

parts of the grate. This is good practice, because there is a tendency for more air to pass up beside the sheets, which would cause thin spots to form around the edges, allowing cold air to pass up into the fire box. Maintaining a slightly thicker fire along the edges prevents this trouble.

27. Fig. 6 shows the thinning action of the draft around the edges.

28. Fig. 7 shows the effect of a temporary reduction in fire box temperature

brick arch and the path of the products of combustion from the fire to the flues.

Operation of the Locomotive. — 32. When the throttle is closed, before making a stop or for drifting, the blower must be used and the fire door placed on latch, and dampers (where provided) should be closed in order to check the fire and prevent steam from blowing off. This practice, with the exception of the use of the blower, should be followed after using the scraper or slash bar, and

er with the use of large quantities of steam, will cause a reduction of steam pressure. If firing is necessary at this time, it is better to do it while standing.

34. The grates should be shaken only when necessary to clear the fire of ash and clinker, in order to admit sufficient air for proper combustion, and in such manner as to avoid the loss of good fires, which means waste of fuel. Care should be taken after each operation to place the grates in a level position to avoid burning the fingers, which is liable to occur if the grates are allowed to remain at an angle with the fingers projecting into the fire.

35. The waste of steam through safety valves must be avoided. Frequent blowing off of safety valves shows poor judgment, and implies that economy is not being practiced. Tests have demonstrated that about 15 lb. of coal, or one shovelful, is required to supply the steam blown off in one minute, or, in other words, if the safety valves are open for 133 min. about one ton of coal is wasted.

36. Careful attention must be given to the use of the injector and to the height of the water level in the boiler. The proper handling of the injector is a very important matter in fuel economy. The best fireman cannot make a showing if the locomotive man floods the boiler. If the injector is to be used to prevent popping, a space must be left so

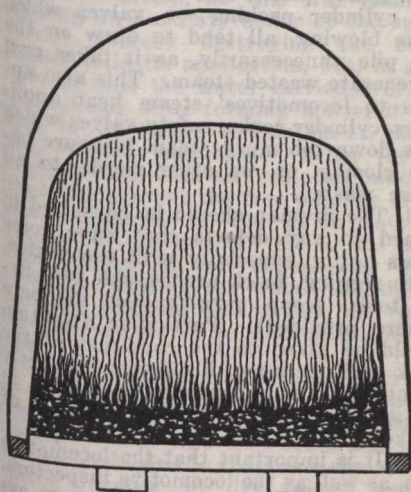


Fig. 5.

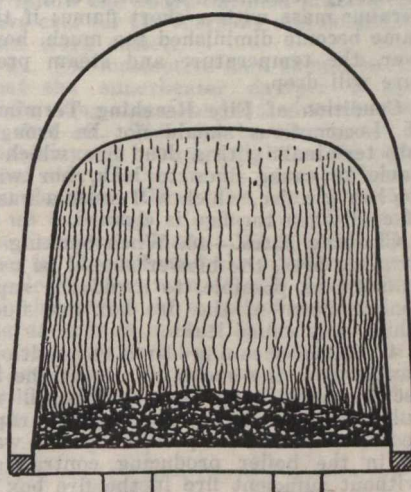


Fig. 6.

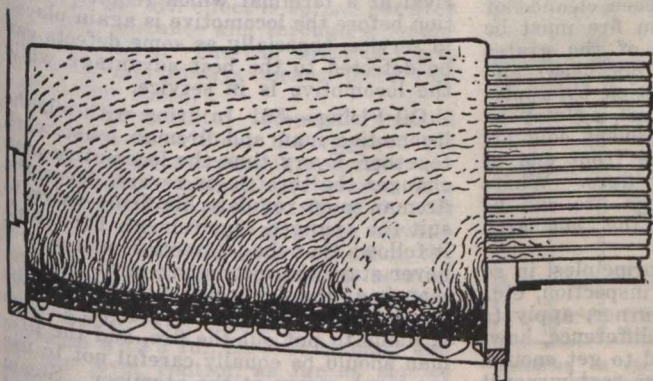


Fig. 7.

