

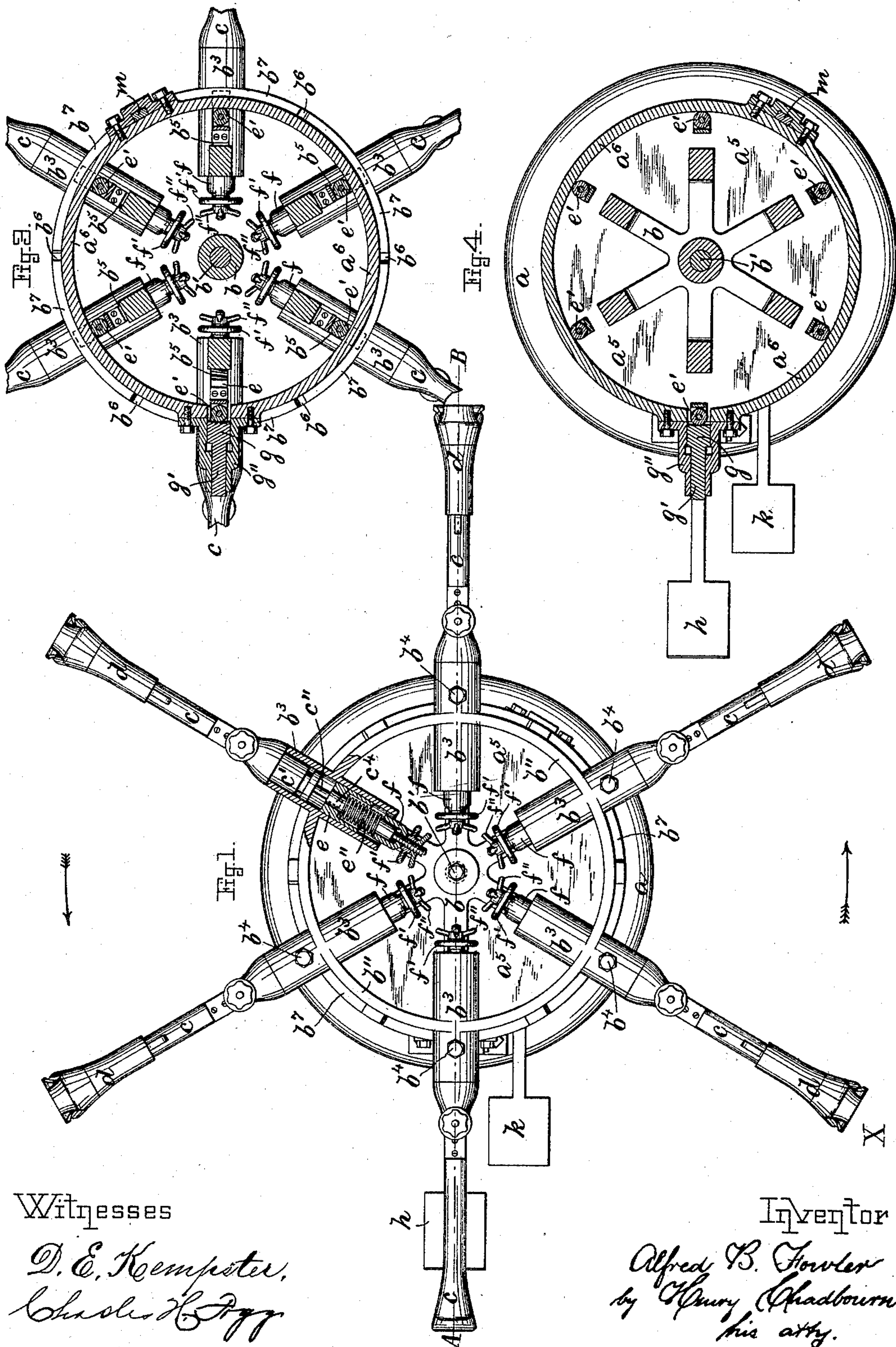
(No Model.)

