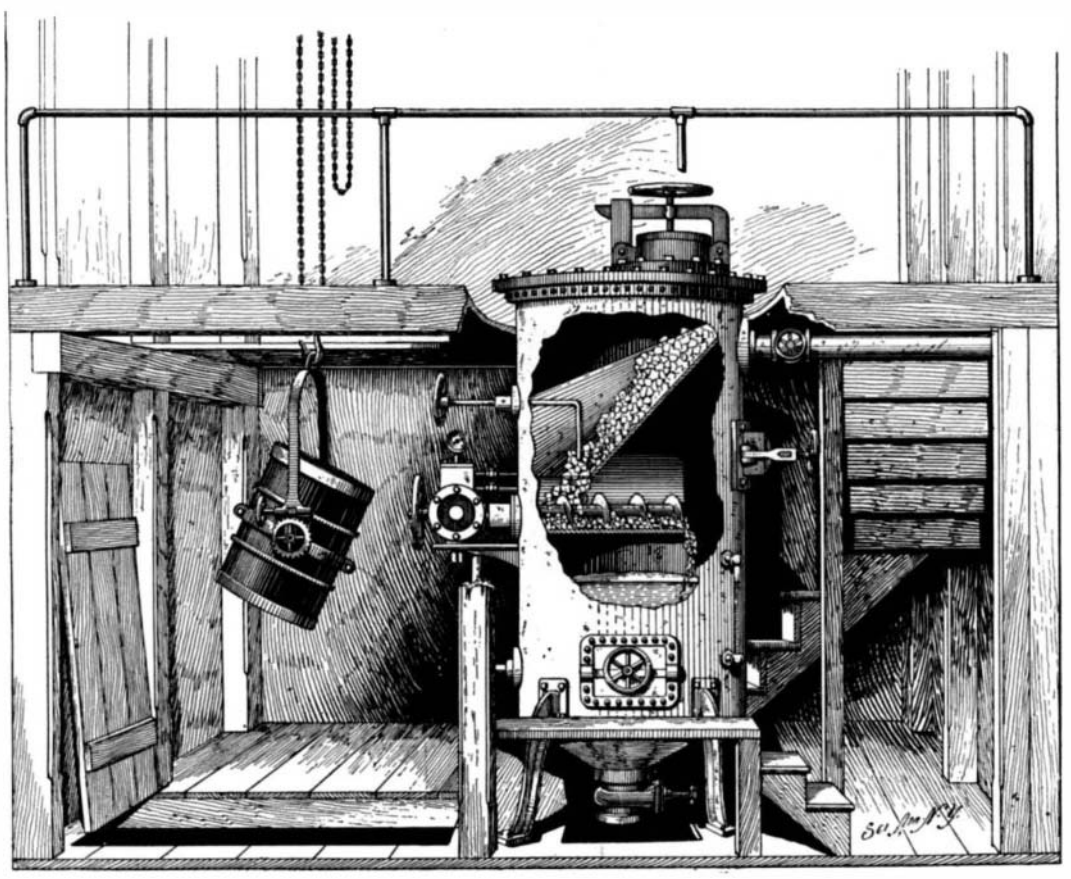
DESTRUCTION OF THE CITY ACETYLENE GAS PLANT AT WABASH, IND.

Wabash, Ind., a beautiful city of 13,000 inhabitants, situated on the banks of the Wabash River, is celebrated especially for its progressive spirit in municipal lighting. It was the first city in the United States to be lighted by electricity, and now it is the pioneer in the use of acetylene gas. The largest acetylene installation in the world was here erected and the new gas, giving such a powerful and brilliant light, is distributed through a system of street mains under the same conditions as ordinary coal gas. It may here be said that Indiana is well in the van in appreciating the possibilities of acetylene, and isolated plants are being installed in many of the smaller cities and towns. Dana, Ind., is another city, the business portion of which is lighted by this means.

