(No Model.) 3 Sheets—Sheet 1.

A. B. FOWLER.

BOOT TREEING MACHINE.

No. 442,034. Patented Dec. 2, 1890.

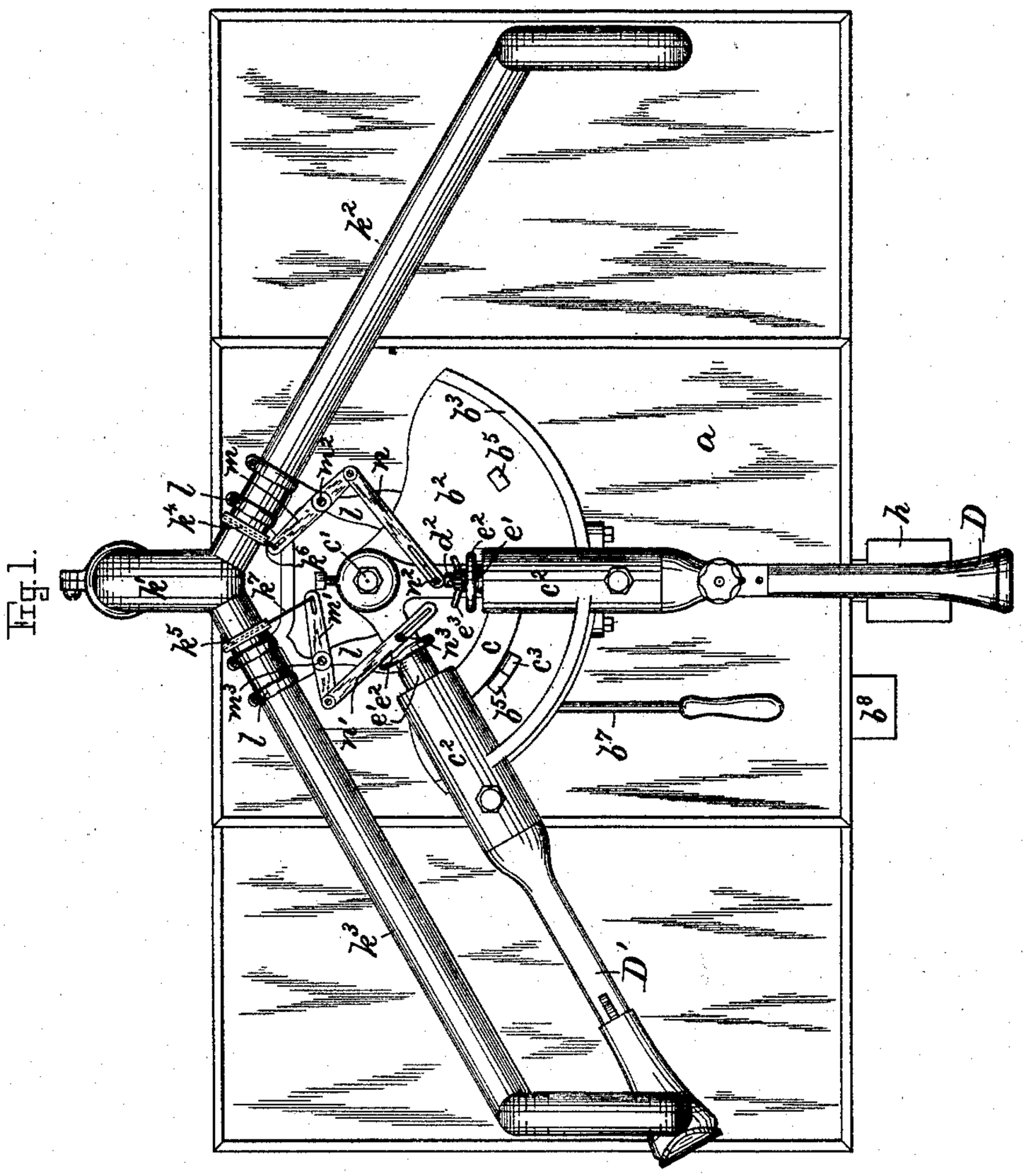

Fig. 1.

