PETROLEUM AS AN ILLUMINANT FOR BUOYS.

We have frequently advocated in the columns of the SCIENTIFIC AMERICAN the more general utilization of petroleum, both as an illuminant and a fuel, mainly because of its cheapness, abundant supply, and efficiency. One of the latest applications of this oil is that for the illumination of buoys, and it is the invention of Mr. James Richardson Wigham, the well-known lighthouse engineer of Dublin, Ireland.

Although the adequate illumination of rocks and shoals by buoys is indispensable for the safe navigation of rivers, estuaries and harbors, it is not imperative that the light cast from the buoys should be of very powerful illuminating intensity. Indeed, it is very seldom that the visibility of their rays is desired from a range exceeding five or six miles. But, on the other hand, occasionally buoys have to be placed in isolated positions, where it is impossible to erect lighthouses, and, owing to the difficulty of access thereto, it is essential that they should continue to burn brilliantly, without any attention, for several weeks or even months. Compressed oil gas is the illuminant generally employed for this purpose, since, although it is more expensive than oil, it possesses none of the drawbacks inherent to the latter. The principle expense incurred by the utilization of oil gas is the installation of the special gas-making establishment on shore. By the use of petroleum, however, all such expense is averted, because it is only necessary to convey the oil to the buoy to replenish the lamp reservoir.

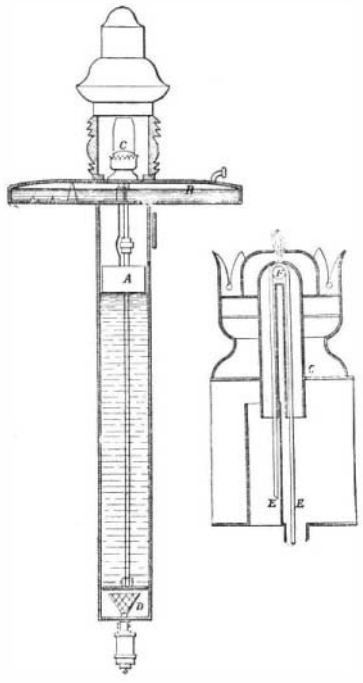
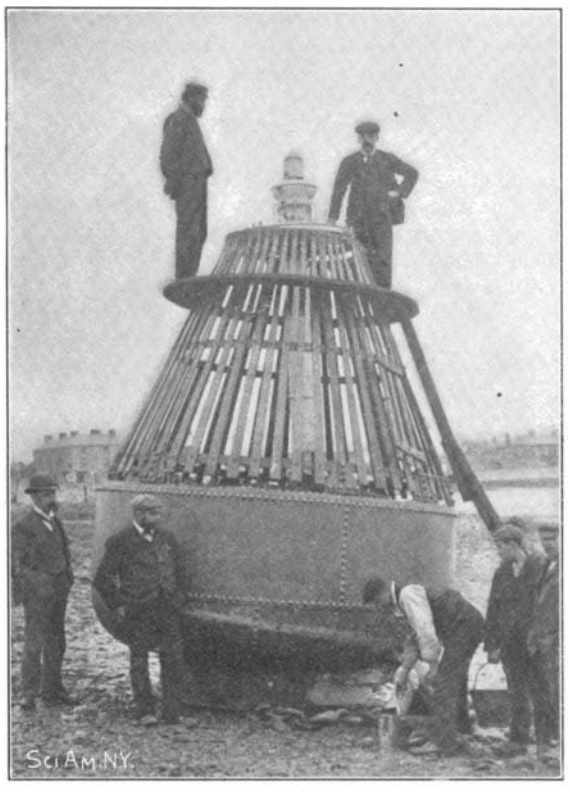


Fig. 2. Fig. 3.

SECTIONAL ELEVATIONS OF LAMP AND BURNER.



PETROLEUM BUOY.

The great disadvantage which has always militated against the satisfactory application of oil is the manipulation of the wick. In a short time after the ignition of the lamp the wick becomes so charred that the capillary attraction which brings the oil to the point of combustion is obstructed, and the light goes out. An attempt was made to overcome this drawback by the construction of a carbonized wick, but, although it lasted longer than the ordinary wick, in a few days the deposit from the oil was sufficient to extinguish the light.

