gear-driven pole road locomotives—conventional rod-style locomotives for industrial use in "Logging, Mines, & Furnaces." These locomotives were built for steel rails and were offered with and without leading trucks. This was a foreshadowing of the company's product line in later years. The partnership began experiencing difficulties toward the late 1880s. The firm had grown too rapidly, and the original partners lost control. Alexander Delaney left the company, and, by 1889, he had started another local partnership, Tappey & Delaney, which built a similar product line. This firm proved short-lived.

William R. Trigg assumed presidency of the old Tanner & Delaney Works and decided to press the company exclusively in the direction of locomotive manufacturing. The business was reorganized in 1887 as Richmond Locomotive and Machine Works (or Richmond Locomotive Machine Works) and continued to grow under different leadership. It eventually became part of American Locomotive Company (ALCO). By the time ALCO's production was moved northward in 1927, approximately 4,500 locomotives had been produced at the Richmond plant.

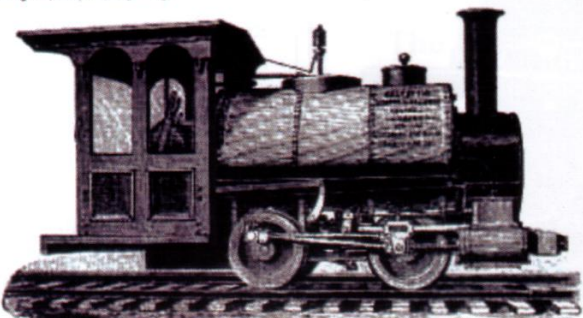
Happily, at least one Tanner & Delaney steam engine has survived to modern times. In 1982, members of the Shenandoah Valley Steam & Gas Engine discovered Tanner & Delaney portable engine #918 on the side of a mountain in the Shenandoah National Park, officials of which loaned the engine to the Association and permitted them to remove and restore the portable. In December of 1982, volunteers cleaned a trail approximately two miles into the woods and towed the engine from the underbrush with a bulldozer. The engine is now restored and is displayed at the association's annual show at Berryville, Virginia. The removal and restoration of this engine proves the dedication of steam enthusiasts who are intent on preserving rare examples of machinery.

There are persistent rumors of an existing Tanner & Delaney pole road locomotive in North Carolina, but there seems to be no hard evidence for this engine. The late Robert L. Johnson told me that all that was left of it was an old boiler in a swamp—definitely not a complete locomotive. Brad Kelley has confirmed that a stationary Tanner & Delaney engine is at the

THE TANNER & DELANEY ENGINE COMPANY. 39



NOTE.—We have in preparation a special Catalogue giving full specifications of our Narrow Gauge Locomotives for Logging, Mines, Furnaces, and other work, and shall be pleased to forward one to any interested party.



Richmond, Va., N. C., May 18th, 1886.

THE TANNER & DELANEY ENGINE CO., RICHMOND, VA.

Dear Sirs—Yours of the 15th to hand, and take pleasure in replying to your inquiries, as follows:

Gauges of track, 22 inches, length, 12 feet, weight of cast, 3,000 lbs. each, usual speed, 12 miles per hour, weight of fuel, 100 lbs. per hour, 5 cord water used in 24 hours, one gallon, weight of iron track, 20 lbs. per yard, number of cars loaded at time, 2, loaded with a 2 ft. 6 in. iron mine, 100 lbs. each, of every mine weight in bags, 400 lbs. give the radius of the sharpest curves, but have them very sharp, consequently, allowing an ordinary track car to run around them. We have no trailing of locomotives. Taking everything in consideration, we think the Locomotive a fine piece of machinery, combining features of workmanship with durability, and deem it worthy of high recommendation.

The full order to hand yesterday, and I give satisfaction, for which accept thanks.

Yours very truly,
LUKE B. SMITH.

CLARKSVILLE, Va., 17th May, 1886.

Tanner & Delaney Engine Co., Richmond, Va.

Gentlemen—Replying to your inquiry contained in your letter of the 15th inst., beg leave to say that we have used two locomotives built by us, the "A. L. Shepherd" and "E. T. D. Mayers," which have given an entire satisfaction, doing all they were represented to do, and being run at an hourly expense.

The "Shepherd" has been in constant daily use for about seven years, the "Mayers" for about four years, and they are "tip-top" engines still. The track is built of wood, is ten miles long, steep, and four-half feet wide, the radius of sharpest curve is about fifteen degrees, and the heaviest grade one foot per mile. Our average loads are twenty to twenty-five tons, we make two trips per day, and speed seven to eight miles per hour. The heaviest engine we have is the Clark and radius of keeping same in order, I cheerfully recommend your engines, especially where long trailing has to be done, and where engine capacity to haul or haul for any length of time.

