

No. 701,860.

Patented June 10, 1902.

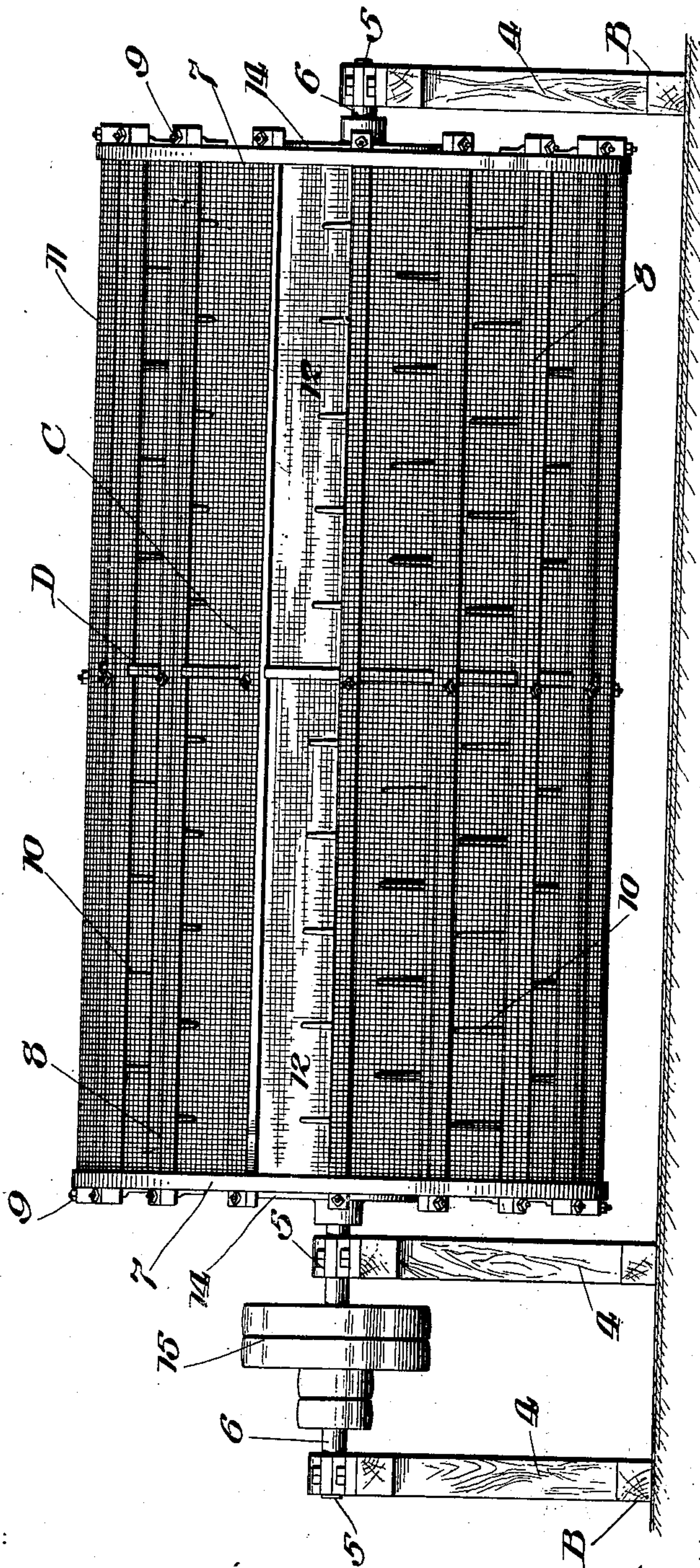
A. N. DUBOIS.
OXIDIZING APPARATUS.

