

No. 765,708.

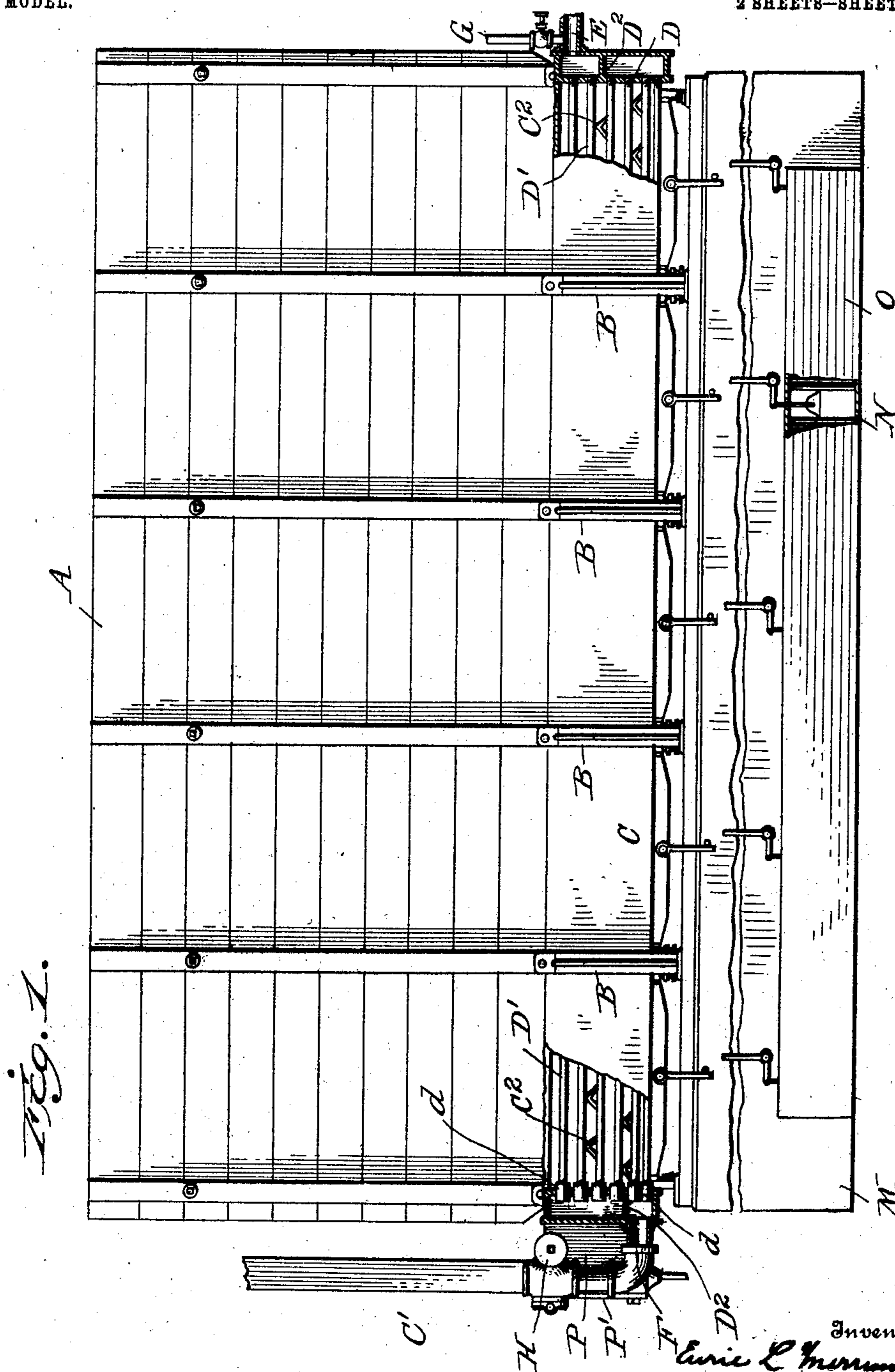
PATENTED JULY 26, 1904.

