Please read and send in as full a discussion as possible at earliest date.

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# HOLDING POWER OF WOOD SCREWS,

BY

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Engineering records, as far as the authors can ascertain, contain only two accounts of experiments having any reference to this subject. In 1874-77 the U. S. military engineers made experiments on drift bolts, and incidentally compared them with wood screws (*Eng. News.*, Feb., 1891), and in 1897 Prof. Martens, of Germany, experimented on the variation of the strength of wood screws in order to find out the most efficient shape of thread and depth of cutting. No effort in either case was made to establish any relation between the strength developed and the size of screw when driven in different sized holes in different woods, both parallel to and across the grain of the wood. This, it is the object of these tests to determine in some small degree.

Screws.—317 tests were made. The screws tested were $\frac{3}{8}''$, $\frac{1}{2}''$, $\frac{5}{8}''$ and $\frac{3}{4}''$, and may be taken as representative types of each size ordinarily used in practice.

Woods.—The woods on which the experiments were made were Red Pine and White Oak, representative respectively of the soft and hard woods. Both were carefully selected, well-seasoned, free from knots and shakes, and of as homogeneous a structure as could be obtained. In order to obtain results that could be legitimately compared, the pieces used were in each case cut out of one large stick and were about $6'' \times 6''$ by 8′ long. They were so dressed that the grain of the wood was parallel and at right angles to the faces.

Boring.—The boring was accomplished by means of a feed drill driven by an electric motor. The holes were bored first on one face