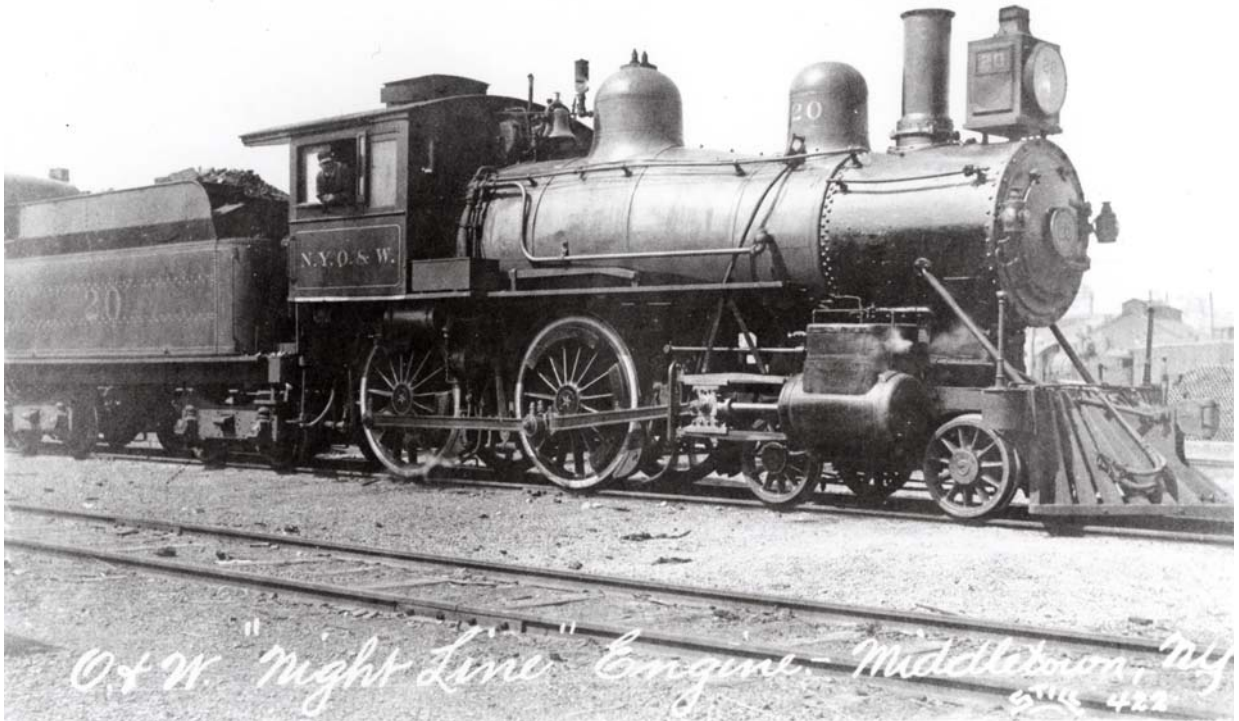


Modeling the O&W
American Standard
N.Y.O.&W Ry. Class A 4-4-0

A Model for the "Early O&W" – Part I
By
Mal Houck



Here in an historic view, posed at Middletown, is the "lead" engine No. 20 of the Cooke Locomotive Works O&W Class A 4-4-0's. This is an early photo showing No. 20 nicely dressed out with what appears to be a "Russia Iron" boiler jacketing and carefully applied, but minimal, decoration. The tender still retains it's Fox (or "Fox Style") trucks, and notice too that the headlamp has been electrified. The turbo generator is located immediately behind the bell atop the boiler, and the ever frugal O&W shop men have not gone to extravagance of replacing the old carbide headlamp with an entirely new Sunbeam lamp, but rather have wired it for electrical operation within the old casing. The Dressel marker lamps still appear to be oil lighted. Along with numerous Parlor Cars, and other passenger cars, the O&W shops went to considerable effort to electrify the lighting in the O&W fleet of steam engines.

In the September 1982 Observer I wrote an article describing the work done to create an O&W Class A 4-4-0 starting with a PFM brass import of a Manchester Locomotive Works prototype. Current producer Bachmann, has brought to the market a Richmond Locomotive Works 4-4-0 which is quite easily detailed out to more than adequately depict an O&W Class A 4-4-0, and in efforts that are far less demanding than my earlier rebuild. So far as Richmond, was a component of the ca. 1901 corporate consolidation that created the American Locomotive Company, its locomotives bear a "family resemblance" other ALCo products; -- including those of the Cooke works, of Patterson, New Jersey, where the O&W Class A engines were built. As such, it is a more than suitable candidate for a model of an O&W Class A 4-4-0. A brief summary of O&W Class A locomotive specifics follows.

