H. H. BEACH.

Grain Drier.

No. 50,789.

Patented Nov. 7, 1865.

Fig. 2.

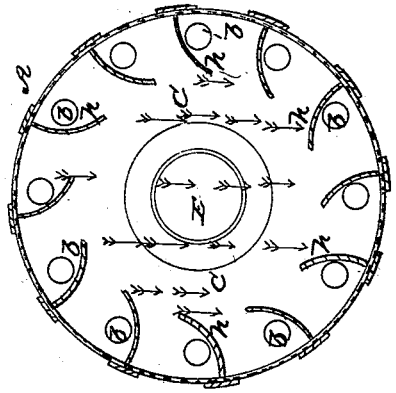


Fig. 4.

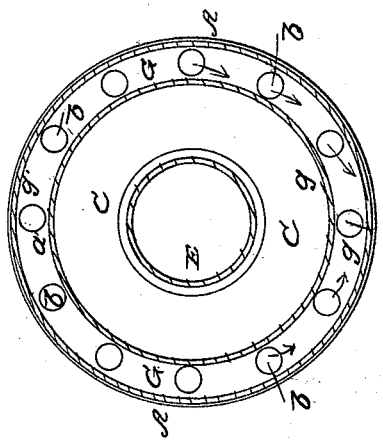


Fig. 1.

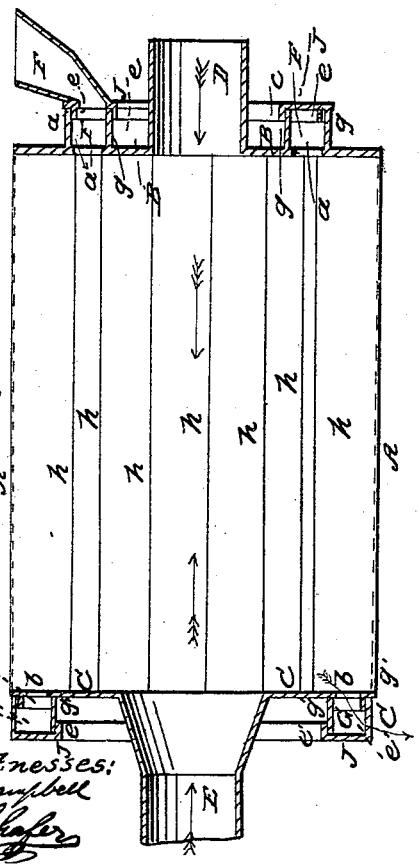
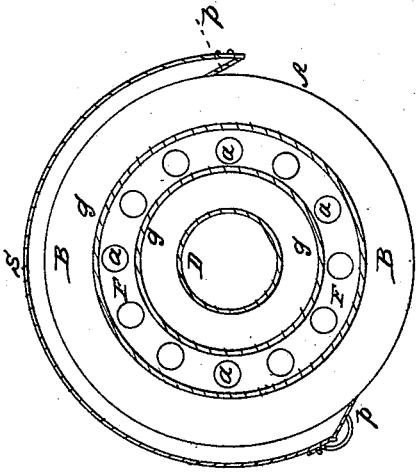


Fig. 3.



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UNITED STATES PATENT OFFICE.

H. H. BEACH, OF ROME, NEW YORK.

GRAIN-DRIER.

Specification forming part of Letters Patent No. **50,789**, dated November 7, 1865.

To all whom it may concern:

Be it known that I, H. H. BEACH, of Rome, in the county of Oneida and State of New York, have invented a new and Improved Grain-Drying Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a diametrical section through the drier. Fig. 2 is a cross-section through the drier. Figs. 3 and 4 show the receiving and discharging chambers at the ends of the drier.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to subject grain to currents of air, for the purpose of drying it, by means of a rotating cylinder, which is furnished on its inside with buckets adapted for lifting the grain to a certain height and gradually pouring it in thin streams through currents of air which are forced through the cylinder, as will be hereinafter described.

Another object of my invention is to provide for forcing currents of air through the center of a rotating cylinder, which is constructed and supported in such manner that grain can be passed through it in a continuous stream and subjected to the currents of air in thin streams, as will be hereinafter described.

