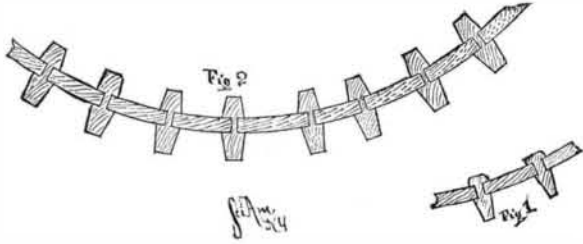


**HEATING WATER RAPIDLY.**

In the SCIENTIFIC AMERICAN of August 21 appeared an article copied from the *British Journal of Photography*, headed "Heating Water Rapidly." Mr. Fletcher has done himself credit in his "heating" inventions, but in the idea advanced in the item referred to, he has been fully anticipated by at least thirteen years, if he puts forth the idea as an invention. With this exception: he advises copper studs, while iron was my own medium.

With this please find sketch of an arrangement which was used in 1873 upon two steam boilers, and in 1876 upon a greenhouse boiler of 30 inches diameter, 54 inches long, which displaced two large and one small cast iron greenhouse boilers, and heated nine



thousand feet of glass far better than the three did, the previous winter, and with far less coal.

The first experiment was made by rivets 1 1/4 inches diameter, next the shell 1 inch diameter at small end, and set the whole length of both fire sheets and for nearly half the circumference of the boiler, 3 1/2 inches from center to center in alternate rows and spacing. Fig. 1 shows first experiment, Fig. 2 the second.

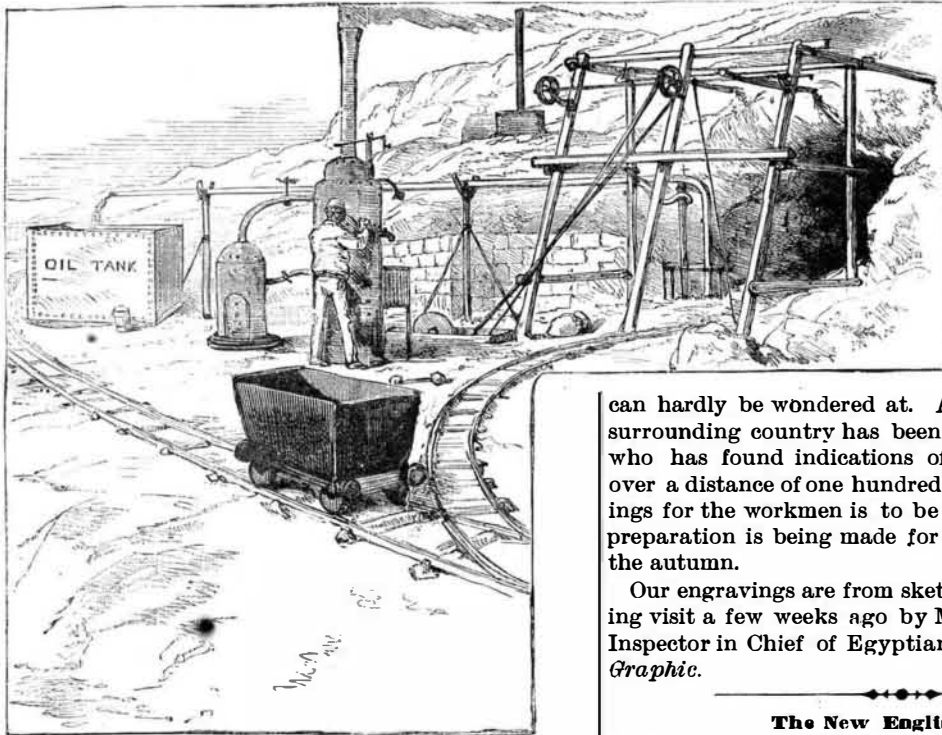
All sorts of trouble was promised by boiler makers, but no trouble or expense of any kind ever came from the arrangement or boilers. The record of evaporation was high, no leakage occurred, and not a cent was called for in repairs; and so far as my own experience goes, no other application has been made of the idea in this country. THOS. PRAY, JR.

Hartford, Conn., October, 1886.

**The Pilgrim Ship Mayflower.**

Amid the many mythical stories which have been afloat as to what ultimately became of the Pilgrim ship Mayflower, it will be interesting to our readers to peruse the following, which from so eminent a writer may be accepted as the true sequel of her voyaging. With regard to this famous ship, Mr. Edwin Arnold, in his delightful book on "India Revisited," says:

Among the curious treasures of the Madras Museum, which the governor has greatly developed, is a golden coin of Claudius the emperor, struck to commemorate the conquest of Britain, and discovered in excavating a foundation near Madras. What chapters of fancy



**EGYPTIAN PETROLEUM WELLS.**

might be written about this aureus, which thus strangely links the past and present of England's history, and came, perhaps, to India in the scrip of St. Thomas!

