

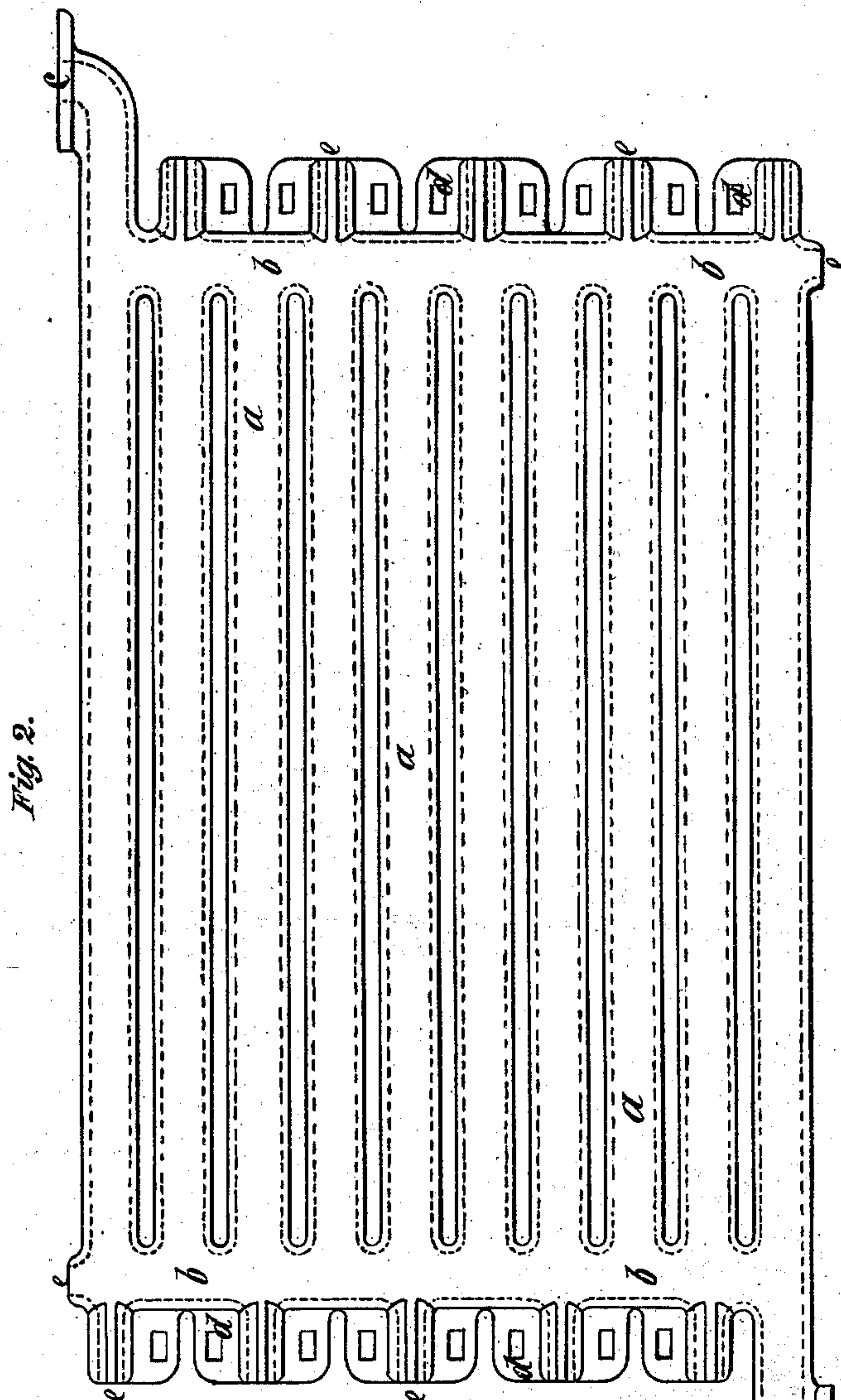
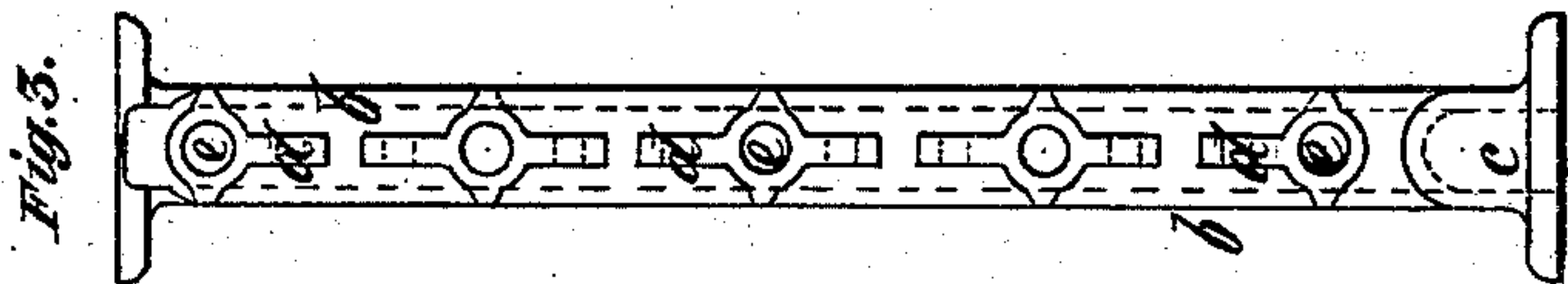
(No Model.)

