Since becoming involved in the large-scale model trains hobby, because of a gift from my wife during Christmas of 2001. Then subsequently becoming involved in David Fletcher’s Master-class series of scratch building locomotives (i.e. Master-class 2001 Building a Mason Bogie) hosted by MyLargescale.com, where I first encountered the term “Russia iron.”

The term “Russia iron” refers to the external sheet iron commonly used as a boiler jacket on steam locomotives until roughly the turn of the century (i.e. 1900). The boiler jacket provides a protective covering for the cladding that insulates and thus reduces heat loss from the actual boiler. The same material was also used as jacket material on domes and piston housings too.

Regarding the term “Russia iron” about the only thing that most will agree on is the fact that it was produced in Russia and imported into the United States. Most everything else regarding this product always provides fertile ground for lively discussion. For example: is the proper term “Russia iron” or “Russian iron”, well even in the course of my investigations I found it referred to in both forms in contemporary documentation, so even back then there wasn’t agreement on terminology; what color was it, here again it’s hard to tell because most if not all photographic evidence is in black & white photographs which to me provides really nothing more than a SWAG (scientific wild-ass guess) as to what color it was, to complicate matters further in the past and even still today some manufactures of model trains use some light shade of blue to imitate its supposed color.

Now I don’t pretend to have found any definitive answers to the many questions surrounding “Russia iron”, the following is nothing more than various assorted facts that I’ve been able to cobble together in a quest to learn. Hopefully others may find it helpful and interesting. One thing that surprised me was I found more information regarding the topic in the history of iron & steel production in the U.S. than anything regarding the railroads.

In all of the following material I found access to it via the Internet and I’ve tried to cite where I found the information and provide a link back to it just incase someone would like to explore the source further or crosscheck my interpretation. Some places I’ve quoted/excerpted and in others I’ve paraphrased what I found. In other areas it’s just downright ragged, as time passes hopefully I’ll continue to refine the format and update it as additional information is found.

There is a companion file to this one (i.e. Planished_Iron_Patents-02.pdf) contained in this file are copies of all the U.S. patents that belonged to the Rogers & Burchfield Co. and the W. D. Wood Co. Limited, that I’ve thus far discovered in my research. If and/or when I encounter additional patents that relate I’ll update the file.

In my research so far I’ve found that there were primarily two individuals most closely associated with producing what was most commonly called “ imitation Russia iron” in the United States. One was an English born ironmaster named William Rogers Sr. and the other was an American born individual named W. D. Wood. So most of the documentation that follows revolves around the history of these two people. Not surprising their natural histories are intertwined.

As to the possible reasons for, and timeline surrounding the reduction in the use of genuine “Russia iron” or U.S. domestically produced “imitation Russia iron” (i.e. planished iron). Were in part due to various railroads moving away from highly decorative locomotives and their tenders to the more modest all black schemes, regardless of what the respective railroad’s reasons were. It must be remembered that from just prior to the American Civil War until well
past the turn of the century, the United States was of a “protectionist” mind set. Which meant that high tariffs were placed on imported goods especially when it came to the iron & steel industries. Add to this the fact that it wasn’t until around 1873-74 that domestic production of planished iron that was on par with the genuine Russian article, and that its production was protected by U.S. patents controlled by a single company i.e. W. D. Wood & Co., Pittsburgh, Penn., which in turn made that cost of that product fairly high. Additionally, in other areas of the iron & steel industry and also in the respective maintenance departments of the railroads it was being demonstrated that a combination of a lower grade sheet-iron and paint provided a lower initial cost and a longer life cycle, thus a better return on the investment, and as always the “bottom line” is paramount in any business.
TRADES AND OCCUPATIONS

With the erection and starting of the iron works came a considerable number of persons following the various avocations incident thereto, such as manager, engineers, rollers, heaters, shinglers, sheares, etc.