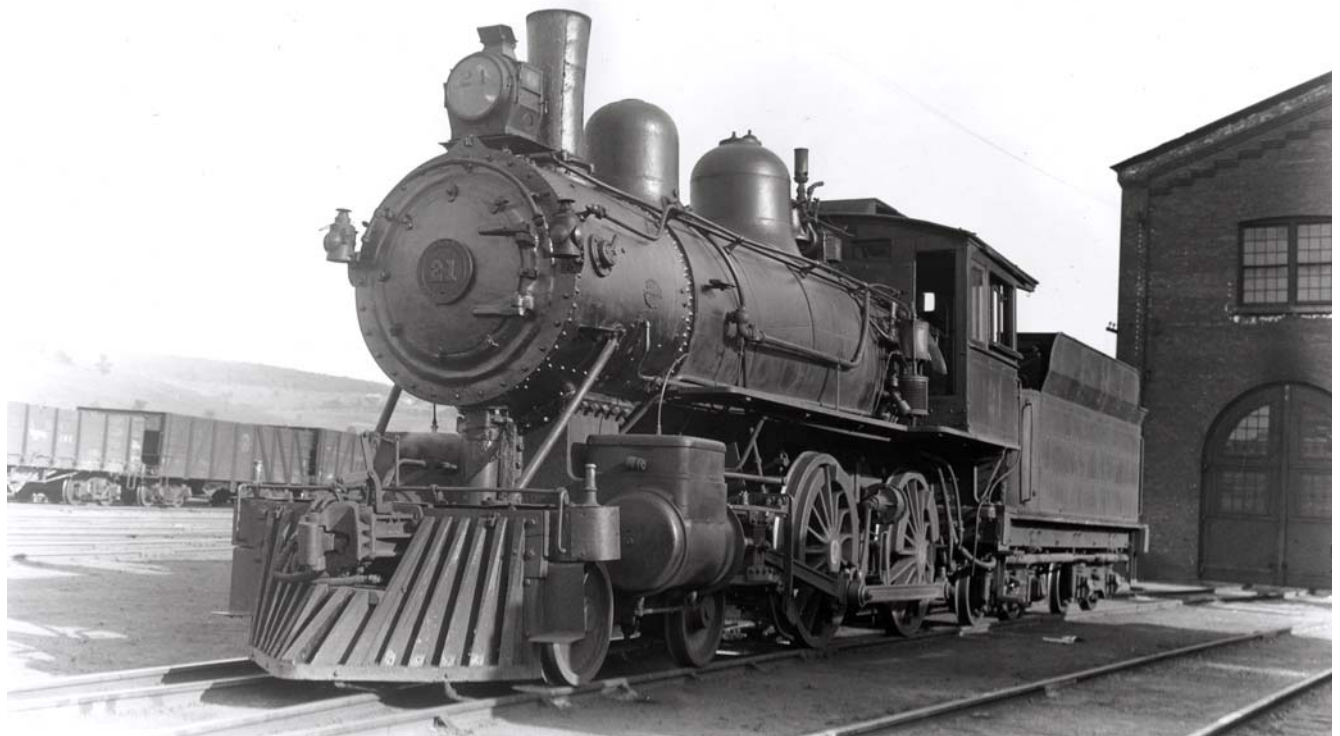
Class A 4-4-0's in their time

The O&W Class A 4-4-0's came to the O&W in two different "batches" of two engines, at two different delivery times, with a single engine of revised design sandwiched in between. According to the roster compiled by Gerald M. Best for the Railway and Locomotive Historical Society Bulletin No. 40 (May 1936) and later published in Railroad Magazine in a three part series for the months of May, June and July 1943 the specifics of these engines were:

NYO&W No.	Builder	Shop #	Date	Drivers	Pistons	Tr .Effort	Disposed
20	Cooke	2476	1899	69"	18"X 28"	20,100	12/31/32
21	Cooke	2494	1899	"	"	"	"
22	Cooke	41333	1907	"	"	"	"
23	Cooke	44800	1908	"	"	20,100	"
24	Cooke	44801	1908	"	"	"	M&U #6 7/24/35

Of the first two engines from Cooke in 1899, No. 20 and 21 weighed in at 91,000 pounds, then No. 22 was a slightly redesigned version of 1907 but, while appearing identical, it had an overall weight on drivers of 94,000 pounds. The last two members of the Class, built in 1908, also tipped in at the 3,000 pound greater weight; -- but all with identical tractive effort.

As "smaller" wheelbase and wheel arrangement locomotives than as were designs of later vintage, and of an historic design, one might be led to assume the O&W intended that these Class A 4-4-0 engines were destined for the lighter duty of branch line service. Nothing, however, can further from the truth.



Posed here outside the Norwich shops is No. 21, still with Fox tender trucks, but also with an electrified headlamp; -- and also here the formerly carbide lighted headlamp has been "salvaged" and simply refitted for electric operation. From the appearance of electrical conduit to the marker lamps, those too have been converted to electric illumination.

