CRANE FOR TRANSFERRING CARS.

(*Continued from first page.*)

of 32 feet from the side of the wharf. If it had been possible to run a steamer into a slip or between ice breakers at all seasons, that method would have been adopted, but the tide runs at a rate of from 5 to 15 miles per hour, and carries with it a body of ice from 2 to 4 feet thick, so that it would be useless to attempt to run a steamer crosswise to such a running stream, or between wharves, as the ice would under such circumstances cut the vessel to pieces. Consequently it was necessary to use a crane which would reach out from the wharf the distance named, and be able to lift a height of 27 feet from the water level. The crane is calculated to lift an ordinary 33-foot loaded box car from the steamer and land it on the end of the wharf in from 1¼ to 1½ minutes. It will be noticed that the bed of the crane forms part of the counterbalance weight, friction rollers being arranged below as well as above the flanges of the girders in which the crane runs. The cars, as will be seen, are run on or into a cage (shown in detail in Figs. 4 and 5), and it is thus lifted with the car to or from the boat. The crane has a lifting capacity of 85 tons.

The plans of the crane and of the works to be used in conjunction therewith, on both sides of the river, have been made by Mr. A. Davis, the mechanical superintendent of the North Shore road.—*The Railroad Gazette.*

Professor Haeckel on Education.

In face of the surprising velocity with which in these last years the development theory has paved an entrance into the most diverse departments of inquiry, we may here express the hope that its high pedagogic value also will be even more recognized, and that it will quite perfect the education of the coming generations. When, five years ago, at the fiftieth meeting of naturalists in Munich, I laid stress on the high significance of the development theory in relation to education, my remarks were so misunderstood that a few words of explanation may here be allowed me. It stands to reason that with these words I could not mean to claim that Darwinism should be taught in elementary schools. That is simply impossible. For just like the higher mathematics and physics, or the history of philosophy, Darwinism demands a mass of previous knowledge which can be acquired only in the higher stages of learning. Assuredly, however, we may demand that all subjects of education be treated according to the *genetic method*, and that the fundamental idea of the development theory, the *causality of phenomena*, find everywhere its acknowledgment. We are firmly persuaded that by this means thinking and judging conformably with nature will be promoted in far greater measure than by any other method.

At the same time, through this extended application of the development doctrine, one of the greatest evils of our day in the culture of youth will be removed—the cramming of the memory, we mean, with dead lumber, which smothers the best powers and prevents both soul and body from coming to a normal development. This excessive cramming is based on the old, fundamental, ineradicable error that the quantity of factual knowledge is the best method of culture, while, in truth, culture depends on the quality of causative science. We would therefore deem it especially useful that the selection of the material of instruction be much more carefully made, and that in making the selection those departments which cram the memory with masses of dead facts do not receive the preference, but those which cultivate the judgment through the living stream of the development idea. Let our worried school youth only learn half as much, but let them understand this half more thoroughly, and the next generation will in soul and body be doubly as sound as the present.—*Eisenach Lecture.*

Simple Facts about Bricks.

The *Carpenter's and Builder's Journal* gives the following facts:

An average day's work for a bricklayer is 1,500 bricks on outside and inside walls; on facings and angles and finishing around wood or stone work, not more than half of this number can be laid. To find the number of bricks in a wall, first find the number of square feet of surface, and then multiply by 7 for a 4 inch wall, by 14 for an 8 inch wall, by 21 for a 12 inch wall, and by 28 for a 16 inch wall.

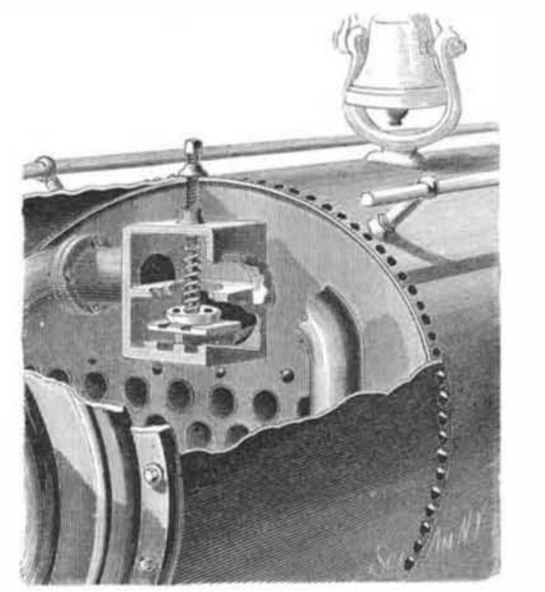
For staining bricks red, melt one ounce of glue in one gallon of water; add a piece of alum the size of an egg, then one-half pound of Venetian red, and one pound of Spanish brown. Try the color on the bricks before using, and change light or dark with the red or brown, using a yellow mineral for buff. For coloring black, heat asphaltum to a fluid state, and moderately heat true surface bricks and dip them. Or make a hot mixture of linseed oil and asphalt; heat the bricks and dip them. Tar and asphalt are also used for the same purpose It is important that the bricks be sufficiently hot, and be held in the mixture to absorb the color to the depth of one-sixteenth of an inch.

