

## DYNAMO ROOM ECONOMY.

BY C. C. HASKINS.

The engineer in charge of the motive power of a large manufacturing establishment holds to a great extent the fortune of his employers in his hand. It lies with him to aid in adding accumulations to the capital invested, or he may disregard the interests of the investors and permit waste and destruction. There are two classes of engineers, and there are two classes of dynamo men, and, while men of the one class are only particularly interested in "quitting time" and pay-day, the second is ever on the alert to accomplish all that can be accomplished in the right direction for the good of all concerned.

The word economy is to the latter employe a word of rich import, of great value, and in the constant practice of that virtue the most successful manufacturers have found the road to wealth and prosperity.

It is not so much what is received or earned, as what is saved of those earnings, which counts in the long run. And it is not alone the larger expenditures which serve to dissipate and fritter away the receipts of any industry. There are numerous smaller expenses which, like the mice in the fable, gnaw many minute holes in the bin, and cause large leaks in the aggregate.

The first and chief factor of importance in the economy of a plant, as all will agree, is the fuel, where the plant is run by steam-power. Assuming that the boilers are of the best, the furnace of the most efficient, the stack a proper one for the purpose, the engineer and dynamo man are both upon trial, from the delivery of the first shovel full of coal under the grate. If the plant is to be run on proper principles of economy not a fire should be built, not a day's run made, without a perfect record being kept of the weight of every shovel of coal and every ounce of refuse left from the burning.

The chemist tells us that we cannot maintain a blazing heat without oxygen, and that this oxygen must come from the air we breathe—that the coal must have sufficient air draft to accomplish perfect combustion of the carbon. The engineer's lieutenant is largely responsible for a very considerable amount of newspaper criticism just now, on account of the waste which darkens the heavens, and gives our atmosphere a decidedly English appearance. The average fireman is not unlike the rest of mankind. He likes to work as little as possible, so he fills the great spaces beneath the boiler to repletion, opens out the draft and goes up to the sidewalk grating, or underneath the coal hole, to rest in the cool breeze and watch the long black cloud which is streaming away toward the horizon from the flag-staff stack of the plant, whence flies the dusky banner.

Think of the waste which is thus set afloat in the air we breathe, to the detriment of health, comfort and laundry, when less fuel at a time, with often repeated charges, would lessen this waste at least 60 to 80 per cent.

But the waste in unconsumed smoke, or, to speak more critically, the permission of this imperfect combustion, has not accomplished all its evil by floating away up and out of the stack. The proportion of ashes and refuse is greater with this method of firing. Then, too, the applied heat is fitful. It rises until there is more steam generated than is needed, and the safety valve comes to the rescue—the doors are thrown open, and huge volumes of heat follow the track of the smoke which a short time before streamed out across the sky like a giant's mourning plume.

There is nothing which conduces to proper economy in an individual equal to an account book. We are all alike in that regard. The engineer and the dynamo man, whether these are represented by one or two persons, are no different from the rest of mankind, and the coal merchant is not widely unlike the rest of us. The economy of weighing the coal will tell two very important and entirely different stories. The per cent of refuse from beneath the grate, when taken from the original weight, will tell the percentage of combustible material in your fuel, and the weighing of the coal will give you a very good idea of how many pounds there are in a ton, down at somebody's coal yard. Mistakes will happen in all well regulated families.

By way of sample, in this connection, let this fact be stated: A fairly large plant with which the writer is acquainted, according to its engineer, uses about 1,900 pounds of coal per diem. Of this 15 per cent in round numbers is waste. Four and one-half pounds of coal per horse-power per hour are used. Is there not a laudable and profitable economy there?

There may be a very considerable saving in the matter of lubricators. There is economy in pans and strainers and apparatus for keeping the oil where it belongs, using it for legitimate purposes, rather than to allow a large percentage for the saturation of a pile of sawdust, or the floor around the engine or the dynamo.

And there is more than the immediate saving of dollars and cents in the practice of keeping the oil in its proper channel. Fire records show that more than one instance of fire in dynamo and engine rooms has arisen from the careless disposition of oil, or oiled rags, and consequent spontaneous combustion.

Insurance companies are suspicious of electric light plants and electric wires, and are inclined to base high rates of premiums on their fears. It is good economy to show by results that the underwriters are mistaken.

There is a plant whose engineer writes me that he has this "oil question worked down. I am running 14 dynamos. My engine, dynamos, shafting, etc., use an average of one barrel of oil in thirty days. I have no use for oil peddlers."

Dynamo men and electric light men generally, are gradually coming to appreciate the necessity of economy in current. If it is wrong to waste the crude material—the coal—how much worse is it to throw away the manufactured article?

I have seen a plant which, for want of a very little knowledge on the part of its owners, had depreciated from a 60-light plant to one of hardly half that capacity, and which required a couple of good workmen over a week to put in good working trim again. The dynamo was in poor condition, the commutator sections were badly roughed up, the lamps worked imperfectly, while the lights danced like fire-flies. Carbon dust had accumulated in the bottoms of the lamps, and this interfered with the feeding apparatus. There were numberless joints in the line, the resistance of any one of which was far more than that of any lamp, so that, while the poor machine did its very best in sending out current, the waste in forcing its way over the line was over one-half the output of the machine, and the furnace was a bottomless abyss of expense.

The electric generator is an expensive and in some respects rather delicate machine. It requires but a little neglect or carelessness to ruin a dynamo or a motor. There is a certain amount of wear to it, and there is a dire necessity for keeping it perfectly clean and free from copper dust and dripping