(Application filed Mar. 12, 1900.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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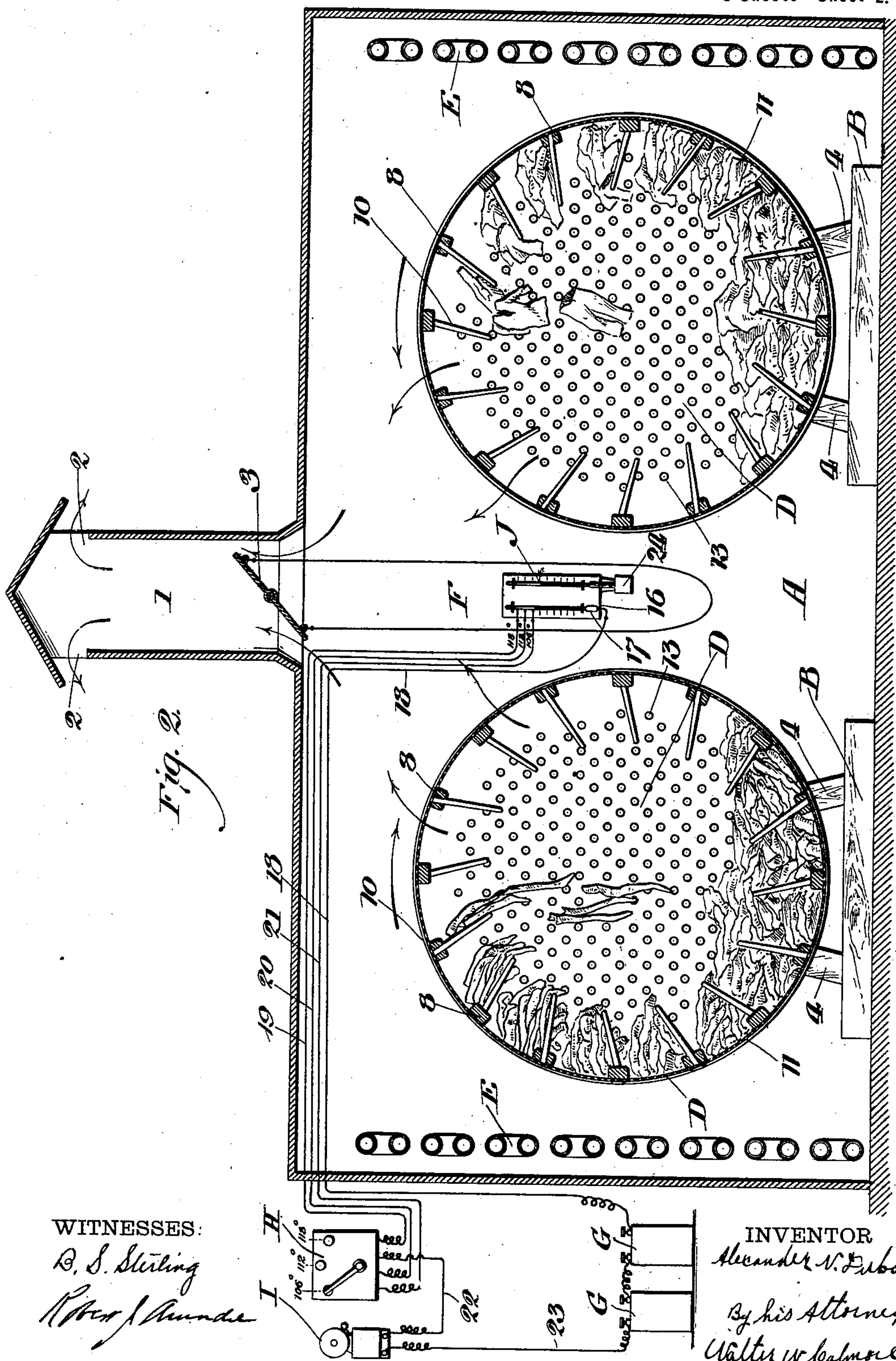
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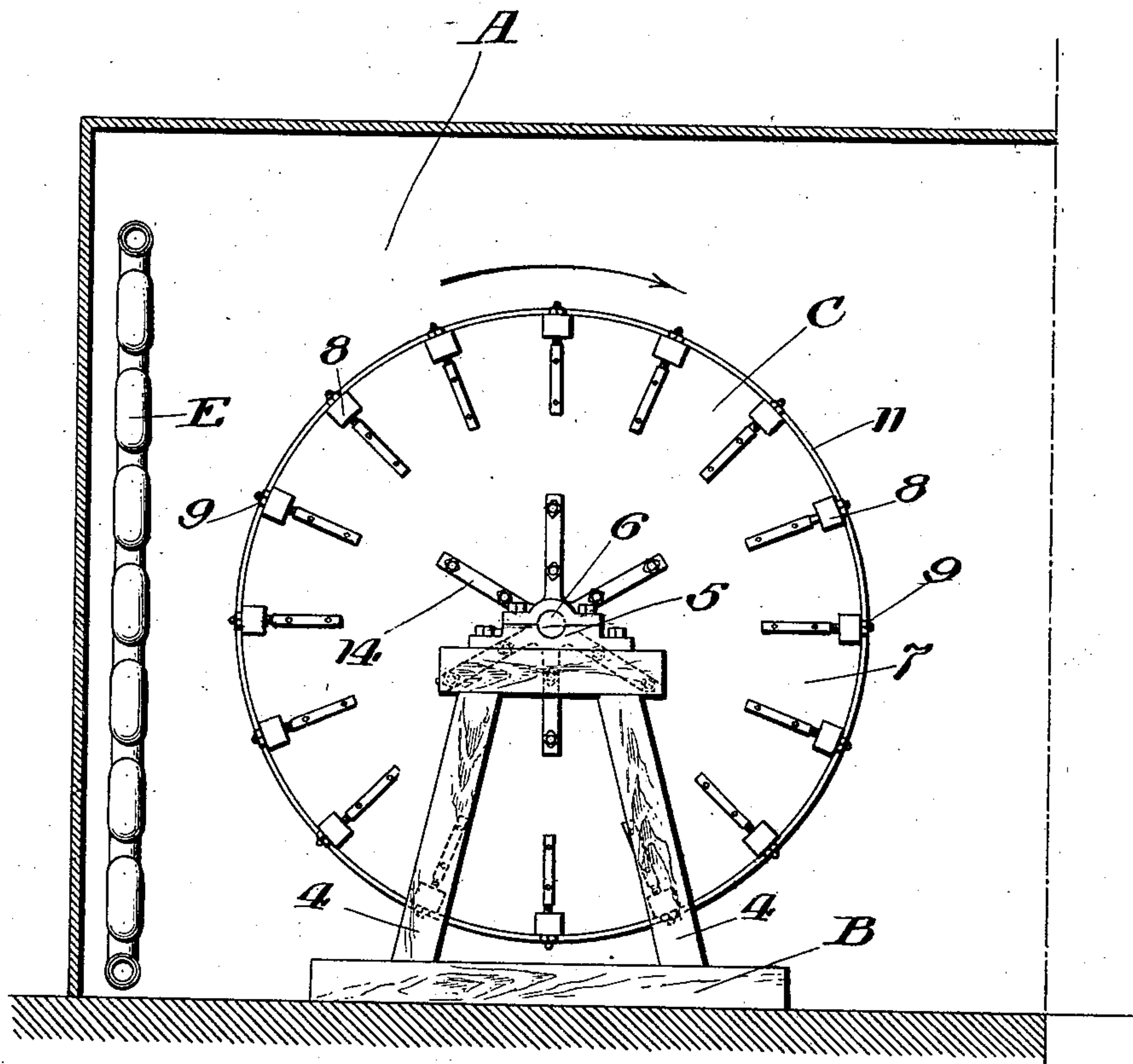
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Fig. 3.



