weight. The results, which fill a large table, showed that in most cases there was absolutely no action and in the few cases where there was a perceptible loss of weight it was so trifling as to be disregarded. To the objection that continued drinking of fluids containing a small quantity of alumina would eventually be dangerous, the author points out that the ash of all the fluids usually drank contains alumina, as well as most foods and drinking water itself. His conclusion is that there is no objection to the use of aluminum for canteens and similar vessels.

These conclusions of Rupp were confirmed by Dr. A. Arche (*Dingler's poly. J.*, **284,** No. 11, 255), whose experiments show that the purity of aluminum (using the percentage of silicon as a means of classification) has much to do with its power of resisting the solvent action of fluids, and they also show that the mechanical preparation of the metal is an important factor. He found that hammered aluminum was least attacked, rolled metal came next, and then the drawn metal, while cast metal was much more easily attacked (by acetic acid).

(*To be continued.*)

## PATENTS OF INTEREST TO CHEMISTS.

EDITED BY ALBERT H. WELLES.

*Iron and Steel.*—Finely powdered wood charcoal with animal charcoal is a combination given by H. A. Harvey for supercarburizing steel (498,390). John A. Hunter has three patents: 498,061 is a process for increasing the per cent. of carbon in low steel by subjecting molten metal in a suitable converter to the action of a blast composed of the gases resulting from heating together hydrochloric acid, calcium chloride, carbon, and sodium chloride; 498,062 is a method for converting iron into steel by heating in a crucible or retort, subjecting to action of a gas containing chlorine, oxygen, and hydrogen evolved from hydrochloric acid, calcium chloride, and sodium choride; 498,063 is another patent on a process for increasing the per cent. of carbon in steel by subjecting the red hot metal in a crucible or retort to the action of chlorine and oxygen, which have first been brought into contact with heated carbon. To concentrate and separate ores, John W. Meier heats and converts into ferric oxide, then into magnetic oxide by heating with carbonaceous substance, and reducing gases as carbon dioxide and then separates with the magnet (497,804).

*Sulphur and Carbon Disulphide.*—A process for roasting sulphur bearing ores and obtaining sulphur in the solid form, Charles W. Stickney, inventor, consists in roasting one portion by means of steam and

mechanical agitation, generating hydrogen sulphide, and roasting another portion by means of air, generating sulphur dioxide, and mingling these gases in contact with a solution of a sulphate of a heavy metal (493,193). Martin Wanner proposes to manufacture carbon disulphide from reduced sulphide ores by mixing the finely divided reduced sulphide with powdered carbon, then moistening the mass with liquid hydrocarbon, heating in a closed retort, condensing the carbon disulphide, and removing reduced metal from furnace (497,256).

*Alkali Recovery, etc.*—An apparatus for recovering alkali (497,088) belongs to Henry Blackman, and Thomas Craney claims 496,863, an apparatus for the electrolysis of salt, and 496,866, an arrangement for washing salt. M. M. Monsanto has an improved process for manufacturing salt (496,615). John A. Just decomposes the manganese dioxide and chloride left after the evolution of chlorine, with nitric acid, removes the manganous nitrate to a neutralizing well, adds manganese protoxide, hydrate, or carbonate, transfers to a settling tank, then to a concentrator worked by waste heat, next to calcining furnaces to decompose, condensing evolved gases and recovering the nitric acid (495,462). W. T. Gibbs and S. P. Franchot (493,023) patent their process for obtaining chlorates of the alkalies or the alkaline earths by electrolysis, while O. Lugo (493,277) deposits metals from a liquid paste composed of a mixture of the insoluble salts of the metals with water by passing the electric current. Karl Sundstrom (492,929) has an improvement in the manufacture of soda. Bicarbonate mud is first purified by dissolving out the ammonia compounds with a suitable solvent, then passing water in a finely divided spray to remove the sodium chloride.

*Sugar, etc.*—Eugen Langen has a patent process for refining sugar (495,614), and Dr. Fahlberg takes out two patents on his improved process for manufacturing pure saccharine, 496,112 and 496,113. A dry mixture of para sulphaminbenzoic acid and ortho sulphaminbenzoic acid is added to an aqueous solution of an alkali or alkaline earth containing just enough alkali to neutralize and dissolve only the ortho acid, filtering off the liquid from the undissolved para acid, and adding to the filtrate an acid stronger than the ortho sulphaminbenzoic acid, whereby the saccharine is precipitated. Alfred Wohl and Alexander Kollrepp (498,000) mix saccharine solutions containing sixty per cent. or more of sugar with dilute acid, heat the mixture and neutralize the acid to obtain invert sugar. Georges de Laire has a process for manufacturing vanilloyl-carbonic acid and vanilline (497,546).

*Tanning, Bleaching, and Dyeing.*—495,028 covers a process for tanning leather, granted Martin Dennis. After treatment in a bath of basic chloride of chromium to fix the gelatine, the hides are subjected to a bath of suspended carbonate of calcium. Heinrich Thies and Emil Herzig dip articles to be bleached first in hydrofluoric acid solution, then steam and wash in a bath containing an alkaline earth compound, again steam and treat with boiling caustic alkali lye (496,072). Peter T. Austen

obtains a solid extract of sumac, hemlock, etc., by incorporating an alkaline nitrite (495,768). Fritz Bender patents a blue dye derived from dimethyl metamido-cresol and derivatives of aromatic amines (494,838) and R. E. Schmidt and Paul Tust obtain an alizarine dye by ozidizing beta nitro-anthropurpurine with manganese dioxide in sulphuric acid solution (496,139).

