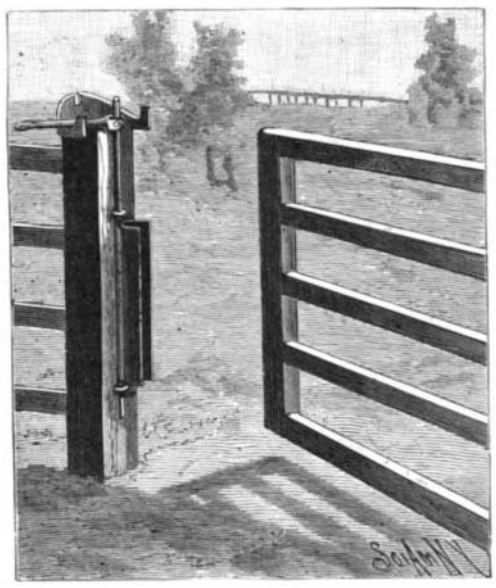
A SIMPLE FASTENER FOR GATES.

A patent was recently granted to John F. Marcum and Godfrey Hauenstein, of Olds, Iowa, for a gate-fastening device so constructed that it automatically moves to its locking position as the gate closes.

Swinging on one gate-post is a locking yoke comprising two divergent plates secured to a rock-bar. To the upper end of this gate-post a segment-rack is secured having a notch at its central portion and stops at its ends. The top edge of the rack between the stops is inclined downwardly and outwardly. Pivoted to the



AUTOMATIC GATE-FASTENER.

upper end of the rock-bar is a latch-lever adapted to engage the central notch in the rack to hold the yoke in its locking position.

In opening the gate, the latch-lever is swung up to clear the notch. Then by pushing the gate in either direction the yoke will be rocked to release the gate. At this time the latch-lever will engage one of the stops at the end of the rack.

The gate when being swung to its closing position engages the yoke and automatically swings it to its locking position, the latch-lever being moved into the central notch of the rack.

By inclining the upper edge of the rack, the locking-yoke will be prevented from being swung to its closed position by force of wind or other slight pressure; because the latch-lever will frictionally engage the inclined edge.

AN IMPROVED ACETYLENE GENERATOR.

An efficient acetylene apparatus should neither undergenerate nor overgenerate gas. The carbide and water should be properly brought together, so that a steady flow of gas is obtained without regard to the number of jets in use. The carbide should be so decomposed that the production of heat is avoided; for hot acetylene has not only a low light-value, but its use is needlessly expensive. To meet these requirements, the Pan-American Acetylene Company, of Buffalo, N. Y., have devised an apparatus in which the defects encountered in many gas-machines seem to have been effectually overcome.

The apparatus in question, known as the "Northlight," has bottom water-feed generation, the principle

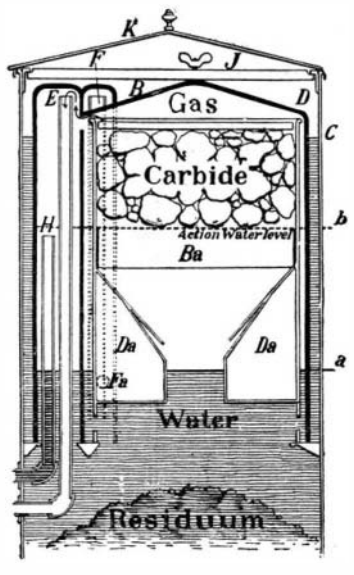


Fig. 2.—SECTION OF THE GENERATOR.

of which is well shown in Fig. 1, representing a miniature generator comprising tumblers inverted in a dish of water. The water in rising within the generator-glass touches the carbide. As soon as the gas thus produced has filled the pipes and apparatus, it forces back the water from the carbide, thereby stopping further generation.

In the actual apparatus, the generator (Fig. 2) consists of an outer casing inclosing a water-sealed gas-bell, *B*, in which there is a peculiar grate (omitted in the engraving) terminating in upward points which support the carbide in a free mass.