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UNITED STATES PATENT OFFICE.

ALEXANDER N. DUBOIS, OF PHILADELPHIA, PENNSYLVANIA.

OXIDIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 701,860, dated June 10, 1902.

Application filed March 12, 1900. Serial No. 8,291. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER N. DUBOIS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Oxidizing Apparatus for the Use of Dyers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to improvements in oxidizing apparatus for the use of dyers, and more particularly to that class of oxidizers wherein the goods or materials after being immersed in the dye liquor are placed in a drum or other receptacle and subjected to attrition and permeated by currents of air and gases at a given temperature.

The objects of the invention are, first, to provide improved means by which a more even circulation of the heated gases may be directed throughout the drum; second, to provide means to permit any excess of heat or gases to escape from the chamber containing the drum; third, to provide improved means whereby the temperature and degree of moisture within the chamber may be relatively ascertained, and, finally, to afford a more positive attrition of the goods in order to produce a lisle finish. I attain these objects by the constructions shown in the accompanying drawings, wherein—

Figure 1 is a view of my apparatus for fast-black dyeing. Fig. 2 is a transverse sectional view of the complete apparatus, showing the ventilator and means for ascertaining the temperature and humidity of the interior of the chamber. Fig. 3 is an end view in elevation.

Referring to the drawings, A designates a suitable casing or compartment, in which the oxidizing-cylinders are placed. This casing is constructed with side walls and ceiling of any material impervious to the gases circulating within the compartment. In the ceiling is a ventilator consisting of a dome or air-shaft 1, adjacent to the top of which are openings 2 to permit of the escape of gases. Within the shaft 1, at any suitable point, is a damper 3, the closing or opening of which either retains the gases and heat within the compartment or allows them to escape into the open air.

Within the compartment A is the main sup-

porting-frame B of the drum, consisting of standards 4. These standards are provided at the top with bearings 5, in which are journaled the trunnions 6 of the cylinder C.

