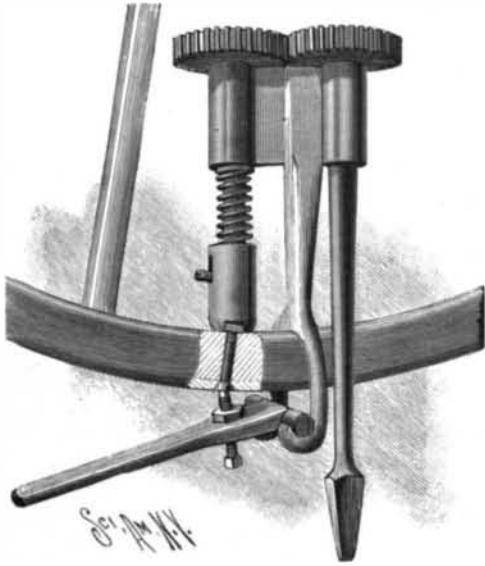


AN EFFICIENT TIRE BOLT WRENCH.

To facilitate screwing up or unscrewing the nuts on bolts used for holding the tire to the rim of a vehicle wheel, a job which often presents considerable difficulty, especially when wheels are to be repaired, the wrench shown in the accompanying illustration has been invented and patented by Lewis C. Wiley, of Smiley, Texas. In the frame or stock of the wrench is journaled a shaft having a squared end for engagement with the chuck of an ordinary brace, while on its other end is a gear wheel in mesh with a gear wheel on a second shaft similarly journaled, and loosely supporting a socket, resting against a spring on the shaft. The socket has in its forward end a diametrical recess adapted to engage two sides of a nut placed on the end

**WILEY'S TIRE BOLT WRENCH.**

of a bolt, on the inside of the wheel rim, and a vertical opening for the passage of the projecting end of the bolt, there being also in the side of the socket an elongated slot through which passes a screw, to cause the socket to turn with the shaft and slide freely thereon. The head of the bolt, on the outside of the tire, is engaged by the chisel end of a tool adjustably held in a lever formed with trunnions placed in hooked bearings on the lower forked end of a post depending from the frame, the rim and tire of the wheel passing through the forked end of the post. The lever can be readily placed in position to engage the tool with the head of the bolt, while at the same time the nut is engaged by the socket, when, on turning the brace, great power may be exerted to screw up or unscrew the nut from the bolt.

AN AUTOMATIC ACETYLENE GAS GENERATOR.

