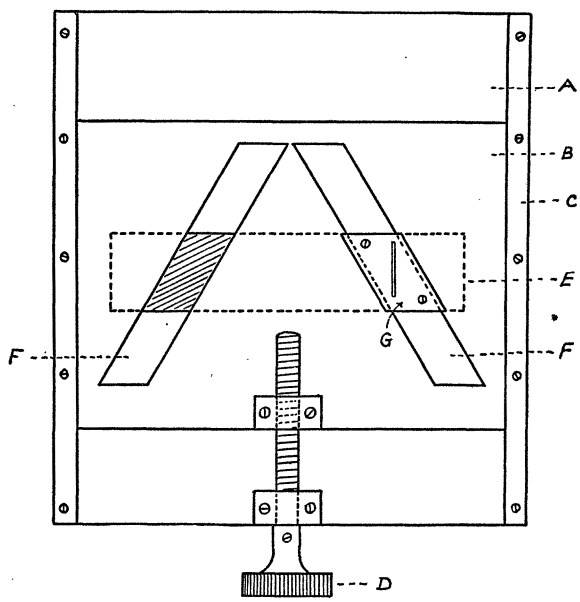
SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN ADJUSTABLE DOUBLE-SLIT

CERTAIN experiments in diffraction and interference require a double-slit in which the distance between two slits may be varied while the slits remain parallel to each other and the space between them is kept closed. It is this last requirement which is, of course, the difficult one to meet.

In preparing a 4-inch telescope to illustrate Michelson's interference method for measuring stellar angular diameters it was found desirable to have an adjustable double-slit which would satisfy the above requirements. The method devised for accomplishing the desired results is quite simple and efficient.

The apparatus consists of two brass plates A and



B which are placed in contact as shown in the figure. Plate B is kept in place by the guides C, and it may be moved over A by means of the screw D.

A rectangular opening E is cut in plate A, and two openings F are cut in plate B. The latter openings make an angle of 60 degrees with each other in the present case. With such openings in A and B it is apparent that two parallelogram shaped holes will extend through both plates. The cross-hatched area at the left side of the figure indicates one of these holes, and the other is at the place marked G. It follows that these holes may be moved close together or far apart by turning the screw D which slides plate B over plate A. It is in these holes that the blocks containing the slits are placed.

G shows one of the slit-blocks in more detail. The slit-blocks consist of three parts. One is a parallelogram shaped piece of brass made just the size of the holes through the two plates. This piece has a thickness equal to that of both plates A and B. To each side of this piece is screwed a thinner brass plate which has the same parallelogram shape but which is slightly larger than the first. The overlapping portions of these plates form flanges which hold the center piece in place. The overlapping of the thin front plate over B is shown in G. A similar overlapping occurs on the back side of A. Apertures of the desired size and shape may be cut in these slit-blocks.

Since the slit-blocks extend through both plates A and B, the wedge action of the openings F in B is able to cause only a lateral motion of the slit-blocks. At the same time the space between the slit is kept closed since the remainder of plate B is solid.

If the plates and blocks are carefully fitted, the slits will remain quite parallel to each other, and no trouble will arise from binding of the parts. In the apparatus described the slits may be moved from 1 inch to 4 inches apart.

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A FUSED QUARTZ FÉRY PRISM

THE following apparatus was constructed to test the possibilities of a fused quartz Féry prism for ultra-violet spectrographic work. A light-tight box was constructed as indicated in Fig. 1, with the quartz

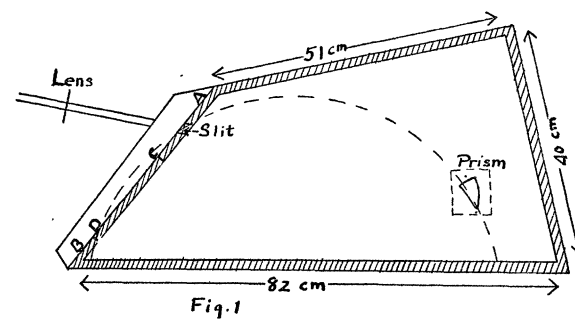

Fig. 1

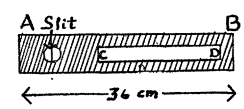

Fig. 2

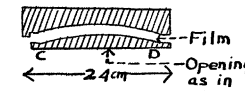

Fig. 3

condensing lens and the quartz prism the only optical parts. The prism, which was cast by the Thermal Syndicate of Brooklyn, N. Y., has a front surface of 28 inches in radius, and makes an angle of 30°