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Inventor
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by Henry Chadbourn
his atty.

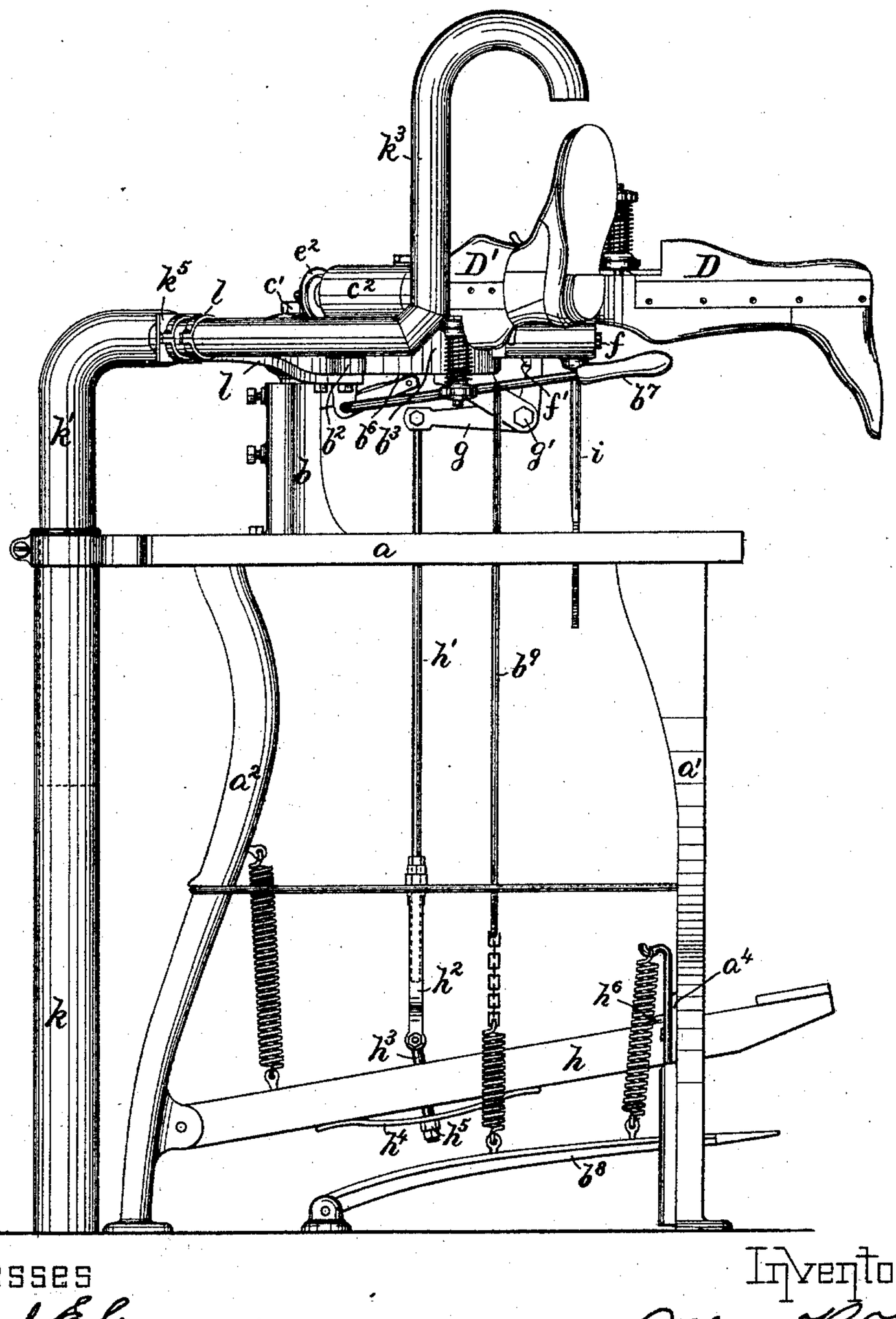
(No Model.) 3 Sheets—Sheet 2.