2 Sheets—Sheet 1.

A. B. FOWLER.
BOOT TREERING MACHINE.

No. 442,033.

Patented Dec. 2, 1890.



Witnesses

D. E. Kempster,
Charles H. Fry

Inventor

Alfred B. Fowler
by Henry Chadbourne
his atty.

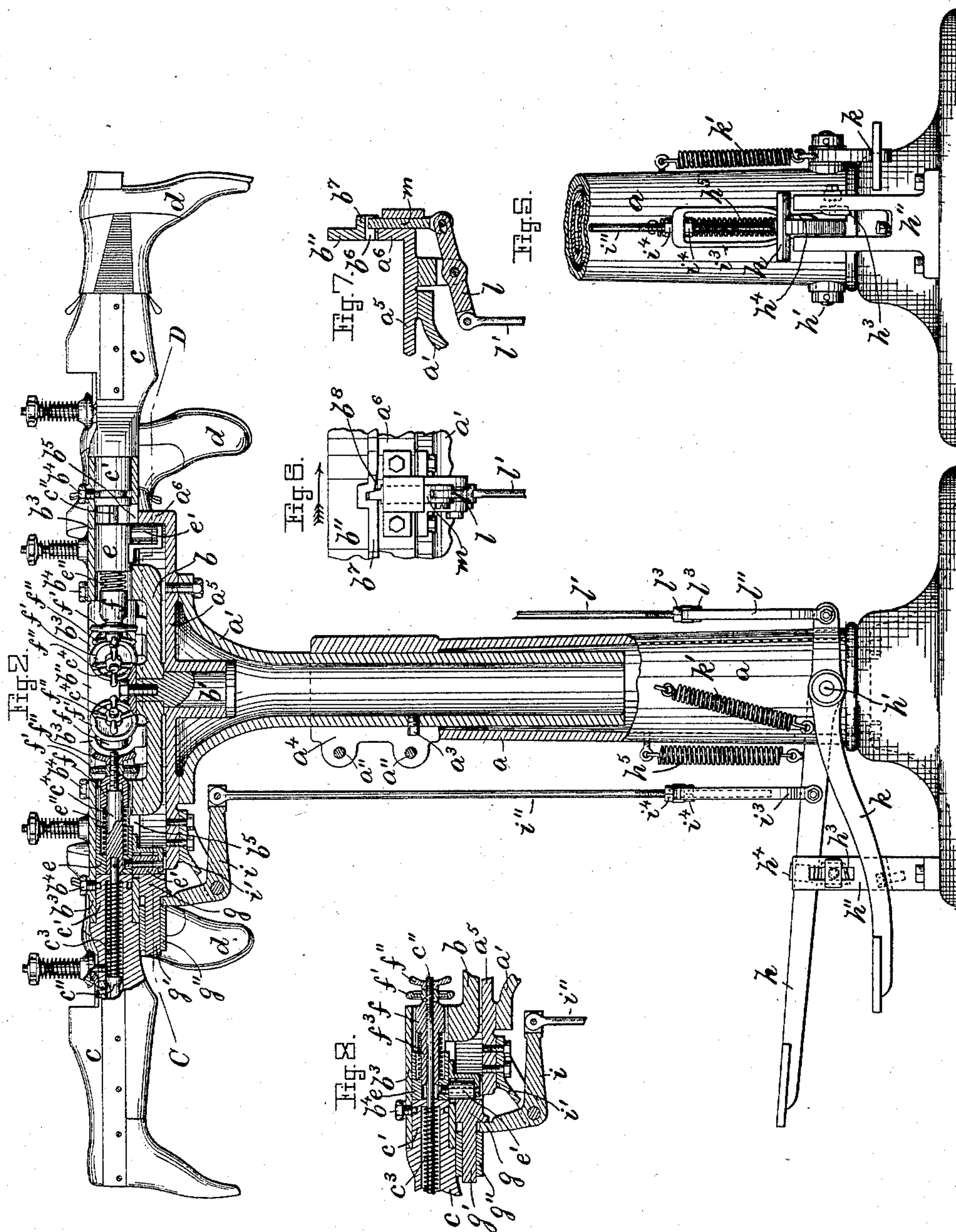
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UNITED STATES PATENT OFFICE.