The drum or oxidizing-cylinder C consists of the heads or end pieces 7, of any suitable material, connected to each other by strips 8. These strips 8 are inserted in holes bored in the rim of the end pieces 7 and allowed to project a sufficient distance beyond them to be securely held by means of the flat bolts 9. Upon the strips at desired intervals are fastened conical pins or projections 10, inclined in the direction of the rotation of the drum at an angle of approximately forty-five degrees and of sufficient length to pick up the material as it falls into the bottom of the drum and hold it until it reaches the top. The inclination of the pins at an angle insures elevation of the material to the top of the cylinder A before it can fall, and thus a greater attrition is attained than if the pins were set at right angles to the strips. Over the strips is stretched a wire cover 11, which retains the goods in the cylinder. This cover is of open wire mesh, so as to allow the hot air and gases to have free circulation throughout the interior of the cylinder.

I provide the cylinder with two doors 12, so as to afford ready access to the interior of the cylinder. These doors are hinged at one side and on the opposite side are supplied with a suitable fastening means to hold them closed while the cylinder is being rotated.

Within the cylinder C, at the center thereof and parallel to the end pieces 7, is a partition D, formed with perforations 13, through which the hot air and gases circulate and causing them to be more evenly dispensed throughout the cylinder. This partition is held in position by bolts let through the strips 8.

The trunnions 6 are suitably secured to the heads of the cylinder by means of spiders 14. One of these trunnions has securely fastened thereon pulleys 15 of various sizes in order to impart a rapid or slow motion to the cylinder.

About the sides of the compartment are steam-radiator pipes E, which supply the necessary heat to the cylinders. These steam-pipes are much more preferable to heat de-

rived from an outside source, since heated air forced into the compartment carries with it more or less hydrogen, which, uniting with the chlorine of the dye, forms hydrochloric acid in a vaporous form, which tends to tender and disintegrate the fibers of the material.

At a suitable point within the compartment A is fixed an electric thermometer F to indicate the degree of temperature to which the goods are subjected. This thermometer has contacts upon its scale at the points where it is desired. I show it in the drawings as having contacts at 106°, 112°, and 118°. At the base of the mercury-bulb 16 is also a contact 17, which touches the mercury-column, from which a wire 18 runs to the battery G. From the contacts on the scale of the thermometer wires 19 20 21 run to a switchboard H, upon which are contacts registering with the points of contact upon the thermometer-scale. From the switchboard a wire 22 runs to a bell I, which is in turn connected by a wire 23 to the battery G, thus completing the circuit. When the attendant desires that a certain degree of heat in the compartment should not be exceeded, he sets the switch at the point desired. When the heat in the compartment causes the mercury in the thermometer to rise to the point indicated on the switchboard, the circuit is completed and the bell rings. If the temperature is too high, the damper in the ventilator is opened, allowing the surplus heat to escape.

If the lisle finish is produced in an oxidizing-room with an excess of moisture, the texture of the cloth is rendered tender, and to remedy this defect I fix a hygrometer J in the compartment in order to ascertain at what point the dry heat may be increased without danger to the goods. The bulb of the hygrometer is kept moist by water held in a small cup 24.

The operation of the device is as follows: The articles to be oxidized are placed in the cylinder, the door 12 is closed, and the cylinder revolved. As the cylinder revolves the pins 10 carry the contents to the top of the cylinder, when they slide from the pins and fall to the bottom. This constant motion of the cylinder and dropping of the articles cause the air and gases to more quickly act upon

the die, and oxidizing is consequently more rapid than by the old method.

What I claim is—

1. In an apparatus for oxidizing dyed material, the combination with an inclosing compartment; of a pervious, revoluble drum or cylinder, and air-feeding means arranged therein, an alarm for indicating when the temperature within the compartment reaches a predetermined point, said device comprising a thermometer arranged within said compartment and provided with a plurality of contacts; a bell, battery and switchboard arranged upon the exterior of the compartment, said switchboard having contacts, and a controlling-switch, and wires extending to the exterior through the wall of the compartment and connected to the contacts of the thermometer with the bell, battery and contacts of the switchboard, together with a ventilator for allowing the heat to escape from the compartment, substantially as described.

2. In an oxidizing apparatus, an inclosing structure containing a revoluble pervious drum, means for heating the air upon the interior of said structure to the exclusion of outside air, means for sealing said structure and excluding and admitting air to the interior of said structure and regulating the discharge of heat therefrom, a thermostat within the inclosing structure, an indicator on the exterior, electrical connections between the thermostat and indicator, and an adjustable controlling device in circuit with the thermostat, indicator and connections for regulating the passage of an electrical current to adapt the indicator to sound at different predetermined temperatures, whereby the indicating means may be adjusted from without while the chamber is sealed, so that when the temperature reaches a given point the sealing means may be opened to admit air to, and allow heat to discharge from, the inclosing structure, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

ALEXANDER N. DUBOIS.

Witnesses:

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