A. B. FOWLER.

BOOT TREEING MACHINE.

No. 442,034. Patented Dec. 2, 1890.

Fig. 2.



Witnesses

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(No Model.) 3 Sheets—Sheet 3.

A. B. FOWLER.

BOOT TREEING MACHINE.

No. 442,034. Patented Dec. 2, 1890.

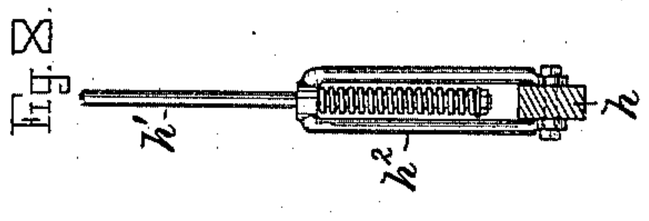

Fig. 8.

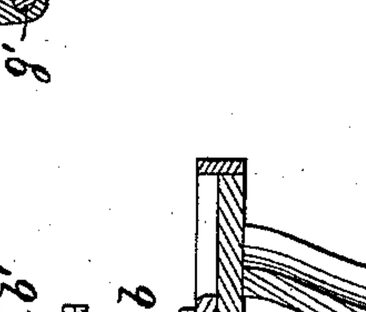

Fig. 7.

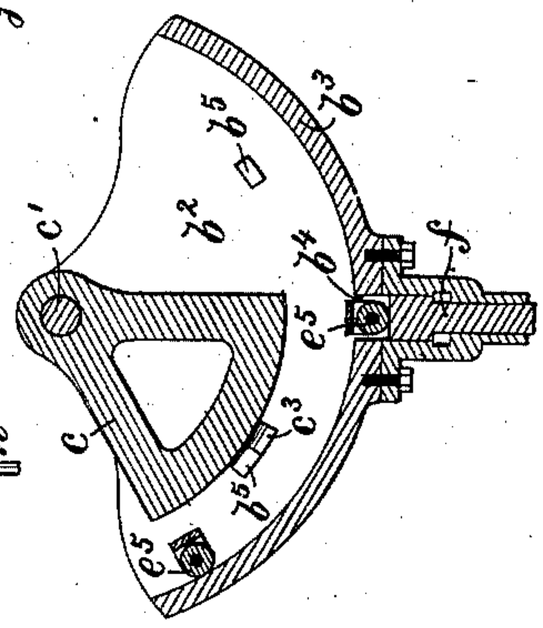

Fig. 4.

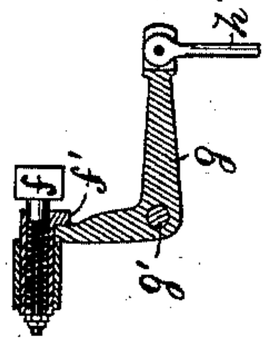

Fig. 6.

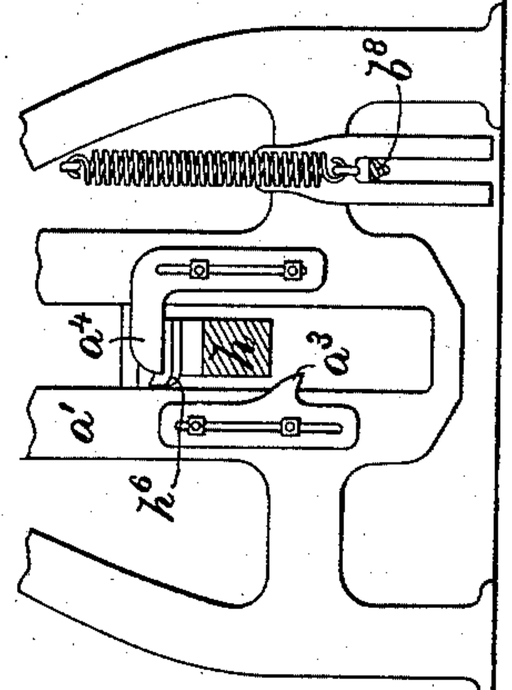

Fig. 5.