The bell, *B*, is formed with sleeves covering the receiving ends of the gas-pipes, *E* and *F*, and of the vent-pipe, *H*. The carbide having been placed upon its grating, water is poured into the outer casing to a certain height. The water in seeking its level rises within the bell, expels the air through the pipe, *H*, and finally comes into contact with the lower edge of the carbide. Gas is immediately generated and is conducted by the pipe, *E*, to the gasometer, and thence throughout the building. The residuum instantly clears itself from the carbide and falls down into the water below. The gas, in passing through the apparatus and distributing pipes then receives a check—assuming that the burners are not in use—and at once begins to push back on the water, forcing it away from the carbide, thus stopping further generation. As acetylene is then consumed at the burners, the pressure within the generator correspondingly decreases, permitting the water to rise again, as at first, into contact with the carbide to generate a fresh supply of gas. It is therefore evident that the generation is controlled merely by the pressure of the gas upon the water, the one acting automatically upon the other. The auxiliary gas-pipe, *F*, leading to the gasometer, is used only when the pressure is so great that the water is forced down below a secondary opening.

The various pipes shown on the exterior of the apparatus (Fig. 3) connect the generator with the gasometer, and comprise a system of traps or water-seals which prevent a back-flow of the gas.

In this apparatus it will be observed that a very small quantity of carbide is made to touch a very large sheet of water. The gas generated is therefore cool. It will be furthermore observed that the carbide is not surrounded by a mass of viscid, slaked lime, thereby preventing that imprisonment of the heat which forms so objectionable a feature in many machines. Incidentally, the fact that the generating chamber is surrounded by a belt of cool water further guards against the production of unnecessary heat. The value of the coolest possible generation is now recognized by

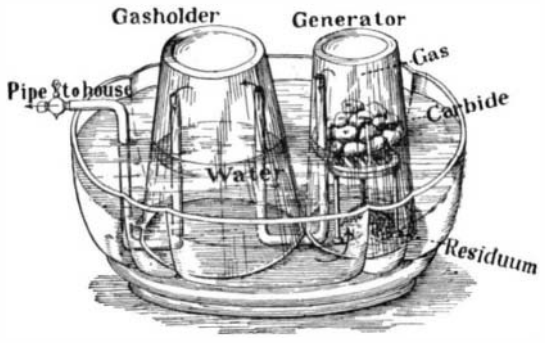


Fig. 1.—A MINIATURE BOTTOM-WATER FEED APPARATUS.

all authorities on acetylene, as heat causes the polymerization of the gas atoms with loss of lighting power.

The merits of the apparatus described earned for it the only gold medal for acetylene machines at the Trans-Mississippi Exposition.

AN AIR-CUSHION FLUID-PRESSURE REGULATOR.

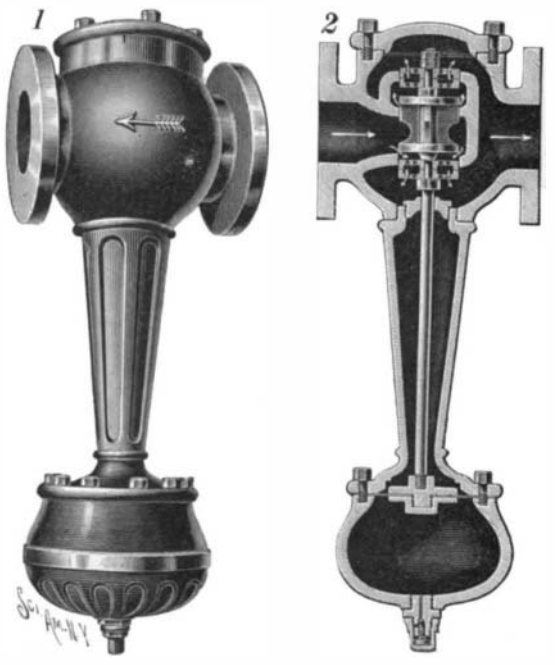
The fluid pressure regulators most commonly in use employ a complicated mechanism composed of weights, levers, or metal springs, to procure the automatic regulation desired. A decided improvement on this form of regulator is to be found in a device made by Julian d'Esté & Company, Boston, Mass., which embodies in its construction a diaphragm acted upon at one side by the fluctuating fluid-pressure, and at the other side by a constant air-pressure.

