

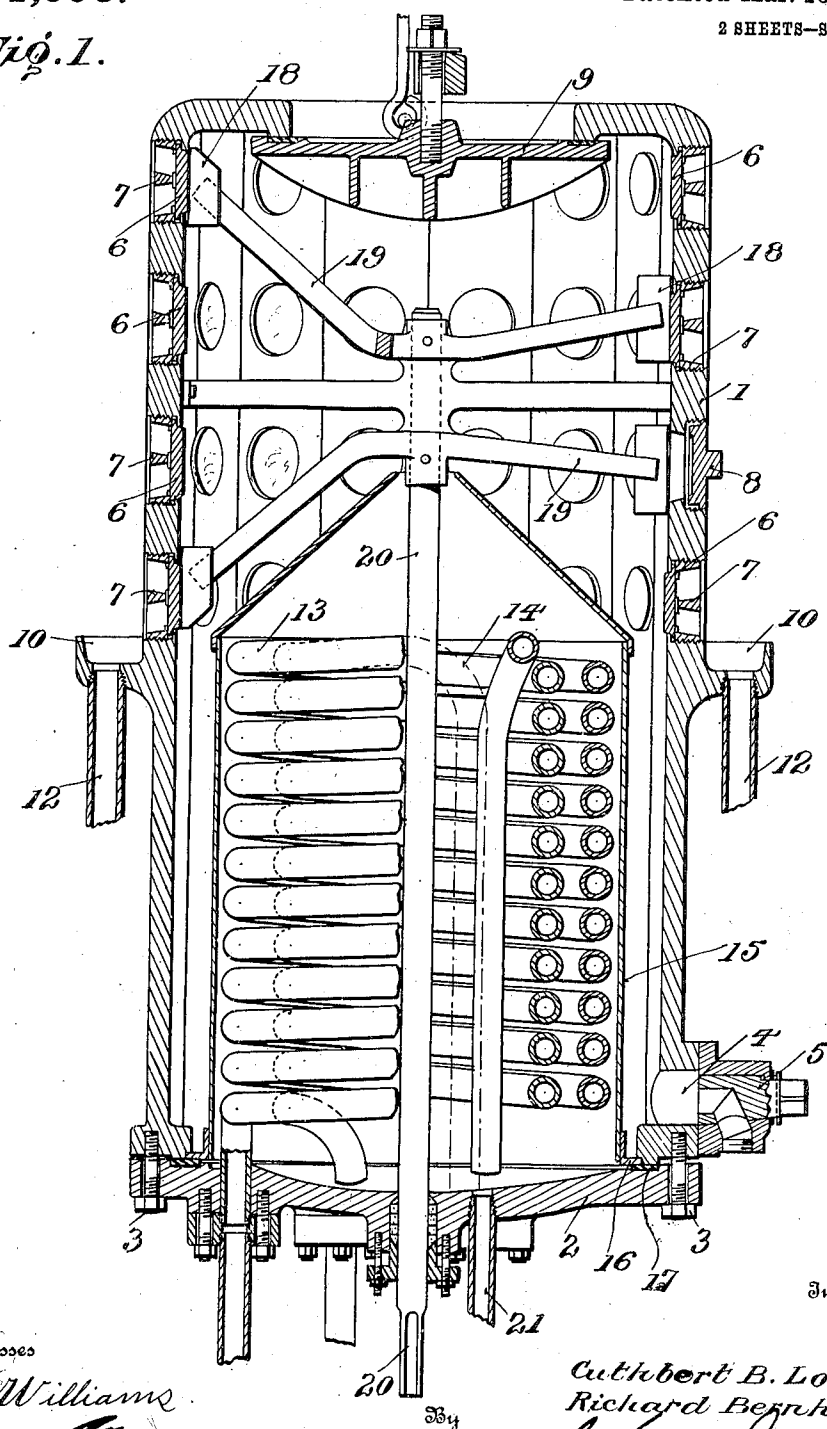
C. B. LOWRY & R. BERNHARD.
 SECURITY TRUST COMPANY, ADMINISTRATOR OF C. B. LOWRY, DEC'D.
 MEANS FOR REMOVING FREE CARBON FROM COAL TAR.
 APPLICATION FILED MAY 26, 1908.