Fig. 3.

Witnesses
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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. 442,034, dated December 2, 1890.

Application filed July 25, 1890. Serial No. 359,898. (No model.)

To all whom it may concern:

Be it known that I, ALFRED B. FOWLER, a citizen of the United States, residing at Exeter, in the county of Rockingham and State of New Hampshire, have invented certain new and useful Improvements in Boot or Shoe Treeing Benches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in machines for treeing boots or shoes; and it consists in mounting two tree-legs upon a tree-frame which is pivoted at one end upon a fixed standard and which operates in conjunction with fixed stops for limiting the movement of the tree-frame and its tree-legs when oscillated to and from a central position and a position at the right of the operator, the other tree-leg oscillating between said central position and a position at the left of the operator.

It also consists in a yielding device interposed between the treadle and the expanding device which expands the tree-legs to allow the treadle to be depressed, after the tree has been expanded, sufficient to lock the treadle under a hooked locking projection, thereby preventing the loss of any of the pressure on the boot or shoe which is being treed on the tree.

It further consists in providing means whereby a blast of air is forced upon the boots or shoes when they are in a position at either side of the central position; and it consists, further, in providing automatic means to shut off the blast of air at the position from which a finished boot or shoe is being moved and at the same time to let on a blast of air at the opposite position toward which a newly-treed boot or shoe is being moved and is desired to be dried by the blast of air.

It consists, also, in minor details of construction and combinations of parts, which will be fully set forth in the specification and claims hereinafter.

Heretofore treeing-benches have been provided with only one tree-leg, and the boots or shoes which have been treed thereon have either been removed from the trees as soon as the manipulations in treeing them have been completed and before they have had time to dry sufficiently to retain their proper form or one operator has been obliged to operate the trees on two or more separate benches and to tree a boot on one bench while the treed boot on the other bench or benches is drying. The latter case, although being preferable to the former, is still objectionable, as the operator is obliged to travel considerable in going from one bench to the other and thereby wastes time; also, the separate benches occupy considerable valuable room. All these objections I overcome by the use of my improved bench, and I also secure the advantage of being able to use right and left tree-legs on a single bench, which is a decided advantage, as it enables one to tree the boots or shoes more perfectly and in better shape than where one tree only is used and both right and left boots or shoes are treed on the same tree-leg.

My invention is carried out as shown on the accompanying drawings, on which—

Figure 1 represents a plan view of my improved treeing-bench complete, with a treed boot upon one of the trees and said boot moved to a position at the left of the operator and under the tube which conveys the blast of air to dry the boot, the other tree being in the central position in front of the operator and contracted ready to receive another boot to be treed. Fig. 2 represents a side elevation of the same seen from the left of the bench. Fig. 3 represents a central vertical section through the central position of the trees, showing the bench without the air-blast attachment. Fig. 4 represents a detailed horizontal section on the line *x x*, shown in Fig 3. Fig. 5 represents a detailed vertical section on the line *y y*, shown in Fig. 3, showing a rear view of the front standard of the bench with the stops and locks for the treadle which operates the tree-legs to expand and contract them. Figs. 6, 7, and 8 represent modified forms of the yielding device interposed between the treadle and the tree-expanding device.

Similar letters refer to similar parts on the different parts of the drawings.