Last fall a portion of the mains in Wabash, then used for conveying naphtha gas, were disconnected, and through these acetylene gas was distributed to a portion of the business houses. This practical test through the winter months proved satisfactory both to the company and the consumers as well. The gas gave a steady white flame, much more brilliant than the incandescent electric lamps, or the naphtha gas, even with the Welsbach burners, and proved to be entirely free from odor, soot and smoke. During the trial period and subsequently, the plant has been so managed that the supply to the city has not been interrupted even momentarily, thus demonstrating its reliability and that the design of acetylene generators is so far advanced as to insure a steady and constant supply of gas.

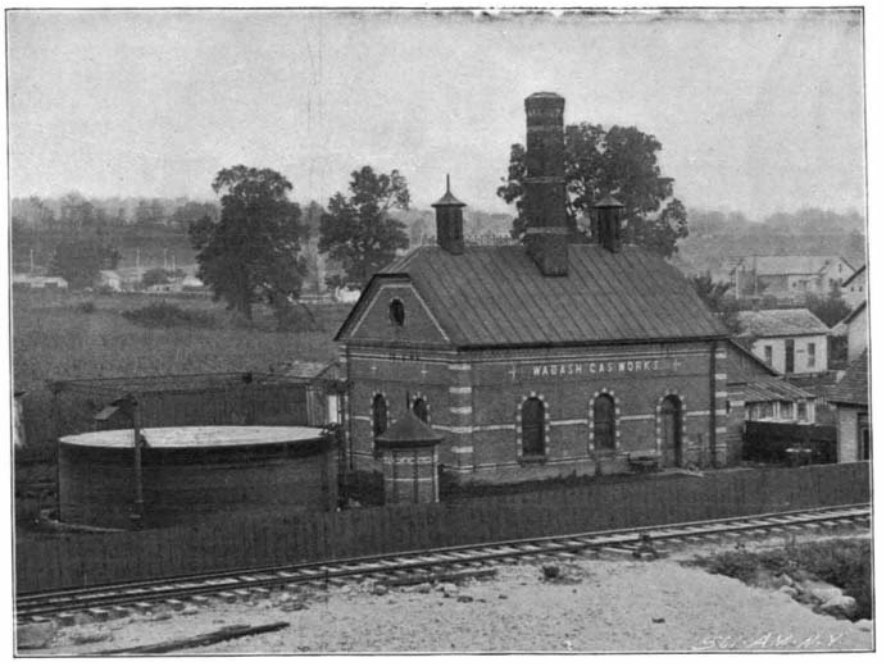
This spring the present plant was installed and acetylene has since been used to the exclusion of other gas. The gas is stored in a tank of 6,000 cubic feet capacity and the distribution is effected in the usual manner. From the generator the gas is led through a 4-inch pipe to a relief holder of 200 cubic feet capacity which equalized the pressure for the station meter, and from thence it passes into the large storage tank.



GENERATOR, PARTLY IN SECTION.

The general arrangement of the generator and structure is shown in the sectional view. The Williamson improved type C generator is designed on the "wet" process principle, i. e., the calcium carbide is small and measured quantities is dropped into a large volume of water. The shell of the generator is 8 feet 6 inches in height, 3 feet 6 inches in diameter, made of $\frac{5}{8}$-inch boiler plate, and was tested to 60 pounds pressure per square inch. About half of this shell contains water which is maintained at a constant level by means of a siphon, and in the upper portion is an iron hopper capable of holding 1,100 pounds of carbide. A water motor is attached to the shell by means of a bracket, and this operates a screw conveyor which draws the carbide from the hopper and precipitates it into the water beneath. The water motor exhausts into the generator and maintains a water supply for gas generation.

