

a city would be very questionable, owing to the risk of the mixing being improperly done, and the quantity of acetylene falling to such a percentage as to form an explosive combination. Any person using the gas in their houses would require a duplicate holder, so that one might be charging while the second was running. As the gas in holders would be at a pressure of over 600 lbs. to the square inch, a valve would be required to reduce it down to that required at the burners. No doubt such a valve is obtainable but would require attention which the average householder would not or could not give. A failure of the valve would entail the escape of the gas. It would appear that considerations of cost and convenience go to show that, at the present at least, the incandescent lamp has nothing to fear from acetylene gas, which may find its way into the residence of an occasional wealthy householder, but not into general use.

Antiquated vs Modern Apparatus.

WE would bespeak a most careful study of the very valuable paper presented by Mr. Gossler before the last meeting of the Canadian Electrical Association. A very large number of our readers are personally and financially interested in electric lighting stations; and as a great proportion of these stations date from the time when electrical machinery had not received the careful study that is now devoted to it, it is only reasonable to suppose that the apparatus used is of the very inefficient types that characterized the early days of electric lighting. Transformers have only of very late years received much consideration, but the study of the conditions under which they operate, and the principles involved, has led to very great and beneficial changes being made in their construction. The saving effected by the changes indicated by Mr. Gossler, resulted from the substitution of modern high-class transformers for the old type ones previously in use; and nothing can more vividly illustrate the difference in value between old type cheap goods and new type expensive ones than the fact, as stated by him, that the annual savings effected by the new transformers will pay for their cost in about $2\frac{1}{2}$ years. In smaller electric lighting plants nothing is more usual than to make selection of machinery and apparatus on the basis of cost solely, i. e., they choose that one that costs the least money. This is really the most expensive policy to adopt, and as the knowledge of electrical investors extends, with respect to the machinery they operate, and what goes on while current is flowing, it will become more and more evident to them that to buy modern, superior, and therefore high-priced machinery, gives a far better investment than cheap stuff. One frequently meets men whose knowledge of electricity is so comprehensive that they know it all. These persons will of course never learn anything, but the earnest electrical student every day becomes more convinced of the fact that the more he studies, the less he finds he knows. The influence that transformers can exert on the profits of an electric plant is so appreciable that we recommend all owners to very carefully examine into the efficiency of that part of their installations.

A writer in *Electricity* of London, with fluent inaccuracy, says the *Western Electrician*, notes that the new president of the "National Electrical Association" is "Mr. Frederick, who is an Englishman. Doubtless the intention was to convey the idea that Frederic Nicholls, lately elected to the presidency of the National Electric Light Association, was born in England.

NOTES FOR ENGINEERS.

To pack piston pumps for kerosene, cup leather, such as is used in packing hydraulic pumps will be necessary.

Have a regular system for doing your work in the engine and boiler rooms and have a time and place for everything.

Long grate bars make hard work for the fireman, and he cannot always keep the back grate of the furnace in good order. A short wide furnace is the best.

When using the ordinary brass check valves, it is a good idea to use one size larger than the pipe calls for, as the water will then flow through them with less friction.

After taking a ground joint apart clean it well, and before putting it together again, oil it thoroughly and if it is to be exposed to heat use cylinder oil for this purpose.

When piping up a plant, use angle valves wherever convenient, as you will then have less joints to make up, and angle valves offer less obstruction to the passage of steam than globe valves.

For removing scale from boilers, or rust from any metal, use kerosene oil. To loosen a nut which is rusted to a bolt, saturate with kerosene. It is simple, but by all odds the most effective rust or scale solvent.

There are two methods of obtaining the heat value of coal; one by burning a representative sample in some kind of oxygen calorimeter, and the other is to analyse the coal and equate the elements with their heat values. The oxygen calorimeter is generally preferred, but some engineers prefer the analysis.

One pound of good coal is equal to about four-tenths of a pound of wood without regard to the quality of the latter. Some woods contain more water and sap than others, some are dense while others are porous, but considering the pure wood fibre, all woods are practically the same so far as their value for fuel is concerned.

If you are using a power pump for feeding your boiler and there is no way to regulate the amount of water delivered, connect a $\frac{3}{8}$ inch pipe into the discharge pipe and also into the suction pipe, with a valve to regulate the circulating water. By opening this valve the amount of water delivered to the boiler may be diminished, and so a uniform water level maintained.

If the safety valve leaks and grinding it in affords only temporary relief it may be caused by impurities in the water causing a thin scale to form on the valve and seat, and after the valve has been opened once it leaks until ground in again. I have known soda ash, used as a boiler cleanser, to do this, but when its use was discontinued and oil used instead, the trouble disappeared.

On taking charge of a steam plant the engineer should at once acquaint himself with the peculiarities of the engine, and next should acquaint himself with the peculiarities of the proprietor or superintendent. One is just as essential as the other, for each will need an equal amount of "managing" if the engineer is to make an unqualified success of running the plant. Some good engineers make a mistake here and fail accordingly.

If your injector has been in use for several years and is not as reliable now as it was when new, do not throw it away, calling it worn out, until you have carefully cleaned it with a solution of muriatic acid and water. Disconnect the injector, put corks in the outlets, and fill it up with the solution, letting it stand over night. Wash out in the morning with water under pressure, and see if it is not as good as new. The solution should not be stronger than about two parts of water to one of the acid.

In case of accident in your boiler room, where prompt reduction of the temperature under the boiler is necessary, too great care cannot be exercised by your fireman. As a rule he will proceed at once to "draw the fire," but if the boiler is in a critical state, such an act is certainly not wise. When a fire is disturbed, the heat which it gives out is materially increased for several minutes, and unless the entire body of the fire can be removed at one stroke, the safest plan is to smother with damp ashes or fresh coal.

Many a leaky piston or valve rod which is chronically so, could be cured by turning the piston so that the worn place at the bottom would come at the top, or by putting a liner at the bottom to carry the piston at a higher level. Sometimes the bottom part of a piston has been drilled, and the holes filled with hard Rabbitt to raise the piston up into line. Spring rings of cast iron or brass cannot be depended on to centre a piston or keep it in line, because of the wear. Rabbitt plugs will serve such a purpose, and they can be renewed when occasion requires. This is an easier and cheaper way than having a new piston made