(No Model.)

F. HASKELL.

DEVICE FOR DRYING WARPS, PIECE GOODS, &c.

No. 408,235. Patented Aug. 6, 1889.

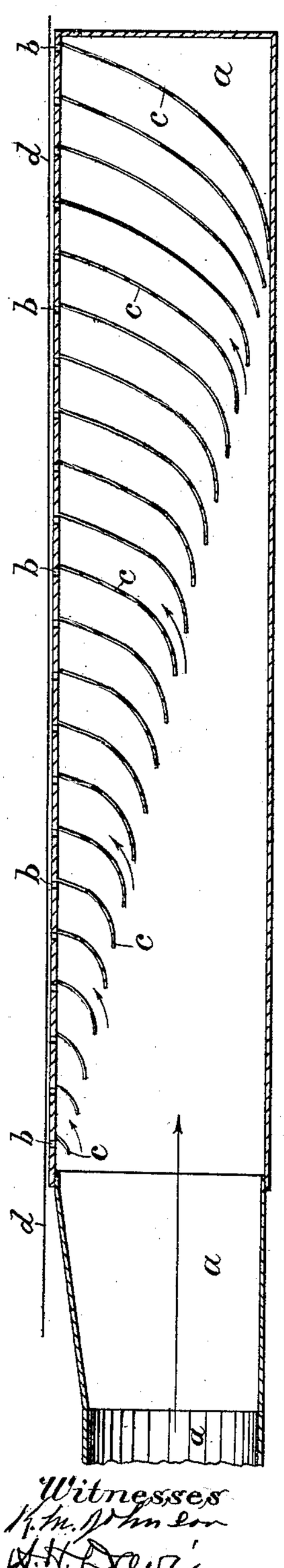

Fig. 1.

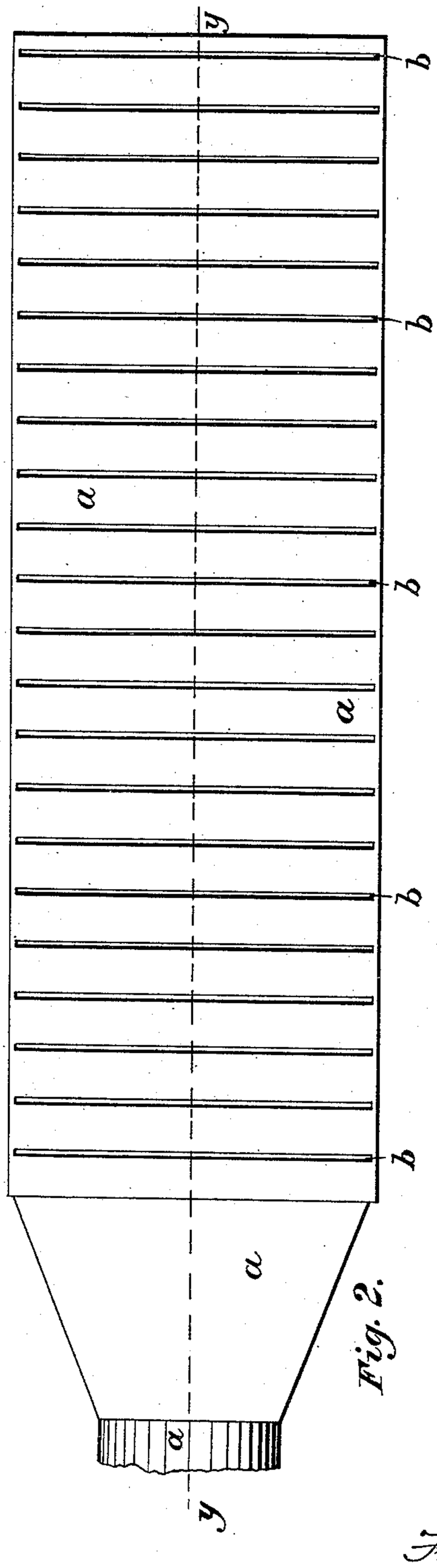

Fig. 2.

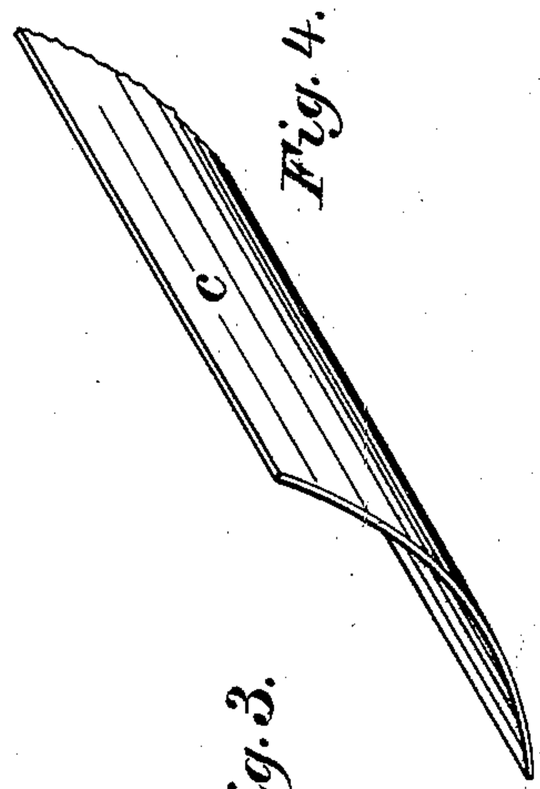

Fig. 4.

