Ten samples of commercial feeds were used and the results obtained for each of these feeds, using the official method for the determination, appear above.

It can readily be seen from the above results that the new apparatus gave better extraction in the greatest number of cases, and averages higher in 8 out of the 10 cases here noted. It was found, too, that there is a greater uniformity in the results obtained, it being necessary in several instances to make as many as six determinations with the straight extraction apparatus and four with the Soxhlet before checks within 0.2 per cent could be obtained.

To summarize, the apparatus gives better extraction than does either the straight extraction or the Soxhlet methods. It is easy to manipulate, presenting a smooth outer surface, reducing the danger of breakage to a minimum. The recovery of the solvent is easy and rapid and entails no loss of time. The cost of the apparatus is also comparatively small.

Acknowledgment should be made to Mr. A. P. Kerr, Assistant Director of this station, for his suggestions.

LOUISIANA AGRICULTURAL EXPERIMENT STATION
BATON ROUGE, LOUISIANA

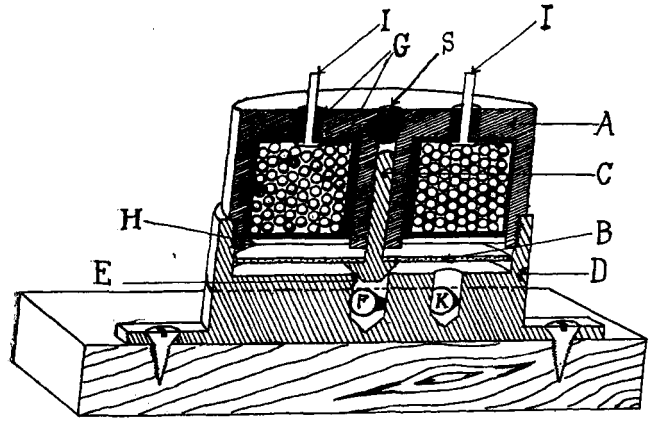
A SIMPLE, DURABLE, ELECTRICALLY OPERATED GAS-VALVE

By ZENO OSTENBERG

Received June, 21, 1915

The valve herewith illustrated was designed and built to regulate the flame of a double-burner gas-stove, which heated a large water bath 24 in. in diameter. Since two of them have been in operation for over a year and a half, with entire success, it was thought that a description and illustration of the mechanism would be useful to others.

The mechanism consists essentially of the "iron-clad" electromagnet *A*, which lifts the iron disc *B* to which is attached the brass valve and stem *C*. The brass valve *C* makes a gas-tight fit with the main brass body *D* at the inlet *E* when no current is passing



through the magnet winding, but when current is sent through the magnet winding, the disc *B* and valve *C* are raised and thus gas is allowed to pass from *E* to *K*, which leads to the burner. *F* is the outlet to a pilot light. The disc *B* is prevented from sticking to the magnet *A* by the plug *S*, which may be screwed down to limit the travel of the valve stem *C*. *G* is insulation which must be able to withstand a rise of temperature up to about 100°, as the magnet sometimes becomes quite hot. The disc *H* is of brass and is soldered gas-tight to the magnet *A* to prevent moisture and gas from attacking the wiring and also to keep the wiring in place. The gas inlet tube (not shown) enters opposite to the pilot opening *F*. When operated from a 110 volt line, the winding consists of No. 26 d. c. c. copper wire with a 16 c. p. carbon lamp in series. This allows slightly less than 0.5 ampere to pass through the winding of the electromagnet. For use with a storage battery No. 30 wire is used.

The electrical circuit is opened and closed by a 75 ohm standard Pony relay, which is operated by a dry battery and thermoregulator. The dry batteries, which were originally put into the thermo-regulator circuits over a year and half ago, are still able to operate the relays as only about 0.02 ampere is used, and this amount of current is so small that no trouble whatever has been experienced from oxidation of the mercury at the contacts in the thermo-regulators.

Obviously the valve may be used on any size of burner, from the smallest micro-bunsen to one which has a gas inlet equal in size to the inlet and outlet of the valve. In the valves in use these holes are 0.25 inch in diameter.

2233 WEBSTER ST., SAN FRANCISCO

PORTABLE TITRATING TABLE[1]

By R. E. OZIAS

Received June 16, 1915

Fig. I shows a convenient portable titrating table which has recently been installed in the United States Appraiser's Laboratory at New York. The burettes are operated by compressed air supplied by a Goodyear air bottle which rests on a shelf attached to the table.

The air is conducted through 1/8 in. and 1/4 in. brass pipe to the main pipe (1 in. diameter), on top of table, on which are seen the air pressure gauge and the individual taps fitted with 1/8 Lunkenheimer brass spring key cocks.

The top of the table is 3 ft. × 6 ft. and is perforated with 8 circular openings, 5 in. in diameter, in which the bottles are placed, resting on a base board securely fastened 5 in. below the top.

The standard solution bottles are of dark glass, 2500 cc. capacity, and as shown are eight in number. Without necessarily increasing the size of the table, a second row of eight bottles could be placed in a similar position and thus give it a capacity of sixteen standard solutions.

No moisture or carbonic absorption apparatus is shown on the train, as the solutions employed did not require their use, but when necessary those accessories

[1] Published with the consent of the Secretary of the Treasury and United States Appraiser, Port of New York.

can be attached readily to any individual connection or placed at or near the outlet from the air supply.

