

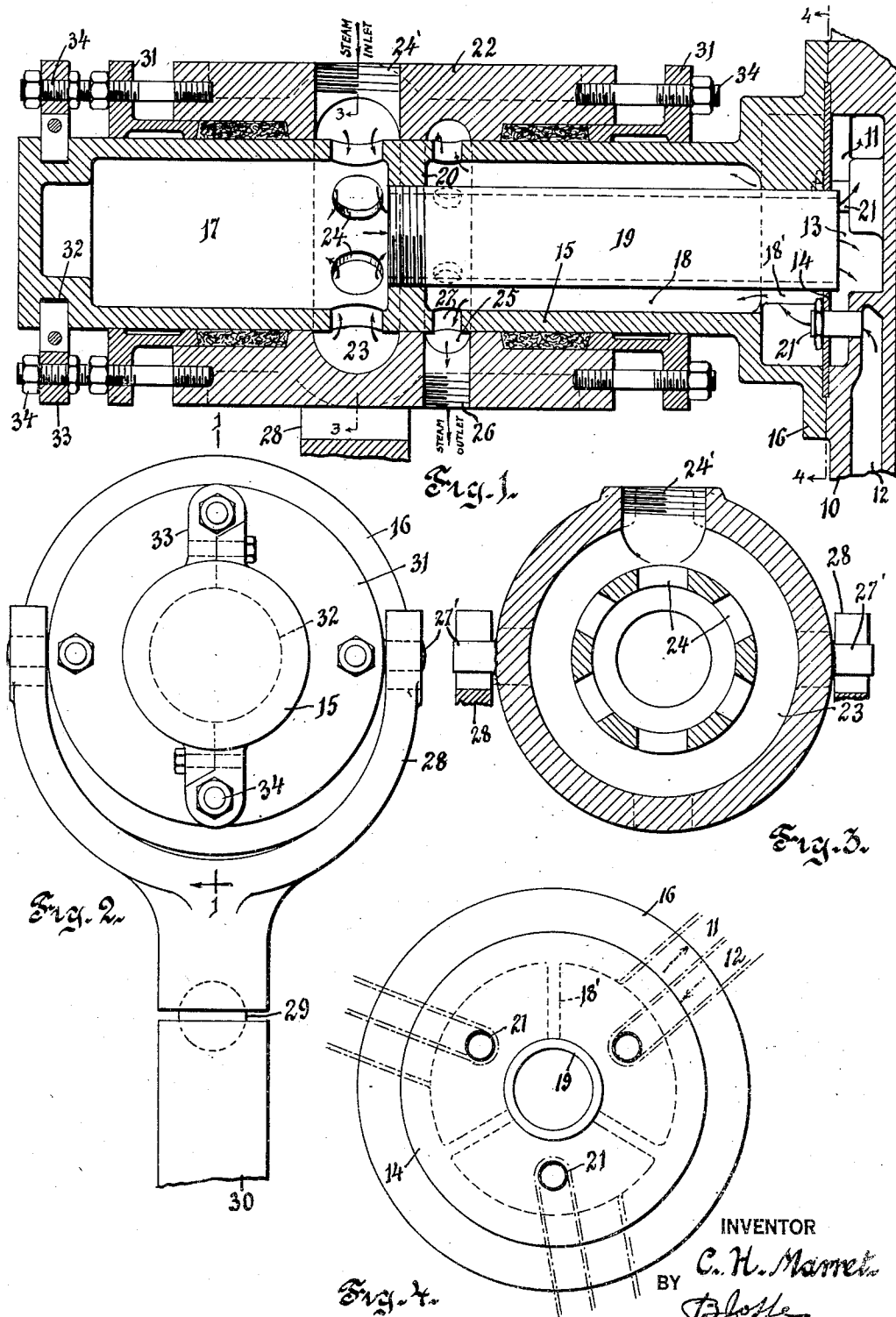
Jan. 20, 1925

1,523,822

C. H. MARRET

STEAM JOINT

Filed May 24, 1924



INVENTOR

C. H. Marret

BY

Attorney

UNITED STATES PATENT OFFICE.

CHARLES H. MARRET, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO LOUISVILLE DRYING MACHINERY CO. INC., OF LOUISVILLE, KENTUCKY, A CORPORATION OF KENTUCKY.

STEAM JOINT.

Application filed May 24, 1924. Serial No. 715,696.

