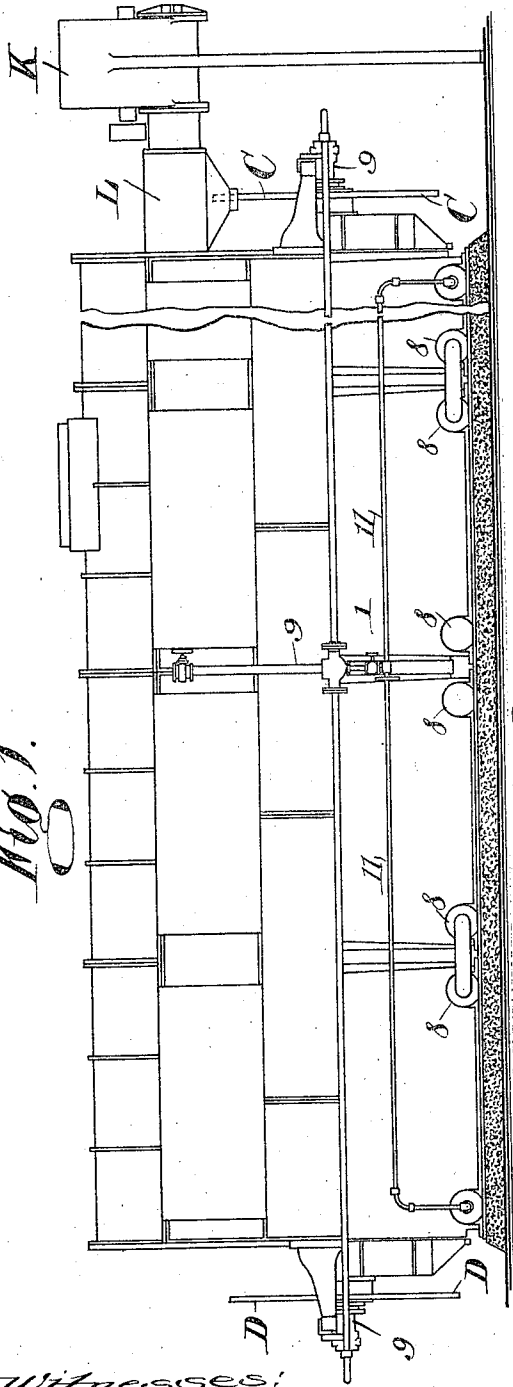


1,237,110.

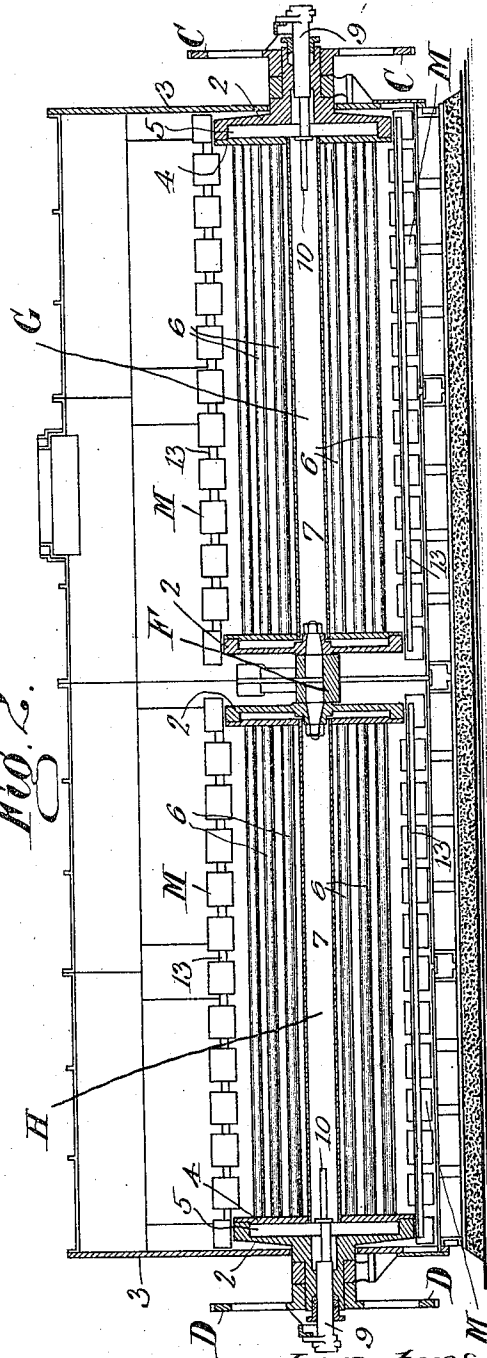
Fig. 1.