The O&W Class A 4-4-0s had a nominal overall weight (with tender and set for service) of 71 tons but, more importantly, the heavier of the Class (No. 22-23-24) had driving axle loadings of 47,000 pounds (Cooper E-47). Among design considerations in determining the loads that a [any] structure may carry, the loading and the concentration of load is more (immediately) important to engineers than the overall weight to be borne by that structure. Railroad structures (bridges) have traditionally been designed and load rated according to the "Cooper's Loading" schedules. A Cooper's Loading is based upon the axle loads of two 2-8-0 locomotives (each with a 4 driving axles along an equally spaced wheelbase) and 30 ton hopper cars (each riding on 4 axles) and is expressed in an alpha-numeric shorthand of "E-X" where "X" = the number of tens of thousands of pounds load. As an example a Cooper's E-30 is a rating of an axle load of 30,000 per axle; E-40 = 40,000 pounds per axle – and so on. There is some latitude so far as there is implicit in a Cooper's Loading is a certain margin of safety (to account for the operating phenomenon of "Dynamic Augment;" – the pounding and rotational stresses of the reciprocating side and main rods). Even though steam locomotive designs advanced well beyond the early design 2-8-0s upon which the Cooper's Loading formulary is based, those loading limitations served well for heavier and larger engines as the designs advanced through the maturity of the steam era.



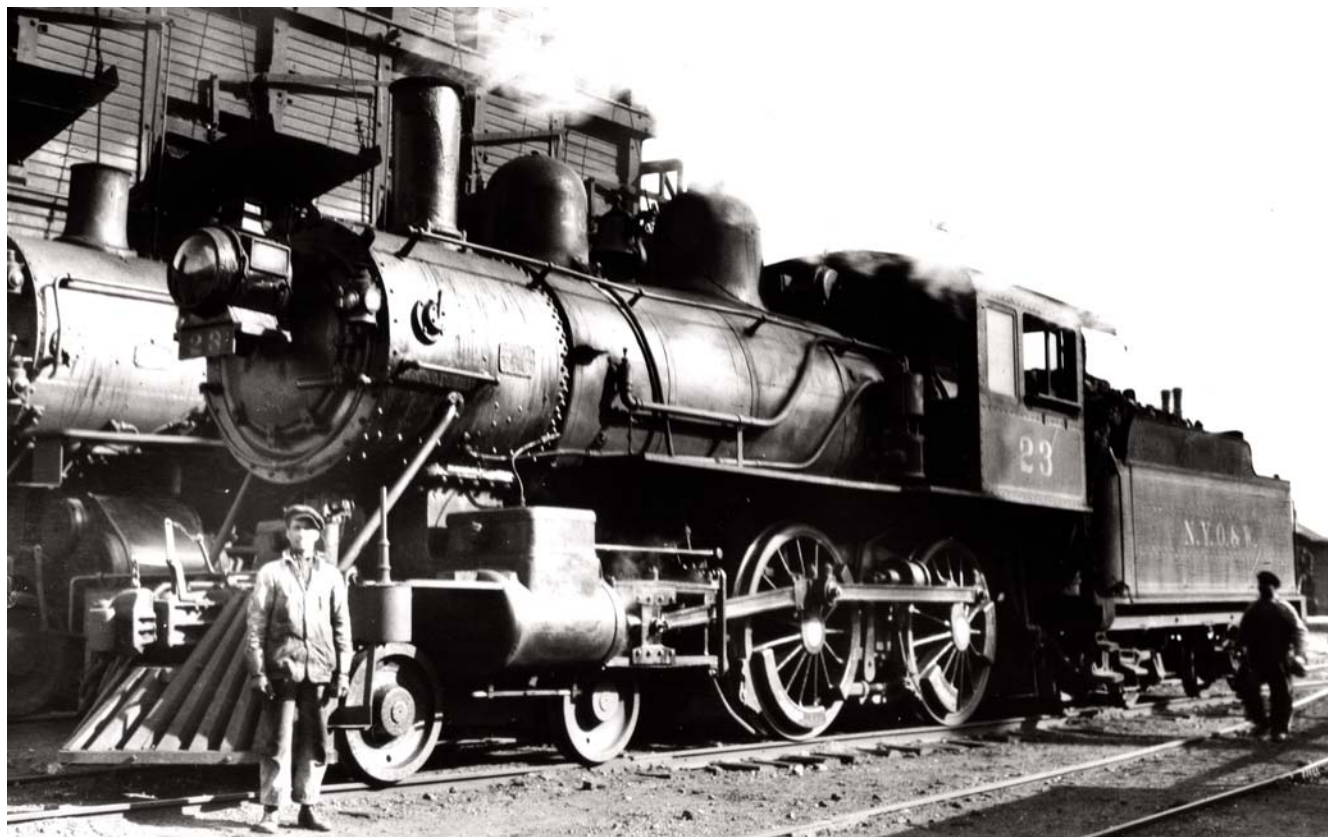
Often seen and often published is a cardstock mounted, small format, builder's photo of No. 22 from Cooke Locomotive Works of Paterson, New Jersey. No. 22 shown here, and No.s 23 and 24 were of the revised design weighed and extra ton and one half over the preceding 1899 Class A engines. Notice that an engineer of this era had to be a strong and well muscled man; -- for the "link" just above the right running board is the link from the "Johnson Bar" to the lever and cam which changes the position of the Stephenson Valve Gear. To call the Johnson Bar a "Reverse Lever" is somewhat misleading since it really is a "Valve Position" lever. While the valve gear is changed in its position to cause the engine to operate in reverse, the Johnson Bar also changes the position of the valves while in operation (in either direction) to conserve steam, and to operate more efficiently at speed: -- when the engine is producing its highest horsepower. The muscle power was needed in order to move the working and moving valves against the operating pressure and expansive properties of the steam intended to be regulated. Later developments assisted the engineer in this chore by means of the so-called "Power Reverse" which was an air operated piston that actually moved the valve settings; -- the engineer then only operating a proportional control valve [connected to the proverbial "Johnson Bar"] that admitted or released air to the power reverse piston.

