

APPARATUS FOR DRYING TEXTILE YARNS, FABRICS, AND OTHER MATERIALS.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.



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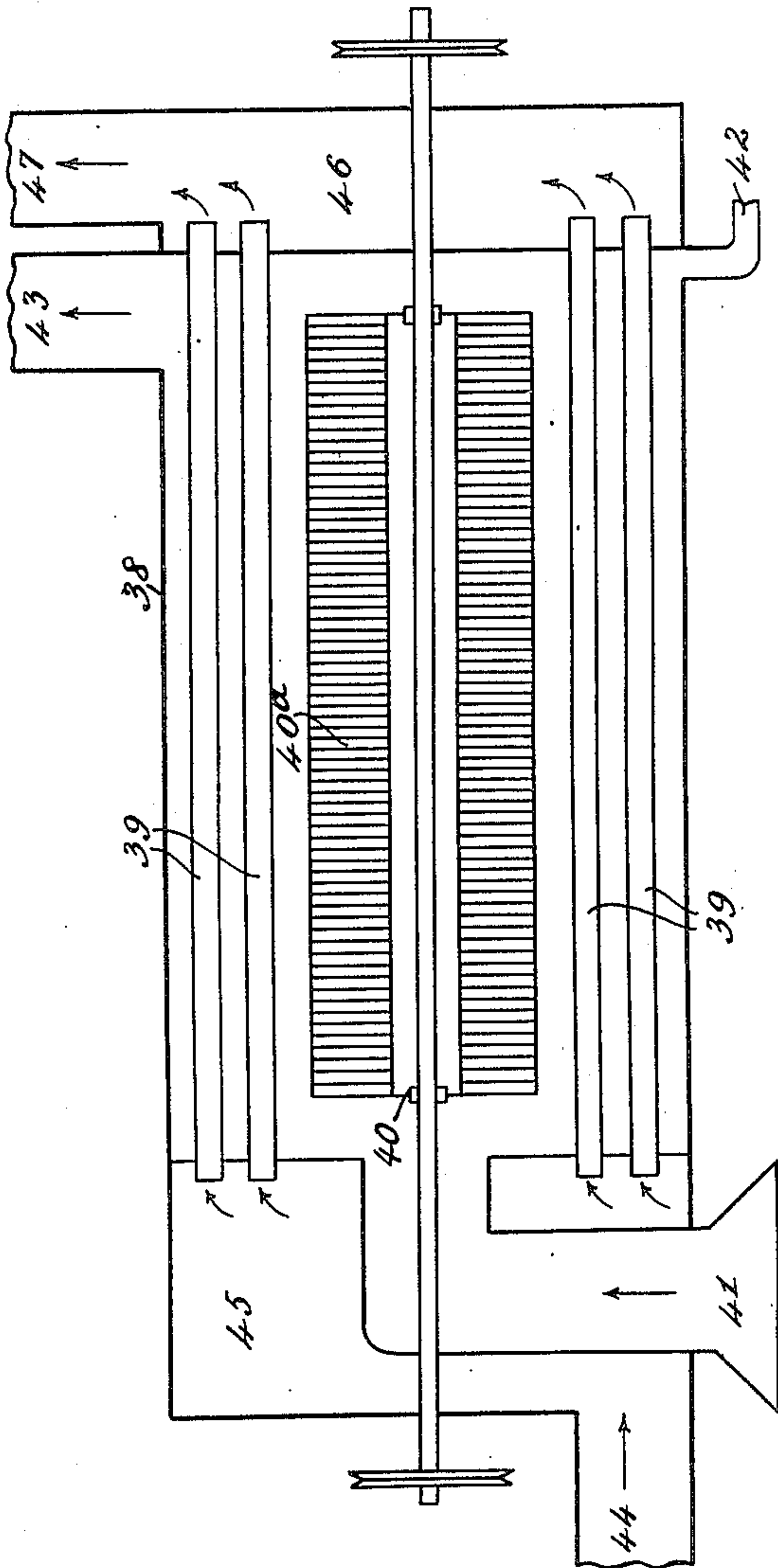
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2 SHEETS—SHEET 2.

FIG. 3.



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# UNITED STATES PATENT OFFICE.

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APPARATUS FOR DRYING TEXTILE YARNS, FABRICS, AND OTHER MATERIALS.

951,859.

Specification of Letters Patent. Patented Mar. 15, 1910.

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*To all whom it may concern:*

Be it known that I, PAUL TURLUR, a citizen of the French Republic, residing at Wattrelos, in France, have invented certain new and useful Improvements in Apparatus for Drying Textile Yarns, Fabrics, and other Materials, of which the following is a specification.

The present invention relates to improvements in drying apparatus for sized textile yarns, raw linens, fabrics, paper and other similar materials, said improvements allowing a rapid and economical drying to be accomplished.

The invention comprises the novel features and arrangements and combinations of parts hereinafter described and specifically pointed out in the claims being illustrated in the accompanying drawings in which—

Figure 1 is a diagrammatic view in longitudinal section of the heating-chamber and appurtenant parts. Fig. 2 is a similar view of a modified form of heating-chamber in which the entrance for the material is located at the lower part thereof. Fig. 3 is a cross-section of a novel form of heat inter-changer or air drier on a larger scale.

The means for securing the circulation or passage of the material to be dried in the various compartments for obtaining a variable temperature in each of such compartments and for separating moist vapors are similar to those described in the specification of my previous application for United States Patent dated 30th August 1906 No. 332,643.

Referring to Fig. 1 the improvements consist firstly in placing in the lowermost compartment or box 20 of the heating-chamber a serpentine or undulating pipe or coil 48 through which pass the products of condensation from the steam-tubes 11 contained in the compartments or boxes 15, 18 and 49. Said serpentine pipe 48 being located in the lowest and coldest part of the drier the products of condensation are cooled therein, imparting their heat to the surrounding air which thus completes the drying of the material at the bottom at a diminishing and comparatively low temperature.

