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Liquid Measuring Apparatus.

The canning of oils for exportation, especially coal oil and spirits of turpentine, has grown within a few years into a business of great magnitude. The difficulty of procuring a vessel not liable to leakage or breakage has been overcome by the invention of the can shown in Fig. 5, which is known as "Pratt's Improved Patent Can." This can is of rectangular form, with corrugated sides and ends, which method of construction, with the peculiar process of manufacture, gives great strength with the least material, and provides for the most compact and convenient storage. This can is the subject of three patents in its form, and of others in the process of construction.

It was found, in preparing oils for shipment, that much care was required to get the exact amount in each, and also to adapt the measure to the different standards of liquid measure in use in this and other countries. These requirements and difficulties led to the contrivance of the apparatus seen in the accompanying engravings.

Fig. 1 is an external view of the measure, with its appendages, and Fig. 2 is a vertical section. Figs. 3 and 4 show the faucet and cock. A is the measure, made of sheet metal, and of any form desired. The measure is air-tight. On the top there is a metallic collar, B, on which is a ring or annular nut, C, designed to form a stuffing box for the cylinder, D, which may be solid or hollow, but should not be open. It is raised or lowered into the vessel, A, by means of a screw, E, which turns in a thread cut in the upper part of the cylinder, D, and passes through a yoke, F. By lowering or raising the cylinder, it is evident the capacity of the measure may be adjusted. By thus varying the capacity of the measure the measurements of different countries may be compensated for, and also the difference in bulk occasioned by changes of temperature.

Means for the escape of the air during the process of filling are afforded by the chamber, G, and valve, H. The chamber connects with the interior of the vessel, A, by an opening under the valve, H. This valve is rather smaller in diameter than the interior of the chamber, sufficiently so to allow of the escape of the air around its sides, and through the opening at the top of the chamber, as the vessel fills with liquid, and forces it out.

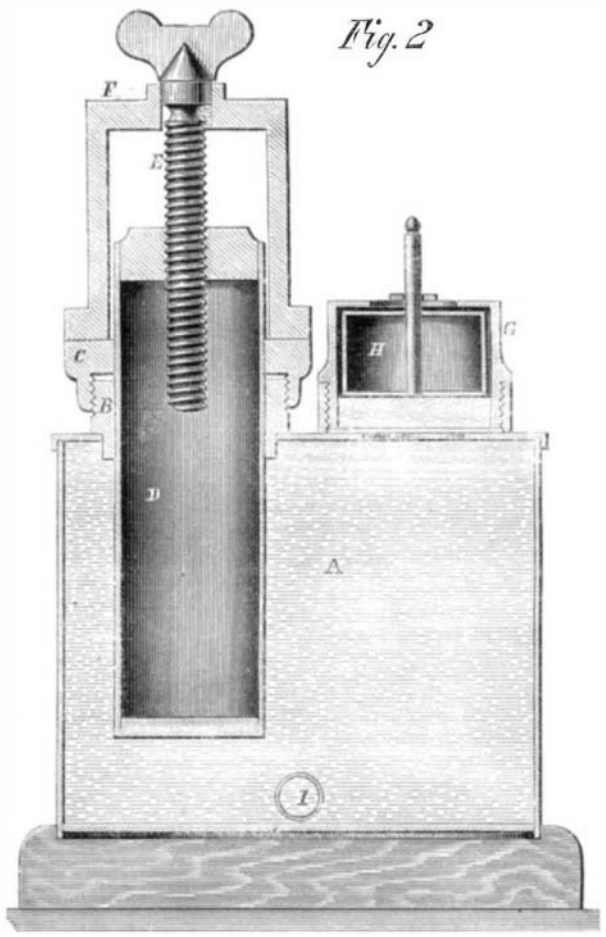
The oil or other liquid with which the measure is filled enters it at the bottom through the pipe, I, from the tank or reservoir. This pipe is of bent form—an obtuse angle—as seen plainly in Fig. 4, and having a two-way cock, J, at the angle; in Fig. 4 the passages in the cock are seen as open to each branch of the pipe. A chamber, K, projects from the angle of the pipe, I, and its wide end is closed by a plate, L, having two holes, as seen clearly in Figs. 3 and 4. M is a plate attached at its lower part by a pivot to the plate, L, moved by the handle, N, and guided by a pin working in a curved slot. To the plate, M, are firmly secured two curved nozzles, seen in Figs. 1 3 and 4. The bent pipe is not seen in Fig. 1.

The operation is as follows: Suppose the measure, A, to be empty, and the operation of canning to be commenced. The two-way cock, J, is turned in the position seen in Fig. 4, so as to permit the flow of oil from the tank or reservoir into the measure, A, and, as it fills, the air escapes up through the chamber, G. the valve, H, being down. When the measure is filled it is indicated by the valve stem, the valve being raised so as to close the aperture in the top of the chamber, G. The measure being filled, the plate, M,—Figs. 3 and 4—is turned so as to bring one of the nozzles into the aperture of the can to be filled. The position of the nozzles, when thus in use, is shown in Fig. 3, the dark aperture in the plate, L, being in connection with the depressed nozzle. The two-way cock being turned, communication between the tank and measure is closed, and that between the measure and can to be filled is open. When the measure, A, is empty, the plate, M, is turned so as to raise the depressed nozzle, and depress the other into another can, and the process of measuring is repeated while the filled can is being soldered. (The can is seen in Fig. 5. It is of tin, the sides corrugated, which gives great strength with lightness.)

