

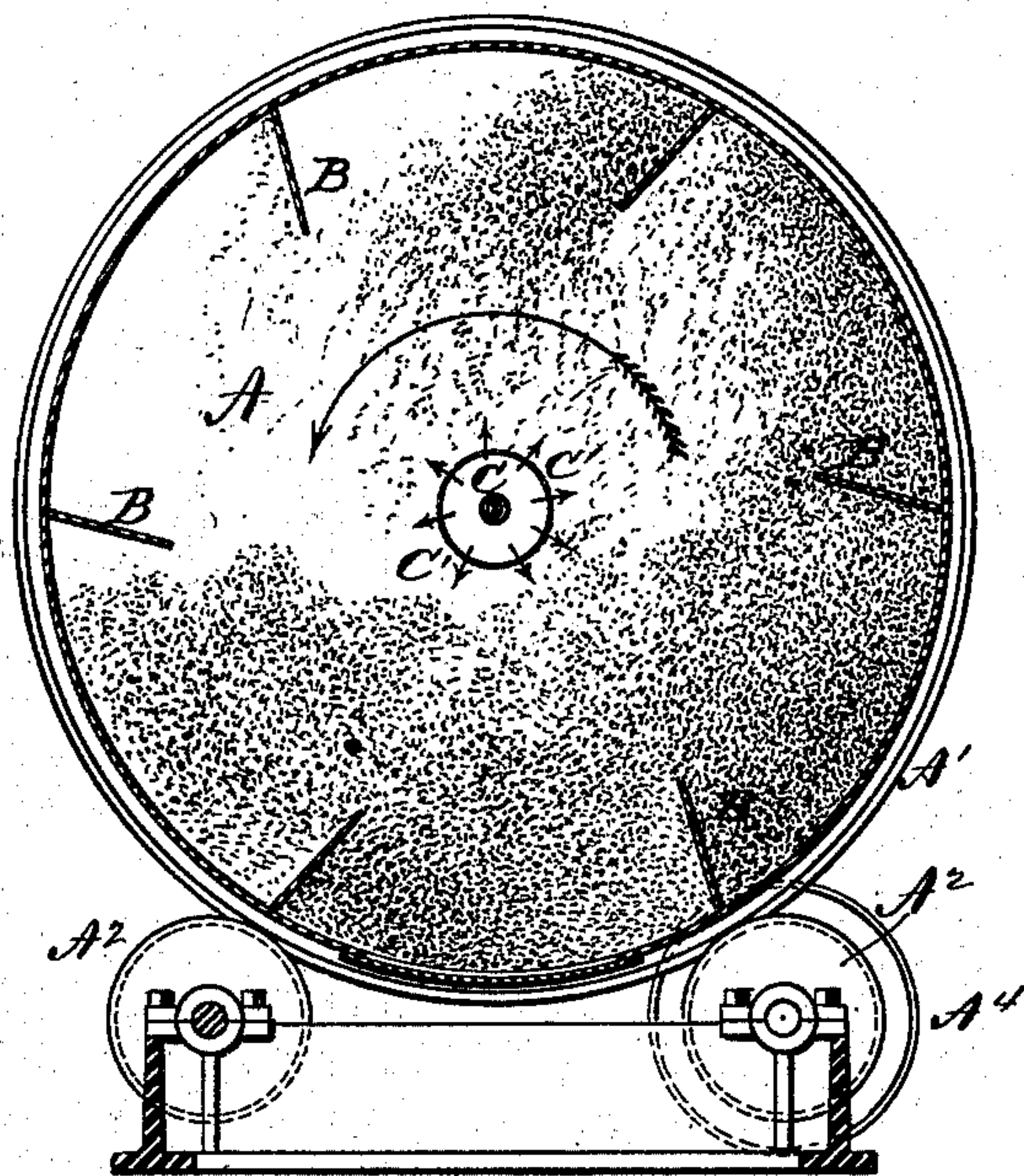
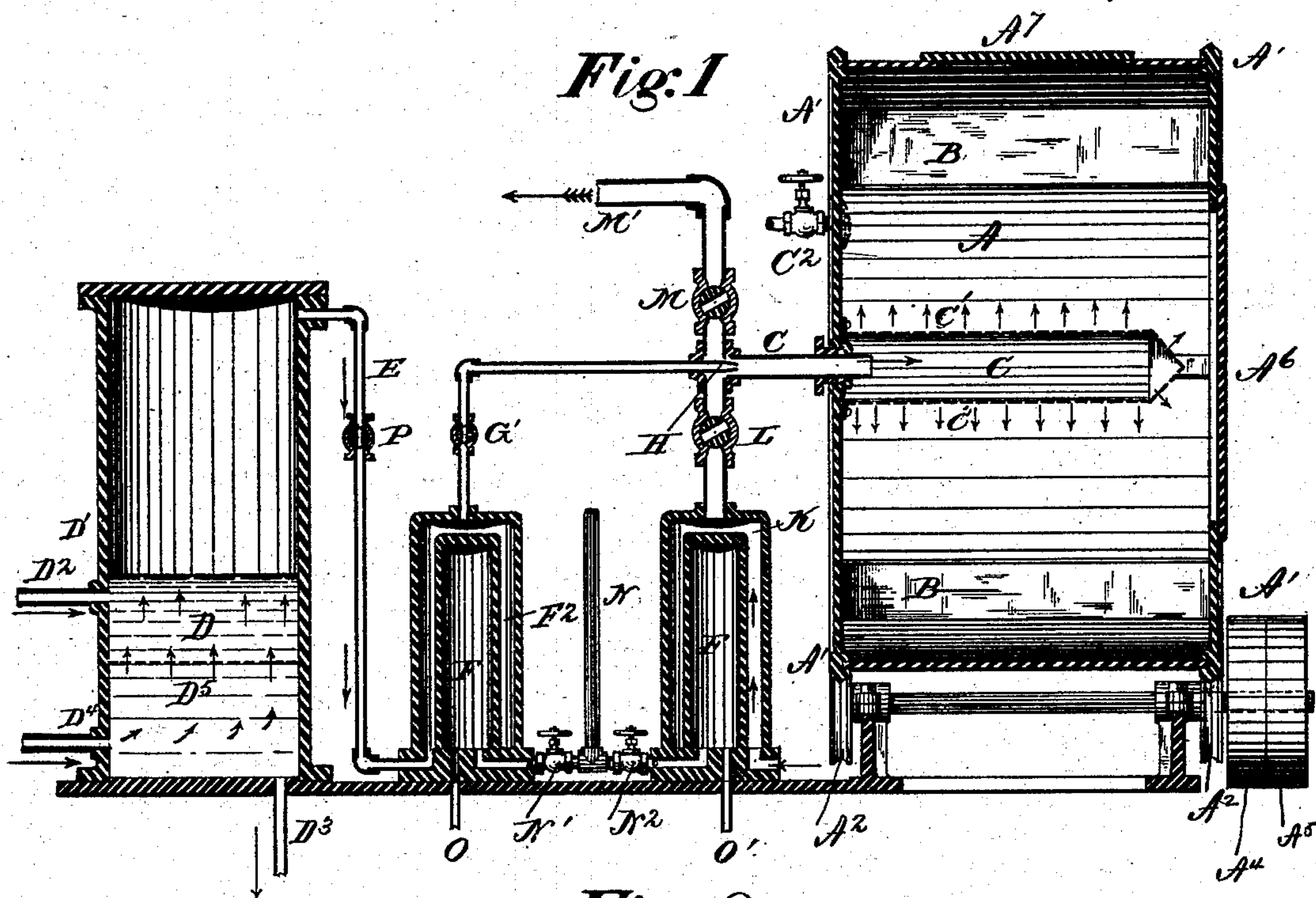
(No Model.)

