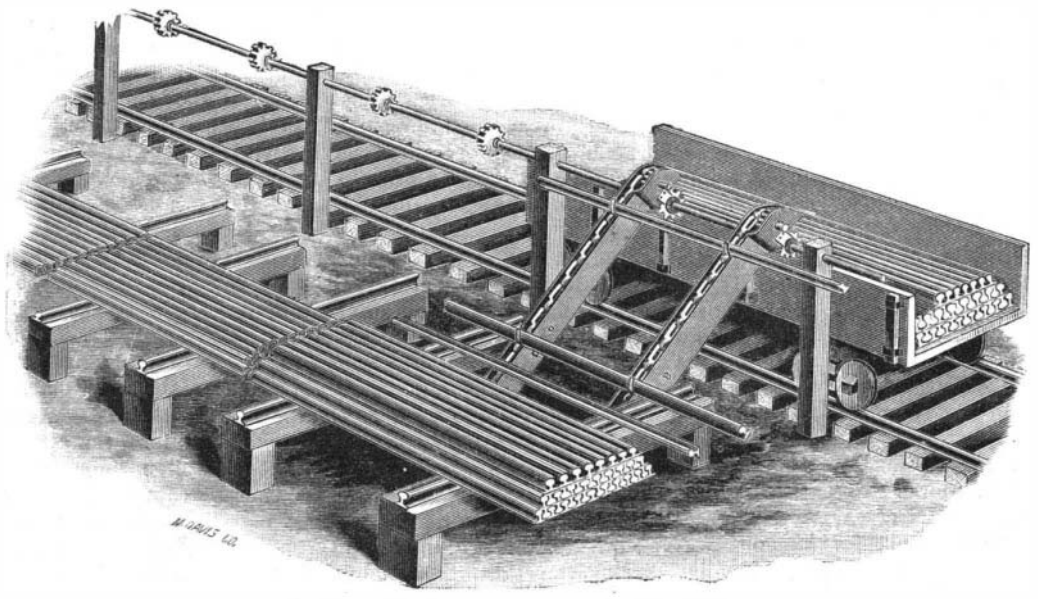
IMPROVED RAIL LOADING MACHINE.

A rail loading machine, by the use of which rails may be loaded into cars cheaply and expeditiously, has been patented by Cyrus P. Tittle, of Johnstown, Pa. A cut and description of it are herewith given. While to a limited extent machinery has been used for loading rails, this machine, being portable, presents a feature not possessed by others, in which there must be duplicate machinery for each bed or pile of rails, or all the rails must be loaded from one pile. This can be moved from one rail pile to another, and when not in use can be taken out of the way.

The machine consists of two plates bolted together, having a short shaft with a cog wheel and sprocket wheel attached running through the upper end, and a similar shaft with sprocket wheel running through the lower end. An endless chain, with hooks at regular intervals, engages with the sprocket wheels. In front of the rails to be loaded, a shaft having fast to it cog wheels in pairs, as many as desired, is supported at a suitable height from the ground. Two of the loaders are used, and are placed with the lugs or supports on the under side of the plates, resting on the shaft in such manner as to have the cog wheel of the machine engage with the cog wheel on the shaft. Power is applied to the shaft and motion consequently imparted to the chain. As the rails are brought to the front of the pile, the hooks elevate them to the top of the machine and tip them into the car. If the car is not of the same height as the machine, suitable sliding bars can be arranged to conduct the rails into the car.

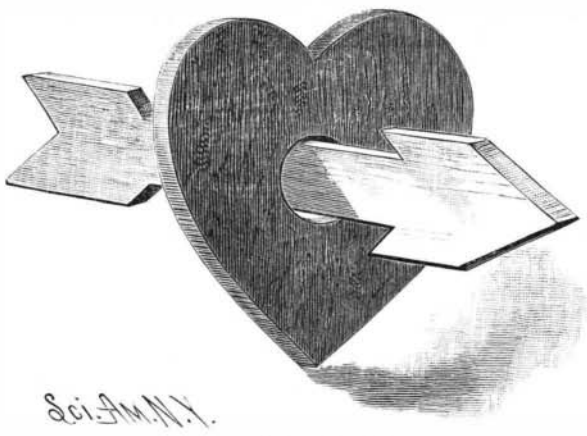


IMPROVED RAIL LOADING MACHINE.

