

(No Model.)

J. A. AMBLER.

Mechanism for Treeing Boots and Shoes of Leather,  
and for Vulcanizing India Rubber Boots and Shoes.  
No. 236,406.

Fig. 1 Patented Jan. 11, 1881.

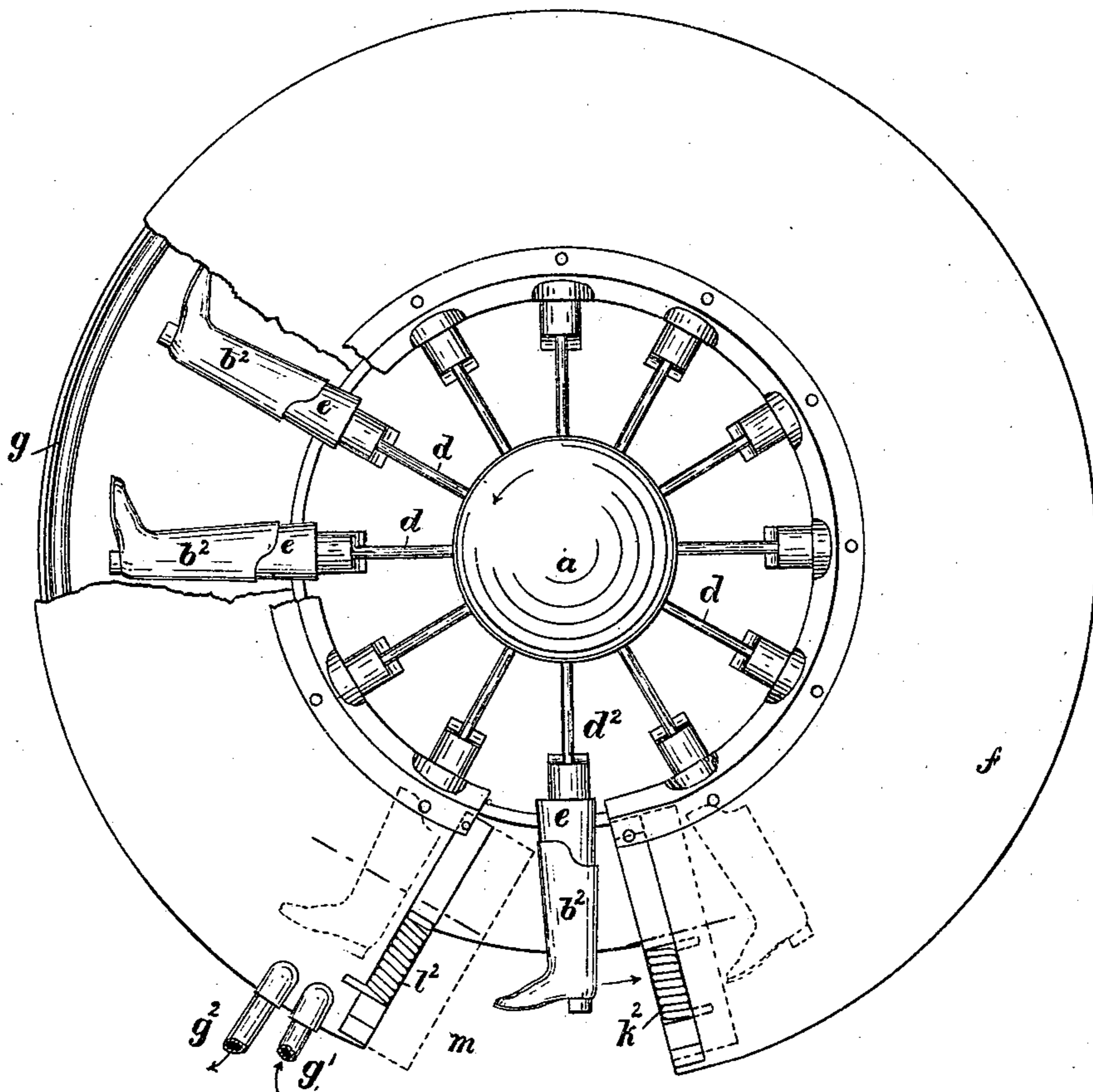
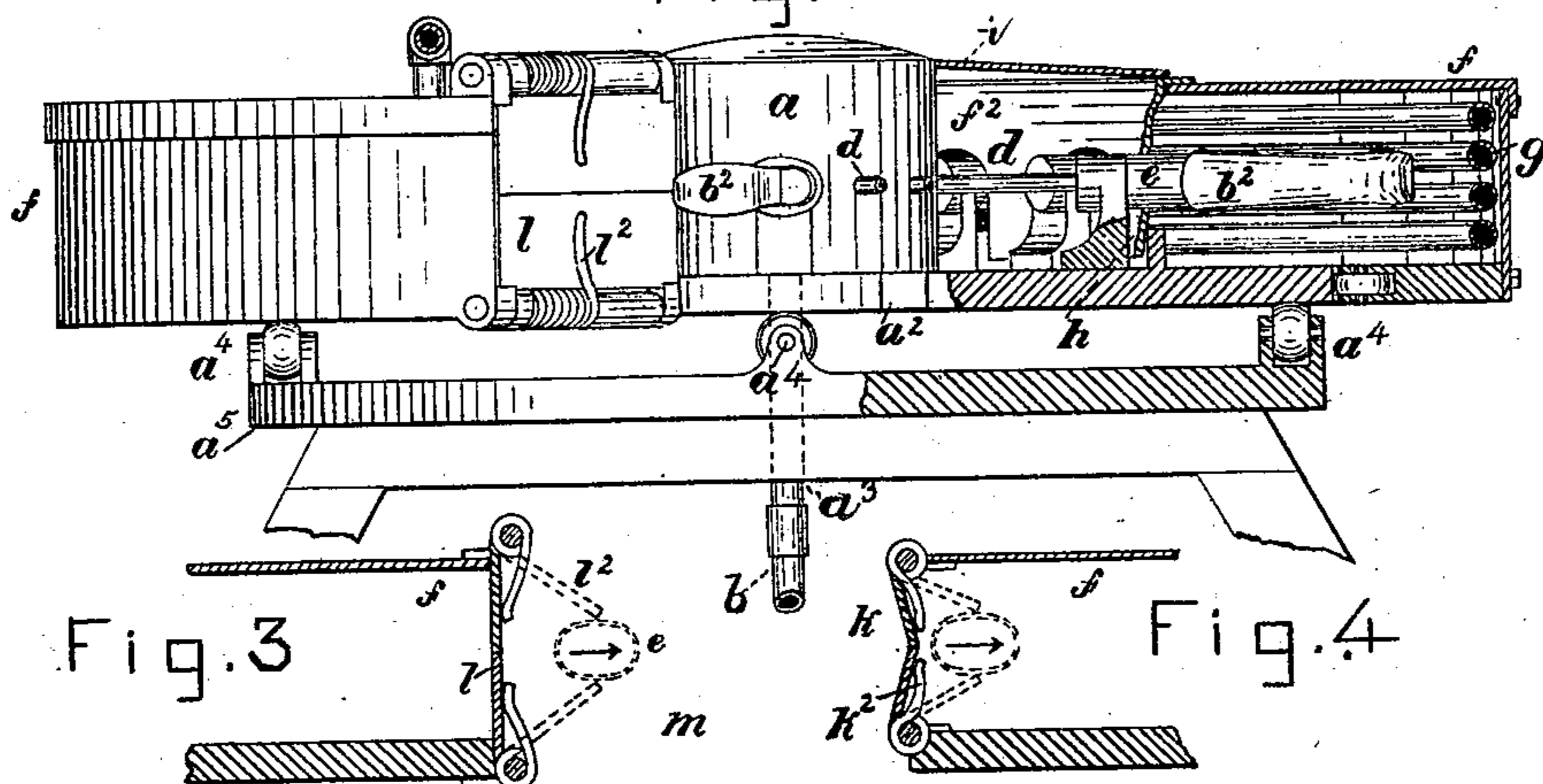


Fig. 2



WITNESSES.

