

J. P. GRUPE.

DRIER.

APPLICATION FILED MAY 18, 1908.

907,993.

Patented Dec. 29, 1908.

FIG. 1

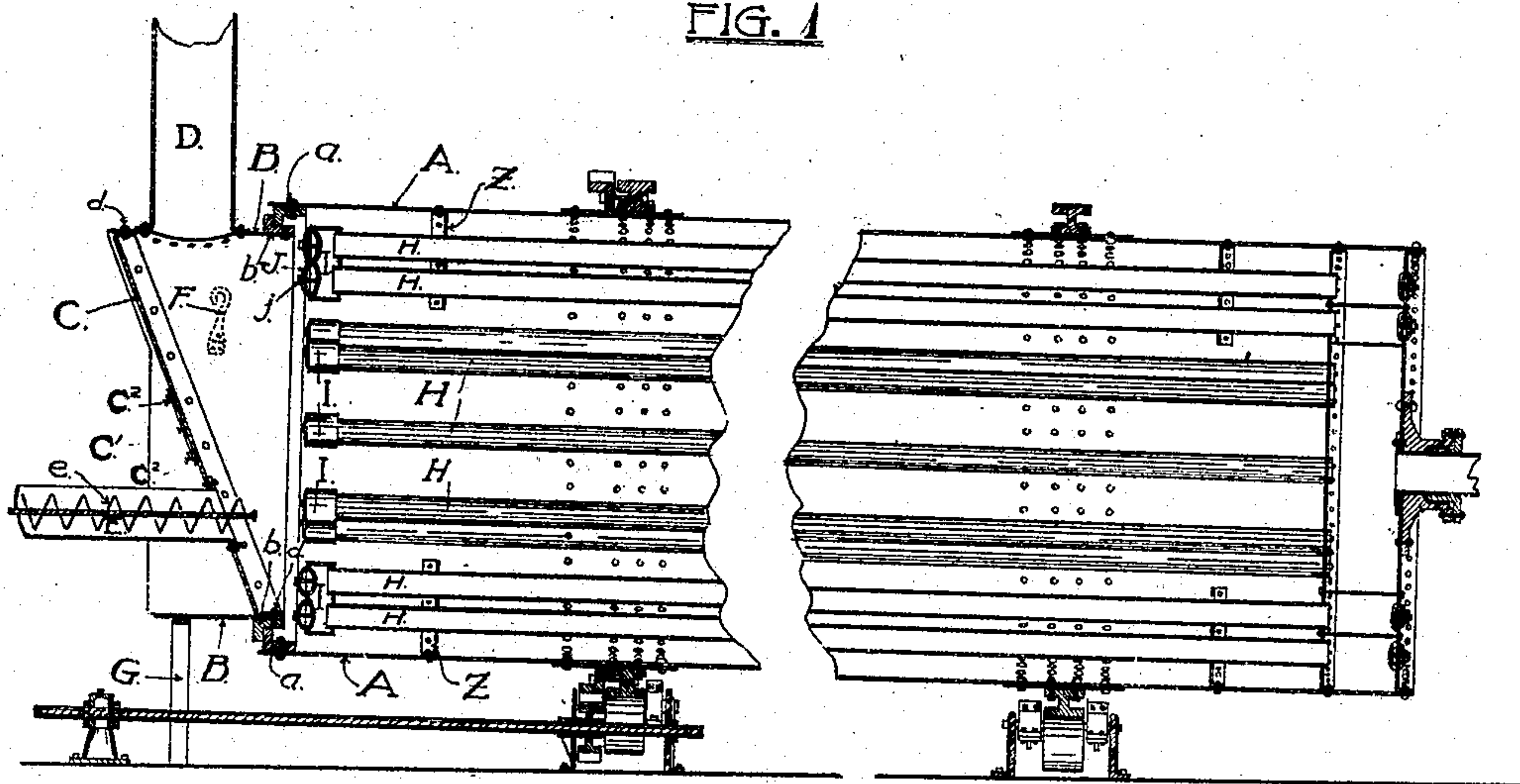
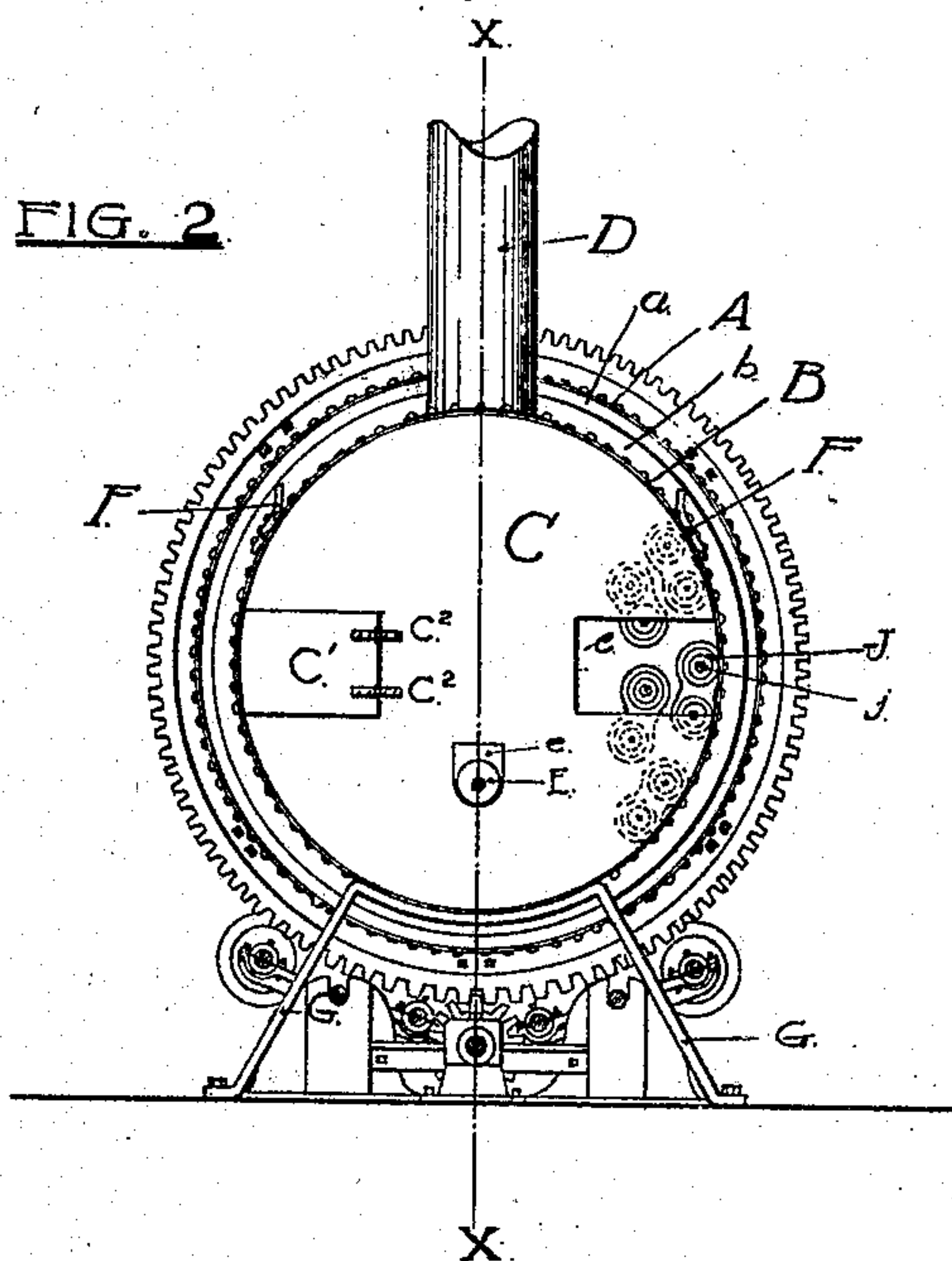