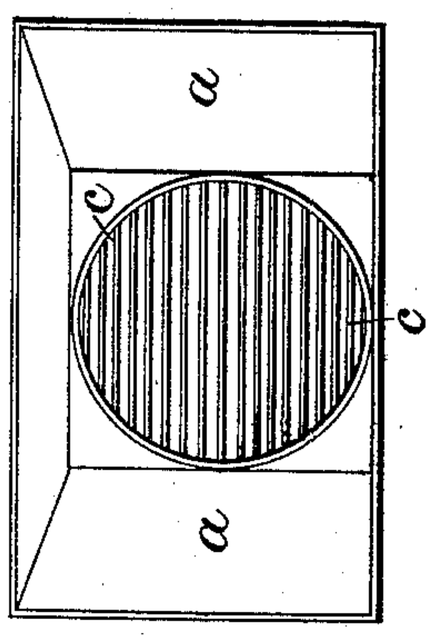

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

FRANK HASKELL, OF WESTBROOK, MAINE.

DEVICE FOR DRYING WARPS, PIECE GOODS, &c.

SPECIFICATION forming part of Letters Patent No. 408,235, dated August 6, 1889.

Application filed April 27, 1887. Serial No. 236,299. (No model.)

To all whom it may concern:

Be it known that I, FRANK HASKELL, of Westbrook, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Devices for Drying Warps, Piece Goods, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a view of a drying device constructed in accordance with my invention, in vertical section through the line *y y* of Fig. 1; Fig. 2, a top view; Fig. 3, an end view of the same, and Fig. 4 a detail in perspective of a wing *c*.

My invention has reference to devices for drying gray, bleached, sized, or colored warps or gains, or goods of cotton, silk, or wool, colored, bleached, or printed in the piece in cotton, woolen, or silk mills, or print works immediately after they are colored, bleached, sized, or printed—in short, any material that can be dried by the application of hot air. Many devices have been employed for the purpose of drying such goods or material, some of which are objectionable because the yarns or other material are exposed to contact with heated metallic surfaces, which injure the surface or texture of the goods, and others because the process of drying is slow and imperfect by reason of the accumulation of vapors in the chambers or pipes on which the drying is conducted, so that the heated air employed is more or less laden with moisture.

It is the purpose of my invention to provide a means of drying the material by subjecting it to a series of blasts of dry heated air, and without bringing the material injuriously into contact with any heated metallic surface.

My device, as illustrated in the drawings, may be described as follows: *a a* is a pipe or chamber, of tin or similar material, preferably of rectangular shape, as shown in the drawings, closed at one end and at the other constructed so as to permit connection with a tube or pipe from a hot-air blast. The broader side of this pipe or chamber *a*, which it will be found desirable to construct as a plane surface, is provided with narrow transverse openings *b b*, extending from side to side and disposed at regular intervals from one end to the other of the pipe. Within the chamber *a a* are placed the wings or curved pieces *c c c*. These wings or curved pieces are connected at their upper ends to the face of the pipe *a a*, containing the openings *b b*, so as to form an air-tight connection and extend from side to side of the box. They are placed, respectively, at the rear of each opening *b*— that is, at the edge of the opening *b* nearer the closed end of the pipe—and curve downward and toward the open end, each of the wings, as they approach the closed end, being slightly longer than the preceding, the last wing touching the bottom of the chamber or pipe *a a*.

In operation the open end of the pipe is connected with an air-blast by which the chamber or pipe *a* may be supplied with a continuous blast of heated air. The warps, yarns, or piece goods (represented by *d* in the drawings) are carried along over the openings *b b*, either by hand or by suitable mechanical means. The heated air as it passes into and through the pipe *a a* is caught by the successive wings *c c* and forced through the successive openings *b b* against the warps or other material, by which it is dried, the moisture produced by the process passing off into the apartment or being withdrawn by pipes or tubes.

The pieces *c* increasing in length from the open end to the rear insure an equal distribution of the heated air upon the portion of the fabric or yarn above the openings, because, as first piece *c* extends only a little way down inside, but a small portion of the inrushing hot air will be deflected outward through the first opening *b*, and a graduation of the amount of the escaping heated air is continued to the end of the chamber by the gradual increase in length of the pieces *c*. Thus the drying action is equal and uniform throughout the length of the box, and every portion of the article being dried thereon is acted on equally and dried

with uniformity, and so it comes out in perfect condition, a result not at all certain where no means are provided for equalizing the action of the drying agent—that is, the heated air—all along the drying-box.

What I claim is—

1. A chamber or pipe closed at one end and open at the other, having in one of its sides narrow transverse openings, from the edges of which openings, nearer the closed end of the chamber, extend downward within the chamber curved pieces or wings, which gradually increase in length as they approach said closed end, substantially as described.

2. The rectangular box *a*, adapted to be connected at one end with a hot-blast pipe and closed at the other end, and having in one of its broader sides transverse openings *b* at suitable intervals from end to end, and within the chamber the curved pieces *c*, placed, respectively, at the rear of said openings *b*, and increasing in length from front to rear, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of April, 1887.

FRANK HASKELL.

Witnesses:

ARTHUR W. RICKER,

ORRA B. VINAL.