

Correspondence.

Large Quarried Stones.

To the Editor of the Scientific American:

You speak of the granite mass quarried by the Bodwell Granite Company, at Vinal Haven, as the largest ever quarried. It may be the largest granite mass ever quarried, but at Baalbec, in Syria, the traveler sees a stone at the quarry nearly ready to be moved from the pillars that support it, a stone 71 by 14 by 13 feet, containing 12,922 cubic feet, whereas the Vinal Haven stone, if the size at the base continued to the top, would contain but 11,500 cubic feet. And this stone has waited for more than a thousand years. There are four stones nearly as large, which have been transported a mile or more and put into the foundations of the Temple of the Sun. The ancients did know how to handle big stones, and we have not yet quite reached their standard of size. JOHN R. THURSTON.

Whitinsville, Mass., March 27, 1891.

A Winter Fishing Ground.

To the Editor of the Scientific American:

I was very much interested in an article on "Fish Manure," in your paper. I wish to suggest something perhaps of value to your man-haden steam fleet Down East. Their season is from May till November. When a big boy, I spent one winter at Charlotte Harbor, west coast of Florida, with mullet fishermen from Mystic, Conn. I believe mullet are as plentiful on the Florida coast as are the menhaden on the New England coast. And perhaps your steam fishing fleet, instead of lying on their oars all winter, would do well to turn their attention to the shores of the Gulf of Mexico. I believe there are fish enough in the Gulf of Mexico, if they were utilized, to feed the whole world. Those fishermen that I was with seined the mullet and dry-salted them for the Havana market. The mullet is a very oily fish, there being a layer of blubber next their ribs of varying thickness.

If these fish may be utilized, what an outlet for your fishing industries during the pleasant winter months in the Gulf of Mexico! The time I speak of was 'way back in 1855. And I don't know but they are steam-fishing there now. EX-BEACH COMBER.

Nashville, Tenn.

Utilization of Sawdust.

To the Editor of the Scientific American:

W. D. says: Your journal is one of our "household words." You have for years at different times given us receipts for sawdust casts and other materials. I have tried all of them, some are too heavy, some shrink too much, and some through too little shrinkage are liable to either break themselves, or break the mould if of wax or plaster and cement, which latter make a good mould for small articles.

I wish your readers to try the following and they will be perfectly satisfied with the result. Make a jelly paste equal parts rye flour and glue; take equal parts of sawdust and common wheat flour; to every half gallon measure of this latter mixture add half cup of molasses. Now knead into a very stiff dough, using as much of the jelly paste as you require, but it must be very stiff. Oil moulds with neat's foot oil and press your dough into all parts, tamping it down smooth with a roller or flat piece of wood. Let stand 24 hours in a dry place. It will then shake out easily on to a papered tin or common oven pan.

Take a soft brush and oil the face of the pattern you have got out of your mould, mending any small imperfections that may exist in your casting, and with a sharp knife or chisel remove all outside edge, or rather I would say, "Trim your cast neatly now." Bake in a moderate bread heat oven, and remember one thing—directly all the moisture is out of your piece of work, it will begin to burn very quickly. So you must watch your oven very carefully.

By following these directions carefully, you will have a casting equal to any piece of carved wood. Shellac or paint when cold.

Anti-Fouling Compositions for Ships' Bottoms.

To the Editor of the Scientific American:

We note Mr. Ganse's remark that "the party who would invent a reliable anti-corrosive and anti-fouling composition would make a fortune."

Allow us to state that such a composition has already been in use for the last twenty-seven years in England and Germany, the so-called Hartmann's "Rahtjen's composition."

This paint has been used by the North German Lloyd steamers since 1864, and they are continuing its use up to the present date. Furthermore, it is almost exclusively used by the English navy, upward of sixty of their ships being coated with this composition, and only recently the largest man-of-war in the world, the Royal Sovereign, has been painted with the same.

We have had considerable experience with this composition, and must admit that it is the best anti-corrosive and anti-fouling composition manufactured at this date.

It thoroughly protects the iron and steel against rust, grass, and barnacles. It reduces the skin friction, thereby increasing the speed, with the use of less coal, as against a dirty bottom.

