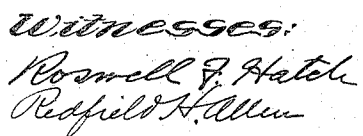


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Fig. 1.



Inventor,
William H. Hooper,
by Robt. P. Hains.
Att'y.

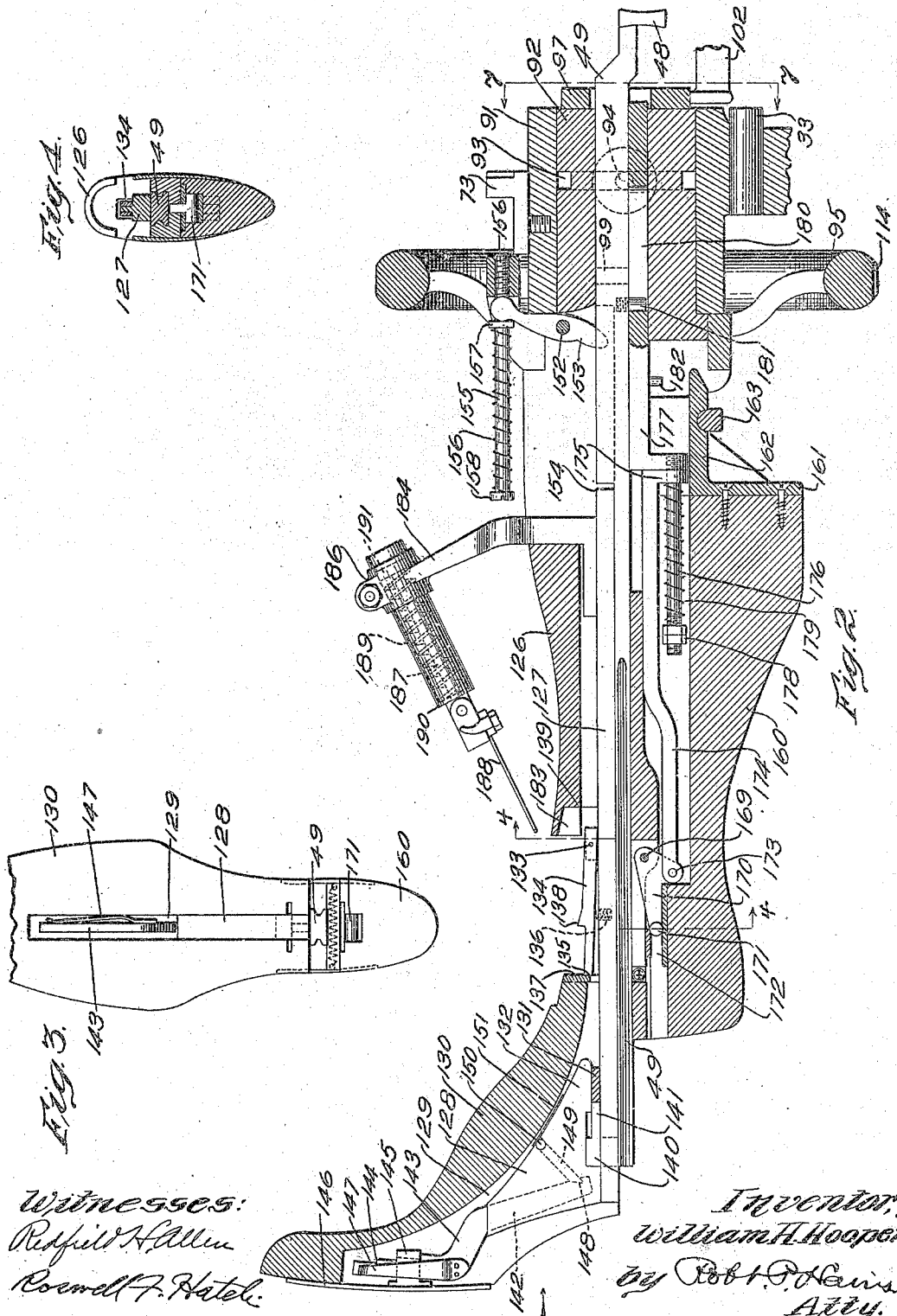
W. H. HOOPER.
TREERING MACHINE.

