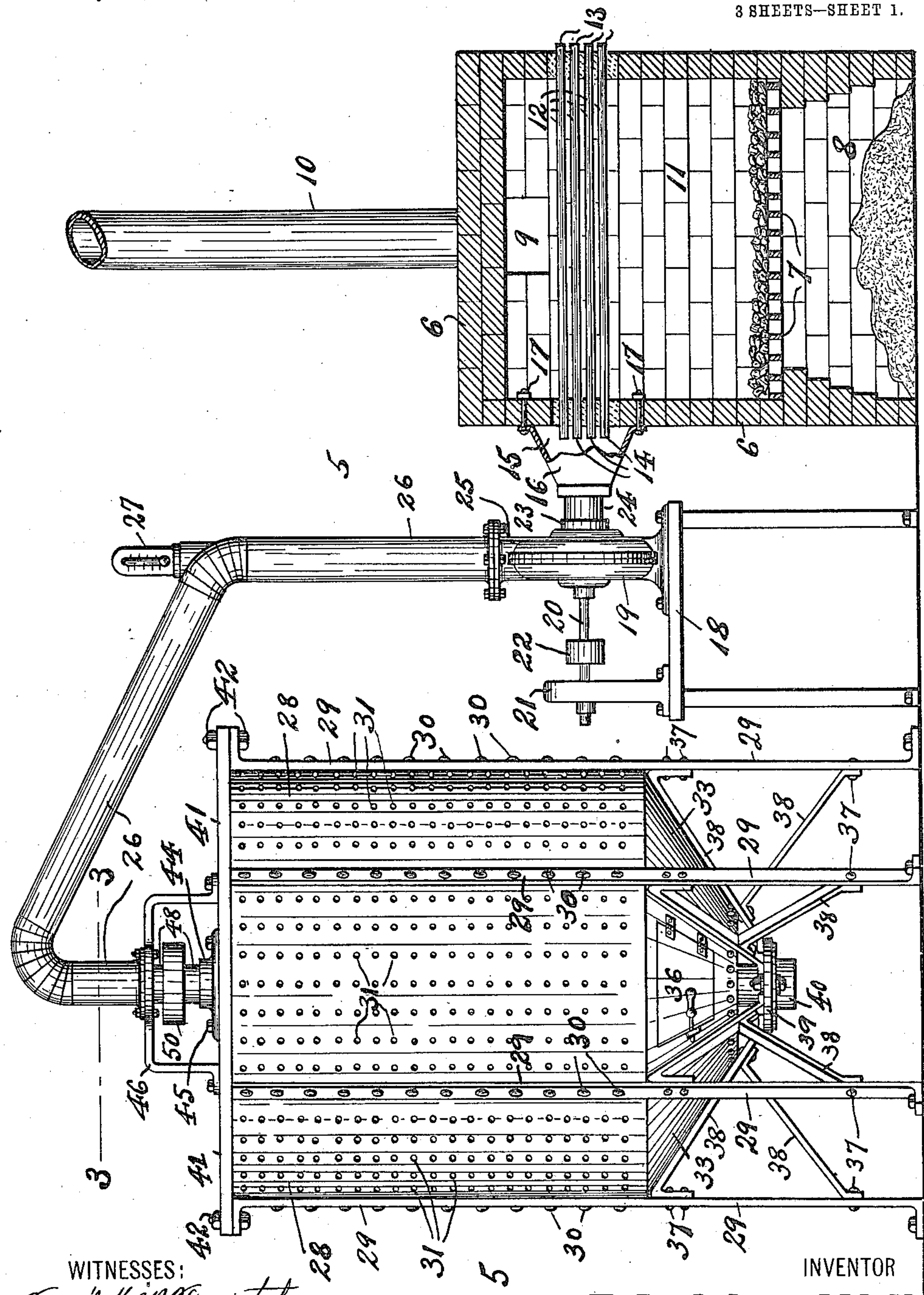


964,342.

P. M. VELILLA.  
DRYING APPARATUS.  
APPLICATION FILED NOV. 2, 1909.

Patented July 12, 1910.  
3 SHEETS—SHEET 1.



