Scientific Museum.

Dammara Varnish.

The following article is from a recent member of the Polytechnisches Centralblatt, by Prof. W. Munzel, and possesses no small amount of interest for a large number of our readers :—

"If dammara resin be dissolved in cold oil of turpentine, a milk-white turbid varnish is obtained; this turbity however does not depend upon the incomplete solution of the resin, but rather upon the moisture adherent to it. This moisture, as well as the moisture enclosed in the interior of the resin, especially in the white opake pieces, produces many defects in the varnish, as when it is prepared cold this water remains in it in a finely-divided state. When such a varnish as this is laid on, the water contained in it, although in such small quantity, can neither evaporate nor soak into the varnished object; and thus these minute water-bubbles produce a dull, rough appearance on the surface of the varnish, so that the latter can never produce a truly glass-like coating. At every change of temperature, these watery particles either expand or contract, until at last, from frequent repetition of this process, or in consequence of a greater elevation of temperature than usual, the coat of varnish bursts or cracks, and falls off as a scaly powder. In order to get rid of this defect entirely, the water adherent to the resin must be completely removed. This is best done by boiling the resin with the oil of turpentine in an open vessel, as in this case the water enclosed in the resin is dissipated below the boiling point of the oil. The object is equally attained when the resin is well dried in a drying oven before solution, and then dissolved in cold oil of turpentine; if the resin were sufficiently dried, a perfectly clear transparent varnish is obtained, possessing all the properties of a good varnish; this mode of preparation, however, from its complicated nature, is not to be recommended for adoption on a large scale. If a very small quantity of water be added designedly to a perfectly clear and well-boiled varnish, and the whole is shaken, the latter immediately acquires the turbid appearance, and all the properties of a bad varnish.

In the preparation of dammara varnish, the author employs enamelled cast-iron pots, capable of containing about 50 lbs.; in these, 25 to 30 lbs. of varnish may be conveniently prepared. The dammara resin is put into the pots in a solid state (the powdering of the resin is disadvantageous, as when in this state it forms a mass during the fusion, and the varnish thus generally acquires a color), the proper quantity of turpentine (5 parts to 4 parts of resin) is then poured to it, and the whole put upon the fire. As soon as the boiling of the oil begins, the water originally included in the resin is dissipated in the form of vapor, and the resin acquires a softer consistence. When all the water is expelled and the oil (or varnish) boils quietly, the solution is completed, and the vessel may be removed from the fire. As long even as traces of water exist in the varnish, its boiling is attended with a bubbling movement; but as soon as all the water is got rid of, the varnish boils quite quietly. That even a very small quantity of water is sufficient to produce this bubbling, may be shown by blowing with the mouth into some quietly-boiling varnish, when the mass immediately appears ready to boil over, entirely in consequence of the slight moisture introduced into it by the breath.

When the varnish is prepared, it is poured through a fine wire seive, and then allowed to settle sufficiently.

By this method, two workmen in the author's factory prepare 4-5 cwts. of good varnish per day.

If it be desired to give the varnish a tougher consistence, 2-3 per cent. of good bleached linseed oil (not boiled with oxide of lead) must be added to it before boiling. This communicates great toughness to it, and it then resists friction, &c., much better."