In a survey of all railroad bridges in the State of New York, dated June 30, 1891, conducted and compiled by the State Board of Railroad Commissioners rated each bridge in terms of "Dead Load" in pounds per foot [of length] and "Moving Loads" only in the "units of "One Consolidation Locomotive" or "Two Consolidation Locomotives." So far as

that survey went the shorthand of "Coopers Loadings" had not yet been dedicated, but the "Yardstick" in a term of units of "Consolidation Locomotives" had been reached. A few more years would be required to refine the methods of structure rating and nomenclature.

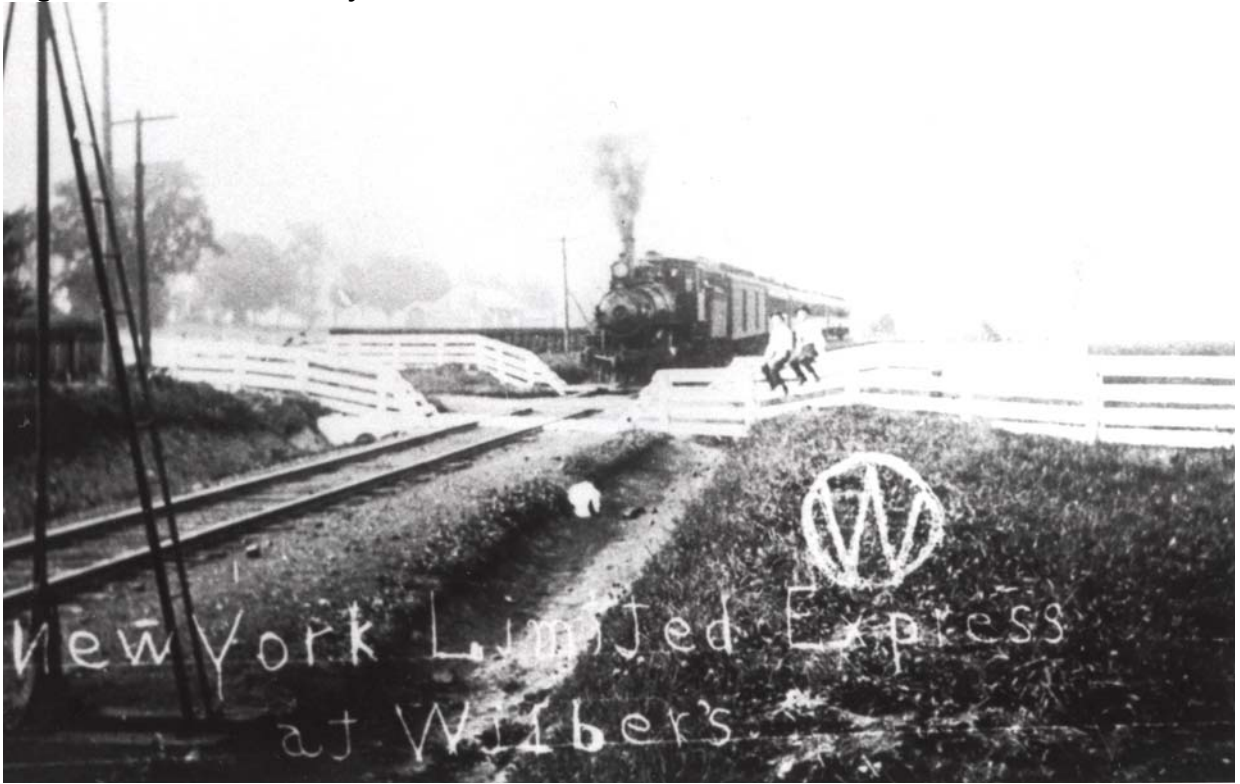
The O&W Class A 4-4-0s, at 47 tons per driver, and over a shorter wheelbase than other engines of comparable weight [and shorter than the optimum wheelbase implied by the 2-8-0 loading model from which the Coopers Loading was derived] compute to a Cooper's Loading of E-47. In the era of the turn of the [last] century many of the O&W main line bridges were Cooper's E-30 or E-40; -- the latter design then being marginal for a 4-4-0 of Class A specifications. Many of the branch line bridge structures and tracks were of a lesser rating; -- suitable, according to the aforementioned 1891 survey, for only a single Consolidation type locomotive with a longer driven wheelbase and more axles over which to spread the load. Replacement of lesser bridge structures of wood-composite design and wrought iron would postdate the delivery of the Class A engines; - - awaiting until the massive capital improvements project undertaken by the O&W contemporary to the double tracking begun ca. 1908-1910, and onward.

