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Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF

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NEW PATENT SELLING TRICK.

The latest trick of pretending patent sellers is to write to the patentee that it will be necessary to send them 180 copies of the new patent in order to effect a sale. If the patentee does not happen to have the 180 copies on hand, they (the sellers) will obligingly obtain them. If not convenient to send the full amount then, the patentee should remit say $9 in part payment for the copies, on receipt of which amount the sellers pretend they will go ahead and sell the patent. Many patentees are thus duped. They send the money, the sellers put it in their pockets, and that is what they live upon.

TUNNEL RAILWAYS IN NEW YORK.

The franchise for the construction of what is known as the East River tunnel was granted to the New York and Long Island Railroad Company by the New York City authorities on December 10. The general features of the proposed work have been already described in our SUPPLEMENT, No. 755. It is to cross the East River on the line of 42d Street in this city. The starting point on the Long Island side will be a little over a mile from the shore. It will descend at a uniform grade of 66 ft. per mile until it reaches a point near the middle of the river. There a level section a little over 1,000 ft. in length begins, which will carry it to the New York City shore line. Thence by a grade of 63·35 ft. to the mile it will approach the surface, reaching the ground level at 11th Avenue on the Hudson River. This will give a total length of about 20,500 ft. from approach to approach. Most of the excavation will be in gneiss rock. The tunnel is to be 26 ft. wide and 22 ft. 6 in. high, a size which will be ample for two tracks and for the largest cars. There will be several intermediate stations with passenger elevators to the street surface. One station is to be at the Grand Central depot, and the others may be arranged to connect with one or more of the elevated railroads.

The most impressive feature about the tunnel is its great depth and the crossing underground of the entire city.

The tunnel will give direct railroad communication between Brooklyn and the North, South, East, and West. It will bring the seashore of Long Island in direct communication with the interior of the State of New York, so that excursion trains can carry their passengers directly to the Rockaway or Coney Island sea beaches.

The estimated cost of the tunnel is $1,000,000 per mile. Its deepest point within the city will be at 2d Avenue, were there will be 118 feet, principally of rock, between it and the surface.

This scheme is in accord with the movement of the day in the direction of giving additional facilities for crossing the Hudson and East Rivers.

The problem of ventilation has been disposed of by the introduction of electric motors and of the electric light. A tunnel to-day may be lighted from end to end, and may have an atmosphere uncontaminated by smoke and gas from engines.

The problem of intercommunication between the opposite sides of the Hudson and East Rivers at New York should be attacked from the standpoint of rapid transit. A number of tunnels should be built, corresponding with the principal cross streets of New York. They could be of smaller size than the present North River tunnel, or this projected East River tunnel, as they would be built to accommodate smaller cars and motors. Each tunnel might cross both rivers and the city, with a number of intermediate stations, corresponding to the different thoroughfares running longitudinally. What the city really needs is rapid transit at a number of points between Brooklyn, New York, and the New Jersey shore. Small tunnels of 10 or 11 feet diameter, like the electric underground railway in London, could be cheaply and rapidly constructed. In London, by working on an average on six faces, as much as two miles of tunnel were driven in one year. It was demonstrated in London, as it was in this city twenty years ago, that such work can be prosecuted in the heart of the city without opening or disturbing the surface of the streets.

If new railroads are to be brought into New York by bridges or tunnels, the establishment of track yards becomes necessary. For these there is no room on the island. This is another indication that the rivers should be crossed by rapid transit lines only. It would be far better to let the railroads, as far as possible, adhere to their present terminal stations, on the shores surrounding New York.

In accord with the ideas of intercommunication between the present city and the adjacent shores is the proposed consolidation of New York and its environs. A board of commissioners is now in existence for investigating this plan, and already a report has been received from the president of the commission, Mr. Andrew H. Green. It is proposed to include New York, Brooklyn, and Staten Island and much adjoining territory in the new municipality. Whether the neighboring cities of the State of New Jersey can be absorbed or not remains to be seen, but the plan which would exclude the 200,000 inhabitants of the adjacent parts of the next State would seem incomplete. Mr. Green, in his report, advocated including Jersey City, which might eventually mean much more than its present municipal district.

