

COAL FOR TEA FIRING*

E. H. B. CHAPMAN

In so far as fuels for tea drying are concerned, coal, until lately, has been little used, and it is somewhat difficult to understand why this is so in view of its many good points.

It would appear that there is a large body of opinion locally that coal is difficult to use. This is incorrect as the best methods are easy to learn and easier still to carry out.

Starting a coal fire is, perhaps, the most difficult part for stoking *coolies* to learn and this is where active co-operation from superintendents for the first two or three times is invaluable. Few, if any, superintendents, one would imagine, have not made up and lit a coal fire in an ordinary grate at home. The operation of starting a drier is just the same. Two or three heavy lumps placed in a line across the bars about eighteen inches back from the doors form the equivalent of a back log, and an ordinary fire laid and lit in front of them is all that is required; the rest of the operation merely consists in gradually increasing the size of the fire and spreading it out until the whole grate area is covered to a depth of five to six inches sloping off at the back to four inches, the heavy lumps at the back preventing the small fire sprawling too much when being spread out.

* The Institute does not necessarily endorse the views expressed in papers contributed by persons not members of the staff.

So far as actual stoking is concerned there are only two or three major points to remember:—

- (1) To keep the fire at a level depth across the bars sloping from six inches at the front to four inches at the back.
- (2) To run the blade of the poker along the tops of all the fire-bars for their full length when poking the fire, as otherwise clinker will form on the bars, and there is a risk of furnace distortion.
- (3) To stoke the fire little and often. The poker should be used as little as possible. Look for the reflected glow of the fire on the ashes underneath and only use the poker when there is practically no glow visible at all.

Draught control is somewhat more difficult, but is nevertheless really very simple when the reason is understood. The rate at which coal burns, and the consequent amount of heat generated, is governed entirely by the amount of air which passes through the fire. Thus, one can damp a fire down to a mere smoulder or apply forced draft for a white-hot blazing fire.

If unrestricted passage is given to the hot gases getting away through the chimney, a tremendous volume of air will be drawn through the fire with a consequent great increase in local heat and coal consumption, and comparatively little rise in temperature of the tubes as the hot gases pass through too quickly to have their full effect; this obviously means waste all round. Conversely, if the chimney is blocked up and the gases cannot get away, an insufficient amount of air for the proper combustion of the coal will be the result.

A very ready indication as to whether fuel is being wasted is the temperature at the base of the chimney.

If full value is being obtained from the fuel one should be able to touch the base of the chimney quickly with one's hand. Any appreciable heat in excess of this is an indication that the draught is too great and heat is being lost up the chimney.

For the satisfactory combustion of coal in tea drier stoves, the ratio of grate area to chimney area should be approximately 3:1.

No two driers ever act exactly the same, and it is a question of repeated trials with the chimney damper to discover the maximum reduction in chimney area which will allow a normal five or six inches deep fire to produce the required heat. There are driers marketed with induced draught fans and with these the increasing and decreasing of the speed of the fan has the same effect as manipulating the chimney damper. The actual adjustments are carried out by a fan valve which is similar to the chimney damper.

Of course, while building up the fire to its full size a brisk flow of air is necessary, and the chimney should be left open till the whole grate area is covered.

Once firing coolies have learnt how to lob coal off the shovel on to any part of the fire the rest is easy. The main trouble experienced in this connection is their tendency to get the shovel as near the fire as possible and then give a jerk to get rid of the coal, and this tendency should be checked as a level fire cannot be maintained by this method. A smooth underhand throwing action is what is required.

The residue of the fire when it is let out should be examined and will be found to consist of ashes, clinker and feathery ash-like dust. The latter is of no use, but the pieces of ash are still good fuel, and should be saved and used the next day, mixed up with the coal, once the fire is burning well. Ashes can easily be recognised as they are brittle and when broken show a scintillating black surface in the middle. Clinker when cool takes on a sort of pinkish-brown tinge with what looks like solidified bubbles on the surface of the lumps. This is no further use for fuel but makes an excellent surface material for dirt paths that are apt to get soggy in wet weather.

When letting the fire out it is best if possible to let it go out in the furnace — just shut all doors and keep as much air as possible out and let the fire go out by itself. If the fire cannot be let out in the furnace a metal barrow should be used and the fire taken out and dumped in a pit and left there, but on no account should water be thrown on it unless absolutely necessary, as this ruins the ash for further use and so wastes fuel.

BANKING FIRES AT NIGHT

The Ceylon Fire Insurance Association, as a result of recent representations, has declared that the Association has no objection to the banking of coal fires overnight.

This is a point of very great importance. By banking fires at night savings can be effected of both coal and time in raising the heat next morning, and also this reduces the wear-and-tear on the drier by minimising expansion and contraction, and we strongly recommend that it be done if possible.

The best method of banking a fire is as follows: When firing has been completed allow the fire to die away to such a point that it can be well cleaned, *i.e.*, thoroughly poked and all lumps of clinker dragged out. Then put on a large charge of coal and on top of that put all the coal dust available and then cut the draught down to *just* above the minimum possible. When this is done put on sufficient of the light feathery ash from the ashpit to form a thick blanket all over the top of the fire. Then leave it alone. When restarting the fire, open the draught at least halfway to full open and leave it there till signs of burning such as smoke, etc., are fairly plentiful, after which judicious poking will probably reveal a good sized bed of burning coal. Firedoors and all louvres in the ashpit should be closed overnight but the louvres should be reopened when the draught is increased.

The size of the charge to put on must of necessity vary with individual driers, but one or two experiments should be quite sufficient to show the correct amount to use to ensure the fire remaining alight all night and leaving sufficient for a brisk start when required.