We have frequently known steamers to run with this composition one whole year without docking, and as for the price, it only costs about \$250 to coat a vessel of about 1,800 tons gross register, with two coats.

We do not think that any ship-owning firm, be it government or private, would want a vessel to run three years without docking, as is claimed for the Japanese lacquer. We think it is to the ship-owner's interest to see his vessel's bottom at least once a year, for various other reasons besides painting, and even though the vessel be coated with Japanese lacquer, she would incur, we think, the expense of docking once a year, the same as if she were painted with any other composition.

The lacquer is said to dry in one day, so that it will take two days for two coats, whereas the Hartmann's Rahtjen's composition dries as quick as applied, thus enabling two or three coats to be given in one day, and the vessel can be put into the water immediately after being painted.

A peculiarity of the lacquer is that it cannot bear the sun well, and consequently the ship must be covered with mats in order to keep the sun off as much as possible. The cost of the lacquer being so enormous, it will hardly be extensively adopted by the merchant marine. GUSTAVUS & CO.

Baltimore, March 21, 1891.

The Duties of the Steam Engineer.

In taking charge of a plant and of steam boilers or generators of steam under pressure, and engines, the engineer must make himself acquainted with the nature and condition of his machinery and all its details, and first of all, of his boilers and steam generators, as to their safety and security against explosion from weakness. When time is permitted, the condition of the interior of the boiler, regarding its cleanliness, the safety valve, water gauges, and steam pressure gauge, should be known, and if the pressure gauge is not known to be correct, and no means at hand to test it, the safety valve should be carefully examined and computed and adjusted to resist or hold down only a safe boiler pressure. The check valve, blow-off, and in fact all parts of the feed apparatus must be known to be in working order, that is the pump, injector, or inspirator. The suction, supply pipe, and the source of feed water should be made sure of performing their functions. The furnace, flues, and chimney should be examined and put in order if so required. Last, but not least, the engineer should see that the steam pipe, cocks, and valves are in order and properly secured; the engine in line, shafts, rods, pins, and journal boxes in good and smooth condition, keys and bolts secure and properly adjusted, piston packing and stuffing boxes, eccentrics, and straps put in proper condition and all lost motion taken up. The steam slide valve, or any other kind of valve regulating the admission of steam, and its seat, should receive proper attention, and the valve motion, if necessary, be adjusted. For a close and accurate adjustment the valve rod should be marked on the outside of the steam chest to show or indicate by the use of a gauge the relative position of the valve; then the proper adjustment can be made when the engine is at a working temperature. The adjustments may also be made on large and automatic cut-off engines from the reading of indicator diagrams.

The condition of flywheel, pulley, and belt with the line shaft, their bearings and lubricating devices, should be ascertained before any attempt is made to fire up the furnace. During the process of raising steam, observations should be made to note the actions of furnace and boiler and its appendages. Before starting the engine by steam, turn over the engine shaft once or twice to see that no obstructions are in the way of rotation. An engine should not be started to running until a proper amount of steam has been admitted on both sides of the piston to heat up the cylinder, piston, and valve, etc., to the normal temperature of the steam. The cylinder cocks are to be left open until after the engine has been started and all the water removed from the cylinder. Previous to starting the engine, all journal bearings should be properly oiled and the valve and cylinder oiler should be primed and adjusted. In case the engine has been standing idle any length of time, the interior of the cylinder, as well as the valve seat, should be examined, smoothed, and well oiled.

When there is metallic packing in piston, adjustable by springs, such packing should be adjusted in a manner to elevate the center of the piston head a very little above the center of the cylinder; the tension of springs should be very moderate; when once the packing rings fit the cylinder and the surfaces are true and smooth, a steam joint is effected; and a slight additional tension of the springs is sufficient to bear the weight of the piston and keep that packing tight for months. Tight packing not only tends to wear the parts, but robs the engine of part of its effective power.

