

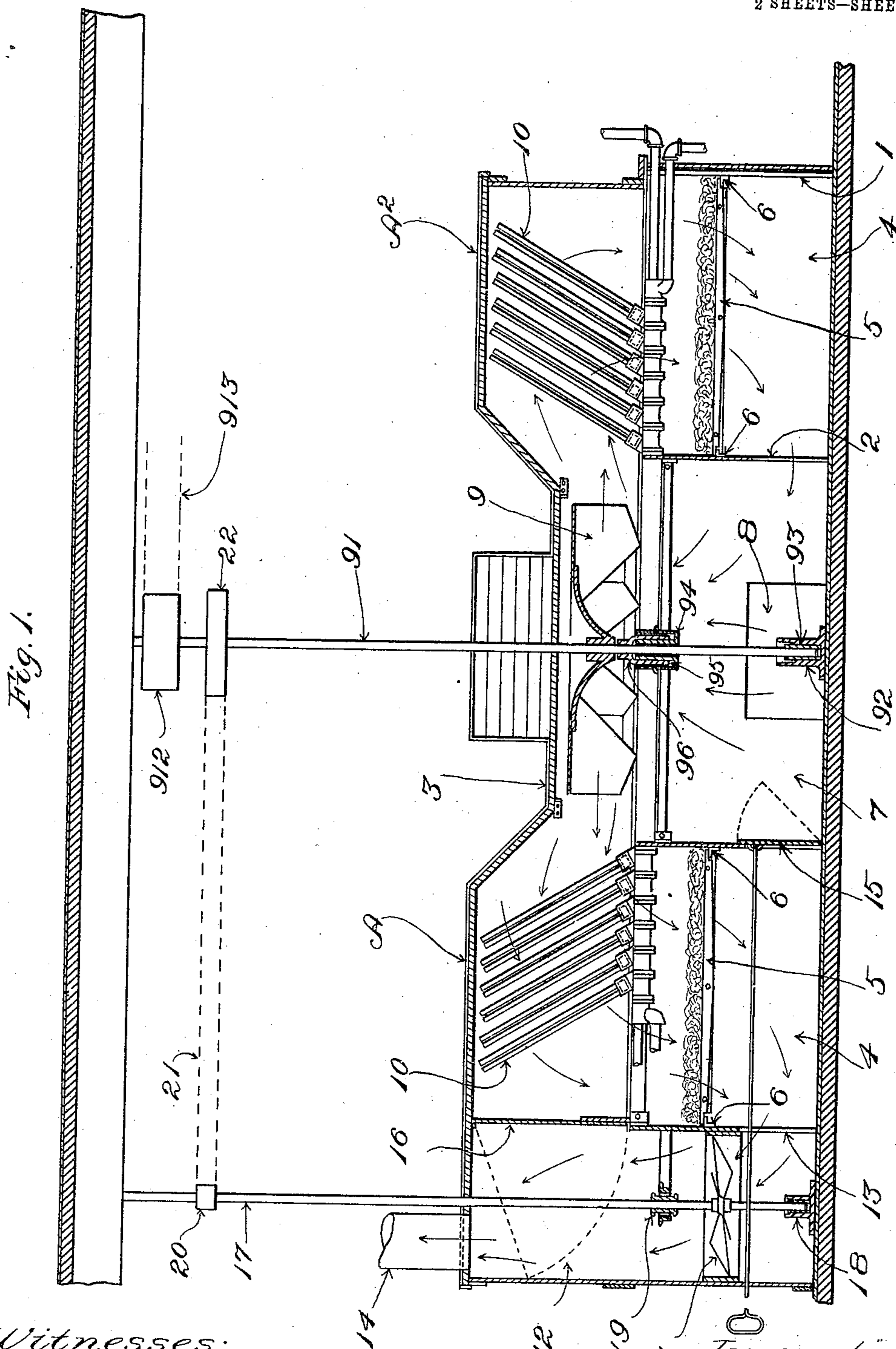
No. 841,056.

PATENTED JAN. 8, 1907.

C. E. T. SCRIBNER.
DRIER FOR FIBROUS MATERIALS.

APPLICATION FILED DEC. 26, 1905.

2 SHEETS—SHEET 1.



Witnesses:
Oscar F. Hill
Edith J. Anderson.

Inventor:
Charles E. T. Scribner
By Chas. F. Randall
Attorney.