WITNESSES:  
*Frank H. W. Thoenig*  
*Anna H. Alter*

FIG. 1

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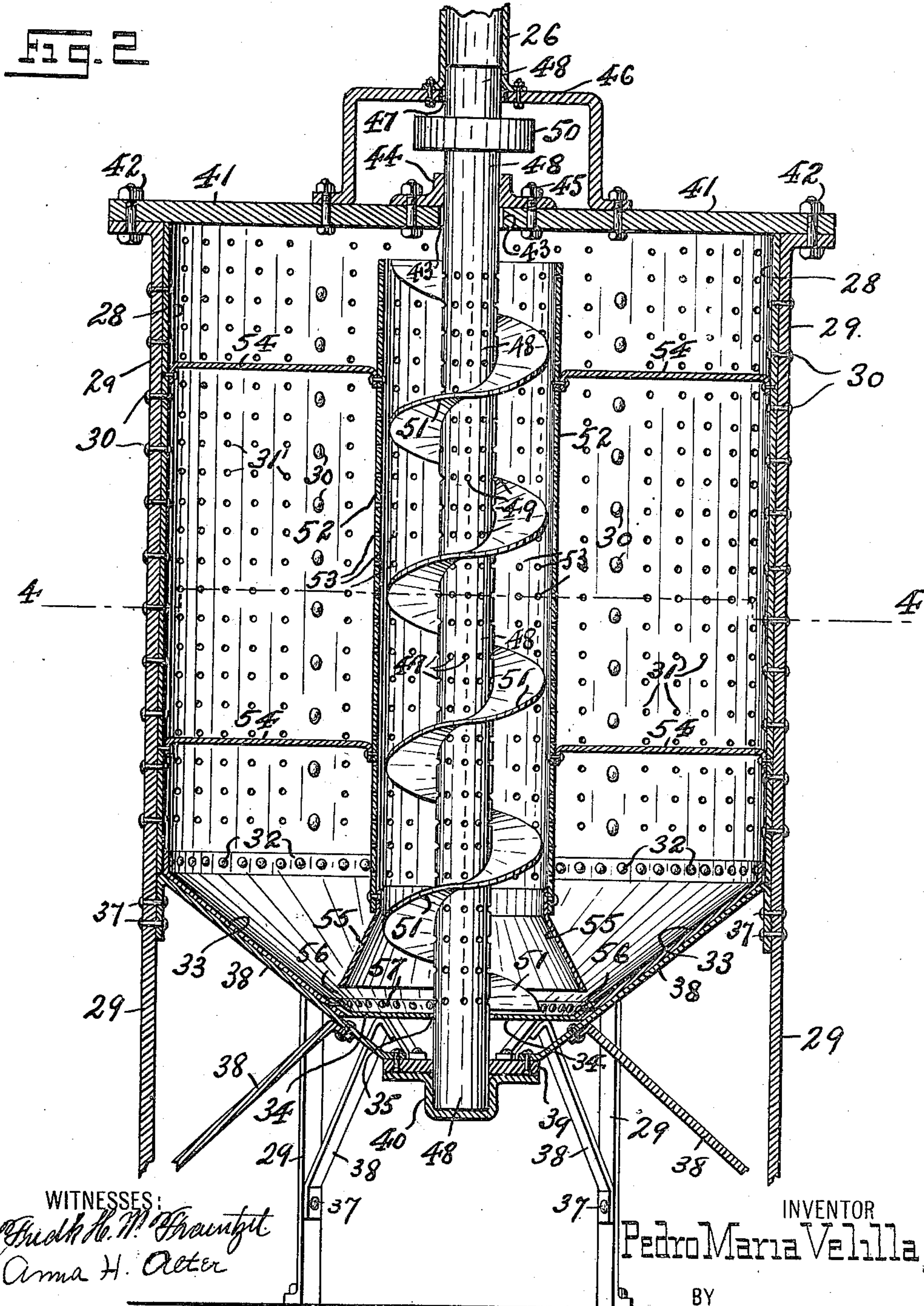


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 DRYING APPARATUS.  
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3 SHEETS—SHEET 2.