J. B. EDSON.

DRYING APPARATUS FOR TREATING PYROXYLINE, &c.

No. 249,600.

Patented Nov. 15, 1881.



Witnesses:

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UNITED STATES PATENT OFFICE.

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DRYING APPARATUS FOR TREATING PYROXYLINE, &c.

SPECIFICATION forming part of Letters Patent No. 249,600, dated November 15, 1881.

Application filed September 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, JARVIS B. EDSON, residing in the city of Newark, county of Essex, and State of New Jersey, have invented a certain new and useful Drying Apparatus for Treating Pyroxyline, &c., of which the following is a specification.

This invention has for its object the complete removal of the moisture, either of water or other chemical substances, from pyroxyline and other similar bodies that are liable to explode or decompose at low temperatures during their process of manufacture; and the invention consists, first, in the method of introducing very dry air which has been cooled under pressure into the substances to be dried, but at a temperature slightly above the freezing-point, so that the moisture of the materials under treatment will not be frozen, but quickly absorbed and carried away, as will hereinafter appear.

Second, the invention also consists in the combination of a receiver for holding the materials to be dried with air cooling and drying apparatus and an intermediate heater for controlling the temperature of the cold and dry air, as will hereinafter appear.

Third, the invention further consists in the combination of a receiver for holding the materials with an agitating apparatus and air distributing and discharging devices, as will hereinafter appear.

Fourth, the invention further consists in the combination of a receiver for holding the materials with an exhaust apparatus and intermediate inlet and discharge passages, as will hereinafter appear.

