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### NEW YORK, SATURDAY, OCTOBER 18, 1879.

## Contents.

(Illustrated articles are marked with an asterisk.)	
Advertisers, a suggestion to	

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ship

travel from Jersey City to Broadway to be six minutes. \*\*\*\*\* construction the concrete was rammed in the moulds, but ' THE PRODUCTION OF BROMINE IN THE UNITED STATES. that process has been abandoned as needless, it having been The only important source of bromine in the United States found that the vertical fall of ten or twelve feet, from the is the liquid which remains after the extraction of salt, and car to the mould, leaves the stuff in a better state of com which is known in the salt-making industry as the "mother pression than could be obtained by ramming. Four days waters." The Moniteur Scientifique gives a short description after the setting has commenced each block is coated with a of the process employed in separating this important element plastering of mortar, laid on from one to three inches thick, from the saline liquors. The latter, when first pumped up JAWEIN. Fischer's Pyrometer. 1 figure. VI. MEDICINE AND PHARMACY.—On the Cure of Consumption. By Dr. JAS. H. SAILSBURY. Notes on Cinchona Bark. By DAVID HOWARD. An Improved Method of Making Phosphorus Pills. By EDWARD F. by means of the trowel. This mortar-composed of equal from the pit, mark 9° Baume. They are evaporated in volumes of American Portland cement and sand—is pre-pared in small quantities and the plastering done quickly. further evaporated to the crystallizing point in wooden CHERRY. A New Method of Making Tincture of Iodine. By E. F. CHERRY. A New Method of Making Tincture of Iodine. By E. F. CHERRY. A New Test for the Presence of Biliary Coloring Matter in the Urine. I, METEOROLOGY AND ASTRONOMY.—Meteors. Theory of Prof. Benjamin Peirce. Meteorological Register. Instrument used at the Observatory of Montsouris. 6 figures. Regulating barometer. Reading apparatus. Thermograph. etc. Pallas Comet II. of 1878. lements and ephemeris. The Planet Jupiter. At the end of two weeks the concrete has become hard tubs heated by steam. The first crystallization forms the enough to allow the removal of the moulds, after which the salt of commerce. The tubs, five in number, are placed side V1I. interspaces are filled with mortar or rubble masonry. By by side, and every day the liquor is decanted from one to far the greater and more difficult part of this concrete work another-from No. 1 to No. 2, then to No. 3, and so on to was in place in the fore part of June. At the current rate No. 5. The crystallized salt is removed from cach tub after Farbag Come II. of 1878. Imments and ephemeris.
The Planet Juriter.
The Standard and The Stand observed. It is expected that the compression due to the of sodium and calcium. Tub No. 1 is filled every day with Distances for Grapes. Sea Weed. Its composition and uses. Production of isinglass from sea weed. tremendous weight of the blocks will continue until the fresh brine, so that the process becomes continuous. The

### CONCRETE WORK AT THE SEA ENDS OF MISSISSIPPI JETTIES.

The largest blocks of concrete ever employed in works of marine engineering are those used to give stability to the sea ends of the South Pass jetties, now approaching completion, at the mouth of the Mississippi Two causes combined to make their adoption an imperative necessity-the entire absence of available rock within a radius of five hundred miles or more, and the enormous force of the waves to be with stood. In an early experiment, masses of rock, in blocks weighing from one to two tons, were placed upon the lower ends of the jetties; but the first gale swept them all away It was accordingly decided to cap the last 3,800 feet of the east jetty and 2,800 feet of the west jetty with blocks of cesame proportionate rate. Postage prepaid. of the great breakwater at Cherbourg, France, and hitherto unrivaled, weighed only forty-four tons.

In a paper read before the American Society of Civil En. gineers, last August, Chief Assistant Engineer Max E. Schmidt gave an account of the mode of constructing and sa distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT depositing these gigantic blocks, a mode which presents several novel and interesting features.