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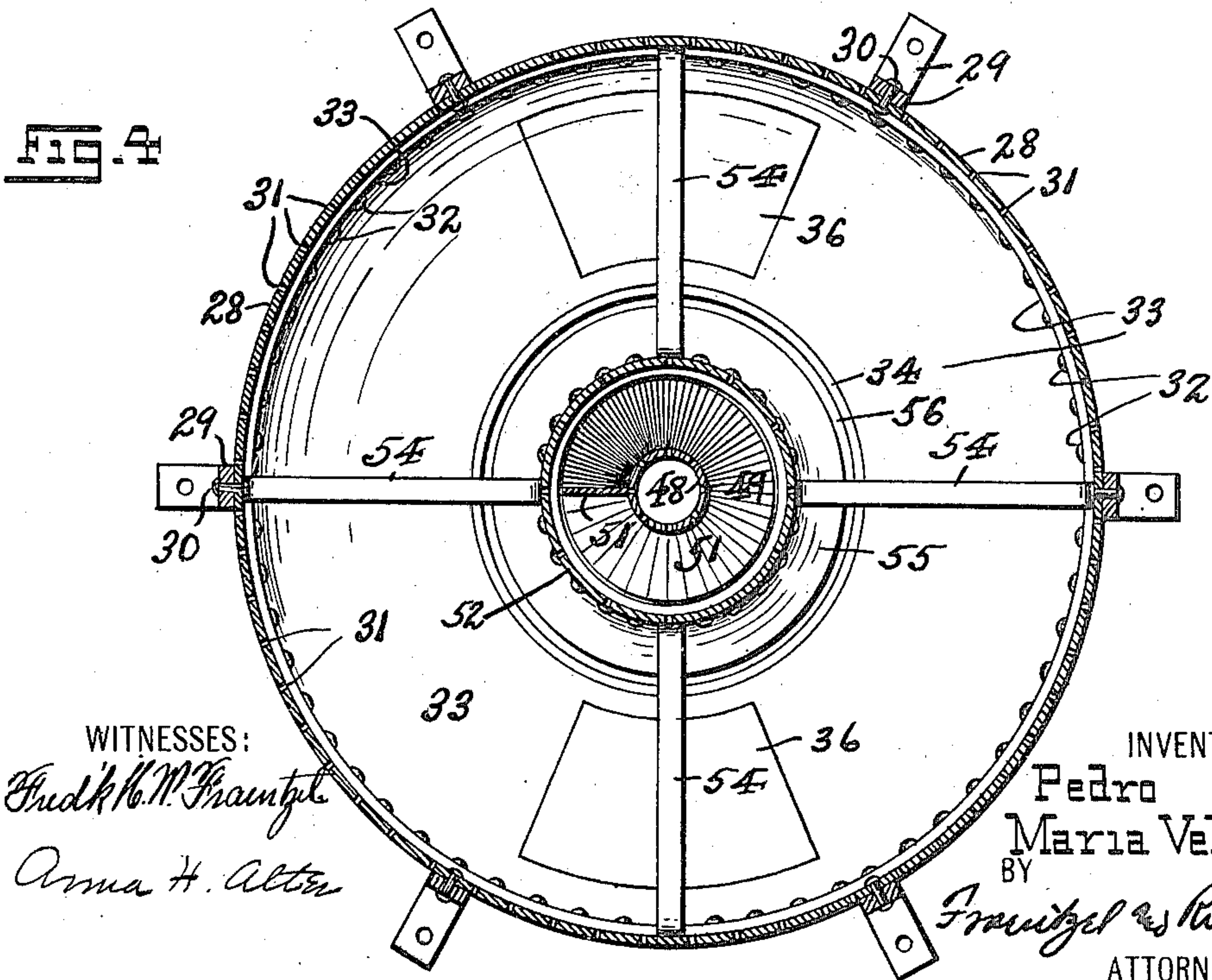
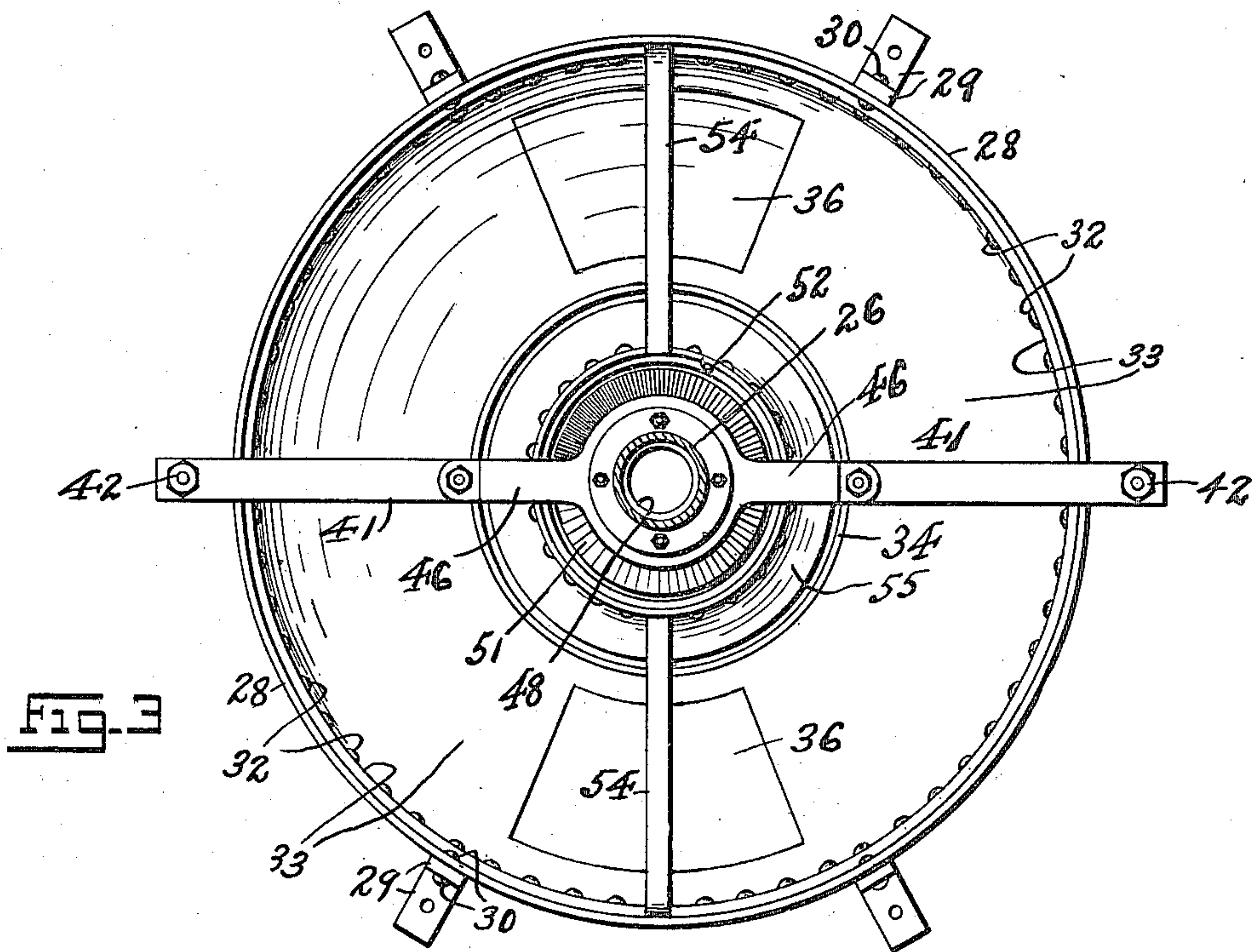


