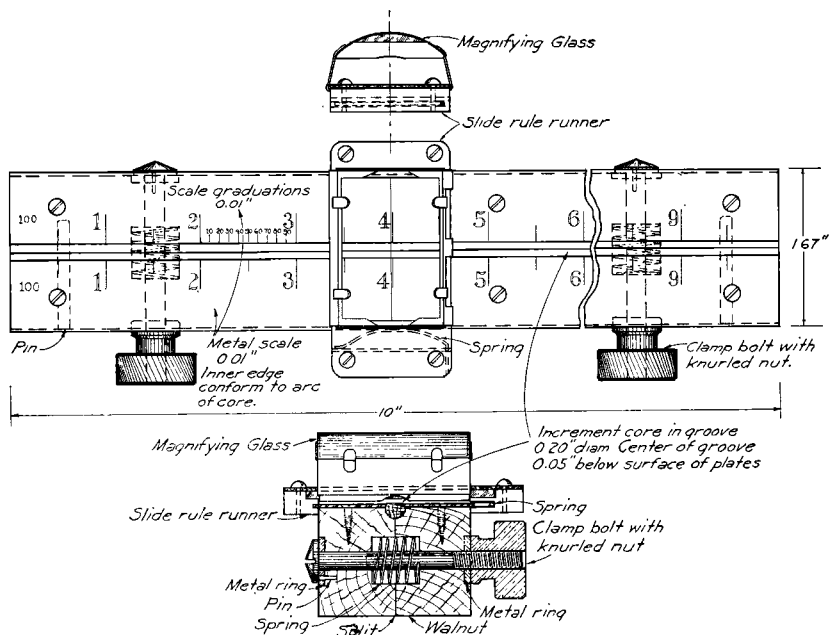


AN INSTRUMENT FOR MEASURING INCREMENT CORES

BY DUNCAN DUNNING,

U. S. Forest Service

A large number of foresters, forest entomologists and others are now making use of the increment borer to investigate the effects of cutting, fire damage and other factors on tree growth, or the relation between tree vigor and insect attacks, besides many other factors. The measurement of increment cores economically with consistent accuracy is usually the most difficult part of such work. A brief description of a simple instrument that has proved helpful in District 5 of the Forest Service may be found interesting.



INSTRUMENT FOR MEASURING INCREMENT CORES

The accompanying drawing is perhaps sufficient to indicate the general features of construction and use. The instrument is essentially a clamp made of two blocks of black walnut 10 inches long grooved along their upper inner edges to accommodate an increment core 0.20 inches in diameter as extracted by the ordinary Swedish

borer made by And. Mattson, Mora, Sweden. The two clamp bolts are of brass 0.25 inch in diameter and two inches long. A pin in the head of each prevents the bolts from turning. A coil spring between the blocks around each clamp bolt spreads the blocks when the knurled clamp nuts are unscrewed. Two brass guide pins near the ends of the blocks make for smooth working of the parts. Two steel scales graduated to hundredths of an inch are screwed to the upper surface of the blocks, the inner edges slightly overhanging the groove and beveled to conform to the cross-sectional arc of the core. The outer edges of the scales overhang the blocks about 0.05 inch to serve as guides for an indicator or runner with a cross hair of the slide rule type. A low power magnifying glass is mounted on the runner. When placed in the groove the surface of the increment core projects slightly above the surface of the scales so that it may be flattened off with a sharp knife, bringing the surface of the core into the same plane as the scale and at the same time rendering the annual rings more distinct. Preliminary to measurement the cores are soaked in water to compensate for shrinkage and make shaving down the surface easier.

With the aid of this instrument cores can be measured with comparative rapidity with a degree of accuracy consistent with field measurements and the ordinary usage to which such data are put. Fatigue and eyestrain are much reduced.

Several improvements have already been suggested by usage. The clamp bolts and nuts should preferably be of steel, since constant use will eventually result in stripping the threads where brass is used. The presence of two graduated scales is due to an error in the design. One of the scales should be replaced by a plain steel plate which would facilitate cutting the cores with a knife and materially reduce the cost of the instrument. It is important to have the cross hair of the indicator as near the surface of the scale and increment core as possible, still permitting free movement of the runner, otherwise accurate reading of the scale is made more difficult. Setting off by a longer mark each fifth hundredth graduation on the scale would be an improvement.

No estimate of cost can be given since the instrument has not been made commercially. The shop work was done by the U. S. Forest Products Laboratory at Madison, Wisconsin, use being made of material already at hand.