



THE CARE OF STEAM BOILERS.

The following is from a sheet of instructions to boiler attendants recently issued by the Manchester Steam Users' Association.

GETTING UP STEAM.—Warm the boiler gradually. Do not get up steam from cold water in less than six hours. If possible, light the fires overnight. Nothing turns a new boiler into an old one sooner than getting up steam too quickly. It hogs the furnace tubes, leads to grooving, strains the end plates, and sometimes rips the ring seams of rivets at the bottom of the shell.

FIRING.—Fire regularly.—After firing open the ventilating grid in the door for a minute or so. Keep the bars covered right up to the bridge. Keep as thick a fire as the quality of the coal will allow. Do not rouse the fires with a rake. Should the coal cake together, run a slicer in on top of the bars and gently break up the burning mass. It has been found by repeated trials that under ordinarily fair conditions no smoke need be made with careful hand firing.

CLEANING FIRES AND SLACKING ASHES.—Clean the fires as often as the clinker renders it necessary. Do not slack the clinkers and ashes on the flooring plates in front of the boiler, but draw them directly into an iron barrow and wheel them away.

FEED WATER SUPPLY.—Set the feed valve so as to give a constant supply, and keep the water up to the height indicated by the water level pointer. There is no economy in keeping a great depth of water over the furnace crowns, while the steam space is reduced thereby, and thus the boiler rendered more liable to prime. Nor is there any economy in keeping a very little water over the furnace crowns, while the furnaces are thereby rendered more liable to be laid bare.

GLASS WATER GAUGES AND FLOATS.—Blow through the test tap at the bottom of the gauge hourly, as well as through the tap in the bottom neck, and the tap in the top neck twice daily. These taps should be blown through more frequently when the water is sedimentary, and whenever the movement of the water in the glass is at all sluggish. Should either of the thoroughfares become choked, clean them out with a wire. Work the floats up and down by hand three or four times a day to see that they are quite free. Always test the glass water gauges and the floats thoroughly the first thing in the morning before firing up.

BLOW-OUT TAPS AND SCUM TAPS.—Open the blow-out tap in the morning before the engine is started, and at dinner time when the engine is at rest. Open the scum tap when the engine is running, before breakfast, before dinner, and after dinner. If the water be sedimentary, run down half an inch of water at each blowing. If not sedimentary, merely turn the taps round. See that the water is at the height indicated by the water level pointer at the time of opening the scum tap. Do not neglect blowing out for a single day, even though anti-incrustation compositions are put into the boiler.

SAFETY VALVES.—Lift each safety valve by hand in the morning before setting to work and see that it is free. If there is a low water safety valve, test it occasionally by lowering the water level to see that the valve begins to blow at the right point. When the boiler is laid off, examine the float and level to see that they are free, and that they give the valve the full rise. If safety valves are allowed to go to sleep, they may get set fast.

SHORTNESS OF WATER.—In case the boiler should be found to be short of water, draw the fires if practicable, and draw them quickly, beginning at the front. In some cases it may be more convenient to smother the fires with ashes or with anything else ready to hand. If the fires are not drawn leave the furnace doors open, turn on the feed, lower the dampers, shut down the stop valve if the boiler be one of a series, and relieve the weight on the safety valves so as to blow off the steam. Warn passers-by from the front of the boiler.

USE OF ANTI-INCrustATION COMPOSITIONS.—Do not use any of these without a thorough knowledge of their effects. If used never introduce them in heavy charges at the man hole, or safety valve, but in small daily quantities along with the feed water.

EMPTYING THE BOILER.—Do not empty the boiler under steam pressure, but cool it down with the water in; then open the blow-out tap and let the water pour out. To quicken the cooling the damper may be left open, and the steam blown off through the safety valves. Do not on any account dash cold water on to the hot plates. But in cases of emergency, pour cold water in before the hot water is let out, and mix the two together so as to cool the boiler down gradually and generally, and not suddenly and locally.

CLEANING OUT THE BOILER.—Clean out the boiler at least every two months, and oftener if the water be sedimentary. Remove all the scale and sediment as well as the flue dust and soot. Show the scale and sediment to the manager. Pass through the flues, and see not only that all the soot and flue dust have been removed, but that the plates have been well brushed. Also see whether the flues are damp or dry, and if damp find out the cause. Further, see that the thoroughfares in the glass water gauges and in the blow-out or scum pipes, as well as the thoroughfares and the perforations in the internal feed dispersion pipe and the scum pipes are free. Take the feed pipe and scum troughs out of the boiler if necessary to clean them thoroughly. Take the taps and the feed valves to pieces; examine, clean, and grease them, and if necessary grind them in with a little fine sand. Examine the fusible plugs. Do not put any blocks under the pipes in the hearth pit.

