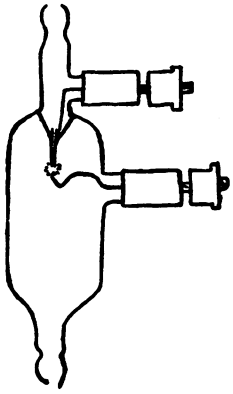
SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN IMPROVED DROP RECORDER

WITH reference to the drop recorder described by S. E. Owen in SCIENCE.[1] It will be noticed that the falling drop has to touch both electrodes in order to function. This causes difficulty in adjustment, especially for fast rates. If, however, the drop is allowed to run down one wire from the dropping tube it is all the time in contact with one electrode and thus it is relatively much easier to adjust the second electrode for contact. A full description of such an instrument was published elsewhere[2] and is also referred to in SCIENCE.[3] They are easily made and when once adjusted and used with a decent relay circuit give no trouble and will record over 1,000 drops per minute. Owing to the difficulty of drawing a dropping tube sufficiently fine, and at the same time not leaving an outside surface on which a larger drop collects, these instruments are difficult to make above 70 drops per cc, so at the request of Professor Babkin, of McGill University, I slightly redesigned the dropping tube for a higher accuracy (100 drops per cc). This was accomplished by using a short piece of platinum needle for the tip of the dropping tube, where it also serves as one electrode. The second electrode is bent up so that the tip touches the lower surface of the forming drop. This causes the film to tear and the drop falls off, at the same moment making contact (see sketch). By using bits



of the same needle instruments of similar accuracy are readily made, thus rendering the adjustable type previously described (2) more or less unnecessary.

For ordinary purposes, however, the original pattern has proved entirely satisfactory over a wide range of experiments in several laboratories. In the course of my travels I so frequently encounter inventors of "new types" of drop recorders none of which so far present any new characteristics, that, while I have no desire to inhibit research in any direction, I feel that much trouble and time would be saved both to the inventors, and also the users, of many of these instruments if reference were made to my paper in which a study of this quite important practical problem was made.

O. S. GIBBS

LONDON, ENGLAND

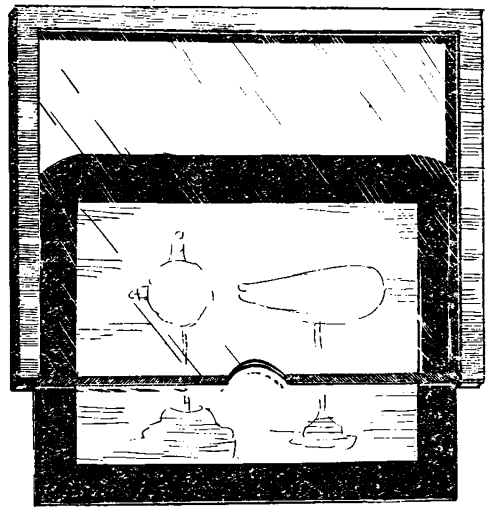
[1] S. E. Owen, SCIENCE: 74, p. 19, July 3, 1931.

[2] O. S. Gibbs, *Jour. of Lab. and Clin. Med.*, 1927, XII, p. 686.

[3] O. S. Gibbs, SCIENCE: 69, p. 649, June 21, 1929.

FILM LANTERN SLIDES

IN order to overcome the difficulties involved in carrying a large number of lantern slides for use in illustrated lectures, we recently made an attempt to replace the commonly used glass slide by a film slide.



Copies of the pictures desired were made on Eastman process film, which lends itself very well to the production of clear slide pictures. A specially constructed holder similar to a glass slide was built to hold these films in the projecting lantern. This holder consists essentially of two clear glass plates which are sealed together in such a manner as to leave a narrow space between them for the reception of the film. Undoubtedly certain refinements can be made in the construction of these holders if they are produced in larger quantities. The outside dimensions of the holder are exactly those of the ordinary lantern slide, so that it fits easily into the standard frame of a lantern. The technique of changing the film slides is the same as that of changing ordinary glass slides, except that the glass holder stays in place when the film slides are changed. A small, semicircular cut in the top of the holder makes this process easy.

The advantages of the film slide over the glass slide are many. By the use of film the weight and bulk of a number of slides are reduced to a minimum; breakage is practically nil, since the only breakable part is the holder which can be safely stored in a small box together with the films; notations may be