No. 640,107. Patented Dec. 26, 1899.

H. W. CUTLER.

GRAIN DRIER.

(Application filed May 6, 1899.)

(No Model.)

FIG. 1.

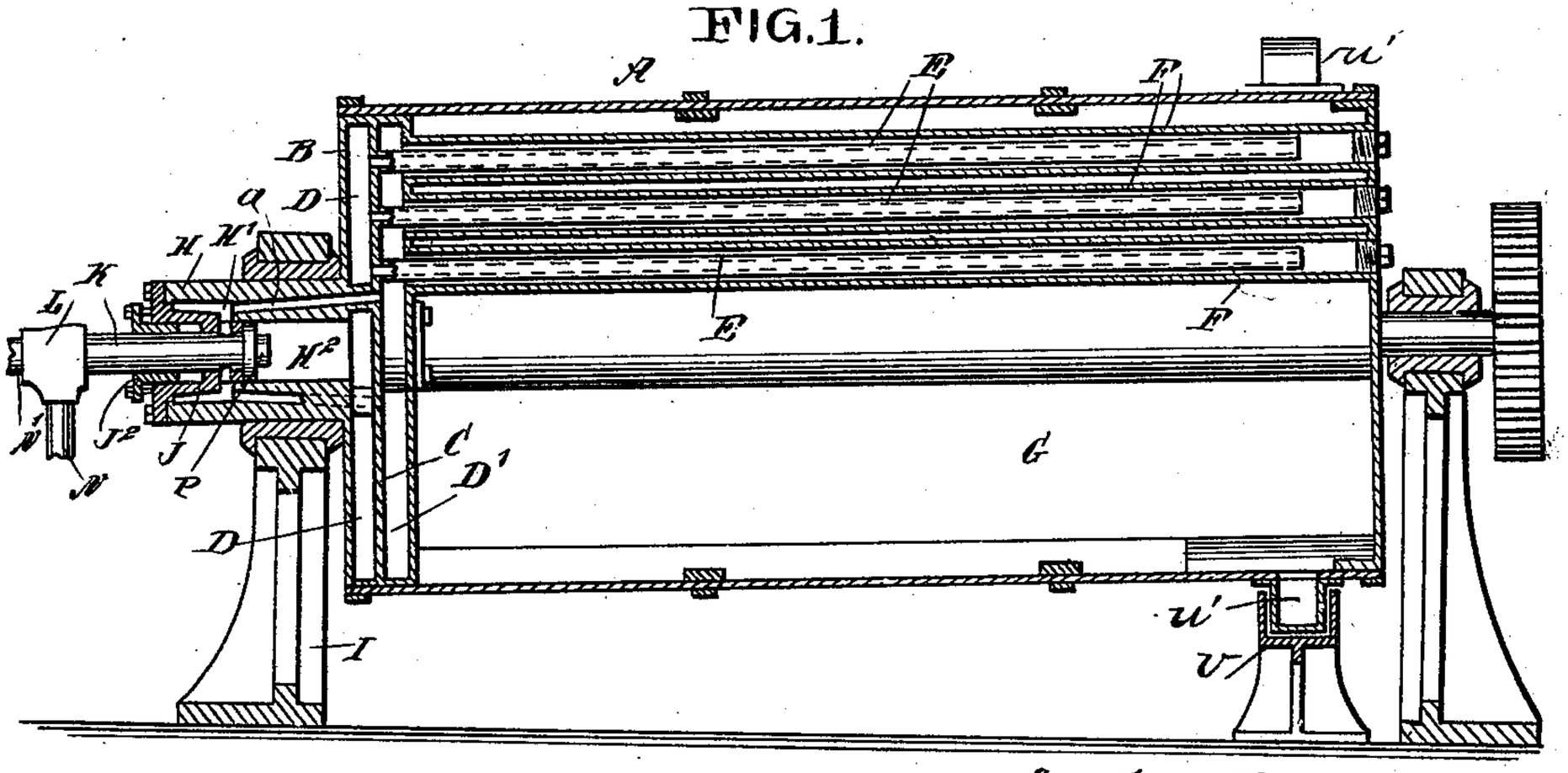


FIG. 2.

