Alloy for Door Furniture.—It is stated that a very beautiful alloy, intended to replace brass in various ornamental uses, especially in window and door furniture, is composed of copper, tin, spelter, or zinc, and lead, which metals are transferred to the crucible in these proportions: tin 1⅓ (say) 1 oz.; spelter or zinc, ½ oz.; lead five-sixteenths of an ounce. These are the proportions the inventor prefers to use, as he has found them to yield excellent and satisfactory results, but he does not intend to confine himself rigidly to the precise proportions named, as they may, perhaps, be slightly varied in some particulars without detracting from the beautiful color of the alloy which it is intended to produce. The molten metals are kept well stirred, and any impurities therein removed. When thoroughly mixed, this alloy, which is termed the first alloy, is poured off into ingot moulds and left to cool. Copper in the proportion of eight parts to one of this first alloy is then placed in the crucible and brought to a melting heat, when the tin, or first alloy, is added and intimately mixed with the copper, for which purpose the molten mass must be well stirred for several minutes. It is then poured into ingot moulds for sale in the form of ingots, or it may be poured into pattern moulds, so as to produce the articles required. This is the mode of manipulation which it is preferred to employ, as an opportunity is thus afforded of removing any impurities from the first alloy before mixing it with the copper, but all the metals may, if preferred, be mixed together in the proportions given, and melted at one operation.

It is pointed out that the factor of safety or stability of the Cleopatra Needle is too small. As it stands, it is already calculated to bear a pressure of 90 lbs. to the square foot, whereas the force of no hurricane is believed to exceed 25 lbs. to the foot. Mr. John Holden, architect of Manchester, recalls the fact that on the 7th day of February, 1808, the pressure registered at the Liverpool Observatory was over 60 lbs. to the square foot. The instrument, in charge of Mr. Hartnup, only registered up to 60 lbs., but his opinion was that the pressure reached between 70 lbs. and 80 lbs. to the square foot. At Liverpool, on the 27th of September, 1875, the pressure registered was 70 lbs. to square foot; and at the same place some time in April, 1867, the pressure was 45 lbs. At Sydney, Australia, on the 10th of September, 1876, the Government Astronomer reports "that the wind in some of the gusts lasting several minutes attained the extraordinary velocity of 153 miles an hour, equal to a pressure of 117 lbs. to the square foot; and during twelve minutes between twelve and half-past the velocity of the wind was 112 miles per hour." The question of the velocity and pressure of the wind is of great importance, especially in the manufacturing districts; and for many years the firm of which Mr. Holden is a member, in calculating the stability of factory chimneys, has assumed the pressure to be not less than 80 lbs. to 90 lbs. on the square foot. —*Engineer.*

Burning Green Wood Greatly Wasteful.—Water in passing into vapor absorbs and hides nearly 1,000 degrees of heat. A cord of green wood produces just as much heat as a cord of the same wood dry. In burning the dry wood we get nearly all the heat, but in burning the same wood green, from one-half to three-fourths of the heat produced goes off latent and useless in the evaporating sap or water. Chemistry shows this, and why, very plainly. Therefore get the winter's wood for fuel or kindlings, and let it be seasoning, as soon as possible, and put it under cover in time to be dry when used. It will, of course, season or dry much faster when split fine......A solid foot of *green* elm wood weighs 60 to 65 lbs., of which 30 to 35 lbs. is sap or water. As ordinarily piled up, if we allow half of a cord to be lost in the spaces between the sticks, we still have a weight of about two tons to the cord, of which fully one ton is water or sap. Such wood affords very little useful heat; it goes off in the ton of sap. The great saving of hauling it home dry is evident—as we get the same amount of real fuel for half the team work. Beech wood loses one-eighth to one-fifth its weight in drying; oak, one-quarter to two-fifths.

