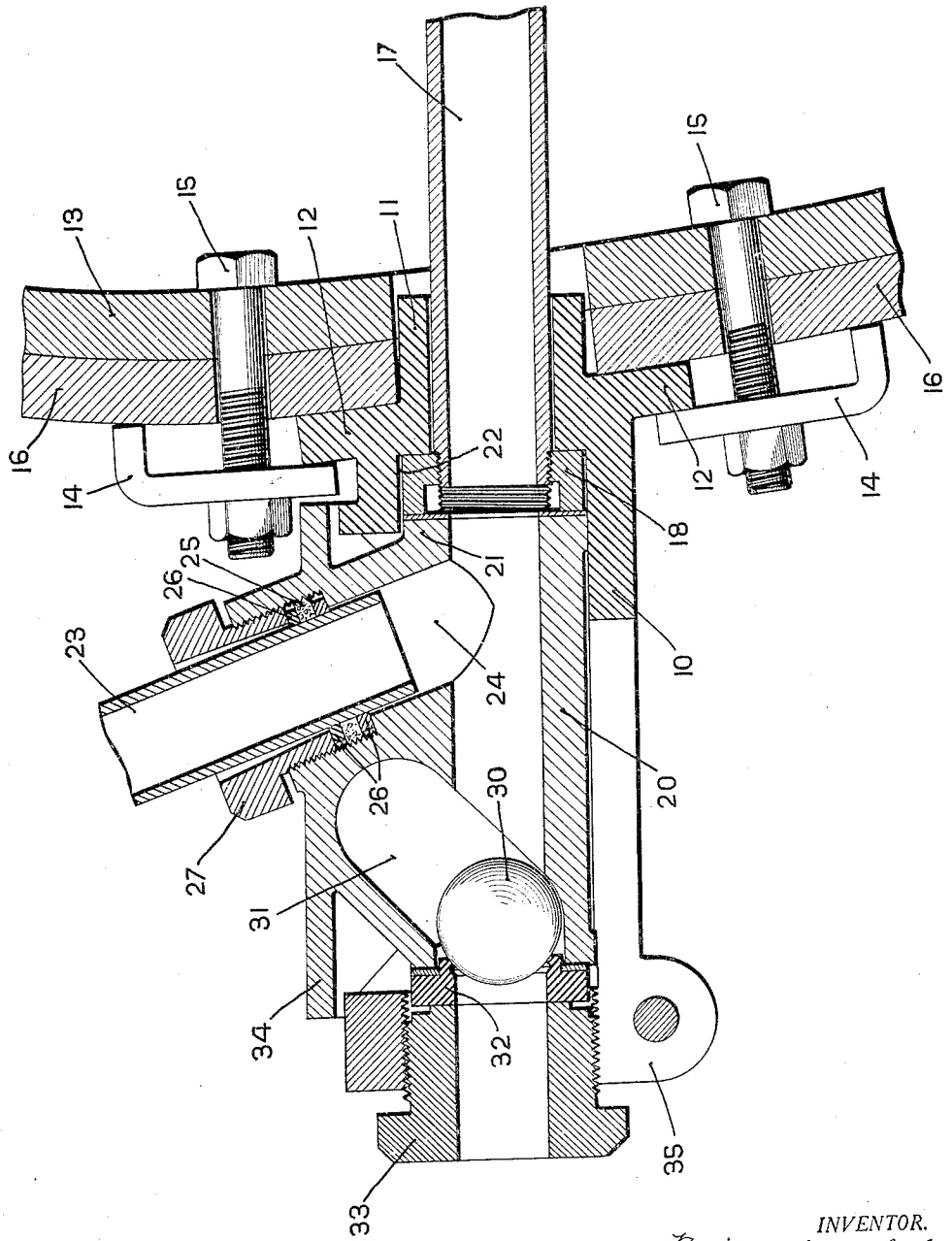
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TUYÈRE

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TUYÈRE.

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This invention relates to fluid pressure devices, and more particularly, to a tuyère adapted to be employed for blowing air into converters or other furnaces.

The invention relates more specifically to a tuyère which is capable of being readily disassembled for the replacement of parts without disturbing the tuyère-pipe or other fixed parts of the apparatus.

In accordance with this invention, a tuyère housing is provided adapted to be rigidly secured to a converter or other furnace and partially inclosing the tuyère-pipe in said furnace, the housing being provided with an open top to permit insertion of the valve mechanism. The valve mechanism comprises a replaceable valve-seat and a ball-valve which is normally maintained against the seat by the pressure of the air within the tuyère. The valve may be readily opened to permit cleaning of the pipes by the insertion of a cleaning-rod.

Although the novel features which are believed to be characteristic of this invention will be pointed out with particularity in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which the figure is a sectional view of a converter tuyère constructed in accordance with the present invention.