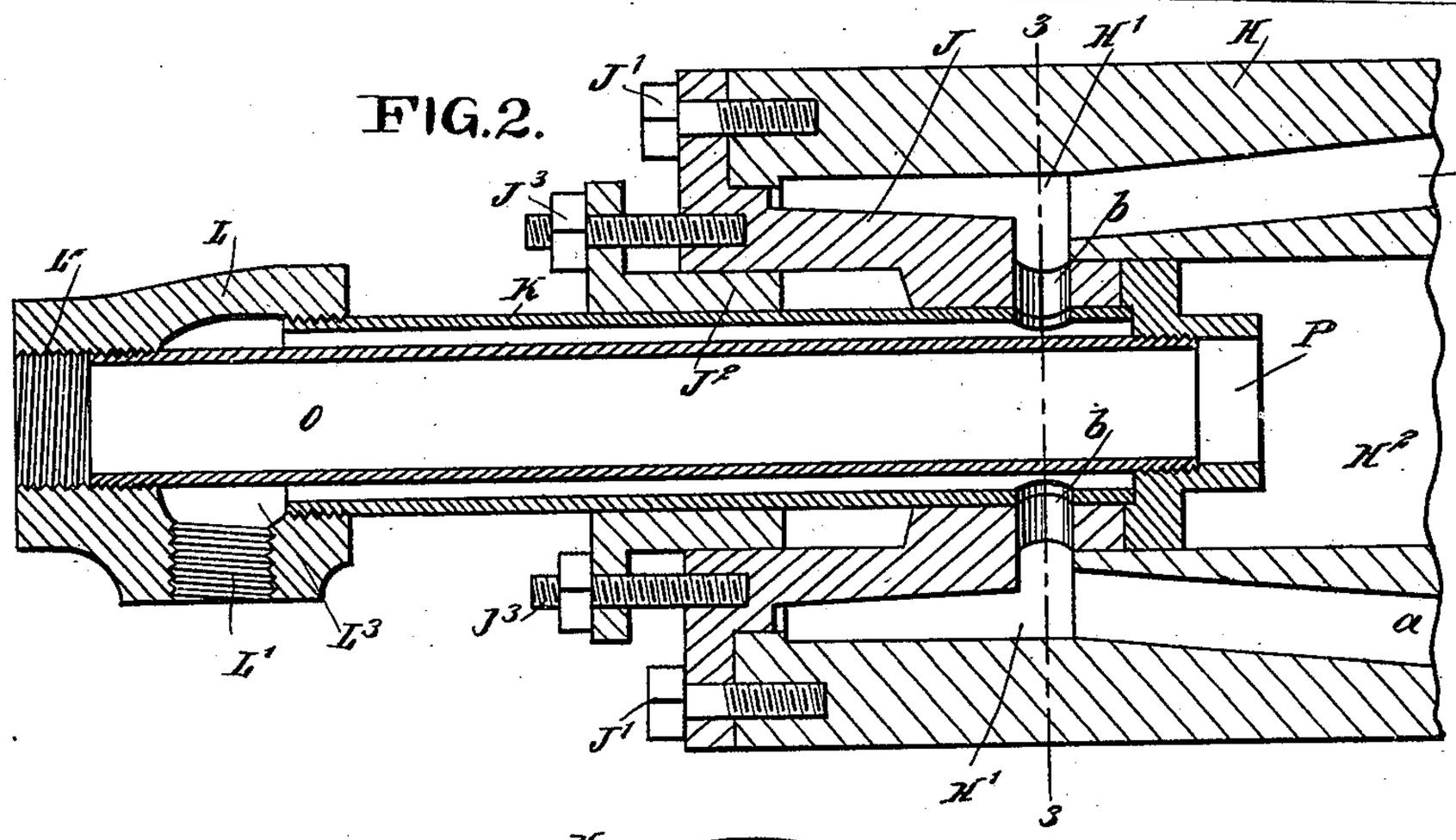
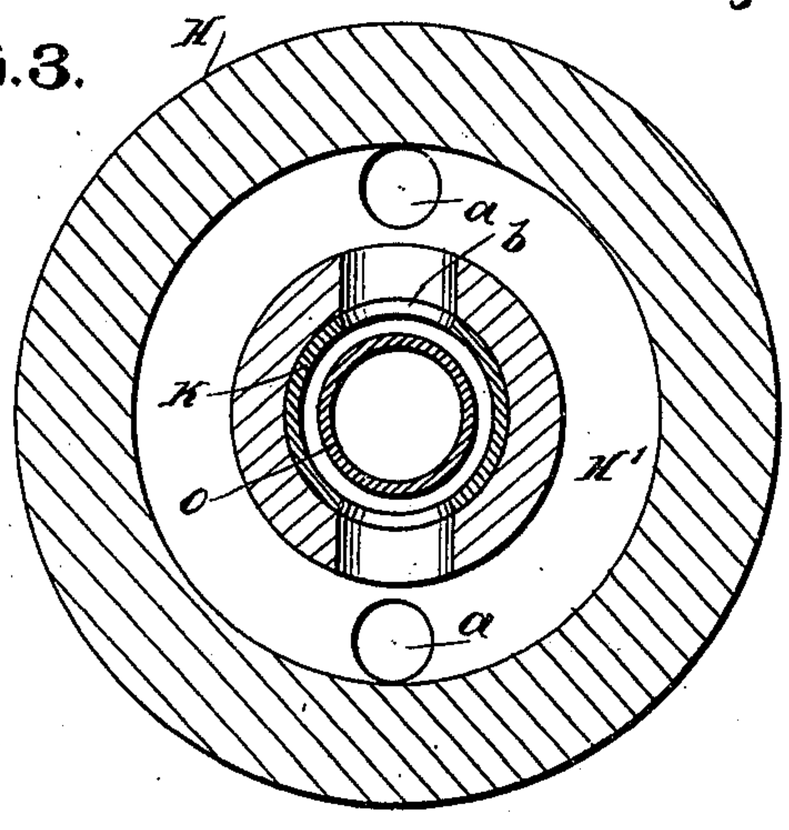


