

warks, deckhouse sides, and awnings were covered with this grease. When it becomes necessary to refill the reel it is believed that powder can be used instead of grease and this feature will be eliminated.

It will be noted in the manufacturer's notes quoted previously that in running the wire a strain of about 38 pounds, as shown on the dynamometer scale, should be used. All our experience has been in depths of from 10 to 25 fathoms and in those depths we have found that a strain of about 36 pounds is the best. To obtain a greater strain than that requires the brake bands to be set up against the brake wheel so tightly that the wheels soon run too hot.

We found it necessary to install new springs on the brake bands, to allow the bands to be set up sufficiently.

CAUTION. — The wire splices on our original are very poorly made and are liable to jam in the lead rollers when using the gear. If this occurs the wire will part, as happened once on the *Oceanographer*, and the flyer might be bent. Refills should be made with wire spliced according to standard Coast Survey methods or preferably with one continuous length.

CIRCUMFERENCE OF MEASURING WHEEL.

The final and careful measurement gave a circumference of 1.86035 meters, which distance is used on all our work with the gear.

ADDITIONAL USES OF GEAR.

The gear was also used in connection with tests for the velocity of sound through sea water. The station ships were at buoys "George" and "Hypo", about 23 miles apart. The *Oceanographer* steamed along the line between the two buoys, kept course by the direction finder, and bombed at intervals of 1000 revolutions of the measuring wheel. R. A. R. distances from each ship were recorded at each bomb. It is believed this will give excellent information regarding the velocity.

Another use was in connection with the location of buoys for the control of an isolated shoal. One buoy was located by R. A. R., the other buoys necessary for the control were located by taut wire distances and azimuths from it.

EVAPORATED METAL MIRRORS.

(Extract from *Nature* - London, 1st September 1934, page 329).

In a letter published in the *Physical Review* of 15th July 1934, R. C. WILLIAMS has described the advantages of making mirrors by evaporating on to glass first a thin film of chromium and then a layer of aluminium. The film is at first fairly soft, but it is hardened by washing in water or alcohol and may then be rubbed hard with cotton cloth without appreciable change. Even rubbing with steel wool affects the film only slightly. The reflectivity of the films is similar to that of pure aluminium. The aluminium may be dissolved off without affecting the chromium, and the author says he has found a method of removing the chromium layer if required.

MICROMETER HYDROGRAPHIC OR SURVEY SEXTANT

The following is the description of a micrometer hydrographic or survey sextant designed and constructed by Messrs. H. HUGHES & Son, Ltd. (1), contractors to the Hydrographic Department of the British Admiralty.

This Sextant (see Fig.) has been specially designed for survey work to give the greatest possible ease and rapidity of observation. By the adoption of the micrometer

(1) Messrs. H. Hughes & Son, Ltd., 59, Fenchurch Street, London, E. C. 3.