Accordingly, the real usage for 4-4-0 engines, not being so light afoot as might be mistakenly assumed, was in main line service and then as what became known as "dual purpose" power; -- for both freight and passenger/mixed trains. The last of the O&W Class A engines were late built in 1908 for this wheel arrangement, upon a perceived need by the O&W managers for heavy 4-4-0s for the then robust and system wide passenger service of the O&W that had been and was continuing to grow annually.



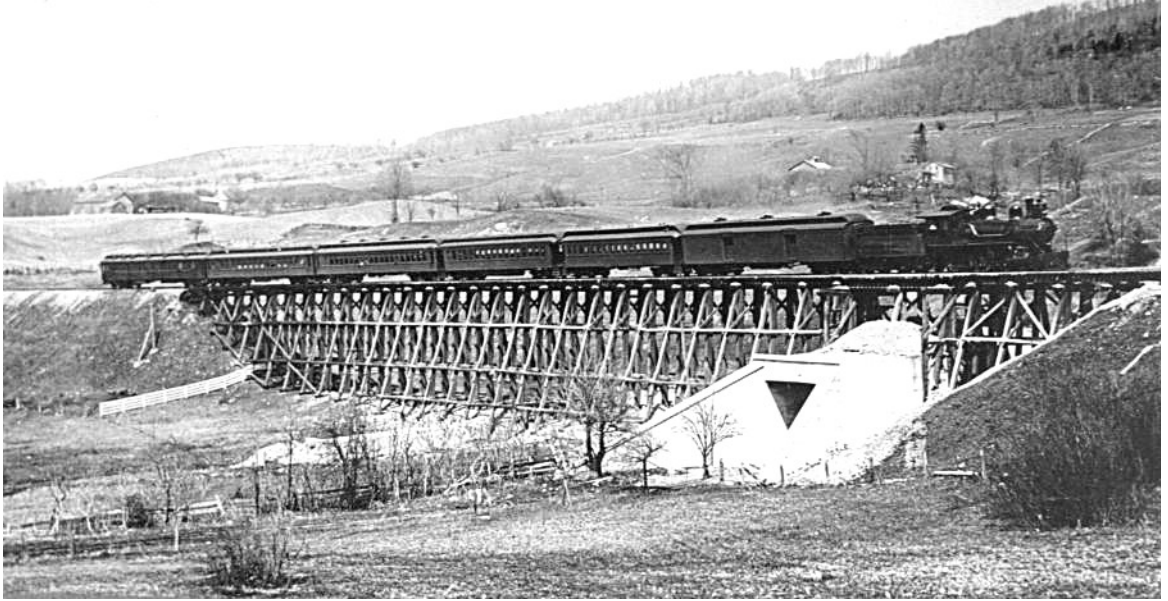
In an unidentified (and uncertain) location is No. 23, the tender for which has been outfitted with leaf spring trucks of some sort. Leaf springs came to be favored for use in trucks carrying caboose, or other types of "rider," cars since they provide for and gave a somewhat easier ride than coil sprung trucks. The additional friction between the load bearing leaves in a leaf spring truck served to provide some

damping that did smooth the ride. Since the fireman is continually stepping back and forth. . . and forth and back across the bridge plate decking between the cab and tender an easy ride for the tender is very desirable for simple reasons of safety and sure footing for the fireman. The "Mystery Engine" hard beneath the coal dock in this image does not appear to be an O&W engine, so far as it has a Vaulclain style steam chest, suggesting that it could be a Lackawanna engine. Whatever the occasion, and wherever t'was, the handsome chap posed out front is justifiably proud of the smart look of his engine although it seems his tailor may have cut his trousers a bit short!



Now Southbound (according to the O&W timetable protocol) to New York City is the "New York Limited" as shown in this homemade "postcard" and handwriting annotated image. The O&W facilities at Wilbur's consisted of only a simple structure converted to an office for train orders utilizing a "Standard Toolhouse" design. The purpose of Wilbur's was to control traffic over the grade at Smyrna Hill where there was located a 90+ car passing siding used when trains were required to "Double the Hill." As can be imagined, it is certainly one thing to cut a freight train and "double," then while it is quite a different story to do this operation with a passenger train! Bundles of timber, loads of coal, and barrels of crackers and other merchandise will not complain about a delay caused by doubling, but passengers surely will...not to mention the disruption visited upon passenger schedules. The Class A 4-4-0's were more than powerful enough to handle both Eaton Summit and Smyrna Hill.

Even more specifically, the Class A engines were purchased to handle the only notable intercity passenger train originated and operated over the O&W rails; -- and that was the northbound Train 5 and southbound Train 6 (in the contemporary timetable designation). Sometimes called out as the "Night Line" this train was also known as the "Chicago Limited" on its Northbound (westward) leg, and then as the "New York Limited" on the Southbound (eastward) run. To further complicate, if not confuse, the train was also known (perhaps "generically") as the "Atlantic Limited." This was not an especially unusual progression since many trains, on other lines with more involved routes and connections than on the O&W, were known by more than one name over time as routes and scheduling changed.