Another object of my invention is to provide a perforated rotating grain-drying drum, with a hood or cover, in such manner that the currents of air which are forced into the perforated cylinder will be prevented from escaping at the upper portion thereof, but caused to pass downward, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a cylinder, which is constructed of finely-perforated sheet metal or of fine wire-gauze, and provided with two heads, B and C, having central openings through them. This cylinder should be properly strengthened with braces applied either outside or inside. I prefer to use internal hoops or ribs, arranged at suitable distances apart and secured to the perforated plates, and also external strips extending longitudinally from one head to the other.

Surrounding the central openings through the cylinder-heads are pipes D and E, which project from their respective heads suitable distances and constitute induction and eduction passages for air which is passed or forced through the cylinder. Surrounding these pipes D E are perforations *a a* and *b b*, for the entrance into and passage out of the cylinder of the grain. The perforations *a*, surrounding the pipes D, receive the grain from an annular chamber, F, into which the grain flows from a hopper, F′, and after escaping through the openings *a* and flowing through the cylinder A the grain passes out through the perforations *b b* into an annular chamber, G, from which it finally escapes through the opening *c* at the bottom of this chamber.

The heads J J′, of the two annular chambers F and G, are stationary, and their flanges *e e′* constitute bearings for the flanges *g g′*, which are secured to and project from the heads B C, and therefore support the cylinder A and allow it to be rotated about its axis.

Within the cylinder A and extending from one of its heads to the other I arrange a number of narrow curved plates, *h h*, shown in Figs. 1 and 2, and suitably secure the outer edges of these plates to the perforated plate which forms the cylinder. These curved strips *h* form buckets for carrying the grain upward, as the cylinder is rotated, and pouring it in thin sheets or streams through the blast of air which is forced through said cylinder simultaneously with the rotation thereof.

In order to obtain a flow of the grain toward its discharge-openings *b b*, during the operation of exposing it to the blast of air I elevate one end of the cylinder according to the speed with which it is desired the grain should pass through the cylinder, and as each bucket, *h*, is terminated at one end by a discharge-opening, *b*, the grain will flow directly from these buckets into the chamber G, as indicated by the red arrows in Figs. 1 and 4.

By curving the buckets *h h*, as represented in the cross-section, Fig. 2, they will each carry up a certain quantity of grain and allow it to escape slowly and uniformly over their inner edges, discharging their contents within the influence of the currents of air passing through the cylinder. In its passage toward the discharge-openings *b b* the grain will be elevated

and discharged through the blast of air several times according to the inclination of the cylinder and speed with which the latter is turned. As the greatest body of grain is at the lowest point of the cylinder and as all the grain therein tends toward this point it is desirable to direct the currents of air downward, or, at least, prevent the air from escaping upward through the cylinder. To effect this object I employ a bonnet or partial covering, S, for the upper part of the cylinder A, as shown in Fig. 3. This bonnet extends from one end to the other of the cylinder A and has its ends closed. It is suitably secured to the frame which supports the cylinder, and therefore does not turn with it.

Valves *p p* are used to prevent the escape of air from the sides of the cover or bonnet S, as shown in Fig. 3, which valves touch the surface of the cylinder and may be held in forcible contact therewith by means of springs or other contrivances suitably adapted for the purpose.

The operation of the drier is as follows: Through the hollow journals or pipes D E air is forced at such temperature as is desired for drying or cooling grain. The cylinder A is set in motion and the grain which is to be dried poured slowly into the hopper F′. From this hopper the grain flows into the cylinder A upon the curved buckets *h h*, which elevate it and distribute it past the center of the cylinder; the grain falling gradually off the edges of the buckets as they successively rise and passing down through the blasts of air, which are forced through or into the cylinder at both ends in a direction with its length.

By this form of apparatus the grain is subjected repeatedly to the blast of air and thoroughly and quickly dried.

If desired, the pipes D and E may be supported upon bearings and made to serve as journals to assist in supporting the cylinder and allow it to rotate freely, thus relieving the flanges at the ends of the cylinder.

Although I prefer to employ a cylinder, as shown in the drawings, I do not confine my invention to this form of drier, as a polygonal-shaped vessel will answer a very good purpose.

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

1. The employment of a perforated rotatory cylinder or drum, which is so constructed that grain can be passed through it in a continuous stream and subjected, at the same time, to currents of air, and elevators or buckets *h h*, substantially as described.

2. Providing a rotating grain-drying cylinder, which is perforated, with a bonnet or cover, S, or its equivalent, substantially as described.

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Witnesses:
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