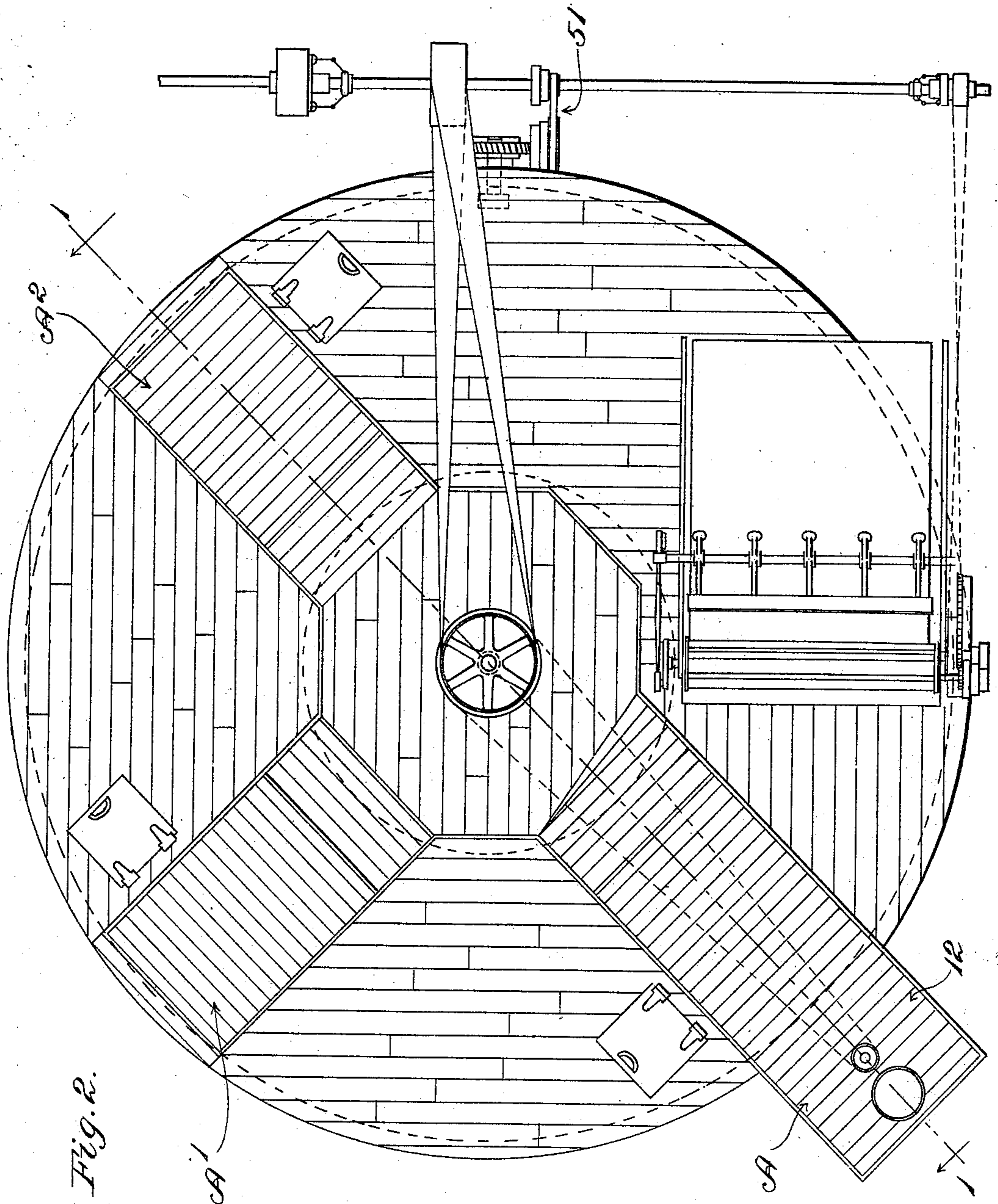
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UNITED STATES PATENT OFFICE.

CHARLES E. T. SCRIBNER, OF NORTH ADAMS, MASSACHUSETTS, ASSIGNOR
TO THE JAMES HUNTER MACHINE COMPANY, OF NORTH ADAMS, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

DRIER FOR FIBROUS MATERIALS.

No. 841,056.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed December 26, 1905. Serial No. 293,274.

To all whom it may concern:

Be it known that I, CHARLES E. T. SCRIBNER, a citizen of the United States, residing at North Adams, in the county of Berkshire, State of Massachusetts, have invented a certain new and useful Improvement in Driers for Fibrous Materials, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has relation to driers of the type at present in use in which a horizontal annular table formed with holes to permit of the passage of air therethrough rotates within an annular chamber, the wool or other material to be dried being deposited upon the said table and while being carried by the rotation thereof around within the said chamber from the place of feeding to the place of discharge being subjected to the action of moving currents of heated air. In a drier of the type in question the said moving currents of air are produced by the action of rotary fans, and the air is heated by being caused to pass through steam-coils.

The invention consists in an improved manner of arranging and supporting the fans and their shafts and in an improved arrangement of the steam-coils.