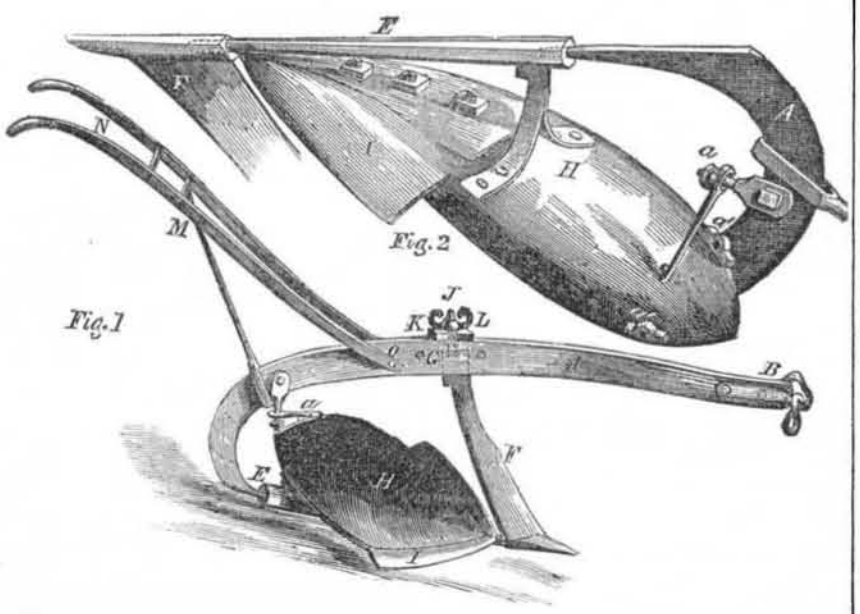
Great Musical Concerts have been held during the past two weeks in the Crystal Palace.

Appearance of the Earth from a Balloon.

Mr. Elliott, the aeronant, in a letter giving an account of his last ascension from Baltimore, says of the appearance of the earth from a balloon:

"I don't know that I ever hinted heretofore that the aeronaut may well be the most sceptical man about the rotundity of the earth.—Philosophy imposes the truth upon us, but the view of the earth from the elevation of a balloon is that of an immense terrestial basin, the deeper part of which is that directly under one's feet. As we ascend, the earth beneath us seems to recede—actually to sink away, while the horizon gradually and gracefully lifts a diversified slope, stretching away further and further to a line that, at the highest elevation, seems to close with the sky. Thus, upon a clear day, the aeronaut feels as if suspended at about an equal distance between the vast blue, oceanic concave above, and the equally expanded terrestial basin below."

IRON HILL-SIDE PLOW.



The annexed engravings are views of an improvement in Side-hill Plows, for which a patent was granted to Nathan Harrison and John W. H. Metcalf, of Ridgeville, Virginia, on the 11th of last October.

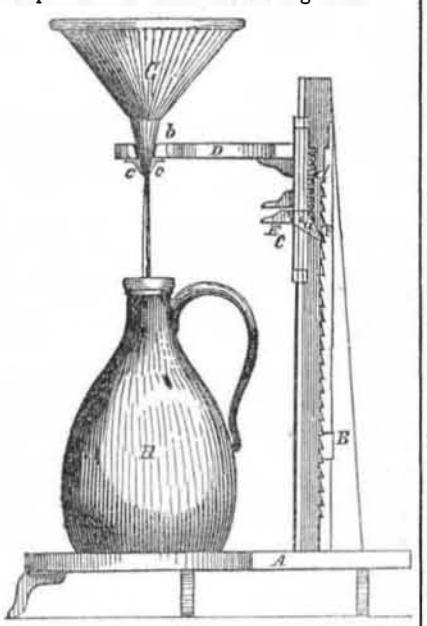
Figure 1 is a perspective view, and fig. 2 is a view of parts of the plow in an inverted position The same letters refer to like parts.