OPENING OF THE NEW PULITZER BUILDING.

The Pulitzer building, erected as the publishing headquarters of the New York *World*, was formally opened on the evening of December 10. Numerous invitations had been issued to leading representatives of the press and government and others, and several thousand guests assembled to inspect the building and take part in the ceremonies. The latter included music, supper, and speeches, and the occasion was one of much enjoyment for all. Seldom has there been so large an assemblage of distinguished people from all parts of the country gathered under one roof. Many governors of States were there, senators, congressmen, judges, lawyers, authors, editors, merchants, and prominent persons in every walk of life.

The building, which stands upon the corner of Frankfort Street and Park Row, in this city, is remarkable for its great height. It is the highest office building in the world, and is the highest structure of any kind in the city. The top of Trinity Church steeple is barely on a level with the floor of the lantern on the dome. In the main structure there are 14 full stories above the sidewalk level, and in the dome there are six full stories. Underground there is one full story devoted to the press room. Besides these there are four mezzanine stories. The total number of floors is 26. From sidewalk to the top of the dome or lantern floor is 309 feet, nearly a hundred feet more than the height of the Bunker Hill monument. It contains 2 miles of wrought iron columns, 16 miles of steel beams, and about 5,000,000 pounds of iron and steel, enough metal to lay 29 miles of railway. There are 142,864 square feet, about 3½ acres, of floor space. There is brick enough in the building for 250 ordinary houses. The composing room is on the twelfth floor. There the type is set and the matrices made for stereotyping. The latter work is executed in the basement, so that the type never leaves the composing room floor.

The editorial offices are elegantly furnished, and the building contains every modern appliance for the tenants as well as for the publishers. It contains 79 rooms devoted to the publishing of the paper and 149 rooms for general office purposes. The success of the *World* is one of the marvels of the day, and is the result of the extraordinary abilities of its enterprising proprietor, Mr. Joseph Pulitzer, who is justly styled the Napoleon of journalism. The *World* has by far the largest circulation of any daily newspaper on the globe, namely, 300,000 copies, while financially it is most profitable.

The new building, contents, and land represent a cost of about two millions of dollars, and according to the official certificates published in the *World* there is no mortgage or indebtedness upon the property.

THE ARTIFICIAL PRODUCTION OF RAIN.

The question as to whether rain can be produced by artificial means is to be tested by the United States government. On motion of Senator C. B. Farwell, of Illinois, a clause was added to the Appropriation bill which provides that, under direction of the Forestry division of the Department of Agriculture, $2,000 shall be expended in experiments having for their object the artificial production of rainfall by the explosion of dynamite.

In a communication from Senator Farwell the following theories are advanced: "My theory in regard to producing rain by explosives is based partly upon the fact that after all the great battles fought during the century heavy rainfalls have occurred. This is historical and undisputed. Senator Stanford, one of the builders of the Central Pacific Railway, informed me lately that he was compelled to do a great deal of blasting through a part of the country where rain had never been known to fall in any useful quantities and where it has never rained since, and that during the period of the blasting, which was nearly a year, it rained every day. I feel almost convinced that rain can be produced in this way. The dynamite could be exploded on the ground or up in the air, and I think I would prefer the latter. The experiment should be made in eastern Iowa, Colorado, or in western Kansas, somewhere along the railway, and my own idea would be to commence early in the morning and explode continuously for seven or eight hours."