Very respectfully yours,
I. T. GASKINS, Manager.

DANIEL, S. C., June 10th, 1886.

Tanner & Delaney Engine Co.

Dear Sirs, " " " Concerning the Locomotive bought of you, we are well satisfied in full capacity. We only know that it worked nicely, and was never out of order during the time we ran it. We had two fire-brick engines in charge of it at different times, and both of them said they never saw a better locomotive. We never had the slightest dissatisfaction here.

Yours very truly,
J. W. BEANLEY, Pres. F. L. S. E.

The Richmond firm also built railway locomotives as seen here.

Richmond Locomotive Machine Works,
RICHMOND, Va.,
BUILDERS OF LOCOMOTIVES,
STANDARD OR NARROW GAUGE,
adapted to every service.
ENGINES AND BOILERS

[15 to 200 H. P.]

FOR ALL PURPOSES.
COMPLETE STEAM PLANTS
FOR FACTORIES AND MILLS.
IMPROVED SAW MILLS,

capable of cutting 5,000 to 30,000 feet of lumber per day, with patented devices for accurate and rapid work.

A LARGE LOT OF
Small Engines & Boilers
 from 4 to 10 H. P., "Tanner & Delaney," for sale low to close them out.

Write for catalogue and estimates on your wants.

W. R. BURGESS,
 Salesman for North Carolina.
 D&W Greensboro, N. C.

Somerset, Virginia, showgrounds, although he thinks it might have come from a portable engine, and that a second stationary engine was still in existence, at least a few years ago, in a private collection.

From Both of Us

So how did Butterworth portables wind up having Tanner & Delaney engines? Thanks to the plethora of online sources available today, we can easily answer the question. Beginning in August and continuing through October of 1888, Tanner & Delaney ran newspaper ads stating, "A LARGE LOT OF Small Engines & Boilers 4 to 10 H. P., 'Tanner & Delaney,' for sale low to close them out." By December of 1889, Butterworth was buying ads stating, "Sole Manufactory of the Butterworth Patent SELF-BINDING THRESHER, SOUTHERN SPECIAL and WESTERN SPECIAL Threshers, ENGINES, Lever and Railway HORSE-POWERS." Presumably, the "ENGINES" were Tanner & Delaney portables. By 1895, the Butterworth firm had redesigned the boiler, the wheels, and the flywheel, and, in 1896, the New Jersey manufacturer announced its "new" portables that happened to have "old" Tanner & Delaney engines on board. The new Butterworth portable bore some resemblance to the Watertown portable, as explained in *E&E* for August and September of 2013.

Contact southern steam authority Mike McKnight at 925 McKnight Loop, Mason, TN 38049; e-mail: steamdaddy75@yahoo.com

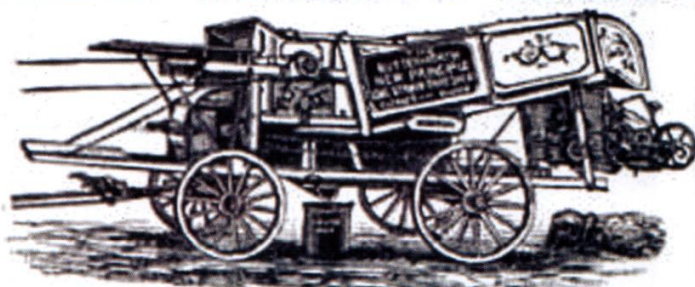
Contact steam historian Robert T. Rhode at 990 W. Lower Springboro Rd., Springboro, OH 45066; e-mail: case65@earthlink.net

Left: The Daily Evening Patriot of Greensboro, North Carolina, for August 6, 1888, was one of several newspapers that carried this advertisement from the Richmond Locomotive Machine Works announcing a close-out sale of Tanner & Delaney engines.

Below: Page 24 of the Farm Implement News Buyer's Guide published in December 1889 carried this advertisement listing "ENGINES" for sale by the New Jersey Agricultural Works.

NEW JERSEY AGRICULTURAL WORKS,

TRENTON, N. J.



Sole Manufactory of the Butterworth Patent
SELF-BINDING THRESHER, SOUTHERN
SPECIAL and WESTERN SPECIAL Thresh-
ers, ENGINES, Lever and Railway HORSE-
POWERS. Also Latest Improved

CIDER MAKING MACHINERY,

Including the New Patent Double Power Champion Press, Jersey Apple Grinder,
and other Cider Making Fixtures.—Correspondence Solicited.