A. WINWARD.

Steam Chest for Hot Air Drying.

No. 239,010.

Patented March 15, 1881.

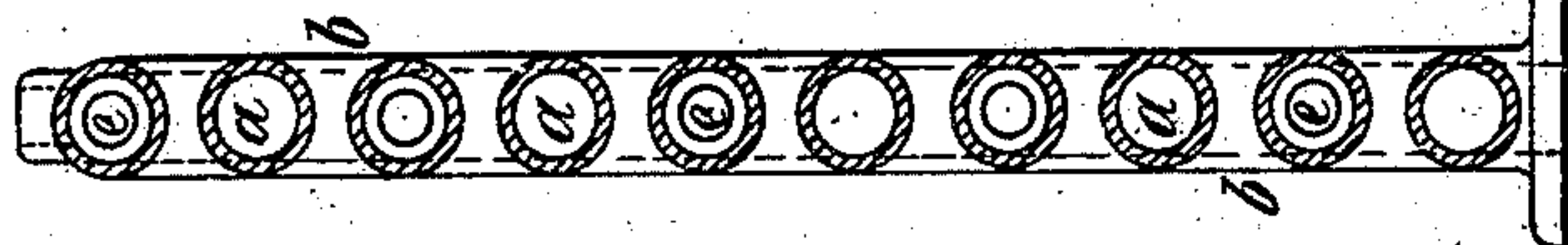


Witnesses:

Donn J. Twitchell.

C. Sedgwick

Fig. 1.



Inventor:

A. Winward

By

Mum R.

Atty's.

# UNITED STATES PATENT OFFICE.

ALEXANDER WINWARD, OF ACCRINGTON, COUNTY OF LANCASTER,  
ENGLAND.

## STEAM-CHEST FOR HOT-AIR DRYING.

SPECIFICATION forming part of Letters Patent No. 239,010, dated March 15, 1881.

Application filed September 17, 1880. (No model.) Patented in England February 28, 1880.

*To all whom it may concern:*

Be it known that I, ALEXANDER WINWARD, of Accrington, in the county of Lancaster, in England, engineer, have invented new and useful Improvements in Steam - Chests for Hot-Air Drying, (for which I have obtained a patent in Great Britain, No. 888, bearing date February 28, 1880,) of which the following is a specification.

10 The invention consists in a sheet of tubes provided with cross-pipes as well as inlet and outlet pipes, as hereinafter described. These tubes may be separate for the greater portion of their length and connected to each other at  
15 either end, the tubes opening at each end into a cross-pipe or steamway in such a manner that the steam may pass through them all; or the outsides of the tubes may be joined to each other by a central web extending the whole of  
20 their length. I place the inlet and outlet pipes for steam at the diagonally-opposite corners of the chest.

In order that my invention may be fully understood and readily carried into effect, I  
25 will describe the accompanying sheet of drawings, reference being had to the figures and letters marked thereon.

Figure 1 is a cross-section, Fig. 2 is a side elevation, and Fig. 3 is an end view, of a steam-chest made according to my invention.  
30

*a a* are the tubes, cast in one piece with the cross-pipes or steamways *b b*, and *c c* are the inlet and outlet pipes for steam.

*d d* are the bolt-holes through which bolts  
35 are passed to fix the steam-chests to the framing. Any number of steam-chests may be bolted together at the flanges of the inlet and outlet pipes.

*e e* are the holes through which the core is  
40 extracted, and which are afterward plugged.

By the use of my improvements high-pressure steam may be used up to one hundred

pounds to the square inch, and with the increased pressure a much higher temperature is obtained, the danger of explosion common  
45 to the old system of flat steam-chests is avoided, and a much greater heating-surface is obtained in a given space.

I am aware that it is not new to make a steam-radiator pipe with a central and a surrounding channel, between which the air is  
50 allowed to circulate, the central one being placed directly opposite to the steam-inlet and coming short at each end of the pipe; also, that it is not new to form a gang or cluster of hot-water pipes united at each end to a hollow trunk,  
55 the inlet and outlet pipes being arranged diagonally opposite; but my chest of pipes is for the special purpose of drying cloth so rapidly that the colors will not mark when the cloth  
60 is folded. Hence it becomes necessary that a very high temperature shall be imparted to the air that comes in contact with the cloth, and for this purpose the chest-pipes must be able  
65 to bear a very great pressure of steam. Here- tofore, the pipes being separate and jointed together in sets placed side by side, it was impossible to attain the degree of heat required. I have found by experiment that where the  
70 pipes are all cast together in a single chest I can secure any desired temperature without difficulty or danger.

What I claim as new and of my invention is—

The tubes *a* of a steam-radiating chest for  
75 drying colors in the process of printing cloths, cast in one piece with the cross-pipes *b* and inlet and outlet pipes *c c*, as and for the purpose specified.

Manchester, August 31, 1880.

ALEXANDER WINWARD.

Witnesses:

MILES DAY,

CHARLES ALFRED BARLOW.