FIG. 3.



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UNITED STATES PATENT OFFICE.

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GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 640,107, dated December 26, 1899.

Application filed May 6, 1899. Serial No. 715,783. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. CUTLER, of North Wilbraham, in the county of Hampden and State of Massachusetts, have invented a new and Improved Grain-Drier, of which the following is a full, clear, and exact description.

The invention relates to grain-driers such as shown and described in the Letters Patent of the United States, No. 269,644, granted to Henry Cutler on December 26, 1882.

The object of the invention is to provide a new and improved grain-drier arranged to permit ready entrance of steam and a separate discharge of the water of condensation, to insure constant and positive circulation of the steam in every pipe of the drier, and to prevent binding of the steam-plug in the journal of the drying-cylinder.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in 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 longitudinal central sectional elevation of the improvement. Fig. 2 is an enlarged sectional elevation of the steam-plug as applied in the hub of the drying-cylinder, and Fig. 3 is a tranverse section of the same on the line 3 3 in Fig. 2.

The grain-drier shown in Fig. 1 is provided with an inclined revoluble cylinder A, essentially of the construction shown and described in the Letters Patent above referred to and having its head B provided with a transverse partition C for dividing the head into a steam-compartment D and a water-discharge compartment D′. The steam from the compartment D can pass into pipes E, extending within the pipes F, arranged in the grain-drier compartment G, said pipes opening at their lower ends into the compartment D′, so that the water of condensation can pass by channels *a* to an annular space H′ in the journal H of the head B, said journal being preferably integral with the head and mounted to turn in a suitable bearing on the standard I.

