

The Duplex machine has not been thoroughly tested, but while using about the same current in operation, undoubtedly averages somewhat more, due to its constant running motors.

THE VALUE OF EXPERT INVESTIGATION.

Reference has frequently been made to the good work accomplished in the exposure of graft by the original Boston Finance Commission, which recently completed its labors. Hon. Nathan Matthews, chairman of that Commission, has, however, pointed out that this part of the work was incidental only to the real work of the Commission, namely, the investigation of the conditions, facts, costs and methods which have made the city government of Boston the most expensive in the world and one of the least efficient. The service rendered by this Commission is indicated not so much by public hearings and disclosures of graft as by the two hundred odd reports submitted by the Commission and its engineers to the city government. Whatever may be the permanent value of this work, it at least differs from that of other municipal investigations in being a detailed study and criticism of actual methods, conditions and facts.

The Commission in the beginning recognized the necessity and great value of expert investigation, upon which its general conclusions might be based. They were fortunate in securing the services as consulting engineers, of the firm of Metcalf & Eddy, of Boston, whose fifty-nine reports in the form of a volume of over 1,200 pages have just been published. Especial value is given to these reports by the standing of the firm by which they were made.

It is manifestly impossible to present in a few words the results presented in such a stupendous piece of work, but a few examples cannot fail to be of interest. The magnitude of municipal waste is manifest in the estimate of the experts that in 1908 the losses resulting from the carrying of unnecessary employees, the performance of work which should have been done by contract instead of day labor, the inefficiency of labor and improvident contracts were not less than \$1,900,000 in five departments alone, the street cleaning and watering, sanitary, sewer, water and paving departments.

The sewer department spent \$1,384,347 in 1906-7 and \$1,240,709 in 1907-8. There was an utter lack of discipline over the employees, favoritism in the award of contracts prevailed, excessive prices were paid for contract work, and there was a further loss in the failure properly to inspect the work. Some employees had enough influence to procure reinstatement after discharge; others got transfers from strict foremen to lenient ones, and others procured positions which required no mental or physical effort.

The financial result of the construction work of the sewer department, as admitted by the superintendent, his chief engineer and his deputy, was a loss to the city of from 25 per cent. to 150 per cent. of the proper cost of the work.

For many years stone had been crushed by the department at an excessive cost. Between 1897 and 1906 the average cost of stone to the city at the crusher plants operated by the city was \$1.60 per ton. In 1906 it was \$2.85, and in 1907 it was \$3.24 per ton. The fair market price, f.o.b. cars in Boston, did not exceed \$1.10 per ton. Although the mayor had been advised by the executive engineer of the department to discontinue this work, he refused to do so, and the aggregate loss to the city in these two years from this cause was about \$179,000.

The cost of laying pipe in the water department was found to have been from 50 to 150 per cent. in excess of the cost of similar work in neighboring cities. The cost of hydrant maintenance in winter was twice what it was in Brookline, and nearly twice as great as in Chelsea or Worcester.

It was shown that on a basis of \$2,500,000 spent nominally for sewer or waterworks construction \$1,750,000 is the fair cost of the work, and \$500,000 in addition is spent for superfluous labor and \$250,000 more in excess prices for contracts and purchases, entered into without competition with favored individuals. It is easy to see that all sections and classes of the community, laborers as well as property owners, are defrauded out of \$750,000, or 30 per cent of the entire outlay.

HOW BOSTON WASTED A MILLION DOLLARS.*

"It having been shown by the expert investigation of an independent engineer that the city stone-crushing plants had been operated at an annual loss of about \$100,000, the Commission recommended their abandonment.

"But the subject was reopened by the mayor in a letter to the Commission, stating that 'at the behest of certain city employees, who professed their confidence at their ability to turn the present tide of extravagance in the operation of stone-crushers, I gave them a promise that for a limited time I should allow them the use of one crusher for experimental purposes . . . I shall appreciate the favor if you will have Messrs. Metcalf & Eddy detail an employee for special supervision of the work on the ledge, in order not only that we may both have information first hand, but also that there will be no question as to its reliability.'"

This request was immediately complied with. The best men in the department were selected to run a three months' test on the most economical plant owned by the city. Nearly nine thousand tons were crushed at a total cost, including interest and depreciation of slightly over \$9,000, the unit cost being substantially \$1 per ton. Independent records kept by Metcalf & Eddy and by the superintendent of the plant showed a nominal difference of only 2 per cent. in the cost.

Under efficient management the output of the crusher should have been 240 tons per day. The actual average during the three months' test was only half that amount, and this in the face of the fact that the men were the best that could be found in the department. Although the perpetuation of the crusher plant hung in the balance and the work was under constant supervision, even these incentives lacked the power to offset personal inefficiency, lax discipline, short hours, high wages, half holidays and absence with pay.

The original conclusions of the Commission were emphatically confirmed, and the folly of undertaking to crush stone by day labor employed by the department was clearly demonstrated by the fact that the cost per ton was nearly double that for which it could have been produced by a contractor under similar conditions. Thus the knell was rung for a policy that in a dozen years had entailed a loss of a round million dollars."

* From an article by Walter B. Snow in the "American City."