

## RECENT FOREIGN INVENTIONS AND DISCOVERIES.

*Manufacture of Alum.*—The common mode of making sulphate of alumina (alum) from shale or china clay, is by mixing the aluminous earth with dilute sulphuric acid and applying a gentle heat. The process is tedious. A quicker method of manufacturing alum has been patented by A. A. Croll, of London. It consists in reducing the aluminous shale or china clay to powder, heating it to about 300° Fah., then causing an equal quantity by weight of strong sulphuric acid previously heated to 300° Fah., to flow into the vessel containing the heated shale. The mass is then stirred and allowed to stand until the temperature is reduced to about 150°. The sulphuric acid unites with the alumina in the clay forming alum. The mass is now treated with boiling water which dissolves the sulphate of alumina, and the liquor is then run off into another vessel in which it crystallizes, forming the alum of commerce.

*Woolen Substitute for Sponge.*—J. Mason, of Nottingham, England, has obtained a patent for making a looped fabric of fleecy wool, to be used as a substitute for sponge. A chain of loops is first knit, corresponding with the size of the sponge required. The ends of the ring of loops thus obtained are then united together, and succeeding rows are formed within the first row, progressively narrowing as the knitting proceeds until the center is gained. This forms the inner surface of the woolen sponge. Layer upon layer of loops are formed in this manner until the desired size is obtained. To prevent the wool from felting it may be mixed with cotton. Woolen sponges may thus be made of any form or size.

*New Chemical for Tanners.*—In treating skins to open their pores after they are unhaired, they are placed in a bath of pigeons' and dogs' excrements. It is quite difficult sometimes to obtain these peculiar substances for the purpose stated, therefore substitutes have been frequently sought, but hitherto we believe without success until now: The substitute discovered for it is prepared by soaking fish in water heated to 212° in a close vessel for about three hours, then running off the contents of the vessel into a vat and allowing them to stand for about twenty days; the liquor is next run through a sieve to separate the solid particles, and it is then employed for the purposes stated. A patent has been obtained for this product by James Steart, of London. The product may be of great use to some of our morocco and sheepskin leather dressers.

*Preserving Timber.*—A patent has been obtained by T. Cobley, of Meerholz, Hesse, for treating wood to render it unflammable and more enduring, as follows:—A strong solution of potash, baryta, lime, strontia, or any of their salts, are forced into the pores of timber in a close iron vessel by a pump. After this operation the liquid is run off from the timber, and hydro-fluo-silicic acid is forced in, which, uniting with the salts in the timber, forms an insoluble compound, capable of rendering the wood unflammable.

*Fluo Silicate of Tin and Zinc.*—Mr. Cobley has also taken out a patent for making pigments for glazing and enameling by dissolving the oxide of tin or zinc in fluo-silicic acid, then acting upon the tin with sulphureted hydrogen, which produces a sulphide that may be applied as a beautiful enamel in the manufacture of porcelain. The fluo-silicate of zinc is formed by dissolving the oxide of zinc in fluo-silicic acid, then drying the precipitate and using it by itself or mixed with baryta, as a pigment or enamel, on porcelain. It is also found to be a good substitute for lead in the manufacture of glass. The patentee states that the glass made with this flux is very pure and free from veins.

*Making Tubes of Paper.*—A patent has been obtained by W. H. Crispin, of Stratford, Essex, England, for making curved tubes of paper as follows:—The improvement is intended to obviate difficulties which have heretofore attended the manufacture of such tubes. In order to form curved paper tubes the paper is, in the first instance, covered with a coating of pitch. This is conveniently done by reducing the pitch to a state of powder, which is sifted or distributed over the surface of the paper, the latter being exposed by means of hot metallic plates or otherwise to the action of a sufficient degree of heat to melt the pitch. The paper thus receives a perfect and even

coating of bituminous substance. The paper having been thus prepared, strips thereof are wound spirally around mandrels of the size and form of the tubes which it is desired to manufacture. The mandrels employed are of metal, and may be either solid or hollow. In the latter case heat may be imparted to the interior by means of hot water, steam or hot air. Upon the prepared paper being twisted round the mandrel, as mentioned, the pitch with which the former is coated is partially melted, causing the convolutions of the paper to adhere together, the compression being continued until the tube or pipe is of sufficient thickness, a coating of pitch being given from time to time as may be deemed requisite, while perfect smoothness and regularity of form may be obtained by molding with the hand or by means of suitable tools. The mandrels should be covered with grease or some other substance which will prevent adhesion of the paper, and the curves employed should, in all cases, be portions of true circles in order that the mandrels may be withdrawn without injuring the tubes. If considered requisite, greater strength and hardness may be given to the tubes by employing external pressure during the process of manufacture, and extra layers of paper may be used at those parts which require greater strength, and, in some cases, layers of canvas or calico may be added for the like purpose.

## RECENT AMERICAN INVENTIONS.

*Oil Press.*—This invention consists in the employment of a slide passing over the top of the several press boxes, and through slots formed in the upper portions of the sliding plates, in such a manner that by inserting said slide the several press boxes are perfectly closed on the top and an additional guide for the sliding plates is obtained. It consists further in the employment of a sliding key passing through slots in the lower parts of the sliding plates, in combination with the hinged doors at the bottom of the several press boxes, in such a manner that, by the action of the key, the doors are prevented being forced open when the operation of pressing commences, and they are not liable to become injured by catching against the followers. Invented by W. V. McKenzie, of Jersey City, N. J.