Kiskiminetas Iron Company--- The certificate of organization of this company is dated September 20, 1855, accompanied with the declaration of the stockholders or partners that they wished to become a body politic, under the act of assembly "to encourage manufacturing operations," approved April 7, 1849. The original number of shares of capital stock was 500. The rolling-mill was erected in 1856. The prime object at the first was manufacture of nails. That company conveys its property to George W. Cass and Washington McClintock for $40,000 by deed dated December 8, 1859. Its interests and that of Washington McClintock in the property of the company were sold by the sheriff, May 1 and 5, 1860, to Cass and McClintock for $4,100, to whom James P. Speer conveyed his interest therein, by deed, dated December 29, 1866, for $5,564.58.

The mill was operated by Geo. W. Cass & Co. for eighteen months. In 1863, Washington McClintock, William Rogers, Sr., and W.E. Foale leased these works, and abandoned the manufacture of nails and commenced that of sheet iron. Until the destruction of dam No. 2, in February, 1866, these ironworks were operated by water-power, the supply of water having been obtained from the Pennsylvania canal. In August of that year, McClintock and Foale retired from, and Thomas J. Burchfield came into, the firm as active partners, and Thomas J. Hoskinson as special partner, and the name of the firm was changed to that of Rogers & Burchfield. A large engine was procured and an additional waid of rolls laid. Then was commenced the manufacture of the cold rolled iron for which these works became noted. Their capacity was fifty tons per week. The number of employees, including the coal diggers, was 140. The different kinds of manufacture were common, Juniata, Nos. 1, 2, 3 cold rolled, and showcard sheet iron. These were operated almost continuously from 1866 until 1875, when the firm went into bankruptcy. It is claimed that William Rogers, Sr., acquired, in 1872, while in Russia, knowledge of the mode of making Russian sheet iron, and, while thus acquiring that knowledge, was for that cause obliged to make a sudden exit from the czar's dominions. The property belonging to these works consists of two sheet-mills, seven puddling furnaces, one heating furnace, two sheet furnaces, two annealing furnaces, one new steam hammer, two gas-wells, sunk for the purpose of obtaining a sufficient supply of gas for fuel, one of which produces a moderate quantity, one large, seven-feet-stroke engine, two small ones, twenty tenant houses, one other dwelling and store-house, a bakery, other necessary buildings, and a wire suspension bridge across the Kiskiminetas to the railroad siding and coalbank.

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LEECHBURG ROLLING MILLS
The most important industry in the town is the rolling mills, which, under different managements, have been in almost constant operation since 1872. In 1871 Rogers & Burchfield purchased the land on which the works now stand, and in 1872 the mills were built. The plant consisted of six single puddling furnaces, two knobbling fires, one refiner's fire, six heating furnaces, four sheet heating furnaces, three annealing furnaces, two pairs of muck rolls, two pairs of sheet rolls, two pairs of tin rolls, two pairs of cold rolls, one pair of muck shears, two pairs of sheet shears, one blast cylinder with engine complete, five cylinder boilers and one Allen engine of about 350 horsepower. The quantity of finished iron made per month was two hundred and fifty tons the quality of which was equal to the Juniata charcoal iron and number one for stamping. All the other was equal to the best brands of sheet iron. The tin works, consisting of three stacks, were built in 1874. Their daily product was ninety boxes of excellent tin. The number employed in the manufacture of iron and tin was one hundred and fifty. They were suddenly thrown out of employment by the suspension of these works September 19, 1875.

Rogers & Burchfield, who also owned the works at Apollo, had strained their financial resources by the building of the Leechburg mill and the purchase of other property, and were unable to stem the panic of 1874, although they held out for a year, and were forced to make an assignment, Reuben Miller, Jr., of Pittsburgh being appointed assignee.

This failure was most disastrous to the members of the firm themselves; quite a number of local businessmen suffered severely by the suspension, and the loss in business could not be estimated. Mr. Rogers, only a year before [1874], had gone to Russia to try to secure the secret of making "Russian" or planished iron and the result was such that he secured valuable patents which were after the failure bought at assignees' sale by DeWees, Wood & Co., of McKeesport, who also re-employed many of the idle workmen.

