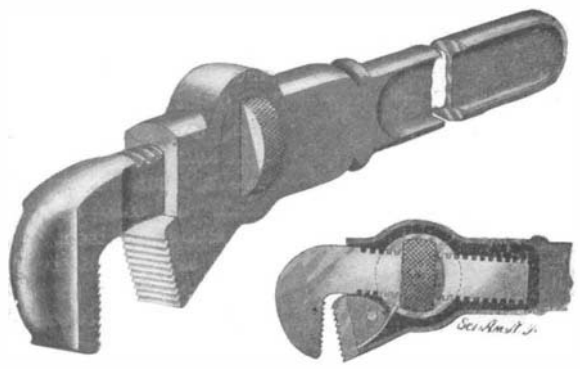
AN IMPROVED PIPE-WRENCH.

The illustration presented herewith pictures a novel pipe-wrench which has been recently patented by Charles M. Ingersoll, of Summit Hill, Penn. The wrench has a hollow body in which a rolling carrier is mounted. Through this carrier the threaded shank of the movable jaw of the wrench is passed. By means of a nut which encircles the shank, and which is fitted in the carrier, the movable jaw can be adjusted to grip pipes of various sizes. The fixed jaw is mounted at the lower front portion of the wrench, and is formed with



THE INGERSOLL PIPE-WRENCH.

a lug engaged by a transverse pin. By reason of this simple arrangement the fixed jaw is rigidly, though removably held in place. The fixed jaw presses against the end of a spring and holds it firmly in position. The free end of the spring is connected with and actuates the rolling carrier. The spring is so set that it tends to throw the inner end of the shank of the movable jaw upward, holding the shank and jaw, when not operating, in the position shown by the larger illustration.

By turning the wrench in the usual manner when a pipe is to be gripped, the oppositely-ratcheted faces of the jaws will engage the metal. When the working strain on the wrench is relaxed, and movement of the wrench reversed to recover the grip of the jaws on the pipe, the shank of the movable jaw is moved by the force of the spring so that its inner end is thrown up. Thus the jaw itself is pressed yieldingly against the pipe. The jaws, by reason of this arrangement, can be moved idly over the pipe to recover their grip; when the wrench is moved again to turn the pipe, the jaws are again brought into action.

It will be observed that, owing to the protrusion of the jaws, the wrench is enabled to turn a pipe close to a wall or ceiling.

A NEW WICKLESS OIL BURNER.

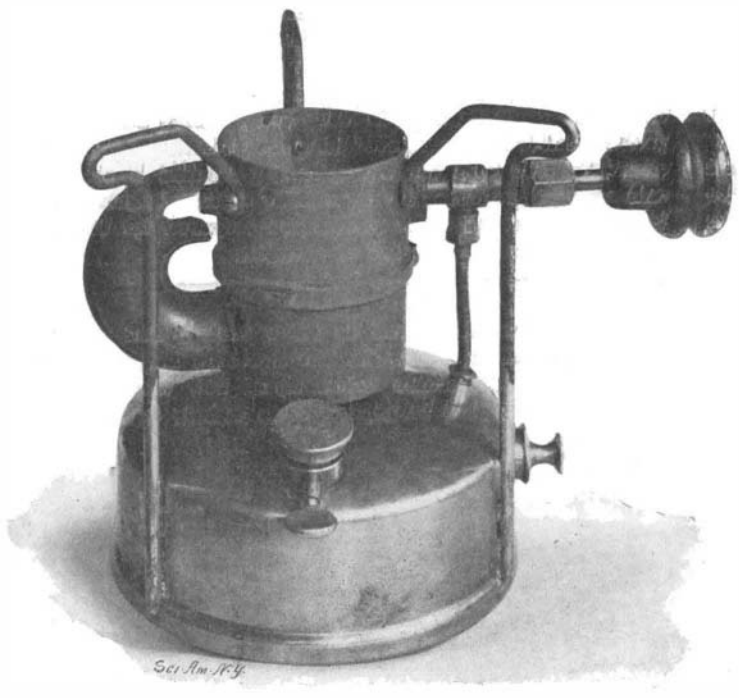
The possibility of generating from common kerosene or petroleum a gas equal in heating power to that obtained from the street mains of a large city is something that has long been desired. The difficulty has been that in heating oil to a vapor there is a certain proportion of carbon that adheres to the tubes through which the vapor passes, and in a short time the generator tubes are filled with this deposit and rendered useless. It is difficult to remove this pipe carbon, and this has been one of the reasons why the use of petroleum has met with little success.