A further improvement consists in placing in the upper part of the drier an air-

distributing box or chamber 49 provided on its under side with apertures or nozzles 49<sup>a</sup> similar to those 15<sup>a</sup> on the upper side of the box 15 in such a manner that the material to be dried is simultaneously ventilated or treated with air on both sides during that portion of its passage through the apparatus where it passes between the boxes 49 and 15 so that it arrives at the roller 7 in a sufficiently dry condition as not to adhere thereto. The material passes to and through the apparatus in the direction indicated by the arrows *y*.

A still further improvement consists in the particular arrangement of the inlet which permits of placing the rack 37 and rollers 37<sup>a</sup> supporting the material to be dried on the drier itself, instead of placing it on the floor in front of the intake rollers 1, as is usually done, thus permitting a drier of longer dimensions to be erected on the same floor space. For the same reason, the blower 33 is placed on the heating chamber itself, instead of being located on the floor alongside same as in my prior application for patent aforesaid. The blower draws air through the trunk 47 from the heat inter-changer hereinafter described and forces the air through the trunks 48 and 49<sup>a</sup> to the boxes 20, 18, 15 and to box 49 respectively.

Fig. 2 shows a modification of the construction shown in Fig. 1, with the inlet to the chamber at a much lower level in order to facilitate access to the rack 37<sup>b</sup> and rollers 37<sup>c</sup>. In this construction the material to be dried passes to and through the drying chamber, as indicated by the arrows *x*. The air passes from the blower 33<sup>a</sup> through trunk 51 and branch trunks 52, 53 to the box 15<sup>c</sup> and the boxes 49<sup>c</sup> and 18<sup>c</sup> respectively. 11<sup>a</sup> represents the steam pipes. 49<sup>b</sup> are downwardly directed apertures or nozzles in the box 49<sup>c</sup>.

A still further improvement comprises a novel form of heat recuperating or inter-changing apparatus of a more appropriate and less cumbersome form. This apparatus which is shown in Figs. 1 and 2 and in cross section on an enlarged scale in Fig. 3 comprises a closed cylindrical chamber 38, inclosing a group of metal tubes 39, and a



rotary agitator 40 provided with pallets or vanes 40<sup>a</sup>. The heated and moist air from the drying chamber enters at 41 into the chamber 38 and is projected against the tubes 39 and the wall of said chamber 38 by means of the agitator 40. Fresh air passes through the pipe 44 (Fig. 3) into an end box 45 whence it passes through the tubes 39 into another end box 46 whence it is sucked by the blower 33 through the pipe 47. The heated and moist air after having been projected against the tubes 39 passes away through the pipe 43. Under the double effect of cooling and agitation the vapor condenses and gives up its latent heat of vaporization, which is considerable, the products of condensation passing out through an outlet such as 42, Fig. 3, while the heated air deprived of its vapor exhausts in a comparatively dry condition through the outlet 43.

The rings 50 for uncrossing or disentangling the sized yarns are given a rocking or reciprocating movement in order to facilitate the detachment of said yarns from one another and to avoid breakages. Means for such action are diagrammatically shown in Figs. 1 and 2 at 54 and 55 respectively.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces between said compartments and a serpentine pipe or coil located in the lowermost compartment and in communication with the aforesaid steam heating pipes substantially as described.

2. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces between said compartments, a serpentine pipe or coil located in the lowermost compartment and in communication with the aforesaid steam heating pipes and an air distributing chamber having apertures opposed to the apertures of one of the compartments aforesaid, substantially as described.

3. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces be-

tween said compartments, an air distributing chamber having apertures opposed to the apertures of one of the compartments aforesaid and a support for the material to be dried located on the drying chamber adjacent the inlet of material thereto and exteriorly of same, substantially as described.

4. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces between said compartments, an air distributing chamber having apertures opposed to the apertures of one of the compartments aforesaid, a support for the material to be dried located on the drying chamber adjacent the inlet of material thereto and exteriorly of same, a heat recuperating device having an inlet in communication with the drying chamber, outlets for moist air to the atmosphere, an outlet for dry air and an outlet for products of condensation, and a rotary agitator in said recuperating device substantially as described.

5. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces between said compartments, an air distributing chamber having apertures opposed to the apertures of one of the compartments aforesaid, a support for the material to be dried located on the drying chamber adjacent the inlet of material thereto and exteriorly of same, a heat recuperating device having an inlet in communication with the drying chamber, an outlet to the atmosphere for moist air, an outlet for dry air and an outlet for products of condensation, a rotary agitator in said recuperating device, and means whereby the vapor discharged from other adjacent driers may be used in said drying chamber, substantially as described.

6. In a drier the combination of a drying chamber, having an inlet and outlet for material to be dried, a plurality of superposed spaced apertured compartments in said chamber, steam heating pipes within said compartments, means for causing the material to be dried to traverse the spaces between said compartments, an air distributing chamber having apertures opposed to the apertures of one of the compartments aforesaid, a support for the material to be dried located on the drying chamber adjacent the inlet of material thereto and exteriorly of same, a heat recuperating device having an inlet in communication with the drying chamber, an outlet to the atmosphere for



moist air, an outlet for dry air and an outlet  
for products of condensation, a rotary agi-  
tator in said recuperating device, and mov-  
able rings for uncrossing or disentangling  
5 the material on the latter leaving the upper-  
most compartment, substantially as de-  
scribed.

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

PAUL TURLUR.

Witnesses:

GEORGES LE COA,  
ALFRED C. HARRISON.