All the parts of this plow are made of wrought iron except the mould-board, which is cast. A is the beam; it is made of a bar of iron from 3-4 to 7-8 inches thick, and from 2½ to 4 inches wide—but it may vary in thickness according to the work it is intended to perform. This beam is nearly straight for about four feet from the clevis, B, and then curves to nearly a semi-circle, and is formed into a pivot point at the land side, fig. 1, E, where it fits into a socket at the hub of the land side. A plate, G G, is riveted or bolted to the beam, and forms a socket for the coulter, F, to pass through, which latter is bent sideways to make it range with the center of the beam. In the hub of the coulter is a socket for the point of the land side of the plow to turn in. A double share, I, is screwed to the mould-board. It may be made of such length and width as will be required, and can be made to turn a wide or narrow furrow, by lengthening or shortening the iron that attaches the heel to the land side, and the hook, *a*, that keeps the mould-board in place. The land-side, mould-board, and *share* being all firmly attached together, revolve on the pivot of a journal of the beam and in the socket of the coulter, so as to move over the mould-board and share, from side to side, and turn over a furrow in the same direction—to the same side—while the team is moving up and down, backwards and forwards, from head-rig to head-rig of the field which is being plowed. A screw, J, is cut on the top of the coulter shank and a washer and nut, K L, keep it firm in its socket, and serve to arrange the pitch of the plow to run deep and shallow. N are the handles or stilts, and M is a rod extending to the beam, and has a hasp, which slips over it, forming a clasp which is keyed to the beam, and can be fixed at various parts on the curve of the latter, to raise and lower the handles which are fastened on an axis pin, O, in the beam. The lugs *a' a'*, have holes in them for the screw bolt to secure the mould-board to the land side on both sides, when revolved from one side to the other, to turn a furrow. All the parts of this plow are strong, and durable—not liable to get out of order, and so simple that any country-blacksmith can make such plows.

The assignees of the patent for this region of the States are N. & I. Kuykendall, of Albany, N. Y., whose advertisement will be found on another page.

Filling Bottles.

The annexed engraving is a side view of an improved device for filling bottles, invented by Leonard W. Cheney, of Chelsea, Suffolk Co., Mass., who has applied for a patent. The nature of the invention consists in securing a funnel, through which the liquid passes into the bottle or jug, in an adjustable arm, for the purpose of allowing the funnel to be placed some distance above the mouth of the vessel to be filled, and thereby cause the liquid to enter the vessel in a small stream and permit the air to escape from the vessel while being filled.



A represents a platform or base on which are placed two vertical guides, B, between which a frame, C, works, one guide only is shown, the guide nearest the eye being removed. D is a horizontal arm attached to the frame, C, and E is a pawl secured to the frame, C, by a pivot, *a*, the lower end of the pawl catches into a vertical rack, F, between the guides and spiral spring, *d*, attached to the pawl, and the frame, C, keeps the lower end of the pawl in the rack. Near the outer end of the arm, D, there is a circular opening, *b*, having two springs, *c c*, underneath it the lower ends of which touch each other. The springs, *c*, may be made of flat steel strips, having their upper ends secured to the under side of the arm, D, as shown in the engraving. G is a funnel, the tube of which is inserted in the opening, *b*, in the arm, D. The springs, *c c*, press against the tube and secure the funnel properly in its place.

H represents a jug or vessel to be filled. The vessel is placed upon the platform or base, A, the mouth being directly under the end of the funnel, which is elevated some distance above the mouth as shown in the engraving.

The liquid when poured in the funnel descends from the tube thereof into the mouth of the vessel in a small stream, compared of course to the size of the tube, and the air is allowed to escape from the vessel while the liquid is passing into it.

The present practice is to place the tube of the funnel within the mouth of the vessel and pour the liquid into the funnel, the air is therefore prevented from escaping from the vessel and great inconvenience is experienced in filling vessels with thick liquids, such as molasses, etc., as the air within the vessel prevents the free escape of it from the funnel.

The funnel, it will be seen, is raised or lowered to suit different sized vessels by throwing the pawl, E, free from the rack, F. The pawl retaining the frame, C, and arm D, at the desired point.

The device may be constructed of wood or metal, either or both being used, and they may be made of various sizes.

More information may be obtained by letter addressed to the inventor.

Minot's Ledge Lighthouse.

A minute survey of these dangerous rocks has just been completed for the U. S. Lighthouse Board, by W. A. Williams, C. E.

The base of the outer Minot rock will permit the construction of a stone lighthouse of sufficient dimensions to resist the force of the most powerful wave, and it is expected immediate measures will be taken to commence the work. This is of the utmost importance to the commercial community, as several vessels have touched upon this dangerous ledge since the destruction of the iron lighthouse, in the great April storm of 1851.

A company at Chillicothe, Ohio, are building a small iron steamer, calculated to draw about eight inches water, and carry twelve to fifteen persons, to run on the Scioto River, and to be launched on the 4th of July next.