The bench proper, which is made as usual, is composed of the top a, supported on a suitable standard or frame a' a^2, and is provided with a standard projecting up from the top of the bench, which standard is preferably made in two parts b and b', adjustable up and down, one within the other, to bring the trees to the proper height for the operator using the bench. The upper part of said standard is provided with a horizontally projecting bearing-plate b^2. To the top of the upper part b' of the standard is pivoted at c' the tree-carrying frame c, which is provided with the two tubes or bearings c^2 c^2, radiating from the center on which the tree-carrying frame is journaled, and in said bearings are journaled the two tree-legs D and D′ in such a manner that they may be turned in said bearings so as to present the entire surface of the boot or shoe in a convenient position to be treed and rubbed by the operator.

Any kind of expansible tree-legs may be used on this my improved bench; but I have shown those which are expanded by drawing on a rod d, projecting from the tree, and are contracted by allowing said rod to be returned by the influence of a spring d' within the tree. The internal mechanism of the tree-leg is not shown on the drawings, as it forms no part of my present invention.

The outer part of the frame c rests and is movable on a lip or flange b^3, projecting upward from the bearing-plate b^2. The flange b^3 is cut away at b^4, for a purpose as will be explained hereinafter.

To the end of the rod d is attached the spindle d^2, on which is loosely mounted the block or sleeve e, and on the screw-threaded inner end of said spindle is adjustably mounted the collar e', held thereon by means of the hand-wheel e^2 and check-nut e^3.

e^4 represents a spiral or other elastic spring which surrounds the spindle between the block e and collar e', said spring tending to press the block and collar apart. The block e fits loosely within the bearing c^2, and is provided on its under side with a pin and roll e^5, which moves within a slot in the bearing c^2, and is pressed against the follower f by the influence of the spring e^4, as shown in Fig. 3. The follower f is guided in a bracket attached to the flange b^3, and also in the cut-away portion b^4 of said flange.

g represents a bell-crank lever pivoted at g' to the plate b^2, or ears attached thereto, one end of said lever resting against a downward projection f' on the follower, the other end of said lever being attached to the foot-treadle h by means of the rod h', yoke h^2, and bolt h^3, which latter passes loosely through a perforation in the treadle h, and also through a perforation in an elliptic spring h^4, resting against the under side of the treadle, said bolt being provided with a nut and check-nut h^5, as shown in Figs. 2 and 3. It will be seen that if the treadle is depressed it will cause the bell-crank lever to force the follower in toward the pivot c', compressing the spring e^4, thereby withdrawing the rod d and expanding the tree until the projection f on the follower comes to a stop against the outer edge of the bearing-plate b^2, and thereby brings the inner end of the follower on a line with the inner surface of the flange b^3, which, being an arc of a circle having the center at the center of the pivot c', will allow of swinging the tree-carrying frame c with the expanded tree thereon to one side, bringing the other tree into its central position with the pin or roll on said second tree resting against the inner surface of the follower in the position from which the first tree has just been moved. As more power is required to compress the elliptic spring h^4 than is required to move the follower to its inner position, just above mentioned, said elliptic spring will remain in its normal position in relation to the treadle during the operation of moving the follower to expand the tree and as the treadle h is adjusted, so that when it is depressed sufficient to force the follower to its inner position it will bring the upper part of the inclined locking-plate h^6 on said treadle just above the hooked locking-catch a^3 on the standard a' of the bench, and it will be seen that in order to lock the treadle in its depressed position it will be necessary to further depress the treadle against the influence of the elliptic spring h^4, compressing said spring until the locking-plate h^6 can be placed under the hooked locking-catch a^3, and if the pressing is then removed from the treadle the spring will force the incline on the locking-plate up into the hook of the locking-catch and lock the treadle, the elliptic spring taking up any slack caused by this upward movement of the treadle without allowing the follower to be moved from its inner position by the influence of the spring e^4. Thus the use of the spring h^4 prevents the strain on the boot or shoe being treed from becoming lessened by the locking of the treadle, as would be the case if such a spring were to be dispensed with and the bell-crank lever attached rigidly to the treadle.

