Aug. 5, 1924. 1,503,823

W. F. FINKL

DRYING TUBE

Original Filed June 16, 1919

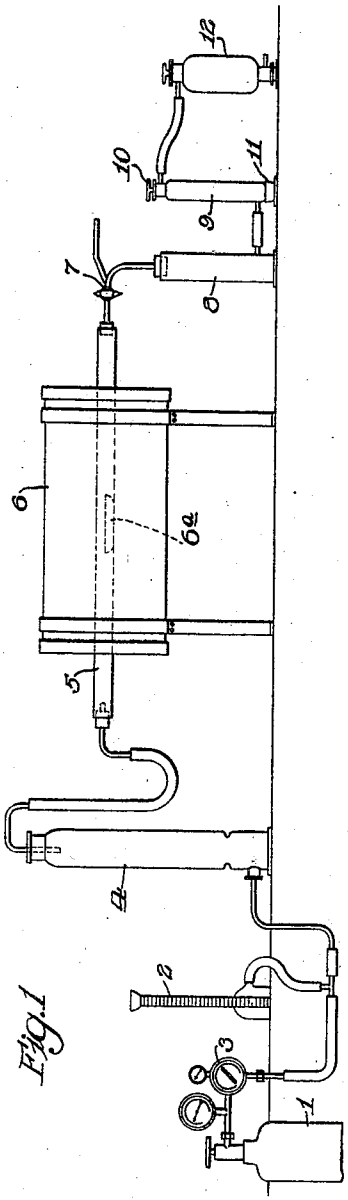


Fig. 1.

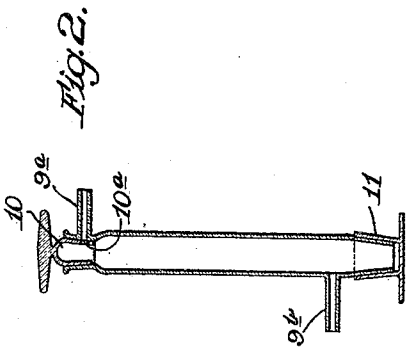


Fig. 2.

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Patented Aug. 5, 1924. 1,503,823

UNITED STATES PATENT OFFICE.

WILLIAM F. FINKL, OF CHICAGO, ILLINOIS.

DRYING TUBE.

Original application filed June 16, 1919, Serial No. 304,466. Divided and this application filed May 20, 1921. Serial No. 471,298.

To all whom it may concern:

Be it known that I, WILLIAM F. FINKL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Drying Tubes, of which the following is a specification.

This invention relates to an apparatus for determining the amount of carbon in ferrous metal and more particularly to drying tubes to be used with apparatus of this class, and has for its object to provide a new and improved form of drying tube.

The invention is illustrated in the accompanying drawings, wherein—

Fig. 1 is a view of one form of apparatus in which the improved form of tube may be used;

Fig. 2 is a sectional view of the drying tube.

Like numerals refer to like parts throughout the several figures.

This application is a division of my application Serial Number 354,466, filed June 16th, 1919.

In order to illustrate the purpose and use to which my invention is applied, I have shown a typical carbon testing apparatus including a suitable source of oxygen such as the oxygen tank 1, and a mercury gauge 2, a pressure reducing valve 3, a dryer purifier jar 4, and a fused silica combustion tube 5, passing through a combustion furnace 6. A suitable combustion boat or receptacle 6ª is placed in the tube 5, as shown, and the sample of ferrous metal such as steel or iron to be tested is placed in this boat.

A three way cock 7 is placed in the stopper at the exit end of the tube 5. This enables the operator to flush the train without passing the gas through the purifying tubes and absorption bulb. The train may also contain a tube 8 containing mesh zinc which takes care of any of the sulphur gases evolved by the combustion.

