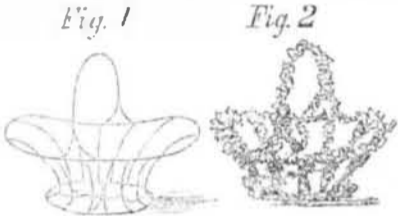


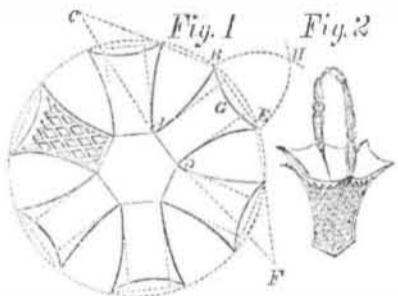


Of late we have been almost too scientific we are afraid, and so to redeem our character with our juvenile friends, we will tell them how to make some very pretty ornaments, and which involve a little science too. There is, as everybody knows, a substance called alum which is beautifully crystalline, and always is seen shaped like double pyramids. This is a compound of an earth, *alumina*, and an acid, *sulphuric*; it is, in fact, the sulphate of alumina, and is put to many useful purposes. This substance is soluble in hot water, and in cooling, it crystallizes out on to anything that



may be in the liquid, and the crystals will take any color, thus indigo will color them blue, cochineal red, and so on. Now, bearing these facts in mind, take a quantity, say a pound of alum, and dissolve it in as little hot water as possible. Then having made a basket of wire, like Fig. 1, immerse it in the hot solution, and put it quietly away to cool. Next morning you can take the basket out, and it looks like Fig. 2, all the wires being covered with beautiful crystals.

Should your first basket have given you some pleasure, here are directions to out a nice one out of cardboard, one like that shown in the engraving, Fig. 2. Take your cardboard and draw one circle in the center, and then a larger, just the distance apart you want the sides to be high. Then on these circles construct the hexagons that form the base and



rim of your basket. Place the point of the compasses in A, and afterwards in B, and draw with the pencil point two arcs which intersect each other at C; this done place the compass point at C, then describe the arc, A, B, which will give the necessary curve to the side and then from the points, D E, draw arcs intersecting at F. From this point you obtain the side, D E, then from the points, B E, describe the arcs, B H, and E H, and from H you get the curve, G, for the top; having done this with each side, on folding them up, they will form a very pretty basket, and any devices that suit the maker's fancy may be drawn or painted on the sides.