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 APPLICATION FILED NOV. 2, 1909.

Patented July 12, 1910.

3 SHEETS—SHEET 3.



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INVENTOR  
 Pedro  
 Maria Velilla,  
 BY  
*Frautzel & Richards,*  
 ATTORNEYS



# UNITED STATES PATENT OFFICE.

PEDRO MARIA VELILLA, OF MEDELLIN, COLOMBIA.

## DRYING APPARATUS.

964,342.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed November 2, 1909. Serial No. 525,947.

*To all whom it may concern:*

Be it known that I, PEDRO MARIA VELILLA, a citizen of Colombia, residing at Medellin, in the county of Medellin and Republic of Colombia, have invented certain new and useful Improvements in Drying Apparatus; and I do hereby 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, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention relates, generally, to improvements in drying apparatus; and, the present invention has reference more particularly to a novel construction of drying apparatus for drying any kind of granular material such as coffee beans, grain or similar material.

The present invention has for its principal object to provide a novel construction of drying apparatus, for the purposes above mentioned, in which a current of hot-air is caused to be circulated through the material operated upon by the said apparatus so that the moisture of said material may be carried off or evaporated thereby.

A further object of the present invention is to provide means in connection with said novel construction of drying apparatus whereby the material to be dried is constantly shifted and kept in movement to permit the hot air circulating through said apparatus to come in contact with all parts of the mass of said material to be dried, and thereby further aiding in the proper circulation and passage of the hot-air through said apparatus.

A still further object of the present invention is to provide a means for generating and conducting the current of hot-air into and through said drying apparatus.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of this invention.

With the various objects of my present invention in view, the same consists, primarily, in the novel drying apparatus hereinafter set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the devices and parts, as well as in the details of the construction of the same, all of which will be hereinafter more

fully described, and then finally embodied in the clauses of the claim, which are appended to and which form an essential part of the specification.

The invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of the novel construction of drying apparatus embodying the principles of my present invention, the hot-air generating furnace being illustrated in vertical cross-section to more clearly illustrate the bank of hot-air pipes contained therein. Fig. 2 is a detail central vertical section of said drying apparatus illustrating more particularly the interior construction of the same. Fig. 3 is a horizontal cross-section of said drying apparatus taken on line 3—3 in said Fig. 1, and looking in a downward direction. Fig. 4 is another horizontal cross-section of said drying apparatus taken on line 4—4 in said Fig. 2, and also looking in a downward direction.

Similar characters of reference are employed in all of the hereinabove described views to indicate corresponding parts.

Referring now to the several figures of the drawings the reference-character 5 indicates the complete drying apparatus embodying the principles of my present invention, the same comprising, a furnace 6 provided with a suitable grate 7 and ash-pit 8, as well as a draft-duct 9 and draft-pipe or chimney 10. The said furnace 6 may be constructed of brick-work, or of iron, or in any other suitable manner. Arranged to extend through the fire-box 11 of said furnace 6 are a plurality of air-pipes or ducts 12, the ends 13 of the same extend through one wall or side of said furnace 6 and are open to permit the outside air to be drawn thereinto. The opposite ends 14 of said air-pipes or ducts 12 project through the opposite wall or side of said furnace 6 and open into the collector-chamber 15 formed by the box 16, which may be constructed of sheet-iron or any other suitable material, and which is secured by means of bolts and nuts 17, or the like, to the wall or side of said furnace 6, or in any other convenient manner. Mounted upon a suitable supporting platform 18 is a blower-fan 19, the driving-shaft 20 of which is journaled in a suitable bearing standard 21, and is provided with a pulley 22 by means of which said fan may be operated. The intake port 23 of said



blower-fan 19 is operatively connected with said box 16 by means of a pipe-connection 24. Connected in any suitable manner with the outlet port 25 of said blower-fan 19 is one end of an air-conduit 26, the opposite end of which is adapted to be connected with the drying apparatus proper to be subsequently described. Connected with said air-conduit 26 in any suitable manner is a thermometer 27, by means of which the temperature of the hot-air passing through said air-conduit 26 may be determined, so that it may be controlled and properly regulated to maintain the desired even temperature.

