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A load test for metal joist hangers

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TECHNICAL NOTE

NOT FOR PUBLICATION

FOR INTERNAL USE

PREPARED BY W.F. Williamson and
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CHECKED BY

APPROVED BY **RFL**

PREPARED FOR Record purposes.

DATE February 1958

SUBJECT A Load Test for Metal Joist Hangers

The purpose of the joist hanger loading test is to establish the load-deflection characteristics and maximum load-carrying capacity of metal joist hangers, so that these can be compared with any minimum performance requirements. A test arrangement which has been found satisfactory is to use two hangers on one short joist and to apply the load downward at the centre of the joist by means of a testing machine. The hangers are supported by two short beams held together by four notched 2 by 4's as shown in Fig. 1, which shows the assembly. This method of assembly eliminates much nailing and thus saves time when doing many tests.

Items required, shown in Fig. 2, are as follows:

- (1) Two joist hangers;
- (2) Nails of the required size;
- (3) One joist 24 inches long with width and depth to correspond with the hanger;
- (4) Two beams 16 inches long, 2 inches wide, and of the same depth as the joist;
- (5) Four 2 by 4 frame members, 36 inches long, notched to hold the beams;
- (6) Two dial gauges with attachments for fastening them to the beams.

To allow the frame members to be re-used, $\frac{3}{4}$ inch deep notches should be cut for seating of the beams. These notches should be spaced to give a clear spacing between beams equal to the joist length plus $\frac{1}{2}$ inch. The extra $\frac{1}{2}$ inch is to allow $\frac{1}{4}$ inch clearance at each end of the joist when assembled.

The first step in assembly, as shown in Fig. 3, is to nail the hangers centrally to the beams with the nails driven as near to right angles with the wood as possible. The beams should then be fitted snugly into the notches in the 2- by 4-inch frame supports and the joist fitted in the hangers allowing equal clearance at each end. The dial gauges, one at each end of the joist, should then be securely fastened to the beams with the feeler touching the top of the joist as shown in Fig. 1. The assembly now can be centred in a testing machine as shown in Fig. 4 ready for loading.

For comparison of readings loadings should be applied at a given rate of strain for all tests. The hangers should be loaded up to $1\frac{1}{2}$ times the design live load then the load should be decreased to 0 and the recovery noted. Loads then should be applied at the same rate up to failure.

