

ENGINEMEN'S M.I.C. MOVEMENT

The Firebox Sand Gun

IT is quite well known that the tube plate and tubes may be maintained in a clean condition by the introduction of small quantities of sand into the firebox at intervals when the engine is working heavily, and engine-men, who were not slow to realise this, often resorted to the practice of giving their engines a shovelful of sand sprayed over the top of the brick arch on heavy sections of the line in order to prevent the tubes from becoming furred.

The firebox sand gun is a natural development of this somewhat crude process along scientific lines. It is so designed as to be proof against most of the abuses possible when sanding the tubes by hand, but at the same time it may be relied upon when correctly operated to clean the tubes and tube plate more thoroughly. The gun is arranged so that it introduces sand into the firebox from a point in the centre of the back plate immediately over the firehole door so that it is discharged straight at the tube plate over the top of the brick arch, the sand being expelled from the

nozzle of the gun at high velocity by a jet of steam.

Our drawing shows the gun and sand container in section and is more or less self-explanatory. The sand container is mounted near to floor level on the R.H. side of the footplate and connected as directly as possible to the gun by the sand pipe (1). The back water-leg of the firebox is bridged by the ferrule (2) which consists of a short length of tube about 5 inches in diameter screwed and expanded into the plates of the inner and outer fireboxes and beaded over at either end.

The gun itself consists of two main parts, the body casting (3) bolted to the back plate over the ferrule (2) and the centre portion or rotor (4) which carries the sand and steam nozzles and can be rotated at will by the hand wheel (5) projecting through the gland at the rear of the gun mounting.

Steam taken from the steam chest by way of an extension from the exhaust injector control pipe is admitted to the gun by the stop valve (6). This steam then passes via the hollow rotor through the small nozzle (7), and thence into the larger nozzle (8), this action resulting in a partial vacuum being created in the cavity between these two nozzles. As the cavity between the two nozzles connects with the sand container by way of the pipe (1), the

partial vacuum which is created by the flow of steam causes particles of sand to be drawn from the container and to be mixed with the jet of steam, and finally expelled with considerable velocity through the nozzle (8) towards whatever portion of the tube plate the gun happens to be directed.

The steam and delivery nozzles are inclined to the axis of the rotor (4) and consequently rotation of the hand wheel (5) causes the stream of sand to sweep round the tube plate in a circular path so that all portions of it are subjected in turn to the scouring action of the sand blast.

The gun has few working parts and is not likely to get out of order provided the sand in the container is kept dry. If moisture is present, however, a plug of damp sand will form at the base of the sand pipe which will interfere with the free passage of sand to the gun. In view of this engine-men will be well advised to lift the lid of the sand container whilst operating the gun in order to watch the sand level inside. If this is seen to fall, delivery of sand to the tubes is proved, but if it does not do so, a stoppage in the sand pipe is indicated and further reliance should not be placed on the gun until the container has been emptied and refilled with dry sand. In some of the later engines a plug is being fitted to the base of the sand container to facilitate removal of damp sand when required.

