(No Model.)

M. L. MOWRER.

GRAIN DRIER.

No. 338,673. Patented Mar. 23, 1886.

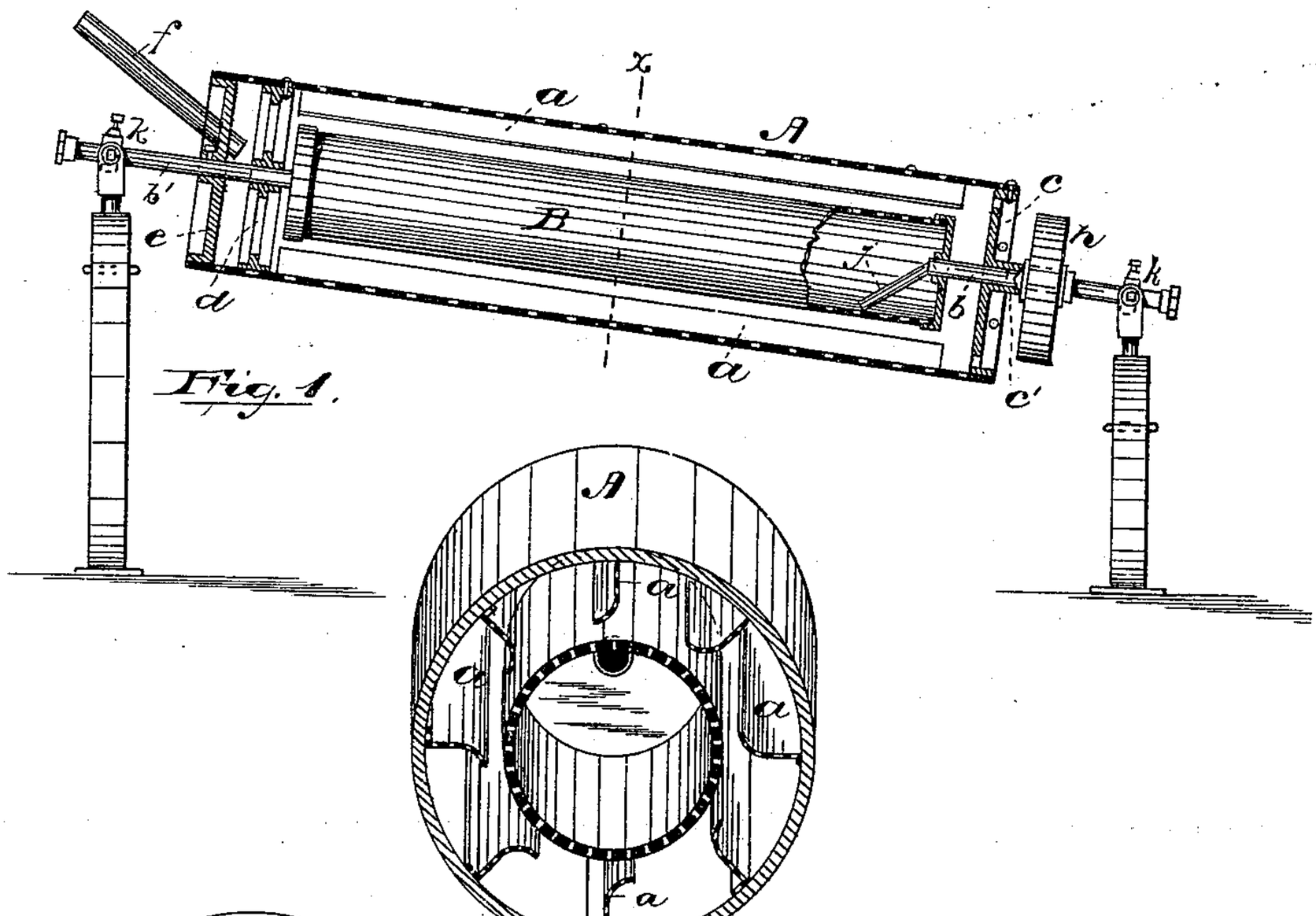

Fig. 1.

Fig. 4.