In the drawings, Figure 1 is a sectional elevation of the entire apparatus, and Fig. 2 is a cross-section of the receiver, and represents the material in a pulverulent state and as acted upon by the agitators.

Various forms of the apparatus may be devised; but a convenient and very practical form is here shown, where A is the receiver for holding the material to be dried. This receiver is of cylindrical form, conveniently made of metal, and formed with flanges A', to support the cylinder on rollers A², or wheels on shafts A³, one of which is provided with a fast and loose pulley, A⁴ and A⁵; to carry a belt for rotating the

cylinder. It is also provided with openings A⁶ and A⁷, for the introduction and discharge of the material, and for permitting the workmen to enter it for cleansing when required. Upon the interior are fastened lifting-plates B, for the purpose of carrying up the material and letting it fall in showers upon the incoming air, which is introduced through a pipe at C, concentric with the axis of the cylinder A, and may extend its entire length, and, for the thorough distribution of the air, is perforated with numerous small holes to discharge the air, as shown by the arrows at C'. Discharge-cocks for the escape of the air are mounted at convenient points on the end of the cylinder, one of which is shown at C².

The cold air is produced in any of the well-known ways by which it may be rendered intensely dry and free from any dust or other impurities, dryness with a low degree of cold, but above freezing, being the essential requisites in my process. Consequently I have selected as preferable the apparatus of one Reynolds, recently patented, in which the air, under great pressure from the pumps, is forced through a column of water, as indicated at D, in a cylinder, D', the upper portion of which constitutes the air-reservoir, and from which a pipe, E, conducts the cold and dry air to a heating-chamber, which may be of any of the well-known forms of such devices, but in this case consists of an interior cylinder, F, for steam and an exterior cylinder, F', to form a heating-space between the two for the air, as at F², and with which the pipe E is connected. The water in the cooling-chamber D' is supplied through a pipe at D², and it escapes at D³, and the air from the compressing-pump is introduced at D⁴, passing up through the water, as indicated by the arrows, and to perfectly distribute it baffle-plates may be used in the water, as shown at D⁵. The air from the heater at F is conducted by a pipe at G, having a cock, G', to the receiver A, where it escapes through the perforated pipe at C, and, being intensely dry and slightly heated to a little above the freezing-point, readily absorbs the moisture from the agitated material and carries it off at the discharge-cocks C'.

As a preliminary step in the drying process, a vacuum and heating apparatus for the ordi-

nary atmosphere may be used, in which air may be heated at K in a heater similar to the one at F through cock L' to the pipe C in the receiver or drying-cylinder, and, when saturated with moisture, the inlet-cock at L' is closed and another cock at M is opened in the pipe M', leading to a suction-fan or exhauster, and the air is drawn off through the perforations in pipe C until a partial vacuum is produced in the receiver A. Then the cock M is closed, and the one at L' is opened, and another supply of warm air is introduced, as before.

Instead of the suction-fan being used, the pipe at G may terminate at H in an enlarged pipe to form a suction from the heater K through the pipe L, and thus, on the injector principle, force the outside air into the receiver during the first portion of the process. Both the heaters are supplied with steam through pipe N and cocks N' and N², and they have an outlet for the condensed water at O and O'. A cock at P in pipe E controls the supply of air from the reservoir.

It is evident that other forms of heaters may be used, as a steam-coil in a chamber will answer the purpose.

Instead of the revolving cylinder A, a stationary tank may be used, and agitators may be made to stir the material or lift it into contact with the air; but it must be evident that by such an apparatus the drying operation of the most inflammable substance, as pyroxyline, can be accomplished without danger of an explosion.

I therefore claim—

1. The method of drying pyroxyline and other similar substances by the use of cold and intensely dry air, maintained at a temperature slightly above the freezing-point, and introduced through the material while in a finely divided condition, and thence discharged from the receiver, as hereinbefore set forth.

2. The combination of a reservoir for cooling and drying the air, a heater for raising its temperature when desired, and the receiver for holding and agitating the material to be treated, as hereinbefore set forth.

3. The combination of a revolving receiver having agitating devices, as described, with a perforated conduit and air-cooling apparatus, as and for the purposes hereinbefore set forth.

4. The combination of a revolving receiver having lifting or agitating devices with an exhausting or suction apparatus, as hereinbefore set forth.

5. The combination of the heating devices with a receiver having lifting-plates or agitators and a suction or exhaust apparatus, as hereinbefore set forth.

In witness whereof I have hereunto subscribed my name and affixed my seal in the presence of two subscribing witnesses.

JARVIS B. EDSON. [L. S.]

Witnesses:

EUGENE N. ELIOT,
BOYD ELIOT.