

COAL HANDLING MACHINERY AT THE RONDOUT YARD OF THE DELAWARE AND HUDSON CANAL CO.

A coal elevating, trimming, and reloading apparatus has recently been erected on the dock of the Delaware & Hudson Canal Co., at Rondout, N. Y. The company have possession of an artificial island in the middle of Rondout Creek, which is entirely devoted to the storage of coal. It is surrounded by a bulkhead, and can accommodate a very large number of vessels. The D. & H. canal enters the upper end of the creek, and barges direct from the anthracite coal regions during the season are continually arriving. Some are discharged at the island, others are sent on without breaking bulk to customers.

The coal handling plant which we illustrate embodies the apparatus of the Dodge Coal Storage Co., of Philadelphia, Pa. It may be resolved into three parts: The elevators, which discharge the boats, emptying them of their cargo; the trimmers, which take the coal from the elevators and deposit it upon the heaps; and finally the reloaders, which transfer coal from the heaps to the holds of outgoing barges or other vessels.

The elevators at present in use are floating structures, constructed on the general lines of a grain elevator. These elevators have a capacity of handling about 5,000 tons of coal a day, and were constructed for this company by the Chase Patent Elevator Co. of Fall River, Mass. An endless chain carrying buckets is kept in motion around a movable drop frame, which is raised or lowered by tackle. The frame is lowered endways into a vessel's hold, and at once makes

its way through the coal until it reaches the bottom of the hold, upon which the base of the frame sets. The string of buckets carry up coal continuously, while the frame seeks its bearing and rapidly raises it to the upper part of the elevator. Here it is received in pockets and is weighed. There are two weighing hoppers, so that the elevator need not be stopped while the final adjustment of the weights takes place. It is then delivered through a short chute to the foot of the coal trimmers.

In the lower cut on this page we illustrate an improved elevator which is shortly to be tested. This presents several distinctive features, which are shown clearly in the drawing. The endless chain of buckets is retained, but the elevating arrangements are modified so as to permit it to extend outward from the pier line a sufficient distance to reach the center of a boat. The bucket chain is worked from a fixed countershaft, and the buckets perform a double role, that of elevating and subsequently of transferring horizontally the coal by drawing it along a trough. The diagram shows the easy adjustability to height of

shear frames are used, whose general features of construction and arrangement are shown very clearly in the engravings. Two trusses are used for each pile of coal. They are joined at the top, or apex, by a large pin passing through them, forming a species of hinged joint. At the lower ends they are based upon masonry and piling, and in addition two tension rods run across the yard from the base of one truss to that of the other, forming a tension member or chord. They are steadied

Coal is now discharged from the elevator chute to a small pocket, and falls between the floats at the lower end of the conveyer truss of the trimmer, near the ground level. The floats actuated by the chain draw the coal away through the trough. Acted on by the moving floats, the coal is carried up the inclined trough until it reaches the end of the ribbon. Here it falls through the trough, now bottomless, and the formation of a coal heap begins. At this point, which becomes the apex of a cone of coal, the mass rapidly rises, and in a few minutes the ribbon has to be still further advanced. In this way a conical heap is formed. As it rises it acquires greater area of base, and the ribbon is shifted less frequently. The same operation continues until the heap reaches the apex of the trusses. The two trusses are placed as nearly as possible at the angle of repose of coal, and it is surprising to see how closely the proper angle has been obtained. This angle is about 50° at the point of juncture and abuts at an angle of about 30° with the ground.

The coal reloaders work on the same general principle. One of them is shown complete in the center of the upper front page engraving, and the pivoted end of the truss and the elevated path of the delivery end is shown in accompanying cut. An endless chain, armed with floats, is carried around a truss, which in this case lies on its side upon the ground, and which is supported by wheels which run on circular tracks. The truss is pivoted at one end, and by means of a windlass worked by hand, which operates the chain running along one of the tracks, the great truss, which may be several hundred feet

in length, is swung around in the arc of a circle, against the base of any pile which it is desired to reload into a vessel.

