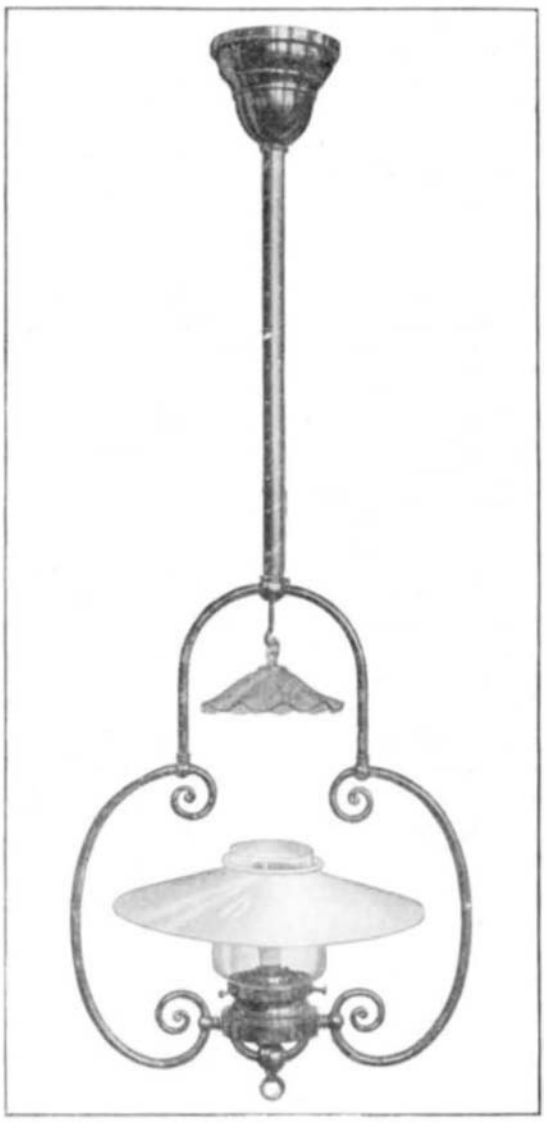
AN IMPROVED INCANDESCENT GAS LAMP.

With the introduction of incandescent lighting in New York city, in 1882, an era of light was inaugurated. The civilized world was no longer satisfied with the kerosene lamp, or even with the gas jet. Inventors turned their attention to the problem of illumination, studied the virtues and defects of the electric light, and endeavored seriously to devise a perfect light, one which should be as steady, as bright, and yet as diffused as daylight, and which should contain all the colors in the same proportions as found in sunlight. For a time it seemed as if gas, long the chief illuminant of city buildings and streets, would be entirely displanted by electricity. But the invention, a few years later, of the incandescent gas mantle opened up new fields for the use of gas. It was possible now to secure a steady, brilliant, white light, closely approaching daylight, and far more satisfactory than the trying, yellow light of the incandescent electric lamp or the unsteady, sputtering glare of the arc lamp. By judicious arrangement of shades and reflectors the light was softened and diffused, so that instead of coming from a small intensely bright crater, as in the arc lamp, the light was spread over a large surface at its source, thus destroying those objectionable sharp, black shadows of the open arc lamp. The resulting effect was, therefore, very similar to daylight. At the same time efforts were made to produce a lamp that would consume a smaller amount of gas per candle power hour. All incandescent gas lamps burn a mixture of air and gas and are consequently more economical than the ordinary gas jet without taking into consideration their higher illuminating efficiency.

But a much greater economy has been provided by the recently invented lamp which we illustrate herewith. In this lamp air is furnished to the burner under compression, instead of being sucked up by the gas current, as in the ordinary Bunsen burner. Of course, there is a limit to the amount of air which it is advisable to mix with gas in order to produce the best results, and it is not the purpose of this invention to overstep this limit. The compressed air expands in the mixing chamber, insuring a more intimate mixture of the air with the gas, and the pressure then drives the mixture with a rapid current to the burner. A more efficient flame is thus produced due to the perfect mixture, and also to the current that rapidly carries away the products of the combustion which hinder the flame.

