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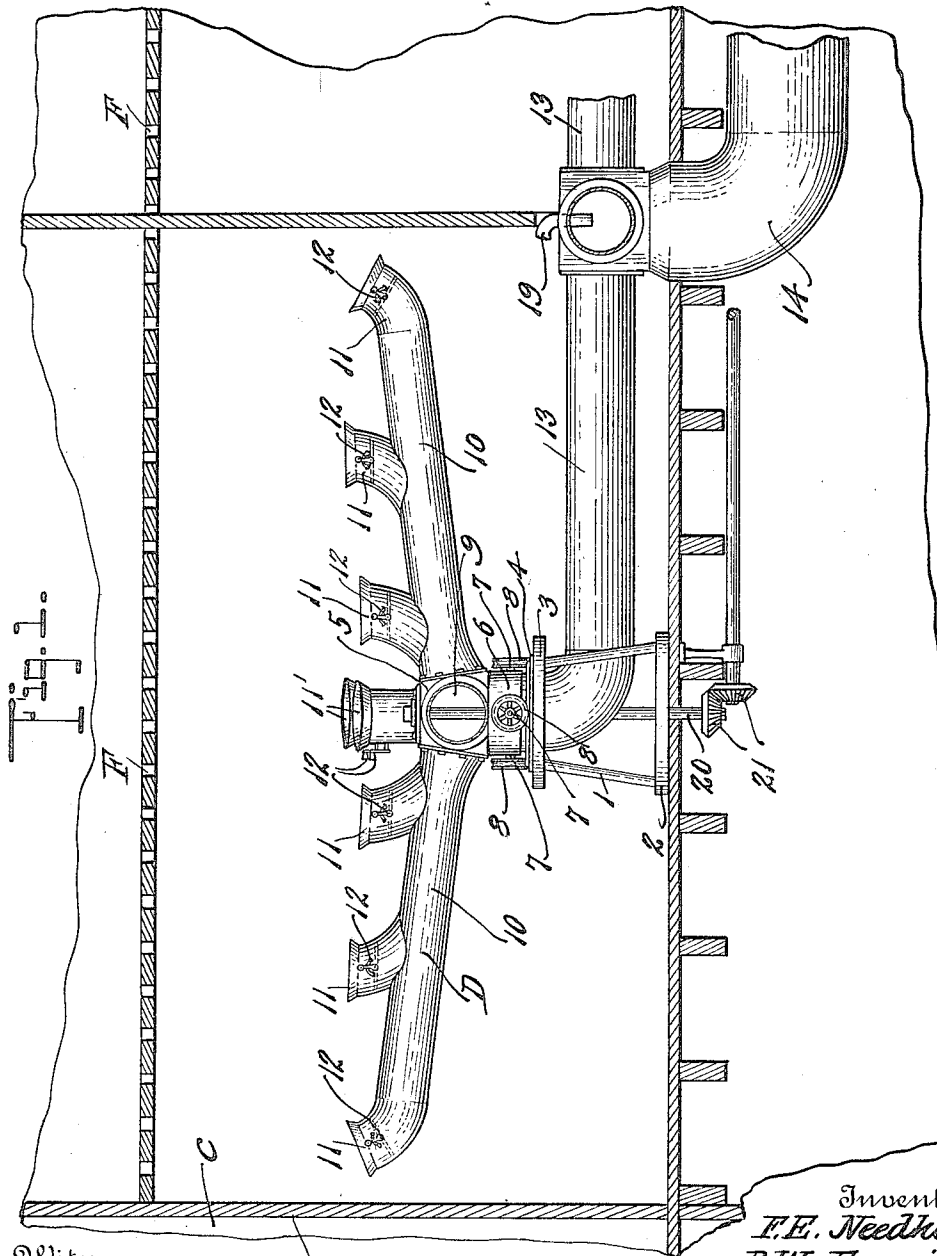
DRYING APPARATUS.

APPLICATION FILED MAY 15, 1916.

1,224,560.

Patented May 1, 1917.