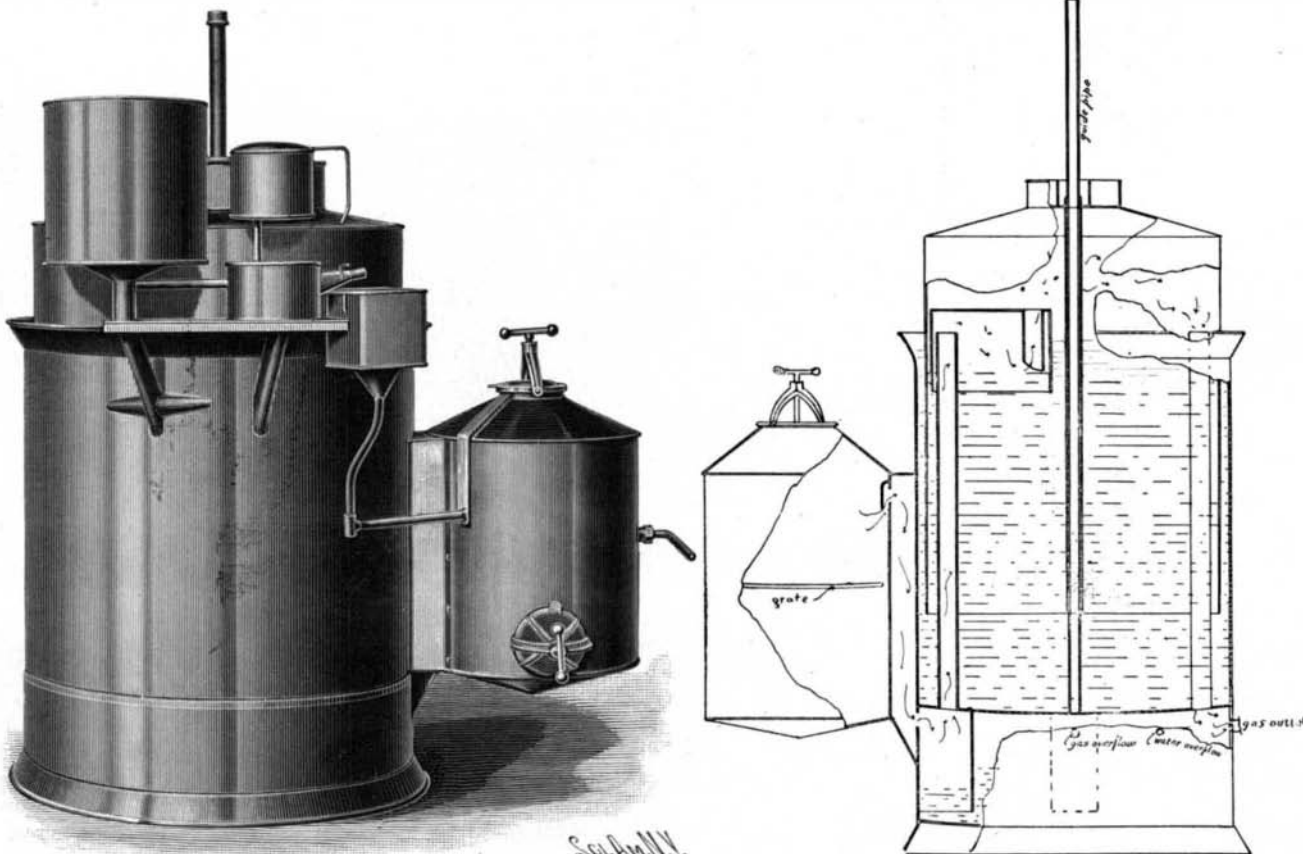
The ideal of perfection of an illuminant is undoubtedly presented by acetylene gas. Incomparably more brilliant than the incandescent lamp, it has a softness and steadiness that make it the most perfect of all illuminants, being restful and natural to the eye, and yet with a power and penetration not to be excelled even by the arc lamp. For these reasons there has been, ever since its experimental introduction to the public some three years ago, a very general desire, especially by those who have seen the light in use under favorable circumstances, that the methods of its production might be so improved and perfected that all element of danger would be removed, and the light furnished at a cost and under conditions that would be generally available to meet the large public demand that would, undoubtedly, immediately follow.

An apparatus designed to meet the desired ends, that is, to furnish the gas under pressures which can never become excessive, the supply being always automatically regulated by the quantity of gas withdrawn in use, and in which every safeguard is provided against accident, is represented in perspective and

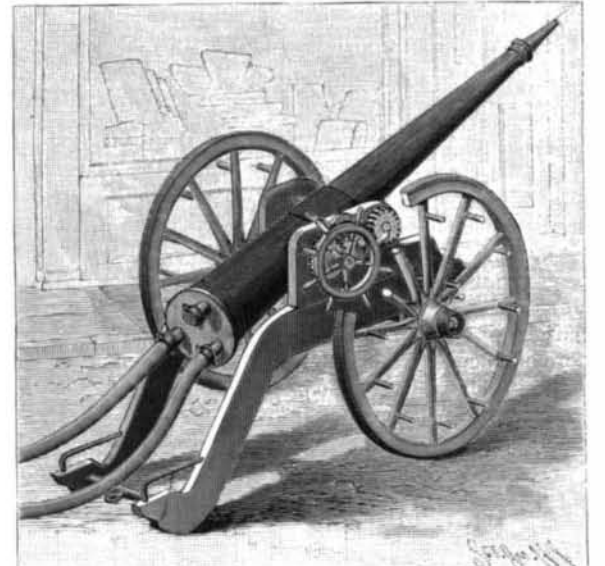
section in the accompanying illustrations, and is now being manufactured by the Niagara Falls Acetylene Gas Machine Company, of Niagara Falls, New York and Canada. The manufacture of the calcium carbide from which, as is generally understood, the gas is produced, by the simple addition of regulated quantities of water, has now become a well established industry, and the price of the carbide is being proportionally reduced with the growth of its production. The method of its manufacture, from lime and coke, or charcoal, in fire-brick furnaces, by means of an electric current of high intensity, has often been explained, the carbide coming out in the form of great pigs of 500 pounds weight, which, on being broken up, resemble chunks of iron ore. The carbide is then placed in tanks or drums, to be sealed up airtight, or the moisture of the air would gradually effect its decomposition. The wholesale price of the carbide is now about \$75 a ton, and it is estimated that one pound of carbide will produce a quantity of acetylene gas equaling 75 feet of coal gas in illuminating power, or about equivalent to 60 cents per 1,000 feet for coal gas. These figures are, however, largely based on theory, and an extended practice might very materially modify them.