The enormous sum of $202,000,000 is invested in the submarine cables of the world, supposed to aggregate 64,000 miles in length.

NEW STOP-VALVE FOR LOCOMOTIVE STEAM PIPES.

This valve is designed to be placed in the steam pipe of a locomotive to be automatically closed by the excessive flow of steam when the driving wheels slip, the object being to cut off the steam from the engines and to stop the wheels. The valve opens automatically after the slipping ceases, so that it requires no attention from the engineer.

The valve is located in the steam pipe anywhere between the throttle valve and the branch pipes leading to the cylinders, but preferably at the junction of these pipes. When the valve is open it rests on a table that is adjustable to and from its seat by a wedge under control of the engineer, a rod extending from it to a suitable lever in the cab. The valve is pressed down on the table by a spiral spring, the pressure of which is adjusted by a screw extending out through the steam pipe and boiler shell. The valve will be

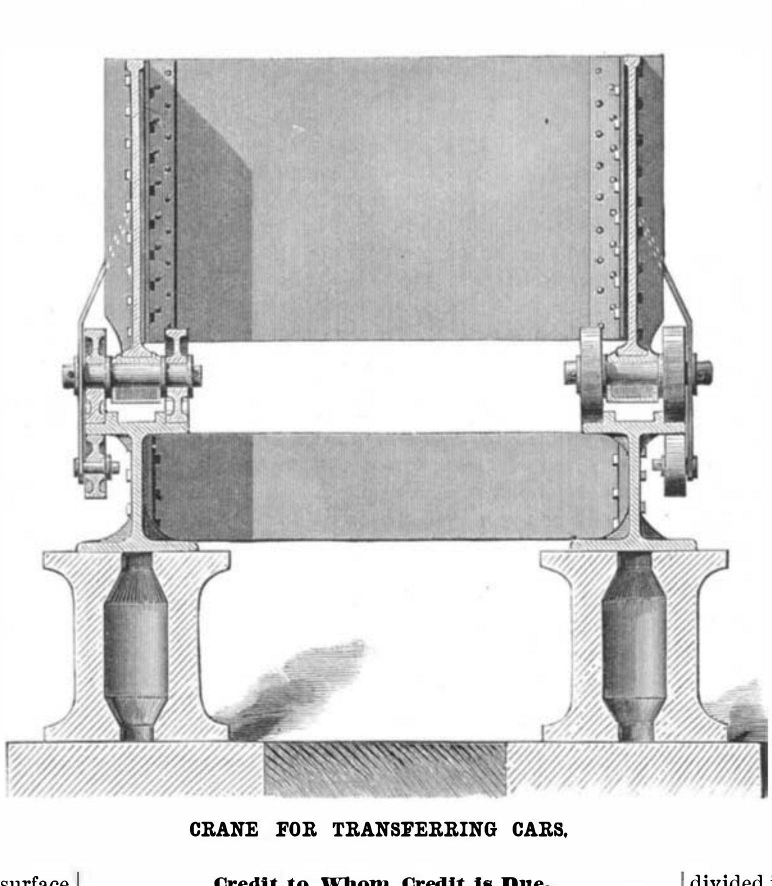


HIGDON'S STOP VALVE FOR LOCOMOTIVE STEAM PIPES.

pressed by the spring with about the same force that the steam exerts on the other side, so that the valve will be in equilibrium, or nearly so, and when any undue rush of steam takes place, the valve will close automatically and stop the flow of steam to the engines.

The object of the wedge above referred to is to regulate the action of the valve by setting it nearer to or further from its seat. The table between the valve and the wedge is designed to receive the lateral thrust of the wedge, the table being placed in guides which permit it to move only vertically.

This invention prevents the slipping of the engine wheels while reversing or backing suddenly, or while running over a slippery track, and not only saves the wrenching of the engine due to extremely rapid motion, but renders it more effective in emergencies. This invention has been patented by Mr. J. C. Higdon, 1008 E. 9th St., Kansas City, Mo.



CRANE FOR TRANSFERRING CARS.

Credit to Whom Credit is Due.