The drying apparatus proper comprises an outer cylindrical shell 28 supported by suitable standards 29 to which it may be secured by means of rivets 30 or the like. Said cylindrical-shell is provided with a plurality of perforations 31 through which the hot-air circulating within said drying apparatus may escape. The top of said cylindrical shell 28 is preferably left open to further aid the hot air circulating within said drying-apparatus to escape therefrom together with the vapors arising from the material being dried therein. Secured, by means of rivets 32 or the like, to the bottom periphery of said cylindrical shell 28 is an inverted conical bottom-shell 33, and secured to the bottom periphery of said bottom-shell 33, in like manner, is a bottom-plate 34 provided with a centrally disposed opening 35. The said conical bottom shell 33 is provided with a door 36 which may be opened to permit the removal of the material contained in said drying apparatus, after the said drying process has been completed. Secured by means of rivets 37 or the like, to the said standards 29 are a plurality of bracket-arms or braces 38, to the free ends of which may be secured, in any suitable manner, a bearing disk 39, and bolted to said bearing disk 39 is a thrust bearing receiving-socket 40. Extending across the top of said cylindrical-shell 28 is a supporting-beam 41, secured at its free ends to a pair of said standards 29 by means of bolts and nuts 42 or the like. Said supporting-beam 41 is provided with a suitably disposed opening 43, and secured, in registration with said opening 43, is a bearing-plate 44, secured by means of bolts and nuts or the like 45. Secured to said supporting-beam 41 so as to straddle said bearing-plate 44 is an arch-member 46 provided with a centrally disposed opening 47. The end of said air-conduit 26 is secured to said arch-member 46 in registration with said opening 47 of said arch-member, by any suitable means. Rotatably mounted in said bearing-plate 44 and said bearing-disk 39 and thrust bearing receiving-socket 40 is a vertically extending air-pipe 48 provided with a plu-

rality of perforations 49. The upper end of said air-pipe 48 is adapted to telescope within the end of said air-conduit 26. Secured upon said air-pipe 48, preferably between the arch-member 46 and said bearing-plate 44, is a driving-pulley 50 by means of which said air-pipe 48 may be rotated. Secured upon the outer circumference or surface of said air-pipe 48, and extending upwardly from the bottom-plate 34 to a point below the top of said cylindrical shell 28, is a conveyer-member 51 arranged in the manner of an ascending spiral and adapted to revolve with said air-pipe 48. Arranged around said conveyer-member 51 is a cylindrical-wall 52 provided with a plurality of perforations 53. Said cylindrical-wall 52 is supported in its operative position by means of supporting-braces 54 which are secured thereto in any suitable manner, and the opposite ends of which are secured, in any suitable manner, to said cylindrical-shell 28. Secured to the lower end of said cylindrical-wall 52 is an outwardly flaring conical plate or apron 55, the free edge of which terminates within a short distance from the inner surface of said bottom-shell 33 so as to provide a space 56 through which the material to be dried is permitted to pass to the space 57 where it can be taken up by the conveyer-member 51. This plate or apron 55 assures a perfect mixture of the material to be dried so that it may be uniformly heated and dried, and the said plate or apron 55 furthermore prevents the said material to be dried from becoming jammed or improperly fed to said conveyer member 51.

Having thus described the general construction of my novel drying apparatus together with the various parts which go to make up the same, it remains to describe the operation of the same in carrying out the process of drying the material placed therein.

Assuming, for the sake of example, that it is desired to dry a quantity of coffee. In such a case the desired quantity of coffee beans are placed within the cylindrical shell 28 so that it fills the space between said cylindrical shell 28 and the cylindrical-wall 52. The air-pipe 48, together with the conveyer-member 51 connected therewith, is then revolved by means of the driving pulley 50. The operation of said blower-fan 19 is then started. The said blower-fan 19 sucks air through the said air-pipes or ducts 12, which being surrounded by the burning gases and heat generated in the fire-box of said furnace 6 causes the air thus passing through the air-pipes or ducts 12 to be heated and passed into the collector-chamber 15. This heated air is then drawn from said collector-chamber 15 and forced by said blower-fan through the air-conduit 26 and down into the revolving air-pipe 48. In the



meantime the coffee-beans flow downward by force of gravity through the opening or space 56 to the foot of said conveyer-member 51. The said conveyer-member 51 carries the coffee-beans upwardly within the cylindrical-wall 52 until the top thereof is reached, whereupon the said coffee-beans fall over the edge of the same and back into the cylindrical-shell 28. In this manner the coffee-beans are kept moving or circulating through the drying apparatus, and are thoroughly mixed so that all parts of the mass are brought in contact with the air-pipe 48. The hot-air within said air-pipe 48 finds its way through the perforations 49 and thence permeates the mass of coffee-beans carried by said conveyer-member 51. The said hot-air then passes through the perforations 53 of the cylindrical wall 52 and finding its way through the mass of coffee-beans within said cylindrical-shell 28 finally escapes through the perforations 31 of said cylindrical-shell 28. In this manner the moisture of the coffee-beans is taken up by the said hot-air and carried off or evaporated. Of course it will be readily understood, that if it is so desired, the upper portion or opening of said cylindrical-shell 28 may be provided with a closure such as doors or covers or the like.