As shown in our illustrations, the smaller of the two principal tanklike receptacles is the acetylene gas generator, having a tightly fitting cover, the carbide being placed on a grate about midway of the receptacle, there being a handle by which this grate may be agitated to throw down the limelike residuum of the dissolved carbide, and a covered opening near the bottom through which such residuum may be removed, after fitting thereon a telescopic device which prevents the escape of dust. The water is discharged upon the carbide from small openings in a plate at the top of the generator, the discharge being automatic, from a pipe in communication with the tank in which the gas holder moves up and down on a guide pipe, according to the pressure of the gas, as indicated in the sectional view. The water supply tank connects with a small tank in which is journaled a tip tank, which automatically empties itself as it becomes gradually filled. There are adjacently supported connected water chambers, in one of which is a displacement float connected by a rod to the dome of the gas holder, the connection being such that, on the downward movement of the dome, as the gas becomes nearly exhausted, water will be discharged into the tip tank, to flow thence into the generator. The discharge of this measured quantity of water causes the generation of sufficient gas to raise the dome and the displacement float to their original position, and the operation continues thus automatically, with the certainty that the gas pressure cannot be unduly raised. It is said that the pressure never exceeds $1\frac{1}{2}$ ounces to the square inch.

The machine represented is especially designed for use in private houses, offices, stores, etc., or any place where gas or electricity is now used. There is not a valve or cock to wear out or be neglected or forgotten—a very desirable feature when it is remembered that the machine is so often likely to be in the hands of people of no mechanical knowledge. The machine may be connected with the ordinary gas piping of a house, substituting for the present gas burners a special form of burner or tip for the burning of the acetylene gas. For an equal amount of light the acetylene gas gives off only about one-fifth the heat produced by ordinary illuminating gas.

**AN AUTOMATIC ACETYLENE GAS GENERATOR.****DISCHARGE NOZZLE FOR FIRE ENGINES.**

A device especially adapted for use in city fire departments, and designed to receive and effectively discharge the water from several fire engines or other sources, is represented in the accompanying illustration, in what is termed a "fire battery," and has been patented by Thomas A. Ready, of No. 126 Hudson Street, New York City. Mounted in trunnion bearings on a carriage which has trail stocks is a nozzle adapted to rock vertically, and having at its rear end a number of inlet nipples. One of the trunnions is connected by different pinions with a hand wheel, a dog having a handle engaging one of the pinions, to facilitate regulating the angle of elevation of the nozzle, which may be effected by one person. Movable through openings

**READY'S FIRE BATTERY.**

in the side pieces of the carriage are blocking rods adapted to engage the spokes of the main wheels when the apparatus is stationary, and these wheels also have hand rods on their spokes to facilitate moving the battery from one position to another. At the ends of the trailstocks are iron loops to receive straps or ropes when it is desired to run the battery down a stairway into a cellar or basement, should the fire there be too hot to allow the firemen to enter, and a ring on a cross-piece is adapted for connection with an engine or hose carriage in moving the apparatus to or from a fire.

The Japanese Rug Industry.

The seat of this industry is the town of Sa'kai, situated about eight miles south of Osaka. The rugs made are principally from jute, the number of people employed in the manufacture being about 9,600, mostly children between seven and sixteen years old. In the course of last year, says The Dry Goods Chronicle, the Sa'kai weavers have made a step forward by turning their attention to the manufacturing of wool rugs, and they are now able to turn out a very creditable article, which, in appearance and durability, is almost equal to a Turkish carpet. Although this branch of the industry is yet in its infancy, it employs 480 weavers on 120 looms, and can turn out 120 square yards daily. The warps and weft are cotton, the filling wool yarn.

Most of the wool yarn is manufactured from Chinese raw wool spun in Osaka. An important improvement in the rug business is the attention now paid to dyeing colors. Fast dyes and beautiful shades are taking the place of their former attempts in this respect, and there seems no question but that the quality of their work is now much superior to what it was a year ago.

IN a review of the past year given by The Progressive Age it is stated that the demand for calcium carbide is far in excess of the supply, and that plans are now maturing for the construction of an enormous plant to utilize 100,000 horse power entirely for its production.