to prevent breakage while the rubber stopper is pressed inward.

Glazed gallon pots with a hole in the side at the base are used. The porous cup unit is placed in the center of the pot with the bent glass tubing leading through the hole at the base. Soil is then placed carefully in the pot to hold the unit in the desired position. Clear plastic tubing is fitted on to the protruding glass tubing.

The pot with the unit assembled as shown in the figure is then placed in water so that the soil is completely flooded. When the soil is saturated, the plastic tubing is connected through a water trap to a vacuum line. Vacuum is applied and water drawn through the system until there are no bubbles of air in the water entering the tubing. A screw clamp is then placed on the plastic tubing to close it and the pot is transferred to a stand. The tubing is placed in a pan of water at a given distance below the bottom of the pot, depending on the tension desired.

A number of cups mounted in the manner described were tested to measure what moisture tensions could be imposed before the column of water broke. With the RA 360 cup the limit was about 0.10 atmosphere, with the RA 98 cup it was about 0.04 atmosphere.

Since there is an inverse relationship between soil moisture content and the rates of oxygen diffusion, the latter were measured in pots containing a Castor silt loam soil at equilibrium moisture. The platinum microelectrode method was used while tensions of 0, 25, 40, 80 and 100 cm. of water were maintained by this technique. Tensiometers were used to check the soil moisture tensions. The rates of oxygen diffusion were found to be 3.9, 7.6, 15.2, 28.9, and 33.3 gm. \( \times 10^{-8} \)/cm.²/min. respectively.

This technique helps avoiding excess soil moisture under greenhouse conditions and will also permit the growing of plants within a reasonably constant range of soil moisture conditions most of the time as long as surface watering is made in excess of plants requirements.—S. J. BOURGET, B. J. FINN, and K. F. NIELSEN, Soil Research Institute, Research Branch, Department of Agriculture, Ottawa, Canada. Contribution No. 3, Soil Research Institute.

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**EQUIPMENT FOR HARVESTING SHORT-GRASS RANGELAND PLOTS**

The measurement of yield on shortgrass rangeland using hand clippers to clip the plots is tedious and time consuming. The equipment described and pictured was used to harvest the blue grama grass and the buffalograss paper sacks by hand, to facilitate separation from dirt that may have been picked up in the process.

When the equipment was used on plots located relatively close together, 3 workers could clip and sack the clipping from 100 29-by-40-inch lots per day.—CLARENCE F. BECKER, Assistant Agricultural Engineer, University of Wyoming. HENRY MAYLAND, Student Assistant, helped in the construction of the equipment.

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**Figure 1**—The electric generator, vacuum cleaner, clipper, and hood.

**Figure 2**—Closeup of clipper, hood, and vacuum cleaner hose.