It is necessary to have the locking-plate on the treadle made inclined and the locking-catch on the standard made hooked in order to prevent any liability of the treadle becoming unlocked by the jarring of the machine, as would be the case if said locking-plate and catch were made straight; but by making the locking plate and catch as described it requires the introduction of a yielding device in the connecting mechanism between the treadle and the follower which will be sufficiently rigid to resist the pressure required to move the follower to its inner position, but which can be compressed enough afterward by the treadle to lock the treadle. This construction keeps the follower in its inner position with the face of the follower flush with the inner surface of the flange b^3, allowing the roll e^5 to be easily moved onto the inner

surface of said flange when the frame *e* is turned on its fulcrum.

Any excess of strain on the boot or shoe which might be caused by the moving of the follower to its inner position is prevented by the yielding mechanism interposed between the follower and the tree-expanding rod *d;* but as such yielding mechanism forms no part of my present invention it is not fully set forth or claimed in this application.

A suitable projecting stop a^4 is attached to the inside of the standard a' to limit the upward movement of the treadle. I prefer to make said stop and also the hooked locking-catch adjustable on the standard to enable me to easily adjust the limits of movements of the treadle.

To support the outer end of the bearing-plate b^2 and to keep it from sagging, I provide a prop *i*, preferably in the form of a rod, the upper end of which rests in a socket on the under side of the bracket for the follower, the lower end of the rod being screw-threaded and passing through a perforation in the top of the bench, where it is provided with a screw-threaded nut i', surrounding the lower end of the rod and bearing against the top of the bench. The rod *i* is made sufficiently long to allow for the adjustment of the tree carrying frame *c* up and down, as above described.

b^5 b^5 represent stops on the plate b^2, operating in connection with the projection c^3 to limit the movement of the tree-carrying frame *c* to either side of its central position.

b^6 represents a pin operated by means of the lever b^7 or by a suitable treadle b^8 and connecting-rod b^9 to said lever to lock the frame *c* in either of its two positions, said pin being guided in a perforation in the plate b^2 and entering one of two recesses on the under side of the frame *c*.

Suitable springs are supplied to the bench to return the treadle *h* to its normal position, and also to hold the locking-pin b^6 within the recess in the tree-carrying frame.

On the principal figures of the drawings I have shown the yielding device introduced between the treadle and the follower as consisting of the elliptic spring h^4; but the same may be varied within the scope of mechanical skill without departing from the spirit of my invention, and I have shown a few of the various modifications in Figs. 6, 7, and 8, in which a yielding device in the form of a spring is applied, respectively, to the follower, the bell-crank lever, and the connecting-rod. The operations of said modifications are thought to be so apparent that no special explanations are needed.

In treeing boots or shoes it is desirable that the same should be dried or as nearly so as is possible before they are taken from the tree in order that they should better retain their shape and finish after being removed. To facilitate the drying of the boot or shoe after it has been treed, I provide the bench with a pipe or tube *k*, which is connected with a suitable fan-blower or to any suitable source of supply of warm air, said tube being preferably provided with a second tube or pipe k', which fits tightly within the tube *k* and is capable of adjustment up or down to allow for the adjustment of the trees, as above described. The tube k' is provided with the branch tubes or pipe k^2 and k^3, which are supported by the bracket *l*, attached to the under side of the bearing-plate b^3, and which convey the warm air to positions just above those occupied by the boots or shoes after they have been treed and moved to one side by the operator, one of said branch pipes leading to the position at the right of the operator and the other one at the left of the operator, where they discharge a blast of warm air directly down upon the boot or shoe which may be under them. I prefer to have the pipes k^2 and k^3 open above the boot or shoe and to force the warm air down upon the same, as by so doing the warm air is held in close proximity to the boot or shoe longer by its tendency to rise and by the force of the air from the pipes; but said pipes might be arranged to open below the boot or shoe or at one side of the same without departing from the spirit of my invention.

Only one of the branch pipes can have a boot or shoe in position under it at any given time, and to prevent a waste of the warm air through the branch pipe which has no boot or shoe under it I provide the branch pipes with suitable valves or cut-offs k^4 and k^5, which are preferably attached to the movable tree-carrying frame *c* in such a manner that they are automatically opened when a treed boot or shoe is moved under their respective branch pipe and are automatically closed by the removal of the boot or shoe from under their respective branch pipe.

