

(No Model.)

3 Sheets—Sheet 1.

M. HECKING.
DRIER.

No. 343,813.

Patented June 15, 1886.

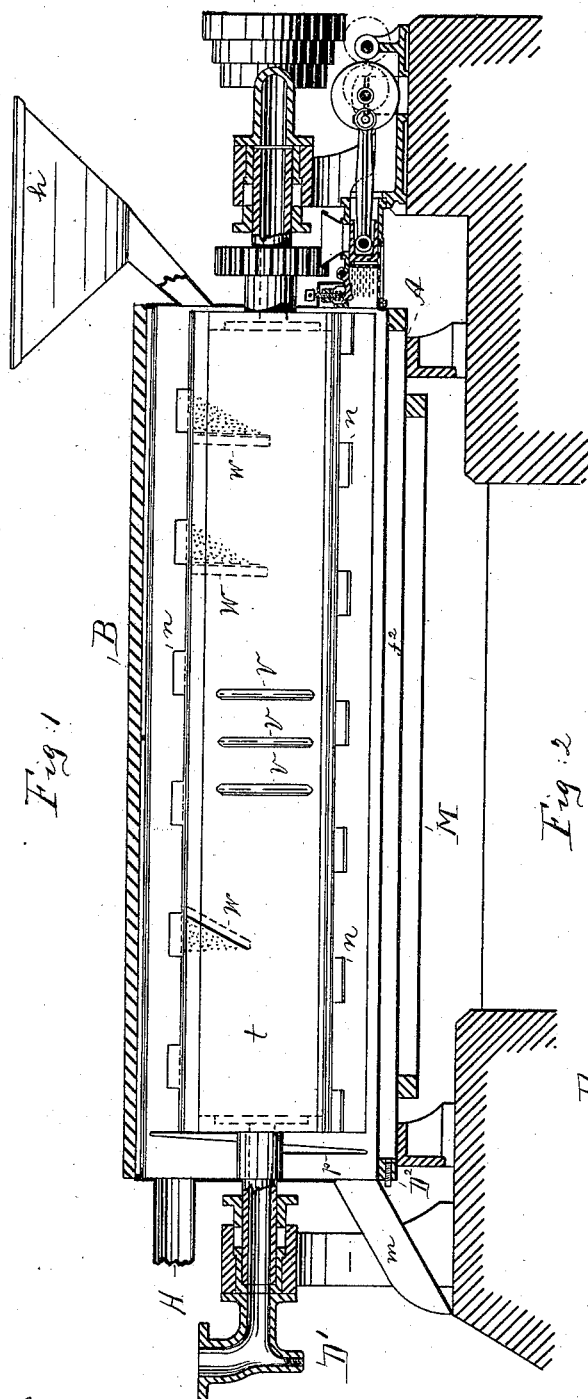


Fig. 1.