E. L. MERRIMAN & J. W. VOUGHT.  
DRIER FOR GRANULAR MATERIAL.

APPLICATION FILED JUNE 14, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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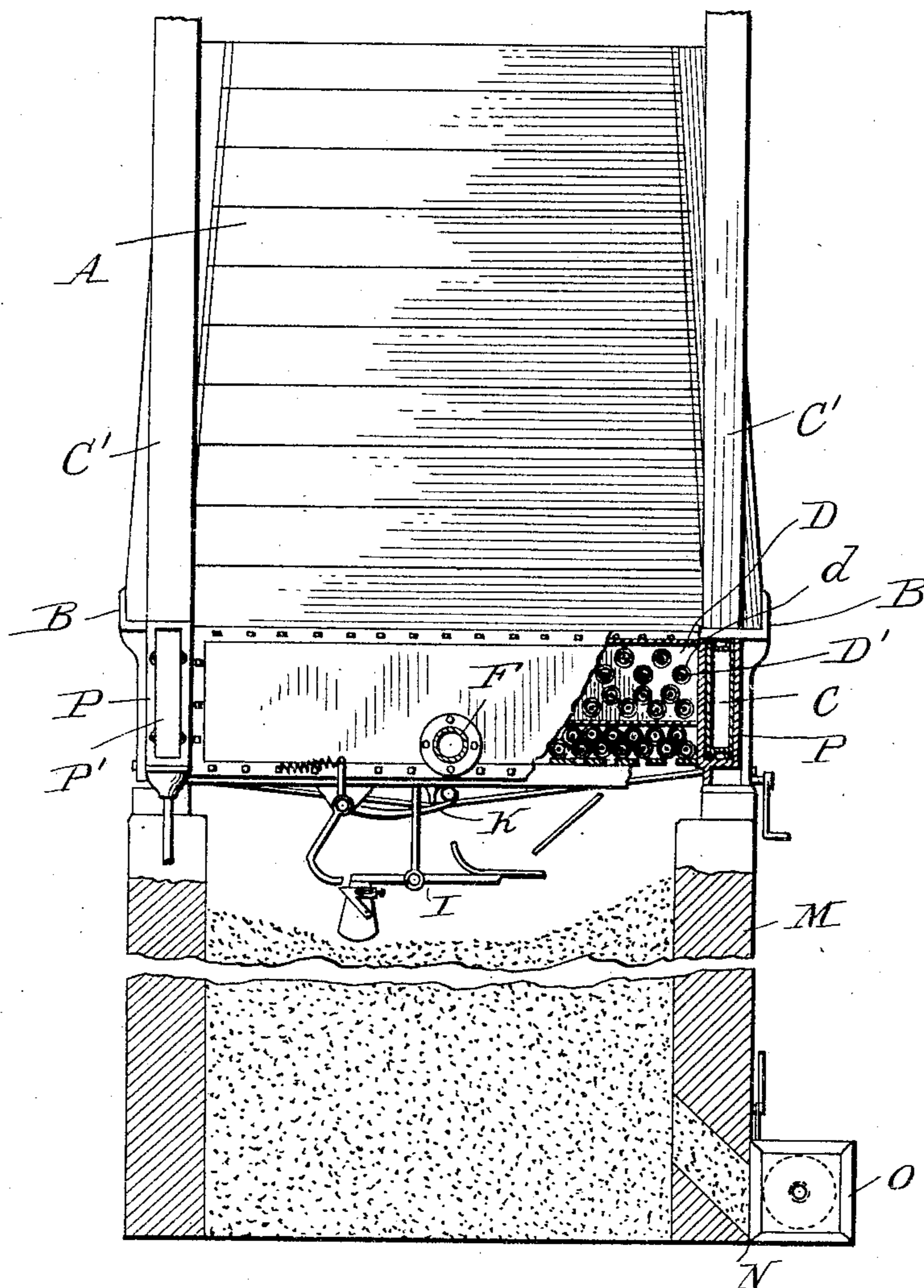
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*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

EURIE L. MERRIMAN AND JOSIAH W. VOUGHT, OF SCRANTON, PENNSYLVANIA.

## DRIER FOR GRANULAR MATERIAL.

SPECIFICATION forming part of Letters Patent No. 765,708, dated July 26, 1904.

Application filed June 14, 1904. Serial No. 212,548. (No model.)

*To all whom it may concern:*

Be it known that we, EURIE L. MERRIMAN and JOSIAH W. VOUGHT, of Scranton, in the county of Lackawanna, State of Pennsylvania, have invented certain new and useful Improvements in Driers for Granular Material; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in driers for sand, grain, &c., the objects being to provide an apparatus in which the moisture in the sand, grain, &c., will be removed by a continuous process and the material thoroughly dried without danger of burning or injuring the same in any particular.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section and with parts broken away, of a drier embodying the present improvements. Fig. 2 is a similar view looking at one end of the drier.