The DeWees Wood Company had attempted previously to manufacture planished iron, but had never been very successful, but after the purchase of the Rogers & Burchfield Company's patents they successfully produced a good quality of planished iron, under their old and newly purchased patents.
1873: Late in the year one of the nation’s largest investment houses, Jay Cooke & Company, failed, sparking a nationwide financial panic.

1875: U.S. government reduced the tariff on tinplate to 1.1 cents per pound. As a result English imports of the product rose to 140 percent.

Rogers & Burchfield survived the financial panic, but the reduction of the tariff caused them to declare bankruptcy in October 1876, U.S. District Court, Western District of Pennsylvania

Rogers managed to hang on to the Apollo mill by forming new partnership with Philip H. Laufman, Sara B. McElroy (i.e. Rogers, Laufman & McElroy). The Leechburg mill was bought at auction in May 1876 by J. C. Kirkpatrick.

December of 1877 Rogers was released by his new partners (i.e. Philip H. Laufman, Sara B. McElroy) of any debt incurred, was paid 1,500.00, with a promise of another thousand dollars some time in the future.

Some of Rogers patents on planished iron and on the manufacture of iron were sold at assigns sale at Reuben Miller Jr.’s office on Wood street, Pittsburgh. W. D. Wood bought the planished iron patents. Kirkpatrick, Beal & Company bought others although legal claim came for many with purchase of the Leechburg mill.

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Xxxx – Kiskiminetas Iron
1860 – Cass & McClintock, good quality nails & spikes
1861 – Closed mill because of workers joining the Union Army, Civil War
1863 – Mill reopened late in the year with new partner.
    British born iron maker William Rogers Sr.
    Born: 1817 Wolverhampton, England
    Emigrated to the United States at age 30 (at age 36 became partner)
    Occupational experience: Unskilled puddler’s helper, skilled puddler, sheet roller, machinist, & mill manager.
    Built and ran a sheet-iron mill.

Page 24
Broke ground for new rolling mill at Leechburg, plant producing sheet iron & a new product, tinplate (i.e. tinned iron not solid tin), which turned out to be more rust resistant than plain iron and durable than tin by itself. This technology had come to Britain from mainland Europe by the 1850s. British efficiency in producing tinplate along with the Morrill Tariff Law of 1861, which levied a 10 percent ad valorem protective duty allowed the British to offer the product at very low prices. The American Civil War provided an opportunity spur domestic competition by implementing an emergency tariff of 25 percent in 1862. The tariff continued to hover around 20 percent until 1875. In 1875 the U.S. government lowered the tariff to 1.1 cents per pound.

Google Books
Appletons' Annual Cyclopædia and Register of Important Events of the Year (1896)
http://books.google.com/books?id=k60YAAAAIAAJ&pg=PA214&lpg=PA214&dq=planished+iron&source=web&ots=tcuc2AY5r8&sig=5eD2WlubYMb5VMrsWw-zKS1XjSE#PPA213,M1

Congress (The Tariff Bill)

Portland & Southwestern Railroad (Chapman Timber Company) #2
http://loggingmallets.railfan.net/list/prtlnd2/portland2.htm

Baldwin Class: 16-31/50-1/4-DD, 1
Type: 2-6-6-2
Tank or tender type: Rectangular tender
Build date: December 1910
Baldwin Construction Number: 35785
Ttractive Force: 50,000 lbs.
Boiler Jacket: Planished Iron

Google Books
The Engineering Magazine: An Industrial Review
The Engineering Index
Vol. III – Five Years 1896~1900:
Editor: Henry Harrison Suplee, B. Sc.
Assisted By: J. H. Cuntz, C E., M. E.
© John R. Dunlap 1901
http://books.google.com/books?id=jFADAAAAAYAAJ&pg=PA591&lpg=PA591&dq=planished+iron&source=web&ots=ZpEnz0zJe8&sig=7-9TvOGU1857cyQ7WKO_zEb8tE#PPP15,M1

Page 586
Locomotive Boiler: Coverings
Experiments with Boiler Coverings. Editorial directed to a comparison of mica boiler covering with those of other kinds, in which mica was found superior to any other material. The experiments were carried out in the Mechanical Department of the Canadian Pacific Railway. A diagram showing graphically the results is presented.