3 SHEETS—SHEET 1.



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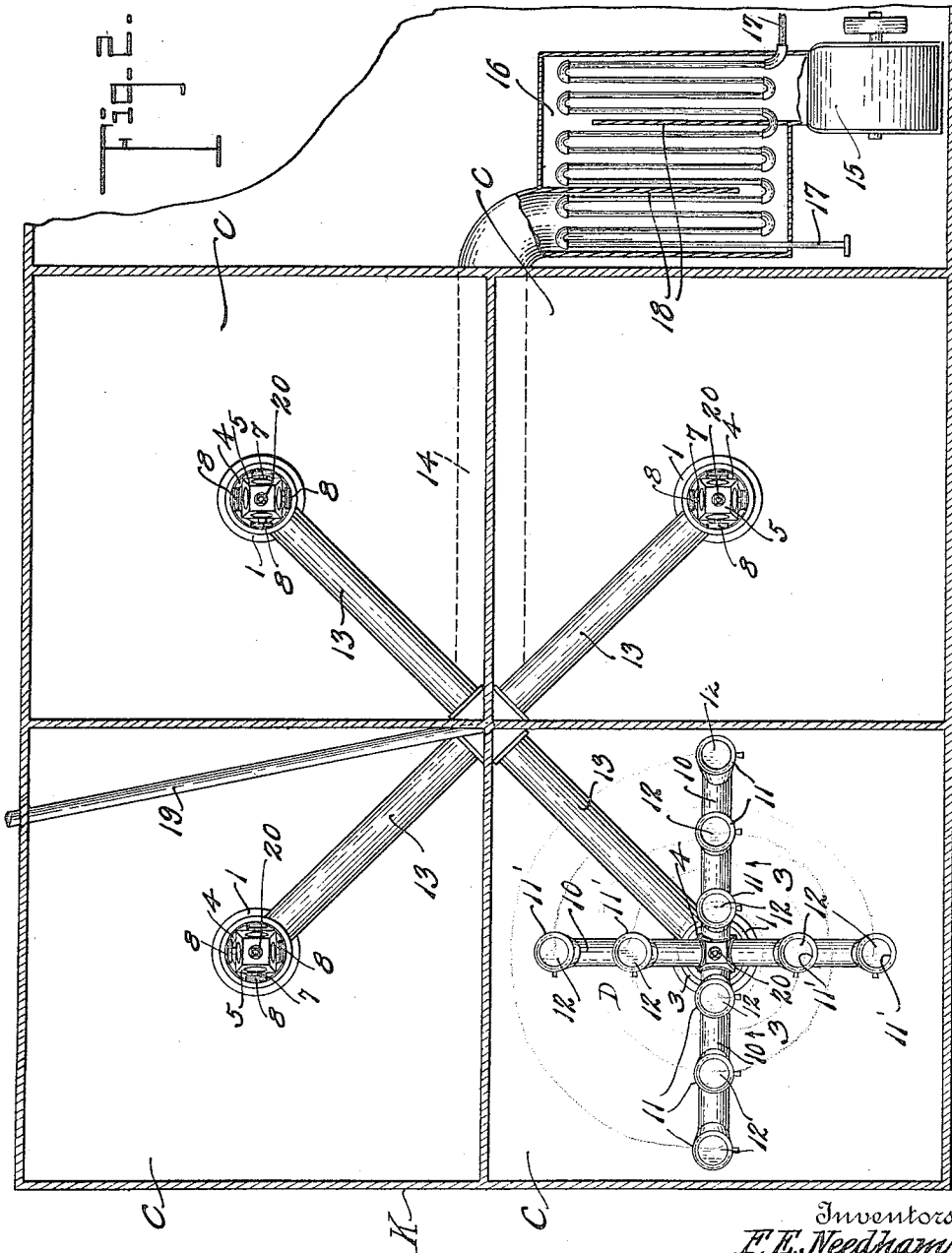
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