

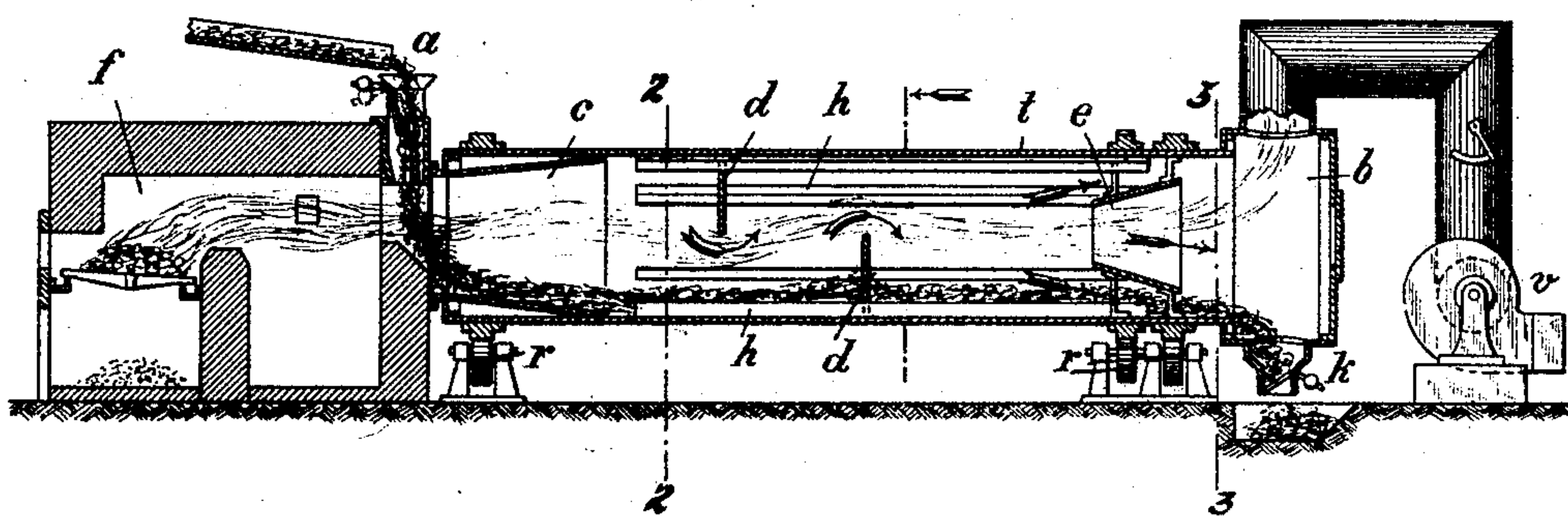
No. 765,666.

PATENTED JULY 26, 1904.

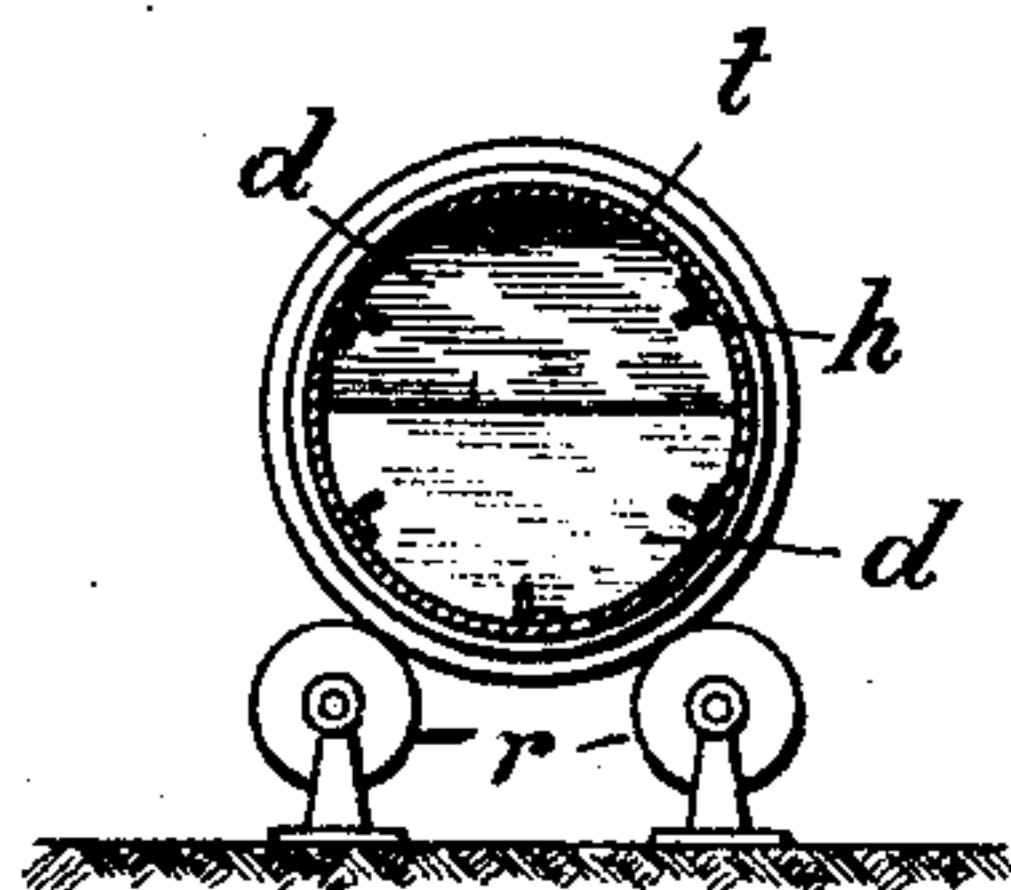
M. HECKING.  
DRYING APPARATUS.  
APPLICATION FILED APR. 4, 1904.