The cut-offs used in the branch pipes k^2 and k^3 are constructed so as to slide into and across the opening in said pipes to close the pipes and to be withdrawn from said pipes to open them. The outer ends of the stems k^6 and k^7 of the cut-offs are attached, respectively, to the ends of the levers *m* and m', which levers are fulcrumed at m^2 and m^3 to the bracket *l* and are pivotally attached at their outer ends, respectively, to the links *n* and n'. The links *n* and n' are attached to the tree-carrying frame *c* by means of the screws n^2 and n^3, which move in the slotted ends of said links in such a manner as to allow the frame *c* to be turned on its fulcrum a part of its movement without moving the links. It will be seen that if the trees are in the position shown in Fig. 1 the cut-off k^4 will be closed, preventing the blast of warm air being forced through the pipe k' from entering the branch pipe k^2; also, that the cut-off k^5 will be open, allowing the blast of warm air to enter the branch pipe k^3 and to be discharged through the mouth of said branch pipe down upon the treed boot, which is on the tree D′ in

a position under said pipe. The operator, after treeing a second boot upon the tree D, proceeds to move the tree-carrying head, with the trees mounted thereon, toward his right, which causes the screws n^2 and n^3 to be moved within their respective slots in the end of the links n and n' until they reach the end of said slots, when they will move said links, causing the levers m and m' to be turned on their fulcrums in such a manner that the cut-off k^4 will be opened and the cut-off k^5 closed when the tree D reaches the extreme end of its movement to the right and is under the mouth of the branch pipe k^2, thus closing the branch k^3 and opening the branch pipe k^2 into free communication with the warm-air-supply pipe $k\,k'$.

If several machines are supplied with warm air from the same supply-pipe from which the pipe k leads to my improved machine and my machine is to remain idle for awhile, it is desirable that the blast of air should be entirely shut off from both branch pipes k^2 and k^3 to my machine, and it is only necessary to move the tree-carrying head to one side until the screws n^2 and n^3 reach the end of the slots in the links n and n', when the cut-off which is then open can be closed by the operator moving it by hand, as the slot in the link will allow the cut-off to be moved sufficiently to close it when the trees are in this position.

I do not wish to confine myself to the exact mechanism used to automatically open and close communication between the supply-pipe $k\,k'$ and the branch pipes k^2 and k^3, as such may be changed within the scope of mechanical skill without departing from my invention.

Having the parts in the relative positions shown on the drawings in Figs. 1, 2, and 3, the operator puts a boot or shoe upon the contracted tree D, which is in the central position in front of him. He then expands the tree by depressing the treadle h and locks the treadle, as above described. He then rubs the boot or shoe and performs whatever manipulations are necessary to tree the boot, after which he swings the treed boot or shoe and the tree D to the right until it is stopped by the projection on the frame c coming in contact with one of the stops b^5 on the plate b^2. This will bring the second tree D′ into the central position, from which the first tree has just been moved, with its pin or roll e^5 resting against the inner face of the follower f. The operator then allows the treadle to return to its normal position by unlocking it, which will cause the tree D′ to contract, as heretofore described. He then places another boot upon the tree D′ and expands the same within the boot in a manner similar to the way he did with the first boot, and after treeing this boot he moves it and the tree D′ to the left until it is stopped by the other stop b^5, at the same time bringing the first boot, which has been dried by a blast of warm air from the branch pipe k^2 during this time, back to the central position. Thus it will be seen that the frame c is caused to oscillate on the pivot c', so as to bring each tree in succession to and from the central position in front of the operator, which is a great advantage, as it relieves him of the necessity of moving from one bench to another to tree a second boot while the first-treed boot is drying, as is the case when an operator trees boots on two separate benches on which single trees are mounted; also, it enables him to have a right foot on one tree-leg and a left foot on the other tree-leg, and therefore he can tree the boots by pairs and in much better shape than with a single tree-leg having a straight foot.