Tests of Locomotive Boiler Coverings. George R. Wallace. A letter commenting on Mr. Quayle’s paper which reported on tests on locomotive laggings and indicating the value of the commercial coverings.

Page 590–591

Locomotive Jacket: Painted vs. Planished

Painted and Planished Locomotive Boiler Jackets. Committee report comparing first cost and maintenance expense. The figures and comment are generally favorable to painted jackets, but no conclusions are presented.

Painted or Planished Jackets for Locomotives. E. E. Russell Tratman. A paper before the New York Ry. Club, giving the experience and practice of a number of roads, showing that painted iron is not only cheaper in first cost, but that it has a longer life than planished iron.
The Russia sheet-iron gauge, given in Table III, applies only to imported Russia iron. This material was formally exclusively used for locomotive jackets, stove bodies,

<table>
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<tr>
<th>Russia Iron Gauge</th>
<th>U. S. Gauge Number (approx.)</th>
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<tbody>
<tr>
<td>Russian Gauge Number</td>
<td>16</td>
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<td>12</td>
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<td>10</td>
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<td>9</td>
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etc, and as it was imported from Russia, it was natural that the foreign gauge numbers by which it was rolled should be used here to designate the various thicknesses. Planished iron and steel is now made by American manufacturers; it is superior in tensile strength and fully as finely finished as the imported sheet, although for certain purposes there is a sufficient demand for Russia iron to warrant jobbers in handling this product.

Since planished iron of American manufacture is gauged by the United States standard gauge, the corresponding approximate gauge numbers of that gauge are placed opposite those of the Russian gauge, to allow for ready comparison.

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The iron produced by the McKeesport works is really a separate class of iron manufacture, being a special article made by only one mill and known as

**Russia or Planished Steel Iron**

The manufacture of this article was established in 1851 by W. Dewees Wood, the present proprietor, under a patent granted to James Wood, the grandfather of W. Dewees, in 1841, and under an improvement by J. Wood Brothers, in 1844. The limitation of Russia sheet iron then made by this establishment, although equal in appearance to the imported article, would not resist the action of the atmosphere as well. This difficulty was partially overcome in 1861 through experiments by the present proprietor of the works. Other improvements were patented in 1865~67, but the required result was not obtained until 1873, through the present mode of manufacture, the principle feature of which is planishing by hammers. The growth of this important branch of Pittsburgh’s manufactures is the result of thirty years experimenting and study on the part of the investor, and the effect is that Pittsburgh is the only point in the country where an article of planished sheet iron is produced fully equal to the best Russia iron, and so endorsed by the heaviest metal dealers and consumers in the country. In the growing indications that the United States will, within the near future, compete with her old creditor, England, this stride of a Pittsburgh manufactory toward freeing the country from a dependence on Russia for its planished iron, is important; especially in view of the facts previously set forth as to Pittsburgh’s ability and power in the production of iron and her facility for reaching foreign markets. There is not a little grim humor in the trade mark which the firm producing this iron has adopted, of an eagle throttling a bear lying prostrate on its back.

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Planished Iron. One of the attempted substitutions for Russia iron. One of many processes consists of an oxidized surface on each sheet over and above the surface secured in ordinary working. The oxidized surface is then reconverted into metallic iron, which will enter readily into combination with an oxidizing agent applied throughout. The surface thus given to the sheet is fixed by planishing or hammering until the desired polish is secured. The recent imitations of Russia iron have been very successful, but nothing yet made out of Russia is quite as good as the original.

Directory To The: Iron & Steel Works of the United States & Canada
Corrected to July 25, 1882
Prepared & Published By: The American Iron and Steel Association
No. 261 South Fourth Street, Philadelphia
Printed By: Allen, Lane & Scott, No. 229–231 South Fifth Street, Philadelphia, Pa.

