

## Investigations of Structural Materials by the United States Geological Survey

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With the problems arising from the growing scarcity and consequent increase in the price of wood, principally lumber used in building construction, the search for a desirable substitute becomes a matter of prime importance and justifies the work now being done by the United States Geological Survey at its structural materials testing laboratories at St. Louis.

A committee, called the Joint Committee on Concrete and Reinforced Concrete, was invited to assist in outlining the work at the laboratories. This committee is composed of members of the American Society of Civil Engineers, the American Society for Testing Materials, the American Railway, Engineer-

and following as closely as possible practical conditions.

In addition to the study of the constituent materials of mortars and concretes, structures of various kinds similar to those used in buildings are made and tested.

The equipment of the laboratories at St. Louis for carrying on this work is very complete. In addition to all needed smaller apparatus there are four testing machines of 200,000 pounds capacity and one of 100,000 pounds capacity, suitable for testing beams and other structures used in buildings. These machines will test beams up to twenty feet in length and are

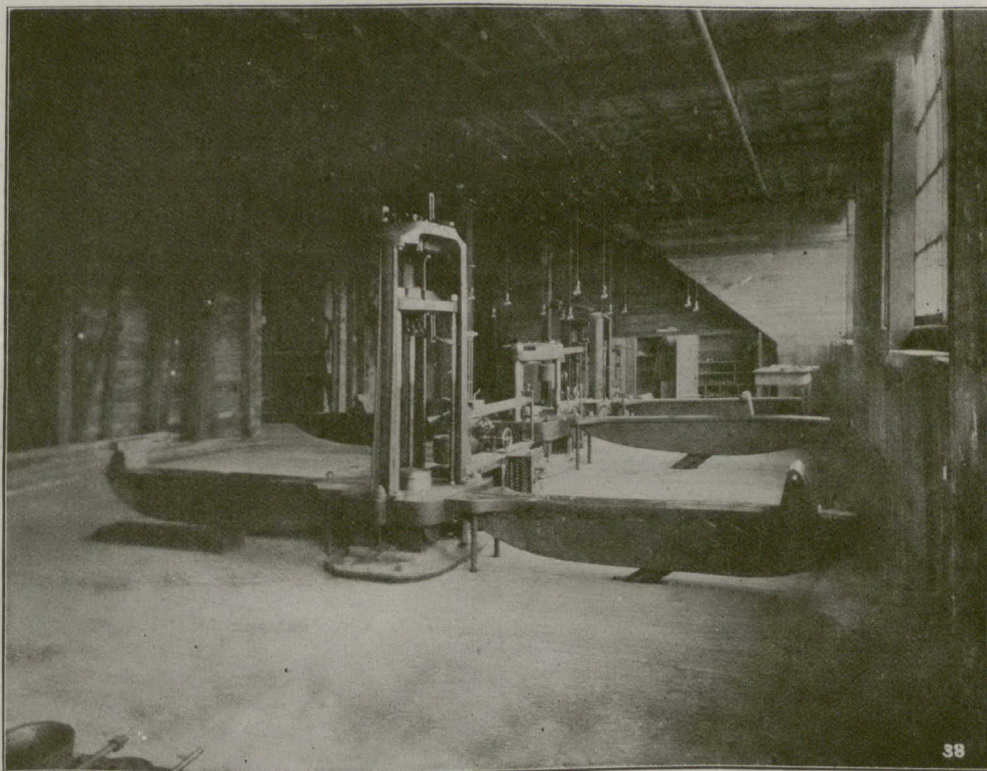


FIG. 1.—THREE CONCRETE-BEAM TESTING MACHINES.

ing and Maintenance of Way Association, and the Association of American Portland Cement Manufacturers. The leading professors of engineering from all of the large colleges in the country are members of this committee, and they exercise general supervision over the work.

An advisory board composed of leading engineers throughout the country was at once created and has had general supervision of the work.

Tests are being carried on to determine the value of different sands, stones, and other materials used in the manufacture of concrete. The material is shipped from all parts of the country by geologists connected with the work and a complete record of the material is sent in by them. At the laboratories this material is made into mortar and concrete by using the different percentages ordinarily employed in practical work

equipped to make tests of the different materials used in construction work. Three of these machines used in the beam division are shown in Fig. 1.

In addition to the above machines a very large machine, having a working capacity of 600,000 pounds, will in a few weeks be installed at the laboratories at St. Louis. As far as known at this time there is only one other machine in the United States similar to this. This machine will make it possible to test columns, beams, and in fact all the different kinds of construction material now used. It will test very large reinforced concrete girders up to spans thirty feet in length and concrete columns up to thirty feet in length.

The value of such tests as these is readily apparent, since their results can be applied directly to practical work. A very serious objection to the use of re-