This image, provided courtesy of John Taibi, shows the “Atlantic Limited” (Train 6 – Southbound) crossing Bridge 332, known as “Harps Trestle” or “Harp Viaduct,” in John’s picturesque Munnsville. The 400 foot long and seventy-five foot high wooden trestle carried the Northern Division main line on a gently curving alignment. Here can be seen the initial stages undertaken to fill this impressive structure, whereby an underpass has been formed and poured in concrete, ca. 1908, to allow the new county road, known ultimately as “Harp Road” to pass beneath and connect with another roadway at Pratts Hollow. The O&W performed this sort of improvement at numerous locations along the line as the early wooden trestles of the Midland were filled in. The O&W civil engineers have calculated the final angle of repose for the fill and extended the underpass and wing walls to accommodate the filling operation and allow for a clear passage.

The O&W portion of the “Night Line” (as originally known) changed its routing several times over its life, until discontinued in 1927, after which time it no longer appears in the O&W timetables.

The Class A engines were regularly assigned to the Northbound “*Chicago Limited*” and its southbound counterpart “*New York Limited*” which represented the only O&W Passenger trains of the era that featured sleeping cars and dining cars (meals were fifty cents extra(!)); -- obviously needed for the lengthy scheduled routing [though, at different locations and at different times, this train was handed off to the New York Central for the next leg following its travel over the O&W]. On a routing through Eaton to a connection with the West Shore (and originally to the west via Suspension Bridge) earlier Brooks and Rome Locomotive works engines could not handle the 1.86 per cent grade to Eaton Summit. The dispatch of the Class A engines on the “Night Line – Limited(s)” ended the previous operational difficulties with the engines of the lesser 17,100 pound tractive effort. Additionally, and whereas many other “modern” steam locomotive wheel arrangements were only at the cusp and beginnings of a matured development, the 4-4-0 design, in dating well back into the preceding Nineteenth Century, was a well developed and understood locomotive configuration.

While not as muscular as later and larger engine designs with greater tractive effort(s), 4-4-0s were desirable since they generally possessed good characteristics of acceleration, and that demonstrated capability to handle trains over Eaton Summit. The M-K-T (“Katy”) employed late built and very modern 4-4-0’s well into the 1930’s in varied services on heavily built branch lines; -- both in scheduled and mixed train service. The Boston & Maine employed their Class A-41 engines through the 1940’s in commuter service from North Station, where short headways and frequent rush hour

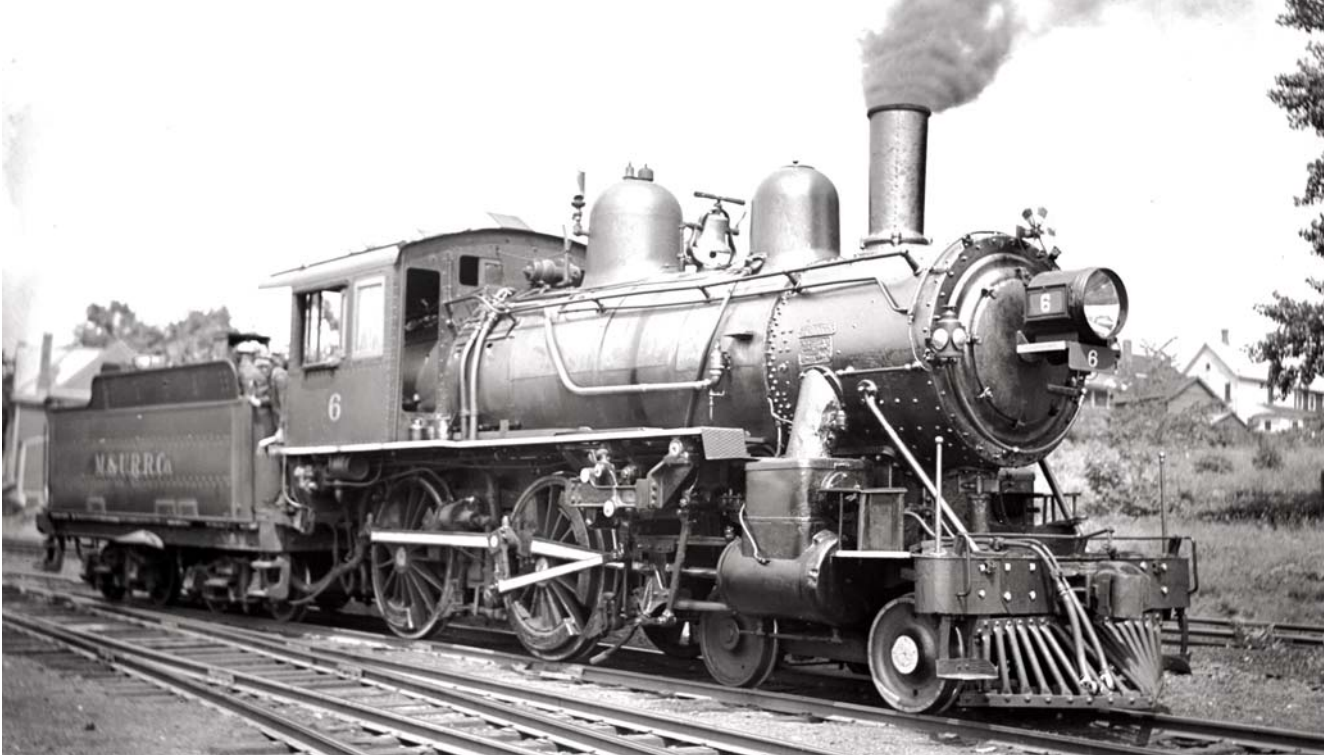
service demanded good train acceleration. When the PRR Philadelphia region commuter lines replaced the heavy 4-4-0's previously used, the railroad managers there found that schedules and headways had to be altered to accommodate the fact that diesels couldn't accelerate the commuter consists as rapidly as the retired 4-4-0's!