Page 119
Works at McKeesport, Allegheny County. Built in 1851; 12 forge fires, 12 single puddling furnaces, 22 heating furnaces, 6 trains of rolls, and 5 hammers; product, sheet iron, both common and planished; specialty, planished sheet iron; annual capacity, 8,000 net tons. Trade mark, a bear in the talons of an eagle.
W. D. Wood & Co. Limited,  
McKeesport Iron Works,  

PATENTED  
April 8, 1873.  
September 9, 1873.  
October 6, 1874.  
January 11, 1876.  
October 17, 1876.  
January 11, 1877.  
February 6, 1877.  

PATENTED  
December 10, 1878.  
January 10, 1882.  
January 1, 1884.  
February 12, 1884.  
March 4, 1884.  
January 6, 1885.  

MANUFACTURERS OF THE CELEBRATED  
Patent Planished Sheet Iron,  

BY AN ENTIRELY "NEW PROCESS."  
Guaranteed fully equal in all respects to the imported Russia Sheet Iron, and at a less price.  

ALSO—  

REFINED, CHARCOAL & JUNIATA GRADES OF BLACK SHEET IRON  
SMOOTH ON BOTH SIDES.  

PITTSBURGH, PA.
Importing Russia Iron: Criticising the Proposed Changes in the Tariff

A Representative Merchant’s views on the present duty, imitation Russia iron, and damage rebates.

“The present duty of 3 cents per pound on Russia sheet-iron is an oppressive one to the country,” said a merchant of this City, whose prominence in, and long connection with, the metal trade enable him to speak in a fairly representative capacity. “It injures the revenues by greatly restricting the importation, while in times of commercial depression like that from which we are slowly recovering it is almost prohibitory. The duty of 3 cents per pound is equal to about 52 percent ad valorem on the cost of the iron at St. Petersburg, which cost is swelled greatly by the expenses of a long and tedious inland transportation before it reaches St. Petersburg. If we add to this the cost of the long voyage and the duty of 3 cents per pound it will be seen that the consumer in this country has to pay about double the original cost of the iron.” The genuine Russia sheet-iron is a fine polished iron, which has long been imported into this country and is widely known for its brightness of surface and durability. It is used for locomotive jackets, fine stoves, stove-pipes, and for many other purposes for which a fine quality and finish are required. Its excellence and high price (the latter said to be much increased by the high duty) have induced some manufacturers in this country to attempt to imitate it. Old and conservative dealers in this particular kind of iron, however, say that the only polished iron now made here “which can be dignified with the name of imitation Russia” is that made by the Wood family, near Pittsburg, Penn., who own or control the patents under which it is made, so that no other persons who would like to go into its manufacture can do so. “It is believed,” said the representative merchant alluded to above, “that, leaving out the question of royalties, it does not cost the Woods to make their iron more than the genuine Russia iron costs in St. Petersburg, say 6 cents a pound, even if it costs them as much. They, however, sell their production at 9 to 10 cents a pound, fixing their prices a little under those of the genuine article, which, costing the same at the port of shipment in Russia, is subjected to the expense and risks of a long voyage and 3 cents duty additional.”

When the revision of the tariff was considered in 1878 the Ways and Means Committee, of which the late Fernando Wood was Chairman, considered the duty of 3 cents a pound on Russia iron excessive, and at first proposed to make it 2 cents a pound, but it is alleged that influences were brought to bear by certain interested persons and the duty was placed at 2½ a pound in the bill that was reported to the house. The members of the metal trade in this City who deal in Russia iron think the duty should be fixed at a figure not to exceed 2 cents a pound. They claim that the Wood imitation Russia iron does not need any protection aside from that which a fair duty for revenue would give it. It is argued that “the Woods could make a good profit on their iron even if the duty was to be reduced to 1 cent, while a duty of 2 cents would be equivalent to the United States guaranteeing the Woods a profit of 2 cents a pound on their manufacture.” The representative merchant remarked to The Times reported: “It is not a question of fostering an American industry, but whether the Wood family shall be insured a fortune every year on their industry. The importation of Russia iron, which has been carried on for the past 50 years, is open
to all who choose to enter into it, and take its risks. The Woods now have a virtual monopoly, but a much greater number of men are interested in working up of Russia and other polished irons than are employed in the manufacture of the imitation article in this country. I do not see why the many should suffer for the benefit of the few.”