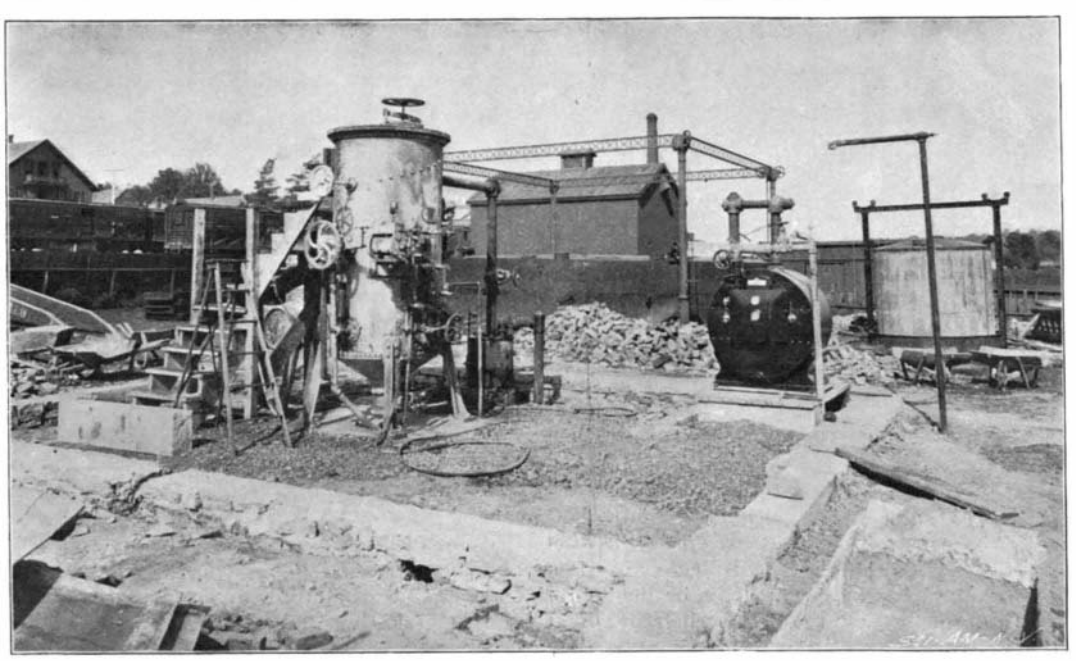
The operation of the plant is very simple and requires a minimum of attention. A large bucket containing 1,100 pounds of carbide is raised to the top of the generator by a chain block and the carbide dumped through a door at the top of the generator into the hopper. The door is then closed and clamped upon a rubber gasket, making a gas-tight joint. When the water motor is started the carbide is dropped into the large body of water, sinks to the bottom, and immediately the gas is evolved. The gas, bubbling through 4 feet of water, is washed clean of dust and solid matter, and the lime in the water enters into chemical union with the sulphur and other impurities which may be in the carbide. The residue which accumulates at the bottom in a slimy gray mass is drawn off by opening a 6-inch gate valve and passes into a receptacle beneath. The interior of the generator can be thoroughly cleansed by washing with water and access may be had to the inside through a manhole. A recent test showed that with the exhaust water from the motor at 40° F. the maximum temperature in the generator was 84° F., thus demonstrating that the gas is delivered cool and pure.



THE WABASH, IND., ACETYLENE GAS PLANT BEFORE THE EXPLOSION.

This plant was brought to public notice by an unfortunate accident in the afternoon of August 7, which was described in the SCIENTIFC AMERICAN, of August 19, page 119. The newspaper reports of this explosion were grossly exaggerated for little damage was done, as was evidenced by the fact that the city supply of gas was not interrupted and the generator and tank were uninjured. A leak occurred in one of the gaskets and the gas accumulated in the small brick building until there was an explosive mixture which was ignited by a jet left burning in the room. This leak was probably started by an excessive pressure due to the use of finely granulated carbide. The carbide dust, which was being used temporarily, gives off gas in the presence of an excess of water with great rapidity on account of the isolation of its particles. From the above statement it is evident that the explosion was one of little consequence, and in no way due to any unusually dangerous characteristics of the gas itself. The condition of the building after the explosion shows the enormous explosive power of the gas.

A word about the expense of the gas to the consumers may be of interest. It is sold by meter, and the price per cubic foot is at the rate of one-half cent per 16-candle power hour with discounts in case of large consumers and payment of bills in a specified time. This is cheaper than electric light, and the constantly increasing number of consumers indicates that it is a popular light both on account of its excellence and from the standpoint of expense.



THE PLANT AFTER THE EXPLOSION.

What One Hears in the Telephone.