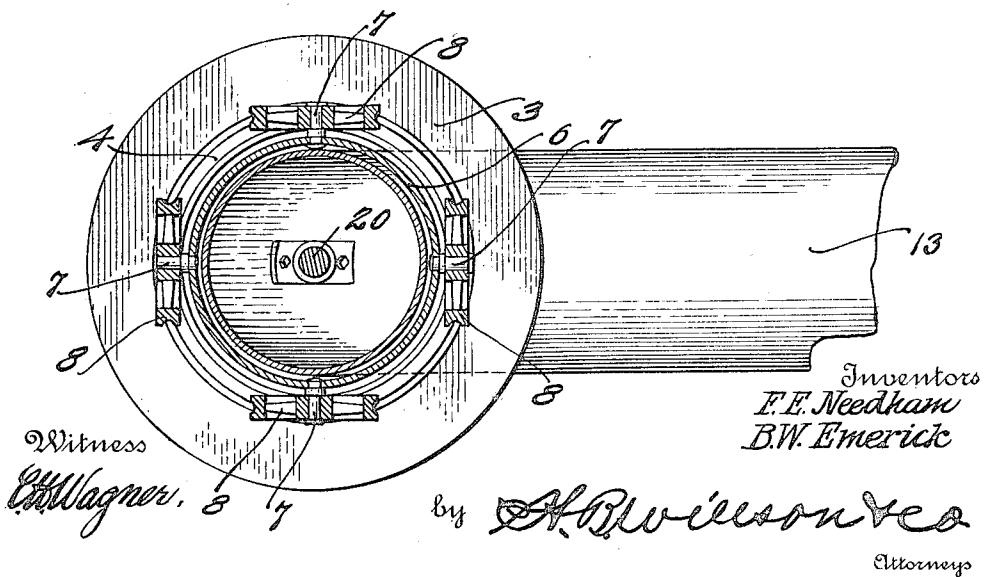
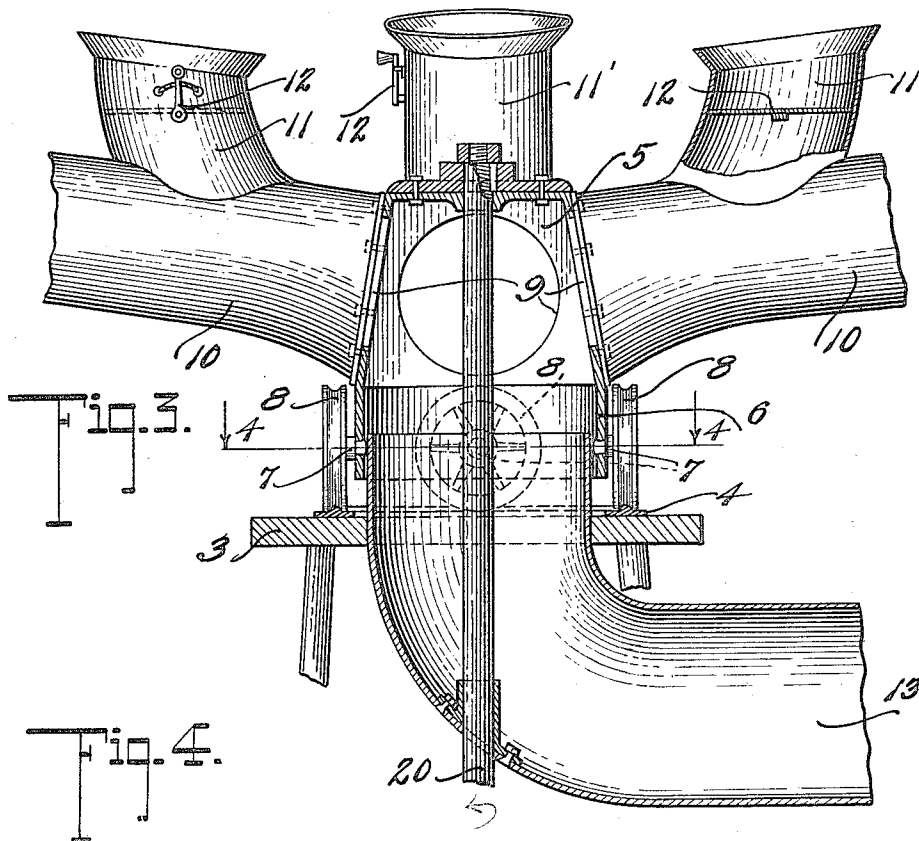
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UNITED STATES PATENT OFFICE.