Referring now particularly to the subject matter of my invention, it will be seen that, the train also contains a drying tube 9 filled with phosphoric anhydride. This drying tube is provided at the top with an upper stopper 10 packed with asbestos to prevent fine particles of the anhydride from passing over into the absorption bulb. As the anhydride liquifies it drops down through the glass wool into the lower stopper 11. This lower stopper is arranged as shown in Fig. 2 so that it engages the exterior of the tube 9. This prevents the anhydride from getting between the stopper and the face of the tube which it engages. The absorption bulb 12 is the last element illustrated in the combustion train, and may comprise any suitable bulb such as that shown which forms the subject matter of my Patent #1,382,072, issued June 21, 1921.

In the operation of the device the weighed sample of ferrous metal to be tested is put in the boat 6ª and the boat is then placed in the combustion zone of the furnace as shown in Fig. 1. The sample of ferrous metal is burned in the presence of oxygen. The carbon of this sample is then converted into carbon dioxide which is forced through the drying tube 9, and thence through the absorption bulb 12 where it is absorbed by the absorbent material therein. The absorption bulb is then weighed in the usual manner to ascertain its gain in weight and this gain represents the amount by weight of carbon dioxide produced by the burning of the sample.

It will be noted that the drying tube 9 is open at both ends and that it has an upper closure or stopper 10 which fits into the body portion, and that it has a lower closure or stopper 11 which is hollow and into which fits the end of the body portion so that the material in the drying tube is prevented from getting between the engaging faces of the tube and the stopper. It will further be noted that there is a laterally projecting part 9ª at the top of the body portion and integral therewith which is hollow and which communicates with the body portion, and that there is also a laterally projecting part 9ᵇ near the bottom of the body portion which is hollow and which communicates therewith. The hollow of both laterally projecting parts form passageways by means of which communication may be had between the body portion 9 and the atmosphere or other devices. The laterally projecting portion 9ª is opposite the stopper 10, and the stopper has a passageway or opening 10ª therethrough. When the stopper is turned to bring the opening 10ª opposite the laterally projecting part 9ª, said tubular portion communicates with the body portion of the drying tube, and when the stopper is turned to another position, the laterally projecting

part 9a is closed so as to shut off the communication between it and the body portion, and thus shut off the passage of material through the drying tube.

I claim:

1. A drying tube having a body portion, an upper stopper therefor, a lower removable stopper therefor forming a base for said tube, the lower end of the drying tube projecting into the interior of said lower stopper so that the lower stopper engages the outer face of the drying tube, whereby the material in the drying tube is prevented from getting between the engaging faces of the tube and stopper.

2. A drying tube having a body portion open at both the top and the bottom, two closures one at the top and the other at the bottom, the lower closure fitting on the outside of the body portion, whereby the material in the drying tube is prevented from getting between the engaging faces of the body portion and the closure, and an inlet and an outlet for said body portion both being above said lower closure.

3. A drying tube having a body portion open at both the top and the bottom, two closures one at the top and the other at the bottom, the lower closure fitting on the outside of the body portion, whereby the material in the drying tube is prevented from getting between the engaging faces of the body portion and the closure, and an inlet and an outlet for said body portion, both above said lower closure, said top closure acting as a control valve to control the passage of material through the body portion.

4. A drying tube having a body portion and open at the top and the bottom, a stopper at the top which fits into the body portion, a hollow tubular portion integral with said body portion at the top, a hollow tubular portion integral with said body portion near the bottom thereof, and a hollow stopper for the bottom into which the end of the body portion fits and which engages the outer face of the body portion so that the material in the body portion is prevented from getting between the engaging faces of the body portion and the stopper.

5. A drying tube having a body portion open at both the top and the bottom, two closures, one at the top and the other at the bottom, the lower closure forming the base of said tube and fitting on the outside of the body portion, whereby the material in the drying tube is prevented from getting between the engaging faces of the body portion and the closure, said tube provided with two laterally projecting portions having passageways therethrough, the lower portion being located above the bottom closure and the other near the other end, one of said closures adapted to control one of said passageways.

Signed at Chicago, county of Cook, and State of Illinois, this 18th day of May, 1921.

WILLIAM F. FINKL.