The only fact that could be mentioned by me at all to match the odd thoughts suggested by this Roman coin, with its device of *ob Britannos devictos*, in connection with the same locality, was one regarding the famous old ship Mayflower, which bore the Pilgrim Fathers to New England. It has recently been ascertained that this vessel was chartered in 1659 A.D. by the East India Company, and went to Masulipatam from Gombroom for a cargo of rice and general produce. She was lost upon the voyage home—one of the ships whose history is linked with that of the birth and uprise of great nations, like the aureus in the Madras Museum.—*Old Colony Memorial.*

**A Remarkable Quarry Accident.**

On the 25th of September last a dreadful accident, involving the loss of eight lives, occurred at a quarry on Lake Fyne, near Glasgow, Scotland. It has been the custom, at these quarries, to have one great blast in the year. This year 14,000 pounds of gunpowder were fired in a single blast by electricity, displacing between 60,000 and 70,000 tons of rock. A steamer had brought an excursion party to the scene to witness the event, and lay about a mile off shore, with the party or board, and by agreement gave the signal for the blast with her steam whistle. About a minute after the signal the explosion took place, after which the steamer ran in, and landed passengers to visit the quarry and inspect the result. So far all had gone well. The visitors, or many of them, went up into the quarry, and were in the midst of animated conversation, when some members began to fall fainting to the ground, and the managers suddenly realized that they were immersed in an atmosphere contaminated with carbonic acid gas, or choke damp. They called out to the people to run, and in the midst of the general consternation, more and more succumbed, until 80 to 100 persons were prostrated. For some minutes people kept falling senseless, in most cases without uttering a sound. Besides eight men who were killed, a number of the visitors were injured.

The weight of powder employed would set free about 66,000 cubic feet of carbonic acid gas. This, mixing with a large volume of air, would render it irrespirable. The sulphureted hydrogen and other products would lend their aid to make the air more poisonous. The accident will probably recall to many of our readers one of the closing scenes in Wilkie Collins' novel "Armadale." Miss Gwilt is described in it as nearly killing Midwinter, by generating a gas that, entering the room in which he slept, would have destroyed him. The gas was carbonic acid gas, although the novelist does not name it, made by the amiable lady out of limestone and presumably crude hydrochloric acid. Eventually, she drags out the prostrated body of her victim, who recovers, while she, entering the room and closing the door, dies under the influence, a suicide.

The high specific gravity of the gas, as in the famous Grotto del Cane, in Italy, caused it to remain in the bottom of the quarry. Usually, a quarry after a blast is considered safe to enter. So unprecedented was this accident, that no blame seems attachable to any one concerned.

**EGYPTIAN PETROLEUM WELLS.**

The working of the petroleum wells at Gebel Zeit and Gensah, in the Red Sea, has been temporarily suspended, but will shortly be resumed under the superintendence of Mr. Tweddle, who is sending out proper boring instruments, with which it is expected oil will be found in large quantities. The present borings, which extend only to a depth of 180 feet, have yielded a comparatively small quantity of oil; but when it is considered that many borings in America are 2,000 feet in depth, this

can hardly be wondered at. A careful survey of the surrounding country has been made by Mr. Mitchell, who has found indications of petroleum extending over a distance of one hundred miles. A pile of buildings for the workmen is to be constructed, and every preparation is being made for recommencing work in the autumn.

Our engravings are from sketches made during a flying visit a few weeks ago by Mr. Arthur Middlemass, Inspector in Chief of Egyptian Coastguard.—*London Graphic.*

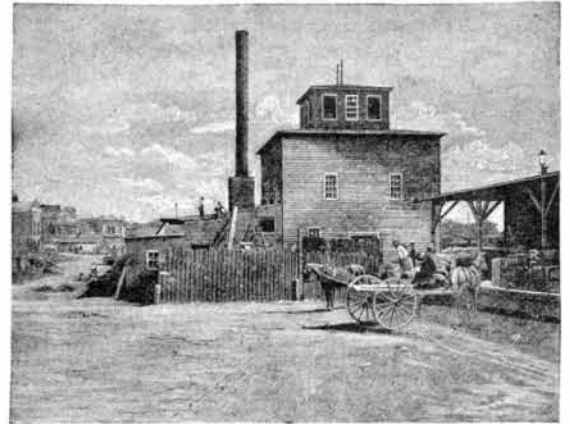
**The New English Gun.**

The new 13.5 inch 68-ton naval gun has been subjected to further and final trial at the government proof butts at Woolwich. After some preliminary rounds, the gun was fired with 580 pounds of black powder, with the service weight of shot. An examination of the crusher gauge, indicating the pressure in the chamber, showed that the gun had passed proof within the terms of the specification. One of the results of the recent Woolwich trials is that in future all large ordnance will have their "liners" expanded by means of special four banded proof cylinders before the completion of the rifling, so as to neutralize any possible twisting of the liners.

