

engine. The writer caught our esteemed friend on the 6 h.p. engine, just as he was preparing to empty about a quart of oil used for a steam-driven mixer, into the base chamber of the hoist-engine. That little joke would probably have cost the contractor somewhere around \$150, as the time he would have spent getting the mess out of piston-rings, etc., would have meant 20 or 30 men idle.

Give your outfit a show! It represents your good money, and on that money you expect, and are entitled to, a fair return in service. Encourage the operator to use his intelligence, and if at the end of the job his machine shows that it has been well cared for, make the encouragement tangible. Buy machines equipped with some simple system of magneto ignition. There are several excellent magnetos. But if batteries are used, don't waste time and money on the old-fashioned "single cell." Use a good multiple battery, of which there are reliable makes; the extra "first cost" will be more than repaid by longer service. Such batteries are usually enclosed in a metal housing, which protects them from dampness and injury, besides greatly reducing chances of short circuits.

The writer is well aware of the difficulties contractors encounter in obtaining efficient help except at wages out of all proportion to the mental effort involved. The only remedy the writer can suggest is for superintendents or foremen to obtain an elementary knowledge of gas engine operation. As before mentioned, instruction books—usually very explicit and non-technical—accompany every engine, and if the care of such machines be put upon a properly organized basis, there should be no call for a specialist, except in rare circumstances, such as *periodical* overhauling.

CLASSIFICATION OF CONTRACTORS BY STANDARD RATINGS*

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MAKING preparation for things that do not happen, usually implies waste—sometimes waste of energy, sometimes waste of both energy and money. Maintaining an organization to attract business, only a fraction of which is eventually secured, is a necessary process, yet it contains elements of waste. Ordinarily, this waste is not considered serious if it bears a sufficiently low ratio to actual sales. But, as the ratio increases, there must come a time when selling costs will constitute an intolerable burden of overhead expense.

Without carrying this part of the discussion further, it will probably be admitted that, if that part of selling—or business-getting—which consists of barking up empty trees, could be eliminated, or materially reduced, much waste would be avoided.

These considerations hold particularly in the case of construction enterprises. He would be rash who would attempt to guess the amount of fruitless expenditure on the part of contractors in the preparation of estimates and proposals for work—especially public undertakings, that is never awarded them. Their only means of gaining consideration is to go through the formula, knowing all the time that the engineer in charge always may rule out a favorable proposal on the ground that the contractor making it is probably incapable of meeting all the obligations entailed in his offering.

Avoiding Waste Through Classification

Under existing circumstances the right to reject any proposal must, of course, reside with the engineer in charge. Yet waste would be avoided by restricting the competition in advance to contractors who can render satisfactory proof of capability for the type and magnitude of the work to be undertaken. Such capability should be immediately determinable in accordance with a system of marks or ratings

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which a board of engineers and contractors could, without much difficulty, devise.

Given a task of known magnitude, it is a simple matter to compute the amount of liquid capital which a contractor must eventually command in order safely to assume the operation. By the same sign, when the nature of a large work is clearly understood, it is foolish to consider—even in theory—placing it in the hands of a contractor who is unable to supply adequate proof of special experience on his own part and on that of the supervisors in his employ.

The item of "plant"—equipment—is of constantly increasing moment. What kind of plant, and in what quantity, does the projected development require? Does the competing contractor own this equipment? If so, in what condition has he maintained it? If not, how and where does he propose to get it, and what assurance has he that he will not be disappointed?

Insuring Existence of Essentials

Eliminate any one of the factors, capital, experience, equipment, and the multiple—satisfactory accomplishment—can never be obtained. That is virtually self-evident. The advisability of insuring the existence of the factors before talking of setting them into operation seems equally clear. If the suggested system of marks, or ratings, were in active existence, the engineer in charge of work on which proposals were to be invited would announce at the outset the limits of ratings within which the proposals of competing firms or individuals would receive consideration.

Such a definition of terms would rid the competition of the purely speculative and irresponsible bidder, as well as of the honest but over-optimistic seeker after business. In so doing it would relieve the engineer of the grave responsibility of rejecting certain bids solely on the basis of his judgment, or of general report. It would have the further advantage of bringing the bidding contractors to a clearly understood common denomination of ability and intention that would make comparisons of their proposals a simple one. In a larger proportion of cases than under existing methods, the award would go to the one making the most attractive offer.

If we ever reach the point of specifying the qualifications of contractors instead of stopping at the specifications of materials and processes, we may, perhaps, hope to see adopted the device of making payments to contractors to cover the cost—often extremely heavy—of preparing their estimates. It is a cost that must be met by some one,—in the first instance the contractor. But he, in due course, dilutes it through the profits of the jobs that he obtains, thereby making them pay toll to the jobs that he loses.

Guaranteeing Skill, Integrity, Responsibility

Here, then, is waste, much of which is avoidable by the comparatively easy and completely honest process of rating contractors according to proved qualifications. Nothing invidious is implied in this process, nor is there anything in it to prevent the contractor from securing added recognition as it is due. It would, indeed, stimulate effort by recording growth through various stages, each carrying its virtual guarantee of capability. Hence, in accomplishing an economic good, it would, in addition, achieve the ethical good of raising the whole tone of the contracting business from that of a too often uncertain trade to that of an honorable profession.

A committee of the U.S. Engineering Council appeared recently before the House Committee on Appropriations at Washington, D.C., in support of the appropriation of \$250,000 asked by the U.S. Secretary of the Interior for investigating the possibilities of the Boston-Washington super-power project. The work would be undertaken by the U.S. Geological Survey, and would cover water, steam, electric and oil power production and distribution, in relation to the industries within the territory surveyed. On May 11th, the House passed the Sundry Civil Bill carrying an item of \$125,000 for this purpose.