To all whom it may concern:

I, CHARLES H. MARRET, a citizen of the United States, and a resident of the county of Jefferson, city of Louisville and State of Kentucky, have invented a new Steam Joint, of which the following is a full, clear, and exact description.

My invention relates to steam joints for rotary dryers of the type disclosed in Patent #1,139,663, issued to C. E. Geiger, on May 18, 1915.

An object of the invention is to provide a steam joint which is simple in construction and cheap in maintenance.

Another object of the invention is to provide a steam joint which will efficiently dispose of the condensation thereby permitting the run of the dryer to its maximum capacity.

With these and other objects in view, my invention consists in the combination of parts shown in the accompanying drawing and described in the specification and more particularly pointed out in the claims.

In the appended drawing,

Figure 1 is a longitudinal section through the steam joint, one line 1—1, Figure 2,

Figure 2 is an end elevation,

Figure 3 is a section on line 3—3, Figure 1, and

Figure 4 is a section on line 4—4, Figure 1.

Referring to the drawing, 10 is a manifold used with rotary dryers of the type referred to, which has a plurality of radiating steam passages 11 and condensation passages 12. (These passages are indicated in full lines in Figure 1 and in dot and dash lines in Figure 4.) The steam passages 11 of the manifold radiate from a central chamber 13 which is open on the outer face of the manifold. The manifold is recessed at the chamber to receive a plate 14 of the steam joint. The plate 14 also fits a recess at the flange 16 of the housing 15 of the steam joint. When the housing 15 is secured to the manifold at the flange the plate 14 is locked into the recess before referred to.

The housing 15 has a steam chamber 17 and a condensation chamber 18. Through the said chamber 18 passes a tube 19 which is screwed with one end into the wall 20 of the housing 15; the other end of the tube passes through the plate 14 and enters the chamber 13 of the manifold. The wall 20

into which the tube 19 is screwed separates the steam chamber 17 from the condensation chamber 18, which chambers, as will be noted, are aligning.

Preferably, an additional bearing surface is provided for the end of the tube 19 at the plate 14, by forming ribs 18' in the enlarged portion of the condensation chamber 18 which enlargement is at the flange 16 of the housing; the number of ribs being preferably the same as there are condensation passages 12. Therefore, the enlarged portion of the condensation chamber 18 is divided by the ribs into as many sections as there are radiating condensation passages 12 and each of them is connected to a respective section formed by the ribs 18', by a nipple 21. (See Figures 1 and 4.)

The housing 15 bears snugly in a stationary sleeve 22 and through which the said housing 15 projects. The sleeve 22 has an annular chamber 23 which leads to a threaded opening 24' adapted to receive the steam pipe through which steam is admitted to said annular chamber 23. The housing 15 has a series of openings 24 which establish communication between the steam chamber 17 and the annular chamber 23. Through the said openings, therefore, steam is supplied from the annular chamber to the steam chamber 17 of the housing.

The sleeve 22 has another annular chamber 25 which leads into a threaded opening 26 to which a pipe may be connected to carry off the condensation that is delivered to said annular chamber 25 through a series of openings 27 provided in the housing 15. These openings 27 establish communication between the condensation chamber 18 and the said annular chamber 25.

The sleeve 22 has lugs 27' which bear in slots of a fork 28 so that the sleeve, and therefore the housing, can move up and down in said slots of the fork. The fork is connected by a ball and socket joint 29 to a stand 30. The ball and socket joint permits the sleeve, and therefore the housing, to move longitudinally and sideways. It is therefore apparent that the slots and the ball and socket joint provide a universal joint for the sleeve and housing therein. In other words, the joint may be said to be floating.

To prevent leakage between the housing and the sleeve, packing glands 31 are pro-

vided at each end of the sleeve 22. Stud 34 connect the glands to the sleeve. The proper register of the openings 24 and 27 with the corresponding annular chambers 23 and 25, during the rotation of the housing in the sleeve, is maintained by a collar 33 which is made to engage loosely a groove 32 of the housing, preferably provided near the front end of the steam joint. The collar is prevented from turning by securing it to extensions of a pair of studs 34 at the adjacent end. These means, as will be seen, will permit the rotation of the housing of the sleeve but prevent any relative longitudinal displacement of the sleeve and the housing.