The air is compressed by means of a simple pump, which may be placed in the cellar or any other convenient place. It takes up about one square foot of floor space, and is operated by the city water power at an expense that is insignificant. We show herewith a diagrammatical view of the lighting system. The city water supply is admitted alternately to opposite ends of the upper cylinder, *A*, of the pump, giving a reciprocating motion to the piston therein. This piston is connected by a rod with a piston in the air cylinder, and the air compressed therein is forced into a galvanized iron tank, *B*, whence it is fed through a small brass pipe to each lamp, *C*. The action of the pump



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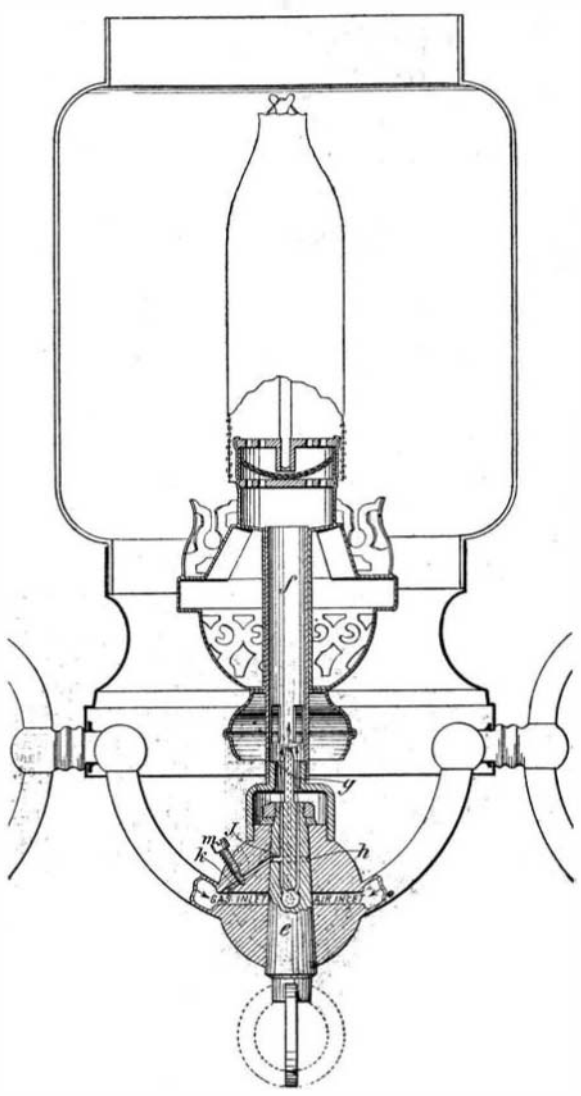
is automatic, and requires but little attention. The pressure is governed by a regulator shown at *d*. This regulator reduces the pressure to 3½ pounds, the amount necessary to produce the maximum candle power in each burner.

The lamps used with this system vary in design to suit different tastes. One of the best designs is illustrated by the accompanying half-tone engraving. The gas supply pipe and the air supply pipe are both inclosed by a tube leading down to the main frame of the lamp. The gas passes down the right side of the lamp through the tubular frame, while the air passes down the left-hand side to the valve at the bottom of the lamp. A set screw is threaded into the air channel, just below the point where the air pipe is connected to the lamp frame, and this provides an additional means for regulating the amount of air admitted to the lamp. The details of this valve and the burner will be clearly understood by reference to the sectional view. The valve plug, *e*, is formed with a central channel for the air supply, which enters the mixing chamber, *f*, through a nipple, *g*, while the gas supply branches and opens into the mixing chamber through two ports, one on each side of the nipple, *g*. The valve plug is also formed with an annular groove, *h*, near its upper end, from which a small channel, *j*, connects with one of the gas channels leading into the mixing chamber. This groove is also connected with the main gas channel in the frame of the lamp, by means of a short branching passageway, *k*, which may be closed or opened to any desired extent by means of the set screw, *m*. The purpose of this construction, it will be observed, is to provide a pilot light which can be left burning when the valve is turned off, and which will serve to light the mixture when the valve plug is turned again to open position. In this way the lamp is made ready for instant use without requiring lighting with a match or taper. Whenever it is desired to entirely shut off the gas, the set screw, *m*, may be screwed down, completely closing the passageway, *k*, and cutting off the supply of gas for the pilot light. It will be observed that when the valve plug is turned, both the air supply and the gas supply is cut off. From the mixing chamber the combined air and gas passes up to the burner, where it is ignited. The flame heats the mantle to a brilliant incandescence, producing a pure and steady white light. The incandescent mantle is protected by a large glass globe, which at its upper end supports a wide shade. This shade serves to reflect the light and diffuse its intense brilliancy. Owing to the large spread of the shade, sharp shadows are destroyed; for the light is distributed over a large surface at its source whence it is shed forth in a soft, mellow, white flood of uniform luminosity. The quality of the light approaches very closely to that of sunlight, and makes the ordinary incandescent electric lamp look yellow in comparison. It is a mistake to assume that all incandescent gas mantles give the same quality of light. When insufficiently heated, these mantles give off a light which is little, if any, better than the ordinary gas flame, and the higher the temperature is raised, the richer they become in violet rays, until a pure white light is produced. This maximum temperature, however, cannot be maintained for long without consuming the mantle; but by means of the compressed air employed in this system and the accurate regulation provided, it is possible to maintain a temperature just high enough to produce an almost perfectly white incandescence without impairing the life of the mantle.