NO MODEL.

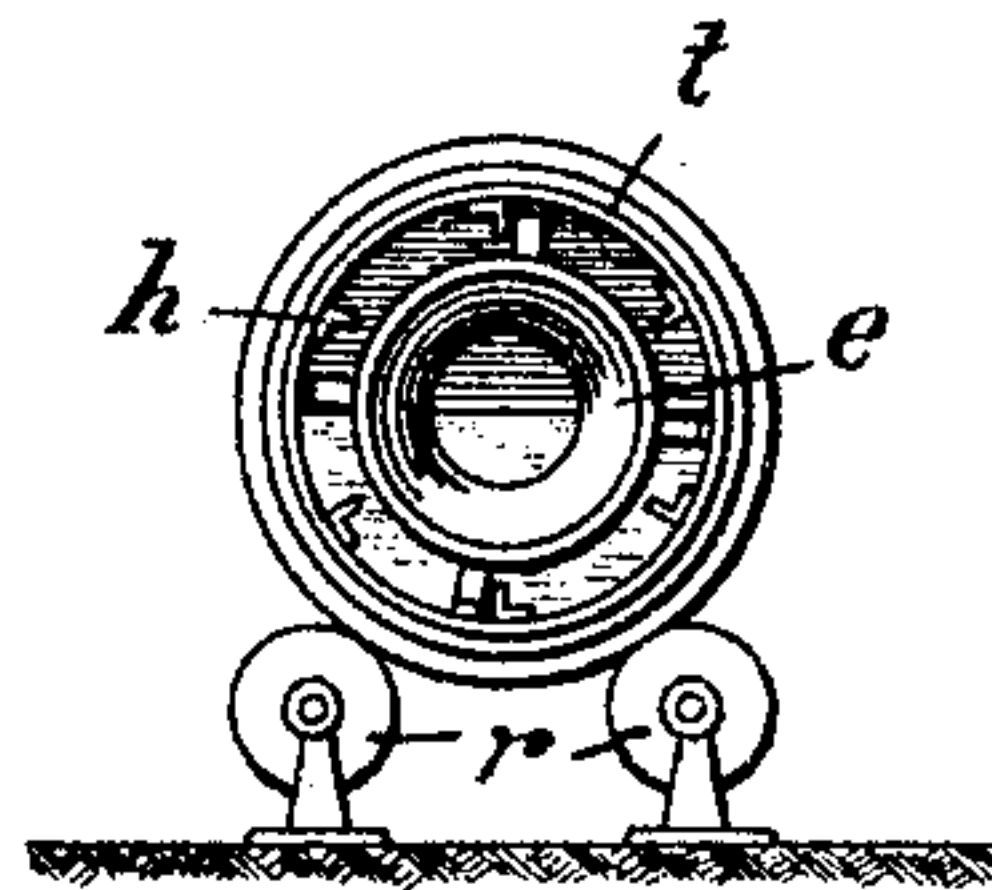
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses  
A. J. Radden  
E. M. Moore

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Max Hecking  
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# UNITED STATES PATENT OFFICE.