The inventor carried out numerous experiments with a view to overcome this obstacle by causing the wick to move automatically as it was consumed, so that the same part of it would not be constantly exposed to the action of the heat of the combustion, thus securing a constant brilliant light. But this was an impossible task under the existing circumstances where the wick in the lamp is placed perpendicular to the level of the oil in the oil container, since it could not be readily made to alter its position automatically as its combustion proceeded. Mr. Wigham, therefore, conceived the ingenious plan of passing the wick over a roller, thus burning it horizontally, so that the light was obtained from the side and not from the end of the wick.

The burner he has invented is surmounted by a combustion cone, and surrounded by lenticular apparatus. One end of the wick, *E* (Fig. 3), is conveyed up through an oil tight copper tube with holes in its sides, and passes over a roller, *F* (Fig. 3), at the burner, *C* (Fig. 2). The other end is brought down through a tube standing above the level of the oil in the lamp and soldered or secured at the lower end. A circular float, *A* (Fig. 2), is placed in a copper cylinder fixed to the bottom of the lamp and filled with oil. When the lamp is first lighted this float is at the top of the cylinder, and is attached by means of hooks or loops to the wick. The oil in the cylinder is caused to drop slowly out of it through a valve, *D* (Fig. 2), of peculiar construction, supplied with a cotton core, at such speed as may be necessary. The oil thus descends into the receiver, bringing with it the float and the wick which is attached to it. When, at the end of one month, or any such other period as may be desired, it is necessary to replenish the lamp with oil, the cylinder is refilled, as is also the reservoir under the lamp.

It is necessary to fix the lamp upon swivels or gimbals, so that, however great may be the motion of the sea, the lamp always maintains practically a level position. Divisions are fixed in the oil reservoir by which, should it for a moment be brought out of level by the motion of the sea, the oil is prevented from flooding the wick during the passing of the wave, after which its proper level is again maintained.

The cost of lighting buoys by mineral oil is very trifling, the consumption being about half a gallon of oil every twenty-four hours. In connection with the buoys at present employed in Belfast Harbor, which are lighted by this means, this amounts to an expenditure of about 6 cents per twenty-four hours. This cost may be decreased if the oil, which constantly drips from the cylinder of the lamp, is collected in a portable vessel instead of falling upon the water, to 2 cents per twenty-four hours. The oil which apparently runs to waste, however, performs a valuable function, for it serves to calm the sea in the vicinity of the buoy.

This system of petroleum illumination of buoys has been used with conspicuous success in many of the harbors and estuaries of Ireland. In some cases the lamps only receive attention once in three months, which is sufficient testimony to their efficiency. The numerous advantages of the oil over the compressed gas are obvious, and the action of the lamp is so simple as to be of easy application.

THE ORCHESTRA-MAN OF THE EXPOSITION.

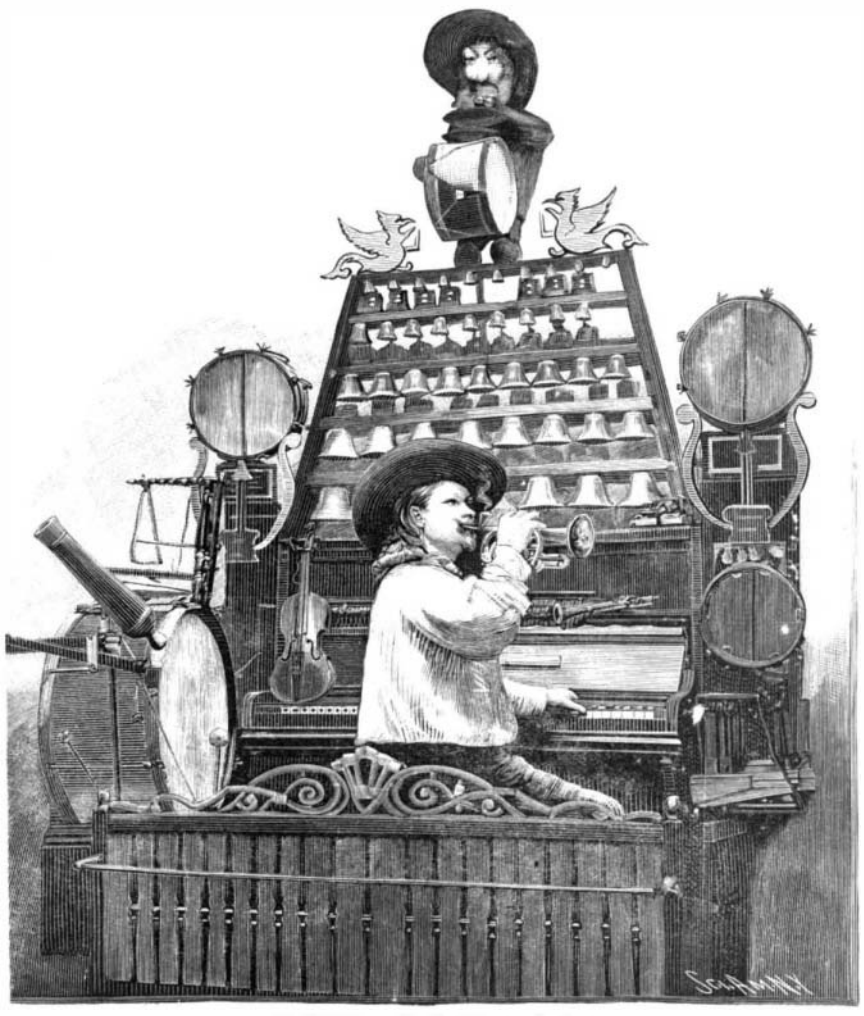
There was much music to be heard at the Exposition of 1900, but the most original was, without any doubt, that played by M. Malboech in the vicinity of the Gallery of Machines. This extraordinary man is capable of playing as many as thirteen instruments—the piano, cornet à piston, clarinet, violin, a chime of forty bells, the bass drum, cymbals, triangles, two kettle drums, tabor, and castanets.