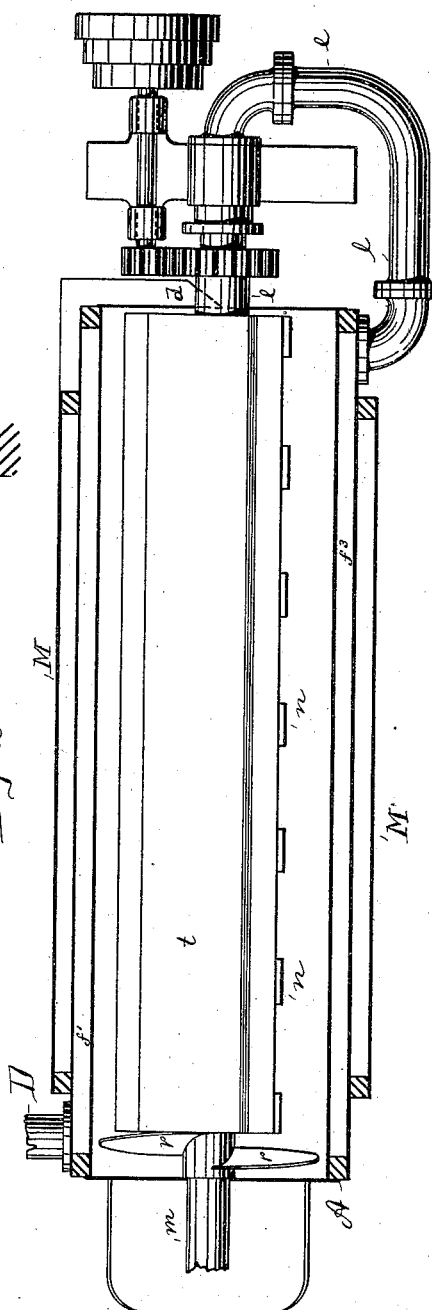


Fig: 2

Witnesses:
Thos Turner
Robt H Roy

Inventor:
Max Haeckel
by his attorneys
Roeder & Briesen

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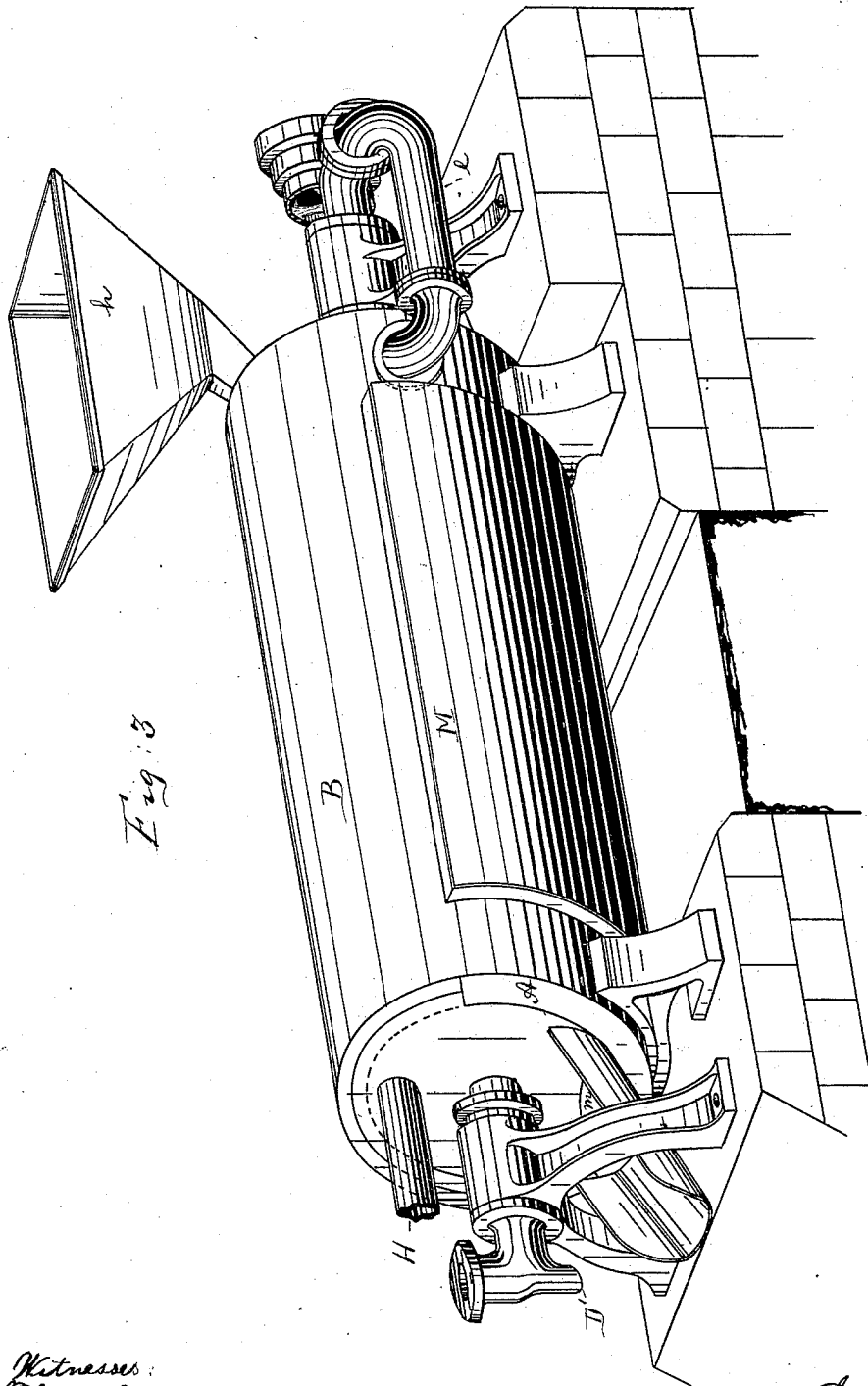