APPLICATION FILED FEB. 6, 1909. RENEWED FEB. 19, 1910.

957,963.

Patented May 17, 1910.

5 SHEETS—SHEET 2.



Witnesses:
Redfield Hallen
Rocwell F. Hatch.

Inventor:
William H. Hooper
by Robt. D. Harris
Atty.

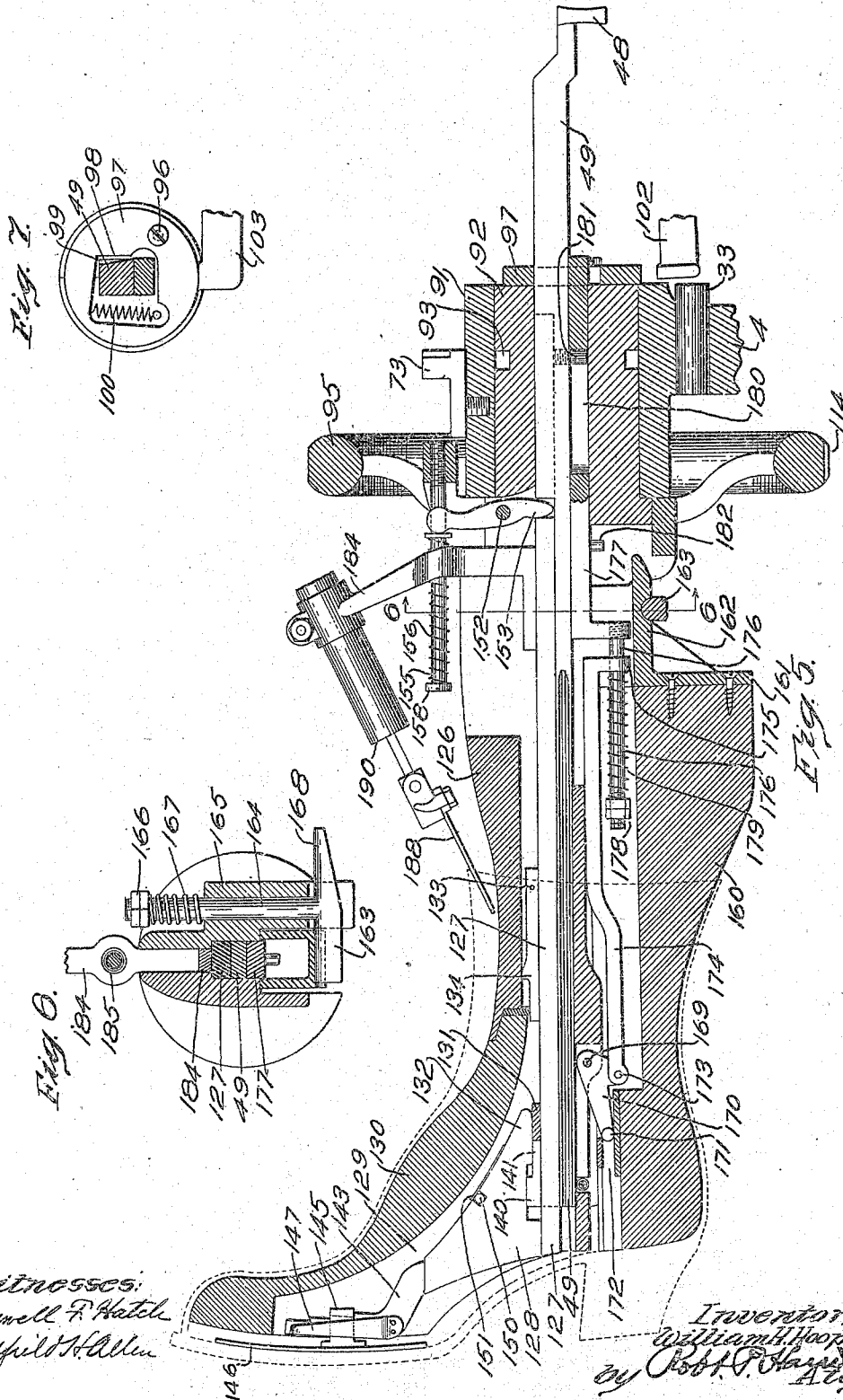
W. H. HOOPER.
TREEING MACHINE.