It is apparent that the plate 14 separates the steam chamber 13 of the manifold from the condensation chamber 18 of the steam joint. In consequence, there is no back pressure at the point where the condensation is delivered by the manifold to the condensation chamber 18. Therefore, the condensation from the manifold is delivered not only by gravity but also by the pressure of the steam which comes from the chamber 17, passing through the manifold and dryer as it tends to pass out into the condensation passages 12 of the manifold before it can leave. This construction increases materially the efficiency of the dryer, particularly when it is run to its maximum capacity, for the heavy condensation caused in such instances is not blocked in the passages of the dryer by the back pressure at the condensation chamber of the steam joint housing, but, on the contrary, is forced ahead to said chamber by the tendency of the steam to flow from the inlet 24' in the sleeve 22, to the outlet 26 of the said sleeve.

I claim—

1. A steam joint of the class described, comprising a sleeve having a steam inlet and a condensation outlet, means for preventing the sleeve from turning but permitting it to float, a housing revolubly mounted in the sleeve, packing glands between the housing and the sleeve, said housing having a steam chamber with means for establishing a continuous communication with the steam inlet in the sleeve, said housing having a condensation chamber with means establishing continuous communication with the condensation outlet in the sleeve, said housing having a passage from the steam chamber through the condensation chamber, and said condensation chamber having a plurality of passages disposed about the steam passage.

2. A steam joint of the class described, comprising a sleeve having a steam inlet and a condensation outlet, means for preventing the sleeve from turning but permitting it to float, a housing revolubly mounted in the sleeve, packing glands between the housing and the sleeve, said housing having a steam chamber with means for establishing

a continuous communication with the steam inlet of the sleeve, said housing having a condensation chamber with means for establishing continuous communication with the condensation outlet of the sleeve, said housing having an axial passage from the steam chamber through the condensation chamber, and said condensation chamber having a plurality of end passages disposed about the axial steam passage.

3. A steam joint of the class described, comprising a sleeve having a steam inlet and a condensation outlet, means for preventing the sleeve from turning but permitting it to float, a housing revolubly mounted in the sleeve and projecting from both ends thereof, means at one end of said housing for securing it, packing glands for the ends of said sleeve engaging the said housing, said housing having a steam chamber and a condensation chamber, said chambers being disposed in alignment with each other, and the condensation chamber being in proximity of the end of the housing which has the means for securing said housing, said housing having means for establishing continuous communication between the steam chamber and the steam inlet of the sleeve, a tube extending from the said steam chamber through the condensation chamber and out of the housing, said housing having means for establishing continuous communication between the condensation chamber and the condensation outlet of the sleeve, said housing having passages from the condensation chamber to the end of the housing which has the means for securing the housing.

4. A steam joint of the class described, comprising a sleeve having a steam inlet and a condensation outlet, means for preventing the sleeve from turning but permitting it to float, a housing revolubly mounted in the sleeve, packing glands between the housing and the sleeve, said housing having a steam chamber with means for establishing a continuous communication with the steam inlet of the sleeve, said housing having a condensation chamber with means establishing continuous communication with the condensation outlet of the sleeve, means at one end of said housing for securing it, said housing having a passage from the steam chamber through the condensation chamber opening at the end of the housing where it has means for securing it, said condensation chamber having a plurality of passages opening at the same end, and means connecting the sleeve to the housing so that the housing is free to rotate but is prevented from a relative longitudinal displacement with said sleeve.

5. A steam joint of the class described, comprising a sleeve having two spaced annular chambers, one of said annular chambers having a steam inlet and the other a

condensation outlet, means for preventing the sleeve from turning but permitting it to float, a housing revolvably mounted in the sleeve and projecting from both ends thereof, packing glands engaging the ends of said sleeve and the housing, said housing having a steam chamber and a condensation chamber disposed in alignment within the housing, said housing having at one end thereof and in proximity of the condensation chamber means for securing the housing, a tube in the housing extending from the steam chamber through the condensation chamber and out, said housing having a plurality of openings leading from the steam chamber into the annular chamber of the sleeve which has the steam inlet, said housing having also a plurality of openings from the condensation chamber leading into the annular chamber of the sleeve having the condensation outlet, said housing having also apertures extending from the condensation chamber to the end of the housing where it has means for securing it, and means located at the other end of the housing and secured to the sleeve, whereby the housing is free to rotate but is prevented from longitudinal displacement and whereby the apertures in the housing are maintained in register with the annular chambers of the sleeve.