In the following description and in the claims parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring to the drawing more in detail, the tuyère comprises a housing 10, which is open at the top to permit the insertion of the valve mechanism to be hereinafter described. Housing 10 is provided with projecting portion 11, which is adapted to surround a tuyère-pipe 17 and be inserted through the walls 13 of a converter or other furnace to which the tuyère is applied. Projecting lugs 12 provide means for rigidly attaching housing 10 to the walls 13 of the furnace, said projections being clamped by clamping-members 14 and bolts 15 passing through said clamping-members and said wall 13.

A reinforcing plate 16 may be provided adjacent the tuyère-pipe for strengthening the walls and ensuring a rigid construction for the entire assembly. Obviously, reinforcing plate 16 may be omitted if desired and any convenient means may be employed for attaching housing 10 to the furnace wall, one type of attaching means being disclosed for purposes of illustration only.

Tuyère-pipe 17 may be inserted through the wall 13 and rigidly secured within housing 10, as by means of nut 18, which is adapted to be threaded upon the end of said tuyère-pipe, and seated within a suitable recess 22 in housing 10. Nut 18 may be provided with grooves to permit its removal after the tuyère-pipe has been firmly seated in the interior of the furnace.

The valve mechanism comprises casing 20 having a longitudinal bore adapted to align, when the valve is in place, with tuyère-pipe 17, and an inclined bore to which a compressed air pipe may be attached as hereinafter described. The casing is further provided with a second inclined bore, which is adapted to serve as a guide for the ball-valve.

Casing 20 may be provided with an extension 21 which is adapted to enter recess 22 in housing 10 and to be firmly seated therein against the face of nut 18 so as to form an airtight joint. Compressed air pipe 23 may be secured in inclined bore 24 and passage of air between said pipe and said casing prevented by packing 25, which may be placed between packing-rings 26 and secured by nut 27. The particular type of packing-joint employed, however, forms no part of this invention but is given merely by way of illustration.

The air-valve carried by casing 20 comprises ball 30, which is adapted to move in an inclined direction in bore 31 and normally to seat against a removable valve-seat 32. Valve-seat 32 is adapted to firmly engage the end of casing 20 adjacent the horizontal bore therein, and, in addition to forming a seat for the valve itself, is adapted to provide means for securing said casing within housing 10. Nut 33 may be threaded into housing 10 and bear against valve-seat 32, thereby

forcing the valve-seat and casing 20 firmly against nut 18 attached to the tuyère-pipe. The portion of casing 20 surrounding nut 33 may be split and provided with projecting ears 35, through which a retaining means such as a bolt may be passed for causing the split casing to tightly clamp nut 33 and prevent movement thereof.

The entire assembly is firmly secured in position not only by the transverse pressure exerted by nut 33 but also by projection 21 co-acting with recess 22 in casing 10 and preventing vertical movement of the valve-casing. A dust-cover 34 may be provided on the valve-casing overlapping housing 10 for preventing dust from accumulating between said casing and said housing.

The above described apparatus may be readily assembled and removed without disturbing tuyère-pipe 17 or the connection of housing 10 to the converter-wall. The mechanism may be removed by loosening nut 33 and withdrawing valve-seat 32 and ball-valve 30 from housing 10. Compressed air pipe 23 may then be disconnected from casing 20 by loosening nut 27 and casing 20 withdrawn from housing 10 by being moved horizontally a sufficient distance to disengage projection 21 from recess 22 in said housing and then lifted vertically through the open top in the housing. The apparatus may, of course, be assembled by performing the above mentioned steps in the reverse order.

During normal operation when air is to be blown into the furnace ball 30 is held in engagement with valve-seat 32, both by the force of gravity and by the pressure of the air within the tuyère itself. The valve may be readily opened, however, to permit inspection or cleaning of the tuyère-pipe by inserting a rod through the open end of the tuyère and forcing the same against ball 30, thereby removing said ball from the valve-seat 32 and forcing it a sufficient distance up inclined bore 31 to permit the rod to pass under said ball and into the tuyère-pipe.

The invention provides means for readily replacing valve-seat 32 whenever such replacement is required. This may be accomplished by removing nut 33 and then withdrawing said valve-seat from housing 10.

The arrangement provides a convenient, compact and unitary assembly which may be readily secured to a tuyère-pipe and which may be disassembled as required for repairing or replacement of parts without removing the tuyère-pipe from the furnace wall.

In the drawings accompanying and forming part of this specification, a practical commercial embodiment of the invention is disclosed, but as such illustration is primarily for purpose of disclosure, it will be understood that the structure may be modified in various respects without departure from the broad spirit and scope of the invention as hereinafter defined and claimed.

What is claimed is:

1. A tuyère comprising a housing having an open top, means for securing said housing to a furnace wall, means for securing a tuyère-pipe in said housing, and an air-valve adapted to be inserted through the open top of said housing for normally permitting air to be blown into said furnace and for providing access to said tuyère-pipe for inspection or cleaning.