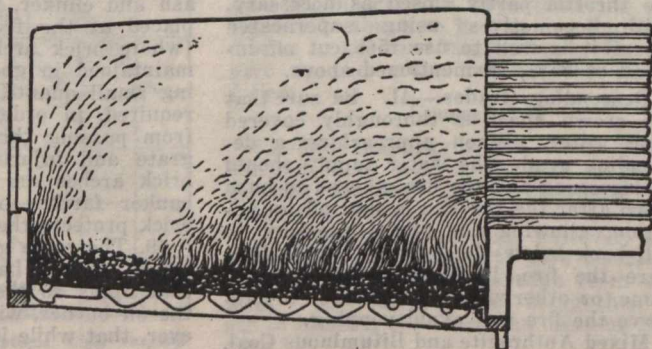


Fig. 8.

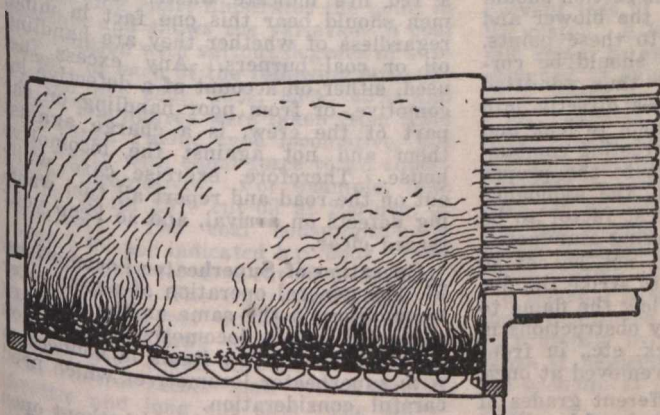


Fig. 9.

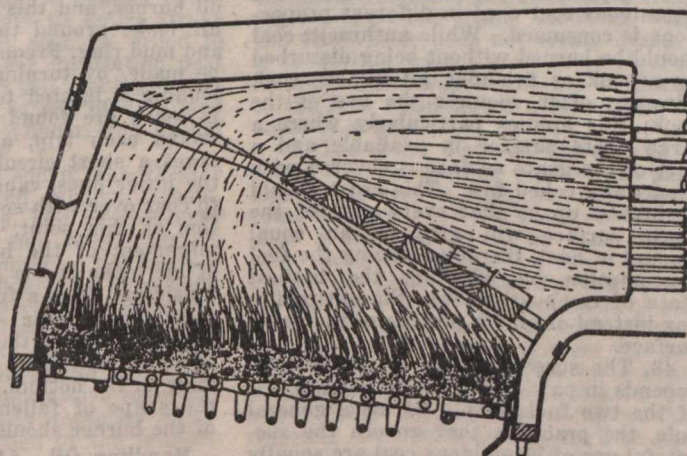


Fig. 10.

when a shovelful of coal is introduced. 29. Fig. 8 shows the restoration of temperature before the second shovelful is introduced at another part of the fire box, as is the case in the system of light and level cross-firing.

30. Fig. 9 shows the effect of a spot or hole in the firing. The admission of a large volume of cold air through such spots causes a serious chilling effect.

31. Fig. 10 shows the application of a

when on sidings, in yards or at terminals.

33. Firing should be stopped long enough before steam is shut off to prevent smoke and waste of coal; and when making station stops the fire should be in such a condition that more coal need not be added until after start is made. It is bad practice to begin firing as soon as the throttle is opened, because the deadening effect of the fresh coal, togeth-

that the injector can be worked. The injector should be put on before, and not after, the safety valve opens. The blower should also be reduced or shut off before the steam pressure rises to the blowing off point.

37. Coal can be saved by the proper use of the injector in feeding the locomotive regularly at a rate governed by the demands, and by taking advantage of every opportunity to increase the