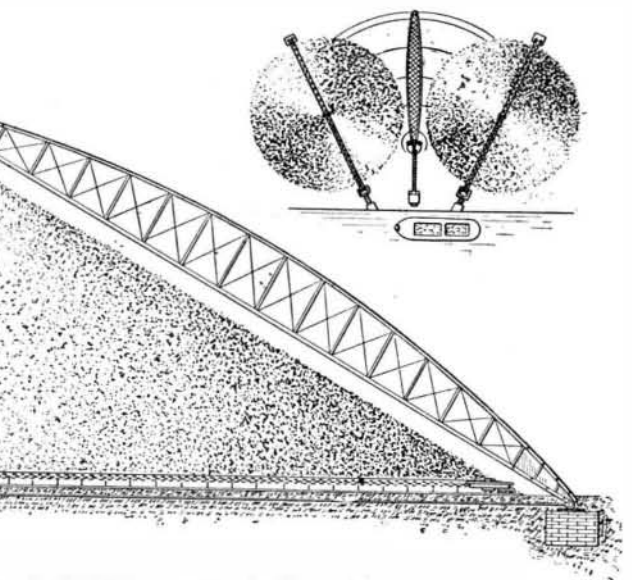
As the chain approaches the edge of the wharf, it is carried up so as to form an elevator and feed the coal into hoppers. From these hoppers it is drawn into pockets for weighing. It is weighed and then discharged through a chute into the hold of a vessel. Here also it is screened. The reloader differs from the trimmer, as far as its operations upon the level ground are concerned, in having no trough. In operation, when it is swung in against the base of a heap, the floats cut into the coal and scrape it away from the base of the heap and bear it on to the scales and loading chute.

A gang of men is in attendance, who regulate the flow of coal in order that it may not be too rapid, who keep the tracks clear, so that the reloader can be swung in against the heap, and who operate the windlass as required. Although the floats on the level ground are not confined within a trough, the coal itself



THE RELOADER SHOWING METHOD OF RAISING AND DELIVERING COAL INTO THE BARGE.

by guys fastened to the apex. An endless chain is arranged with pulleys so as to travel up and down in two troughs, going up in one trough and descending in the other. These troughs are carried by the truss on one side of the pile, termed the conveyer truss. At intervals on the chain square plates of iron or floats are attached that extend down from it and scrape along upon the bottom of the lower trough. The other trough lies along the upper member of the truss and is more properly a guide, the plates occupying the reverse position in it. Coal thrown into the lower trough will follow the motion of the chain. The floats fit the trough approximately only. The bottom of the trough up which the coal ascends is a steel band or ribbon 12 in. wide and 1/8 in. thick. At its lower end it is attached to a drum, around which it can be wound, while to its upper end a wire rope is attached by a shackle. This rope runs up the truss under the center of the working trough, and is carried around a pulley at its upper end, then running down to the base of the frame, being contained within a gas pipe on its downward course, and below is attached to a windlass. This



DETAIL SHOWING CONSTRUCTION OF TRIMMER AND RELOADER AND NEW TYPE OF ELEVATOR.

this new type of elevator, which it will be observed is to be established upon the pier.

By the elevators of whatever system, the coal is lifted from the boat's hold and passed through a chute to the base of the trimmers. During this passage it is screened, a portion of the bottom of the chute being formed of open work for this purpose. While much of the discharging is done without any manual assistance, a gang of trimmers is kept in the boat, who shovel coal down to the mouth or lower end of the elevator frame.

Having reached the dock, the coal has next to be raised and formed into piles. For this purpose trussed

provides a movable bottom for the trough, one which can be drawn up as far as desired, or which can be lowered, always closing the bottom of the trough for the extent which may be used. The lowering operation consists in feeding out rope from the windlass and winding the ribbon in upon its drum, so as to keep it tightly stretched. The reverse operation draws up the ribbon and closes the trough for a greater or less portion of its length. In using the apparatus for trimming coal the following is the sequence of operations:

The chain with its floats is put in motion. The steel ribbon is drawn up to a point a little beyond the proposed base of the pile, one point of which always coincides approximately with the lower end of the truss.

forms windrows which act as the sides of a trough, and hold the moving coal perfectly in place. Where it elevates the coal, troughs are provided.

This gives a general idea of the operations of the three parts of the plant. In the outline drawing already alluded to, the elevator, trimmer, and reloader are all shown in their proper relations to each other. At the base of the conveyer truss is shown the drum on which the steel ribbon is wound. Along the base of the heap the reloader chain can be traced, which afterward ascends the inclined plane on the left side of the cut. The small plan shows the formation of two coal heaps with the reloader between them, resting on the circular tracks. As the latter has to serve for two heaps,

the machinery is arranged to drive the chain in either direction.