951,993.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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Fig. 2.

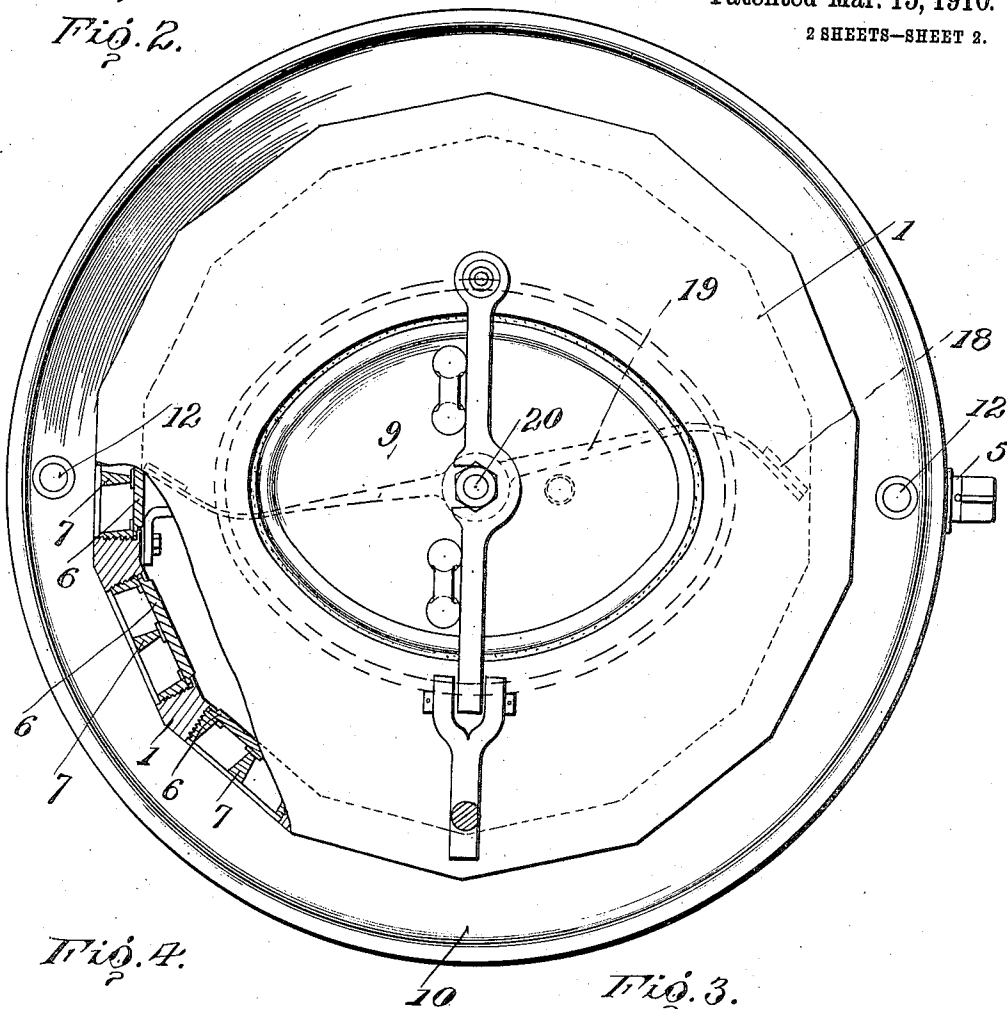


Fig. 4.

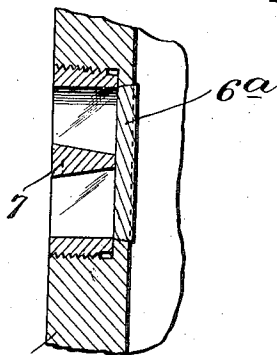
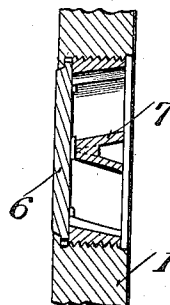


Fig. 3.



