Raising Sunken Vessels.

According to Lloyd's List, taking an average of three years, not fewer than 557 vessels are sunk or altogether lost annually.

A vessel having gone down, the first operation is to ascertain her position as nearly as possible, by sweeping with a rope of sufficient length, having two leads fixed thereto, at about sixty fathoms apart, the object of which is to draw the rope along the bottom till it meets with an obstruction. It is easily ascertained by sounding whether the obstruction to the progress of the sweeping-rope is caused by the vessel, or by an anchor or other object; if it be the vessel, it is necessary to ascertain the position in which she lies; this is done by again sweeping the vessel with a small working chain, properly buoyed at equal distances, which will shew her length and beam. To ascertain if the bowsprit is still standing, it is necessary to sound again at each end of the vessel. The purchase-chain is next passed round the vessel, having a sufficient number of collapsed air-cases (formed as above described) shackled on to it, and when tautened round her by means of other cases, or purchase-lighters, the chain is effectually secured round the vessel by stoppers. The operation of filling the air-cases is next proceeded with, which is effected by powerful air-pumps on board a steam-vessel taken out for the purpose, and as the displacement of the water is going on the vessel is gradually being raised from her bed, and by the time they are filled she will be above the surface of the water, and ready to be towed to shore by the steamer.

ON THE ATMOSPHERIC BUDE-LIGHT.

By John Bethell, Esq.

The invention of the Bude-Light is due to Goldsworthy Gurney, Esq. of Bude, in the county of Cornwall, who, for the last twenty years, has been endeavouring to obtain, by numerous experiments, a powerful and beautiful light. In 1822, he invented the Oxy-hydrogen Light, which he fully explained in his lectures delivered in Cornwall in 1822, and subsequently published in his book on Chemistry in 1823. This light was the result of his experiments on the oxyhydrogen blowpipe.

Some years afterwards Mr. Gurney invented another powerful light, which was effected by passing a stream of pure oxygen gas through the wick of an oil-lamp, whereby a most intense and beautiful light was produced. This light, which was originally called the Bude-Light, was put up at the Trinity House, and

afterwards adopted for the House of Commons. Difficulties, however, occurred in the practical working of this light, and Mr. Gurney determined on still further prosecuting his experiments; and the result of which was, the production of the present, or what may be called the Atmospheric Bude-Light.

The mechanical arrangement by which the light is produced consists of a series of concentric rings, perforated on the upper surface for the escape of the gas, placed at equal distances from each other, and so arranged as to regulate the quantity of atmospheric air, and to communicate by conduction and radiation sufficient heat to raise the temperature of the gas to a given point, so as to effect the separation of its charcoal immediately on its leaving the burner, and then, by an arrangement above, to bring fresh atmospheric air to the proper points of the flame. A perfect lamp will deposit the charcoal in the flame the instant it passes the jet. If so imperfect as to deposit too soon, charcoal will be found in the rings; if too late, then high up in the flame. There is a point of accuracy required which practice has determined. This mechanical arrangement brings about a series of chemical changes involved in the evolution of light and heat which are very interesting. The rapidity of chemical union governs the respective quantities of heat and light. By a too rapid combination, heat without light may be produced.

By the concentration of a mass of light a powerful illuminating effect can be diffused over the whole apartment, without shadows incidental to many lights, which may be softened down by glass shades to any pitch, and tinted, if desired, with any colour.

Its economy has been proved to be very great. The evidence given by the scientific gentlemen examined before the Committee of the House of Commons proves that, for the same quantity of light, the saving for using the Bude burner is equal to fifty per cent.

The Committee, in their report to the House, state that the saving effected upon the lighting the House by the introduction of this light was 484*l.* 9*s.* per session. Its effect in the different churches where it has been placed is most excellent. Clapham New Church is lighted by one burner of eleven inches diameter, which is composed of five concentric rings.

The importance of ventilation has, until of late, been very much neglected, notwithstanding all that has been said on the subject by our medical gentlemen of eminence. An ordinarily sized person breathes about ten cubic feet of air per hour, and contaminates by the exhalations from his body as much more; and one oil-lamp consumes about forty cubic feet of air in the same time. So that, in a room filled with twenty persons and lighted by four oil lamps, as much as 360 cubic feet of air per hour is rendered not only unfit for respiration, but absolutely poisonous. The air thus heated

rises to the upper part or ceiling of the room, and would escape if there were any outlet for it. But in most of our private dwellings there are none to be found. Builders seem to suppose that the fireplace, with the chimney, is the only ventilator necessary. This supposition is decidedly incorrect. The greater part of the air which goes up the chimney is drawn from the lower stratum of air in the room—from that which is the coldest and purest portion, leaving the hot and impure air to collect in the upper part of the room. The Atmospheric Bude-Light remedies this important defect. It is always fixed high up in the room, with a large escape-pipe over it, leading to the chimney, which entirely carries off the products of the combustion of the gas. Without this pipe it is considered that London gas cannot be pleasantly burnt in the rooms of private dwellings.

BEALE'S ROTARY ENGINE.

Mr. Beale, the inventor of the rotary engine, which it is the purpose of this short notice to describe, has endeavoured for the last twenty-five years to obtain that which has ever been considered an important desideratum, viz. a perfectly steam-tight rotary engine, subject in all its parts to comparatively little friction, and capable of revolving at very high velocities.

An engine of Mr. Beale's last construction is in daily operation at his engineering works, at East Greenwich. The outer cylinder of the engine measures 14 inches in diameter, and $9\frac{1}{2}$ inches long, internally. The piece serving as the piston is a cylinder of 12 inches diameter, placed excentrically within the former of 14 inches, so that the two cylinders nearly touch at one part, and are 2 inches distant at the opposite point; the mean transverse area of the excentric annulus being 14 square inches. The piston has 4 segmental indents, for the reception of as many rollers, each of $4\frac{1}{8}$ inches in diameter, and $9\frac{1}{2}$ inches long, which rest in contact with one side of the respective indents, and with the interior of the great or stationary cylinder, and divide the annulus into four chambers. The steam enters by a pipe from the boiler at top of the engine, and passing down the left-hand or ingress channel impinges against part of the roller which is nearest to the bottom of the channel; the roller is thus moved forward with a *rolling motion in contact with the inside of the cylinder*, and having passed the egress passage in the opposite side of the cylinder, the escape of the steam commences, either into the atmosphere or into the condenser, as the case may be. The engines are generally formed with three or four rollers acted upon in turn, and so a continuous rotary motion is produced; and the power is given off by