

**THE POWER  
HANDBOOKS:  
ERECTING WORK**

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The Power Handbooks: Erecting Work by Hubert E. Collins

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**HUBERT E. COLLINS**

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THE POWER HANDBOOKS

# ERECTING WORK

COMPILED AND WRITTEN

BY

HUBERT E. COLLINS

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## INTRODUCTION

THIS handbook is designed for the use of the erecting engineer and to enable those in charge of plants to erect their own machinery.

It describes the processes and gives valuable hints in the matter of laying foundations as well as the setting up of machinery and the handling of very heavy parts.

In general, instructions are given which can be applied to almost any shape of machinery or erecting work, large or small.

The bulk of this material has appeared serially in the columns of *Power* and the compiler acknowledges his indebtedness herewith to various contributors for portions of articles which have appeared therein. He is especially indebted to Messrs. H. V. Hunt and C. G. Robbins.

HUBERT E. COLLINS.

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# I

## FOUNDATIONS

AN engine, to be properly set, must be set rigidly. It is necessary to have the foundation of ample size, rightly proportioned, of good material, and skilfully built. The nature of the ground must be carefully considered and provision made, in preparing it for the foundation, to reduce the liability of settling to a minimum.

Concrete foundations for engines have come into general use throughout the country, owing to their cheapness and durability, and some points on the building of these will be of service. Material for the foundations should be the best of its kind. The stone (if stone is used) should be broken clean and dry. The sand should be coarse and gritty.

Wet a small quantity of cement, and mold it in the hands; then put the sample away and see how long it takes it to set. After it has set, see how much pounding will be required to break it up. By these simple means, bearing in mind that good cement should set in twenty-four hours, or less, the quality of the cement can be readily determined.

The length of time it takes a foundation to set before weight may be safely placed on it can be ascertained,

a day or two after placing the foundation, by drilling into the side for a distance of 12 in. or so. Beyond 12 in. the concrete will not be dry for several weeks, but it should be stiff enough to make some show of resistance after the first few days. Unless it does so, weight should not be placed upon it.

In "made" ground it is often advisable to drive piles, and if they are kept submerged in water, or if the ground is continually wet, the piles will not decay. The use of wood should be avoided as much as possible, however, because of its elasticity and its propensity to decay.

If a concrete foundation is to be built in the ground, with the top extending a few inches above the finished floor line, molds will not be needed for the body, but only the top is molded. A simple excavation of sufficient size and depth is all that is necessary, and after the templet and foundation bolts have been located the excavation is filled in. The size of the excavation depends on the dimensions and shape of the foundation plans furnished by the manufacturer. It should be large enough to allow for the foot measurements shown on the plans.

If no foundation plans are furnished, but only a center-line plan of the bolts, some knowledge of the principles of foundation designing is requisite. All well-designed foundations are widest and longest at the bottom, thereby securing large bearing surface, lessening the liability of settlement, and affording greater resistance to strain.

When the ground is soft and moist, the foundation