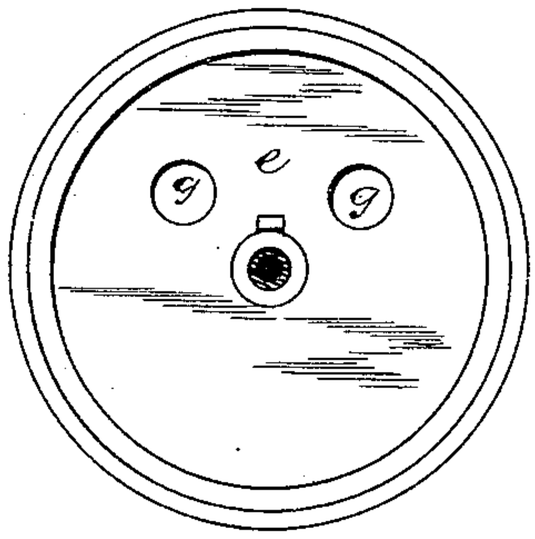

Fig. 2.

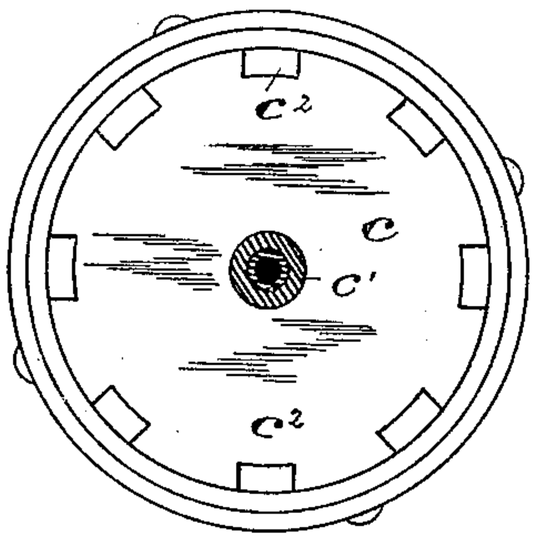

Fig. 3.

Attest:

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UNITED STATES PATENT OFFICE.

MARTIN L. MOWRER, OF NEWARK, NEW JERSEY.

GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 338,673, dated March 23, 1886.

Application filed August 29, 1885. Serial No. 175,621. (No model.)

To all whom it may concern:

Be it known that I, MARTIN L. MOWRER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Grain-Driers; 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 letters of reference marked thereon, which form a part of this specification.

In the figures of the drawings, Figure 1 is a longitudinal section of a device illustrating my invention. Fig. 2 is an elevation of the upper or higher end of the drier. Fig. 3 is an elevation of the lower end thereof; and Fig. 4 is a section of Fig. 1 on the line *x*.

Similar reference-letters are employed to indicate parts corresponding in each of the views.

The invention relates to improvements in steam-heated grain-driers, and is designed to prevent the annoyances and imperfect results attained in driers heretofore employed in which a stuffing-box is used.

The invention is further intended to regulate the rapidity with which the grain is dried, whereby its treatment may vary with the condition thereof.

The essential feature or element of the invention consists of an outer rotating cylinder, which is constructed and adapted to carry the grain around within the same as it turns, and throws it upon the heater or drier, which is arranged within the rotating cylinder and is stationary.

The invention also consists in the mechanism whereby the grain is fed to and escapes from the cylinder, which, together with said cylinder and the drier, is illustrated in the accompanying drawings, and described and claimed herein.

A in the drawings indicates the outer revolving cylinder, to the inner surface of which scoops or buckets *a* are secured, that carry the grain around and throw it upon the drier B, which is placed within the cylinder, and consists of a shell, through the head of which steam-pipes *b b'* communicate with the interior thereof.