FRANK EMERSON NEEDHAM AND BERTON WASHINGTON EMERICK, OF SALEM, OREGON.

DRYING APPARATUS.

1,224,560.

Specification of Letters Patent.

Patented May 1, 1917.

Application filed May 15, 1916. Serial No. 97,679.

To all whom it may concern:

Be it known that we, FRANK EMERSON NEEDHAM and BERTON WASHINGTON EMERICK, citizens of the United States, residing at Salem, in the county of Marion and State of Oregon, have invented certain new and useful Improvements in Drying Apparatus; and we do 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.

This invention relates to improvements in devices for drying hops and similar articles and for evaporating fruits.

The principal object of the present invention is to provide an apparatus of the character described which will greatly shorten the time usually necessary for drying hops or for evaporating fruits.

An additional object is to provide a device equipped with a plurality of air distributors from which the heated air may be equally distributed to all parts of the building in which the drying operations are taking place.

With the foregoing and many other objects in view, my invention resides in the novel features of construction, combination and arrangement of parts which will hereinafter be more particularly described and claimed.

In the accompanying drawings wherein similar reference characters indicate like parts throughout the several views:

Figure 1 is a vertical sectional view taken through one of the compartments of a drying kiln, showing a rotary distributor constructed in accordance with this invention in side elevation, one of the arms thereof being broken away;

Fig. 2 is a horizontal sectional view taken through the drying kiln on a plane below the drying floor thereof, showing in top plan view the arrangement of a number of distributors with respect to the various compartments of the kiln;

Fig. 3 is a vertical sectional view through one of the heads; and

Fig. 4 is a horizontal sectional view taken on the plane of the line 4—4 of Fig. 3.

In the drawings we have shown our apparatus as being disposed in a kiln or similar building K beneath the drying floor F thereof. Any number of devices may be employed, depending upon the size of the kiln and the amount of heating space therein. As shown in Fig. 2 the kiln below the drying floor is preferably divided into four equal compartments C in each of which an air distributor D is rotatably mounted.

Mounted upon the bottom of the kiln in each of the compartments C is a stand or support 1 which has a base 2 and a top 3, upon the latter of which a track 4 is formed. These stands are designed to rotatably support the rotary distributors D, each of which comprises a head 5 preferably rectangular in plan view from which depends a cylindrical portion 6. Said portion 6 has a number of stub shafts 7 extending therefrom preferably at diametrically opposite points upon which bearing wheels 8 are rotatably secured, said wheels being disposed on said track 4 so that the distributor can be readily rotated as will be hereinafter more particularly described.

In the opposite sides of each head 5 is formed an opening 9 which is surrounded by a hollow arm 10, said arms extending radially outward from the head as illustrated. These arms may each be formed of a single pipe or in a plurality of sections as most convenient, and are inclined upwardly slightly from the heads. Since each head 5 is preferably rectangular we provide the same with four radiating arms 10, one extending from each face thereof.

In the upper portion of each of the hollow arms 10 is formed a plurality of outlet openings which are surrounded by discharge pipes 11 and 11', said pipes being secured in any preferred manner to said arms. It will be seen that the outlet pipes 11 and 11' are formed at varying distances from the heads 5, there being three pipes 11 on two of the arms and only two outlet pipes 11' on the other two arms. The arms which contain the same number of outlets are preferably those which are in the same vertical plane. From Fig. 2 it will be seen that the outlets 11' are spaced from the

heads 5 distances such as would dispose them between the outlets 11 were they on the other arms. In other words, the line of travel of the outlets 11' when the distributor is rotated, will be between that taken by the other outlet pipes 11. By this arrangement air or other gas which is discharged from the outlet openings through the pipes 11 and 11' will be equally distributed throughout the compartment C in which it is disposed, thus providing an apparatus which will greatly shorten the time necessary for evaporating fruits and drying various classes of goods.

Both of the outlet pipes 11 and 11' extend upwardly and outwardly and have dampers 12 disposed therein whereby the flow of gas may be regulated.