NOVEL PUZZLE.

Our engraving shows a single perforated piece of wood having the form of a conventional heart, and in the perforation is inserted an arrow, also formed of a single piece of wood, the barb and head being much larger than the perforation in which the shank of the arrow is received. The heart is made of one kind of wood and the arrow of another. The question is, How did the arrow get into the heart? We have heard of the philosopher who was unable to rightly place a horse collar, and we have seen philosophers who could readily harness a horse, but who could not explain how the arrow got into the heart.

The puzzle illustrated is one of many thousands distributed gratuitously upon the streets of New York as an advertisement. The heart is of black walnut and the arrow is of basswood. Now we fear that the secret is out, for any one familiar with the properties of basswood knows that it may be enormously compressed, after which it may be steamed and expanded to its original volume. One end of the arrow was thus compressed, and in its compressed state was passed through the aperture of the heart, after which it was expanded. Advantage has been taken of this principle in the manufacture of certain kinds of mouldings. The portions of the wood to be left in relief are first compressed or pushed down by suitable dies below the general level of the board, then the board is planed down to a level surface, and afterward steamed. The compressed portions of the board are expanded by the steam, so that they stand out in relief.



A NOVEL PUZZLE.

Charles Loudon Bloxam.

Mr. Charles Loudon Bloxam, who for many years held the professorship of chemistry in King's College, London, and was formerly lecturer at the Royal Military Academy, Woolwich, died on November 28, aged fifty-five years. Mr. Bloxam's original researches, contributed mostly to the Chemical Society, were of a highly technical character. As far back as 1853 he devised methods for the analytical separation of tin, antimony, and arsenic; and he subsequently investigated the action of boracic acid upon the alkaline carbonates and alkaline earths. The poisonous metals claimed a good deal of his attention; he suggested an electrolytic test for the presence of arsenic, made a special study of the compounds of arsenious acid, and investigated the source of the arsenic which occurs in the sulphuric acid of commerce. In conjunction with Sir F. A. Abel, about thirty years ago, he conducted researches on the valuation of niter. Mr. Bloxam was the author of a well known manual of chemistry and of some smaller works on the metals.

APPARATUS FOR THE ELECTROLYSIS OF WATER.

T. O'CONOR SLOANE, PH.D.

The apparatus shown in the cut accompanying this article is intended to demonstrate that water disappears when electrolyzed, and to afford an approximate measurement of the amount decomposed. It forms a very good appendix to the ordinary experiment of decomposing water by the electric current and collecting the evolved gases separately. The amount of water corresponding to a large volume of electrolytic gases is so very small that the most delicate means have to be adopted to render it perceptible, unless a very strong current is used, and a long time occupied in the decomposition.

The apparatus consists essentially of two tubes, one the decomposition tube and the other a funnel tube. Their general shape is apparent from the cut. The decomposition tube is twelve inches high. The large portions are three-quarters of an inch in internal diameter. The connecting portion is made of capillary tubing. This may be from one-sixteenth to one-sixty-fourth inch bore. To this a scale is attached. It may be made of paper or pasteboard and secured by gum tragacanth. The funnel tube is six inches long, and its long stem is made of the same capillary tubing as that used for the other. It communicates by an India rubber tube with a lateral outlet leading from the decomposition tube.

Two plates of platinum are inserted at opposite sides of the lower portion of the decomposition tube, and a good cork is driven in to retain them. A portion of each plate projects downward, lying against the side of the cork outside of the tube. If an ordinary cork is used, it is well to insert with it a lump of sealing wax or paraffine. Then, when the cork is forced in well, the wax or paraffine is melted so as to be completely fluid, and is allowed to solidify while the tube stands vertically. This must be done while the tube is perfectly dry. If a very good and soft India rubber cork is used with thin plates of platinum, the treatment with wax is unnecessary.