As the drier remains stationary and the cylinder A rotates around the same, it is necessary to provide a method of feeding the grain into the cylinder and discharging the same after it is dried without hindering the operation of the machine. This is effected by providing heads *c d*, bolted or otherwise secured to the revolving shell, one of which, *c*, is secured in the lower end of the shell A, and is provided with a collar, *c'*, working on the steam-pipe *b* as a journal. The head *d* is secured to the shell A, a short distance from the raised end, as indicated in Fig. 1, and turns on the steam-pipe *b'*. A second head, *e*, is arranged in the raised end of the cylinder, and is keyed or otherwise fastened to the pipe *b'*, remaining stationary therewith. Two orifices, *g*, are formed in the fixed head *e*, into which feed-tubes *f* are inserted. One of said tubes serves to conduct the grain into the cylinder, the other acting as a flue through which the damp, heated, and impure air, &c., may escape. A pulley, *h*, driven by a belt, chain, or in any well-known manner, is keyed upon the collar *c'*, whereby the outer shell is rotated.

As indicated in Fig. 1, the apparatus is inclined to facilitate the downward movement of the grain through the cylinder, entering through the feed-tube and discharging through slots or openings c^2 in the head *c*. The heating medium employed is steam, which is admitted into the drier B through the induction-pipe *b'* and exhausts through the eduction-pipe *b*, a siphon-pipe, *j*, serving to carry off the water from the drier.

The grain to be dried is fed into the cylinder A through one of the tubes *f*, and is thrown upon and kept in contact with the drier by the scoops, the grain gradually working its way down toward the lower end of the cylinder, out through the openings c^2.

Any suitable pipe, tube, or receptacle may be arranged around or beneath the discharge end of the cylinder, to receive the dried grain as it leaves the cylinder.

Adjustable and pivotal bearings *k* receive the ends of the pipes *b b'*, and permit the cylinder to be inclined at any desired angle, according to the time necessary to thoroughly dry the grain. In the drawings the scoops are shown with curved edges, and are preferably so formed; but they may be straight or

otherwise formed; also, the scoops, instead of being arranged parallel with the axis of revolution of the cylinder, may be placed obliquely within the shell, so as to give the grain a downward and forward throw.

A stationary steam-heater has been arranged within a rotating shell having grain-scoops therein; hence I do not lay claim to the broad construction; but in the device to which reference is made the outer revolving shell is perforated, which allows the heat to escape rapidly before it has opportunity to sufficiently dry the grain. Moreover, owing to the rapid radiation of the heat, the drier is liable to become cooled, and thereby destroying its efficiency.

In my drier the heater and the outer revolving shell to which the scoops are secured, are both solid shells, and the heat from the radiator passes the entire length of the shells before it leaves them, thereby utilizing the full drying effect thereof, besides protecting the heater from the effects of too rapid radiation.

Having thus described my invention, I wish to claim the following:

1. A grain-drier consisting of an outer revolving cylinder, the entire periphery of which is solid, having scoops or grain-buckets therein, a stationary drier arranged within said revolving cylinder, and mechanism for introducing steam into said drier and exhausting it therefrom, for the purpose set forth.

2. In a grain-drier, in combination, a revolving cylinder having scoops or grain-buckets therein, a stationary drier consisting of a hollow cylinder arranged within said revolving cylinder and having hollow journals projecting from the ends thereof, a head, as *c*, secured in one end of the revolving cylinder and turning on one of the hollow journals of the drier and provided with openings therein, a stationary head, as *d*, secured to the hollow journal in the opposite end of the revolving cylinder and around which said cylinder turns, and means for feeding grain into the revolving cylinder, for the purpose set forth.

3. In a grain-drier, in combination, an outer revolving cylinder, scoops secured to the inner surface of the said revolving cylinder, an inner stationary drier having hollow journals *b b'*, a head, *c*, having slots c^2, and a collar, *c'*, secured in one end of the revolving cylinder and turning on one of the hollow journals, a head, *d*, secured to the other of said journals in the opposite end of the revolving cylinder, and having orifices *g* therein, pipes *f*, connected with the orifices *g* in the head, and adjustable and pivotal bearings *k*, that receive the hollow journals, all said parts being arranged and operating substantially as and for the purposes set forth.

In testimony that I claim the foregoing, I have hereunto set my hand this 15th day of August, 1885.

MARTIN L. MOWRER.

Witnesses:
FREDK. F. CAMPBELL,
CHARLES H. PELL.