In order to supply air to the heads 5, a branch air duct 13 leads from each of the compartments C to a main air duct 14 which is connected to the source of supply. Each of the ducts 13 extends across each compartment below the radiating arms 10 to a point beneath the top 3 of the stand 1, where it is extended upwardly through an opening in said top. A portion of the pipe or duct which extends through the top 3 is disposed within the cylindrical depending portion 6 of the head 5, although a tight joint cannot well be formed between each head 5 and the upwardly extending portions of the ducts 13 because of the fact that said head is designed to rotate while the other parts remain stationary. It is seldom necessary to form a tight connection at this point as the air which is to be discharged from the distributors is forced through the ducts under pressure by means of a blower or fan 15.

The air duct 14 leads into a heating chamber 16 through which the air from the blower 15 is forced. In the heater is arranged a plurality of coils of steam pipe 17 or any other suitable heating medium through which the air is directed by the baffle plates 18. Thus, the air which is to be discharged through the outlet pipes 11 and 11' is heated to the desired temperature before it passes to the distributors. In drying and evaporating fruits a suitable pipe 19 may be led to a suitable point in the main air duct and allowed to discharge thereinto so that sulfur-dioxid or any other form of gas may be mixed with the air which is forced from the blower.

As hereinbefore mentioned the distributors D are designed to be rotated upon the stand 1, and means for accomplishing this consists of a number of upright shafts 20 which are suitably connected to any form of driving mechanism not shown. One of the shafts 20 is provided for each of the distributors D and is disposed upright through the stand 1 and extends through the head 5 to which it has its upper end secured in the

top thereof. The shafts also extend through suitable bearings formed in the air ducts 13. In the lower end of each shaft 20 is preferably disposed a bevel gear 21 which is connected to the driving mechanism not shown.

From the foregoing description of the construction of our invention, it will be seen that after the fruit which is to be evaporated or the hops to be dried are placed upon the drying floor of the kiln or other building, the blower 15 may be started to force the air through the heater 16 and through the ducts 13 and 14 to the distributors D. These parts of the device when forced to rotate will thoroughly distribute the heated air to all parts of the building so that the fruit or hops may be thoroughly evaporated or dried.

We claim:

1. In a device of the class described, a rotary distributor comprising a head, a plurality of radiating arms extending therefrom and a plurality of outlets in each arm, and means for supplying gas to said distributor.

2. In a device of the class described, a plurality of radiating hollow arms extending from said head, and a plurality of outlet pipes for each hollow arm, the outlet pipes from the adjacent arms being disposed varying distances from said head, whereby when said distributor is rotated the line of travel of said outlets on one arm will be between that taken by those on the other arms, means for rotating said distributor, and means for supplying gas to said hollow arms.

3. In a device of the class described, a plurality of rotary distributors, each comprising a hollow head, means for revolving said heads, a number of radiating hollow arms extending from each head and communicating with the interior thereof, a plurality of upwardly and outwardly discharging outlet pipes for each hollow arm, said outlet pipes being spaced varying distances from said heads, and means for supplying gas to each head to be discharged through said arms and outlet pipes.

4. In a device of the class described, a rotary distributor comprising a head, a plurality of radiating arms extending from said head, and a plurality of outlets in each arm, a stand, a track thereon, said head being rotatably mounted on said track, means for rotating said head, and a supply pipe extending through said stand to said head.

5. In a device of the class described, a rotary distributor comprising a head having an open bottom, a depending portion surrounding said opening, a plurality of radiating arms extending from said head, and a plurality of outlets on each arm, a stand, a track thereon, a number of bearing wheels carried by said head whereby the former

may be rotated on the latter, an operating shaft extending through said stand and head and connected to the latter, means connected with the shaft for rotating the same, and a stationary supply pipe extending through said stand and projecting within said depending portion.

In testimony whereof we have hereunto

set our hands in presence of two subscribing witnesses.

FRANK EMERSON NEEDHAM.
BERTON WASHINGTON EMERICK.

Witnesses:

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MARIE BREITENSTEIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."