With this apparatus there is no waste by drip or leakage, all differences in measure standards and variations of temperature are adjusted, and the filling from the bottom insures accuracy impossible to be obtained when measures are filled from the top. It was patented through the Scientific American Patent Agency, Sept. 17, 1867. All further information relative thereto may be obtained of the owner of the patents, Charles Pratt, manufacturer and dealer in oils, 108 Fulton street, New York.

Fig. 1

Fig. 2



APPARATUS FOR MEASURING LIQUIDS WITH PRECISION.

Fig. 3

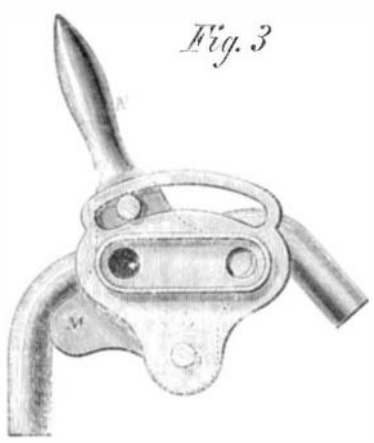


Fig. 4

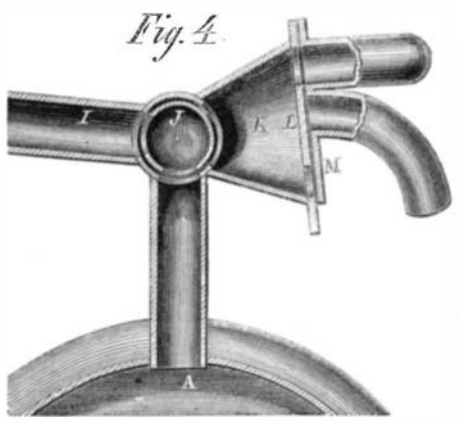
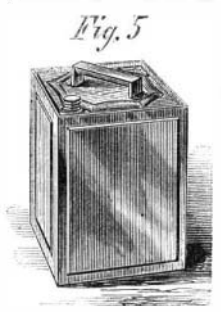


Fig. 5



ANILINE---ITS HISTORY, PROPERTIES, AND PREPARATION.

Aniline was discovered in 1826 by Unverdorben. The original method for its preparation was by digesting indigo with hydrate of potash, and subjecting the resulting product to distillation. Aniline was also obtained from the basic oils of coal tar; but the process which is now employed for its preparation is a remarkable instance of the manner in which abstract scientific research becomes, in the course of time, of the most important practical service. It was Faraday who first discovered benzole; he found it in oil gas. After this it was obtained by distilling benzoic acid with baryta, which result determined its formula, and was the cause of its being called benzole. After this, Mansfield found it to exist in large quantities in common coal-tar naphtha, which is the source from which it is now obtained in very large quantities. Benzole, when studied in the laboratory, was found to yield, under the influence of nitric acid, nitro-benzole. Zinin afterwards discovered the remarkable reaction which sulphide of ammonium exerts upon nitro-benzole, converting it into aniline. And, lastly, Bechamp found that nitro-benzole was converted into aniline when submitted to the action of ferrous acetate. It is Bechamp's process which is now employed for the preparation of aniline by the tun. Had it not been for the investigations briefly cited above, the beautiful aniline colors now so extensively employed, would still remain unknown. When Mr. Perkins discovered aniline purple, nitro-benzole and aniline were only to be met with in the laboratory; in fact, half a pound of aniline was then esteemed quite a treasure, and it was not until a great deal of time and money had been expended that he succeeded in obtaining this substance in large quantities. and at a price sufficiently low for commercial purposes.

The coloring matters obtained from aniline are numerous; they are the following: Aniline purple, violine, rese ine, futschine, alpha aniline purple, bleu de Paris, nitrosophenyline dinitraniline, and nitro-phenyline diamine.

Pure aniline is a colorless liquid, very astringent, having an aromatic odor and an acid burning taste, slightly soluble in water, very soluble in alcohol and ether. Its specific gravity is 1·028, It does not freeze at —20. It boils at 262·4° Fah., and distils unchanged. When warmed it dissolves sulphur and phosphorus. It is a powerful basis, combining with acids, and forming salts, which in general are soluble. It decomposes salts of protoxide and peroxide of iron, and the salts of zinc and alumina, precipitating from them the metallic oxides. It precipitates also the chlorides of mercury, platinum, gold, and palladium, but does not precipitate the nitrates of mercury and silver. Aniline easily oxidizes, turning yellow in water, and in time becoming resinified.

When aniline dissolved in hydrochloric acid is acted on by chlorine, the solution takes a violet color, and on continuing the current of chlorine, the liquid becomes turbid and deposits a brown-colored resinoid mass. In distilling the whole, vapors of trichloraniline and trichlorophenic acid pass over.

A solution of the alkaline hypochlorites colors aniline violet blue, which turns rapidly red, especially in contact with acids. A mxture of hydrochloric acid and chlorate of potash acts on aniline, the final result of the action being chloranile C^{12} Cl^4 O^4, but in the course of the reaction several colored intermediary bodies are formed.

If a solution of chlorate of potash in hydrochloric acid be added to a solution of a salt of aniline mixed with an equal volume of alcohol, and care is taken to avoid an excess of the hydrochloric solution, a flocculent precipitate is deposited after a time of a beautiful indigo blue color; this precipitate filtered and washed with alcohol contracts strongly, and passes to a deep green. The filtered liquid has a brownish red color; on boiling it, adding fresh quantities of hydrochloric acid and chlorate of potash, a yellow liquor is obtained, which deposits crystallized scales of chloranile.

An aqueous solution of chromic acid gives, with solutions of aniline, a green, blue, or black precipitate, according to