ALFRED B. FOWLER, OF EXETER, NEW HAMPSHIRE, ASSIGNOR TO OLIVER
A. MILLER, OF BROCKTON, MASSACHUSETTS.

BOOT-TREEING MACHINE.

SPECIFICATION forming part of Letters Patent No. 442,033, dated December 2, 1890.

Application filed September 7, 1889. Serial No. 323,264. (No model.)

To all whom it may concern:

Be it known that I, ALFRED B. FOWLER, a citizen of the United States, and a resident of Exeter, in the county of Rockingham and State of New Hampshire, have invented certain new and useful Improvements in Boot-Treeing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

10 This invention relates to improvements in boot or shoe treeing machines, and especially in the machine for which Letters Patent of the United States were issued to me, dated November 20, 1888, and numbered 393,003, and in which a plurality of trees are radially
15 mounted on a revolving head and capable of being locked in position so as to bring each of the trees in its turn in front of the operator.

20 My present invention consists, first, in a novel construction of the mechanism for expanding the tree within the boot and to keep it in its expanded condition until it has been revolved one complete revolution with the head of the
25 machine on which it is mounted and to contract the tree within the boot when it has completed its revolution; also in mechanism for automatically taking up the slack that may occur in the boot during the revolution
30 of the tree caused by the stretching of the leather; also to adjust the amount of strain on the boot.

My invention is carried out as follows, reference being had to the accompanying drawings, wherein—

35 Figure 1 represents a plan view of my improved boot or shoe treeing machine. Fig. 2 represents a partial central vertical section of the same on the line A B, shown in Fig. 1, showing one of the trees in side elevation and the other tree partly in section and partly in
40 side elevation. Fig. 3 represents a horizontal section of the machine on the line C D, shown in Fig. 2, as seen from below said line. Fig. 4 represents a horizontal section of the machine on the line C D, shown in Fig. 2, as
45 seen from above said line. Fig. 5 represents a front elevation of the lower portion of the standard of the machine, showing the treadles for operating the machine. Figs. 6 and 7

represent, respectively, in front elevation and in section, detail views of the locking device for locking the rotary head in any of the required positions; and Fig. 8 represents a detail sectional view of a modification of the
50 machine.

Similar letters refer to similar parts wherever they occur on the drawings.

The standard of the machine is preferably made in two parts, as in my former patent
60 above referred to—a lower part *a*, adapted to be fastened to the floor, and an upper part *a'*, adjustable up and down within the lower part in order to bring the trees to the most convenient height for the person who is to
65 operate the machine. When in the proper relative position, the two parts of the standard are clamped and held together by means of the bolts *a'' a''*, (shown in Fig. 2,) or by any other well-known means.

70 *a*³ represents a pin secured to the part *a'* and having its end projecting into the slot *a*⁴ in the upper part of the lower part of the standard. The pin *a*³ prevents the upper part of the standard from turning in the
75 lower part while they are being adjusted to the proper height. To the upper part *a'* of the standard is firmly secured the plate *a*⁵, which is provided with a circular flange *a*⁶, as shown, which forms a split ring, a portion
80 of said flange being cut away for a purpose, as will hereinafter be described.

b represents the tree-carrying head, which is pivoted by means of the bolt or stud *b'* to the center of the plate *a*⁵. The head *b* is
85 formed with a ring *b''*, which rests on top of the flange *a*⁶, forming a support to keep the head *b* steady while it is being rotated. The ring *b''* is provided with any suitable number of radiating tubes or bearings *b*³ *b*³ *b*³ for
90 the trunnions *c' c' c'* on the trees *c c c*.

*b*⁴ *b*⁴ *b*⁴ represent screws screwed through the bearings *b*³ *b*³ *b*³ and having their inner ends projecting into annular grooves on the trunnions of the trees for the purpose of hold-
95 ing the trees within the bearings *b*³ *b*³ *b*³ and still to allow them to be turned in said bearings to present the entire surface of the boot *d*, which may be on the tree, in convenient position for the person treeing the boot to rub
100

the same or to finish the boot in any desired manner.

