TAPPING THE OPEN HEARTH FURNACE

Below the rear of the furnaces an 8 feet deep ladle pit ran the full length of the staging. In the bottom of this pit two rail lines also ran the full length on which the ladles were mounted on a pair of steel wheeled axles much the same as railway rolling stock, the only difference being that the ladles could easily be mounted and lifted clear as necessary. A ladle was basically a giant steel bucket lined with refractory bricks with 2 exit holes at opposite sides in the base. Corresponding with these holes were refractory covered rods which dropped into the holes thus sealing them. Pressing down on the handle would lift the rod to allow the steel to pour out. The ladle was placed beneath the rear of the furnace where it would be pre-heated in readiness for the tapping.

The tap-hole of the furnace was a 5inch diameter drain hole running from the bottom of the bath and out of the rear where it was connected to an open, brick lined chute which projected out over the pit and terminated above the waiting ladle. The chute was in 2 parts, a short section which was a permanent fixture to the furnace and a longer section which pivoted at the centre point. The two sections were held in place by an easily removed steel bar, the joint between the 2 parts being made good with fire clay.

The tap-hole was plugged with alternate layers of dried coke dust and fire clay which could be easily broken out. When the tap was ordered, the second hand, who was responsible for that aspect of the furnace, would kneel on the edge of the chute and using a sharp bar proceed to break out the dried plugs until the steel started to run, at which point he had to be very quick in order to withdraw before being seriously burnt as the molten steel poured down the chute and out into the waiting ladle.

The pouring steel resulted in multitudes of tracer lines of sparks and steel droplets which splashed up into the air before splattering onto the floor, rolling in all directions until turning to a dull red and finally expiring. The tapping of a furnace could be quite a spectacle and indeed often drew crowds from other departments who managed to sneak away to see it. Any last minute make-up of alloy or carbon content to meet the required target would be shovelled into the ladle at this point, the resulting large steel splashes from the impacts frequently setting fire to the hessian sacks used as aprons by the smelters.

When the ladle was full, the massive overhead crane would hoist up the multi cabled hook which held the ladle lifting frame, taking it away for casting. As the ladle rose it raised up the outer end of the chute (with the iron bar removed) which then broke at a pre-made clay joint allowing the remaining liquid (slag) to run off into a special slag tub placed below the joint. When the tub was full and cool, the ladle men had the un-enviable task of cleaning it all out with pneumatic breakers and shovels.

Malcolm Mowbray 2015