The subject of rain production by means of concussion

has been frequently discussed during the last twenty-five years. A great number of instances were stated by Francis Powers, C.E., in a volume entitled "War and the Weather, or the Artificial Production of Rain," 1871. Many cases are cited in which great battles have been followed by speedy rain. Six occurred during our war with Mexico in 1846 and 1847; nine cases of battles or skirmishes are given which occurred in 1861 in the war of the rebellion, and which were followed by rain at no great interval; forty cases are cited in 1862; thirty for 1863; twenty-eight for 1864, and six for 1865. Eighteen similar cases are also cited from among the great battles which have occurred in Europe during the past century, making a total of 137 cases. In a criticism of Mr. Powers' theory, *Silliman's Journal* said: "To this argument it may be replied that throughout the region from which his examples are mainly drawn, rain falls upon an average once in three days, and probably a little more frequently; so that from the conclusion of one rain to the commencement of another, the interval is on an average but little over two days. Now, battles are not usually commenced during a period of rain; generally not till some hours after the conclusion of a rain. Rain, therefore, ought to be expected in about one day after the conclusion of a battle. Now, the argument of Mr. Powers is lame in this point. He takes no precise account of the length of the interval between the conclusion of a battle and the commencement of rain; nor does he show that the interval is less than it should be if the battle had no influence in the production of the rain; and in particular he takes no account of the cases unfavorable to his theory, in which rain follows a battle only after a very long interval."

Some of the cases, however, which may be cited where the fall of rain seems to have been caused by the discharge of cannon are very striking. During the siege of Valenciennes by the allied armies in June, 1793, the weather, which had been remarkably hot and dry, became violently rainy after the cannonading commenced. Two hundred pieces of heavy artillery were employed in the attack and one hundred in the defense of the city, the whole of which were frequently in action at the same time.

At the battle of Dresden, August 27, 1813, the weather, which for some days had been serene and intensely hot, during the progress of the battle suddenly changed. Vast clouds filled the skies, and soon the surcharged moisture poured itself in a torrent of rain. At Waterloo, according to Siborne, the weather during the morning of June 17, 1815, had been oppressively hot. It was now a dead calm; not a leaf was stirring, and the atmosphere was close to an intolerable degree, while a dark, heavy, dense cloud impended over the combatants. The 18th Hussars were fully prepared and awaited the command to charge, when brigade guns on the right commenced firing for the purpose of breaking the order of the enemy's advance. The concussion seemed instantly to rebound through the still atmosphere and communicate like an electric spark with the heavily charged mass above. A violent thunder clap burst forth, which was immediately followed by a rain which has never probably been exceeded even in the tropics. In a few moments the ground became perfectly saturated.

Humboldt says that when a volcano bursts out in South America during a dry season it sometimes changes it into a rainy one. It is well known that in very hot calm weather the burning of woods, long grass, and other combustible materials produces rain. Very extensive fires in Nova Scotia are so generally followed by heavy floods of rain that there is ground for believing that the enormous pillars of smoke have some share in producing them.

Captain James Allen, acting signal officer of the War Department, in reply to interrogatories recently addressed to him regarding the probability of producing rain by artificial means, said: "One fact would seem to be easily admitted, that an attempt to explode gunpowder in order to practically demonstrate the advisability of attempts in rain production should at first be made after most careful consideration of the atmospheric conditions. For example, if these explosions should be made in the center of a high area, as shown by our weather maps, or even after a low area has passed any point, we may be absolutely certain no rain will follow. The first experiments should be undertaken to the southeast or east of a low area, and 300 to 600 miles from the center.

"Observing stations should be established every 5 or 10 miles for 200 miles to the eastward of the point of explosion. If the explosions are made in a comparatively clear sky, and after that unmistakable clouds are observed to the eastward and not to the westward, some connection may be surmised. It must be said, however, that even if the production of rain be practicable, it can only be for a very limited area, and it is believed that any benefit which can possibly arise from such rain can never amount to the expense of the enterprise."

The opinion of Captain Allen is similar to that of President H. C. Russell, of the Royal Society of New South Wales, contained in an anniversary address delivered in 1884. He says: "It would seem unreasonable to look for the economical production of rain under ordinary circumstances, and our only chance would be to take advantage of a time when the atmosphere is in the condition called unstable equilibrium, or when a cold current overlies a warm one. If under these conditions we could set the warm current moving upward, and once flowing into the cold one, a considerable quantity of rain might fall, but this favorable condition seldom exists in nature."