FIG. 2



WITNESSES:

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DRIER.

No. 907,993.

Specification of Letters Patent.

Patented Dec. 29, 1908.

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To all whom it may concern:

Be it known that I, JOHN P. GRUPE, a citizen of the United States of America, residing at Davenport, in the county of Scott and State of Iowa, have invented a new and useful Improvement in Driers, of which the following is a specification.

My invention relates to an improvement in driers in which a cylinder containing steam pipes suitably supported therein, is supported by rollers and rotated thereon by a pinion driving a gear ring secured to the cylinder.

The steam is fed and circulated in the flues by any of the well known means in common use, and the objects of my invention are to provide a feed end for such drier which will efficiently carry off the vapor arising from the grain or other material to be dried in the drying process; to provide for a slow movement of a large volume of vapor into the vapor flue or exhaust pipe whereby the dry material carried by the vapor will readily settle; to provide a feed end which will allow easy access to the ends of the flues; to provide a feed end which is strong and simple, and easily erected; to provide a feed end which allows of simple connections with the feed press adapted to receive the conveyer at any convenient height; to provide a feed end which will prevent the spilling of grain at the receiving end of the drier; to provide a feed end which permits inspection of the grain during the drying process. I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a vertical section of my improved drier taken on the line X—X of Fig. 2. Fig. 2 is a front elevation.

Similar letters refer to similar parts throughout the views.

The drier cylinder is composed of a cylindrical part or shell A, in which flues H, are supported by supporting plates Z, in a well known manner. A multiple head I, connects one end of each pair or group of flues and each multiple head is provided with caps J, secured to the head in a well known manner.

The feed end of the cylinder has suitably secured to it an inner angle ring *a*, which may be ground to form a close loose joint with a corresponding outer angle ring *b*, riveted or otherwise suitably secured to the cylindrical part B, of the feed end. These

rings are preferably of cast iron although they may be made of any suitable material.

An approximately elliptical plate C, is riveted or otherwise secured to the cylindrical part B, slantingly so that its lower edge comes approximately even with the adjacent end of the cylinder A, and its upper end extends outward far enough from the end of the cylinder A, to allow the attachment of a suitable vapor flue D, to the part B on its upper side between its junction with the slanting plate C, and the outer angle ring *b*. The feed end may be supported by hooks F, secured to each side hooked into supporting bars or chains or by a cradle bar G, secured to the lower side of the part B, and formed with legs which may rest upon the floor or other suitable support. Openings for inspection, as at *c*, are provided in the slanting plate C, closed by doors C', secured to the plate by hinges C². Fig. 2 shows one of the openings with the door C' attached by hinges C² and one opening *e*, with the door omitted. A screw conveyer trough or box E, is connected to the plate C, slightly below the center but may be placed at any desired height. A screw conveyer *e*, is mounted inside the conveyer box in the usual manner.

In operation, the feed or other article to be dried, is conveyed into the feed end by the screw conveyer *e*. The slant of the plate C, carries the feed to the main cylinder A, of the drier. The drier is supported at a slope which carries the feed from the receiving end to the other end as the drier is rotated on its axis and the feed is discharged through suitable openings in the other end of the drier. The receiving end of the drier being higher than the discharge end, the heated vapor from the material being dried moves toward that end and the draft carries it through the flue D. The receiving end is built with a diameter nearly equal to that of the cylinder of the drier so that there is no material obstacle to retard the passage of the vapor from the drier into the receiving end and into the flue D, and the size of the receiving end allows a slow movement into it so that a large proportion of the dried material carried by the vapor is precipitated and is carried by the sloping plate C, with the wet feed back into the drier cylinder. This form of receiving end also allows the fresh material to be conveyed into the drier direct from the feed press and the openings in the plate C,

allow ready means for inspecting the feed during the drying process without stopping the drier, and for readily removing any of the flues or flue caps when necessary.

5 With the driers and feed ends heretofore in use, difficulty has been experienced because the drier heads have retarded the passage of the vapor to the flue and the small sizes of the apertures from the drier cylinder
10 to the vapor flue have caused strong draft which carried considerably dry material with the vapor. Difficulty was also experienced in getting at the flues to remove them or repair them and no means existed for examining the feed during the drying process.
15 The feed ends heretofore in use have been complex, difficult to connect with the feed press and have required separate driving gears for their conveyers and have occupied
20 considerable unnecessary space. All of these objections are overcome by the feed end just described.

I am aware that various styles of feed ends have been used with cylindrical driers and
25 therefore do not claim such combination broadly.