"It is very hard to realize that the voice one hears over the telephone is not the voice of the person who is talking," said an electrician, chatting about the oddities of the business, to a reporter of The New Orleans Times-Democrat. "It seems exactly like the real tones, drawn out thin and small and carried from a long distance by some mechanical means, but it is not. When one speaks into the instrument, a little diaphragm, like a drum-head, begins to vibrate, and each vibration sends a wave of electricity over the wire. These waves set up a mimic vibration in another diaphragm at the opposite end, which jars the air and produces an imitation of the original voice. That's not a very scientific explanation, but it's accurate. The autograph-telegraph, which makes a fac-simile of handwriting, is a fair parallel. You write your message with a pen, attached to a special electric apparatus, and a little ink siphon at the other end of the line exactly imitates every dot and curve. The result seems like the real thing, but is merely a first-class counterfeit. It's the same way exactly with the voice in the 'phone."

THE executors of the late Prof. O. C. Marsh of Yale University, have sold his valuable collection of orchids. The prices brought were extremely low. It was very unfortunate that a collection of this size and importance could not have been left intact.

Science Notes.

The new observatory and great refractor of the Astro-Physical Observatory, at Potsdam, were inaugurated August 26 in the presence of the German Emperor.

The highest observatory in Germany is now completed. It is situated on the Schnee Koppe, the highest summit of the Silesian Mountains, at an elevation of 5,216 feet. It will be managed as a Prussian State Institute.

Prof. Dewar found by using a rhodium-platinum resistance thermometer and by the use of methods designed to overcome the difficulties arising from the presence of air in the hydrogen, that the boiling point was —246° C. A constant volume hydrogen thermometer working under diminished pressure gave —252° C. The pure platinum resistance thermometer gave —238° C.

In France, at a small place near Quimper, a statue of a local hero was ordered of a sculptor and in due time the work arrived. One of the authorities of the town was not acquainted with bronze sculpture and was greatly disappointed when he saw the dull color of it, which was obtained with infinite care and labor by an expert colorer of bronze. The official ordered that the surface should be rubbed with emery paper until it acquired the appearance which was considered necessary. It is not likely that the official will ever become a Minister of Fine Arts in France.

For several years attempts have been made at Omaha and Los Angeles to hatch the eggs of the ostrich artificially, but so far we believe their attempts have been unsuccessful, the difficulty being the application of moisture. Now, however, an ostrich farm in Florida can boast of the first incubator-hatched ostrich in the United States. The incubation required forty-one days of careful watching, the thermometer was kept at 110° and the moisture was applied at intervals. A London concern manufactures many incubators for use in Cape Colony. The incubators are large enough to hatch seventeen eggs at one time.

Probably the largest poster ever used in the world was brought out by the committee in charge of the advertising of the Street Carnival at Battle Creek. The poster was neatly pasted on the pavement between the car tracks of the main thoroughfare. According to The Inland Printer this huge poster was printed in a roll of paper containing 2,264,000 square inches, each one 35 inches wide and over a mile in length. The printed matter was repeated every 24 inches. The poster was obtainable by diverting the printed web from its regular course to the folder end of the printing press and attaching it to a rewinding device.

A lady of Cincinnati was poisoned by the ink which is used on typewriter ribbons. Her fingers were stained by the blue ink used on the typewriter ribbon, and in trying to break a small blister on her lip she placed the stained finger on it, and very soon she felt a slight pain in her face. This was followed in a short time by a slight swelling. The pain then became almost unendurable and her lip began to swell badly and turn black. Everything that medical skill could do was done, but she got rapidly worse and died in great agony. The poisoned lip had swollen to gigantic proportions and nothing could reduce it.

It is not often that specimens in museums are destroyed by reason of being eaten, but it seems that in one of the Southern States a negro clayeater who was employed as a scrubwoman devoured some of the finest specimens of kaolin on exhibition at the State Geological Museum. The State geologist found that five blocks of clay which were very highly valued on account of their purity were missing, and upon examining some of the other specimens he found on them the impression of teeth. Detectives were set to work on the case and the negress employed to scrub the marble floors was accused of taking the specimens. The woman appears to have a mania for eating clay and she had been indulging her strange appetite for some time.

