

**TRI-NITRO-GLYCERIN:
AS APPLIED IN THE
HOOSAC TUNNEL**

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Tri-Nitro-Glycerin: As Applied in the Hoosac Tunnel by George M. Mowbray

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GEORGE M. MOWBRAY

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West Heading, with Burleigh Drill, from Photograph taken with
Magnesium Lights.

TRI-NITRO-GLYCERIN,

AS APPLIED IN THE

HOOSAC TUNNEL,

And to Submarine Blasting, Torpedoes, Quarrying, etc.; being the Result of Six Years' Observation and Practice, during the Manufacture of upwards of Five Hundred Thousand Pounds of this Explosive; Mica Blasting Powder, Dynamitus; with an account of the various Systems of Blasting by Electricity; Priming Compounds, Exploders, Electrical Machines; etc., etc., etc.

BY

GEORGE M. MOWBRAY,
Operative Chemist.

With Thirteen Illustrations, Tables and Appendix.

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North Adams, Mass.*

To

WALTER SHANLY, M. P.

Indebted to you for the resources which have enabled me to investigate the properties of Nitro-Glycerin, and render its manufacture a commercial success, permit me to dedicate the following pages in token of my appreciation of the indomitable energy, admirable organization, integrity of purpose, and engineering talent which have rescued the Hoosac Tunnel from the mire of politics and rendered it an engineering success; notwithstanding extraordinary impediments of flood, water fissures, strikes, jealousy and indifference on the part of those chiefly interested, that must have been most disheartening to your mind, and challenged a resolution and resources seldom combined with the abilities you have shown in this work. Our relations during the past five years having been without a ripple, render this, my simple duty, an agreeable task.

GEORGE M. MOWBRAY.

PREFACE TO THIRD EDITION.

Since the last edition of this work, the withdrawal of a suit and promised payment of costs by the president of the United States blasting oil company, now defunct, renders superfluous any details of the litigation I have had to sustain, in order to protect the public against an attempt to monopolize Sobrero's discovery of nitro-glycerin. And further, since it is now admitted that this explosive is the most powerful known to man, being in fact "the ideal of portable force," it seemed to me I might properly omit the anecdotes of early difficulties encountered in its introduction to the Hoosac tunnel; the miners' prejudices have now disappeared, and those who obstructed its use have since threatened to strike, if deprived of tri-nitro-glycerin for a month, in order to institute a strict comparative test with powder; men who for thirty years lived through powder smoke, in their mining operations, declaring it unfit for a human being to endure in deep shafts or long tunnel. These omissions have enabled me to re-write the work, to add tabulated results, and give a resume of the old world's experience and experiments with gun cotton, so that, if less interesting to the general reader, the substituted matter is perhaps of more value to the engineer, contractor and projectors of international improvements, which cannot be carried through in any reasonable period without this powerful agent. I am more than ever sensible that my exacting occupation unfits for literary success, to which this book has no pretensions.

GEO. M. MOWBRAY.

North Adams, Mass., June, 1874.

PREFACE TO FIRST EDITION.

A paper read by request at the Albany Institute, was the germ of the following pages; its publication in this form, I considered would furnish engineers, contractors and railroad directors, who occasionally apply to me for particulars as to the use of nitro-glycerin in the Hoosac tunnel, with detailed information impossible to condense in a business letter. Hurriedly composed during the spare hours of a manufacture involving grave responsibility, the writer weighted with the additional task of defeating an attempt to monopolize the use (not the manufacture) of nitro-glycerin throughout the United States, whilst the subject itself, "Explosives, and firing mines by Electricity," constantly demanded experimental research, this work has not the arrangement nor the completeness I could desire; but the author hopes it will create a more favorable regard in the public mind, towards the most powerful blasting agent known, by correcting errors in respect to its properties, and the casualties attending its use; and assist miners and contractors to a more intelligent acquaintance with some of the materials the present advanced state of engineering progress has brought into practical use.

GEO. M. MOWBRAY.

North Adams, Mass., June, 1872.

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