

DIAL GAGE METER BAR

By Milton A. STOWALL,

Mechanical Engineer, Reed Research, Inc., 1048 Potomac St. N.W., Washington 7, D.C.

The standard of length, so fundamental in cartography, is still the meter and its decimal subdivisions. Unfortunately, however, the physical problem of accurately laying off length on maps has lagged far behind the developed mathematical theories. Cartographers, using trammels or a pair of dividers, have had to estimate their millimeter settings to the nearest one/one tenth for the coordinates of the map plots. Mr. L.M. Samuels of the United States Navy Hydrographic Office conceived a meter bar capable of accuracy to two/one thousandths of a millimeter, using a dial gage in combination with a meter bar. The good estimating eye or the experienced feel of the practitioner is now aided by a proven scientific instrument.

Developed basically for maps and charts up to fifty (50) inches, the bar is actually graduated for one hundred and twenty-five centimeters. Its principle may be adapted to any suitable scale or length required for specified operation. The problem of length stability is met by using $1/4" \times 1"$ invar stock, ground for true surface and graduated in centimeters from 0 to 125. A V-cut centerline is engraved on the reading surface longitudinally. The centimeter lines are engraved transversely and individually numbered. Centered between 0 and 1, and extending forward to the graduation, a 0.25 inch wide \times 0.13 inch deep and 1.69 inches long slot is machined in the bar to slip-fit the slide.

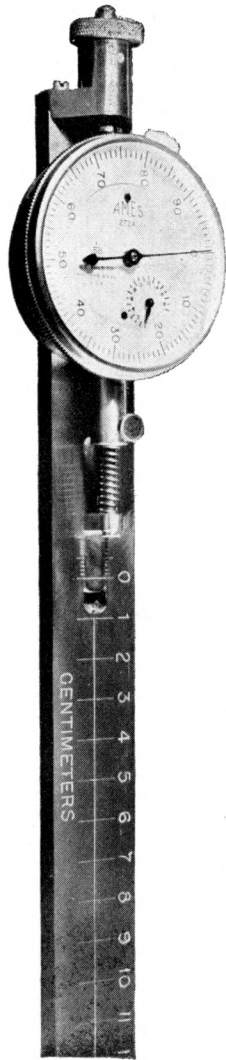
The slide, 0.75 inches long, is rigidly fixed to the rack spindle of the dial gage. The surface of the bar and the slide are in the same horizontal plane to obviate possible error by vertical displacement when setting the trammels or dividers.

The dial gage, manufactured by the B.C. Ames Co. as Model 272M, is graduated into 0.01 mm. and its range is 19 mm. The rack spindle is fixed to the slide in the bar slot. Its other end is coupled by a stud screw to the knurled adjusting nut for setting zero on the dial gage. This assembly of gage, slide, screw, and nut is rigidly attached to the invar bar. The only translatory motion is made by the rack spindle and slide. When the slide is replaced, the gage is simply zeroed for the replacement by resetting of the dial face.

A desirable feature of this design allows replacement of the slide when scuffed or worn by continuous use of the instrument. The slide is the item always used in this type of instrument, so its wear is greatest. The conventional meter bar is completely discarded when its vernier end is scuffed and worn by the pin pricks of the dividers or trammels. In this instrument, the slide alone is replaced very inexpensively while the life of the expensive graduated bar is extended indefinitely.

Errors in setting of trammels or dividers are minimized by the open and easy-to-read face of the dial gage. Setting the desired length by screw motion is an operation familiar to all persons. The resultant lessening of operator fatigue by large, easily read numerals is obvious. Speed in selection of length is realized with this instrument. In all, a more efficient meter bar has been developed for use in cartography and allied fields. Its use should result in a large saving of time in map preparation.





Dial Gage Meter Bar.