By means of his hands he plays either the piano or the clarinet and piano at the same time, but more generally the cornet à piston and piano. The left hand, used for this latter instrument, actuates the chimes also. The secondary instruments are played through the pressure of the feet upon pedals.

These multiple occupations do not prevent the artist, while playing the cornet, from smoking his pipe. This is a fact that it is impossible to see accomplished every day. Our musician correctly executes pieces that are often difficult, and when a person closes his eyes he would be willing to affirm that he was present at a concert given by a dozen persons, so great is the volume of sound produced. The execution is sometimes fantastical, as, for example, when a gun is fired to terminate certain scores à la Berlioz or à la Wagner.

Malboech himself superintended the installation of his orchestra and arranged the different parts of it.

Although the artist, who is a native of Holland, is but forty years of age, he has traveled over nearly the entire world. He announces in his circulars that he offers $2,000 to any one who will succeed in imitating him, and styles himself "the greatest artist in the world."—La Nature.



MALBOECH THE ORCHESTRA-MAN.

Therapeutic Action of Light.

Dr. P. Garnault has lately read a paper before the Académie des Sciences dealing with the therapeutic action of light, and mentions a number of cases in which he has used this treatment with success. His attention was first called to the subject by M. Trouvé, who was among the first to bring out this action of light; in 1893 he observed that a workman afflicted with rheumatism was completely cured after having remained for forty-eight hours in the vicinity of a very intense arc light used for an electric fountain. Since then it has been observed that in works where electric soldering is carried on, this being accompanied by great luminous intensity, the workmen cease to be affected with gout or rheumatism. In the present experiments Dr. Garnault uses apparatus which has been specially constructed for the purpose by M. Trouvé. The experiments were confined to the effects of local action of light, and there seems to be no doubt that the results are due to the light radiations and not to other causes. A lamp of 50 candle power provided with a silvered parabolic reflector was applied in eight cases of muscular or articular rheumatism of average gravity and several years' standing, and in all these cases a very marked improvement was obtained at the end of three to twelve operations, and not followed by a relapse. Chronic catarrh of the nose may be also treated with success by the application of light accompanied by vibratory massage. The treatment was also applied in cases of deafness, accompanied or not by humming noises in the ear; the apparatus used consisted of two ten-volt lamps provided with reflectors and applied to each ear by a curved spring passing around the head; in some cases the action of heat was eliminated by placing alum screens in front of the lamps. In three such cases a marked diminution of the humming noises and an improvement of the hearing; other cases without the use of the alum screen were a so successful. The most complete observation was made upon a person thirty years of age who had undergone, the year before, an operation in which the tympanum and small bones of one ear had been removed; on the operated side the intensity of the humming noises had been greatly reduced, but on the other they were very marked; these were made to disappear by a series of applications of light. They reappeared after a severe cold contracted by the patient, but were again made to disappear by a second treatment. In twelve cases of deafness the application of light brought about good results. Dr. Garnault has also used the treatment in other cases, and is convinced that the luminous rays may be