Fig. 3

Witnesses:
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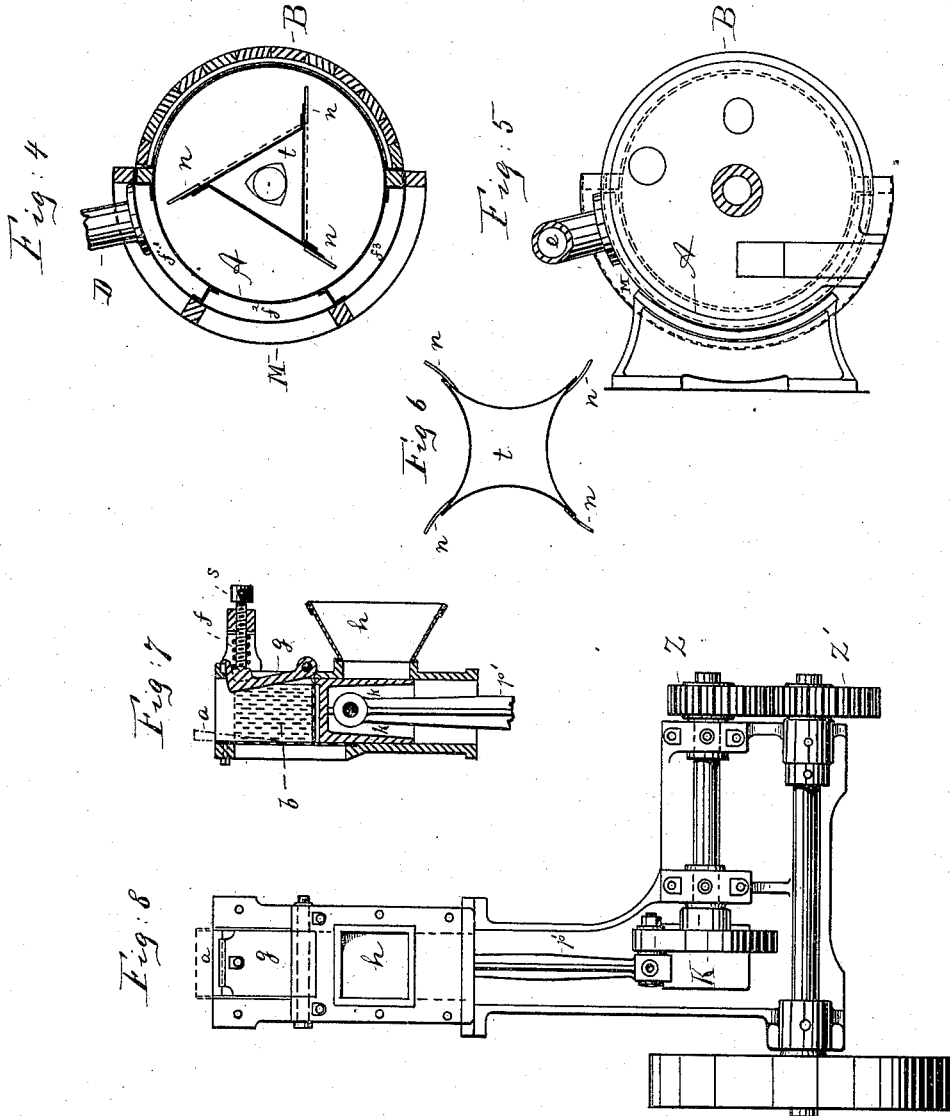
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3 Sheets—Sheet 3.

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Patented June 15, 1886.



Witnesses:
Thos. Turner
Robt. Roy

Inventor:
Max Hecking
by his attorneys
Roeder & Bensen

UNITED STATES PATENT OFFICE.

MAX HECKING, OF DORTMUND, PRUSSIA, GERMANY.

DRIER.

SPECIFICATION forming part of Letters Patent No. 343,813, dated June 15, 1886.

Application filed October 20, 1885. Serial No. 180,387. (No model.)

To all whom it may concern:

Be it known that I, MAX HECKING, of Dortmund, Prussia, Germany, have invented a new and Improved Drying Apparatus, of which the following specification is a full, clear, and exact description.