2. A tuyère comprising a housing having an opening, said housing being provided with a projection adapted to extend into a furnace wall, means for securing said projection in said wall, a tuyère-pipe passing through said wall and firmly seated within said projection, a fluid supply pipe, and a valve comprising a casing adapted to be readily inserted through the opening of said housing, said casing having a horizontal bore adapted to align with said tuyère-pipe, means for closing the open end of said bore and means for rigidly attaching said fluid supply pipe to said casing.

3. A tuyère comprising a housing having an opening therein, a tuyère-pipe secured in said housing, a valve mechanism adapted to be inserted through said opening, comprising a casing having intersecting bores, said casing being adapted to bear against said tuyère-pipe, a fluid supply pipe, means for securing said fluid supply pipe within one of said bores, and means for closing the end of the other of said bores comprising a valve and a removable valve-seat.

4. A tuyère comprising a housing having an opening therein, a tuyère-pipe adapted to pass through a furnace wall and secured to said housing, a valve mechanism adapted to be inserted through said opening, comprising a casing having a longitudinal bore and a transverse bore, a fluid supply pipe, means for securing said fluid supply pipe within said transverse bore, means for closing the end of said longitudinal bore, comprising a valve and a removable valve-seat, and means for securing said valve within said housing.

5. A tuyère comprising a housing provided with an open portion and a projection adapted to extend within a furnace wall, a tuyère-pipe secured in said projection and adapted to pass through said wall, a valve mechanism, comprising a casing having a longitudinal bore and a transverse bore, said casing being provided forwardly with an extension adapted to bear against said tuyère-pipe, a fluid supply pipe, means for securing said fluid supply pipe within said transverse bore, means for closing the end of said longitudinal bore comprising a valve and a removable valve-seat, and means for securing said valve within said housing, said as-

sembly being normally adapted to permit fluid to flow into said furnace, said valve being adapted to be moved in response to a cleaning-rod to permit said rod to be inserted in said tuyère-pipe.

6. A tuyère comprising a housing having an opening therein and a projection adapted to extend within a furnace wall, means for securing said housing to said wall, a tuyère-pipe secured to said housing and adapted to pass through said wall, a valve mechanism adapted to be inserted through said opening, comprising a casing having a longitudinal bore and a transverse bore, said casing being provided forwardly with an extension adapted to bear against said tuyère-pipe, a fluid supply pipe, means for securing said fluid supply pipe within said transverse bore including a packing-joint, means for closing the end of said longitudinal bore comprising a ball-valve, said ball being adapted to move in an inclined bore in said casing, a removable valve-seat and means for securing said valve within said housing comprising a follower nut, said nut being adapted to bear against said valve-seat and to clamp said seat and said casing firmly against said tuyère-pipe, said assembly being normally adapted to permit fluid to flow into said furnace, said valve being adapted to be moved in response to a cleaning-rod to permit said rod to be inserted in said tuyère-pipe.

7. A tuyère comprising a housing having an opening therein and a projection adapted to extend within a furnace wall, means for securing said housing to said wall, a tuyère-pipe secured to said housing and adapted to pass through said wall, a valve mechanism adapted to be inserted through said opening comprising a casing having a longitudinal bore and a transverse bore, said casing being provided forwardly with an extension adapted to bear against said pipe, a compressed air pipe, means for securing said pipe within said transverse bore comprising a packing-joint, means for closing the end of said longitudinal bore comprising a ball-valve, said ball being adapted to move in an inclined bore in said casing, a removable valve-seat, means for securing said valve within said housing, and a dust-cap attached to said casing and overlying a portion of said housing, said assembly being normally adapted to permit compressed air to be blown into said furnace, said valve being adapted to be moved in response to a cleaning-rod to permit said rod to be inserted in said tuyère-pipe.

8. A converter tuyère comprising a housing provided with an open top and a tubular projection adapted to extend within a converter wall, a pair of projections on said casing adjacent said tubular projection, means for securing said last mentioned projections to said wall, a tuyère-pipe adapted to pass through said wall, an external nut threaded on the end of said pipe, said nut seated in a suitable recess in said housing and providing a bearing-surface for said valve, a valve mechanism adapted to be inserted through the open top of said housing comprising a casing having a horizontal bore and an inclined bore, said casing being provided forwardly with an extension adapted to bear against the face of said nut and to seat within said recess, a compressed air pipe, means for securing said pipe within said inclined bore comprising a packing-joint, means for closing the end of said horizontal bore comprising a ball-valve, said ball being adapted to move in a second inclined bore in said casing, a removable valve-seat, means for securing said valve within said housing comprising a follower nut, said nut being adapted to bear against said valve-seat and to clamp said seat and said casing firmly against said tuyère-pipe, means for securing said follower nut against unauthorized movement, and a dust cap attached to said casing and overlying a portion of said housing, said assembly being normally adapted to permit compressed air to be blown into said converter, said valve being adapted to be moved in response to a cleaning-rod to permit said rod to be inserted in said tuyère-pipe.

In testimony whereof I have hereunto set my hand and seal.

BENJAMIN GEORGE CALL.