In accordance with the invention I employ fans which are carried by upright or vertical shafts, the latter being driven by power transmitted to their upper portions. Within the casing of the drier I provide supports provided with bearings for the lower portions of the upright or vertical fan-shafts. Preferably I employ bearing devices having vertical chambers or cups containing bearings and receiving the bearing portions of the fan-shafts, the said chambers or cups being adapted to hold a comparatively large quantity of lubricant in connection with the said bearings and bearing portions. In this manner I provide against tendency of the bearings to become dry and to cut or heat. With one filling with lubricant the said bearing-supports will contain lubricant sufficient to run for a long time, notwithstanding the effects of the heat and circulation of air within the drier. In order to obviate the tendency of dust to accumulate upon the steam-coils, I avoid horizontal surfaces and arrange the steam-coils in an erect or substantially erect position, so that the longitudinal surfaces

thereof shall extend upward and downward, or nearly so. The steam-coils may occupy a strictly vertical position, but preferably I dispose them in a somewhat-inclined position, leaning outward at their upper ends, and in this respect conforming more closely to the direction of the currents of air as they pass outward from the central space of the drier and its fan and then downward through the wool resting upon the annular table in process of being dried and the holes of the said table.

A drier of the type above referred to having the invention embodied therein is shown in the drawings, in which latter—

Figure 1 is a view of the said drier in vertical section on the plane indicated by the dotted line 1 1 of Fig. 2 looking in the direction indicated by the arrows adjacent the ends of such line. Fig. 2 shows the said drier in plan.

In the drawings the outer cylindrical shell or casing of the drier is indicated at 1, the inner cylindrical shell at 2, and the top or cover of the casing at 3. The annular space or chamber between the said cylindrical shells 1 and 2 is designated 4, and the annular table, which is located within the said chamber, is shown at 5. The supports or "runs" carried by the cylindrical shells and upon which the outer and inner marginal portions of the table rest during the rotation of the table are indicated at 6 6 in Fig. 1. At 51 are the variable-speed driving devices of the table. The central space or chamber of the drier is indicated at 7. The said central space or chamber is in communication with the lower portion of chamber 4, beneath the table 5, through openings, one of which is shown at 8, Fig. 1. At 9 is a centrally-arranged centrifugally-acting fan, by means of which air is forced to circulate within the drier. At 10 10 are the steam-coils by means of which the said air is heated, the said steam-coils being located, as before mentioned, above the table 5, and being partly contained within elevated portions of the top or cover of the casing at A A' A². By the rotation of the fan 9 air is forced radially outward from the central chamber 7 through the steam-coils 10 10 and downward through the table 5, and the wool resting thereon, a portion of the air returning from the lower

part of the chamber 4 to the central chamber 7 by way of the opening 8. At 11 is an exhaust-fan occupying a small compartment 12 of the casing at one side of the latter. The lower part of the said compartment communicates, through an opening at 13, with the lower part of the adjacent section of the chamber 4 vertically beneath the steam-coil 10, which occupies the raised portion A of the top or cover. With the upper part of the said compartment a flue 14 is in communication. Air drawn from chamber 4 through opening 13 by fan 11 is forced by the action of such fan out through flue 14. At B is an automatic or self-feed of well-known character, by means of which stock to be dried, carbonized, &c., is deposited upon the upper surface of the rotating table. Suitable means is provided in practice for discharging from the table stock which has been dried or carbonized. In operation the stock is fed by the automatic or self feeder upon the slowly-rotating perforated table. By the rotation of the latter the stock is carried beneath the steam-coil 10 at A, where it is subjected to the action of the current of hot air passing downward from such steam-coil, the moisture-charged air being drawn away by means of fan 11 and discharged through flue 14. In passing on the stock is subjected successively to the action of descending currents of hot air from the steam-coils at A' A² and then on arriving at the place of discharge (beneath the automatic or self feed, but in advance of the place at which fresh stock is deposited upon the table) is discharged from the drier. When carbonizing is to be effected, the speed of the table is reduced below that maintained for drying, and the dampers at 15 16 are regulated.