I am fully aware that changes may be made in the arrangements and combinations of the various parts as well as in the details of the construction of the same without departing from the scope of my present invention as set forth in the appended claims. Hence, I do not limit my invention to the exact arrangements and combinations of the devices and parts as described in the foregoing specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

I claim:—

1. In a drying apparatus, the combination with a container mounted upon suitable standards of bearings, an air-pipe rotatably mounted in said bearings, means for circulating the material to be dried so as to bring the same in contact with said revolving air-pipe, and means for supplying hot-air to said revolving air-pipe, substantially as and for the purposes set forth.

2. In a drying apparatus, the combination with a container mounted upon suitable standards of bearings, an air-pipe rotatably mounted in said bearings, means for circulating the material to be dried so as to bring the same in contact with said revolving air-pipe, means for generating a supply of hot air, and means for conveying said hot-air into said revolving air-pipe, substantially as and for the purposes set forth.

3. In a drying apparatus, the combina-

tion with a container mounted upon suitable standards of bearings, an air-pipe rotatably mounted in said bearings, means for circulating the material to be dried so as to bring the same in contact with said revolving air-pipe, a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a plurality of air pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, means for conveying said hot air into said revolving air-pipe, substantially as and for the purposes set forth.

4. In a drying apparatus, the combination with a container mounted upon suitable standards of bearings, an air-pipe rotatably mounted in said bearings, means for circulating the material to be dried so as to bring the same in contact with said revolving air-pipe, a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a plurality of air pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet port of said blower-fan, said air-conduit being adapted to convey said hot air into said revolving air-pipe, substantially as and for the purposes set forth.

5. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a cylindrical shell provided with a plurality of perforations, a bottom-shell connected with said cylindrical shell, a bottom-plate provided with a suitably disposed opening secured to said bottom-shell, suitable bearings connected with said container, an air-pipe extending vertically through said container and rotatably mounted in said bearings, said air-pipe being provided with a plurality of perforations, a conveyer-member connected with the outer surface of said air-pipe, a cylindrical-wall surrounding said conveyer-member, said cylindrical-wall being provided with a plurality of perforations, a driving pulley connected with said air-pipe, and means for supplying hot-air to said revolving air-pipe, substantially as and for the purposes set forth.

6. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a cylindrical shell provided with a plurality of perforations, a bottom shell connected with said cylindrical shell, a bottom-plate provided with a suitably disposed opening secured to said bottom-shell, suitable bearings connected with said container, an air-pipe extending verti-



cally through said container and rotatably mounted in said bearings, said air-pipe being provided with a plurality of perforations, a conveyer-member connected with the  
 5 outer surface of said air-pipe, a cylindrical-wall surrounding said conveyer-member, said cylindrical-wall being provided with a plurality of perforations, a driving pulley connected with said air-pipe, means for gen-  
 10 erating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, substantially as and for the purposes set forth.

7. A drying apparatus, comprising a con-  
 15 tainer mounted upon suitable standards, said container comprising a cylindrical shell provided with a plurality of perforations, a bottom-shell connected with said cylindrical shell, a bottom plate provided with a suit-  
 20 ably disposed opening secured to said bottom-shell, suitable bearings connected with said container, an air-pipe extending vertically through said container and rotatably mounted in said bearings, said air-pipe be-  
 25 ing provided with a plurality of perforations, a conveyer-member connected with the outer surface of said air-pipe, a cylindrical-wall surrounding said conveyer-member, said cylindrical-wall being provided with a  
 30 plurality of perforations, a driving pulley connected with said air-pipe, means for generating a supply of hot-air, comprising a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box  
 35 providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, means for conveying said hot air into said revolving pipe, substantially as and  
 40 for the purposes set forth.

8. A drying apparatus, comprising a con-  
 45 tainer mounted upon suitable standards, said container comprising a cylindrical shell provided with a plurality of perforations, a bottom-shell connected with said cylindrical shell, a bottom plate provided with a suit-  
 50 ably disposed opening secured to said bottom-shell, suitable bearings connected with said container, an air-pipe extending vertically through said container and rotatably mounted in said bearing, said air-pipe being  
 55 provided with a plurality of perforations, a conveyer-member connected with the outer surface of said air-pipe, a cylindrical-wall surrounding said conveyer-member, said cylindrical wall being provided with a plu-  
 60 rality of perforations, a driving pulley connected with said air-pipe, means for generating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, comprising a furnace, a plurality of air-pipes arranged within the fire-box of  
 65 said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air

generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet-port of said blower-fan, said air-con-  
 70 duct being adapted to convey said hot air into said revolving air-pipe, substantially as and for the purposes set forth.