As regards other details, the chains of the trimmers and reloaders are driven by sprocket wheels. This would not answer for the elevators of the type now in use, as they have to be raised and lowered. A short endless chain, driven from a sprocket wheel, lies within the main bucket chain. Teeth are attached to its links which, catching the links of the bucket chain, drive it at whatever level the frame may be set. Tension screws are applied to the bearings to keep the chains stretched. Between each pair of links where they would otherwise come in contact with each other is a bearing block of malleable iron that prevents wear and supplies a more fixed journaling for the end of the link.

The capacity of the yard is placed at 120,000 tons. There are six trimmers. The largest pair, 74 feet high and 260 feet spread, can form a pile of 30,000 tons capacity. There are three reloaders, one for each pair of trimmers. Five elevators are at present in use. In general the conveying machinery can dispose of two or three tons a minute. One important feature is that the coal is never dropped more than a foot, so that the formation of slack is avoided. Two engines, aggregating about 200 horse power, drive the trimmers and reloaders, of course not all at once.

The large capacity of the yard provides an element of security against strikes or other interruptions in the coal supply. It represents the distributing point for anthracite coal by water in all directions, while coal may be sent by barges across the Hudson River to be transferred to other railroads. Improved coal-handling machinery makes such transfer economical.

AN IMPROVED ELEVATOR CAR.

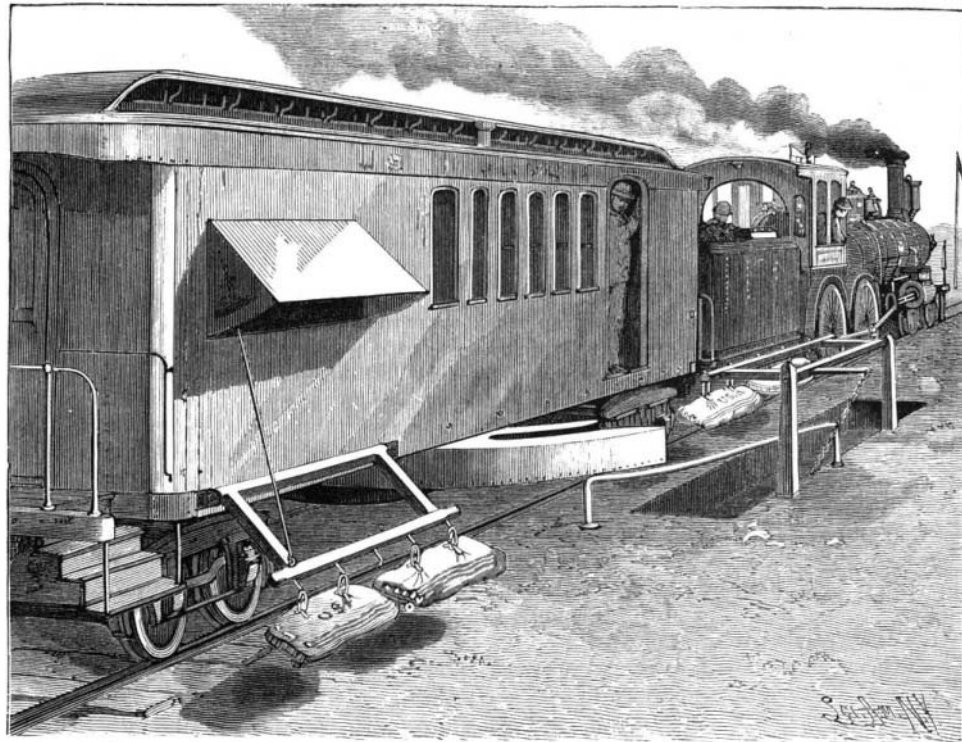
The illustration represents an elevator car designed to facilitate the handling, transferring, and stowage into cars of grain that has been deposited in cribs or granaries along the line of a railway, affording an elevator privilege at every station in the country upon roads employing such cars. It has been patented by Mr. James E. Snevely, of Chetopa, Kansas. The car is divided into three compartments, one of which accommodates a boiler and engine, the smoke stack being hinged to fold down upon the car roof when the car is in transit. In the second compartment is a frame, adapted to be raised by chains and windlasses, or lowered so that its top will be flush with and form a portion of the car roof, the windlasses being located in the third compartment. The framework supports hoppers connected with scale beams so arranged that the weight of the grain may be read by an attendant upon the car roof, and the hoppers have discharge orifices to a conveyer belt that leads to a chute extending outward through the side of the car, where it is connected with such number of conveyers as may be necessary to reach the car that it is desired to load. A bucketed elevator is provided to transfer to the car the grain or corn to be handled, the elevator delivering directly to the receiving trough of a combined sheller and separator, and in connection with this elevator is a conveyer driven by a chain connection and arranged to be passed beneath the flooring of a crib or granary. This elevator is designed to have a capacity of three thousand bushels per day, while requiring the labor of only four men to operate it.