This invention relates to an apparatus for subjecting grain or other material to the action of hot air or steam in order to dry the same.

The invention consists in the various elements of improvement hereinafter more fully pointed out.

In the accompanying sheets of drawings, Figure 1 is a longitudinal vertical section of my apparatus. Fig. 2 is a horizontal section of the same. Fig. 3 is a perspective view of the apparatus; Fig. 4, a vertical transverse section through the center of the apparatus; Fig. 5, a similar section near the receiving end thereof. Fig. 6 is a transverse section through the inner drum; Fig. 7, a vertical section of an automatic feeding attachment, and Fig. 8 a top view of the same.

The apparatus comprises, essentially, an outer casing or drum adapted for the circulation of the heating medium and inclosing a revolving inner drum within the heating-space. The material to be dried is fed into the heating-space, is stirred by the inner drum, and is conducted to the discharge opening.

The outer casing or drum, A, contains three longitudinal ways or passages, $f' f^2 f^3$, connecting at their ends, so as to constitute a sinuous course, and separated by the longitudinal plates shown in Fig. 4. The steam is admitted to passage f' through inlet D, and is discharged from passage f^3 through the curved pipe e into the interior of the casing. The passages $f' f^2 f^3$ together are formed in the lower half of the outer casing or drum, the upper half being formed by a cover, B, made of wood or any other poor conductor of heat. The outer drum may be surrounded at its lower half by an enveloping shell, M, also made with sinuous passages. Cold air being admitted into this shell at one end is warmed on passing through the shell by the hot air or steam in passages $f' f^2 f^3$, and is finally discharged at d into the interior of the drum, Fig. 2, leaving it through exit H.

D' D² are openings for permitting the escape of the waters of condensation.

Within the outer drum there is hung the inner rotating drum, t , made with three, four, or more sides. In Fig. 4 three sides and in Fig. 6 four sides are shown. I prefer to make the sides of concave form, as shown in Fig. 6, so that they retain the material to be dried upon the drum for some time.

n are a number of scoops projecting outwardly from the edges of drum t , which take hold of the material to be dried as the latter enters through the hopper h . These scoops also serve to feed the work toward the exit-opening m , their action being aided by the ribs $W W$ and the grooves V . (Shown in Fig. 1.) Above exit m is a helical screw, p , to direct the dried material to such opening.

The device shown in Figs. 7 and 8 is designed to produce an automatic feed of the material to be dried from the hopper into the drum. It consists of a reciprocating piston, k , connected by pitman p' with eccentric K. The piston k forces the matter introduced through hopper h into an open chamber back of said hopper at each forward motion of the piston. The walls of this chamber may be formed of perforated plates b to permit some of the moisture to be removed by compression. In this case the chamber has either tapering sides or its mouth is made converging by means of an adjustable wedge, a . In place of this construction one side, g , of the chamber may be hinged to the same. The inclination of this side is adjustable by screw s , surrounded by coiled spring f , which bears upon side g . The eccentric K receives motion from elliptical gear-wheels $Z Z'$, which cause a slow motion of piston k during its forward stroke and a fast motion during its back stroke.

I claim as my invention—

1. The combination of drum A, having passages $f' f^2 f^3$ in its bottom, and provided with cover B with an interior rotating drum, t , and with a lower shell, M, having a sinuous passage, all being so constructed that the passage f^3 and the interior of shell M communicate with the interior of drum A, substantially as specified.

2. The combination of drum A, having passages $f' f^2 f^3$, and containing a rotating drum, t , having concave sides and scoops n ,

projecting outwardly from its edges, with the shell M, and with the curved pipe *e* that connects passage *f*³ with interior of drum A, substantially as specified.

5 3. The combination of drums A *t* with hopper *h*, communicating with drum A by a converging chamber and with a piston, *k*, entering said chamber and operated by pitman *p*' and eccentric K, substantially as specified.

10 4. The combination of drums A *t* with hopper *h*, communicating with drum A and with a piston, *k*, adapted to reciprocate be-

neath the discharge end of said hopper and operated by pitman *p*', eccentric K, and elliptical gear-wheels Z Z', substantially as specified. 15

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

MAX HECKING.

Witnesses:

EDMUND BACH,
OTTO GÜNTHER.