To operate, air is admitted to the main pipe to about 15 lbs. pressure when the valve on the air bottle is

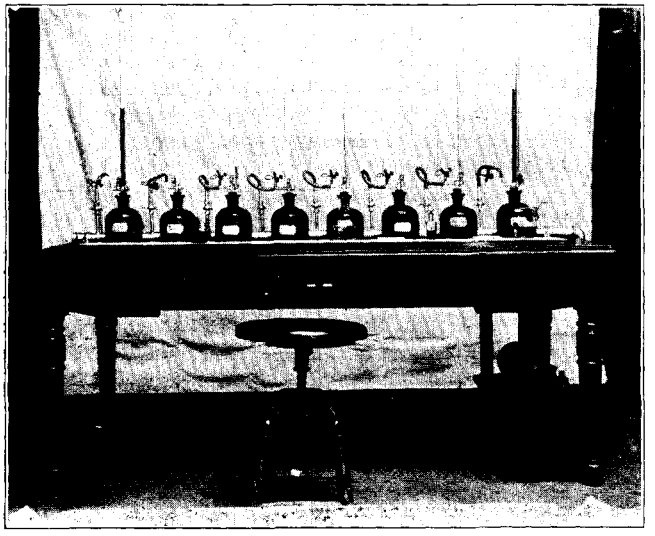


FIG. I

closed, followed by the closing of air valve on the vertical pipe leading from the supply.

To fill any burette, its corresponding air cock is opened cautiously until solution is moving into burette, when it is closed. After the solution has passed

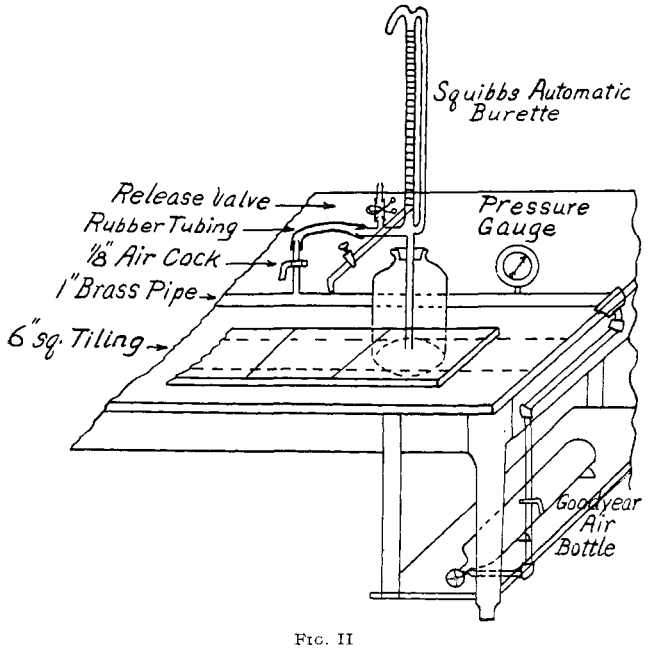


FIG. II

the zero mark, the relief valve attached to the side of burette is opened, when liquid flows back and automatically sets at zero.

The relief valve is made with a small piece of glass tubing with a nozzle end connected with rubber tubing to the air outlet attached to side of burette, using the pinchcock on the rubber tube connection. The glass tube outlet must be a nozzle of comparatively small orifice in order to release air pressure gradually, for if released suddenly there will be upward flow of solution through the relief valve.

The amount of air consumed is very small and as bottles are recharged at a cost of $1.00, the cost of air per annum in operating a table with eight solutions should not be over 50 cents.

White tilings 6 in. square are placed along the front of the bottles and under the spits of the burettes, the distance between tiling and spit of burette being about 7 in.

U. S. CUSTOMS SERVICE, TREASURY DEPARTMENT
641 WASHINGTON ST., NEW YORK

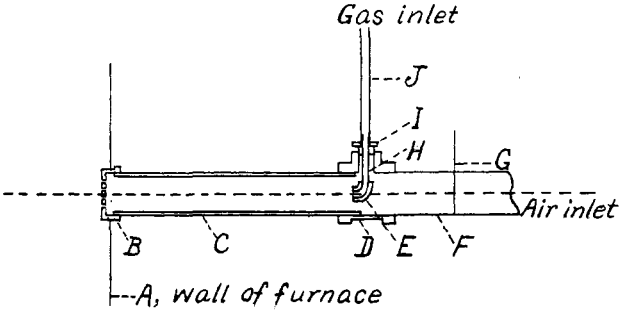
A SIMPLE GAS BURNER FOR SMALL LABORATORY FURNACES

BY D. L. RANDALL

Received June 21, 1915

The burner described below was devised to use natural gas instead of gasoline in heating a small assay furnace of the combined muffle and crucible type. Its merit lies in its simplicity and cheapness, as it can easily be made by any pipe fitter.

A section of the burner is given in the accompanying figure and it is constructed as follows: The part *C* is a piece of 2 in. iron pipe about a foot long. On one end of this is screwed a cap, *B*, and on the other a tee, *D*, 2 × 3 1/4 in. In the end of the cap as many 1/8 in. holes as possible are bored. The air is led into the burner through the large end of the tee. This air



is supplied by a centrifugal blower and is under a pressure of about 1/2 in. of water. Into the side opening of the tee is screwed a bushing, *I*, 3/4 to 1/4 in., and into this is screwed the 1/4 in. pipe that admits the gas. The lower end of this pipe, *J*, is tapped out to receive the 1/8 in. pipe *E* and to the lower end of this is screwed the 1/8 in. elbow *E*. A stopcock not shown in the figure regulates the gas supply while the air supply is regulated by the damper *G*.

The burner so constructed, when properly adjusted, burns very steadily at the openings at the end of the burner. There is no danger of it snapping back and a temperature sufficiently high for all assay purposes is easily obtained. This simple burner will doubtless be useful in heating other forms of apparatus and the writer sees no reason why it could not be used with any form of fuel gas.

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