6. In combination with a manifold for a revoluble dryer of a steam joint, said manifold having a central open steam chamber with steam passages radiating from said chamber and condensation passages converging towards the center but not opening into the central chamber, a plate covering the said central steam chamber, said steam joint having a cylindrical housing presenting in alignment a steam chamber and a condensation chamber, said condensation chamber being open at the end remote from the steam chamber, said open end being adapted to be closed by the plate when the housing is secured to the manifold, a tube in the housing extending from the steam chamber through the condensation chamber and the plate whereby said tube establishes communication between the steam chamber of the housing and the central steam chamber of the manifold, a nipple from each of the condensation passages of the manifold through the plate whereby communication is established between the condensation passages of the manifold with the condensation chamber of the housing, a sleeve fitting snugly on to the housing and through which the housing projects, said sleeve having an annular chamber encompassing the steam chamber of the housing and providing an opening for a steam inlet, said housing having openings establishing communication between the annular chamber of the sleeve with the steam chamber of

the housing, said sleeve having also a second annular chamber encompassing the condensation chamber of the housing and said second annular chamber has also an opening forming a condensation outlet from the said second annular chamber, said housing having openings establishing communication between the condensation chamber and said second mentioned annular chamber of the sleeve, a collar engaging the housing at the end in proximity of the steam chamber so that the housing and collar are free to revolve relative to one another but cannot move longitudinally, means for securing the collar to the sleeve, and means engaging the sleeve to prevent it from turning but permitting it to float.

7. In combination with a manifold having steam passages and condensation passages of a steam joint having a housing adapted to be secured to the manifold, said housing having a steam chamber and a condensation chamber, means connecting the steam chamber to the steam passages of the manifold, means connecting the condensation chamber of the housing to the condensation passages of the manifold, a sleeve fitting snugly on to the housing and in which the housing is free to revolve, said sleeve having a steam inlet and a condensation outlet, said housing having means for establishing continuous communication between the steam chamber and the steam inlet of the sleeve, said housing having also means for establishing continuous communication between the condensation chamber and the condensation outlet of the sleeve, means connecting the sleeve to the housing, permitting a rotary motion thereof but preventing a relative longitudinal displacement between the sleeve and the housing, packing glands interposed between the sleeve and the housing, and means for preventing the rotation of the sleeve but permitting it to float.

8. In combination with a manifold of the class described having a steam chamber with passages radiating therefrom and converging condensation passages not connected to the steam chamber of a steam joint having a housing adapted to fit over the central chamber of the manifold, said housing having a steam chamber and a condensation chamber, said condensation chamber being in proximity of the steam chamber of the manifold, a tube extending from the steam chamber of the housing through the condensation chamber thereof and into the central chamber of the manifold, nipples connecting the condensation passages of the manifold to the condensation chamber of the housing, a sleeve fitting snugly over the housing, said sleeve having a steam inlet and an annular chamber in communication therewith, said hous-

ing having means for establishing continuous communication between the steam chamber thereof and the annular chamber of the sleeve, said sleeve having also a condensation outlet and a second annular chamber in communication with said outlet, said housing having means in the condensation chamber to establish communication with the second annular chamber of the sleeve, packing glands at the ends of said sleeve engaging the housing, a collar engaging the housing and sleeve so that the said housing can rotate in said sleeve but is prevented from relative longitudinal displacement in said sleeve, and means associated with the sleeve to prevent it from turning but permitting it to float.

9. In combination with a manifold of the class described having a central open steam chamber with steam passages radiating from said chamber and condensation passages converging towards the center but not opening into the central chamber of a steam joint having a cylindrical housing provided with means for securing it to the manifold over the central chamber, said housing having a steam chamber and a condensation chamber, said condensation chamber being located in proximity of the central chamber of the manifold when the

housing is secured thereto, a tube in the housing extending from the steam chamber through the condensation chamber and into the central chamber of the manifold, a nipple from each of the condensation passages of the manifold into the condensation chamber of the housing, a sleeve fitting snugly on to the housing and through which the housing projects, packing glands associated with the sleeve and housing, said sleeve having an annular chamber and a steam inlet leading thereto, said housing having an opening establishing communication between the annular chamber of the sleeve with the steam chamber of the housing, said sleeve having also a second annular chamber with an opening forming a condensation outlet, said housing having openings establishing communication between the condensation chamber and said second mentioned annular chamber of the sleeve, a collar on said housing and connected to the sleeve so that the housing is free to turn in the collar but is prevented from longitudinal displacement relative of the sleeve, and means associated with the sleeve and preventing it from turning but permitting it to float.

CHARLES H. MARRET.