The experiment of producing rain by exploding dynamite is about to be tried, and the result will be awaited with much interest.

Daniel B. Fayerweather.

The bequest of $2,100,000 to twenty different colleges, and $95,000 to five hospitals, brings the name of Mr. Fayerweather, a New York leather merchant recently deceased, prominently before a public to which he was, while living, comparatively unknown. The largest beneficiary is Yale College, with $300,000, of which the Sheffield Scientific School receives $100,000, while Cornell and Columbia each receive $200,000. All the bequests, large as is their total, have been made with a wise discrimination, for the purpose of widening the scope and strengthening the forces of established institutions which aim to afford facilities for a liberal education to the largest possible number of those who will grasp it.

Mr. Fayerweather, without the advantage of much schooling when young, and with an environment which made it necessary for him from his earliest days to earn his own way in the world, was himself an example of one of the best educated of men, in the best sense of the term. His associates in the leather business described him in several speeches made at a meeting held at the time of his decease as being, above all things else, a model business man—thoroughly conversant with every detail, with an energy equaled by few, an uprightness and purity of personal character which no shadow could touch, and with a most winning presence. But there was this further about him—there was no useless lumber in his brain, no idle or purposeless efforts found occupation for his hands; and for an individual to attain a self-mastery which renders such description a truthful one is but to reach the end to which all thorough education is directed. He did not derive thoroughness of reasoning and close analysis from diligent study of the higher mathematics, nor were his powers of application strengthened and his mental forces trained by the discipline of the classics, but, with the broad intelligence which is almost a birthright of every American citizen, he united a mental equilibrium and integrity of purpose which, supported by tireless application, seemed to remove without effort every obstacle in the way of his success. He was always simple, direct, practical, and conscious of his own limitations; but, although he was extremely modest and diffident in manner, his view embraced a wider field than most of those who knew him were aware of. He was harnessed to hard work all his life, and, dying at the age of sixty-nine years, leaves the greater part of his accumulations to promote the cause of higher education in the world. It has been said that to know Shakespeare was a liberal education in itself. To know personally Daniel B. Fayerweather, as he was in business and in private life, was to be familiar with traits of character certain to insure success in any calling, without the help of fortuitous circumstances, and with a disposition ever open to opportunities to exercise a wise generosity. He was a high exemplar of American business men of the very best class.

The Argentine Cruiser 25 de Mayo.

The ship was built by Sir W. G. Armstrong, Mitchell & Co., and was designed by Mr. Philip Watts. She is 325 ft. long between the perpendiculars, 43 ft. broad, 16 ft. mean draught, and her load displacement is 3,200 tons. Her contract powers with natural and forced draught were 8,500 and 13,500 indicated horses respectively; and the contract speeds with natural and forced draught were 20¾ and 22 knots respectively. Her armament consists of:

Two 21 centimeter breechloading guns.
Eight 12 centimeter quick-firing guns.
Twelve 3 pounder quick-firing guns.
Twelve 1 pounder quick-firing guns.
Three 18 in. torpedo guns.

Her machinery, which lies wholly below the water line, and is further protected by a strong steel armor deck, has been constructed by Messrs. Humphrys, Tennant & Co. It consists of two sets of triple expansion four cylinder engines, working separate screws and supplied with steam from four double-ended boilers. In each set of engines there are two low pressure cylinders, each 66 in. in diameter, one intermediate pressure 60 in. in diameter, and one high pressure 38 in. in diameter; and the length of stroke is in each case 30 in. The armor deck extends the whole length of the vessel and is provided with sloping sides, as is usual in this class of vessel. Over these slopes the plating is 3½ in. and 4½ in. thick and the horizontal plates of the deck are 1¾ in. thick. The armor deck is 1 ft. above the water line along its middle, and the principal hatchways are protected by 5 in. armor glacis plates and cofferdams. Immediately above the armor deck, also extending the whole length of the ship, is a raft body 3 ft. deep along the midship portion, and of greater depth toward the extremities where the armor deck inclines downward. Coal bunkers are constructed along the sides of the vessel above the armor deck, so as to form part of the raft body, and these and all the raft body spaces are very minutely subdivided by water-tight bulkheads. The normal supply of coal is 300 tons, but bunker capacity for 600 tons is provided.