The regulator consists of a casing, the interior of which is divided into two chambers by a flexible diaphragm. In the lower of these two chambers air is pumped through a convenient nipple, by means of an ordinary bicycle pump, until the desired pressure upon the lower side of the diaphragm is obtained. A spindle is attached to the diaphragm and carries at its upper end a double valve controlling a series of ports through which the fluid (such as steam, water, or the like) flows.

From this construction it follows that at its under side the diaphragm is subjected to a constant yielding air-pressure and at its upper side to the varying pressure of the fluid. When the pressure of the fluid passing through the ports in the upper chamber exceeds that of the air in the lower chamber, the diaphragm is depressed, thus causing the spindle to close the double valve above and to shut off the fluid. When the pressure has decreased and has sunk below that of the air in the lower chamber, the diaphragm will rise, thereby causing the double valve to open the ports which it controls in order to permit the passage of the fluid. The valve, it is evident, can be made to open or close automatically at any desired pressure by varying the pressure of the air in the lower chamber.

The air chamber, if so desired, may be placed in any convenient position and at any distance away, being connected by a pipe with the cover clamping the diaphragm in position. The filling-pipe of the air chamber may be brought down on the wall or supporting column to a convenient point with the fitting (with which the air pump is connected) on the end of it.

When used in libraries, schoolhouses, and office buildings, the air cushion regulator satisfies a want



A SIMPLE PRESSURE REGULATOR.

long felt; for it reduces the high pressure steam now in common use for heating to very low pressure without making any sound whatever.

The Motion of a Perfect Liquid.

At a recent meeting of the Royal Institution Prof. H. S. Hele-Shaw dealt with the subject of "The Motion of a Perfect Liquid," says The Mechanical Engineer. There was no such thing in existence, he explained, as a perfect fluid, and actual liquids differed from it in the possession of several properties, particularly that of viscosity. Yet by virtue of this very property they could be made to flow in the manner of a perfect fluid if inclosed as a thin film between two plates. For this purpose increased viscosity in the liquid was an advantage, because it gave stability; thus the high viscosity of glycerine enabled it to be more effectually controlled than water. By using plates of glass and appropriate coloring matters, the lecturer proceeded to exhibit by the aid of the lantern a series of experiments elucidating the motions of an ideal liquid. He pointed out that the effects actually obtained in this way completely agreed with some of those which mathematical analysis had been able to work out, the films indeed not only affording a striking instance of mathematical prediction, but even offering solutions of problems whose complexity baffled

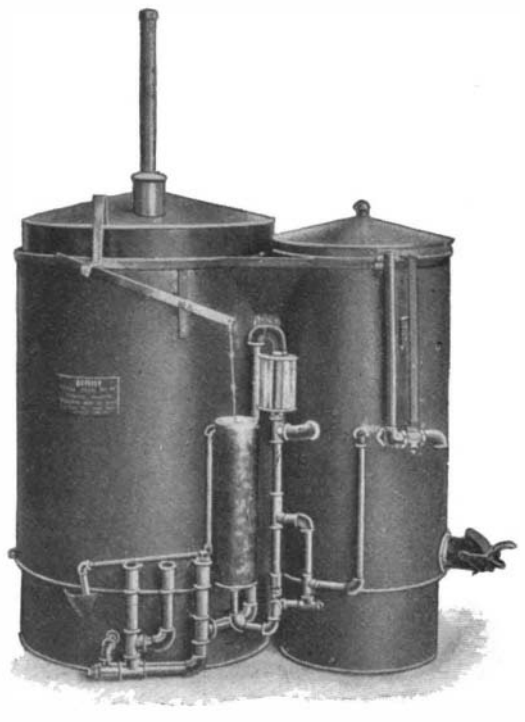


Fig. 3.—THE "NORTHLIGHT" ACETYLENE-GAS GENERATOR.

mathematicians except in a few simple cases. Prof. Hele-Shaw also showed how the liquid could be made to imitate the lines of magnetic and electric induction, and how, by altering the thickness of the film in places, the form of the stream lines could be changed to represent the altered resistance of a magnetic field, due to the presence of a paramagnetic or diamagnetic body.