COMSTOCK'S TECHNICAL SERIES: LIGHT, HEAT AND POWER IN BUILDINGS

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ALTON D. ADAMS

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LIGHT, HEAT AND POWER IN BUILDINGS

BY

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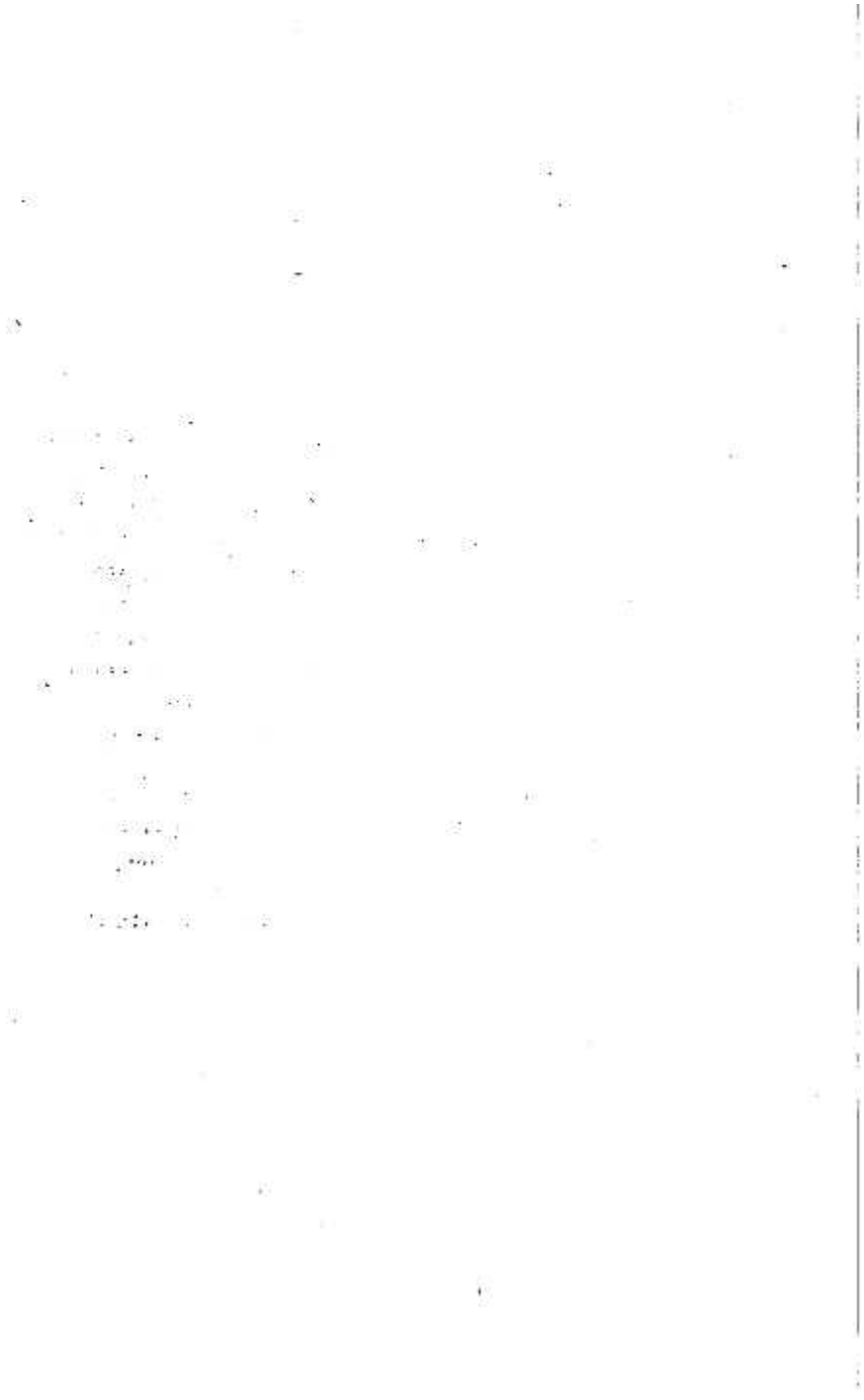
PREFACE.

In this volume the object is to present in compact form the main facts on which selection of the sources for light, heat and power in buildings should be based. The problem for which a solution is sought is to determine the kind of equipment that will yield the service required in any case at the least total cost. Such a purpose leaves little room for discussions of theory relating to any particular class of apparatus, which has already been done in separate and larger volumes. It follows that the only novelty to be expected here is that of arrangement, by which the costs of service from widely different sources are set down side by side.

Should this arrangement prove convenient for those charged with the selection of apparatus for light, heat and power, the labor spent on the following pages will have accomplished its purpose.

ALTON D. ADAMS.



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Light, Heat and Power in Buildings.

CHAPTER I.

COSTS OF HEAT, LIGHT AND POWER FROM PUBLIC GAS AND ELECTRICAL SUPPLY AND FROM COAL.

An open gas flame of sixteen candle power consumes five cubic feet of average gas per hour. At one dollar per 1,000 cubic feet, the cost of this gas flame is $100 \times .005 = 0.5$ cent hourly. Ten cents per kilowatt-hour is a moderate rate for electrical energy. Fifty-six watts is a fair rate of energy consumption for an incandescent lamp of sixteen candle power. Such a lamp requires an hourly expense of $10 \times .056 = 0.56$ cent at the rate for energy just named. Simple, non-condensing engines, with good boilers, will readily yield each horse-power hour of work with a consumption of four pounds of fairly good coal. If this coal costs three dollars per ton of 2,000 pounds, the expense for fuel per horse-power hour amounts to $300 \times 0.002 = 0.6$ cent. This brake horse-power, when delivered on the shaft of a dynamo which has an efficiency of 90 per cent., produces an output of $746 \times .90 = 671.4$ watts. At 56 watts each, the number of sixteen candle power lamps that may be supplied from this output is $671.4 \div 56 = 12$. As the fuel cost of the horse-power hour is 0.6 cent, the charge against each sixteen candle power lamp is $0.6 \div 12 = 0.05$ cent hourly.

Gas from public supplies usually contains 20 to 40 per cent. of the heating power of coal, from which it is derived, according to its variety. It seems at once evident from this fact that gas is ill-suited for general warming