Presence of Mind in a Parrot.

A dispatch to the *New York World* from St. Louis says: Several days ago a thief entered the house of Dr. D. Morrow, at No. 308 Jefferson Avenue, and, choosing between a sideboard full of silverware and a red-tailed gray parrot in a gilded cage, took the latter. The error of his preference was soon made manifest to him when the burglar reached the street, for the parrot set up vociferous cries of "Stop thief!" and whistled up all the dogs in the neighborhood. The thief stood this as long as there seemed the faintest show of escaping in spite of it, but at last, as men, boys, and dogs closed around him, he threw down the cage and nimbly sped away, but was soon arrested.

AN IMPROVED MAIL CAR.

The illustration represents a novel construction designed to facilitate the delivery of mail bags from a moving train, and also the taking up of mail bags by such a train, which forms the subject of several patents issued to Mr. William H. Elliot, of No. 499 Eighth Street, Brooklyn, N. Y., to whom those desiring fur-



ELLIOT'S MAIL CAR AND DEVICES FOR RECEIVING AND DELIVERING MAIL BAGS.

ther particulars should apply. The receiver consists of a cylindrical chamber located below the car floor between the front and rear trucks, and arranged upon a vertical axis, the chamber having at one side an entrance spout, which, by turning the chamber on its axis, will be swung out at the side of the car. This spout may be joined to the circular chamber by a hinge, if preferred, when it would be swung out independently of the inner chamber. In the top of the spout is a slot, adapted to engage and release the hooks by which the filled mail bags are held upon a properly arranged delivery bar, the bags being then carried into and around the circular chamber until their momentum is lost by friction. The station delivery bar, as shown, is hinged to standards at a short distance from the side

ing ready means for turning outward the spout of the circular chamber, this drum, with the crank or lever by which it is operated, being the only portion of the mail receiving and delivering apparatus which takes up any space within the car proper. The curved bar located at or near the platform of the station releases the bags from the hooks on the car delivery bar, and they fall automatically into the box sunk under the track, where they are in no danger of being carried by momentum under and being crushed beneath the wheels of the cars, as sometimes happens when they are thrown loosely on the platform of the station. The bags may be delivered by the car and collected simultaneously, as the operations of delivery and collection do not in any way interfere with each other.

African Indigo.

