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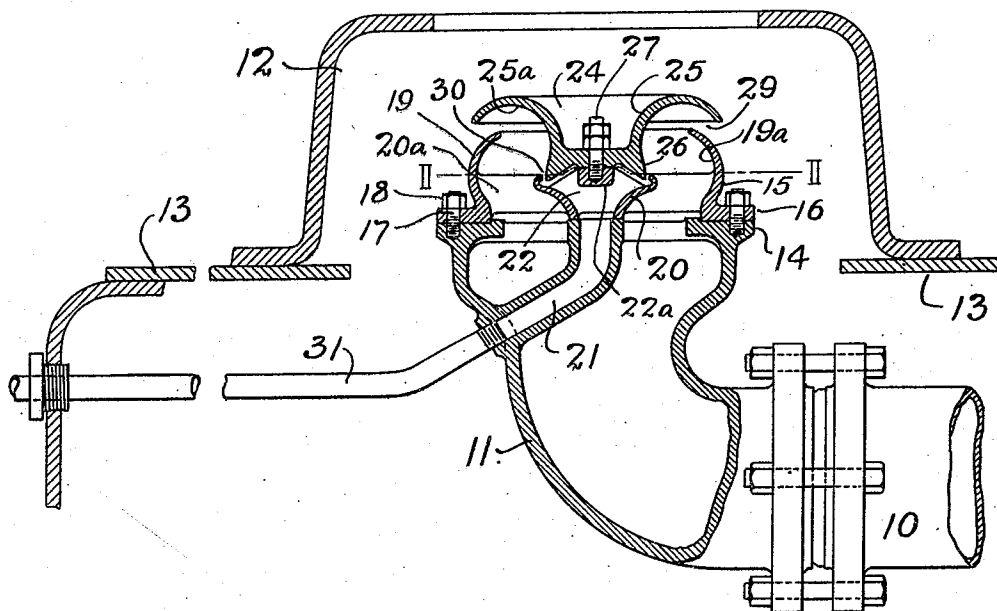
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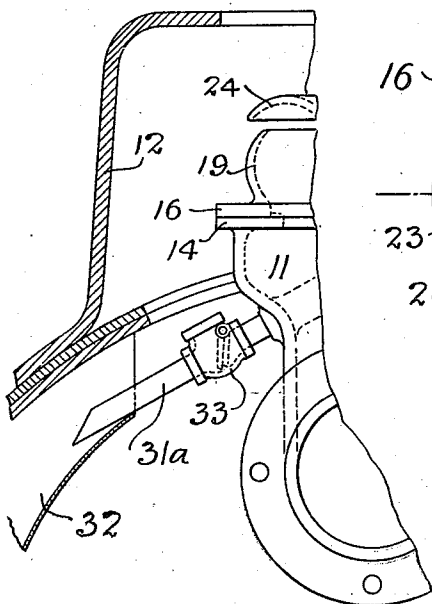
STEAM DRIER

Filed Feb. 6, 1930

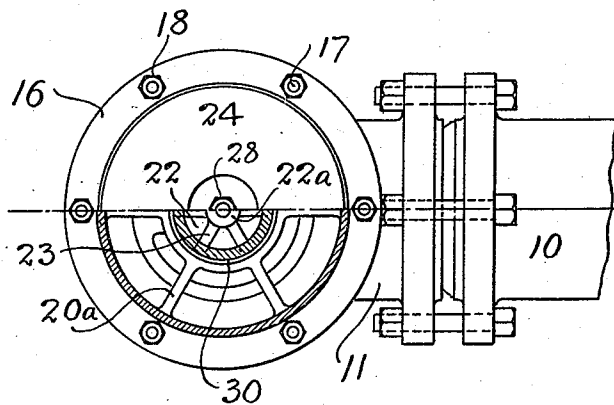
— FIG. 1.—



— FIG. 3.—



— FIG. 2.—



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STEAM DRIER

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This invention relates to steam driers, and more particularly to such devices adapted to dry boiler steam prior to its delivery to a throttle valve.

8 An object of the invention is to provide a steam drier of the type indicated, which is more economical to manufacture and maintain, and which is more efficient in operation than those heretofore known.

10 Other objects of the invention will hereinafter readily appear.

The improvement claimed is hereinafter fully set forth.

15 In the accompanying drawings: Figure 1, is a view in longitudinal central vertical section, illustrating the application of the invention to a locomotive boiler; Fig. 2, a view partially in top plan, and partially in horizontal section on the line II—II of Fig. 1, 20 of the dry steam pipe and steam drier shown in Fig. 1; and, Fig. 3, a fragmentary view, partially in transverse vertical section showing a modified form of construction wherein the water collected by the drier is discharged 25 directly back into the boiler through a check valve.