In a recent article in The Journal of the American Chemical Society, Mr. C. G. Hopkins, describes a method by which a jet of recently generated hydrogen can be ignited with absolute safety and without loss of time. As soon as the action begins collect the escaping gas in a test tube and when the latter is thought to be full of pure gas, remove it 2 or 3 feet from the generator and ignite the hydrogen in it; then immediately attempt to light the jet of hydrogen with a hydrogen flame contained in the test tube. If the gas is explosive, it will explode in the test-tube and leave no flame. If, on the other hand, a flame remains in the test-tube with which the jet can be ignited, it is certain that the gas in the generator is no longer explosive. By adopting the precaution, therefore, of never lighting the hydrogen jet except with the hydrogen flame obtained as described above, absolute safety can be insured. Attempts may be made to ignite the jet by this method as often as thought proper, and if the hydrogen is properly generated, the gas will be ignited in less than a minute.

Engineering Notes.

The average daily advance of the Simplon Tunnel is about 30 feet, but the contractors will have to average 42 to 46 feet per day in order to meet their engagements. About 2,600 men are at work with twelve drills. The calculated length between the two heads of the tunnel is 12½ miles.

A Western railroad company has adopted the method of making up its passenger trains with the sleepers next to the engine; the coaches come next and the baggage cars last. This reverses the usual practice. It is claimed that this arrangement makes the sleepers ride steadier, and there is also less dust.

The use of steel ties for experimental purposes on the New York Central Railroad has not given satisfactory results, says The Engineer. They are durable, but hard to line; the ballast shakes away from them and they give a rattling sound from the stone ballast and from the bolts, and this sound is disagreeable to passengers. Some have proved to be so unsatisfactory that they are now being removed and are being replaced by oak ties.

According to Commercial Intelligence, an American furniture manufacturing company is now shipping from its factories American furniture in the rough. Being in parts and tightly packed, it occupies little space and consequently the freight is low. It is put together in London and Glasgow workshops, and the salesmen place the furniture in the hands of dealers in England and Scotland. It is an excellent example of the enterprise with which our merchants are pushing our export trade.

The city of New Bedford, Mass., some twenty-five years ago, adopted and laid down a considerable quantity of iron pipe having a cement lining. The last of this pipe has just been removed, and it was found to be still capable of doing its duty, although the iron was considerably corroded at places. Some spots were corroded entirely through, although the cement held its shape. This is an excellent showing and proved the wisdom of the original commissioners who placed underground so large a quantity of this pipe. At the time it was laid, gas iron pipe was very expensive while cement-lined wrought iron pipe was comparatively cheap.

As we noted some time since, the Saxon State Railway ordered twenty locomotives from the Baldwin Locomotive Works. The order has caused such indignation in Germany that a semi-official note has been issued by the authorities, saying it would be impossible as a regular thing to order locomotives from a foreign firm, as the German engines are of a special type not used elsewhere and for the building of which German workshops have been specially fitted up, but the Saxon State Railway is an exception, light engines being used on this system. The order, coming as it does from Germany, must have been most gratifying to the Philadelphia firm and aggravating in the same degree to German builders, who could not compete in price or in time of delivery.

The Dismal Swamp Canal, which was originally surveyed by George Washington, was formaly opened for navigation on October 14. For more than a hundred years the waterway was abandoned. A procession of vessels passed through, the United States torpedo boat "Talbot" bringing up the rear. The canal cost nearly $1,000,000, and we have already illustrated its construction. It allows small vessels to go south through the inland route, avoiding the dangers which always exist in rounding Cape Hatteras. This route avoids the noted Diamond Shoals. The canal extends from Deep Creek near Norfolk to Pasquotank River, North Carolina, and is 22 miles long, 10 feet deep, and 80 feet wide. There are two locks, one at each end. The government will send all its light draught vessels through the canal.

Our naval exhibit at Paris will undoubtedly prove most interesting, and the models of the vessels which destroyed the Spanish fleets at Manila and Santiago will probably be as popular as any exhibit in the whole exposition. Models have not been made of all the ships, but of types of war vessels. They are now on exhibition in Washington in the State, War and Navy Building. The models were constructed at the Washington Navy Yard, and are exact reproductions of the vessels, to the smallest detail. A model of the "Maine" will probably be the most interesting to the average visitor. The model was built prior to the destruction of the battleship in Havana harbor. A working model of a dry dock will also be shown. It is an exact reproduction of the timber dry docks which are to be built at the Portsmouth, Philadelphia and Mare Island yards. According to The Marine Review, a model of the "Illinois" class will be exhibited in the dry dock. It can be docked and undocked just as the actual ship would be. Facilities are to be provided showing how the ship can be floated, and a complete system of piping and valves is provided so that the dock can be filled or drained. A model of a traveling crane is also provided.

