

**BOILER TESTS; EMBRACING THE  
RESULTS OF ONE HUNDRED AND  
THIRTY-SEVEN EVAPORATIVE  
TESTS, MADE ON SEVENTY-ONE  
BOILERS**

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Boiler tests; embracing the results of one hundred and thirty-seven evaporative tests, made on seventy-one boilers by George H. Barrus

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**GEORGE H. BARRUS**

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# BOILER TESTS;

EMBRACING THE RESULTS OF ONE HUNDRED AND  
THIRTY-SEVEN EVAPORATIVE TESTS, MADE  
ON SEVENTY-ONE BOILERS, CON-  
DUCTED BY THE AUTHOR.

BY

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## P R E F A C E.

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This book relates to a large number of evaporative tests, which were conducted personally by the author. The substance of Parts I and II, which form the body of the work, was originally prepared at the request of the New England Cotton Manufacturers' Association, and embodied in a paper, which was read to that Society. A few copies of the paper were reprinted from the Transactions of the Association, and furnished to parties interested in the subject. The supply of these was quickly exhausted. The favor with which the paper was received, not only by members of the Association, but also by those who have been supplied with the reprints, led to its publication in the present form. In the revised work the arrangement and numbering of the various boilers have been changed, and cuts have been introduced to show the general features of the boilers tested. An index has also been added. These changes supply what was lacking in the paper as first prepared, and give to the work that degree of completeness which is desired in a book of reference.

The book is offered to the public in the belief that it is of considerable interest and value to steam engineers, manufacturers, and any persons who are concerned, either directly or indirectly in the burning of coal and the economical generation of steam.

GEO. H. BARRUS.

95 MILK ST., BOSTON,  
*May, 1891.*





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PART I.

# BOILER TESTS.

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## INTRODUCTION.

In the pursuit of his business as a steam engineer the author has had frequent occasion during the past ten years to make evaporative tests of steam boilers. The interests which have led to the work are of a varied character. Inventors or builders of new types of boilers have been desirous of learning what economical features their improvements possess, and they have called for the results of an evaporative test as a means of comparison with the performance of existing boilers; or, knowing themselves the economy of the improved generator, they wished, for purposes of trade, to corroborate their own testimony of its superiority, by the certificate of a disinterested engineer. Managers of factories have sought advice upon the cause of excessive consumption of coal in their steam plants. To solve this problem it is necessary to ascertain the evaporative efficiency of the boilers, so as to separate the process of generating the steam from that of its use after generation. They have also desired information upon the general economy of their boilers, and upon the kind of fuel which it would be most advantageous to burn, when all the questions of current price, evaporative efficiency and incidental advantages and objections are taken into account—questions which can be determined satisfactorily only by means of an evaporative test. They have had occasion, too, before completing a settlement with the contractor for a new plant of boilers, to call for a test, to ascertain whether in capacity or economy, or both, the boilers do their work in the manner stipulated in the contract. They have also sought information, which only an evaporative