But in the modern improved burners which have been introduced by the Hydrocarbon Burner Company, of 197 Fulton Street, New York city, which form the subject of the present article, the difficulty is very simply overcome. A novel cleaning device is now used, which answers all requirements and insures a steady flow of vapor.

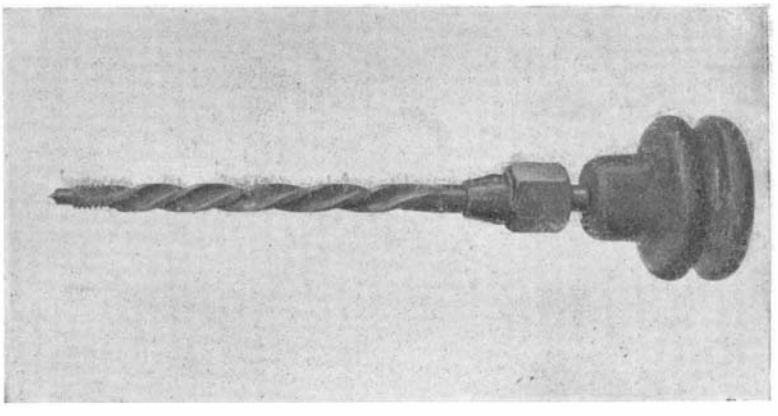
The improved hydrocarbon burner consists of an oil-reservoir provided with an air-pump and with a filler-cap, on which reservoir a burner is supported by three standards. By means of the air-pump sufficient pressure is obtained to force the oil upwardly through a small tube into the vaporizing-tube extending horizontally above the burner. From the vaporizing-tube the vaporized oil passes into an air-tube curved downwardly and terminating beneath the burner. The vaporizing and air tubes are not directly connected, but are slightly separated so that the vapor, in bridging the space between the tubes, is mingled with sufficient air to give an intensely hot, blue flame. The vaporizing-tube is located above the burner, so that the oil may be converted into gas by the heat of the burner. In order to start the generation of gas, the vaporizing-tube is first heated by alcohol. As soon as the burner is ignited, vaporization proceeds automatically.

To control the flow of vapor from the vaporizing-tube to the air-tube, a needle-valve is employed. And the particular formation of the stem of this needle-valve constitutes one of the most important features of the apparatus. For the stem in question is not merely a straight rod, but an auger, or screw, which permits the passage of oil, and also acts as a cleaner. A slight rotation of the valve causes the auger-like stem to remove from the entire interior wall of the vaporizing-tube the accumulation of carbonized matter. By this simple device, the tube can be readily cleaned whenever desired, and the regular flow of oil and gas at all times controlled.

The present device seems practical, and is said to be efficient in removing carbon from the tubes by the ordinary operation of the stove, at the same time keeping the exit opening for the vapor clear of obstructions. It has great power. The pump which forces the oil into the burner gives any reasonably strong power desired. By means of the needle-valve, the power can be so regulated that a flame can be obtained, varying from a consumption of 35 feet of gas per hour to 1 foot of gas per hour. This principle can be applied to a larger burner of greater power.



AN IMPROVED HYDROCARBON BURNER.



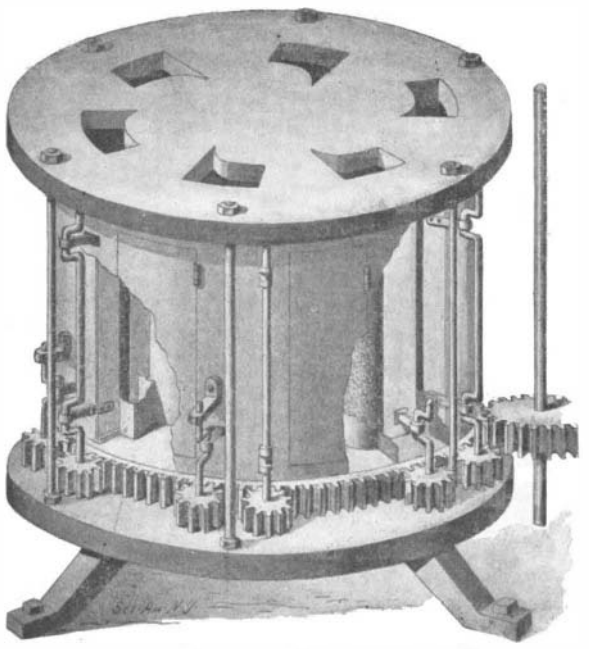
THE NEEDLE-VALVE AND ITS AUGER-STEM.