This method of inserting the plates is given because it is the easiest. It is advisable to bend them a little inward, so that they will not lie against the glass. But it would be still better to secure them to platinum wires, which, by a good glass blower, could be passed through the glass tube above the cork, and there melted in place. Care in either case must be taken to see that they do not touch each other

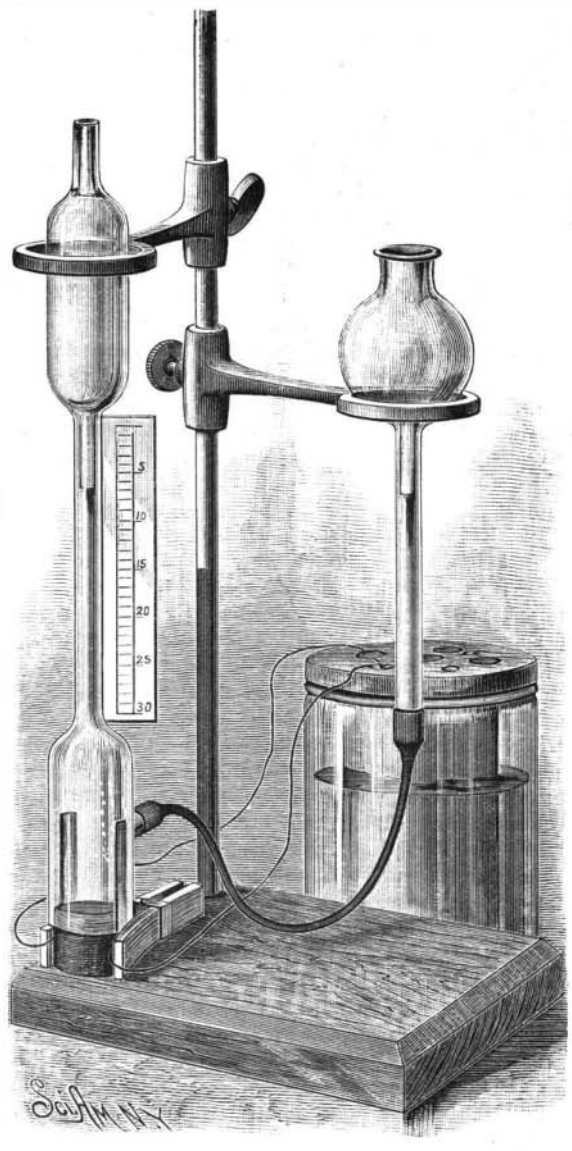
The apparatus may be supported in some kind of an improvised stand. As shown, it is arranged with a ring stand, an extra ring being borrowed to hold the funnel tube.

Some water is mixed with one-twentieth its volume of sulphuric acid and allowed to become perfectly cool. This fluid is poured into the funnel tube. It flows down through this into the decomposition tube. Air bubbles are almost certain to be carried with it. These are disposed of very easily by raising and lowering either tube several times until they all escape. In this way the acidulated water is added until it stands at about the middle of the stem of the funnel, and near the top of the scale attached to the decomposition tube. The ring carrying the funnel may be moved up and down, and water added very slowly until this condition is secured. Upon the stem of the funnel tube near its center a mark should be made. This may be done with a piece of thread tied around it, or with common ink. When filled, the water must stand exactly at the level of such mark.

The apparatus is allowed to stand for a few minutes, the funnel tube is adjusted if necessary, and the reading of the scale is taken and noted. The funnel is lowered until the level of fluid in the decomposition tube sinks just to the shoulder, but is well above the plates. Then a current of electricity is caused to pass through the water. The wires may be connected to the plates, as shown, by a spring clothespin.

At once bubbles rise in clouds from the plates. The gas as evolved may or may not be collected by a tube connected to the upper end of the decomposition tube. After ten or fifteen minutes' working, enough water will have been decomposed for its disappearance to be discernible. The battery is disconnected. The funnel tube is raised and lowered a few times to free the liquid of bubbles. It is brought to such a level that the fluid rises exactly to the mark on its stem, being allowed to stand before final adjustment, and a second reading is taken. This should be lower than the first, and the difference should give the amount of water decomposed. But as the gases are somewhat soluble in water, and as some gas may adhere to the platinum, the first reading will generally be higher, indicating an increase of volume. This reading, then, is taken as the basis. The funnel is again lowered, the current, for ten or fifteen minutes more, is passed through the solution, and the operations already described are repeated. This time the reading will be lower, indicating a disappearance of water.

Some knack is required to manipulate the apparatus. It should always be allowed to stand a few minutes before the final adjustment of the level of the funnel tube, to collect any drainage from the funnel. The experimenter must remember that he is making an exceedingly delicate measurement, and must exert patience and care. By raising and lowering either the funnel or the decomposition tube, or both in succession, every bubble can be disposed of without trouble.



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