*Press for Baling.*—This invention, by Isaac S. Schuyler, of New York City, relates to an improvement in that class of presses in which racks and pinions are employed for operating the plunger and follower. The object of the invention is to obtain a press of the class specified, which will admit of having its plunger or follower operated by a direct application of power to the driving shaft by means of cranks so that speed may be obtained when pressure is not required, as, for instance, in moving the plunger or follower to and from its work, and also admit of having the power applied through the medium of levers arranged with clutches in such a manner that the operators may work at opposite sides of the driving shaft and one pass upward while the other passes downward, in order to operate it and thereby obtain a more uniform application of the power when pressure is required, or when the plunger or follower is at work. This invention is assigned in full to J. J. Echel, of New York City.

*Ordnance.*—This invention, by R. P. Parrott, of Cold Spring, N. Y., is more particularly designed for guns with rifled bore, the object being to obtain great strength and safety with simplicity of manufacture and at moderate cost. It consists in providing a gun having a cast-iron body with a peculiarly-applied reinforce of wrought iron; and it further consists in permanently closing the rear of a so-reinforced gun for muzzle loading, with a solid screw plug of larger diameter than the bore screwed into the rear of the body, the body having had the bore continued through the rear, and having been counterbored and a female screw having been cut in the counterbore for the reception of the said plug. This is the celebrated Parrott gun.

*Cut-off.*—This invention relates to that class of cut-offs in which the cut-off valve is fitted to the back of a main slide valve through which the induction and eduction of steam to and from the cylinder of the engine is effected. It consists in the construction of the cut-off valve with its ends oblique to the direction of the movement of the main valve, and in so applying the said valve to the back of the main valve

that it may work transversely thereto without interfering with the longitudinal movement of the latter valve, which has the outer orifices of its steam ports arranged obliquely to correspond with the oblique ends of the cut-off valve. This construction of the valve seat and ports permits the point of cutting off to be varied throughout the whole length of the stroke of the piston by a transverse movement of the cut-off valve, either by hand or by the governor. A. K. Rider, of Hydeville, Vt., inventor.

*Hydrometer.*—To ascertain the specific gravity of a liquid correctly by the ordinary hydrometer, it is necessary to have the liquid exactly at a certain temperature, as the instrument can only indicate correctly at one temperature. When, therefore, it is desirable to test the density or strength of a hot or warm liquid or solution, as it is very frequently in the process of refining sugar, and in other manufacturing processes, a portion of the liquid or solution has to be cooled, and so much difficulty is experienced in bringing it to the exact temperature to suit the hydrometer, that an absolutely perfect test is seldom obtained. This invention consists in a hydrometer by which the specific gravities of liquids can be ascertained at any temperature, such hydrometer being composed simply of a tube having its lower end closed by a flexible diaphragm. This tube being filled with water to a certain point while placed in a vessel of water, and afterward plunged up to that point in the liquid to be tested, will quickly have the water contained within it brought to the same temperature as the surrounding liquid, and according as the specific gravity of such liquid, which is in contact with one side of the flexible diaphragm, is greater or less than that of the water in the tube, which is on the other side of the said diaphragm, the column of water in the tube will be thereby caused to rise or fall, and the tube being properly graduated, will have the specific gravity of the liquid indicated within it by the height of the column of water. The invention also consists in the arrangement of the so-constructed hydrometer within an inverted syphon, through which the liquid to be tested may flow constantly, so that the specific gravity of the said liquid can be ascertained at any time without any manipulation whatever, by merely looking at the tube. The patentee of this invention is Peter Hogg, of Brooklyn, N. Y.

*Vacuum Tank.*—The object of this invention, patented to Joseph P. Walter, of Brooklyn, N. Y., is to save the time required to carry vacuum tanks, such as are used for emptying privies or sinks, back to the yard or station, and also the expensive machinery required for exhausting the air; and the invention consists in the application to each tank of one or more air pumps, which are operated by a working beam receiving its motion from an eccentric attached to one of the wheels of the truck supporting the tank, in such a manner that the air from the tank can be exhausted, while the same is driven through the streets, and that each tank, when emptied, can be driven back directly for a new charge without interruption. It consists also in the arrangement of one or more reservoirs containing suitable acids or chemicals, in combination with said air pump, and with the vacuum tank in such a manner that the noxious gases exhausted from the tank, after the same has been discharged, are forced through said acid or chemicals, thereby depriving them of the bad smell which otherwise would render it a nuisance to exhaust the tank in the public streets of a city.

*CEMENT FOR JOINTS OF PETROLEUM STILLS.*—A correspondent states that refiners of petroleum are much troubled to obtain a suitable cement for their stills so as to form a tight and durable joint. The cement used for cast iron, made with iron filings, sal ammoniac and sulphur, has been tried and found wanting; Lead makes a tight joint, but is liable to melt out with the high heat used. Copper also makes a tight joint, but it soon corrodes and becomes useless. Various cements have been tried, but a perfect one has not yet been obtained.

*SUBSTITUTE FOR IVORY.*—The *British Journal of Dental Science* states that dry collodion, when mixed with gutta percha, or india rubber, forms a compound of great hardness and elasticity. It may be used in the arts as a substitute for horn, ivory, and such-like materials, and billiard balls, buttons, &c., may be made of it.