Automobile News.

The number of automobile delivery wagons which are seen every day in New York is constantly on the increase. Drygoods firms are among the considerable users of these vehicles.

On September 20, the second race organized under the patronage of the Committee of the Berlin Exhibition was successfully run from Berlin to Leipsic, a distance of 115 miles. The average speed of the winning carriage was about 22 miles an hour.

A Belgian royal decree has approved the resolution of the provincial council of Brabant fixing an annual tax after January 1, 1900, on all automobiles. The tax will be $3·86 for an automobile weighing less than 880 pounds and vehicles which weigh more will pay $9·65 per annum.

It has been decided to make a trial of the collection of letters in Paris by motor wagons. The trial will last one month and if the experiment proves successful it will probably be generally adopted throughout Paris, and undoubtedly the hour of collection can be much delayed owing to the speed with which it can be effected.

It is said that the Committee of the Fairmount Park Commission which was appointed to examine into a report upon the advisability of admitting automobiles to the park drives will recommend that certain of these drives be open to the automobiles as an experiment, other drives to be opened if the results are found to be satisfactory.

The Italian army is now studying the advisability of introducing the automobile. It is considered that it could be used both for transporting ammunition from the rear to the firing line and for carrying the wounded to the nearest hospital. With comparatively free roads a higher velocity can be maintained with a motor carriage than with a horse. The roads in Italy are so perfect that experiments in this line should be very interesting.

A new factory for the manufacture of automobiles will be started at Buffalo, the New York Central Railroad being about to establish a system of automobiles for that city, and it is their desire to get the system into operation before the Pan-American Exposition. They realize the value of the horseless carriage as an advertisement in connection with the rates which the company will offer for the fair of 1901. C. E. Woods, General Manager of the Woods Motor Vehicle Company, of Chicago, is arranging the matter. It is thought that the automobiles will compete with the street cars.

Fifty years ago a steam carriage might have been seen on the streets of New York. It was the invention of Robert Dudgeon who is well known by reason of his many inventions. He used this carriage to go from his business to his residence in Harlem. Two bushels of coal were used on every trip, so it will be seen it was not a particularly economical means of conveyance. The water tanks carried 60 gallons. Finally after being used for about ten years the city authorities forbade its use on the streets of the city and it was taken on Long Island where it ran for some time on country roads.

All the horses in the royal stable of Her Majesty Queen Victoria have been drilled in the presence of an automobile. The horses in the three stableyards at Windsor Castle were first led and then driven around the stationary car, then the car was propelled around the horses and finally the horseless carriage was moved between the horses as they stood near each other. The horses behaved very well as they had already been schooled to such noises as the playing of bands, the sound of cannon, railway trains and the cheering of crowds. Strange to say the best bred horses cared the least about the automobiles and according to The New York Sun a pure bred Arab stallion showed the least concern of all. Few lives are watched with such care as the Queen's and those of the members of the royal family, hence the trouble which has been taken to protect Her Majesty from any danger while driving, through the meeting of automobiles.

The Automobile Club of America had a formal meeting on Monday, October 16, and a constitution and by-laws were adopted and permanent officers were announced. The Club promises to be a large and influential body and it was suggested at a meeting held in June when temporary officers and an executive committee were appointed. It is probable that the choice of a permanent club house will soon be made and that arrangements will soon be perfected for the storage of vehicles, depots for charging and repair shops with skilled help. The club will appoint legislative committees who will use their efforts to prevent the passage of unjust laws and to attempt to get laws passed in the interest of automobilists. The Automobile Club of Great Britain now has 500 members, and the Association has procured the passage of considerable necessary legislation. The President of the Automobile Club of America is General Avery D. Andrews, Secretary, Homer W. Hedge.