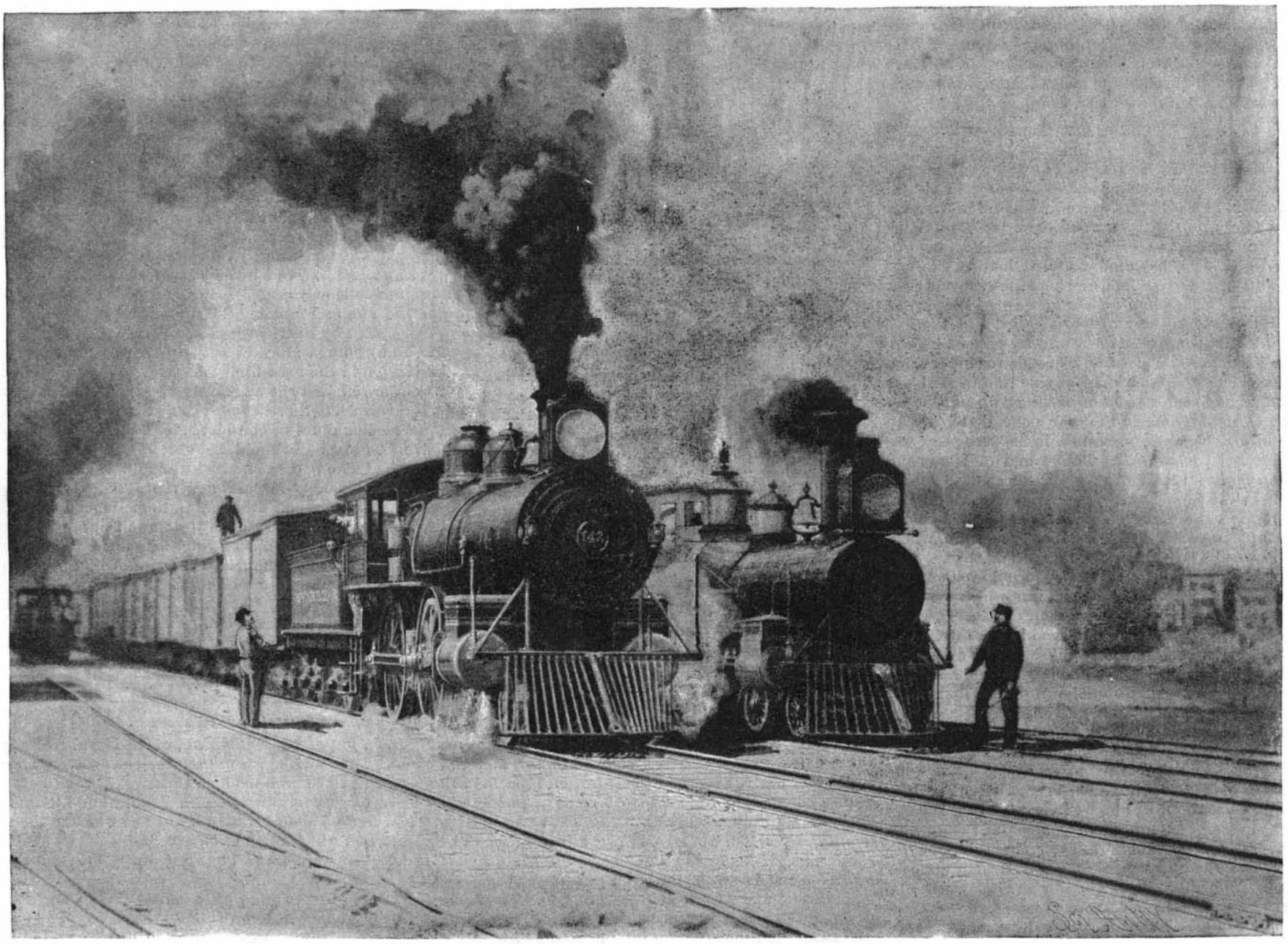
A LOCOMOTIVE WITH GREAT STEAMING CAPACITY.

Within a month past six new locomotives, embodying some striking features, have been placed on the New York, New Haven, and Hartford Railroad, to run between New York and Springfield and intermediate points. These locomotives were built at the Baldwin Locomotive Works, Philadelphia, from original designs, and one of them is shown in the accompanying illustration, where it is represented in comparison with a full sized locomotive of the ordinary type. The great size of the boiler, the top of which is 10 feet 9 inches high, or only 3 feet below the top of the smoke stack, at once attracts attention whenever the engine is seen, and the corresponding size and weight of all the working parts, except the moderate sized driving wheels, are matters of comment among all the engineers under whose notice they have come.

The cylinders of these engines have a diameter of 20 inches by 22 inches stroke, the steam ports being 1¾ by 16 inches. The driving wheels are 68½ inches diameter, and the engine truck wheels and tender wheels 33 inches diameter. The spread of the driving wheels is 9 feet 1 inch, and the total wheel base of the engine 23 feet 7 inches. The total wheel base of the engine and tender is 47 feet 9½ inches, and the length of engine and tender over all is 58 feet 2½ inches. The tender has a capacity for 6½ tons of anthracite coal and 3,200 gallons of water, and is fitted with a water scoop for taking up water from a long tank laid between the rails—a system which has not heretofore been employed on this railroad, but for which the company are now getting ready by placing tanks in position at the desired distances to facilitate long, straight runs.