“Are the importers of Russia iron satisfied with the existing methods of allowances for damage?” asked the reporter.

“No, they are not.” Was the reply. “Under the existing tariff laws Russia iron, tin plates, &c., as indeed, mostly all dutiable articles, if damaged on the voyage of importation, are allowed a rebate on the duty proportionate to the damage incurred. Thus, if Russia iron is damaged 25 percent, as determined by the United States Appraisers, a rebate of 25 per cent, of the duty is allowed. This, every one must admit, is eminently fair and just. It is said that in the proposed new tariff bill Congress will be recommended to abolish such allowances for damages. It is believed that the Woods are at the bottom of this, and that the recommendation is directly or indirectly the result of their influence and efforts. Not content with the already extravagant duty, the design seems to be to add to the risks and burdens of importers, so as to curtail and as much as possible prevent the importation of genuine Russia iron. This iron has to undergo a long voyage, and is very susceptible to damage on the sea. It is obvious that an article, whose chief characteristic is its highly finished surface, must be greatly injured in value by being stained and rusted. I have known it to be so badly damaged as to sell for 3 cents a pound, when the market value for sound iron was about 10 cents a pound, showing that it is an article which can be damaged to the extent of two-thirds or three-quarters of its market value. Now, in the case to which I have alluded, where the damage amounted to, say 70 per cent., there would be under existing laws a proportionate allowance from the duty, and the importer would have to pay equal to nine-tenths of a cent per pound duty instead of the full duty of 3 cents. He would then have 2 1-10 cents per pound left for iron which cost him 6 cents before it left Russia, while, if he had to pay the full duty, notwithstanding the damage, as is now proposed, it is obvious that he would have nothing whatever left. If, however, notwithstanding the hardships involved. Congress should insist on abolishing allowances for damage, I would suggest that it would be an act of humanity to the importer for the national legislators to add an amendment giving him the privilege, in cases where the article is so damaged as not to be worth the duty, of abandoning it altogether to the Government. The whole case, in a nut-shell, seems to be. Shall the importation of the genuine Russia sheet-iron, which has been so long and well known throughout the country for its superiority, be obstructed, and, perhaps, entirely cut off, and the community heavily taxed, only to give a clearer field for a patented monopoly?”

A petition is being talked of among importers of Russia sheet-iron and other metals, requesting the Secretary of the Treasury to cause the order of the Treasury Department, dated Feb. 26, 1880, numbered 4,431, and relating to Russia iron, to be rescinded or modified. This order refers to the examinations of Russia sheet-iron in bonded warehouses. It instructs United States storekeepers that the examinations should be made by the appraising officer while the packages are in their original condition, and that such iron should remain packed and undisturbed in the original packages in which it was imported until the proper examining officer had carefully inspected the damaged portion sheet by sheet. If, merchants desire to obtain a knowledge of the condition of their imported iron before the examination by the Customs officers, the Appraiser is permitted to authorize the removal of one of the three iron bands of each package so that the ends of the sheets can be pried apart and their appearance observed. The importers assert, and apparently with good reason, that by viewing one end only of a sheet of iron they can form no intelligent idea of the extent of the damage done, and the petitioners declare that the order as it stands “is practically obstructive of the operation of the law which gives to importers the right to an appraisement for a rebate in duty for damage sustained on the voyage of importation.” The rules
of the Custom-house require that applications for damage appraisement shall be made within 10 days from the landing of the goods, and shall be based on the personal examination and statement of the importer that such damage exists. The order above alluded to practically prevent the importer from making such proper and needful examination. The petitioners also respectfully suggest “that our interests imperatively demand that we should be enabled to examine and put in merchantable order by repacking in the bonded warehouses the packages of iron imported by us.” It is also suggested that the time in which the examinations of imported iron in bonded warehouses may be made be extended from 30 to 90 days, provided the Appraiser, in the exercise of due discretion, deems such extension advisable.

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