What I claim and desire to secure by Letters Patent is—

1. In a feed end for a cylindrical rotary
30 drier, a cylindrical part and a transverse plate secured therein in a position slanting downward toward the body of the drier.

2. In a feed end for a cylindrical rotary drier, a cylindrical part, a transverse plate
35 having a feed opening and secured therein in a position slanting downward toward the body of the drier, and means for conveying the feed through the feed opening in the transverse plate.

3. In a feed end for a cylindrical rotary
40 drier, a cylindrical part, a transverse plate secured therein in a position slanting downward toward the body of the drier, and a vapor flue connected with the upper part of
45 the cylindrical part.

4. In a feed end for a cylindrical rotary drier, a cylindrical part, a transverse plate having a feed opening and secured therein
50 in a position slanting downward toward the body of the drier, means for conveying the feed through the feed opening in the transverse plate, and a vapor flue connected with the upper part of the cylindrical part.

5. In a rotary drier, the combination of a
55 cylindrical casing providing a drying chamber and containing flues and a cylindrical part providing a vapor chamber and containing a transverse plate secured therein in a position slanting downward and toward
60 the drying chamber.

6. In a rotary drier, the combination of a cylindrical casing providing a drying chamber and containing flues, a cylindrical part providing a vapor chamber and containing a
65 transverse plate having a feed opening and

secured therein in a position slanting downward toward the drying chamber, and means for conveying the feed through the feed opening in the transverse plate.

7. In a rotary drier, the combination of a
70 cylindrical casing providing a drying chamber and containing flues, a cylindrical part providing a vapor chamber and containing a transverse plate secured therein in a position slanting downward toward the drying chamber,
75 and a vapor flue connected with the upper part of the cylindrical part.

8. In a rotary drier, the combination of a cylindrical casing providing a drying chamber and containing flues, a cylindrical part
80 providing a vapor chamber and containing a transverse plate having a feed opening and secured therein in a position slanting downward and toward the drying chamber, means for conveying the feed through the feed opening
85 in the transverse plate, and a vapor flue connected with the upper part of the cylindrical part.

9. In a feed end for a cylindrical rotary drier, the combination of a cylindrical part
90 containing a transverse plate having a feed opening and openings for inspection and secured therein in a position slanting downward toward the drier proper, and a conveyer operating through the feed opening.
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10. In a feed end for a cylindrical rotary drier, the combination with a cylindrical part containing a transverse plate having a feed opening and openings for inspection provided with doors and secured therein in a position slanting downward toward the drier proper, and a conveyer operating through the feed opening.
100

11. In a feed end for a cylindrical rotary drier, the combination of a cylindrical part
105 containing a transverse plate having a feed opening and openings for inspection and secured therein in a position slanting downward toward the drier proper, a conveyer operating through the feed opening and a vapor
110 flue suitably secured to the upper part of the cylindrical part.

12. In a feed end for a cylindrical rotary drier, the combination with a cylindrical part containing a transverse plate having a
115 feed opening and openings for inspection provided with doors and secured therein in a position sloping downward toward the drier proper, a conveyer operating through the feed opening, and a vapor flue suitably secured to the upper part of the cylindrical part.
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13. A feed end for a cylindrical rotary drier comprising a cylindrical part having an internal closely fitting transverse plate secured in a position obliquely thereto.
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14. A feed end for a cylindrical rotary drier comprising a cylindrical part containing an internal closely fitting transverse plate having a feed opening and secured in a position
130

tion obliquely thereto, and a conveyer operating through the feed opening.

15. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured on the upper side thereof, a closely fitting oblique transverse plate having a feed opening and secured inside of the cylindrical part and a conveyer operating through the feed opening.

16. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured upon the upper side thereof, and a closely fitting transverse plate having a feed opening and an inspection opening and a door closing the inspection opening and secured obliquely on the inner surface of the cylindrical part.

17. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured upon the upper side thereof, and a closely fitting transverse plate having a feed opening and inspection openings and doors closing the inspection openings and secured obliquely on the inner surface of the cylindrical part.