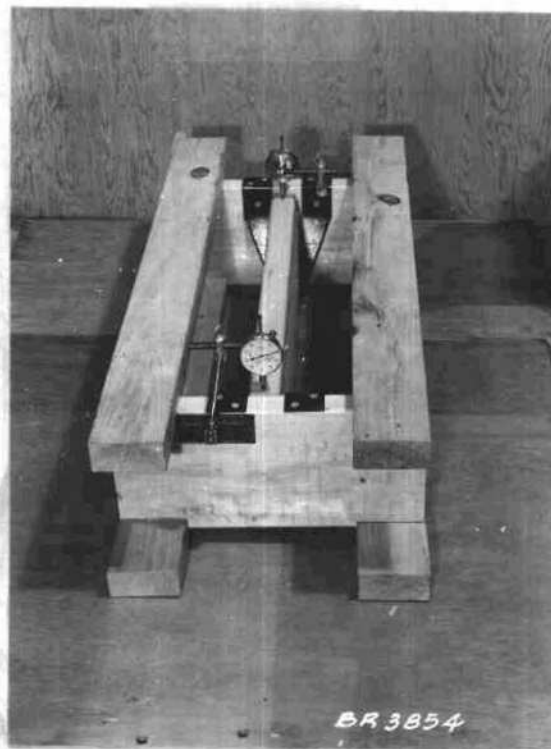


Figure 1. Assembly

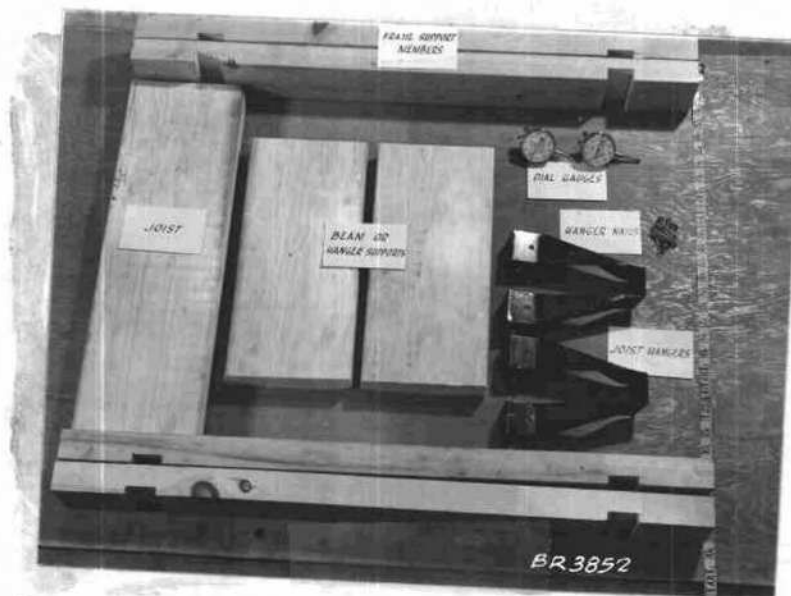


Figure 2. Required parts

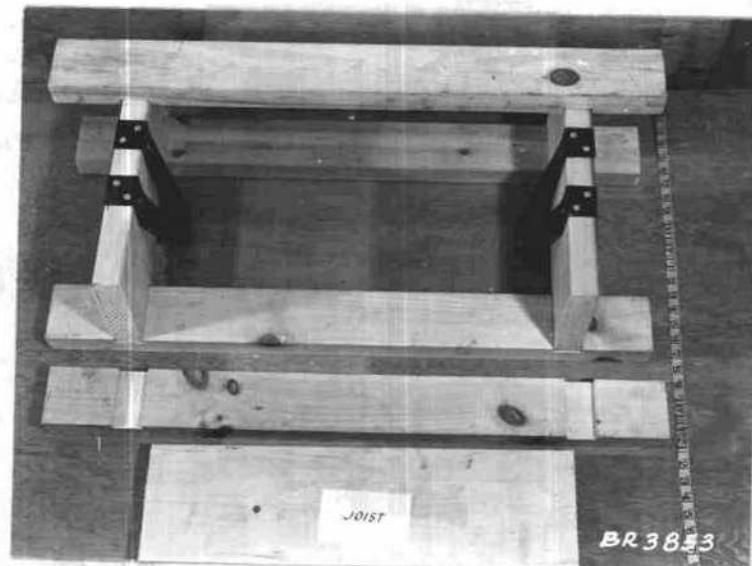


Figure 3. Partial assembly

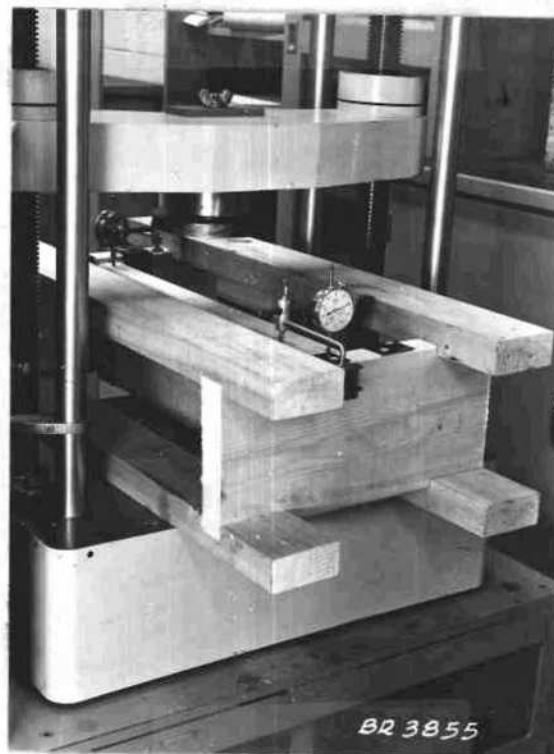


Figure 4. Complete set-up in testing machine