*L. P. Connor*  
*Arthur Reynolds*

INVENTOR.

*James A. Ambler*  
by *Crosby & Gregory* Attys.

# UNITED STATES PATENT OFFICE.

JAMES A. AMBLER, OF NATICK, MASSACHUSETTS.

MECHANISM FOR TREEING BOOTS AND SHOES OF LEATHER AND FOR VULCANIZING INDIA-RUBBER BOOTS AND SHOES.

SPECIFICATION forming part of Letters Patent No. 236,406, dated January 11, 1881.

Application filed November 19, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. AMBLER, of Natick, county of Middlesex, State of Massachusetts, have invented a new and useful Improvement in Mechanism for Treeing Boots and Shoes of Leather and for Vulcanizing India-Rubber Boots and Shoes, of which the following description, in connection with the accompanying drawings, is a specification.

10 This invention relates to mechanism for treeing leather boots and shoes and for vulcanizing india-rubber boots and shoes.

My invention has for its object to facilitate and simplify both these operations.

15 In a patent of the United States, No. 224,506, heretofore granted to me, I have shown a hollow metallic expansible tree heated by either hot air or steam, hot air being preferably employed. In the apparatus described in the  
20 said patent the leather of the boot or shoe derives all its heat from the tree, whereas in this my present invention I provide means for heating the boot or shoe internally from the tree, and also externally for the desired time,  
25 such means being a chamber into which the boot or shoe is placed, and allowed to remain for a greater or less time while it is held in stretched or distended condition upon the tree.

In the vulcanization of india-rubber boots  
30 and shoes it is customary to place the tree, covered with the usual india-rubber compound, in a heated chamber, where it is left for the desired length of time. In the vulcanization of boots and shoes, so far as I am aware, the boot  
35 or shoe, while in the usual heated chamber, has never been heated internally by heat applied directly into the tree from a source outside the heated chamber, as provided for in this my invention. My machine greatly facilitates the vulcanizing operation.  
40

Figure 1 represents, in top view, an apparatus containing my invention, a portion of the heated chamber being broken out to more clearly show the operation of the parts; Fig.  
45 2, a side elevation of Fig. 1; and Figs. 3 and 4 are details, illustrating the doors which permit the exit of the boot and tree from and their entrance into the heated chamber.

Referring to the drawings, the drum  $a$ ,  
50 mounted on a rotating table,  $a^2$ , has a central

pipe,  $a^3$ , which is entered within a packed joint of a stationary pipe,  $b$ , supposed to be in connection with a suitable hot-air or steam generator or supply. The table  $a^2$ , supported on the rollers  $a^4$  of bed  $a^5$ , common to United States Patent No. 230,601, may be rotated in the direction of the arrow thereon by any suitable means, but preferably by a worm which will engage a worm-gear connected with the under side of the said table  $a^2$ . This drum, supplied with hot air or steam taken from any usual or suitable source, has a series of radially-projecting pipes,  $d$ , which at their outer ends enter the boot-trees  $e$ , carried by the table  $a^2$ , the said boot-trees being made hollow, and being provided with any suitable or well-known expanding devices, or with expanding devices such as described in my said patent. These trees receive hot air, or, if desired, steam, in regulated quantities and at proper temperature to heat the tree and the boot thereon internally. Hot air contained in the said trees may escape therefrom through slots or openings made therein, but not shown, located outside the end of the boot-leg. Each pipe  $d$  will, in practice, contain a stop-cock,  $d^2$ , as shown, in connection with one of the said pipes. The boots  $b^2$ , placed on the said trees, may be heated internally to a greater or less degree by opening the cocks  $d^2$ , which control the admission therein of hot air, and the boots or shoes on the trees are at the same time heated externally by their introduction into the receiving-chamber  $f$ . (Shown in section, Fig. 2.) Boots or shoes on trees moved into this heated chamber are allowed to remain there for a longer or shorter time, according to the class of boot or shoe contained on the trees, and they are subjected externally to the heat of the chamber, and internally to heat applied to the tree from some proper source outside the heated chamber, the degree of heat depending upon the quantity of moisture contained in the leather, or the dressing applied thereto, to properly tree it; or, if a rubber boot, the degree of heat will be that required to properly vulcanize the particular compound of india-rubber then being employed. This chamber  $f$  is heated by means of a coil of pipe,  $g$ , which receives steam from