18. A feed end for a cylindrical rotary drier comprising a cylindrical part containing a closely fitting transverse plate having a feed opening and secured obliquely inside thereof, a conveyer operating through the feed opening and means for supporting the receiving end adjacent to the end of the drying chamber of the drier.

19. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured on the upper side thereof, a closely fitting oblique transverse plate having a feed opening and secured inside of the cylindrical part, a conveyer operating through the feed opening, and means for supporting the receiving end adjacent to the end of the drying chamber of the drier.

20. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured upon the upper side thereof, a closely fitting oblique transverse plate having a feed opening and an inspection opening, a door closing the inspection opening and secured on the inner surface of the cylindrical part, and means for supporting the receiving end adjacent to the end of the drying chamber of the drier.

21. In a rotary drier, a feed end comprising a cylindrical part provided with a vapor flue secured upon the upper side thereof, a closely fitting oblique transverse plate having a feed opening and inspection openings, doors closing the inspection openings and secured on the inner surface of the cylindrical part, and means for supporting the receiving end adjacent to the end of the drying chamber of the drier.

22. In a rotary drier, the combination of a cylindrical shell provided with inner supporting plates secured thereto, flues carried in the

supporting plates, a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured therein, a ring secured upon the inner end of the cylindrical part, a ring secured to the receiving end of the cylindrical shell adjacent to the ring secured upon the inner end of the cylindrical part, and a conveyer working through the feed opening.

23. In a rotary drier, the combination of a cylindrical shell provided with inner supporting plates secured thereto, flues carried in the supporting plates, a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured therein, a ring secured upon the inner end of the cylindrical part, a ring secured to the receiving end of the cylindrical shell adjacent to the ring secured upon the inner end of the cylindrical part, a conveyer working through the feed opening, and a vapor flue secured to the upper side of the cylindrical part.

24. In a rotary drier, the combination of a cylindrical shell provided with inner supporting plates secured thereto, flues carried by the supporting plates, a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured therein, an angle ring secured upon the inner end of the cylindrical part, an angle ring secured to the receiving end of the cylindrical shell adjacent to the angle ring secured upon the inner end of the cylindrical part, a conveyer working through the feed opening, a vapor flue secured to the upper side of the cylindrical part, and means for supporting the cylindrical shell and the cylindrical part with their angle rings in juxtaposition.

25. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, and a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate secured on the inner surface thereof in a position slanting downward toward the drying chamber.

26. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof in a position slanting downward toward the drying chamber, and a conveyer operating through the feed opening.

27. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof in a position slanting downward toward the drying chamber, a conveyer operating through the feed opening,

and a vapor flue secured at the top of the vapor chamber.

28. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof, in a position slanting downward toward the drying chamber, a conveyer operating through the feed opening, a vapor flue secured at the top of the vapor chamber, and means for supporting the vapor chamber and the drying chamber in juxtaposition.

29. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate secured on the inner surface thereof, in a position slanting downward toward the drying chamber, and corresponding angle rings secured respectively to the adjacent ends of the cylindrical part forming the vapor chamber and the cylinder forming the drying chamber.

30. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier with a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof, in a position slanting downward toward the drying chamber, a conveyer operating through the feed opening and corresponding angle rings secured respectively to the adjacent ends of the cylindrical part forming the

vapor chamber and the cylinder forming the drying chamber.

31. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier with a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof in a position slanting downward toward the drying chamber, a conveyer operating through the feed opening, a vapor flue secured at the top of the vapor chamber, and corresponding angle rings secured respectively to the adjacent ends of the cylindrical part forming the vapor chamber and the cylinder forming the drying chamber.

32. In a rotary drier, the combination of a drying chamber formed by the cylinder of the drier, with a vapor chamber freely accessible therefrom formed by a cylindrical part containing a closely fitting oblique transverse plate having a feed opening and secured on the inner surface thereof in a position slanting downward toward the drying chamber, a conveyer operating through the feed opening, a vapor flue secured at the top of the vapor chamber, means for supporting the vapor chamber and the drying chamber in juxtaposition, and corresponding angle rings secured respectively to the adjacent ends of the cylindrical part forming the vapor chamber and the cylinder forming the drying chamber.

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Witnesses:

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