In carrying the invention into effect I arrange the fans 9 and 11 to rotate upon vertical or upright axes. Fan 9 is fixed upon the vertical or upright shaft 91, which is arranged at the center of the drier, its lower portion, with the fan 9 thereon, being contained within the central chamber of the casing of the drier. Shaft 91 is furnished with a band-pulley 912, to which power is transmitted to turn the said shaft by means of a driving-band 913. The bottom end of shaft 91 is fitted to a step-bearing 92, the body of which is formed with a cylindrical upward extension surrounding a portion of the length of the shaft adjacent said end and containing a sleeve 93 constituting a lateral bearing for the said portion of the length. The space within the said cylindrical extension constitutes a chamber to receive and hold lubricant. At a higher point within the central chamber 7, immediately below the fan 9, is located a bearing-support 94, which is cylindrical and surrounds the shaft 91, the said bearing-support being attached to fixed por-

tions of the casing. The said bearing-support is formed with an annular chamber 95, open at the top and adapted to contain lubricant. Within this chamber is received the outstanding skirt of a sleeve 96, that is fast upon the shaft 91. The said skirt is concentric with the shaft. It fits interiorly upon the outer surface of the proximate wall of the said chamber 95, the construction providing a bolster-bearing for shaft 91 adjacent the fan 9, by means of which the said shaft is afforded lateral support. The exhaust-fan 11 is fixed upon the vertical or upright shaft 17, the bottom end of which is received within a step-bearing at 18, similar to the bearing at 92 for shaft 91 of fan 9. At 19 is a bolster-bearing for shaft 17, affording lateral support to the said shaft above the fan 11. A band-pulley 20 is fixed upon the upper portion of shaft 19, power to turn the said shaft being transmitted to the latter through a band 21, passing around the said band-pulley 20, and a band-pulley 22, fast upon the shaft 91 of the fan 9.

The erect position of the steam-coils, but somewhat inclined so as to lean outward at their upper ends, is shown clearly in Fig. 1. It will be perceived that possibility of lodgment of dust upon the steam-coils is practically eliminated with this arrangement.

What is claimed is—

1. In a drier of the type aforesaid, in combination, an inclosing casing comprising a central chamber and an annular chamber surrounding said central chamber, separated therefrom by a partition, and communicating with the central chamber above and below, an annular revolving perforated table within the said annular chamber, a fan rotating on a vertical axis within the said central chamber and operating to cause the air to circulate outward from the said central chamber into the upper portion of the annular chamber, down through the said table and the material spread thereon, and from the lower portion of the annular chamber back to the central chamber again, and steam-coils in the path of the moving air.

2. In a drier of the type aforesaid, in combination, an inclosing casing comprising a central chamber and an annular chamber surrounding said central chamber, separated therefrom by a partition, and communicating with the central chamber above and below, an annular revolving perforated table within the said annular chamber, steam-coils above the plane of the said table, and a fan rotating on a vertical axis within the said central chamber and operating to cause the air to circulate outward from such chamber through the said steam-coils, down through the said table and the material spread thereon, and from the lower portion of the annular chamber back to the central chamber again.

3. In a drier of the type aforesaid, in com-

5 bination, an inclosing casing comprising a
central chamber and an annular chamber
surrounding said central chamber, separated
therefrom by a partition, and communicat-
ing with the central chamber above and be-
low, an annular revolving perforated table
within the said annular chamber, steam-coils
occupying an erect position above the plane
of the said table, and a fan rotating on a ver-
tical axis within the said central chamber
and operating to cause the air to circulate
outward from such chamber through the said
steam-coils, down through the said table and
the material spread thereon, and from the
lower portion of the annular table back to
the central chamber.

4. In a drier of the type aforesaid, in com-
bination, an inclosing casing comprising a
central chamber and an annular chamber
surrounding said central chamber, separated
therefrom by a partition and communicating
with the central chamber above and below,
an annular revolving perforated table within
the said annular chamber, a fan rotating on
a vertical axis within the said central cham-
ber and operating to cause the air to circu-
late from the said central chamber into the
annular chamber and from the latter back to
the central chamber again, and steam-coils
in the path of the moving air.

5. In a drier of the type aforesaid, in com-
bination, an inclosing casing comprising a
central chamber and an annular chamber
surrounding said central chamber, separated
therefrom by a partition, and communicat-

ing with the central chamber above and be-
low, an annular revolving perforated table
within the said annular chamber, a fan ro-
tating on a vertical axis within the said cen-
tral chamber and operating to cause the air
to circulate from the said central chamber
into the annular chamber, through the said
table and the material spread thereon, and
from the annular chamber back to the cen-
tral chamber again, steam-coils in the path
of the moving air, and an exhaust-fan for dis-
charging a portion of the air from the annu-
lar chamber to the exterior.

6. In a drier of the type aforesaid, in com-
bination, an inclosing casing comprising a
central chamber and an annular chamber
surrounding said central chamber, separated
therefrom by a partition and communicating
with the central chamber above and below,
an annular revolving perforated table within
the said annular chamber, a vertical fan-
shaft and fan within the said central cham-
ber, the said fan operating to cause the air to
circulate from the latter into the annular
chamber and from the latter back to the cen-
tral chamber, and reservoir-bearings for the
said vertical shaft also located within the
central chamber.

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

CHARLES E. T. SCRIBNER.

Witnesses:

A. D. CADY,
GEO. C. HADLEY.