MR. JUAN BROWN, of Valparaiso, Chili, is at work on a balloon resembling in principle that described by Mr. Maccaffrey in the SCIENTIFIC AMERICAN of July 24, 1886. Mr. Brown's balloon is, however, an entirely independent invention.

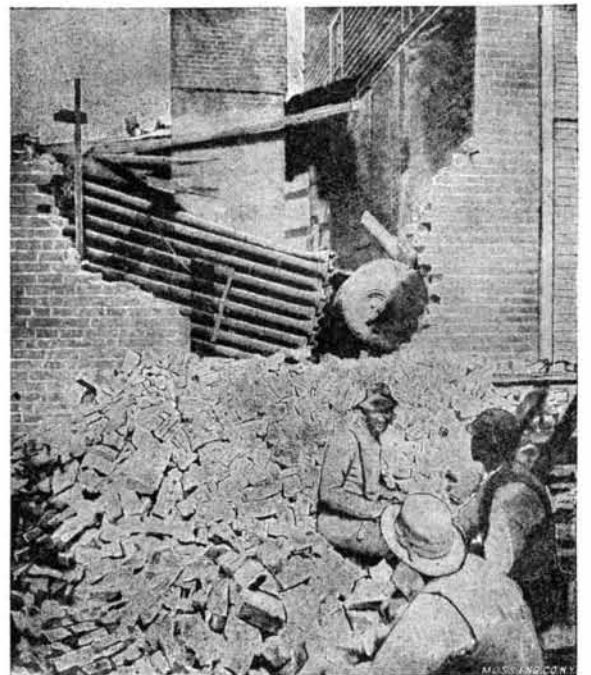
**A BOILER EXPLOSION AT CHARLOTTE, N. C.**

At Charlotte, N. C., on October 4, an explosion occurred in the boiler room of the cotton compress, by which the compress building was partially destroyed and the fireman, Moses White, was killed. The compress started up business for the season on Friday, October 1, after having remained idle through the summer months, and the third day's business was just being finished up when the explosion occurred.



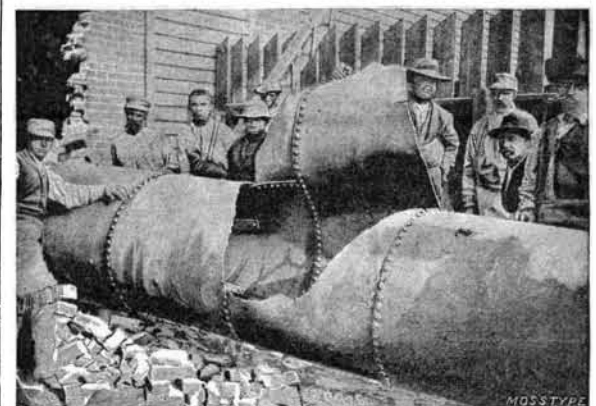
**THE COMPRESS BUILDING.**

The steam to operate the huge machinery of the compress was generated by Abendoff & Roots patent tubular boiler. The boiler was provided with two dry steam drums, which were located on top of the boiler. The drums were 3 feet in diameter by 8 1/2 feet long, and it was the explosion of one of these drums that caused the mischief. At the time of the explosion the steam gauge registered only 100 pounds, and the fireman was at work trying to get the steam up to 150 pounds, the usual pressure required for the opera-



**THE EXPLOSION.**

tion of the compress machinery. The force of the explosion was directly upward, the exploding drum rising straight in the air, and in falling landing within a few feet of its original position. The roof of the boiler room was blown away and the brick walls were demolished. The twin drum was blown from its position, but was uninjured. The boiler was mashed badly, but can be repaired. Our photo engravings, prepared from photos taken by Mr. J. H. Van Ness, specially for the SCIENTIFIC AMERICAN, give a view of the compress



**THE EXPLODED DRUM.**

building, together with a sketch of the explosion and an illustration of the exploded drum, showing the extent of the rent. The iron at the opening caused by the explosion was scarcely thicker than ordinary cardboard, but the interior of the drum showed no signs of corrosion. The drum had been in use three years. Two days previous to the explosion it was subjected to a test pressure of 200 pounds, which it successfully resisted.