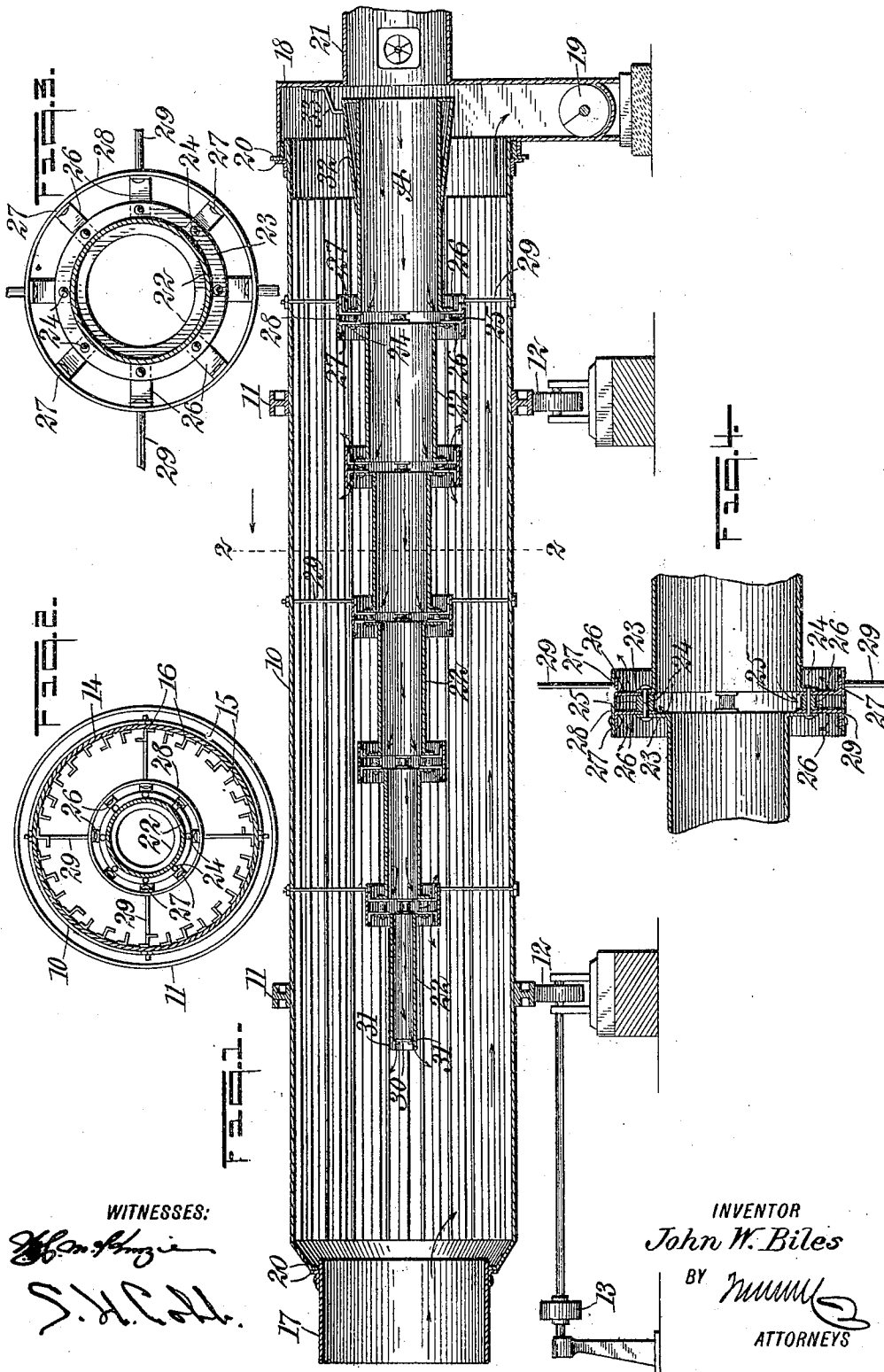


No. 807,997.

PATENTED DEC. 19, 1905.

J. W. BILES.
DRIER.

APPLICATION FILED MAR. 1, 1905.



WITNESSES:

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DRIER.

REISSUED

No. 807,997.

Specification of Letters Patent.

Patented Dec. 19, 1905.

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To all whom it may concern:

Be it known that I, JOHN W. BILES, a citizen of the United States, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and Improved Drier, of which the following is a full, clear, and exact description.