The concrete is made of broken stone, gravel, sand, and cement from the limestone region near Rose Clair, on the Ohio, 1,300 miles up the river. The stone is broken by hand, all the pieces being small enough to pass through a threeinch'ring. The gravel is brought from Prophet's Island, La., two hundred and fifty miles up the river, and ranges in size from 1-30th of an inch to  $2\frac{1}{2}$  inches in diameter The sand, which comes from the islands near the mouth of Pearl River, Miss., is moderately coarse and sharp grained. The cement is Saylor's American Portland Cement, of which over 5,000 barrels have been used. The proportions of these ingredients employed are by volume, 15 parts broken stone, 4.38 parts gravel, 8.28 parts sand, and 3 parts cement. One hundred and sixty-five cubic yards of these materials (dry) make 100 cubic yards of concrete after final induration. The ingredients are mixed with fresh water in quantity equal to about  $10\frac{1}{2}$  per cent of the dry material.

The blocks of concrete are constructed in place on the top of the jetties, and are from 16 to 20 feet long, from 5 to 13 feet wide, and from 21/2 to 4 feet thick, the dimensions enlarging by offsets as the jetties approach the sea ends. The mixing is done in a 5 ft. 9 in. cubical box made of quarter inch boiler iron, well riveted and strapped with flat and T iron, and supported by a strong framework of timber resting on the jetty. A separate mixer is used on each jetty. The mixer is suspended by two hollow cast-iron trunnions, 71/2 inches in diameter, which are riveted from the inside of box to two corners diagonally opposite, so that the box with its contents is easily revolved by a steam engine on the wharf below.

ns...... 245 ngraving. 240 \*------ 246 The mixer is charged and discharged through a triangular s..... 248 250 252 door, formed by cutting off one corner of the box, the any similar work has ever been constructed for. It is be-7ed..... sliding cover being strongly clasped and secured by screws. 244 251 lieved that its present capital of \$10,000,000 will be abun The water enters the box through hollow journals while ion..... dant for that purpose. The plan of construction contemthe ingredients are being revolved for mixing. The dry materials are handled and lifted by steam power Twenty-two revolutions of the mixer, requiring a out two pected to exert sufficient pressure to hold in place and pre-minutes and a half, suffice to thoroughly incorporate the ingredients. The concrete is discharged into cars beneath, is also expected to carry back to the working-shaft through and is quickly drawn to the point of deposition by a small pipes all sand, mud, or water that may accumulate in the locomotive along a railway running above the surface of the •••••••••• jetty, supported by piles. The cars, which contain about that the tunnel can be advanced five feet a day, and that two cubic yards each, are strongly built of boiler iron. By the whole work can be completed in two years. TABLE OF CONTENTS OF means of two ratchet wheels and wooden levers perma-THE SCIENTIFIC AMERICAN SUPPLEMENT nently attached to the axle on each end of the car, the dumping of nearly 9,000 pounds of concrete is done almost No. 198, automatically, and the car is easily turned back to its up-For the Week ending October 18, 1879. right position by two men. The moulds, constructed almost entirely without nails or spikes, are sawed out in parts and I: ENGINEERING AND MECHA ICS.-The Most Economical Speed for Steam Ships of the Navy. By JOHN LOWE, B.A., Eng. U. S. N. 1 of the semifluid materials to be supported. fitted by carpenters, and are carried on trucks over the Ordenin Salpert and Way. By other bound in the bar, black, finished blocks to the place where needed. Then the floor-26 feet wide and 24 feet high) is to establish direct railway ing is laid down and the other parts quickly put in place. As soon as the mould is ready the freshly-prepared concrete termini at Jersey City-the Erie, Pennsylvania, Delaware, Bedonomy of Fuel. Nervices in Article Structures:
Sewer Ventilation in Berlin. From Karwisse's report on the sewage systems of Furope.
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Sewer Ventilation in Berlin. From Karwisse's report on the sewage of Furope.
Sewer Ventilation in Berlin. From Structure in By R. G. Hatfield. The have of Geological Survey of Pencesylvantus. By R. G. Hatfield. The have of Geological Survey of Pencesylvantus.
M. ARCHITECTURE. - Ant Lite Construction. By R. G. Hatfield. The have of Geological Survey of Pencesylvantus.
M. ARCHITECTURE. - Antific Power. Professor W. E. Ayrton's British Association. Annual Discourse to working men. History of electric motors. Water power versus electric motors. Conditions of electric generation.
Electrical Clocks and Clockwork. By HENRY DENT GARDNER. Bains' electrical looks etc. 13 HENRY DENT GARDNER. Bains' electrical productor. Structure of the mould. State of the mould, leaves the stuff in a better state of commerse of the setting has commenced each block is coated with a plastering of mortar, laid on from one to three inches thick, Fisher's Prometer. 1 figure. is filled in, and the concrete is left to set. Less than twenty Lackawanna and Western, and New Jersey Central. It is estimated that more than 400 trains of cars could be passed through the tunnel every twenty-four hours, the time of