**House-Heating Apparatus.**

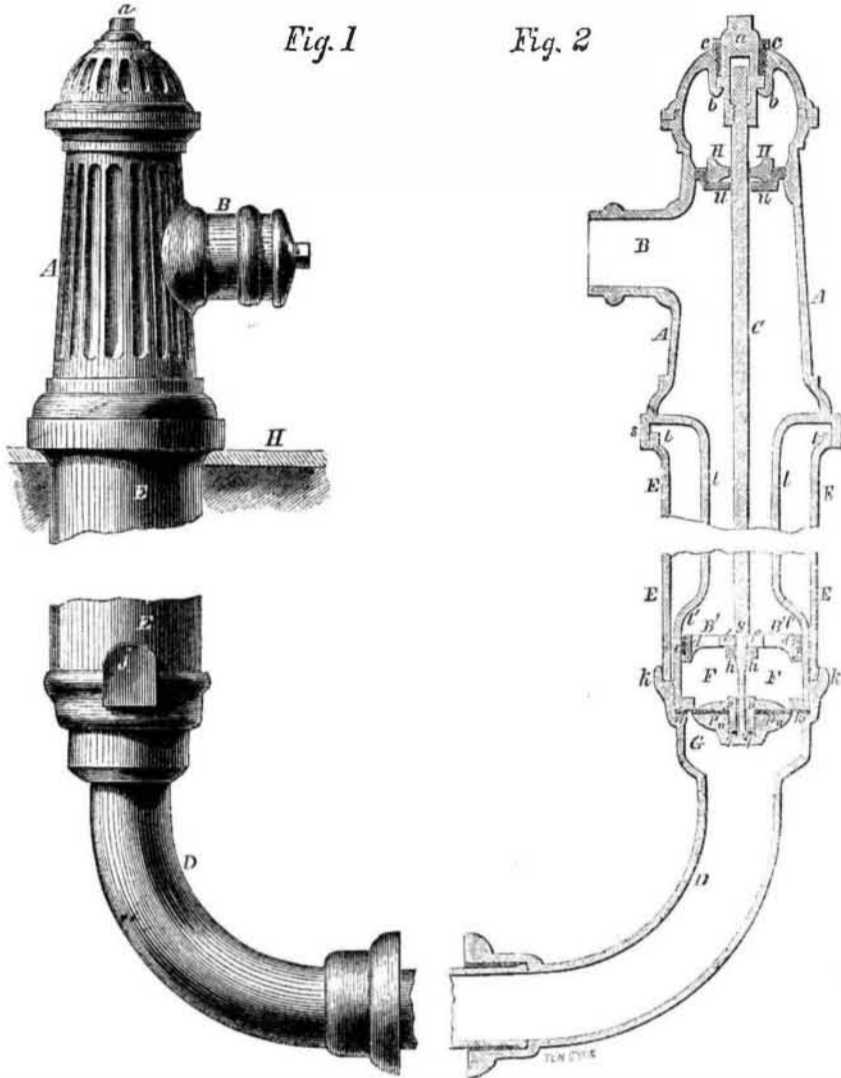
We recently (on page 213) expressed opinions relative to the best mode of heating buildings, and good hot water furnaces were favorably noticed. This subject is justly exciting considerable attention at present, and we have received several letters referring to it. One from Thomas T. Tasker, Sr., states that his hot water apparatus, described on page 148, Vol. X, SCIENTIFIC AMERICAN, has been successfully and extensively introduced into Philadelphia, and will soon be in use in this city. Another from a correspondent in Lockport, N. Y., advocates hot air furnaces,

and instances the benefits which its author and several others have derived from their use. At some future period we may present extracts from it, as it endorses very fully our views regarding ventilation. We have also examined "Brown's Hot Water Heater," at No. 22 Spruce street, this city, since the arti-

cle referred to was published, and will probably soon be able to illustrate it in our columns.

On page 213 reference is made to the illustrated furnace on page 51, Vol. XI, SCIENTIFIC AMERICAN; it should have been page 401, No. 51.

**RACE & MATTHEWS' HYDRANT.**



The chief features of novelty in this hydrant are that, by the peculiar arrangement of the valve, the waste pipe is opened as the induction pipe is closed, and it can be readily removed from its base without the necessity of excavating.

The engravings illustrate a perspective (Fig 1) and sectional (Fig. 2) view of the hydrant. A is the case, the upper part of which can be of any appropriate ornamental form provided with one or more horizontal nozzles, B. The lower part of the case, l, is smaller in diameter than the upper, and is cylindrical; this part is below the surface of the ground. The lower part of l is widened out at l', and an annular valve, B', is fitted into it. This valve is formed of a flat ring, d, grooved on its surface to receive a packing, e, of leather or other suitable material. The ring, d, has a crossbar, f, having a hub or boss through which the rod, C, is fitted; this rod, C, has a shoulder g upon it, that serves as a bearing to the upper side of the boss. A nut, h, on C, under the boss, firmly secures B' to the rod. A screw passes through d at a point directly opposite the waste opening in l. The lower end of l' has a screw thread formed upon it, and it is screwed into the head of the bent pipe, D, that communicates with the "main," and is permanently secured in the ground. An annular piece of packing, m, is interposed between l' and D. An annular valve seat, F, is also screwed into the lower part of l'. G is a valve formed of two parts, n and o; the part n is of cup form, and contains a nut, g, by which G is secured to C. The other part of the valve, o, is a cap that is screwed down upon a packing, p, which, when the valve is closed, bears against the seat, F. The valve, G, can turn freely on C. Around the outer side of l' a groove is made in the same plane as the lip of the waste opening, j

in k. A and E are attached to each other by means of flanges, s and t. In the upper part of A, a cap, H, is screwed, and secured into a recess, u, in which a packing is placed, thus forming a stuffing box. The upper part of rod, C, has a screw thread worked on it, and this screws into a cap, a, that rests by a flanch on b, and is held secure by a nut, c. A wrench applied to a will operate G, and by moving it one and a half inches, the full capacity of the hydrant is let on. The top, a, is made so as to require a peculiar wrench, thus forming a key.

