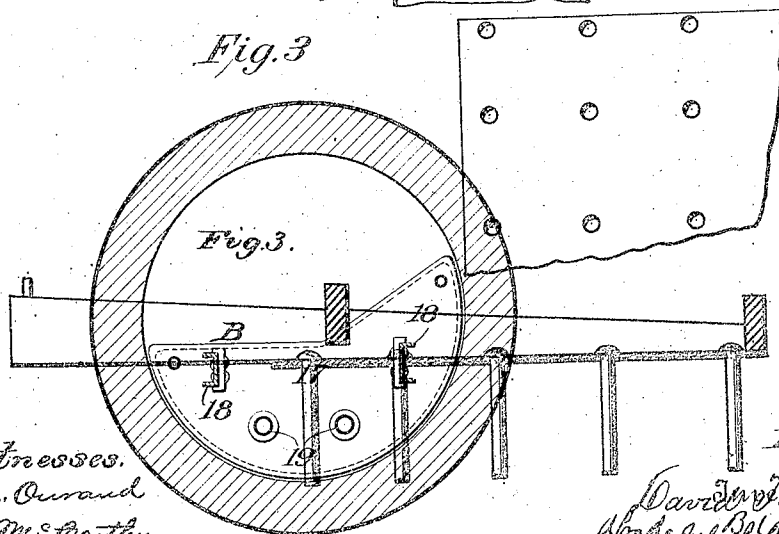
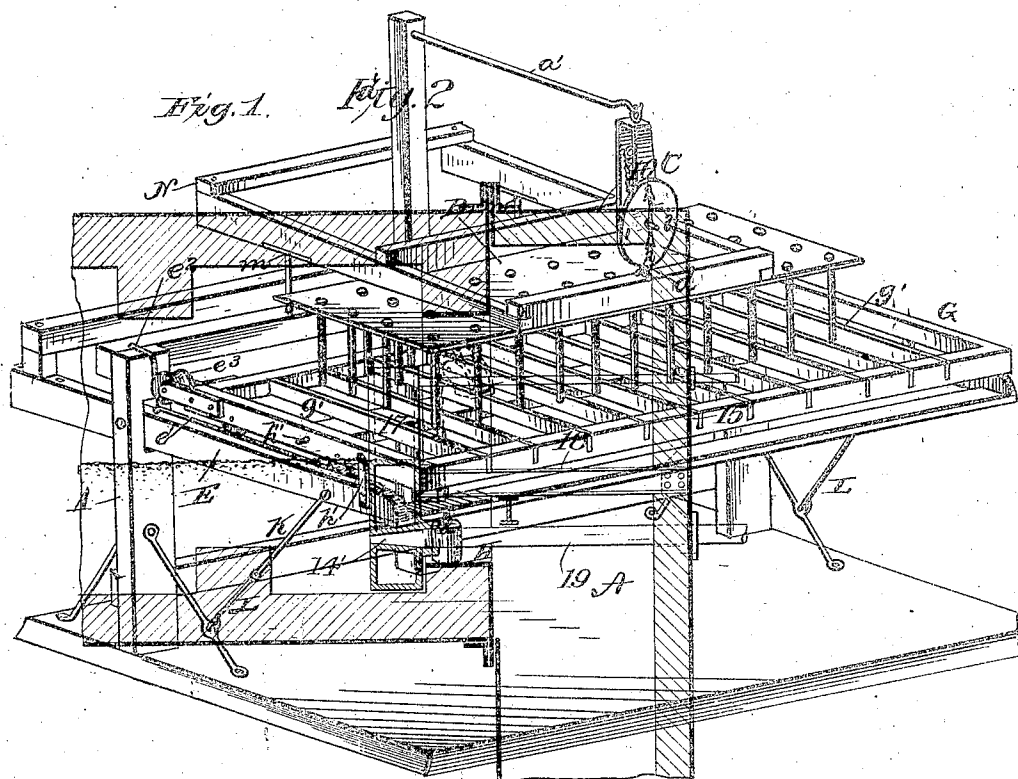


3 Sheets--Sheet 1.

MACHINE FOR MEASURING THE AREA OF HIDES, SURFACES, &c.
 Jan. 8, 1924. 1,480,152
 No. 258,969. A. B. COX Patented June 6, 1882.

GAS PRODUCER

Original Filed April 14, 1917 2 Sheets-Sheet 2



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Patented Jan. 8, 1924.

1,480,152

UNITED STATES PATENT OFFICE.

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GAS PRODUCER.

Application filed April 14, 1917, Serial No. 132,041. Renewed June 5, 1923.

To all whom it may concern:

Be it known that I, ABRAHAM B. COX, a citizen of the United States, residing at Cherry Valley, Otsego County, New York, have invented new and useful Improvements in Gas Producers, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 shows a section of a machine embodying my invention; Fig. 1^a shows in section a detail of the tuyère; Fig. 1^b is a partial cross section of the machine showing the lifting blades; Fig. 2 shows a partial section of a machine embodying a modification of my invention, and Fig. 3 is a rear elevation thereof.

