

SOILS ANALYZED FOR LITHIUM	PER CENT LITHIUM	
	Soil	Subsoil
SOILS OF RIVER AND FLOOD PLAINS PROVINCE		
Cahaba Fine Sandy Loam, Clay County, Ga.	0.002	0.004
Cahaba Very Fine Sandy Loam, Minden, La.	0.001	0.002
SOILS OF GLACIAL AND LOESSIAL PROVINCE		
Memphis Silt Loam, Grenada Co., Miss.	0.002	0.002
Memphis Silt Loam, Smooth Phase, Grenada Co., Miss.	0.001	0.002
Carrington Loam, Lawville, Wis.	0.002	...
Gloucester Stony Loam, 3 mi. E. Marlboro, N. H.	0.003	...
Volusia Silt Loam, 3 1/2 mi. S. W. Naples, N. Y.	0.003	...
SOILS OF COASTAL PLAINS SERIES		
Ruston Fine Sandy Loam, Minden, La.	0.002	0.003
Susquehanna Clay, Clark Co., Miss.	0.008	0.007
Susquehanna Fine Sandy Loam, Smith Co., Texas.	0.003	0.003
Orangeburg Sand, Terrell Co., Ga.	0.002	0.003
Norfolk Fine Sandy Loam, 3 mi. S. W. Murphy, Colquitt Co., Ga.	0.003	0.003
Susquehanna Fine Sandy Loam, Colquitt Co., Ga.	0.002	0.003
Portsmouth Fine Sandy Loam, Colquitt Co., Ga.	0.003	0.004
Tifton Fine Sandy Loam, Bellville, Ga.	0.002	0.004
SOILS OF THE LIMESTONE VALLEY AND UPLAND PROVINCE		
Hagerstown Loam, 1 mi. N. W. Conshohocken, Pa.	0.010	...
SOILS OF GREAT PLAINS PROVINCE		
Oswego Silt Loam, 2 mi. N. W. Manhattan, Kan.	0.003	...
Colorado Sands, Greeley, Col.	0.002	...
SOILS OF PIEDMONT PLATEAU PROVINCE		
Louisa Loam, Trevilians, Va.	0.003	...

during the analysis of these standards. Approximately the same amount of sodium chloride as the soil samples contained was added to the standards.

The soils were taken from six different areas. The results of the analyses are given in the accompanying table.

Lithium, although occurring in small amounts, was found present in all soils examined and in many cases in larger amounts than rubidium¹ is usually found. The content of lithium does not seem to follow that of any other element in the soil. Nearly the same amount of lithium is found in soil and subsoil but in most cases the proportion found in the subsoil is greater.