*Miscellaneous.*—Wm. W. Jacques uses grains of carbon treated with alumina for granulated material for transmitting telephones (495,090). Jonas E. Blomén dissolves picric acid and a hydrocarbon separately, then mixes, and the "picrated" hydrocarbon is dissolved in nitroglycerol, forming a blasting compound (495,178). Robert Hutchinson has a composition for lubricant, lime combined with fatty acids in excess, with a mineral or hydrocarbon oil and an alkali "pinate" (496,225). Paper pulp, sour milk, albumen, lime, and chloride of zinc form the combination which Wm. P. Emery proposes to use for making railroad ties (495,581). To make coal-briquettes, John N. Macrath adds to coal-dust a binder of a viscous liquid (made by boiling wood moss in silicic acid) and a solution of silicic acid (495,679). R. J. Parke and Isaac Goodman have a paint-filling composition (496,277) and "soap, ether, ammonia, glycerol, alcohol, and water" form a cleaning compound patented by Charlotte E. Moor (496,274). Otto Jensen and R. Keck claim the rock "phonolite," sodium sulphate, and limestone as a glass compositiou (494,636). Another patent wall-plaster, Barbara Dirnberger, the inventor, consisting of sand, plaster of Paris, slaked lime, muriatic acid, lime, soluble glass, glue water, and tissues of fiber (494,981.) Frank S. Culver has two patents on a fire-proofing composition, 495,149 and 495,166, the former containing a large proportion of asbestos fiber, plaster of Paris, and a small proportion of gypsum cement with a binding fiber of jute or hemp, while the latter patent omits the gypsum. Herman Giessler mentions pulverized magnetic oxide of iron, a metallic soap, a glass flux, and a refractory body-substance as emery or metallic powder, as a compound for coating metallic surfaces with a film of vitreous luster and dark violet blue color (495,629). A compound of cresol—para-isobutyl-ortho-cresol iodide—a yellow powder, soluble in ether, chloroform, and olive oil, which decomposes above 60° C., and on further heating gives off iodine vapors, is patented by Josef Messinger and G. Vortmann (495,204). Louis Aronson (497,621) for an electro-tinning bath uses a combination of water, ammoniacal alum, chloride of tin, sodium pyrophosphate and caustic soda. T. S. Harrison and C. Semper have two patents: one (497,570) an "aluminous compound," composed of sulphate of aluminum, and a double sulphate of aluminum and soda; and the other (497,571) an improvement in the process for making same, which consists in hardening or drying by the addition of sulphate of soda. M. L. Griffin (497,785) precipitates calcium carbonate by adding lime to a soluble carbonate, then mixes the precipitate with clay, drys, calcines, and grinds to form Portland cement. George Wegner and Paul Gührs

prepare articles to be electroplated with aluminum by first steeping in a bath of "acetic verdigris dissolved in vinegar," oxide of iron, sulphur, and ammonium chloride, brushing after removal from bath with a soft brass wire brush and rinsing with water (496,176). F. J. Clamer's method for coating metal articles, is first to clean by making them anodes in an electrolytic cell, then washing in a bath of dilute hydrochloric acid, immersing next in a bath of molten lead and phosphorus, and finally subjecting to pressure (494,667 and 668). To prepare basic bismuth gallate, which is described as a yellow powder, odorless, insoluble in water, dilute acids, alcohol and ether, but soluble in a large excess of mineral acids and containing 55–56 per cent. $Bi_2O_3$, Arthur Liebricht uses the method following: Neutral bismuth nitrate is dissolved in dilute nitric acid, a solution of gallic acid, alcohol, and water is added, and to this mixture caustic alkali or alkali carbonate until just slightly acid, when the salt is precipitated either with sodium acetate or by diluting with water (495,497). Emil Jacobsen forms sulfur compounds of hydrocarbons, according to his patent, 495,343, and Adolf Spiegel describes his method of obtaining sulphocompounds in 495,124. Hydrocarbons are treated first with caustic soda, then with sulphuric acid, washed with water and brine successively, and the washed product is neutralized with alkali and the sulpho products separated by some suitable solvent. Leonard Paget has five patents, the first and second, 494,790 and 495,263, on pyroxyline solvents, the other three on pyroxyline compounds—494,791, 494,792, 494,793. Dieudonnés Rigole extracts gutta percha from the leaves and twigs of the gutta percha tree, according to 495,757. To preserve meat, F. G. Dosmond and Jean F. Rozès exhaust air from the receptacle, and introduce under pressure gases obtained by calcining charcoal which has absorbed water (496,047). Peter Murray uses the following scheme to preserve timber: After coating with coal oil or mineral oil, animal fat, and brimstone, he burns the composition while applied to the timber until the composition is consumed (495,991). Samuel P. Sadtler and John H. Grimm patent a process for obtaining licorice extract (495,271) and Alfred Dervaux purifies water by charging an upwardly flowing column with lime at a point below the outlet of the water, forcing the lime to gravitate against the water and decanting the charged water at a safe distance below (495,313). H. L. Castner manufactures the higher oxides of sodium and potassium from the alkali metals by heating to 300° and oxidizing the metals by the action of air with a decreasing proportion of nitrogen (494,757). James J. Fronheiser mixes an aqueous solution of iron sulphate and sulphuric acid, evaporates, and adds finely divided ferruginous matter and heats in his process for pigments (495,197). To convert insoluble hydrated phosphates of alumina into soluble forms, Stephen L. Goodale heats the hydrates in suitable receptacles until the water of combination is expelled and then allows the phosphates to cool spontaneously (493,889).