Into the outer end of the journal H extends a stuffing-box J, containing a steam-plug formed of two concentric pipes K and O, secured at their outer ends to a head L, having a threaded outlet-opening L′ for a water-discharge pipe N, and a threaded opening L^2 for a steam-inlet pipe N′, connected with a boiler or other suitable source of steam-supply. The opening L^2 connects with the outer end of the pipe O, and the opening L′ connects with a chamber L^3, opening into the outer end of the pipe K, which latter forms a water-passage with the outer wall of the pipe O for the water of condensation to pass to the discharge-pipe N. The flange of the box J is secured by bolts J′ to the outer end of the journal, and the gland J^2 is fitted into the box over the pipe K and is secured by bolts J^3 to the box, so as to securely hold the gland in position to prevent leakage of steam or water. The inner reduced end of the box J fits into the central opening H^2 of the journal H, and on the inner end of the pipe O is secured a thrust-collar P, abutting against the inner end of the pipe K to close the inner end of the water-passage between the pipes K and O. In the box J and the pipe K are formed registering ports *b*, so that the water of condensation flowing into the annular space H′ from the channels *a* can readily pass through said ports *b* into the water-passage between the pipes K and O to finally flow into the chamber L^3 and to the water-discharge pipe N. The steam from the pipe N′ passes to the pipe O and through the same and the thrust-collar P into the central opening H^2 to finally reach the steam-compartment D, which distributes the steam through the several pipes E, as previously mentioned.

Now it will be seen that by the arrangement described the steam-plug is fitted into the stuffing-box in such a manner that the steam can readily pass to the steam-compartment D, and the water of condensation has a ready outflow from the journal without danger of leakage either of steam or of water. By the construction described the steam-plug can be nicely fitted into the stuffing-box to insure true running, so as to prevent binding when the hub revolves, it being understood that the steam-plug is stationary.

By having the thrust-collar P abutting against the inner end of the box J outward longitudinal movement of the steam-plug is prevented without affecting the packing in the stuffing-box, and at the same time the inner end of the water-passage is closed by the said collar.

The operation is as follows: When the cylinder A is rotated, the cylinder-buckets u', leading to the several compartments G, scoop the grain out of the trough v and deliver it to the said compartments, as more fully described in the patent above referred to. The grain in the compartments G is subjected to the heat of the pipes F, filled with steam from the pipes E, the steam passing from the boiler by way of the inlet-pipe N′ through the pipe O and the central opening H^2 of the journal H to the steam-compartment D, from which the steam passes into the said pipes E and F to dry the grain surrounding the pipes. The water of condensation in any one of the pipes F readily flows into the water-compartment D′, from which the water can drain by the channels a to the annular space H′ in the journal H, and from said space H′ the water of condensation flows through the registering ports b into the pipe K and chamber L^3 of the head L and finally by the opening L′ and pipe N to a suitable place of discharge. After the grain is dried in the compartments it is discharged therefrom through suitable outlets. (Not shown.)

The device is very simple and durable in construction, is not liable to get out or order, and does not require frequent repacking, as was necessary in the construction shown and described in the patent above mentioned.

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

1. A grain-drier, provided with a steam-plug having a passage for the steam and a separate passage for the water of condensation, a stuffing-box for containing the inner end of the said plug and secured to the journal of the drying-cylinder, and a thrust-collar on the inner end of the steam-plug and abutting against the said stuffing-box, substantially as shown and described,

2. A grain-drier, provided with a revoluble cylinder having a journal formed with a steam-passage and water-channels, a stuffing-box secured to the said journal and having ports for connecting with said channels, and a stationary steam-plug fitted into said stuffing-box and having a steam-passage registering with said journal steam-passage, said plug also having a water-passage adapted to register with said stuffing-box ports, substantially as shown and described.

3. A grain-drier, provided with a stationary steam-plug, comprising two pipes one within the other to form a steam-passage and a water-passage, and a head for receiving the outer ends of said pipes, to form a steam-inlet and a water-discharge, one separate from the other, the inner ends of said passages having connection with the steam-inlet for the drying-cylinder and the discharge of the water of condensation, substantially as shown and described.

4. A grain-drier, provided with a stationary steam-plug, comprising two pipes one within the other, to form a steam-passage and a water-passage, a head for receiving the outer ends of said pipes, to form a steam-inlet and a water-discharge, one separate from the other, the inner ends of said passages having connection with the steam-inlet for the drying-cylinder and the discharge for the water of condensation, and a collar for the inner ends of the pipes, to close the inner end of the passage formed between the said pipes, substantially as shown and described.

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