elasticity of the subaqueous layers of mattresses has been destroyed The greater part of the settling seems to occur within the first ten days after the construction of the blocks.

### USE OF PHOTOGRAPHY IN WOOD ENGRAVING.

In the practice of the ordinary method of wood engraving the artist whitens the surface of the block and makes his drawing thereon with India ink or pencil. The engraver then cuts upon the drawing, endeavoring to keep in mind the general effect of the original; but the latter is of course gradually obliterated as the work of cutting proceeds. To this obliteration of the original drawing is probably due a part of that loss of artistic effect in the finished engraving, of which draughtsmen are apt to complain.

The facilities offered by photography are now, however, being used by engravers and draughtsmen to assist in the production of better engravings. Instead of drawing directly upon the wood, the artist now makes his finished picture upon paper, which is then photographed upon the wood in exact facsimile: the engraver then proceeds to cut the photograph, and during the whole time of cutting he has before him the original paper drawing, to which he may refer for assistance in his endeavor to maintain and reproduce the spirit and feeling of the picture.

# THE HUDSON RIVER TUNNEL.

The Hudson Tunnel Company, which began excavations almost five years ago for a submarine passage to connect the cities of New York and Jersey City, lately resumed operations after a litigation of several years begun by railroads and private citizens to restrain the work. The courts of New Jersey decided that the company were legally entitled to build their tunnel, and Colonel DeWitt C. Haskin, the President, immediately set to work a force of about fifty masons and laborers at the original point of departure, Jersey avenue and Fifteenth street, Jersey City. The tunnel was begun in November, 1874, after extensive borings which had been begun a year before in the bottom of the Hudson River. A circular working shaft thirty feet in diameter, walled with four feet of brick, was begun 100 feet inland, it being intended to make it 65 feet deep, at which point the tunnel was to be constructed. Colonel Haskin informs the World that he expects to get well under the river before winter sets in. It is estimated that the tunnel will cost \$10,000,-000. It will be 12,000 feet long, including the river approaches, and the greatest depth under water will be over sixty feet. The location of the New York terminus has not been fixed upon, but Washington Square has been suggested. It is now proposed, to gain time, to work at once on each side of the river, as many men to be employed as possible at one time in gangs, which are to be relieved every eight hours. The company claims that by the aid of compressed air, as applied in the patent obtained by Colonel Haskin, it will be able to complete the work at much less expense than plates no coffer-dam, caissons, or Brunel shields, the compressed air introduced into the face of the tunnel being exvent any irruption of silt, clay, or water. The air pressure heading during the course of the excavation. It is believed.

All this, of course, is contingent upon the success of Col. Haskin's method of tunneling. That it will succeed without radical modifications is highly questionable, indeed altogether impossible, since the air in the tunnel would have to be maintained at a density at least equal to that

The object of the tunnel (which is to be circular in form, connection between New York and the railways having