Built and delivered to the O&W prior to the widening use of superheated steam as a means for greater operating economy of steam locomotives, all but one of the Class A engines retained its saturated steam output until consignment to the scrap lines. Through the era of the First World War and on into the 1920's the O&W shopped through a substantial number of its saturated steam engines for conversion to superheated steam operation; -- all Class E, Class W, Class L, and Class P engines underwent rebuilding and reconfigurations to emerge from the AV shops with Superheater Company superheaters and new piston valve steam chests; -- along with other alterations. Only No. 24, was the single Class A engine to benefit from superheat conversion, and it also got Baker Outside Admission valve gear; -- though in a somewhat peculiar choice the shop crews retained the original steam chest and slide valves.



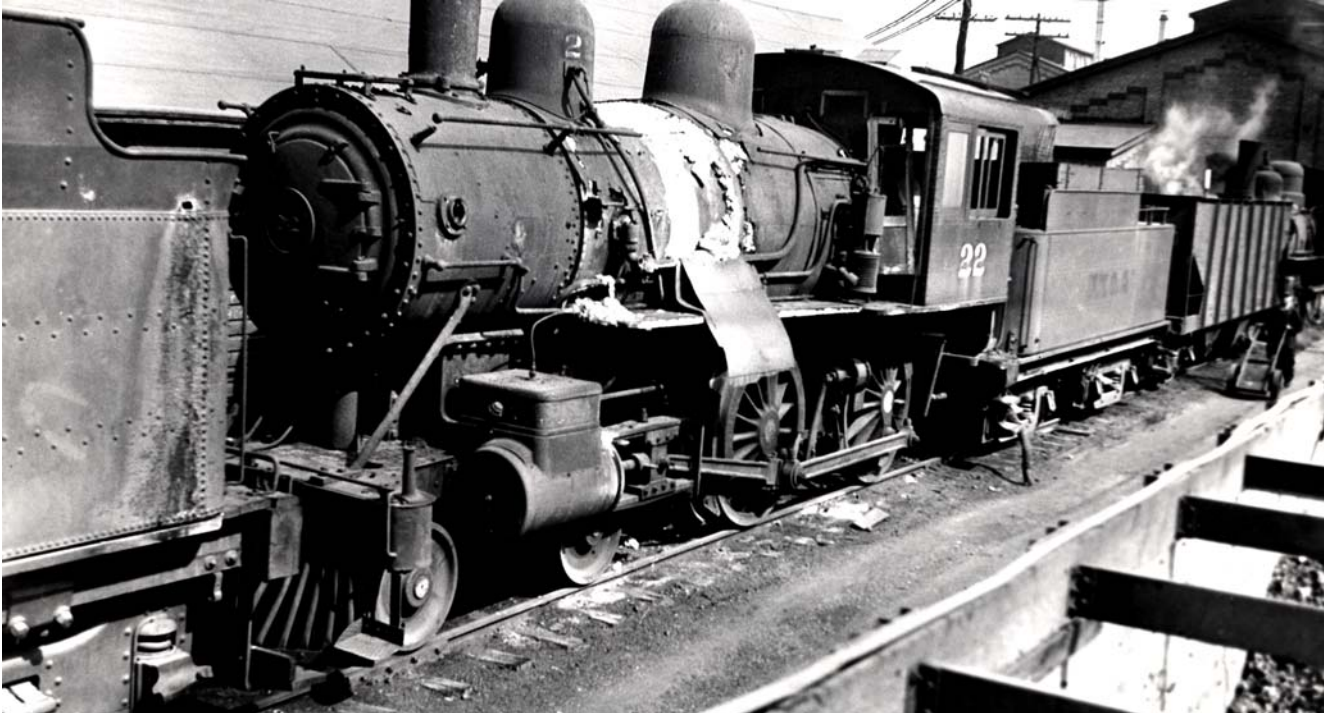
This image shows No. 24 in an early configuration at Middletown (with the Dodge Coal Trimmers just visible in the left background), with it yet to receive and electrified headlamp, as witnessed by the lack of a turbo generator between the steam dome and cab front.