BUREAU OF SOILS
U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON

LABORATORY AND PLANT

SAND BLAST FOR MARKING GLASSWARE

By GEORGE SPITZER AND L. S. TRACHSEL

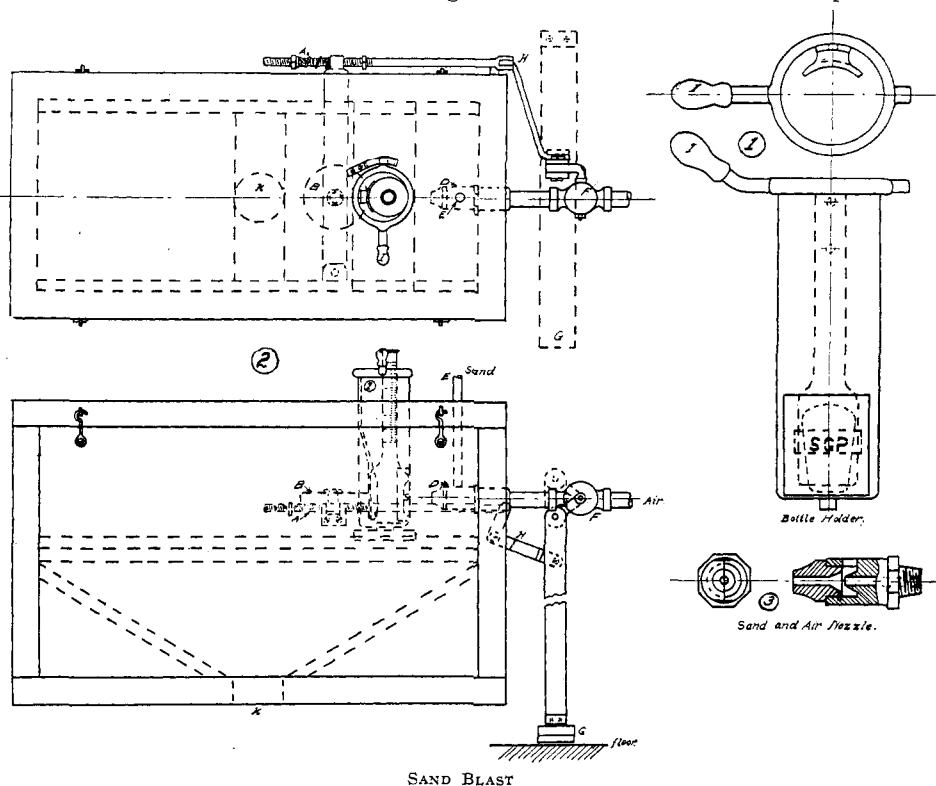
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Sometime ago it became necessary for the senior writer to devise a means for marking glassware. The main objects desired were rapidity, economy and durability. Where large quantities of glassware are to be marked rapidity is very essential. The method of using an emery wheel or emery paper answers the purpose quite well where only "spot etching" is required and the glassware is sufficiently strong to withstand the pressure of the rapidly moving emery wheel or emery paper. When lettering is to be done other methods are resorted to, and the so-called diamond ink or hydrofluoric acid method is sometimes used. Before employing either hydrofluoric acid or diamond ink for effective etching it is necessary that the glassware be warmed and free from grease or dirt. The rubber stamps used for applying the etching agent clog up with the paste, making frequent cleaning necessary and also making the whole operation very slow and sometimes unsatisfactory. In addition the etching done by the hydrofluoric acid is fine-grained and soon becomes very faint if the glassware is handled to any great extent. This is true when grease or greasy substances come in contact with the etching.

To overcome these difficulties an effort was made to devise a sand blast, embodying the features necessary for rapid work, economy in various relations and one that would give durable markings. In this we believe

we have succeeded, in a great measure, and it is hoped that perhaps others who may have occasion to make use of the sand blast may find some suggestions in our description and drawings.

The sand blast devised by the writers has given excellent results in marking Babcock test bottles. It is easy to manipulate, economical and rapid. From the drawing it will be seen that the manipulation is



very simple; the bottle to be marked is placed in a cylindrical receptacle (bottle holder), the bell-crank presses the bottle against the stencil, the air cock is opened and the sand forced against the stencil. At the same time the cylinder is rotated by the hand sufficiently to expose the letters to the blast; when the turn is made the foot-lever is released which cuts off

¹ Bull. 122, Bureau of Soils, U. S. Dept. Agriculture, 1914.

the air blast, also prevents the sand from escaping, and the glassware is then withdrawn. From the construction of the apparatus very little sand is blown out during the marking, even though high pressure is used.

Where large quantities of bottles are to be marked the cost of marking becomes an important factor from the financial point of view, not only for time consumed, but also with reference to cost of the material. During the past year over twenty thousand (20,000) bottles have been marked at a cost of less than ten cents for sand and two dollars (\$2.00) for stencils, in addition to the cost of compressing the air. The last item is to be considered and varies in different locations. In places where steam power is available, as in factories, creameries etc., the expense is scarcely to be considered after the initial cost of installing an air compressor. Where only a limited number of bottles are to be marked a hand compressor will answer quite well; for rapid work the pressure need not exceed 20 to 25 lbs. per sq. in.

It has been possible for an experienced man to mark six to eight gross per hour, in a very satisfactory manner. The sand blast requires no previous cleaning of glassware, as is frequently the case when marking with hydrofluoric acid.

DESCRIPTION OF DRAWINGS

Fig. 1 is a brass receptacle of such dimensions as will accommodate the bottle to be etched or marked. This receptacle has a guide opposite the opening containing the stencil. The stencil is held in front of the piece of glassware to be marked, by two clamps.