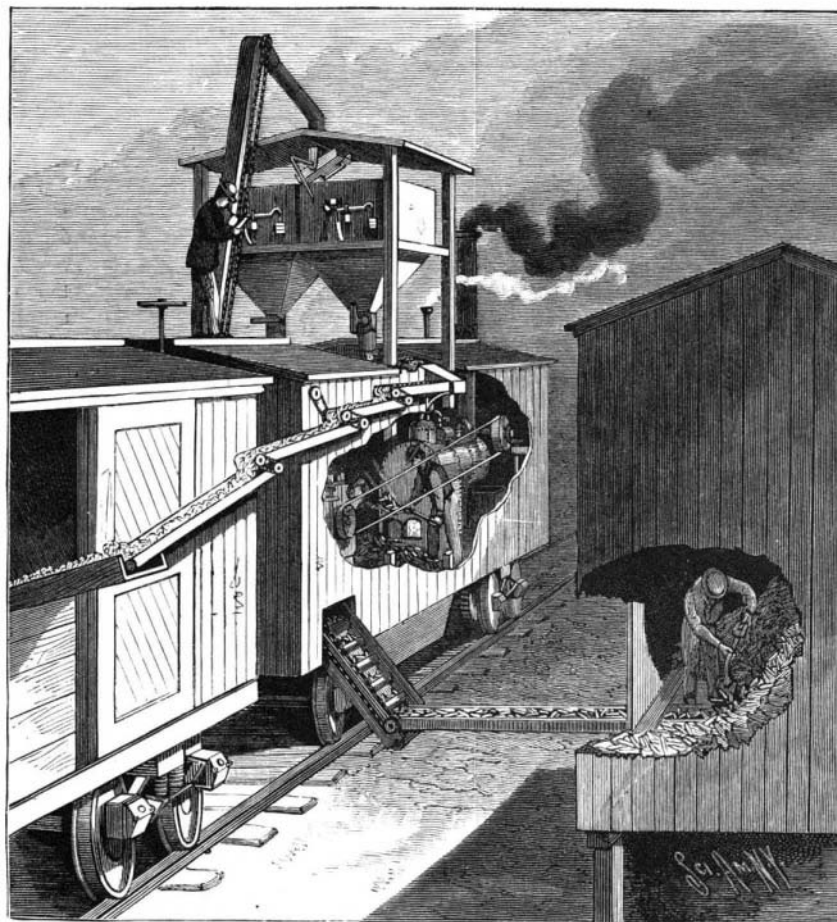
The production of indigo in West Africa, says the *Deutsche Wollen Gewerbe*, is almost entirely in the charge of women, and its extent depends upon the manufacture of cotton goods by the natives. How important this industry is can be judged from the fact that millions of meters of cotton fabrics are annually manufactured, upon the primitive hand looms of the country, for the domestic consumption and for export. Especially extensive is the export of these goods to Brazil, where they have become very fashionable and are particularly used for decorative purposes. The most popular color for these fabrics is the blue derived from indigo. A commission which, in 1886, was sent by the government from Lagos to Yoruba, to report on the culture of indigo, stated that in the city of Ibadan, with a population of about 150,000, nearly everybody is clothed in blue stuffs. Upon the banks of the Gambia River this industry is carried on very extensively. The indigo is there known under various names, as "Carro" in Mandingo, "N'Gangha" in Volof, "Elu" in Yoruba, "Suini" or "Luai" in Hausa, while the plant is called "Baba." In the valley of the Niger River the pure precipitate is produced, in which form alone the indigo has a market value. In Gambia and Yoruba it is found in the form of balls of rotten leaves, mostly mixed with cowdung, and without commercial value outside the country. The process of extracting the indigo is as follows: In an earthen vessel of about 60 quarts capacity the leaves are steeped and thereby an extract produced, which is fermented; then the liquid is poured off and exposed to the action of the air. When the precipitation takes place and all the dyestuff has settled to the bottom of the vessel, the supernatant liquor is poured off, the pulverulent precipitate mixed with a little gum and formed into small balls, etc. The materials to be dyed are steeped in the extract before exposing it to the air, and dried in the open air, which operation is repeated until the desired shade is obtained. For the production of stripes or of patterns in different shades of color, the material is sewed together where a lighter shade is desired, whereby the intensity of the blue is diminished.

Paper Matrices.

Paper matrices for making stereotype plates from type forms, used in newspaper offices, are prepared as follows: Make a jelly paste of flour, starch and whiting. Dampen a sheet of soft blotting paper, cover its surface with the paste, lay thereon a sheet of fine tissue paper, cover the surface with paste, and so on until four to six sheets of the tissue paper have been laid on.

The combined sheet thus made is then placed, tissue face down, upon the form of types, which are previously dusted with whiting, and with a brush driven down upon the types and thereon allowed to dry. The operation of drying is facilitated by having the types warmed by placing them upon a steam-heated table. A blanket is placed over the paper during the drying operation.

A WEAK galvanic current, which will sometimes cure a toothache, may be generated by placing a silver coin on one side of the gum and a piece of zinc on the other. Rinsing the mouth with acidulated water will increase the effect.



SNEVELY'S ELEVATOR CAR.

of the track, and a chain or cord extends outward from the bar to a fixed support, whereby the bar may be readily held at the desired height. The station receiver is shown in the form of a rectangular box sunk at the side of the track, and extending partly over it is a curved rail adapted to engage the hooks of the mail bags held upon a delivery bar swung out from the side of the car. This car delivery bar is adapted to be swung out and in by means of a cord passing to a drum inside, simple connections with such drum also afford-