In the Scientific American of November 4 appeared an engraving and description of some of the plumbing arrangements in Mr. Cornelius Vanderbilt's new house in this city. Credit should have been accorded to the *Sanitary Engineer* for the article.

England has thirty electric light companies, with a capital of over $30,000,000. Nearly as much money is similarly invested in France.

Iceland Moss in Woolen Mills.

The cost of oil for lubricating the wool is a considerable item in a woolen mill. Many ways have been tried to reduce this item, and several substitutes have been used with only indifferent success. In France steam has been tried on the principle that wool is a hollow tube which can be filled with steam, and that, being a horny substance, it is softened and made supple by heat, but as the moisture leaves the wool almost as quickly as it takes it up, these attempts have proved futile, though an addition of water to the oil has yielded a certain advantage. Thus, a good mixture is made of 100 lb. water, 40 lb. oil, 3 lb. soda ash, and 4 lb. to 5 lb soap, as used for milling. Some spinners (country ones, evidently) have added to the oil double its quantity of milk, or milk and water; or one-third oil, two-thirds water, with a few pounds of soda, are taken. It is always of importance that the oil and the water should be well mixed, and for that purpose a little soda is of use. A better amalgamation can, however, be obtained by the addition of Iceland moss (Carrageen). It is nothing new, but we believe not known to many spinners, and is of advantage with dark colored goods and yarns which are made of dyed wool. Where goods are dyed light colors in the piece it is not to be recommended, as the cloth then may easily get mottled. On the whole, however, Iceland moss can be used with great advantage and a considerable saving in oil.

It is used in the following manner: In a wooden vat about 18 buckets of water are put, and steam introduced into it to boil. About 3 lb. soda ash is then introduced, after which 4 lb. to 5 lb. Iceland moss is put into a bag, and the latter, well tied, placed into the soda bath. The steam tap is then opened, and the water boiled for about four hours, while it is stirred about once every hour. The bath takes up this way a certain quantity of the gelatine which is made from the moss, and varies in strength according to its quality. When the mixture has cooled a little, three parts of this are mixed with one part of oil. Where olein is used instead of oil the mixture must be boiled a little after it has been made. A little practice will show how much moss should be taken, for too much is not good, and when enough gelatine has been extracted from the bag, the remainder may be used for the next mixing.

For 20 lb. white wool, 4 quarts of the mixture and 1 pint water are to be taken; for dyed wool, 4½ quarts should be taken and 1 to 2 pints water. Where a wool is to be used for proportionately fine counts, a little more oil may be used in mixing; for instance, 4½ quarts instead of 4 quarts for white wool, or a little more water may also be added. As in this mixture a good deal of water is contained, which soon evaporates, it is not advisable to make large mixings, or, where more has been mixed than is immediately wanted, to store this in a cool, damp, fireproof place. The safe storage is so much more important, as oiled wool, when compressed, is liable to spontaneous combustion, which may happen so much sooner where oily mungo is contained in the mixing, especially when oiled with olein.

The importance of having the wool well oiled is especially perceptible in mixings with mungo and short wool, which easily dry in the lap when lying by a few days; for instance, on holidays. The same mixing which before the stoppage spun easily would be difficult to manipulate after them, and the threads from the condenser bobbins would be constantly breaking. In such cases it is absolutely necessary, when recommencing work, to damp the laps with water to replace that lost by evaporation. The same result may be observed where the full bobbins have been lying in the sun, or been dried by other means. That dampness and warmth are necessary for spinning need hardly be mentioned here, and can best be observed on a winter's morning, when the spinners sometimes have much trouble on starting on Monday with the first score or two of ends near the windows.—*Textile Manufacturer.*

A New and Fast Steamer.

The first trip of the new steamer Werra, of the North German Lloyds, lately arrived here, was made in remarkably good time, notwithstanding head-winds and unusually high seas throughout most of the voyage. Her corrected time from Southampton to Sandy Hook was 7 days and 19 hours, closely crowding the best time on record from that port made by the Elbe with favoring winds and fair weather. The Werra was built at the yards of John Elder & Co., on the Clyde, and on her trial trip to Bremen made an average speed of seventeen and three-tenths miles an hour. She is a screw steamer of 5,109 tons gross burden, 2,856 tons net. She is 450 feet long over all, 46 feet beam, and 36 feet 6 inches depth of hold. Her hull is divided into a number of water-tight compartments. Her engines are of the compound, inverted cylinder type, and have developed 6,700 horse power. She has accommodations for 170 first, 90 second, and 1,100 third class or steerage passengers.

Copal varnish applied to the soles of shoes, and repeated as it dries until the pores are filled and the surface shines like polished mahogany, will make the soles waterproof, and last as long as the uppers