Water-Proof Cement.—1. Soak pure glue in water until it is soft; then dissolve it in the smallest possible amount of proof spirit by the aid of a gentle heat. In 2 ozs. of this mixture dissolve 10 grains of gum ammoniacum, and while still liquid add half a drachm of mastic dissolved in 3 drachms of rectified spirit. Stir well, and for use keep the cement liquefied in a covered vessel over a hot water bath. 2. Shellac, 4 ozs.; borax, 1 oz.; boil in a little water until dissolved, and concentrate by heat to a paste. 3. Ten parts of carbon disulphide and one part oil of turpentine are mixed, and as much gutta percha added as will readily dissolve. 4. Melt together equal parts of pitch and gutta percha, apply warm, and press the parts firmly together until quite cold. 5. The ordinary marine glue consists of caoutchouc 1 oz.; genuine asphaltum, 2 ozs.; benzole or naphtha, q.s. The caoutchouc is first dissolved by digestion and occasional agitation, and the asphalt gradually added. The solution should have about the consistence of molasses.

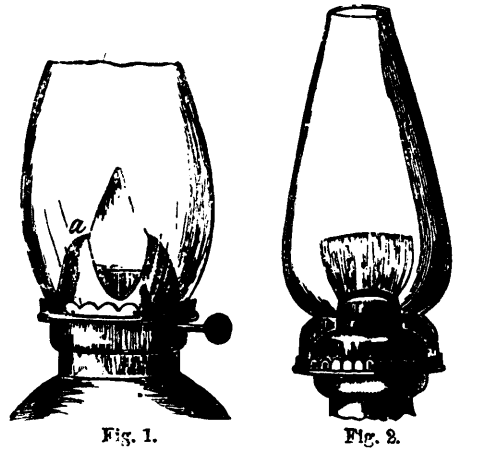

Fig. 1. Fig. 2.

How Common Lamps Waste Light.—Did it ever occur to the reader, that most of the common lamps actually waste one-half or more of all the light produced, and are therefore doubly expensive? The flame gives off rays from its surface; but if we half cover the flame, half of the rays are intercepted and lost. This is just what is done in a majority of lamps. Figure 1 shows this. The metal cap, *a*, partly covers the flame: only the portion that rises above *a* gives out light to the room. In several of the lamps now made, this loss is saved by omitting the metal cap, and having the glass chimney set down below the bottom of the flame, as in figure 2. Such an arrangement is equivalent to saving half the expense of oil.—The Argand principle is of great utility. This is an arrangement for having a current of air pass up through the *centre* of a circular flame, furnishing oxygen to its interior. The combustion is much more intense, and the light correspondingly greater.

Mars' Satellites.—Last year some discussion took place as to the first mention of satellites to Mars. Voltaire was stated to be the originator of the suggestion, but Mr. Proctor claimed the honor for Kepler, and, writing to the *Times* the other day, he gives the passage Kepler wrote in 1610 to Wachenfels: "I am so far from disbelieving the existence of the four circum-Jovial planets that I long for a telescope to anticipate you, if possible, in discovering two around Mars, as the proportion seems to require six or eight around Saturn, and perhaps one each around Mercury and Venus." It was, says Mr. Proctor, from this suggestion, no doubt, that Voltaire and Swift borrowed their guesses, which, however, they present in such a way that some supposed they had really seen the satellites—an idea utterly inconsistent with possibilities, even if Kepler's original suggestion be overlooked.—*Eng. Mech.*

Volatilization of Arsenious Acid.—In chemical treatises there appear contradictory statements concerning the temperature at which arsenious acid gives off vapor. According to Thenard, volatilization begins at a cherry-red heat; according to Berzelius, if heated in open vessels, it softens and begins to sublime at incident redness. In the *Encyclopédie Chimique* it is said to soften and sublime under an ordinary pressure of 200° C. Wurtz gives the same degree, but without mentioning the softening to Wormley at 190° C. The author finds that it volatilizes at much lower temperatures, especially when assisted by the evaporation of a liquid in which it is contained. Under this circumstance, it is more or less volatile at temperatures ranging from 100°.

According to Mr. W. M. Preece, the British Post-Office Electrician, the telephone has not yet found much favor in England. It bids fair, he says, to be of use in some branches of telegraphy, but its progress has been disappointingly small. Its effects are feeble. It is too sensitive for practical use on existing lines. It requires complete quietude, not only in the air about it, but in the wires conveying its signals, and its employment has been checked by the outrageous terms demanded.