Like letters of reference in both figures indicate the same parts

The letter A indicates a casing or hopper for the reception of the sand, grain, or other granular material to be dried, such casing or hopper being preferably made larger at the bottom than at the top to provide for clearance and prevent clogging or lodgment of the wet material, which latter is shoveled or dumped into the hopper and is discharged at the bottom of the hopper through the drying-chamber and feed-controlling appliances to be now described.

The drying-chamber and feed-controlling appliances are an improvement upon the appliances for the same purpose illustrated and described in our prior patents, Nos. 591,413 and 652,369, and in the present arrangement are assembled in a structure which constitutes the base for the hopper, the vertically-extending

timbers of the latter being connected at their lower ends to brackets B on the framing of the drying-chamber. The sides of the drying-chamber are formed by boxes or longitudinally-extending flues C, communicating at the ends with vertically-arranged stacks C' for carrying off the moisture-laden air which enters the boxes or flues through transverse ducts formed by inverted-V-shaped channels C<sup>2</sup>, as in the structures of the before-mentioned patents. The ends of the chamber are formed by manifolds D, and between such manifolds are a series of heating-pipes D'. These pipes are threaded into the manifold at one end and at the opposite end are provided with sleeves d, fitting accurately, but capable of a slight sliding movement in apertures in the other manifold, whereby the pipes may expand and contract without straining and distorting the structure. The manifolds are formed with transverse horizontal partitions D<sup>2</sup> for forcing the circulation of the heating medium through the pipes in succession. Thus the steam may enter through a pipe E at one end and will be forced to traverse the pipes back and forth until it can escape through an exhaust-pipe F.

The coils or heating-pipes are normally intended to be heated by the exhaust-steam from an engine; but provision is made for supplying live steam from a boiler, as by a pipe G, and a pressure-valve (indicated at H) is preferably provided in the exhaust to increase the temperature of the heating-pipes.

The heating-pipes are preferably spaced, as in said before-mentioned patents, so as to bring the material into more intimate relation to the pipes as the drying progresses, and a valve mechanism I and a knocker K are arranged below the pipes for controlling the passage of the material, all as in said prior structure.

The whole drier may be set on a foundation M, which may also constitute the receiver for the dried material and from which it may drop through valved openings N to a conveyer arranged in a box O at one side of the drier.

The stacks C', it will be noted, communicate at the lower ends with stack-boxes P, which

are virtually prolongations of the side flues or boxes C, and the ends of said stack-boxes are closed by removable plates or doors P' to permit of access to the flues for cleaning the same by means of any suitable long-handled implement.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is--

10 1. A drier such as described, comprising a receptacle for the material to be dried and of larger dimensions at the bottom than at the top, a drying and feed-controlling apparatus on which said receptacle is mounted, having  
15 side flues in communication with the drying-compartment, end manifolds, heating-pipes opening into said manifolds and extending longitudinally of the drying-compartment, steam inlet and exhaust pipes communicating  
20 with the manifolds and means for controlling the flow of material through the drying-compartment; substantially as described.

2. A drier for granular material comprising a hopper or receptacle for the reception  
25 of the wet material, a series of heating-pipes below said hopper and between which the material passes, manifolds into which the pipes open forming the ends of the drying-chamber and flues forming the sides of said drying-  
30 chamber, said flues having ducts communicating with the drying-chamber and stacks at the ends for carrying off the moisture-laden air; substantially as described.

3. A drying-chamber for a drier for granular material formed by end manifolds connected by pipes extending longitudinally of  
35 the chamber and side boxes or flues having

transverse ducts open to said chamber; substantially as described.

4. A drying-chamber for a drier for granular material having a feed-controlling mechanism at the bottom and formed by side boxes or flues having transverse ducts opening on the under side in said chamber and end manifolds connected by pipes extending longitudinally of the chamber, means for circulating a heating medium through the pipes and manifolds and means for carrying off the moisture-laden air from the side boxes or flues; substantially as described.

5. In a drier such as described, the combination with the drying-chamber formed by the side flues and end manifolds, said flues having transverse ducts opening into the chamber and said manifolds being connected by heating-pipes, of brackets at each side of said chamber, vertical supports held by said brackets and a hopper having its walls supported by the vertical supports; substantially as described.

6. In a drier such as described, the combination with the hopper, of the drying-chamber having the end manifolds, the heating-pipes threaded into one of said manifolds and sleeves on the opposite ends of the pipes fitting into openings in the other manifold to permit of expansion and contraction; substantially as described.

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