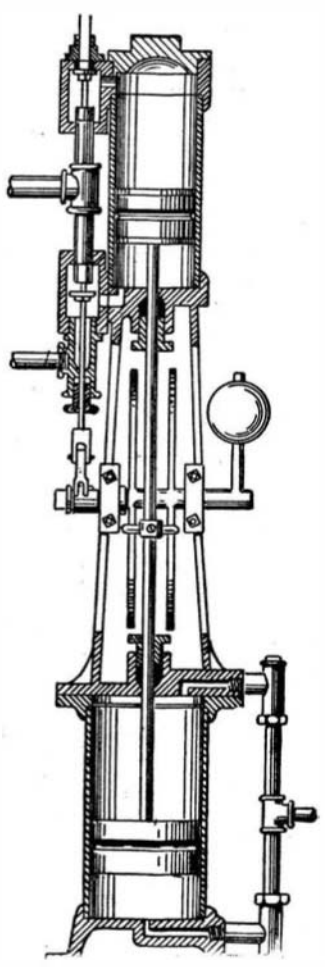
One of the lamps, such as we have just described, will yield 500 candle power with ordinary city gas, and this brilliant light, it is claimed, may be produced at the inappreciable cost of one cent per hour. Owing to its economy and high power, this lamp should be found very useful for illuminating dwellings, stores, halls, theaters, and streets of towns and cities. In stores, particularly, this white light should be found invaluable for matching colors.

This light is called the Century Light and is owned and controlled by the Century Light Company of America, a Massachusetts corporation with headquarters at 32 Portland Street, Boston. The system was developed only after long, careful, and expensive experiment which was not confined to the laboratory and workshop; but the most exacting conditions with most favorable results.

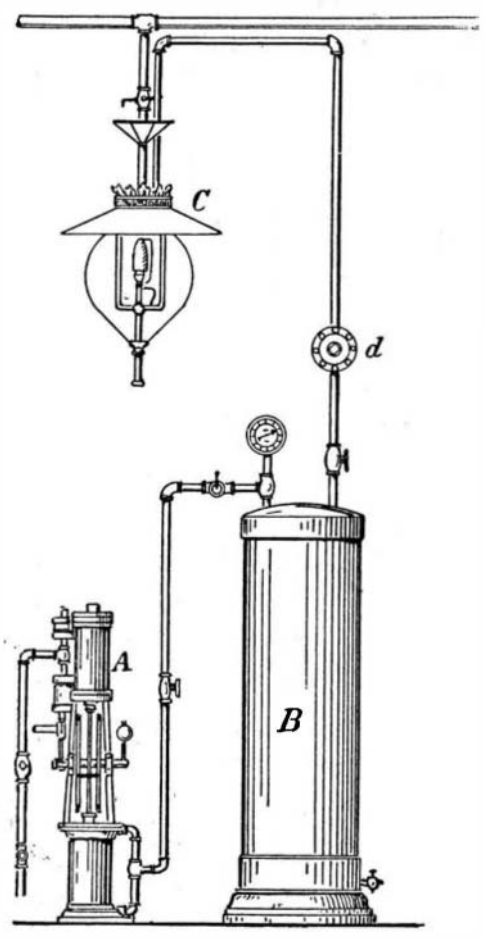
H. R. Leighton & Co., bankers, are the financial representatives of the company and their offices at 246 Washington Street and 69 Devonshire Street, Boston, have been lighted by this system for over two years.



DETAILS OF THE BURNER.



SECTION OF THE PUMP USED FOR COMPRESSING THE AIR.



DIAGRAMMATICAL VIEW OF THE NEW CENTURY LIGHTING SYSTEM.