The trees used on this my improved machine are of that kind which are expanded by mechanism within the tree, (not shown on the drawings,) and which are operated by pulling on the rod c'' , which projects from the trunnion c' of the tree against the influence of the spring c^3 within the tree, said trees being returned to their normal contracted condition by the influence of said spring c^3 when the pulling strain is released from the rod c'' .

To the end of the rod c'' , I attach the spindle c^4 in any suitable manner, said spindle forming an extension of the rod c'' .

e represents a block or collar fitting within the bearing b^3 and loosely mounted on the spindle c^4 , and e' represents a suitable pin or roll on the lower part of the block e , adapted to rest against and to travel on the inner surface of the flange a^6 or against the follower g , to be described hereinafter.

f represents a collar or sleeve adjustably mounted on the inner end of said spindle, and e'' represents a spiral or other suitable spring surrounding the spindle between the block e and sleeve f . The amount of pressure exerted by the spring e'' is adjusted by means of the hand-wheel f' and hand check-nut f'' , screwed on the inner end of the spindle c^4 . The block e is prevented from turning in the bearing b^3 by means of the pin or roll e' , passing through and guided in the slot b^5 in the under side of the bearing b^3 .

Each of the radiating trees are provided with the attachments herein described, and I have shown six of such trees; but the number may be varied as desired.

g'' represents a bracket secured to the outside of the flange a^6 , and forming a bearing for the spindle g' of the follower g , as shown in Figs 3 and 4. The follower g is guided in the bearing g'' , and cut-away portion of the flange a^6 , and has its inner face preferably made in the form of an arc of a circle of equal radius with the inner face of the flange a^6 , so as to form a continuous circle when the follower is forced inward, as hereinafter to be described, for the pins or rolls $e' e' e'$ to travel on when the trees are rotated from one position to the next in succession.

h represents a treadle pivoted to the lower part of the standard of the machine on the shaft h' , and guided in a suitable bearing h'' , secured to said standard. The treadle h is secured to a bell-crank lever i , pivoted to a bracket i' , secured to the under side of the plate a^5 by means of the rod i'' and yoke i^3 , said rod being adjustably secured to the yoke i^3 by means of the nuts $i^4 i^4$, screwed on the screw-threaded lower end of the rod i'' above and below the yoke i^3 . The peculiar construction of the rod i'' and its connection to the treadle h is to allow said rod to be adjusted to the varied heights of adjustment of the standard of the machine. The opposite

end of the bell-crank lever i , to which the rod i'' is attached, rests against a projection on the lower part of the follower g in such a manner that when the treadle h is depressed and the bell-crank lever i turned on its fulcrum it will force the follower inward until its face, against which the pin or roll e' rests, will coincide and form a completion of the circular inner face of the flange a^6 , and by so doing it will cause the tree whose pin or roll rests against the follower to be expanded by the block e exerting a pressure against the spring e'' , which in turn presses against the sleeve f with a yielding pressure and causes a pulling strain to be exerted on the rod c'' and expands the tree.

h^3 represents a block adjustably secured to the guide h'' , and h^4 represents a block or projection on the side of the treadle adapted to be placed under the block h^3 when the treadle is depressed, so as to lock the treadle in that position while the operator turns the rotating head to carry the tree just expanded within the boot or shoe to the next position and to bring another of the radiating trees to a position in front of him, or to the position marked A in Fig. 1.

h^5 represents a suitable spring attached to the treadle h and to the standard of the machine, which tends to hold the treadle in its upper position, and the bell-crank lever with its free end resting against the inner end of the bracket g'' , as shown in Fig. 1. The springs c^3 and e'' tend to hold the follower g in such a position that the projection on its under side rests against the bell-crank lever at all times.