The packing in stuffing boxes, when new, ought not to be tight at first, and should only be tightened up gradually; and such steam packing joints should always be loose enough to leak a small quantity of water without any steam, insuring a constant lubrication and easy wear. Although an engineer in charge may be perfectly familiar with his plant and all its details, it is his duty before starting his fire in the morning to examine his stage of water in the boiler, and where there is an uncertainty of condition of anything, don't trust to luck. Don't load down your safety valve any more than absolutely necessary. Don't carry any more steam than required, and then at as near uniform pressure as possible. Feed the boiler uniform, and carry the water no higher than is absolutely necessary for safety. The fire in the furnace should be kept as even as possible and the charges of fuel small and often and well distributed. No holes should be allowed in the fire for the cold air to pass up through the grate, no air should be allowed to pass from the exterior to the interior of the furnace, except through its proper channel and in a proper manner. A uniform temperature and pressure of steam is very essential to the longevity of a boiler and is a good evidence of the skill of the operator or person in charge. It is also very essential that the boiler be kept clean on the outside as well as the inside; the scale on the inside is considerable of a non-conductor, and the ashes and soot on the outside of boilers and flues is still worse. The evaporating capacity of a clean boiler both in and outside is sometimes more than double that of a neglected and dirty boiler, not speaking of the greater liabilities of burning and exploding. There is no particular rule for the blowing out and cleaning of boilers, as to how often it should be done, excepting that there should be as little as possible between the fire and hot gases on the outside and the water on the inside of the heating surface, excepting the boiler plate itself. The engineer must be guided by the quality and condition of the feed water, to determine how often the boiler should be blown out and cleaned on the inside. The chimney draught, combustion of fuel, and method of firing will determine the necessity of outside cleaning.—FRANK L. RUTH, M.E., in the Stationary Engineer.

Telephone Rates.

The oft-repeated assertion that telephonic service cannot be afforded at a lower rate than that which prevails in most of our large cities, and the oft-repeated statement, on the part of the American Bell monopolists, that "the larger the business, the larger the expense" (which is contrary to all known data of commercial science), have of late received a most convincing set-back. As everybody knows, the fundamental Bell patents have expired in Great Britain. In 1893, the same patents will expire in the United States. By reason of certain adverse judicial decisions, there exists just across the border—in Canada—a state of affairs which is plainly indicative of what will take place here in 1893. To-day Montreal furnishes the cheapest telephonic service on this continent. The long-established "Bell" company demands only \$25 a year for either residential or business houses. The opposition company, the Federal Telephone Co., which brought rates to their present basis, charges \$35 a year for business houses and \$25 a year for residences. Both concerns are doing a lively business. The local "Bell" Co. has about 5,000 subscribers in the city, and the opposition company has about 6,500 subscribers. Both organizations use the same apparatus. This reduction in telephone rates not only applies to cities with from 5,000 to 10,000 subscribers, but is also taking place in Berlin, which has even a larger number of subscribers, and also in London, where the rates have been reduced from £15 to £10 per annum. What better evidence than these facts can be adduced to prove that the business can be done, and is being done to-day, in the largest cities of the world when the patents have become invalid through expiration of their terms, and that legislatures, in this country, will regulate the rates so as to conform to these, in some just proportion, after the patent monopoly on the Bell and Blake apparatus shall have expired?—Practical Electricity.

Convicts in the United States.

A census bulletin gives statistics of penitentiary convicts in each State in proportion to population. In 1880, out of a population of 50,000,000, the proportion of convicts was 709 to each 1,000,000 of population. In 1890 the proportion was 722 to the 1,000,000. The population of the United States in 1890 was 24.86 per cent greater than in 1880. In 1890 there were 27.88 per cent more convicts than in 1880. This shows that the number of convicts has increased 2.42 per cent faster in a decade than the population. Of the 45,233 convicts in penitentiaries in the United States in 1890, the whites formed 67.53 per cent, and the colored 32.47 per cent. Of the 30,546 white convicts, the native born represented 75.60 per cent, and the foreign born 23.79 per cent, while the place of birth of 0.61 per cent was unknown. The men formed 96.1 per cent and the women 3.9 per cent, showing 24.64 times as many male convicts as female.