MAX HECKING, OF DORTMUND, GERMANY.

## DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 765,666, dated July 26, 1904.

Application filed April 4, 1904. Serial No. 201,536. (No model.)

*To all whom it may concern:*

Be it known that I, MAX HECKING, a subject of the King of Prussia, Emperor of Germany, residing at Dortmund, Germany, have invented certain new and useful Improvements in Drying Apparatus, of which the following is a specification.

This invention relates to improvements in that kind of drying apparatus which comprises horizontal drying cylinders or drums, through which the material to be dried is moved in the direction of the flow of heated gases passing through the drums from suitable heat-generators, the drums being mounted on rollers.

One form of the improved apparatus is shown in the annexed drawings, in which—

Figure 1 is a longitudinal section thereof. Figs. 2 and 3 are cross-sections on the lines 2 2 and 3 3 of Fig. 1, respectively.

$t$  is the heating-drum, mounted on rollers  $r$ , and  $f$  the stove or furnace from which the heating-gases are supplied. The material to be dried is fed into the drum through the hopper  $a$  and the dried material is discharged through the automatically-opening trap-door  $k$ . The fan  $v$ , connected to the chamber  $b$ , removes the heating-gases saturated with vapor. Inside the drum  $t$  are the lifting bars or ribs  $h$  or single longitudinally-arranged lifting-blades, by which the material to be dried is lifted and exposed to the heating and moving action of the gases. With this method of drying the important disadvantage has hitherto been felt that the material to be dried was not conveyed through the drum at a uniform rate. At the beginning of the process it was conveyed too slowly, more particularly if it was of such a nature as to be liable to form into lumps while moist. On the other hand, as the drying process proceeded the velocity of the material increased to such an extent that the latter did not remain in the apparatus for a sufficient length of time to be fully dried or to utilize the heating-gases until they were completely saturated with moisture. To remove this disadvantage, the drums have in some cases been provided with baffles in the form of blades or the like, perpendicular or inclined to the longitudinal axes of the drums;

but this arrangement either answered the purpose very imperfectly or not at all.

According to this invention, for the purpose of at first accelerating the speed of the material a hollow truncated metal cone  $c$  is arranged in the horizontal drum  $t$  at the end at which the moist material enters the latter.

Without altering the shape of the drum  $t$  itself a cone of different pitch can be substituted, according to the nature of the material to be treated.

To prevent the too rapid passage of the partially-dried material from the drum, semicircular plates  $d$ , Fig. 2, are arranged in the drum perpendicular to the longitudinal axis of the latter, so that at intervals the cross-sectional area of passage is reduced by approximately one-half and the drum is divided into sections. The gases by which the material is driven through the drum are repeatedly deflected from a longitudinal direction to a transverse direction by these plates  $d$ , so that the movement of the material is retarded. A similar effect is produced by the concentric truncated cone  $e$ , arranged in the drum near the outlet end thereof, Fig. 3. By this cone  $e$  the gases and the material to be dried are again deflected from the longitudinal direction and checked.

I declare that what I claim is—

1. The combination with a horizontal rotary drying-drum, means for supplying material to and discharging it from the latter, and means for passing a current of heated gases through said drum adapted to drive the material therethrough, of a hollow truncated cone arranged near the inlet end of the drum for accelerating the passage of the material at said inlet end, substantially as described.
2. The combination with a horizontal rotary drying-drum, means for supplying material to and discharging it from the latter, and means for passing a current of heated gases through said drum adapted to drive the material therethrough, of a hollow truncated cone arranged near the inlet end of the drum for accelerating the passage of the material at said inlet end and semicircular transverse walls to the rear of said cone and adapted to reduce the cross-sectional area of the drum



and retard the passage of the material and gases substantially as described.

3. The combination with a horizontal rotary drying-drum, means for supplying material to and discharging it from the latter, and means for passing a current of heated gases through said drum adapted to drive the material therethrough, of a hollow truncated cone arranged near the inlet end of the drum for accelerating the passage of the material at said inlet end, semicircular transverse walls to the rear of said cone adapted to reduce the

cross-sectional area of the drum and retard the passage of the material and gases and a hollow truncated cone to the rear of said walls for further retarding the material and gases substantially as described. 15

In witness whereof I have signed this specification in the presence of two witnesses.

MAX HECKING.

Witnesses:

WILLIAM ESSENWEIN,  
PETER LIEBER.