

unavailable because of its high percentage of ash. It crumbles before burning and about two-thirds of the heating value of the briquette is lost in unconsumed substance in the ash. Shortly before his death, Trainer, who is freely quoted by the *Frankfurter Zeitung*, acknowledged that a good, combustible briquette could be made only with the aid of sulfite liquor freed from lime, an opinion that can only be confirmed.

"It is asserted that the coal briquettes made with thick spent liquor, gave no satisfactory results, even where made insoluble in water by preliminary heating.

"Attempts to use coke refuse or low-grade coal waste for briquetting with sulfite liquors, would involve heavy financial risk. It is said that even the best anthracite coal does not yield, with sulfite liquor, a commercially combustible product.

"That the briquettes are smokeless and do not soften under heat, is admitted and this may, in the future, prove a factor in coal-briquetting with lime-free lye. The weatherproof properties of the pitch praised in the *Frankfurter Zeitung* are of no consequence in relation to its combustible properties.

"The elimination of road dust has not so far been very successful, and if tar, so difficult of solution in water, is washed out in a comparatively short period, how much more quickly would the sticky, readily soluble sulfite liquor disappear. No large town can be named that, after the trials, has laid its road dust on a large scale with spent sulfite liquors."

NEW PRESSURE FILTERS

Bornett's pressure filters are being manufactured in several forms, with porous filter plates, for the filtration of liquids of all kinds, especially acid and alkaline solutions. It is claimed that they require but one man for the operation of a filter capable of dealing with 150 cubic meters of liquid leaving 30 tons of residue, and that in all cases the filtrate is clear.

The construction of the vertical type is shown in Fig. 1. A is the outside shell, or container, B is the filtering material, and C are filter plates. During filtration, A is hermetically closed and compressed air is forced in; the apparatus is not disturbed by air under high compression, and may be easily cleaned after the operation. The container is constructed of tin, lead, wood or clay, enclosed in a shell of cast iron or steel.

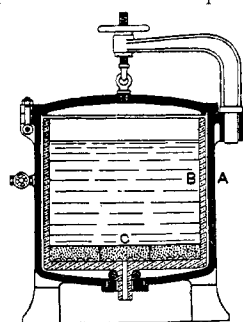


Fig. 1.

The horizontal type is shown in Fig. 2. B is the cover of the

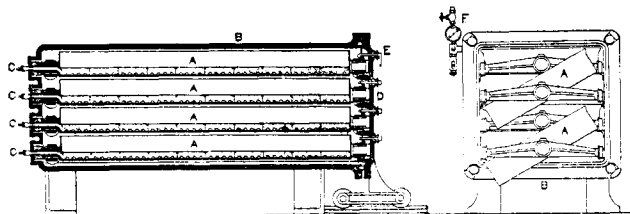


FIG. 2.

container and A the filter shell-plates arranged in a horizontal position. Underneath A, filter plates are placed in a position similar to that in the vertical filter.

THE PURIFICATION OF WATER BY "ALLOPHANIDS"

Attention has already been directed to the purification of water by means of artificial zeolites (THIS JOURNAL, 4, No. 4). The Deutsche Filtercompagnie, G. m. b. H. (French Patent 440,351, February 19, 1912) now claim that "allophanoids" (the siliceous, non-crystallizable portion of volcanic rocks) may be used instead of zeolites in the purification of water,

particularly for the elimination of calcium and magnesium salts. It is said that "allophanoids" may be obtained by the elutriation of the powdered volcanic rocks by successive portions of water, they being lighter than the crystalline portions of the rocks.

"ELECTRIT"

"Electrit" is an abrasive made from aluminum oxide by fusing it in an electric furnace at a temperature of about 3,000° C. *The American Machinist*, 37, 24, states that its specific gravity is less than that of emery and corundum, but its hardness is considerably higher, being about 9.25 on the 10° sclerometers scale. The grain of "electrit" is almost amorphous; it is resistant under pressure and shock, and is tough and not brittle. "Electrit" grinding wheels are bound ceramically, are said to be proof against moisture and acids, and usable for wet or dry grinding.

THE UTILIZATION OF WASTE SODA LIQUORS

The *Société Commerciale des Crins* has a process for the utilization of waste lyes which have been used in treating vegetable fibers, especially coconut fiber, in the manufacture of hard and soft soaps. The waste lyes are filtered, then mixed with oils or fats in suitable proportions. It is claimed that the considerable amounts of dissolved resins present in the lye impart certain desirable properties to the resulting soap. Owing to the heavy cost of recovery, such lye is generally run to waste, so that the process presents the advantage of economy.

THE CASEIN INDUSTRY

Technical casein is discussed by Martin in *The Chemical World* for October, 1912.

The first firm to manufacture technical casein in Europe, and which performed most of the pioneer work in connection with this new industry, was a company known as "Casein Limited," founded by E. P. Carpenter. The firm consumes about 30,000 gallons of skim milk daily in the summer months, representing about 4 tons of casein daily. Their factories are situated at Tipperary in Ireland.

The starting point of the industry is skim milk. The casein is precipitated by various acids such as sulfuric, hydrochloric, acetic, lactic, and sulfurous (casein for different purposes is precipitated with different acids), washed, freed from traces of fat, and dried. The mother liquors and wash waters are worked for the milk sugar and milk albumin by partial neutralization, followed by low temperature concentration *in vacuo* and crystallization. The albumin may be separated by steaming, when it coagulates and separates on the surface of the sugar syrup. It is pressed to cakes and sold as a constituent of cattle foods. It is now more usually separated in a soluble form by a complicated and costly process and sold as a component for invalid foods under the names "Lactalbumin," "Milk albumin," etc. Refined milk sugar is used for children's foods, and for adding to various beers and stouts. The sugar, not being fermentable by ordinary yeast, may be added to the wort and remains in the finished stout to increase its "extract value."

Casein is largely used for sizing paper. It is dissolved in alkaline solutions, and mixed into the paper pulp, when it forms an excellent binding agent for filling matter and pigments. The process is especially useful when the paper pulp has to be moulded or pressed into relief forms, as the casein size is very resistant to heat or moisture. When employed in certain special surfacing processes it produces extremely beautiful art papers. Some of the very best photographic papers are casein-sized, the papers being extremely resistant to heat and moisture, and thus will keep in the tropics.

More usually the casein solution merely supplements ordinary engine-sizing. The leather and textile industries also employ casein for "dressing" and "finishing" purposes.