the pipe  $g'$ , supposed to be in connection with a suitable steam-supplying reservoir, the steam, after circulating through the said coil, passing out through the exit-pipe  $g^2$ . The inner edge of this hot-air chamber is open to receive the legs of the boot-trees. To retain in the said chamber most of the heat radiated from the coil of heated pipe, I have provided the chamber, about its inner edge, with a curtain which falls upon the legs of the trees, and I have extended up against the said legs a flexible lip or flange,  $h$ . (See Fig. 2.)

It is obvious, in case I desire to further lessen the escape of hot air from the chamber  $f$ , that I might extend horizontally from the drum  $a$  an annular rim,  $i$ , (shown in section at right of Fig. 2,) so as to bear upon the curtain  $f^2$  where it is joined with the top of the heated chamber  $f$ , the said curtain serving as a packing for the said joint; or, instead of the curtain, I might use any other proper packing between the chamber and rim. Should I employ such rim, it would be necessary to provide it at top with suitable doors, just above the pipes  $d$ , by which to gain access to the trees when it was desired to operate their usual expanding devices. This chamber  $f$  has two sets of doors,  $k$   $l$ , controlled by springs  $k^2$   $l^2$ , to keep them closed, as represented in full lines, Figs. 3 and 4, the said doors being made double, so as to open at their centers, as the boots on the trees press against them during the rotation of the table. The dotted lines, Figs. 3 and 4, show how the trees will operate the said doors. These doors, when closed, prevent the escape of hot air from the chamber  $f$  at that point. The dressing or other material usually applied to the leather of the boot or shoe to tree and finish it having been applied thereto, and the tree having been heated, the surface of the boot or shoe is rubbed, as usually done, and to facilitate the drying of the boot and dressing thereon, the tree, with the boot or shoe on it, is made to travel through the heated chamber, and when again brought into the open space  $m$ , between the doors  $k$   $l$ , the boot or shoe may be again rubbed to give it its final finish.

In case an india-rubber boot is to be vulcanized, it being composed of any usual mate-

rial in layers on the tree, the tree and material thereon must be retained in the heated chamber for a greater length of time, and to do this the table and drum  $a$  are rotated more slowly or only intermittingly at the proper times.

By applying heat within the trees, and then placing the heated trees within the heated chamber, I am enabled to apply heat both upon the interior and exterior of the boot, and dry it or cure it more rapidly than when the tree and boot are heated only internally or the boot is heated only externally.

I could tree a leather boot or shoe, and do very good work, with the heated chamber alone, heat being omitted from the interior of the tree; but I could not work so rapidly and economically as with it.

It is obvious that the contrivances for admitting the trees within the heated chamber and for controlling the escape of the heat therefrom might be variously modified without departing from my invention.

The number of trees in the series of trees connected with the drum  $a$  may be more or less.

I claim—

1. An apparatus for treeing boots, it being composed of a series of movable trees provided with expanding devices and a heated chamber to receive them and permit hot air in the said chamber to act upon the boots externally, as and for the purpose described.

2. The hot-air or steam drum and series of hollow trees heated internally from the said drum, combined with the heated chamber  $f$ , through which the heated trees, with boots thereon, are made to travel, as and for the purpose described.

3. The rotating drum and its series of boot-trees, combined with the chamber provided with doors for the entrance of the trees and boots into and their exit from the said chamber, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. AMBLER.

Witnesses:

G. W. GREGORY,  
ARTHUR REYNOLDS.