The weight of the engine in working order is about 110,000 pounds, the weight on the driving wheels being 68,000 pounds, and on the front truck wheels 42,000 pounds. The weight of the tender, with coal and water, is about 70,000 pounds, making the total weight of engine and tender, ready for service, 180,000 pounds. The boilers are wagon top in form, 60 inches diameter at the smoke box end, and the fire boxes are 6½ feet long by 34⅜ inches wide inside. These engines are designed for an ordinary working steam pressure of 160 pounds, which, we are informed, is obtained and carried as readily as 140 to 145 pounds on the locomotives heretofore in use on the road.

The present superintendent of motive power of the company, Mr. J. Henney, Jr., was formerly for many years in charge of their shops at Hartford, where many locomotives of excellent design and fine finish were turned out, which have done and are doing good service on the road. These new engines, however, have been specially designed for high speed for long distances, drawing heavy trains, with which they have, thus far, been shown to easily make sixty miles an hour on any comparatively straight sections of track. In the matter of first cost these engines seem marvelously cheap, their approximate cost being stated at about $10,000 each, the establishment at which they were made now turning out completed locomotives at the rate of two a day. The dimensions of the boiler and fire box, with the great amount of heating surface provided, give them extraordinary steam making power, and it is claimed that they are economical of fuel. It is not unlikely, also, that in providing engines with such extra steaming capacity, the company are anticipating the enforcement next winter of regulations compelling the railroads in that section to heat their cars by steam, and discard entirely the car stove.



A LARGE LOCOMOTIVE ON THE NEW YORK, NEW HAVEN, AND HARTFORD R.R.—(From a photograph.)

Manufacture of Quinine.

Within the last twenty years the growing of the bark has been established in India, and the alkaloid is now successfully made at the government works at Sikkim. The whole of the quinine in yellow bark can be extracted in a form undistinguishable, either chemically or physically, from the best brands of European manufacture. This can be done so cheaply that so long as the supply of bark is kept up, quinine need never cost government much above 25 rupees per lb. It is pointed out that the price of English-made quinine in the London market is at the present time somewhere about this figure.

The bark is first reduced to powder by means of a Carter's disintegrator, and this powder is passed through a scalper, the sieves of which are made of silk and have 120 meshes to the lineal inch. This extremely fine powder in the proportion of 100 parts is mixed with 8 parts of commercial caustic soda dissolved in 500 parts of water, and there is then added 600 parts of a mixture of fusel oil 1 part and kerosene oil 4 parts. Slaked lime may be used instead of the caustic soda, 15 parts of it being intimately mixed with the powdered bark before the water is added. The whole mixture—bark, alkali, water, and oils—is next thoroughly agitated in barrels for four hours, then allowed to rest, and the oily layer drawn off from the top. This oil is again agitated for five or ten minutes with water acidulated with hydrochloric or sulphuric acid, whereby the alkaloids are dissolved out from the oil. Separation is again effected, the oil being transferred to the bark mixture, and agitated with it for two or three hours; again drawn off and washed as before in the same acidulated liquor. This process is repeated a third or fourth time, or until it is found by testing a small quantity of the oil that the bark has been thoroughly exhausted of its alkaloids. The quantity of acid required to take up the alkaloids from the oil depends, of course, on the quality of the bark operated on. If the bark contains 4 per cent of alkaloids, about 2 lb. of sulphuric acid mixed in 20 gallons of water are sufficient. The after-treatment of the acidulated solution of alkaloids is simple. The solution is first neutralized with ammonia or soda and set aside to crystallize. The crystals are collected on a cloth and drained, then dissolved in about fifty times their weight of boiling water, and filtered hot through a little animal charcoal. On cooling after filtration, the crystals again form and are separated as before from the mother-liquor by filtration. The crystalline mass obtained is then placed in small lumps on sheets of white blotting paper stretched on slabs of plaster of Paris. By this means they are practically dried. They are afterward thoroughly dried by being laid on blotting paper in a room heated to about 10° above the temperature of the open air. The foregoing presents the salient points of Mr. Gammie's process for the manufacture of "sulphate of quinine." The resulting product doubtless contains other alkaloids than quinine, but in what proportion there is nothing to indicate.—*Chem. and Druggist.*

Electrical Phenomena.

In a note to the *Army and Navy Journal*, Lieut. P. H. Uberroth, of the U. S. S. Dexter, at New Bedford, Mass., says that on June 15, at about 9:40 evening, while lying at anchor, a violent thunderstorm passed over us, a thunderbolt striking the vessel, shattering her main-topgallant mast and pole, shaking the vessel from stem to stern.

Lightning flashes continued without any apparent intervals of obscurity, thus producing a continuous illumination about us, enabling us to view the surrounding country as at midday. The lightning struck the main truck, and passed down the mast to the eyes of the wire rigging, at which place it was shunted off, passing down the rigging on both sides to the water. During the conduction of the electricity, loud crackling sounds were heard, blue flames were visible around and about the shrouds and smoke-stack, and huge balls of fire flew from the vessel on all sides.