The operation is as follows:—By applying the wrench to a, the rod, C, can be raised or lowered. When it is raised, the valve, G, bears against its seat, F, and water from the "main" cannot pass into the case, A, of the hydrant. When the valve, G, is closed, the valve, B', is above the opening, j, and therefore any water in the case can pass out. When the rod, C, is lowered, the valve, G, is opened, and the valve, B', closes the opening, j, while the water from the "main" passes up through it into case, A, and through the nozzle, B. In case any of the parts require to be repaired, the whole hydrant may be raised, the jacket, E, remaining stationary; this is done by turning the case, A, which unscrews l and l' from k.

This excellent hydrant is the invention of Washington Race and S. R. C. Matthews, of Seneca Falls, N. Y., and it was patented January 28, 1858. Further information may be obtained by addressing Messrs. Race & Matthews, as above.

At the "galvanized iron works" of Messrs. McCullough & Co., Prime st., Philadelphia, Pa., two large storehouses of corrugated galvanized sheet iron are being constructed for firms in the island of Cuba.

**Literary Notices.**

THE APPLICATION OF ART TO MANUFACTURES, WITH 180 ILLUSTRATIONS. By George C. Mason. New York: G. P. Putnam & Co. 13mo., \$1 50. The object of this work has been to collect the historical facts relative to metal working and the manufacture of textile products, together with such particulars of the various processes of converting the raw material into finished goods, as are most likely to prove interesting and attract attention to the importance of a higher development of art in our manufactures. The author has performed his work well, and his book is replete with suggestions and illustrations which will prove of infinite service to those engaged in the branches of manufacturing treated of. The tendency of American ingenuity and skill is toward utilitarianism almost exclusively, leaving art to take care of itself; but, in nine cases out of ten, a product may be rendered pleasing and attractive to the eye and the mind, at the same time it is rendered useful, without additional cost, by simply observing the acknowledged rules of art, therefore we welcome this volume to our list of practical mechanical works, and cordially recommend it to our readers.

SORGHO AND IMPER.—A. O. Moore, No. 140 Fulton st., this city, has just published Henry S. Olcott's excellent little work, with supplement, on the above plants, embracing a full account of the successful experiments of Mr. Lovering, of Philadelphia, in making Sorgho sugar, which have been alluded to by us in a previous number. Very extensive experiments will undoubtedly be made this year in the cultivation of the above plants to test their capacity and economy as sugar producers.

IMPERIAL CYCLOPEDIA OF MACHINERY.—Parts 13, 14, 15, and 16 of the above well-named work have just been issued by Messrs. C. E. Russell & Bros., Tremont street, Boston. It is edited by Wm. Johnson, of Glasgow. No. 13 contains large working drawings of direct acting engines, by Jas. Watt & Co., of Soho, London, fitted in the largest ship of war, *James Watt*. No. 14 contains an engraving of an improved throstle spinning frame, by Messrs. Sharp & Roberts, the renowned manufacturers of cotton machinery in Manchester, England. No. 15 contains engravings of the engines of the *La Plata*, the West India mail steamer, by Robert Napier. No. 16 contains engravings of an expansion double cylinder engine; also, a huge cotton warp sizing machine.

THE ATLANTIC MONTHLY.—This vigorous young magazine for April contains fourteen able articles. The leader is on "The Hundred Days," by an eye witness, from the time Napoleon arrived in Paris, from Elba, until his sun went down on the Field of Waterloo. It is full of thrilling incident. Published by Phillips, Sampson & Co., Boston.

BLACKWOOD'S MAGAZINE.—The number of this old and favorite magazine for March has been promptly re-published by Messrs. L. Scott & Co., No. 54 Gold st., this city. "What will he do with it?" by Bulwer, is continued, and so is Capt. Burton's journal of his interesting travels in Zanzibar. The other articles are all good, and worthy of Blackwood in its palmy days.

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