PREPARATION FOR INSPECTION.—Have the boiler cooled and carefully cleaned out as explained above. Show both scale and sediment to the inspector, as well as the old cap of the fusible plug, and tell him of any defects that may have manifested themselves

in working, or of any repairs or alterations that may have been made since the last examination.

FUSIBLE PLUGS.—Keep these free from soot on the fire side, and from incrustation on the water side. Change the fusible metal once every year, at the time for preparing for annual examination.

GENERAL KEEPING OF BOILER. Polish up the brass and other bright work in the fittings. Sweep up the flooring plate frequently. Keep water out of the earth pit below the flooring plates. Keep the floor on the top of the boiler free, and brush it down once or twice a week. Take a pleasure in keeping the boiler and the boiler house clean and bright, and in preventing smoke

THE BRUSH ELECTRIC LIGHT.

The ancient saw about the share of milk obtained by the still sucking seems to be pretty well borne out in the progress of the brush system of electric lighting. A dozen systems, so-called, have made more noise and have attracted more newspaper attention; but while they are for the most part still "promising," the Brush system has been quietly taking possession of the field. How far this is due to the superior business management of the company controlling the Brush patent it is impossible to say; the indications are, however, that the remarkable success of the brush system is mainly due to the practical genius of Mr. Brush in meeting the requirements of outdoor or large room lighting with an efficient generator, and a lamp which is so simple in construction so automatically regular in action, and so easy to keep in order, that practical business men can afford to use it. It is perhaps the least ornamental in appearance of all lamps, but it gives the light required, and calls for comparatively little care. On the score of economy the users of the lamp profess to be well satisfied, and the rapid and largely extended adoption of the system, abroad as well as at home, would seem to justify the favourable judgment which those who have tried the lamp have freely expressed with regard to its practical value.

The latest list of prominent users of the Brush light embraces twenty-five rolling mills, iron and steel works, machine shops, car works, and the like; twenty saw mills, paper mills, oil works, printing houses, and other factories and manufacturing establishments; twenty woollen, cotton, linen, and silk factories, several of them employing over a hundred lights each, a dozen tin-smelting works, etc., more than a dozen wholesale and retail stores, using from six to sixty-four lights; a dozen public parks, docks, summer resorts, and the like, including a mile and a half of river front and docks at Montreal, circuses, colleges, hotels, steamers; and large numbers of city lights in San Francisco, St. Louis, Chicago, Cleveland, Detroit, Grand Rapids, and other cities besides New York and Brooklyn, where a hundred or more lights are already in use. The contracts of the company in San Francisco called for the erection of about

a thousand lamps by the beginning of the current year. Wabash, Indiana, claims the credit of being the first large town to adopt the electric lamp for general illumination, four Brush lights, of 3,000 candle power each, on the court house dome, sufficing for the outdoor needs of the entire town of 10,000 inhabitants.

The company formed in London to introduce the Brush light there have already placed two hundred lights in various parts of the city, and have ordered from Cleveland nearly as many more, contracts having been signed for the lighting of the Houses of Parliament, Charing Cross Station, Ludgate Hill Station, Blackfriars' Bridge, St. Paul's Churchyard, and other conspicuous places. Even the extremely conservative British Admiralty has taken kindly to the Yankee invention, 432 lights have been purchased for the use of the Royal Navy. Mr. Brush is now making a 40-light machine (80,000 candles) designed to throw the entire current into one huge lamp, which has been ordered for the British torpedo service. The carbons for this artificial sun will be as large as a man's arm, and the light, when directed by a projector of corresponding size, will of itself be a formidable weapon of defense. With a proper system of curtains it will be possible to flash upon an approaching enemy a sudden glare of light that will be little less than blinding.

A less imposing but more admirable application to this light, and one that is being rapidly adopted, is in connection with locomotive headlights. The generator is operated by a small engine taking steam from the boiler and placed opposite the air compressors of the Westinghouse breaks. By attaching the reflector to the forward truck the light may be thrown so as to illuminate the track ahead even when rounding curves. It is obvious that the same machine which supplies the headlight will also furnish a current for illuminating the cars.

Wherever the electric light has been brought into competition with gas for lighting large rooms or open spaces, it has given a good account of itself in comparisons of cost. In very many cases, however, any comparison with gas is out of the question. With gas it is simply impossible to do certain kinds of work at night, or to do it as rapidly and well as by daylight. With the electric light night production is brought up to the level of day production. The gain of one night's increased production will often pay the cost of electric lighting for months. Practical business men are not slow to appreciate advantages of this sort. The question with them is how much will the electric light cost, but can the light be depended on for a steady, uniform, certain operation, without requiring too much expert attention? The ability of the Brush lamp to meet such practical requirements would seem to be the secret of its substantial progress.—*Scientific American.*

A sale of over 100,000 feet of lumber was recently made at Ottawa to be shipped by way of Brockville.