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UNITED STATES PATENT OFFICE.

CUTHBERT B. LOWRY, OF LEXINGTON, KENTUCKY, AND RICHARD BERNHARD, OF CUDAHY, WISCONSIN; SECURITY TRUST COMPANY, ADMINISTRATOR OF SAID LOWRY, DECEASED, ASSIGNOR TO STOUGHTON A. FLETCHER, TRUSTEE, OF INDIANAPOLIS, INDIANA.

MEANS FOR REMOVING FREE CARBON FROM COAL-TAR.

951,993.

Specification of Letters Patent.

Patented Mar. 15, 1910.

Application filed May 26, 1908. Serial No. 435,061.

To all whom it may concern:

Be it known that we, CUTHBERT B. LOWRY, of Lexington, in the county of Fayette, State of Kentucky, and RICHARD BERNHARD, of Cudahy, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Means for Removing Free Carbon from Coal-Tar; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide simple and highly efficient means for separating free-carbon from coal-tar, specifically, to carry out the process embraced by application for patent filed February 27, 1908, Serial No. 418,073.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view. Fig. 2 is a top view with parts broken away, and others in dotted lines. Fig. 3 is an enlarged sectional view. Fig. 4 shows a slight modification.

Referring to the drawings, 1 designates a vessel, preferably cylindrical, and 2 a bottom plate, these parts being united by bolts 3. The lower portion of the vessel is practically imperforate, save for an opening 4 for the sludge outlet which opening is controlled by a cock 5. In practice we employ several outlets and control each by a separate cock.

The upper part of the vessel constitutes the filtering chamber and is equipped with a medium through which coal-tar is caused to pass so that it may be collected, devoid of free-carbon, at the outside of the chamber. For this purpose we have shown the latter formed with several circumferential rows of spaced-apart openings, each opening being closed by a wooden disk 6, preferably beveled on its periphery and retained by a spider 7 bearing against a flange thereof. The disks may be formed of cotton wood or yellow poplar, or other comparatively soft wood, but preferably one of soft fiber. The wood is cut at right angles to the grain. The spiders are screwed into the openings

and may be readily adjusted to suit the disks. In the event of any opening not being used, it may be closed by a plug 8, shown at the right of Fig. 1. As shown in Fig. 4 the disks 6^a may be inserted in the openings from the inside of the filter and their edges being beveled the pressure within the vessel will tend to force them more firmly against their seats, the spiders then serving to prevent the disks from breaking or being forced out.

In the top of the vessel is a large manhole normally closed by a door 9. Surrounding the vessel at a point beneath the lowest row of openings, is a circumferential trough 10, which is shown as being integral with the vessel. This trough collects the coal-tar, deprived of free-carbon, on the exterior of the vessel, and such tar is conveyed away through a pipe or pipes 12.

To effect the filtration of the coal-tar the latter must be heated to approximately 250° F., the temperature depending upon the consistency of the coal-tar and the resistance of the filtering medium. The coal-tar may be heated before it is introduced into the filter, but it is preferable, for many reasons, to have all the parts consolidated in one structure. Hence within the imperforate portion of the vessel we locate two heater coils 13 and 14, which are connected to bottom 2 by heavy flanges capped both inside and out to enable steam connections to be readily made. These coils are located within a heating chamber, that is, they are surrounded by a casing 15 of thin metal having at its bottom a flange 16 which is held against a gasket 17 by the bottom edge of the filtering vessel. The object of this internal chamber is to prevent any of the free-carbon, after being filtered from the coal-tar, from contacting with the heating coils upon which it would bake and hence impair their efficiency.

