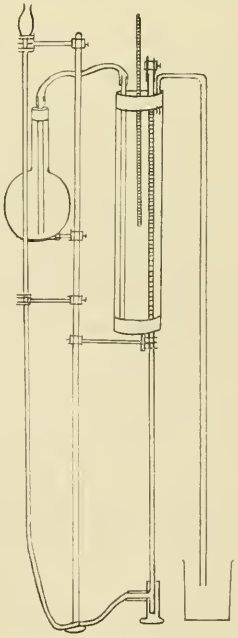
main a matter of chance and the experiment, seemingly so simple, but in reality so complicated, can not well be put into the hands of students doing their first work in chemistry.

Modifications of the experiment which will avoid these sources of error are in the mind of the writer, but have not been subjected to test for lack of time. Should they prove successful I shall be pleased at some future time to communicate them to the Academy.

An Apparatus for Illustrating Charles's and Boyle's Laws.

James H. Ransom.

Some difficulty having been experienced in making clear to students the changes in the volumes of gases due to the simultaneous changes in



temperature and pressure, it seemed that a clearer notion could be given by having a single piece of apparatus to illustrate their laws. Such an

apparatus, a cut of which is presented, was devised to overcome the difficulty. It consists of an ordinary graduated gas burette connected with a reservoir for mercury and surrounded by a water jacket which in turn is connected with a flask containing water. The flask and jacket are so arranged that water of any desired temperature can be siphoned from the former through the latter, thus heating the gas in the burette to any temperature between 0° and 100° C. A thermometer inserted in the jacket indicates the temperature of the water. At the beginning of the experiment the water in the jacket should be at the room temperature, and the flask should hold several times the volume of the jacket. By the method of siphoning the change in tempeature is so gradual that the gas is heated to the water temperature almost as rapidly as the latter passes through, and there is no danger of breaking the burette. With the apparatus each law may be deduced separately with a fair degree of accuracy. Then the two laws united and the results compared with those found mathematically from a combination of the two. The idea of absolute zero is illustrated in a very clear and convincing way. If desirable the burette may be filled with different gases, and thus it may be shown that all obey (practically) the same laws.

Some $\triangle_2$-Keto-R-Hexene Derivatives.

James B. Garner.

A study of the reactions which might be brought about between benzöin and unsaturated aldehydes, ketones, and esters through the agency of cold (15° C.) alcoholic sodium ethylate, was begun several years ago[1]. At that time it was found that benzöin is added to benzalacetone giving rise to a 1.5 diketone which by loss of water and ring formation, is converted into 3-4-5-triphenyl-4-oxy-$\triangle_2$-keto-R-hexene. This substance had previously been prepared by Professor Alexander Smith[2], using potassium cyanide as condensing agent[3]. When sodium ethylate is used as condensing agent, the yield is much greater, the reaction takes place more smoothly and the product formed is purer than when potassium cyanide is used. Knoevenagel has made an exhaustive study of the $\triangle_2$-keto-R-hexene de-

[1] Dissertation, Chicago, 1897, p. 17.
[2] Berichte, *26*, 65.
[3] Amer. Chem. Jour. XXII, 250.