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957,963.

Patented May 17, 1910.

5 SHEETS—SHEET 3.



Witnesses:
Frederick F. Hatch
Rufus H. Allen

Inventor:
William H. Hooper
by Robert P. Pollock
Attorney

W. H. HOOPER.
TREEING MACHINE.

APPLICATION FILED FEB. 6, 1909. RENEWED FEB. 19, 1910.

957,963.

Patented May 17, 1910.

6 SHEETS—SHEET 4.

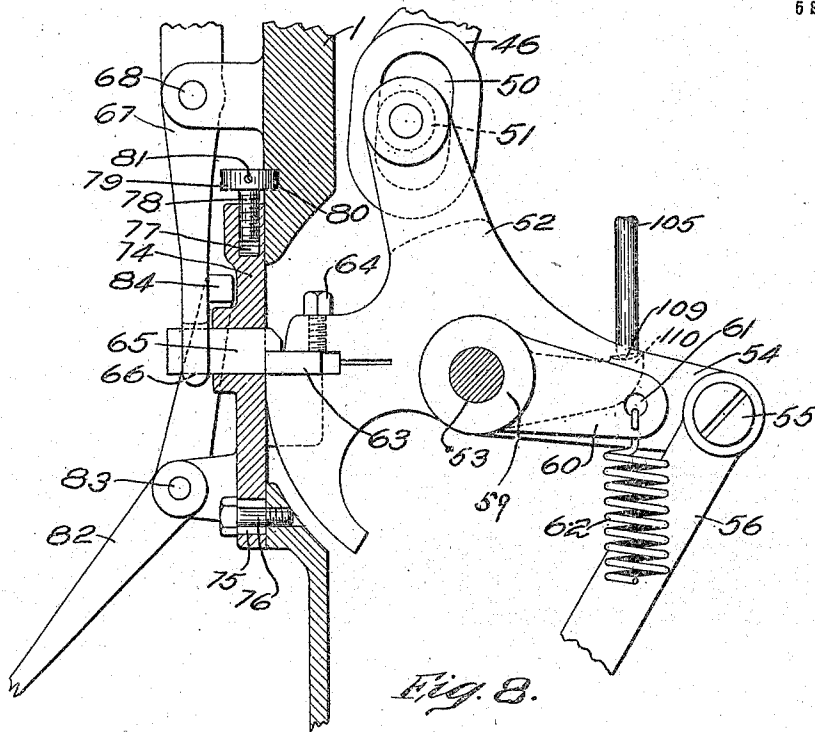


Fig. 8.

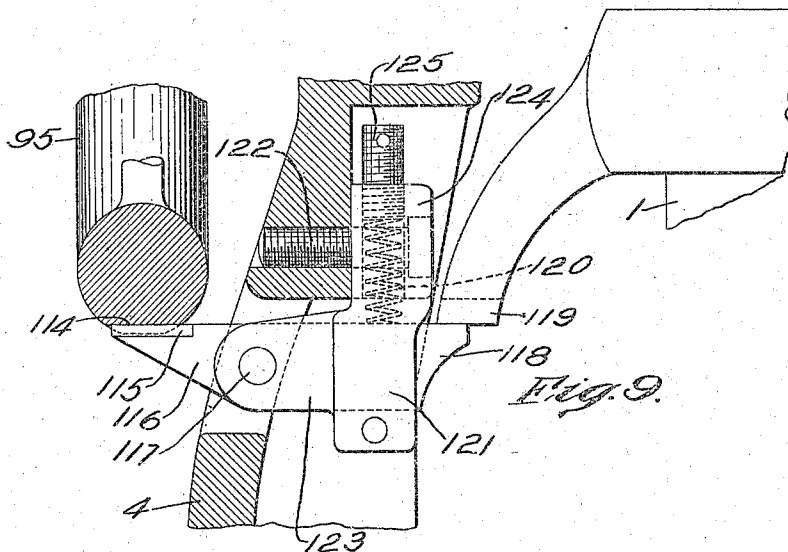


Fig. 9.

