This invention relates to a tuyere assembly for a Bessemer Converter. The tuyeres in a Bessemer Converter last for a relatively short time and for this reason a spare bottom assembly is provided. This assembly includes the bottom ring, wind box, tuyere plate, tuyeres and a refractory bottom. One form of tuyere used is assembled from the top, but no means are provided to hold the tuyere down. Thus, if the bond between the tuyere and the refractory bottom is poor there is danger of the tuyere being blown upwardly if the openings in the tuyere become plugged. For that reason the tuyeres most commonly used have means for preventing the tuyere from moving upwardly as well as downwardly. This tuyere has the disadvantage that it must be inserted from the bottom up through a hole in the tuyere plate and held in position while a clamp is positioned beneath the tuyere plate. Since the tuyeres are heavy this is a difficult operation and the bottom tuyere is also relatively fragile so that it may sometimes break during the installation or during the operation of the furnace. The seal between the bottom plate and the tuyeres of which we have knowledge is poor so that air leakage may occur.

It is therefore an object of our invention to provide a bottom assembly for a Bessemer Converter in which the tuyere is supported firmly and from which air leakage is a minimum.

This and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is an elevation of a Bessemer Converter;
Figure 2 is a fragmentary sectional view of the bottom assembly of our invention; and
Figure 3 is a top plan view of a tuyere.

Referring more particularly to the drawings, the reference numeral 2 indicates the shell of a Bessemer Converter which has the usual refractory lining 4 therein. A bottom ring 6 is detachably attached to the bottom of the shell 2. For that purpose the outer portion of the shell has a plurality of spaced pairs of outwardly extending flanges 8, and the bottom ring 6 has a plurality of spaced apertures 10, one beneath each of the pairs of flanges 8. A key bolt 12 is supported in each pair of flanges 8 and has a slot at its lower end for receiving a key 16 which engages a shoulder 18 on the bracket 10. A wind box 20 is attached to the lower part of the bottom ring by means of bolts 22. A wind box cover 24 is attached to the lower part of the wind box 20 by means of bolts 26. The wind box 20 has a horizontal inwardly extending peripheral flange 28 adjacent the top thereof. The bottom ring 6 and wind box 20 have aligned openings 30 and 32 therein. The parts so far described are conventional.

A cast steel tuyere plate 34 is supported on the flange 28 and is fastened thereto by means of bolts 36. The plate 34 has a plurality of vertical openings 38 therethrough. The number of holes 38 may vary, but in a typical Bessemer Converter there may be 25 such holes. Each of the holes 38 has a generally horizontal shoulder 40 therein. A false plate 42 made of steel is received in the opening 30 and is supported on the bottom ring 6 by means of lugs 44 welded to the top of the plate 42. The plate 42 has a plurality of vertical openings 46 therein, one aligned with each of the openings 38. A tuyere 48 is received in each pair of aligned openings 38 and 46. The tuyere 48 is made of a refractory material, preferably fire clay, and has an elongated generally cylindrical body with a plurality of longitudinal holes 50 therethrough.

The number of holes 50 may vary and the tuyere is shown with a central hole and six holes equally spaced therearound. The lower part 52 of the tuyere has an enlarged diameter portion so as to provide a generally horizontal shoulder 54 between the enlarged portion and the main portion of the body. The shoulder 54 is in approximately the same horizontal plane as the top of plate 42. The bottom of the tuyere 48 rests on the shoulder 54 preferably with an asbestos rope seal ring 56 therebetween. Asbestos rope seal ring 58 may also be provided between the tuyere 48 and the top of tuyere plate 34. A frusto-conical projection 60 is provided on the top of the tuyere 48 to prevent dihing or the slight concavity that occurs in conventional tuyeres. A standard bottom mixture 62 made of canister and fire clay surrounds the tuyeres 48 in the bottom ring 6. Since it is necessary to replace the tuyeres quite frequently, the Bessemer Converter has spare bottom rings, wind boxes, and tuyere plates. These parts along with the tuyeres and the bottom mixture form a bottom assembly which is made up into a unit and inserted in place of a similar unit having burnt out tuyeres.

In making up a bottom assembly, the wind box 20 with its cover 24 is attached to the bottom ring 6 and the tuyere plate 34 is attached to the wind box 20. The false plate 42 is placed in position and then the tuyeres 48 are inserted from the top into the position shown with the asbestos rings in place. The standard bottom mixture 62 is then packed around the tuyeres 48 and on the shoulder 54 of the tuyere thereby holding the tuyeres in the tuyere plate 34. When it becomes necessary to replace the bottom assembly, the wedges 16 are knocked out of the bolts 12 and the wind box 20 is detached from the air supply pipe 64. This permits ready removal of the bottom assembly after which a rebuilt bottom assembly is placed in position and attached to the shell 2 and conduit 64 in the usual manner. It will be noted that a space is provided between the tuyere plate 34 and the false plate 42. This helps keep the bottom cool. Also, if moisture is generated in the bottom mixture 62 it can escape into this space and then into the atmosphere through holes 66 in the wind box 20. Also, if there is metal leakage around the tuyeres or through the refractory bottom it can escape through the holes 66 and give warning to the operator.

While one embodiment of our invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:
1. A bottom assembly for a Bessemer Converter comprising a detachable bottom ring having an opening through the bottom thereof, a wind box attached to the bottom of said bottom ring, said wind box having an opening through the top thereof aligned with the opening on said bottom ring, a tuyere plate mounted in alignment with said openings adjacent the top of said wind box, said tuyere plate having a plurality of vertical openings therethrough, a shoulder in each of said last named openings, the cross section of each of said last named openings having greater dimensions above said shoulder than below said shoulder, a false plate arranged above said tuyere plate in spaced relationship therewith, said false
3. A bottom assembly for a Bessemer Converter comprising a detachable bottom ring having an opening through the bottom thereof, a wind box attached to the bottom of said bottom ring, said wind box having an opening through the top thereof aligned with the opening in said bottom ring, a peripheral inwardly extending flange on said wind box, a tuyere plate resting on and fastened to said flange, said tuyere plate having a plurality of vertical openings therethrough, a shoulder in each of said last named openings, the cross-section of each of said last named openings having greater dimensions above said shoulder than below said shoulder, a false plate above said tuyere plate in spaced relationship therewith and having openings therethrough in alignment with the openings in said tuyere plate, said false plate having a flat upper surface, a tuyere for each of said openings in said tuyere plate, each of said tuyeres having a generally cylindrical refractory body with a plurality of vertical holes therethrough, the top of said body having a central frusto-conical projection thereon, the diameter of the bottom portion of said body being greater than the diameter of the remaining portion of said body so as to provide a shoulder therebetween, the holes in said false plate having a diameter greater than that of the said bottom portion of said tuyeres, the said bottom portion of each of said tuyeres being received in the openings in said false plate with the shoulder on the tuyere at approximately the same level as the top of said false plate, a seal ring between the bottom of said tuyere and the shoulder on said tuyere plate, and a refractory in said bottom ring on top of said false plate surrounding said tuyeres and on said tuyere shoulders, said refractory terminating below the top of said frusto-conical projection.

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