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Fig. 2.



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R., W. G. & F. R. SIMON.
 CONSTRUCTION OF DRYING MACHINES WITH ROTARY HEATING DEVICES.
 APPLICATION FILED MAY 21, 1914.

1,237,110.

Patented Aug. 14, 1917.
 2 SHEETS—SHEET 2.

Fig. 3.

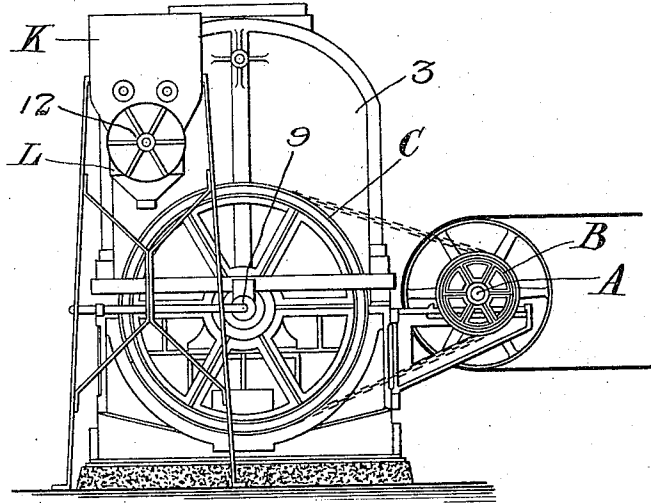
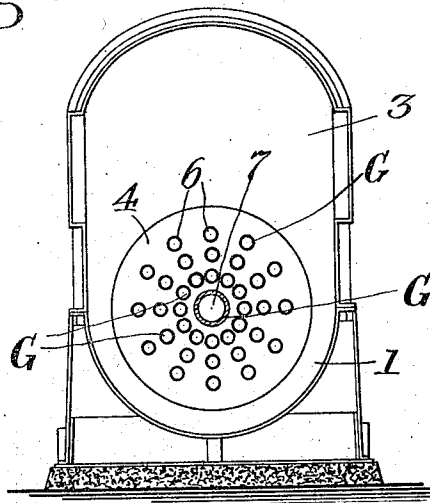


Fig. 4.



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UNITED STATES PATENT OFFICE.

RICHARD SIMON, WILLIAM GEORGE SIMON, AND FREDERICK RICHARD SIMON, OF
BASFORD, ENGLAND.

CONSTRUCTION OF DRYING-MACHINES WITH ROTARY HEATING DEVICES.

1,237,110.

Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed May 21, 1914. Serial No. 840,074.

To all whom it may concern:

Be it known that we, RICHARD SIMON, WILLIAM GEORGE SIMON, and FREDERICK RICHARD SIMON, subjects of the King of Great Britain, residing at Basford, Nottingham, England, have invented certain new and useful Improvements in or Relating to the Construction of Drying-Machines with Rotary Heating Devices, of which the following is a specification.

In order to obtain a maximum heating effect, in devices of this character, use is made of means consisting of rotating the bundles or nests of heated tubes revolving in the stationary body or trough of a drying machine of the type shown and described in British Patents Nos. 9,331 of 1899 and 13,837 of 1899. However, the present invention does not contemplate a covering for the nests of heated tubes, but permits the material to be dried to fall among the tubes directly from the feeding chamber, or device. At the same time, means are also provided to diminish torsional strain and more particularly to obtain control over the energy of the drying process at its initial and final stages at which the condition of the material is that is being dried. The invention, specifically, consists of two bundles or nests of uncovered heated tubes, placed longitudinally in the trough of the machine, and each nest driven separately at opposite ends by means of suitable gearing from an outer shaft. The trough in which the uncovered heated tubes revolve may, if desired be made with a chamber or chambers for heating the material to be dried in addition to the heated tubes.

It is a further feature of the invention to provide rotatable supporting disks adapted to support the nested tubes in position, and form therewith in the form of a revolving drum, said disks being formed with a chamber communicating with the tubes, and suitably connected with a supply of a heating element. It is, also, a feature of the invention to provide each rotatable drum, formed by the tubes and disks, with a centrally extending enlarged conduit or passage connecting with the chambers of said disks, which passage is so arranged with respect to the feed from the supply source as to permit a free circulation of the heating element through said tubes.

The invention further consists in certain

novel constructions and combination of parts hereinafter more fully described and pointed out in the appended claim.

In the drawings which form part of the specification:

Figure 1 is a drying machine in side elevation.

Fig. 2 a section in side elevation.