k represents a treadle pivoted to the lower part of the standard of the machine on the shaft h' and adjustably attached at one end to the inner end of the lever l (shown in Figs. 6 and 7) by means of the rod l' , yoke l'' , and nuts $l^3 l^3$, in a similar manner to the way the treadle h is attached to the bell-crank lever i , described heretofore. To the outer end of the lever l is pivoted the sliding latch m , which is guided in a bearing secured to the plate a^5 or its flange a^6 , as shown. The latch m is provided in its upper end with a tooth which fits into one of the series of notches or recesses $b^6 b^6$ on the under side of the ring b'' and holds the rotating head b firmly in position while the operator is working on the boots which are on the trees. A suitable spring k' , attached to the upper part of the treadle k and the standard of the machine, tends to hold the treadle in its upper position and the latch within one of the notches or recesses b^6 . The ring b'' is provided with a projecting flange b^7 between each successive notch or recess b^6 , on which the upper part of the tooth of the latch m presses while the head b , with its trees $c c$, are being rotated and the pressure is removed from the treadle k . The flange b^7 is inclined upward or cut back, as shown at b^8 in Fig. 6, so as to obviate the liability of the tooth on the latch m pass-

ing by one of the recesses when the rotary head is rotated in the direction, as shown by arrow in said Fig. 6, to carry the trees from one position to the next in succession. It is obvious that the pin or roll e' might be attached directly to the rod c'' , which operates the tree; but such a construction would be defective, inasmuch as it would exert a rigid strain on the boot or shoe and would be liable to burst the same, as boots or shoes of one number are not all made exactly the same size, and the leather from which they are made is not all of the same elasticity.

In Fig. 8 of the drawings I have shown a modification of the connecting mechanism between the pin or roll e' and the rod c'' of the tree, and in such modification the rod c'' is extended to form a spindle, on which the sleeve f is mounted, and on which the hand-wheel f' and hand check-nut f'' are screwed. The sheave f has a reduced extension f^3 , as shown, around which the spring e'' is placed. The other parts of the mechanism are the same as shown on the other figures on the drawings.

In using this my improved treeing-machine an operator stands in the position at A in Fig. 1 and has a tree c in front of him, said tree being in a contracted condition, as shown in Fig. 2. After placing a boot or shoe on this tree he depresses the treadle h with his foot and locks it in its depressed position, and by so doing he expands the tree within the boot or shoe. He then depresses the treadle k to withdraw the latch m from the recess in which it rests to unlock the head b from the standard of the machine and rotates the head b , with its radiating trees, in the direction shown by the arrows in Fig. 1 until the next tree, with a finished boot or shoe on it, comes in front of him and the latch m has sprung into the next notch b^6 in succession, he having meantime removed the pressure from the treadle k . He then removes the boot or shoe from this tree by unlocking the treadle h and allowing the tree to contract within the boot or shoe and replaces such treed or finished boot or shoe by another boot or shoe to be treed and finished, and he then repeats the operation heretofore described. It will be seen that the tree is kept in an expanded condition during a complete rotation of the head of the machine and is only contracted when the operator unlocks the treadle h . When the first boot has been placed upon the tree and rotated to the position X in Fig. 1, as before described, another operator performs the operation of treeing the same in the usual manner of treeing boots or shoes, while the first operator is taking off one boot and replacing it with another, as above described. The boot is caused to pass from one position to the next until it has reached the position marked B in Fig. 1, where it may be subjected to a blast of warm air by means of a common blower, which, however, is not shown on the drawings, for

the purpose of drying the boot, so as to cause it to hold its proper form better after it has been removed from the machine, and also to prepare it for the dressing which is to be applied to the boot before it is taken from the tree and which requires the boot to be dry before it is applied, in order to retain the gloss on the boot or shoe given by such dressing. After the boot has been dried, as described, it is caused to pass to the next position, where it is treated with a coat of dressing to finish it.