Fig. 2 shows plans of and elevations of the air-tight box which encloses all the etching mechanism. The spring (A) through the medium of the roller (B) forces the guide and the bottle against the stencil. This rotation is obtained by pressing the foot-lever (G) and is communicated through the bell-crank and rod (H). The spring (A) is adjusted to obtain the proper pressure of the bottle or piece of glassware against the stencil. The sand is blown from the nozzle (D) and forced against the stencil. The receptacle is rotated by means of the handle (I) sufficiently to bring each letter of the stencil normal to the blast of sand. The sand enters the nozzle (D) through the opening (E) by gravity. The compressed air enters through the valve (F), which is controlled by the foot-lever (G), this one lever operating the valve (F) and spring (A) simultaneously. The sand entrance to the nozzle is so located that no sand escapes when the air pressure is removed. All the motions necessary to mark each piece of glassware are controlled by the foot-lever simultaneously, except the rotation of the receptacle, the speed of which depends upon the depth to which the glassware is to be marked. All the sand blown into the box escapes through the opening (K) into a container. The sand is returned to the sand box supplying the sand to the nozzle. This sand box is placed two or three feet above the apparatus and the sand is carried by means of rubber tubing or small glass pipe to the opening (E) of the nozzle.

The fundamental design of this apparatus can be made use of in marking various kinds of glassware. Stencils can be easily made containing a greater number of letters or rows of letters. Stencils having plain openings may be used in etching laboratory glassware, beakers, necks of flasks, etc., or for "spot" etching.

PURDUE UNIVERSITY, LAFAYETTE, INDIANA

A MODERN HYDRATED LIME PLANT

By RICHARD K. MEADE

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One of the newest hydrated lime plants is that of the Dutchess County Lime Company, at Dover Plains, N. Y. This plant was completed in the fall

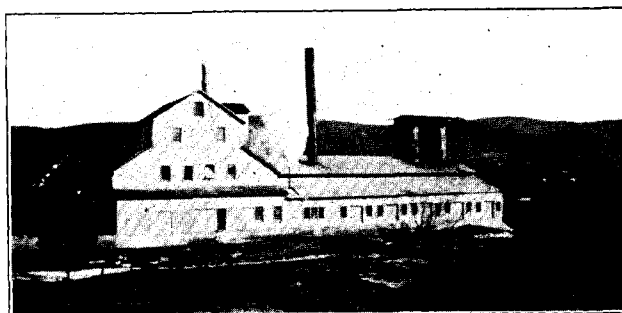


FIG. 1—PLANT OF THE DUTCHESS COUNTY LIME CO., DOVER PLAINS, N. Y.

and has now been in operation for about four months. This company, however, has been in existence for several years, operating two small kilns about two

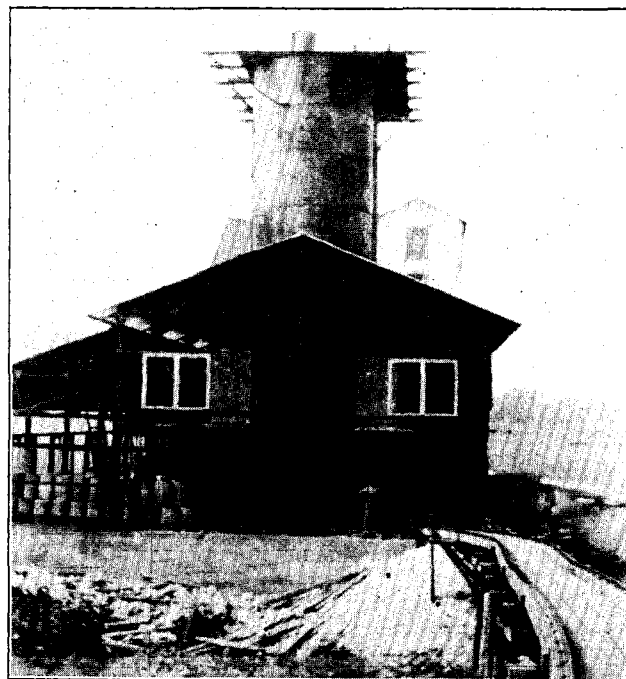


FIG. 2—LIME KILNS DURING CONSTRUCTION

miles from the town of Dover Plains, hauling their lime to the railroad with teams and bringing the coal and other supplies to the plant by the same means.