In the practice of the invention, referring descriptively to the specific embodiment thereof which is herein exemplified, the dry steam pipe 10, comprises a stand pipe section 11, which projects upwardly into a steam dome 12 of a boiler 13. The upper end of the stand pipe section is provided with a horizontal annular flange 14 to which is connected a casing member 15. The casing member comprises an annular horizontal flange 16 which is fastened to the flange 14 of the stand pipe by studs 17 and nuts 18; an upstanding annular wall 19, concavo-convex in cross section; and a cup shaped drain receptacle 20 for collecting the water separated from the steam, which receptacle is supported centrally of the annular wall 19, by spaced radial bars 20a. The parts of the casing members are preferably preformed together as an integral casting, but it is within the contemplation of the invention to form one or more of the parts separately if desired. A conduit 21 leads from the receptacle 50 through the wall of the stand pipe and is pref-

erably, but not necessarily, cast integral with the stand pipe. To provide for the attachment of a deflector, the receptacle is provided at its top with a support 22 comprising a central metal block 22a, from which radiate 55 spaced bars 23, the outer ends of which are supported by the wall of the receptacles at the mouth thereof. The support 22 is preferably cast as an integral part of the casing member, but it is within the contemplation of the invention to form it separately if desired. 60

The deflector 24 comprises an annular upstanding wall 25, concavo-convex in cross section, and a circular base 26 which projects into the mouth of the receptacle and is secured to the block 22a by a stud 27 and nuts 28. The annular wall 25 has its lower portion projecting into the casing concentrically thereof and spaced therefrom, and its upper portion spaced above the top of the casing and flared outwardly to project concentrically beyond the casing. This construction provides an annular passageway 29 for the passage of steam from the dome, through the casing, and into the stand pipe. The base 26 75 of the deflector is made of less diameter than the internal diameter of the mouth of the receptacle to provide a passage 30 through which water separated from the steam by the deflector may drain into the receptacle. 80

An auxiliary pipe 31 leads from the conduit 21 through the wall of the boiler, thus enabling the steam and water entering the receptacle to be utilized for operating an auxiliary, not shown, for example a stoker steam jet. It is within the contemplation of the invention to lead the pipe 31 through the wall of the boiler, at any suitable point, to a steam trap (not shown) of any usual or desired type, from which the water can be returned 90 to the usual water supply tank of the boiler.

In Fig. 3 is shown a modified form of construction wherein the pipe 31a communicating with the conduit 21, discharges the water collected in the receptacle 20 directly into 95 the boiler to the rear of a deflector 32 which extends downwardly into the boiler. A check valve 33, is interposed in the pipe 31a, and acts to permit water from the receptacle to flow through the pipe 31a into the boiler, 100

but prevents water in the boiler from passing up the pipe into the receptacle.

By referring to the drawings, it will be noted, that steam in its travel from the dome 12 to the stand pipe 11 flows through the passageway 29 into contact with the concave surface 25a of the wall 25 of the deflector, on which surface the water globules in suspension will be deposited. The steam thus dried 10 is deflected from the surface 25a to the concave surface 19a of the casing, from which latter surface it is deflected into the mouth of the stand pipe. The water deposited on the surface 25a of the deflector flows downwardly 15 through the passage 30 into the receptacle 20 from which it is drained to the outside of the boiler by the conduit 21 and the auxiliary pipe 31.

While one of the preferred forms of construction has been described and shown, it is obvious that many variations in procedure, form, arrangement, and construction of parts, may be resorted to, and the invention, therefore, is not limited to the particular embodiment disclosed, but includes such changes and modifications as come within the spirit and scope of the invention as set forth in the appended claims.

The invention claimed and desired to be 20 secured by Letters Patent is:

1. In an apparatus of the character described for a boiler, the combination of a dry steam pipe adapted to be disposed in the boiler and having a stand pipe section with a 25 main passageway open at its upper end; a water collecting receptacle disposed inwardly of the wall of the passageway and fixed with relation thereto; a deflector supported on the receptacle, said deflector having an annular concave outer face for separating water 30 from steam and conveying said water to the receptacle; an annular wall supported on the said open end of the stand pipe section, said annular wall having a concave inner face confronting and spaced from the concave outer 35 face of the deflector, providing a passageway therebetween fixed in area for the admission of steam to the stand pipe; means connecting the annular wall and receptacle to rigidly hold said receptacle in its said fixed 40 relation and a conduit leading from the receptacle through the wall of the stand pipe section and adapted to be disposed through the wall of the boiler.

2. In an apparatus of the character described for a boiler, water separating means adapted to be disposed within said boiler comprising a band shaped wall, and a deflector having a wall shaped to deflect steam 45 against the band shaped wall, said deflecting wall being spaced from said band shape wall and immovable relative thereto and having a portion disposed within the band shape wall and a portion extending above and 50 laterally beyond the mouth of said band

shaped wall, said spaced walls providing a steam passageway fixed in area; water collecting means, comprising a cup shaped structure disposed beneath said deflector, having its rim projecting above the lower edge of the deflector wall and spaced therefrom to form a water discharge outlet; an open top stand pipe communicating at its top with the steam outlet of said water separating means; 55 a pipe adapted to be disposed within said boiler and to extend therethrough for supplying steam for operating an auxiliary outside of the boiler; and a conduit in said stand pipe, joined at its upper end to said water collecting means and at its lower end to said 60 auxiliary pipe.

3. In a stand pipe for locomotive boilers, a receptacle disposed in the mouth of the pipe immovable relative to the pipe, for receiving water separated from the steam entering the stand pipe; a pipe connecting the receptacle with the outside of the stand pipe; and a water separating wall above the receptacle, immovable relative to the stand pipe, having its lower edge within the 65 boundary of the edge of the mouth of the receptacle, and extending upwardly and outwardly to provide, in conjunction with the upper edge of the wall at the mouth of the stand pipe, an opening fixed in area for the 70 admission of steam from the boiler to the stand pipe.

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