The separation of the free-carbon from the coal-tar is effected by filtration through the wooden disks. While all the stable and preservative properties of the tar are permitted to filter through the disks, the free-carbon (which alone renders coal-tar, in its normal state, incapable of use as a wood preservative) is separated from the other constituents. While we prefer to use wood as the filtering medium, yet we do not confine our-

selves thereto, since any fibrous substance of such consistency as to serve the purpose herein indicated may be employed.

For the purpose of removing or scraping the carbon from the inner faces of the several disks, we provide flexible scrapers 18, carried by arms 19, mounted on a shaft 20 extending longitudinally within the vessel and squared at its outer end so that by the application of a wrench or other suitable tool the shaft may be readily rotated, the result being that the scraper applicable to each row of disks will remove the carbon deposits from the inner faces thereof, whereon it collects in the form of thick scum or heavy solution. When the scrapers are actuated this substance will accumulate in the settling chamber surrounding the heating chamber where there is no agitation. The heavy residue may be withdrawn intermittently through cock 5. If any of the free-carbon should bake and solidify in the settling chamber, it may be removed by a scraper inserted through the top manhole, and if need be the vessel as a whole may be readily removed from the bottom plate without disturbing any of the steam pipe connections. If it be necessary, access may then be had to the coils by merely removing the heating chamber casing.

In practice, coal-tar is supplied through pipe 21, leading from a force-pump (not shown.) The coal-tar is heated by steam admitted into the coils, and while the expansion consequent upon the heating is in some instances sufficient to insure the percolation of the coal-tar through the wooden disks, yet we preferably place the coal-tar under pump pressure. The coal-tar will filter through the several disks, but the free-carbon will be arrested at the surfaces thereof. The former will fall into the surrounding trough 10, while the carbon after being scraped from the disks will accumulate in the settling chamber without danger of baking on the heating coils.

We claim as our invention:—

1. Means for separating free-carbon from coal-tar comprising a closed vessel having an outlet opening in the upper portion of the wall thereof, a filtering medium composed of a block of soft wood located over such outlet opening, means within the lower portion of the vessel for heating coal-tar, and a receptacle on the outside of the vessel beneath said opening for receiving the coal-tar after it is deprived of the free-carbon.

2. Means for separating free-carbon from coal-tar comprising a closed vessel having an outlet opening in the upper portion of

the side thereof, a filtering medium composed of a block of soft wood located over such outlet opening, means within the lower portion of such vessel for heating coal-tar, revoluble means within the upper portion of the vessel for removing free-carbon from the surface of such block, and a receptacle on the exterior of said vessel beneath said opening for receiving the coal-tar after it is deprived of the free-carbon.

3. Means for separating free-carbon from coal-tar comprising a closed vessel having a circularly arranged row of openings in the upper portion of the side thereof, disks of wood fitted in such openings, spiders preventing the outward movements of such disks, a revoluble scraper within the vessel for engaging the inner faces of such disks, and means in the lower portion of the vessel for heating coal-tar.

4. Means for separating free-carbon from coal-tar comprising a closed vessel having openings formed in the upper portion of the side wall thereof, disks of wood fitted in said openings, means in the lower portion of the vessel for heating coal-tar, and a circularly-arranged trough on the exterior of the vessel beneath said openings.

5. Means for separating free-carbon from coal-tar comprising a closed vessel having its lower part imperforate and its upper part formed with a series of circularly-arranged openings, disks of wood fitted in said openings, a trough surrounding said vessel beneath said openings, heater coils within the vessel, a centrally-arranged shaft and a scraper carried thereby for scraping the inner faces of said disks.

6. Means for separating free-carbon from coal-tar comprising a vessel having a lower imperforate portion and an upper filtering portion, a bottom, heating coils mounted on said bottom, a casing surrounding said coils forming a heating chamber, a supply pipe opening through said bottom within said heating chamber, and means for detachably securing the lower ends of said casing and vessel to said bottom.

In testimony whereof, we have signed this specification in the presence of subscribing witnesses.

CUTHBERT B. LOWRY.

RICHARD BERNHARD.

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