9. A drying apparatus, comprising a con-  
 75 tainer, mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, a bottom-plate connected with said bottom-shell, said bottom-plate being pro-  
 80 vided with a suitably disposed opening, bracket-members secured to the standards of said container, a bearing-plate secured to the free ends of said bracket-members, a thrust bearing receiving socket connected with said bearing-plate, a supporting beam  
 85 provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe extending vertically through said container  
 90 and rotatably mounted in said bearing-plates and said thrust bearing receiving socket, said air-pipe being adapted to extend through the respective openings of said bottom-plate and said supporting beam, a  
 95 spirally arranged plate forming a conveyer-member secured upon the outer surface of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical shell, a perforated cylindrical-wall arranged around said con-  
 100 veyer member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical-wall, the same projecting toward said bottom-shell, a driving-pulley connected with said  
 105 air-pipe for rotating the same, and means for supplying hot-air to said revolving air-pipe, substantially as and for the purposes set forth.

10. A drying apparatus, comprising a  
 110 container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, a bottom-plate connected with said bottom-shell, said bottom-plate being pro-  
 115 vided with a suitably disposed opening, bracket members secured to the standards of said container, a bearing-plate secured to the free-ends of said bracket-members, a thrust bearing receiving socket connected  
 120 with said bearing-plate, a supporting beam provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe ex-  
 125 tending vertically through said container and rotatably mounted in said bearing-plates and said thrust bearing receiving-socket, said air-pipe being adapted to extend through the respective openings of said  
 130



bottom-plate and said supporting-beam, a spirally arranged plate forming a conveyer-member secured upon the outer surface of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical-shell, a perforated cylindrical-wall arranged around said conveyer-member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical wall, the same projecting toward said bottom-shell, a driving-pulley connected with said air-pipe for rotating the same, means for generating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, substantially as and for the purposes set forth.

11. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, a bottom-plate connected with said bottom-shell, said bottom-plate being provided with a suitably disposed opening, bracket-members secured to the standards of said container, a bearing-plate secured to the free ends of said bracket-members, a thrust bearing receiving socket connected with said bearing-plate, a supporting beam provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe extending vertically through said container and rotatably mounted in said bearing-plates and said thrust bearing receiving-socket, said air-pipe being adapted to extend through the respective openings of said bottom-plate and said supporting-beam, a spirally arranged plate forming a conveyer-member secured upon the outer surface of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical-shell, a perforated cylindrical-wall arranged around said conveyer-member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical wall, the same projecting toward said bottom-shell, a driving-pulley connected with said air-pipe for rotating the same, means for generating a supply of hot-air, comprising a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, means for conveying said hot air into said revolving air pipe, substantially as and for the purposes set forth.

12. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-

shell, a bottom-plate connecting with said bottom-shell, said bottom-plate being provided with a suitably disposed opening, bracket-members secured to the standards of said container, a bearing-plate secured to the free ends of said bracket-members, a thrust bearing receiving socket connected with said bearing-plate, a supporting beam provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe extending vertically through said container and rotatably mounted in said bearing-plates and said thrust bearing receiving-socket, said air-pipe being adapted to extend through the respective openings of said bottom-plate and said supporting-beam, a spirally arranged plate forming a conveyer-member secured upon the outer surface of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical-shell, a perforated cylindrical-wall arranged around said conveyer-member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical wall, the same projecting toward said bottom-shell, a driving pulley connected with said air-pipe for rotating the same, means for generating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet port of said blower-fan, said air-conduit being adapted to convey said hot air into said revolving air-pipe, substantially as and for the purposes set forth.

13. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, a bottom-plate connecting with said bottom-shell, said bottom-plate being provided with a suitably disposed opening, bracket-members secured to the standards of said container, a bearing-plate secured to the free ends of said bracket-members, a thrust bearing receiving socket connected with said bearing-plate, a supporting beam provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe extending vertically through said container and rotatably mounted in said bearing-plates and said thrust bearing receiving-socket, said air-pipe being adapted to extend through the respective openings of said



bottom-plate and said supporting-beam, a spirally arranged plate forming a conveyer-member secured upon the outer surface of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical-shell, a perforated cylindrical-wall arranged around said conveyer-member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical wall, the same projecting toward said bottom-shell, a driving pulley connected with said air-pipe, for rotating the same, means for generating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, comprising a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet port of said blower-fan, said air-conduit being adapted to convey said hot-air into said revolving air-pipe, and means for operatively connecting said air-conduit with said revolving air-pipe, substantially as and for the purposes set forth.