After the delivery of the Class E 4-6-0 engines from Brooks in May 1911 the Class A engines were displaced from duty on the "Night Line – Limited(s)" and were shifted to other service. The Kingston Branch was [relatively] late built, coming to service in 1902-1904, but constructed to a more robust structural design standard than other branches. This allowed assignment of No. 24, as well as others of the Class A engines to regular service from Summitville northbound to KN. On certain occasions No. 24 was loaned out to the Middletown & Unionville.



Back and forth a couple of times to the Middletown & Unionville on temporary loan and assignment as that picturesque short line found itself power short and in need, O&W No. 24 was a well known quantity and entity to the M&U when the time came for its disposal by the O&W. Returned to the O&W a last time under O&W ownership No. 24 had burned out grates and wound up in a "Dead Line." Shopped and repaired after a brief slumber the O&W sold No. 24 to the M&U as their No. 6 as shown here just after the transfer of ownership in 1937. No. 24 was the only O&W Class A engine equipped with Baker Valve gear (Outside Admission) and was the sole Class A engine to be superheated. As mentioned in the preceding text, the steam chests were not replaced but rebuilt and remanufactured in the O&W shops with the unusual addition to the tops of the original "D-Valve" chambers. The M&U installed the huge headlamp, and the interesting and peculiar little propeller affair (which was a popular automobile accessory of the time) at the top of the boiler front; -- all to whizz around in the breeze evidently at hand as this historic image was captured.

The O&W Class A 4-4-0's were at the end of a long experience with engines of that wheel arrangement and themselves survived until the 1930's when the O&W began to experience the throes of what would represent the demise of many formerly meaningful services as soon as the middle of the following decade. With many passenger trains, and the mixed trains and milk trains to which they had been assigned most lately during the era of system wide service then being eliminated wholesale, the retention of the O&W 4-4-0's was no longer meaningful and they were soon only so much scrap metal. All but one were retired by 1932, and with No. 24 held out of service until a later sale to the M&U, this all then rang down a curtain on the run of 4-4-0's which dated back to the very founding of the line.



A forlorn No. 22 sits in the "Dead Line" at Norwich awaiting the inevitable burn of the scrapper's torch and the dismemberment into pieces and parts bite-sized for the steel mill furnaces. Already the headlamp, generator and bells have been scavenged, hopefully by frugal and careful shop crews; -- but more likely by souvenir hunters, since the final curtain will soon be drawing down on the steam era and there just won't be any more steam engines that will be able to draw from an accumulated store of salvaged parts intended for such recycling. The tender appears to now be riding on Commonwealth Steel Castings Company trucks, but those too will soon be only so much surplus and scrap iron. No. 22 came to final rest at Norwich, since operation out of the Norwich terminal, on mixed trains and milk runs, was a regular assignment for this engine after it was displaced from its earlier more elegant and important duties on the "Limiteds."

A Model O&W Class A 4-4-0.

I receive E-mails with considerable frequencies inquiring about "converting" or "bashing" models to make representative O&W steamers. As for any clear favorable response, the answers unfortunately are few. O&W steam engines are so distinctive, with clean high boilers, proprietary designs not resembling many more common steam engines of the steam era, and with those very features which set them apart from so many others, as to defy expedient attempts to easily craft reasonable facsimiles. The many brass O&W locomotives imported by Nickel Plate Products are now of a time long ago, and although some examples show up from time to time on E-bay, but those appearances too are a rare occurrence.

With the recent production of "Ready to Roll F-Unit diesels, well decorated for the O&W and produced by several manufacturers HO Scale modelers can now easily assemble a credible O&W diesel locomotive roster, but suitable steam engine models still elude all but the most dedicated of locomotive builders, or those who have accumulated a cache of the old brass imports. Despite having a well represented personal collection of O&W prototype steam engines, I'm always in the hunt for those models with characteristics suitable for a little engine "bashing."

That ca. O&W Class A 4-4-0 1982 built model began its life as a brass Boston & Maine Class A-41 4-4-0 model from long departed importer Pacific Fast Mail. The prototype for the B&M model was a Manchester Locomotive Works engine, and as

another ALCo shop, it as well shared the desired features and profile and a family appearance to Cooke locomotives. Without a complete reprise of that earlier article the work, while not especially significant and tending more to details rather than extensive structural work, the creation of my earlier version of an O&W Class A 4-4-0 was time consuming and required some years of background experience, tools and acquired capabilities in working with brass engines to complete. The work needed to detail the Bachmann engine is considerably less involved than my earlier effort.....and that shall be the subject of the second part of this column; -- shortly to follow.

So, now I'll conclude this somewhat lengthier than anticipated column, and reserve the description of "converting" the little Bachmann Richmond Locomotive Works 4-4-0 into a reasonable facsimile of an O&W Cooke 4-4-0. I ran this particular column longer than intended at the outset, but did so in providing an album of historic photo images; -- with one image for each of the class.

In Part II of this column I'll also include an interesting piece of my personal history with the O&W and earlier writings (for the then ten times annually Observer). That is in the form of a letter in correspondence about the article I'd written in 1982. Until then. . .

More Later...

Mal Houck