

secured in a socket in the bottom of the gasometer. The tube through which the rod passes serves to prevent the escape of gas from the gasometer, as its lower end reaches into the water in the gasometer sufficiently to prevent this, the tube also serving to hold the dome in position. Experience has shown this to be the simplest and best method of guiding the dome without effecting the pressure of gas in the gasometer or the steadiness of the lights in the slightest degree.

The desirability of some simple means for preventing the accumulation of more gas in the machine, from any reason whatever, than it can safely contain, and which will prevent the pressure of the gas from increasing its normal condition, is conceded not only to be a distinct advantage to the machine itself, but an absolute necessity. This feature of an acetylene gas machine is like the safety valve on a steam boiler; it is placed there, not for the purpose of using it, but to prevent an accident by interference with the working of the machine, either by design or otherwise. To accomplish this desirable object, a large tube, six or eight inches, is connected to the dome of the gasometer and reaches down to within a few inches of the bottom of the dome, passing up through the bottom of the gasometer, and slightly above the water therein, and within the tube referred to is an overflow pipe, the outer end of which can be carried without the building if desired. In operation, should the dome of the gasometer ascend sufficiently to cause the suspended tube to be raised out of the water in the gasometer, the gas would pass within said tube, where it would enter the overflow pipe, and be carried to the outside of the building. When the gasometer dome again descends the tube enters the water, inclosing within it the overflow pipe, which prevents any further escape of gas. It will therefore be readily seen that a simple and sure means is provided for the protection of the machine, and the prevention of the escape of gas within the building. It will also be readily understood that this arrangement does not operate by friction, or in any way vary the pressure of gas.

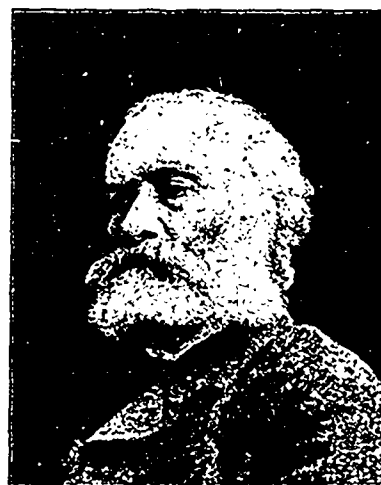
An appreciable improvement, has, it is claimed, been made in the construction of the gasometer. By reference to the engraving it will be seen that the upper part of the generator slides within the lower part, double walls in the lower part being provided for, the space between the two walls into which the upper part of the generator slides is filled with a liquid, which provides an effective seal to prevent the escape of gas. Within the generator is a round table, which turns on a shaft that extends through a liquid seal to the top of the generator. This table has a rim around it, several inches deep; within the table is secured four cells, separated from each other about half an inch, the space between them and within the rim of the table being filled with an inexpensive liquid, whose presence does not cause moisture, hence no gas is generated. Suspended from the top of the generator, at a position just above one of the cells, is a tube, open at both ends and slightly larger than the cells, in the table. The top of this tube is closed by a liquid sealing cover, which enters double walls. In the top of the generator beneath the discharging end of the syphon, is seen the funnel-shaped opening, into which water passes, to reach the carbide, which is placed in cans, and set within the cells on the table. To operate the generator, the top is pressed down as far as it will go. This causes the tube connected with the generator to surround one of the cells which is directly beneath it. The tube entering the liquid surrounding the cell, completely isolates the cell from the remainder of the generator. The cover over the top of the tube, now being removed, the can within the cell and containing the spent carbide, is exposed, the escape of gas from the generator being prevented by the lower end of the tube being immersed in the liquid in the table. To replenish the supply of carbide, the can containing the spent carbide is removed, and a fresh can set within the cell. The cover is then replaced and the catch which held the top down, released, when the top of the generator raises of itself by the pressure of the gas in the gasometer, which passes into the generator, as its top continues to raise, this gas having originally passed from the generator to the gasometer when the top of the former was pressed down and the gasometer dome rose to accommodate it. When it is necessary to replenish another cell, the table is turned by grasping a wheel on the top of the generator, and giving it a quarter turn, its correct position being indicated by a rib on the base of the table engaging in a slot on the bearing, on which the table turns. It will thus be seen that the spent carbide can be re-

moved and the supply replenished while the machine is in operation without the escape of gas and without soiling the hands, the whole operation requiring less than two minutes' time.

As the odor from acetylene gas is decidedly objectionable, it will thus be seen what desirable features this apparatus contains, in not permitting the escape of gas at any time, within the house or other building within which it is kept. The exhaustion of the cells is indicated by an electric bell connected by wires to the gasometer, and located any desirable place within the building. When the alarm is given it is only necessary to turn the wheel on the top of the generator one-quarter of a revolution. This turns the table in a like manner, and places a fresh cell of carbide beneath the water feed. The operation requires but a moment's time.

From this extended description it must not be inferred that the machine is complicated, having respect to what the machine accomplishes. It is quite the reverse. The machine here illustrated is capable of sustaining from fifty to a hundred lights. A machine suitable for lighting residences where but ten to twelve lights are required is made in a modified form, the gasometer and generator being constructed together, so that little space is occupied. Arrangements for the manufacture and sale of this invention will be made at once. Those interested in acetylene gas lighting may communicate with Messrs. Kerr & Fry, of Niagara Falls, Canada, who at present control the patents.

#### SIR SANFORD FLEMING.



Sanford Fleming, K.C.M.G., LL.D., C.E., Ottawa, is the most prominent and original of Canadian civil engineers. He was born at Kirkcaldy, Fifeshire, Scotland, January 7th, 1827. He received his early education near his birthplace, and came to Canada at the age of eighteen. He was on the engineering staff of the Northern Railway from 1852-1863, the latter half of service being as chief engineer. In 1863 he was sent as delegate to the Imperial Government in reference to a railway from the Provinces of Canada to British Columbia. He was appointed in 1863 by Governments of Canada, New Brunswick and Nova Scotia, and by the Imperial Government, chief engineer of the Intercolonial Railway. In 1871 he was made engineer-in-chief of the Canada Pacific Railway. When the construction of the C.P.R. was well advanced, political questions arose, and in 1880 he resigned—and though he was not thereafter concerned in the construction of the work, no one has sought to take away from him the reputation of the pioneer engineer of Canada, and the country's benefactor. On his retirement in 1880, he was elected Chancellor of Queen's University, re-elected 1883, 1886, 1889 and 1892. In 1885, he received the honorary degree of LL.D., from St. Andrew's University, Scotland. In 1881 he went as delegate from the Canadian Institute and Meteorological Society to the International Geographical Congress, at Venice, and in 1884 he was appointed delegate of Great Britain to represent the Dominion at the International Prime Meridian Conference at Washington. Mr. Fleming was engineer of the Hoosac tunnel, the greatest achievement of its kind at the time of its construction. Mr. Fleming has been a contributor to various scientific and other publications, and has been a mover in the "time reform" and Pacific cable movements. Mr. Fleming married in 1855 Miss Hall, daughter of Sheriff Hall, Peterboro', Ont. On the occasion of the Queen's Diamond Jubilee, no honors were more worthily bestowed than that of knighthood conferred on Sir Sanford Fleming.