Fig. 3 an end elevation, and

Fig. 4 a section of the machine.

Like reference characters denote similar like parts through the specification and drawings.

Referring to the drawings, 1 denotes the trough of the machine having extending longitudinally therein the two revolving drums G and H. The independently revolving drums G and H each consists of a pair of spaced end disks 2. The outer disks are, respectively, journaled in the opposite end walls 3 of the trough 1, while the inner disks are journaled in the bearing F suitably disposed and supported in approximately the center of the trough 1. The disks 2 have their opposing faces recessed and covered with a plate 4, thus providing the chamber 5 for the heating element. By this means two chambered heads are provided in connection with each revolving drum, the outer end heads being journaled in the outer end walls 3 of the trough 1, while the chambered heads are journaled in the bearing F and disposed in alignment. Extending longitudinally of the trough and between each pair of disks 2 are the bundles or nests of tubes 6 communicating through the plates 4 of the respective pairs of disks, with the chambers 5 thereof. It will thus be seen that the above construction provides two independently rotatable drums formed of bundles or nests of heated tubes longitudinally disposed in the trough 1. Each drum G and H has extending centrally therethrough the conduit or passage 7 of a comparatively larger diameter than the diameter of the tubes. The conduit 7 communicates through the plates 4 with the chambers 5 of the disks of each drum which, according to the present construction shown and described, has an independent heat circulation so that different pressures or calories of heat may be supplied to either of the drums, according to the nature or character of the material to be dried.

The end or outer disks of each drum G

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100

105

110

and H carry rigid therewith the sprocket wheels C and D, respectively, disposed without the trough 1. A shaft A mounted upon the trough of the machine and parallel therewith is driven by any suitable means and has keyed thereto the sprocket wheels B, over which a suitable sprocket chain passes. This mechanism is, preferably provided to impart motion to each of the wheels C and D, respectively, it being understood that the drums G and H are to be rotated independently of each other at varying speeds according to the character of the material to be dried. The heating tubes 6 may have any desired relative diameters, however, those shown being of equal diameters. As before mentioned, the trough 1, and as here shown, is provided with suitable heating chambers in addition to the heated tubes, said chambers being indicated by the numeral 8 and supplied with the heating element from the source of supply.

The pipes 9 from the source of supply, not shown, extend into the end or outer disk 2 of each drum G and H and have a jet 10 extended for a distance into the conduit or passage 7. Branch pipes 11 extend from the pipes 9 for supplying the chambers 8 with the heating element, which may be of steam, hot water, or the like.

It will thus be seen that when steam is emitted from the jet 10, the same will be conveyed to the inner disks 2 of the drums G and H and will then circulate through the nests of uncovered tubes 6 to the chamber 5 in the outer or end disks of the drums, and thence to the passage or conduit 7 again, and so on. The material to be dried is supplied to the trough 1 by a screw conveyer 12 disposed in the feeding chamber L and extending into the trough 1, the feed chamber L communicating with the feed hopper K. The material to be dried passes into the machine and drops from the feed chamber L on and among the heated and rotating tubes 6 of the heating drum G, this being termed the preparing section. The material falling among the tubes 6 to the bottom of the trough 1 is picked up and thrown on the tubes again by the shovel members

M. The members M are disposed in spaced relation upon the bars 13 secured to the periphery of the disks 2 of each drum G and H extending longitudinally thereof, and also serve to forward the material to be heated toward the drum H and the discharge end of the machine, the drum H being what is termed the finishing section of the machine.

Having thus described the invention, it is believed that a full and clear understanding of the same may be had. However, it is to be understood that certain changes as to the precise construction, combination and arrangement of parts may be resorted to that fall within the legitimate scope of the appended claim.

What we do claim as our invention and desire to secure by Letters Patent is:—

A machine of the character described comprising a trough, two independently revolvable drums mounted in said trough in longitudinal alinement, and each provided with an outer and inner chambered head, a series of tubes between the heads around the center and opening into said heads at opposite ends and a central conduit or passage of larger diameter than the tubes also opening into the heads, the inner chambered heads of both drums being separated, the drums carrying shovel members rotatable therewith to pick up the material to be dried and cause it to fall into the drums and also to move the material toward one end of the drier, gearing means for imparting to the drums and the parts carried thereby different speeds of rotation, and pipes for supplying the heating medium connected to the outer heads of the two drums and regulable to introduce a heating means under different pressures in the two drums.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

RICHARD SIMON.

WILLIAM GEORGE SIMON.

FREDERICK RICHARD SIMON.

Witnesses:

K. BALL,

B. HASTINGS.