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ARTESIAN WELL ENGINEERING.

An artesian well which is remarkable for the power and constancy of its flow is illustrated herewith, and being taken directly from a photograph, gives an accurate representation of its great force and volume.

This well is situated at St. Augustine, Fla., and is 1,400 feet deep and has a diameter of twelve inches.

The water flows continually and with sufficient force to maintain the form of a fountain about twenty feet high and an estimated volume of 7,000 gallons per minute, or ten million gallons daily. The mouth of the well is about ten feet above tide water. After passing through various strata of sand in boring the well, small shells, and blue clay, rock was struck in which, at a depth of 450 to 495 feet, a water-bearing vein was found and in chalk formation. At a depth of 520 feet, there was a sudden large increase in the flow. The drilling was further continued through coral and thin shells of limestone, but with no further accession of water until a depth of 1,100 feet had been reached, when the flow was perceptibly increased. After this the drilling was continued down through alternate layers of sandstone and limestone to the total depth of 1,400 feet, but without materially adding to the supply.

The temperature taken at different depths showed a constant rise, as follows: 62° Fah. at 27 feet below the surface, 74° at a depth of 94 feet, 79° at a depth of 520 feet, and 86° at a depth of 1,340 feet. The formations passed through were generally soft, and the whole time occupied in the work was but a little over two months.

In the making of tools and appliances for drilling deep wells, American inventors and mechanics have long held the lead; but in order that such work may be successfully attempted and economically prosecuted, and a well put down that will give permanent satisfaction,

considerable geological data and competent engineering supervision are of the utmost importance. Few of those following the occupation of well drilling make the causes and conditions of artesian flow a special study, or find it within their province to master the geological elements of the question. Large sums are often needlessly spent in endeavors to obtain these natural fountains, when the essential conditions warranting a reasonable expectation of success are altogether wanting. It is, therefore, especially gratifying to note this instance of a phenomenal success in artesian well drilling. The well was commenced with a diam-

eter of 9¼ inches, but when indications pointed to there being so large and constant a supply, its size was increased to twelve inches. This work was done by Mr. Daniel Dull, of this city (corner of Broadway and Fifty-first Street), who is an extensive and successful operator, having an experience in this line extending over

nated terraces, producing with prismatic effect a most gorgeous cascade.

The beautiful fountain made by this well has also most appropriate surroundings in the buildings and grounds of the new Ponce de Leon Hotel. This hotel has been erected by Mr. H. M. Flagler, of New York.



ARTESIAN WELL AT HOTEL PONCE DE LEON, ST. AUGUSTINE, FLA.

more than twenty years, and is now boring wells in six different States in the Union. He has bored a large number of wells of great depth and capacity, having recently completed one at Northampton, Mass., to the depth of 3,700 feet.

The immense volume of water from this well—having a developed pressure of over 50 H. P.—is utilized as a source of power, fire protection, and most efficient sanitary purposes at the hotel. It is designed to construct on the grounds terraces of colored glass lighted by electricity, and after the water gushes forth as an impetuous geyser it will be conducted over these illumi-

It is the most desirable site in the city of St. Augustine, covering in all an area of six acres, and introduces one of the most beautiful examples of Spanish Renaissance that has been erected in this country. On another page will be found an illustration of this magnificent structure, now almost completed. The material used in the construction is beach sand, small shells, and cement, making a beautiful and durable concrete, with arches, window caps, and trimmings of deep red brick, and cornices and finials of terra cotta of the same hue. There are also several other buildings erected and in process of construction, some of them being copies of historic Spanish structures, which, with the gardens rich in tropical plants and avenues overarched by orange trees, will undoubtedly make this section of St. Augustine one of the most beautiful places on the continent for a winter residence.

Sensitiveness of Taste.

The substances examined were weighed and then dissolved in known volumes of the appropriate solvent. This solvent was generally water, and water was always used in dilution, so that the taste was not interfered with by the solvent. To eliminate personal error, two persons acted as tasters. In each case one cubic centimeter of the solution was tasted. The solutions were diluted to a point at which the taste was barely perceptible (in some cases perceptible to only one of the experimenters), and that was taken as the limit.

The results were as follows:

Sugar.—3-1000ths of a grm. barely tasted.
Salt (NaCl).—1-1000th of a grm. barely tasted.
Tannin.—2-10,000ths tasted; 1-10,000th failed to taste.
Hydrochloric acid.—1-10,000th of a grm. barely tasted.
Saccharin.—5-1,000,000ths of a grm. barely tasted.
Strychnin.—5-10,000,000ths of a grm. barely tasted.—
F. P. Venables, Chem News.

A GRANITE tile on exhibition in a show window at Detroit is over eight hundred years old, and said to have been taken from the tomb of William the Conqueror at Caen, Normandy.