ble so that one may at any time know that there is ample flow of water through the condensers. These tubes should not, therefore, dip into the trough. The trough (galvanized sheet iron) is about 3.5 cm. wide,

FIG. II—REFLUX CONDENSER FOR USE ON BEAKERS IN CRUDE FIBER DETERMINATION (1/4 Size)

about 13 cm. deep and, of course, extends along the entire length of the "plant."

These condensers prevent completely loss of liquid by evaporation, and suppress, or hold sufficiently in check, frothing. But the boiling must be started gently and conducted gently; violent ebullition is not at all necessary and is to be avoided. Frothing is due to bubbles filled with steam—and doubtless to some extent with hot air; condense the steam and the bubbles or froth collapse. The upper region of the beakers is kept cool

by the condensers; hence there is no need of a cold blast of air—it is the *coldness*, not the *blast*, that checks the frothing. A cold air-

blast could, however, be easily introduced through these condensers. Such a condenser is shown on a beaker in the foreground of Fig. I. Beakers of 500 cc. capacity, 7.5 cm. inside diameter and 14 cm. high, Jena glass, are preferred; but beakers of 600 cc. capacity, 8 cm. diameter, 15.5 cm. high, can be used interchangeably with the smaller ones. The beakers can be given a rotary shaking without lifting them from the heating plate. After the boiling has been gotten under way and the beakers have been rotated a time or two, the apparatus may be left to itself.

The heating plate (wrought iron) is about 4 mm. thick and has a top surface about 9.5 cm. wide. Along its entire length is turned a flange about 2.5 cm. wide. The object of the flange is to give rigidity and prevent sagging or buckling.

LABORATORY OF THE NORTH CAROLINA
DEPARTMENT OF AGRICULTURE, RALEIGH

A FURNACE FOR CRUDE FIBER INCINERATION

By J. M. PICKEL

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If the chemist have at his disposal the requisite electric current and \$50 to \$100, he will be apt to invest in an electric furnace. If he have but a dollar or two, he can, with that capital and with materials ready to hand in the laboratory, construct a wonderfully efficient incinerating furnace. Such a furnace, occupying on the table a space 20 × 20 cm. (8 × 8 in.), is shown in Fig. I in the previous article (page 366), at the left uncovered, at the right as it appears when performing. Twelve crude fiber incinerations are made in 15 to 20 min. on, or in, this furnace

by the heat of one small Bunsen burner; and the ash is as nearly perfect as the writer and designer of the furnace has ever seen.

A piece of asbestos board 0.7 × 19 × 19 cm., in whose center is cut a circular opening 9 cm. in diameter, is laid on an ordinary laboratory tripod. On this board is set a disc of wrought iron (cast iron would probably be better) about 2.5 mm. thick and 13.5 cm. in diameter (14.5 cm. would be better since it would furnish space for several more incinerations). The disc is supported on three legs, 1 cm. long, screwed into it. On the disc are set 12 crucibles, alundum RA 98, 3.8 cm. high and 3.7 cm. in outside diameter, in which the fiber has been filtered, washed, dried and weighed. On the asbestos board is placed an asbestos cylinder 15.5 cm. in diameter and 6.5 cm. deep. The cylinder is covered with a piece of asbestos board of the same dimensions as the one previously described, but having in its center a hole only 3.5 cm. in diameter. A small Bunsen burner, whose gas tip has been widened somewhat by inserting the point of a penknife blade, furnishes the heat. The burner should be set on a block so as to bring its top close to the iron disc, thus causing the flame to spread over the under surface of the disc. In a few minutes (6 or 8) the disc and the crucibles will be brought to a bright glow.

The cylinder is easily and quickly made. Strips of suitable width (about 6.5 cm.) are cut from asbestos board of suitable thickness (about 7 mm.) and their ends beveled by shaving with a sharp knife. These strips are saturated with water, and, while wet, are wound, two or three thicknesses, around a suitable core (an empty 2-kilo ether can or a piece of sheet-iron stovepipe), bound in place by two or three bands of wire and allowed to dry out at room temperature and finally on or near a steam radiator. The core is removed and the lapped ends of the strips riveted.

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A GAS PRESSURE REGULATOR

By J. R. POWELL

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Occasion arose in this laboratory to make use of a gas-heated thermostat, but a great deal of inconvenience was experienced because of varying gas pressure. In casting about for some simple pressure regulator, the apparatus described below and illustrated in Fig. I was finally hit upon as a practical solution of the trouble. It will be noted that the apparatus is constructed from material readily obtainable in almost any laboratory; also that there is no great skill required for its assembly. Practically every chemist has the rudimentary knowledge of glass-blowing necessary to make the one "Y" required.

A and C are rigidly fastened, in the position shown, to a board which acts as a mounting for the whole apparatus. B is suspended inside of A on the end of E by a rubber stopper. E is so arranged that it may