Summary

1. The adsorptions and velocities of adsorption of hydrogen on manganous oxide and manganous-chromic oxide have been measured in the temperature range −78.5 to 444°.

2. Two forms of hydrogen adsorption have been demonstrated and differentiated, each with characteristic heats of adsorption and activation energies of adsorption on a given surface.

3. The activation energy of adsorption is a function of the composition of the surface and of the physical state of the surface; the velocity of adsorption is small on sintered surfaces and decreases rapidly with increased surface area covered.

4. Activated adsorption of the type here studied is not necessarily a rapid process but may, at certain temperatures, occur at rates so slow as to be immeasurable over periods even of years.

5. Similar observations have been made, qualitatively, with carbon monoxide. This type of investigation can, therefore, probably be generalized for various gases and surfaces.

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NOTES

A Micro Hydrogen Electrode.—The electrode described in this paper was designed to be used where small amounts of liquid were available for the determination. The electrode was made from an ordinary platinum hypodermic needle. The tip was cut off and the needle was threaded for about 5 mm. on the outside. A small shield made of platinum was made to screw on the needle over the tip. A short length of copper wire was soldered to the side of the nub of the needle, leaving enough room at the end to attach a rubber tube for the hydrogen. The entire electrode and cap were insulated by covering with bakelite paint. The electrode was then platinized on the inside. The potassium chloride can be brought into the vessel by means of a capillary or a piece of cotton string soaked in the potassium chloride.

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A Lampbank Rheostat.—A system of lamps in parallel makes a serviceable laboratory rheostat for use with magnetic stirrers, electric furnaces, motors, etc. The figure illustrates an easily and cheaply constructed lampbank that has proved to be very convenient. It avoids the use of the switches, sockets and wiring that the ordinary form of lamp board

requires, occupies less area per lamp and its resistance can be more easily and rapidly altered.

On a narrow baseboard B whose length depends on the number of lamps it is desired to use are fastened two brass or copper "bus bars" A and C. The lower (C) is flat and serves as a contact for the lamp base terminals. The upper (A), which is round, is set out from the board and so forms a rack on which to hang the lamps. To the side terminal of each lamp is soldered a short hook made of narrow copper strip which hooks over C and

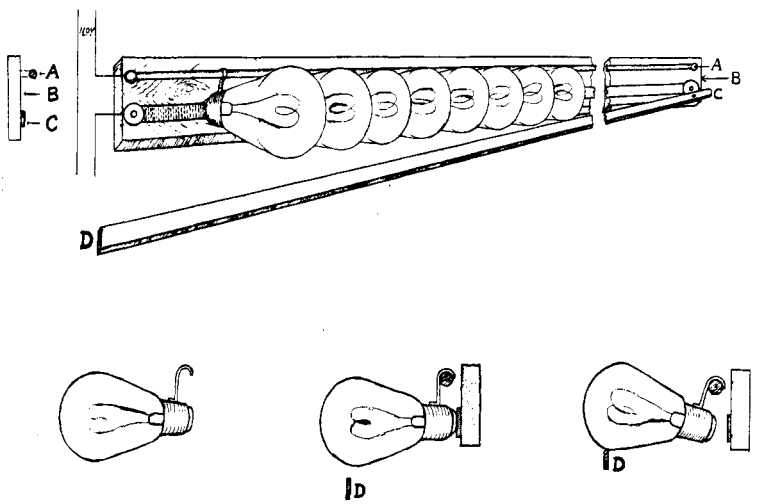

Fig. 1.

so completes the circuit through the lamp. A light strip of wood D is set out about half the length of a lamp from the board and is pivoted at one end, the other being free to move. By raising and lowering the free end of D any required number of lamps may be instantly thrown in or out in a manner made obvious by the diagram. By means of pulleys and a cord attached to D the rheostat may be operated from a distance. The lamps may be adjusted easily to hang freely at right angles to the board by bending the hooks with a pair of pliers. For large resistance steps it has been found convenient to make up spools of nichrome wire equivalent to a given number of lamps that can be hooked over A and thrown in or out with the lamps by raising or lowering D.

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