The treeing, drying, and finishing of the boot may be accomplished at one position only, or it may be done at more than one, as may be desired. While the boot or shoe is undergoing the several operations described any slack that may occur between the tree and the boot or shoe from the stretching of the same will be taken up by the spring e'' pressing against the sleeve f , and said spring will also prevent a strain sufficient to burst the boot from being exerted on the same by said spring yielding, and the amount of the strain on the boot can be adjusted by means of the hand-wheel f' and hand check-nut f'' .

It is obvious that I may use only one of my improved trees with its yielding connection to the power-applying device for expanding it and dispense with the rotary head and circular flange, and mount the tree in a fixed bearing on a standard having a follower to operate the tree in a manner substantially as shown on the drawings.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent, and claim—

1. In a boot or shoe treeing machine, an expandible tree mounted on a pivoted frame on the machine, a circular flange adapted to hold said tree in an expanded condition, a slot or cut-away portion in said flange, a follower adapted to expand and contract said tree, and mechanism to operate said follower, all combined for the purpose set forth and described.

2. In a boot or shoe treeing machine, a tree mounted on a standard and adapted to be expanded and contracted by the manipulations of a rod and mechanism within the tree, a follower mounted on the standard and adapted to manipulate the rod to expand the tree, a yielding mechanism between the rod and follower, a treadle, and connecting mechanism between the follower and treadle, substantially as and for the purpose set forth.

3. In a boot or shoe treeing machine, a fixed standard, a circular flange attached to or made in one piece with said standard and having a cut-away portion, as described, a follower adapted to be moved to and from the center of said flange within said cut-away portion by suitable mechanism, substantially as described, combined with a rotary head pivotally attached to said standard, a plurality of radiating trees carried by said head, and a pin or roll attached to the rod of each of said trees and operated by the said follower to ex-

pand and contract the trees and to travel on the inner surface of the flange on the standard of the machine, as and for the purpose set forth.

5 4. In a boot or shoe treeing machine, a standard, a circular flange attached to or made in one piece with said standard and having a cut-away portion, as described; a follower adapted to be moved to and from
10 the center of said flange within the cut-away portion by mechanism substantially as described, combined with a rotary head pivotally attached to said standard, a plurality of trees carried by said head, each provided with
15 a rod for operating its tree, a sleeve adjustably mounted on said rod or extension thereto, a block or sleeve loosely mounted on said rod or extension, a pin or roll on said block to be operated by the said follower
20 and to travel on the inner surface of said flange for the purpose of expanding and contracting the tree or to hold it in its expanded condition while the head is being rotated, and a spring on said rod or extension
25 thereto between said sleeve and block to cause a yielding pressure to be exerted on said rod, for the purpose set forth and described.

5. The herein-described treeing-machine
30 for boots or shoes, consisting of the standard $a a'$, having the plate a^5 , secured to its upper end, said plate being provided with the flange a^6 , which is cut away at one place, as described, the follower g , guided within the

cut-away portion of the flange a^6 and in a bracket g'' , and capable of movement to and from the center of the plate a^5 , the treadle h , bell-crank lever i , rod i'' , yoke i^3 , and spring h^5 , for operating said follower, the rotary head b , the radiating trees $c c c$, carried by said head and capable of turning within bearings $b^3 b^3 b^3$ on the head b , the sleeve f , adjustably mounted on the rod c'' or an extension c^4 thereto, the hand-wheel f' and check-nut f'' for adjusting the sleeve f , the block e , loosely mounted on the rod c'' or extension c^4 thereto, the spring e'' , surrounding the rod c'' or extension c^4 , the pin or roll e' on the block e , which is moved to and from the center of the plate a^5 with and by the follower g in order to expand and contract the tree c , and which travels on the inner surface of the flange a^6 to keep the tree c in an expanded condition during a complete rotation of the head b , with its trees $c c$, the flange b^7 and recesses $b^6 b^6$ on the head b or a ring b'' attached thereto, the treadle k , spring k' , lever l , rod l' , yoke l'' , and the latch m , adapted to lock the head b in its different positions, all combined to operate as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 3d day of July, A. D. 1889.

ALFRED B. FOWLER.

Witnesses:

HENRY CHADBOURN,
DANIEL E. KEMPSTER.