My invention relates to driers, and more particularly to means for applying heat thereto. Its principal objects are to provide an air-conduit which will uniformly distribute the heat to the drying-chamber without danger of scorching the material operated upon and which may be readily repaired, if necessary.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical longitudinal section through one embodiment of my invention. Fig. 2 is a vertical transverse section therethrough on the line 2 2 of Fig. 1. Fig. 3 is a similar view showing the heating-conduit and its more closely associated parts enlarged, and Fig. 4 is an enlarged longitudinal sectional detail through the meeting portions of adjacent conduit-sections.

I have here illustrated a drying-chamber, which in the present instance is in the form of a cylinder 10, supported upon peripheral rings 11, which rest upon pairs of suitably-journaled rolls 12 12. The cylinder may be rotated through a pulley 13, fixed upon an extension of the journal of one of these supporting-rolls, and may be lined at 14. It is preferably provided with longitudinally-extending elevating members or flights 15 and 16, which are shown as in the form of alternate L and Z bars, secured to the interior of the cylinder. The material to be dried may be delivered to the cylinder through a stationary throat 17, extending into one of its open ends, while the opposite end of said cylinder projects into a discharge-head 18, from which the dried material is removed by a suitable conveyer 19. Coacting contact-faces 20 20 are preferably applied to the cylinder and the throat and head to insure tight joints.

Connected to the discharge-head is shown a supply-conduit 21, leading from a furnace or some source of heated air and situated longitudinally of the cylinder, and in alinement with the supply-conduit is a heating-conduit A, its end adjacent to the supply-conduit being open and its opposite extremity extending into proximity with the feed-throat. This heat-

ing-conduit preferably comprises a series of tubular sections 22 of gradually-decreasing diameter as they go from the discharge end of the cylinder toward the inlet. At the adjacent ends of the sections are opposed and outwardly-extending projections or flanges 23, connected to one another by bolts 24 and being spaced to leave circumferential openings by thimbles 25 encircling the bolts. From the flanges conveniently held in place between them and the thimbles project arms 26, having outer angular ends 27, upon which are supported deflecting-rings 28, which surround the spaces between the sections. Rods 29 are shown as radiating from a portion of these rings and are attached at their outer ends to the cylinder, thus serving to support the heating-conduit axially of said cylinder. Within the outlet end of the heating-conduit is a head 30, supported by angular brackets 31 and spaced from the conduit at its periphery.

The portion of the conduit A into which the supply of heated air enters is preferably provided with insulating means to avoid the scorching of the material by the comparatively high temperature at this point. For this purpose I have shown an outer wall 32 converging from the end section toward its extremity and furnishing a dead-air space. A shield 33 may be mounted upon the inside of the head and extend over the space between the juncture of the conduit to prevent material from dropping through directly in the path of the entering air.

The cylinder being rotated at the desired speed and the material to be dried introduced through the throat, the material is then elevated by the flights and dropped through the cylinder upon and in proximity to the heating-conduit. The hot air entering said conduit passes toward the feed end of the machine and being checked by the decrease in diameter between the sections is retarded and passes through the intermediate spaces, where it strikes the encircling rings and is deflected in both directions, thus being effectively delivered to the interior of the cylinder. At the same time these deflecting-rings shield the spaces and render it impossible for the falling substances to enter them, while the projection of the flanges from the sections guards against the movement of material along the exterior of the conduit into said spaces. The successive sections may approximate in diameter the quantity of air which is present in the conduit for discharge at each space, the opening

left between the head 30 and the last section being such that a proper space is provided for the outflow of the remainder of the air. At the outlet end of the cylinder, after the material has come under the influence of the air from each of the spaces between the sections and the radiation from the sections themselves, it is discharged into the head and removed by the conveyer without endangering it by the intensity of the heat of the entering air. This method of construction also furnishes a ready means for the removal and replacement of any worn-out section or associated elements, each of said sections being capable of separation from its companions by the withdrawal of the connecting-bolts.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a drying-chamber, of a heating-conduit extending into the chamber and comprising sections between which are spaces, and deflectors extending outside the sections and opening at each side of the spaces.

2. The combination with a drying-chamber,

of a heating-conduit extending into the chamber and comprising separated sections having at their adjacent ends outward projections, and deflectors carried by the projections.

3. The combination with a drying-chamber, of a heating-conduit extending into the chamber and comprising sections having at their adjacent ends outward projections, and spacing members interposed between the projections.

4. The combination with a drying-chamber, of a heating-conduit extending into the chamber and comprising sections having at their adjacent ends outward projections, spacing members introduced between the projections, and deflecting-rings supported upon the projections.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN W. BILES.

Witnesses:

MAMIE SHABEE,
WILLIAM T. HALE.