At the recent steam trials, runs with and against the tide were made at various speeds on the Admiralty measured mile at the mouth of the Tyne, and a curve of performance in terms of revolutions of screws constructed. The official trials included a run of six hours' duration with natural draught, and the mean speed was determined by taking the total number of revolutions of the screws, obtaining therefrom the mean number of revolutions per minute, and applying these to the curve of performance previously obtained; the actual performance was 21·237 knots per hour. The mean power developed over the six hours was 8,700 indicated horses, and the mean number of revolutions 144·9 per minute.

We understand that the commission attached so very little importance to the forced draught performance of the ship that they would have accepted her without any official forced draught trial at all; but at the close of a long day's steaming, runs over the measured mile with and against the tide were made, and the mean speed obtained was 22·43 knots per hour with 160 revolutions, and a mean indicated horse power of 13,800. There can be no doubt that, if it had been desired to do so, with fresh stokers and clean fires, a much better performance with forced draught might have been obtained.

The general features of the design of the 25 de Mayo are similar to those of the Piemonte, completed by the same firm about eighteen months ago for the Italian government, but the former vessel is about 700 tons heavier than the latter.—*Engineering.*

Washing Out the Stomach.

During the past year several physicians in New York have tried, with a gratifying success, a novel treatment for dyspepsia and cancer of the stomach by washing out that organ. The process is very simple and not dangerous. A long flexible pipe is passed down the throat until one end is in the stomach. The upper end has a funnel attached, into which hot water is poured until the stomach is filled. The weight of the water in the pipe and funnel gives a hydraulic pressure sufficient to distend the stomach. The pipe has an aperture big enough to hold a lead pencil. After the stomach has been filled, the funnel end of the pipe is turned down until it is lower than the bottom of the stomach, and the stomach is emptied as a barrel of any fluid is emptied through a siphon. The process may be repeated several times. The result is that the undigested food and mucus are washed out, and the hot water closes the blood vessels and reduces inflammation. The relief is immediate. The dyspeptic may have his stomach washed out before a meal, so that he can take a fresh start. After the lapse of a sufficient time for ordinary digestion, the stomach may be washed out again. This process has been in use at the New York Hospital, we are informed, for some time.

New Arms Wanted by the Government.

In his recent annual report to the Secretary of War, Gen. Benet, Chief of the Bureau of Ordnance, says: "The improvements in magazine mechanism have been rapid, and it seems peculiarly necessary, now that a change in caliber is contemplated, that our present Springfield single-loading system should be replaced, if it is possible, by an equally efficient magazine system. Accordingly, this office will recommend that a board be convened to select a suitable magazine mechanism, after a full and free competition among the best existing systems, as soon as the necessary preparations can be made. We have lost nothing by waiting until the present time. Several European nations during the past few years have made premature changes of caliber or have adopted crude repeating systems that have had to be abandoned for newer and better ones, often before the armies were fully armed with them."

Here is a fine field for the exercise of inventive genius.

Another Successful Inventor Gone.

The Rev. Robert Dick, the well known inventor of the newspaper mailing machine which is in use in most newspaper offices, died at the age of 74 in Buffalo, N. Y., on December 10. Mr. Dick made his first mailing machine in 1856, and he added improvement after improvement till the capacity of one of his machines will run up to 15,000 or 20,000 per day of labels like the subscriber's name on the wrappers of all the SCIENTIFIC AMERICAN publications sent through the mail.