I am fully aware that boot and shoe treeing machines have been made with a rotating head mounted on a standard, said head carrying a number of radiating tree-legs which rotate with said head from a position in front of the operator around an entire circle back to their first position, as shown in the patents to Ambler and Wires, No. 227,669, dated May 18, 1880; Ambler, No. 230,601, dated August 3, 1880, and to myself, No. 393,003, dated November 20, 1888; but such machines are expensive to manufacture and cover a great deal of valuable floor-room.

I am able to secure all the advantages of the machines mentioned above by my improved treeing-bench, which costs much less and is made more compact, covering much less floor-space.

I do not wish to claim in this application the mechanism herein described for expanding and contracting the trees, as such is fully set forth in another application, No. 323,264, filed by me and duly allowed May 17, 1890; nor do I wish to confine myself to the use of the precise mechanism shown for expanding and contracting the trees, as other means may be used to equal advantage without departing from the spirit of my invention, which consists, broadly, in supplying a treeing-bench with two tree-legs mounted on a pivot and adapted to be oscillated so as to bring either of the trees in its central position in front of the operator and to carry the other tree to one side to allow the boot or shoe treed thereon to dry while a boot or shoe is being treed on the other tree-leg, and also combining therewith mechanism whereby the operating-treadle is locked under a hooked catch without loss of strain on the treed boot or shoe; also, means whereby the boot or shoe may be subjected to a blast of warm air to dry the same after it has been treed and moved to one side.

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

1. The combination, in a boot or shoe treeing machine, of a bench provided with an upright standard, an oscillatory frame journaled at one end upon the standard and carrying two tree-legs, and a fixed horizontal support-

ing-plate located under the oscillating table and provided with two fixed stops separated from each other a distance equal to the extent the frame oscillates and serving to arrest the frame in the two directions of its movement, substantially as described.

2. In a boot or shoe treeing bench, a tree-frame and mechanism for oscillating it with its two tree-legs to and from a central position, an expansible tree mounted thereon, a follower for expanding said tree, a treadle to operate said follower, and a hooked catch to lock said treadle when the tree is expanded, combined with a yielding spring interposed between the follower and treadle to obviate the loss of strain in the boot or shoe caused by locking said treadles, substantially as described.

3. In a boot or shoe treeing bench, two expansible trees mounted upon a pivoted frame on the bench and adapted to oscillate to and from a central position, a bearing-plate attached to the bench and having a flange for supporting said tree-carrying frame, a cut-away portion in said flange, a follower for expanding and contracting said trees, a treadle and connecting mechanism to said follower for operating the latter, a stop on the bench to limit the upward movement of said treadle, a hooked catch upon the bench for locking said treadle in its depressed position, and a yielding device interposed in the connecting mechanism between said treadle and follower to allow the treadle to be locked under said hooked catch after the tree has been expanded without loss of strain on the treed boot upon said tree, for the purpose set forth.

4. In a boot or shoe treeing bench, two trees mounted upon the bench and adapted to oscillate to and from a central position and positions at the right and left of said central position, respectively, combined with air-blast pipes leading from an air-blast supply to deliver a blast of air upon the trees when in the positions at the right and left of the central position, for the purpose set forth.

5. In a boot or shoe treeing bench, two trees mounted upon the bench and adapted to oscillate to and from a central position and positions at the right and left of said central position, respectively, combined with an air-blast-supply pipe, branch pipes leading from the supply-pipe to suitable positions to deliver a blast of air upon the trees when in the positions at the right and left of the central position, a cut-off in each of said branch pipes, and means for automatically opening said cut-offs when the trees are moved to their respective branch pipes and for closing the same when the trees are moved away from their respective branch pipes, substantially as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALFRED B. FOWLER.

Witnesses:

HENRY CHADBOURN,

FRANK E. GREENWOOD.