14. In a drying apparatus, the combination with a container mounted upon suitable standards of bearings, an air-pipe rotatably mounted in said bearings, means for circulating the material to be dried so as to bring the same in contact with said revolving air-pipe, a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet port of said blower-fan, said air-conduit being adapted to convey said hot-air into said revolving air-pipe, and means for operatively connecting said air-conduit with said revolving air-pipe, substantially as and for the purposes set forth.

15. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a cylindrical shell provided with a plurality of perforations, a bottom-shell connected with said cylindrical shell, a bottom plate provided with a suitably disposed opening secured to said bottom-shell, suitable bearings connected with said container, an air-pipe extending vertically through said container and rotatably mounted in said bearings said air-pipe being provided with a plurality of perforations, a conveyer-member connected with the outer surface of said air-pipe, a cylindrical-wall surrounding said conveyer-member, said cylindrical wall being provided with a plural-

ity of perforations, a driving pulley connected with said air-pipe, means for generating a supply of hot-air, and means for conveying said hot-air into said revolving air-pipe, comprising a furnace, a plurality of air-pipes arranged within the fire-box of said furnace, a box providing a collector-chamber arranged about the outlet of said air-pipes and adapted to receive the hot-air generated in said air-pipes, a blower-fan, the intake port of which is connected with said box, an air-conduit connected with the outlet-port of said blower-fan, said air-conduit being adapted to convey said hot air into said revolving air-pipe, and means for operatively connecting said air-conduit with said revolving air-pipe, substantially as and for the purposes set forth.

16. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, suitable doors hinged to said bottom-shell to permit the removal of the dried material from said container, a bottom-plate connected with said bottom-shell, said bottom-plate being provided with a suitably disposed opening, bracket members secured to the standards of said container, a bearing-plate secured to the free ends of said bracket-members, a thrust bearing receiving socket connected with said bearing-plate, a supporting beam provided with a suitably disposed opening, arranged and secured across the top of said container, a bearing-plate secured upon said supporting beam, a perforated air-pipe extending vertically through said container and rotatably mounted in said bearing-plates and said thrust bearing receiving socket, said air-pipe being adapted to extend through the respective openings of said bottom-plate and said supporting-beam, a spirally arranged plate forming a conveyer-member secured upon the outer surfaces of said air-pipe and extending from said bottom-plate upwardly to a point below the top of said cylindrical-shell, a perforated cylindrical-wall arranged around said conveyer member, means for supporting said cylindrical-wall, a conical apron connected with the lower end of said cylindrical wall, the same projecting toward said bottom-shell, a driving-pulley connected with said air-pipe for rotating the same, and means for supplying hot-air to said revolving air-pipe, substantially as and for the purposes set forth.

17. A drying apparatus, comprising a container mounted upon suitable standards, said container comprising a perforated cylindrical shell, an inverted conical bottom-shell, suitable doors hinged to said bottom-shell to permit the removal of the dried material from said container, a bottom-plate connected with said bottom-shell, said bot-



tom-plate being provided with a suitably  
 disposed opening, bracket members secured  
 to the standards of said container, a bear-  
 ing-plate secured to the free ends of said  
 5 bracket-members, a thrust bearing receiving  
 socket connected with said bearing-plate, a  
 supporting beam provided with a suitably  
 disposed opening, arranged and secured  
 across the top of said container, a bearing-  
 10 plate secured upon said supporting beam, a  
 perforated air-pipe extending vertically  
 through said container and rotatably mount-  
 ed in said bearing-plates and said thrust  
 bearing receiving socket, said air-pipe being  
 15 adapted to extend through the respective  
 openings of said bottom-plate and said sup-  
 porting-beam, a spirally arranged plate  
 forming a conveyer-member secured upon  
 the outer surface of said air-pipe and ex-  
 20 tending from said bottom-plate upwardly to  
 a point below the top of said cylindrical-  
 shell, a perforated cylindrical-wall arranged  
 around said conveyer member, means for  
 supporting said cylindrical-wall, a conical  
 25 apron connected with the lower end of said

cylindrical wall, the same projecting toward  
 said bottom-shell, a driving-pulley connect-  
 ed with said air-pipe for rotating the same,  
 means for generating a supply of hot-air,  
 and means for conveying said hot-air into 30  
 said revolving air-pipe, comprising a fur-  
 nace, a plurality of air-pipes arranged with-  
 in the fire-box of said furnace, a box pro-  
 viding a collector-chamber arranged about  
 the outlet of said air-pipes and adapted to 35  
 receive the hot-air generated in said air-  
 pipes, a blower-fan, the intake port of which  
 is connected with said box, an air-conduit  
 connected with the outlet-port of said  
 blower-fan, said air-conduit being adapted 40  
 to convey said hot air into said revolving  
 air-pipe, substantially as and for the pur-  
 poses set forth.

In testimony, that I claim the invention  
 set forth above I have hereunto set my hand 45  
 this seventh day of October 1909.

PEDRO MARIA VELILLA.

Witnesses:

GUSTAVO PORADA,  
 JESÚS RENDÓS R.