My invention relates to machines which are capable of use in gasifying materials, and consists in the apparatus for gasifying materials which I shall hereinafter describe and claim.

Referring to the drawings, 2 is a metal shell or casing adapted to be rotated by any well known means, having a refractory lining 3, which may be equipped with buckets or lifting blades 4, for lifting the material and distributing it as the vessel revolves. At the feed end 5 of the vessel is a conveyor 6, by which the material is admitted, and at the discharge end is a fixed head 10, in the bottom of which is a settling basin 11, and into which the ash drops as it is discharged from the cylinder. At the feed end is an outlet 12 for the gas.

To prevent the entrance or leakage of air or gas between the moving casing 2 and the stationary parts at each end I provide flexible joints 13. The conveyor 6 is also so designed that it will contain sufficient material to prevent any leakage of air therethrough.

At the discharge end of the conveyor is a tuyère 14, which is secured to the outer wall 15 of the head 10. The inner end projects into the interior of the vessel and has a downwardly-turned nozzle 14^a. The tuyère is preferably provided with a water cooled jacket 14^c as is shown in Fig. 1^a. Water is supplied through the pipe 14^d and withdrawn through the nozzle 14^a. The nozzle 14^a extends some distance below the top of the fuel bed and serves to aerate and disturb the fuel and thereby assists in promoting combustion as the vessel revolves. Access to the interior of the vessel is obtained through a door 16 in the wall 15.

In the production of producer gas in the apparatus just described, combustion is started in the interior of the producer, fuel in the form of producer gas being supplied if desired through the tuyère 14. When the interior of the producer has become hot enough, fuel is fed through the screw conveyor 6 into the vessel and the vessel is set in rotation. The rotation of the vessel constantly exposes new surfaces of the material to promote combustion and this action is greatly assisted by the air or other oxygen bearing agent from the tuyère 14 which, because of its downwardly directed end, always delivers a blast downwardly into the fuel bed and thus generates a zone of intense combustion immediately thereabout. The tuyère 14 by reason of its downwardly directed end 14^a, stirs also the material as the vessel rotates and thereby assists in promoting complete combustion. With light fuels such as coke breeze, slack, etc., the blast from the tuyère tends to blow the materials away from the nozzle, but this is overcome by having the revolution of the vessel timed to keep bringing new fuel into the zone of combustion.

The gas passes through the outlet 12, near the fuel inlet end while the waste material passes out through the discharge end of the vessel through the fixed head into the settling basin 11.

When the producer is used in the manufacture of water gas, air is supplied through the tuyère 14 to promote combustion, and when the fuel has become highly heated, steam is blasted in through the tuyère. If desired, a combusting agent for the water gas, such as oil, may be introduced with the steam.

The apparatus just described is particularly suitable for use in gasifying such finely divided fuels as coke breeze and lignite slack, which are usually regarded as waste materials. With such materials a very complete gasification has been obtained.

In Figs. 2 and 3, I have shown a modified form of apparatus suitable for carrying out my invention, in which the lower portion of the discharge end of the vessel is obstructed by a water-cooled segment 17, which is mounted on brackets 18 on the wall 15' of the head 10'. Tuyères 14' are provided in the segment, to permit an oxygen

bearing agent to be blown into the fuel bed. The oxygen bearing agent is supplied through the pipes 19.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described, or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

1. A gas producer comprising a rotary vessel having an intake for the fuel at one end and a discharge opening for the waste material at the other end, a stationary tuyère projecting through the discharge end of the vessel having a downwardly turned water cooled nozzle projecting downwardly into the body of the fuel and arranged to direct an oxygen-bearing agent down into the body of the fuel beneath the nozzle to promote gasification below the nozzle and also to stir the material mechanically as the vessel revolves.

2. A gas producer comprising a rotary vessel having an intake for the fuel at one end and a discharge opening for the waste material at the other end, a stationary

tuyère projecting through the discharge end of the vessel having a downwardly directed water cooled nozzle projecting into the body of the fuel, through which an oxygen-bearing agent is directed downwardly into the body of the fuel and below its surface, said nozzle being also adapted to stir the fuel mechanically.

3. A gas producer comprising a rotary vessel having at one end an intake for the fuel and at the other end a wall adapted to bank up the material in a deep fuel bed at that end, a water cooled tuyère at the discharge end adapted to stir up the material and having an orifice through which an oxygen-bearing agent is distributed beneath the surface of the fuel, and an outlet for the waste material through which the waste material from the surface of the fuel bed is discharged.

4. A gas producer comprising a rotary vessel having an intake for the fuel and a discharge opening for the waste material, the discharge opening being approximately on a level with the normal surface of the fuel bed, and a tuyère at the discharge end having an orifice adapted to distribute an oxygen bearing agent beneath the surface of the fuel.

ABRAHAM B. COX.