THE WENTWORTH COTTON-GIN.

Cotton-growers have ever been reluctant to cultivate long, fine staple cotton for the reason that the proper gin to separate the lint from the seed and to prevent the breaking and cutting of the fiber has never been invented. The objections to existing machines seem, however, to have been overcome by Mr. William H. Wentworth, of Fort Sam Houston, San Antonio, Texas, who is well known as the first successful grower of Egyptian cotton in America.

Mr. Wentworth's experience with the roller system of ginning taught him that the main disadvantages encountered were slowness or lack of capacity, and the impossibility of treating any but the long free ginning cottons. In the belief that our common cottons, if ginned in the roller process, would command better prices he associated himself with Mr. Otto Klaus, of the same town, and patented the gin which forms the subject of the accompanying illustration.

In the Wentworth machine the seed-cotton is fed through openings in the head of the gin-casing to a series of compartments each containing a ginning-roller covered with hide, the hair of which has been cut short. In each compartment are vertical feed-boards pivoted at their upper ends. Between the feed-boards and the rollers the seed-cotton falls, the feed-boards being reciprocated to force the seed-cotton to the rollers. Vertical seeding-blades each coact with a roller, one of the blades being fixed and the other movable to and from the fixed blade. The rollers conduct the cotton to the space between the fixed and movable blades. By reason of the operation of the coacting fixed and movable blades the cotton-seeds are forced from the fiber. The bottom of the casing of the machine is provided with a central opening for the fiber and openings for the seed.



THE WENTWORTH COTTON-GIN.

The driving mechanism comprises a system of gearing which consists of a master-wheel having teeth on its inner edge meshing with gears on the rollers and teeth on its outer edge meshing with pinions on the cranked shafts by which the feed-board and movable blades are operated.

The capacity of the machine is regulated by the number of rollers used, one roller representing one bale per day. The hide covering of these rollers grips readily the short-linted common cottons. A gin of ten rollers will occupy about the floor space of one horizontal roller gin, or 15 square feet.

New Alkaloids of Tobacco.

Three new alkaloids of tobacco have been isolated by Messrs. A. Pictet and A. Rotschy. One of these has received the name of nicoteïne ($C_{10}H_{12}N_2$). It is a liquid body, easily soluble in water and the organic solvents, and has a strongly marked alkaline reaction. Its odor is agreeable, somewhat resembling that of parsley. It is extracted from nicotine in the proportion of two per cent. The second alkaloid is solid, and has received the name of nicotelline. It appears in the form of small prismatic needles, melting at 148 degrees C. The proportion of this body contained in tobacco is extremely small. It is but slightly soluble in water and ether, but dissolves easily in alcohol and chloroform. The third alkaloid, which has not yet been well examined, has been called nornicotine; its composition appears to be very close to that of nicotine, and it is supposed to be derived from it by the elimination of the methyl group attached to the nitrogen. The physiological action of these substances has not yet been determined.

The Current Supplement.

The current Supplement, No. 1318, is filled with interesting articles. The first-page engravings are views in Taormina, one of the most beautiful places in Sicily. "The Effect of Physical Agents upon Bacterial Life" is a very practical article by Dr. Allan Macfadyen. "Information Concerning the Angora Goat" is concluded. "The Oil Fields of Baku" is by Prof. G. Frederick Wright. "The Museum of Artillery at Paris" is accompanied by a large number of interesting engravings showing arms and armor. "Wooden Railways" dsecribes some curious old railways. The third installation of "American Engineering Progress" deals with the "Influence of Combination," which is very timely at the present moment. "A New Elliptical Cutting Machine" is by Prof. C. W. MacCord.

Contents.

(Illustrated articles are marked with an asterisk.)