Witnesses:

Roswell F. Hatch.
Redfield Hallen

Inventor:
William H. Hooper,
by Robt. H. Harris,
Atty.

W. H. HOOPER.

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5 SHEETS—SHEET 5.

Fig. 10.

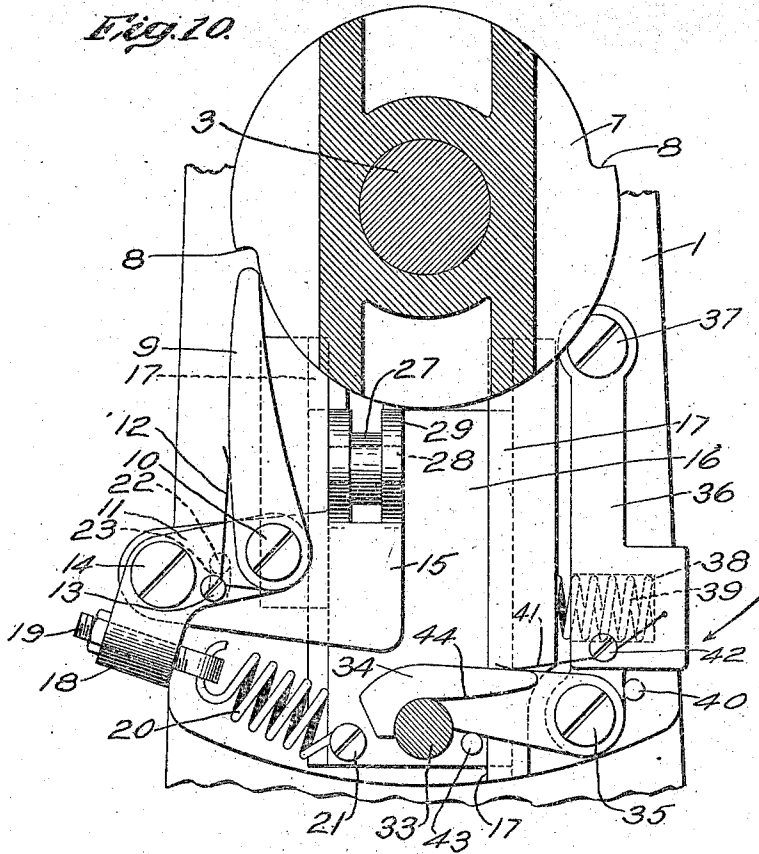
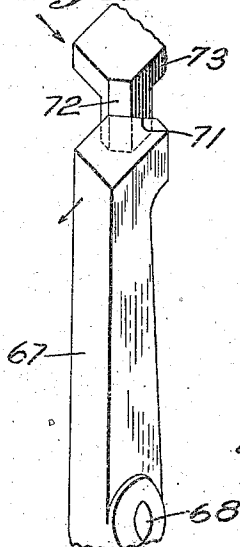


Fig. 11.



Witnesses:
Roswell F. Hatch.
Redford Hallen

Inventor:
William H. Hooper,
by Robt. P. Hains.
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. HOOPER, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THOMAS G. PLANT,
OF BOSTON, MASSACHUSETTS.

TREEING-MACHINE.

957,963.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed February 6, 1909, Serial No. 476,442. Renewed February 19, 1910. Serial No. 544,897.

To all whom it may concern:

Be it known that I, WILLIAM H. HOOPER, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented an Improvement in Treeing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to boot and shoe treeing machines, and more particularly to that class of such machines having a plurality of boot or shoe trees mounted so that they can be brought into working position.

The aims and purposes of the present invention are to provide a machine of the above general type wherein the parts shall be simple in construction and shall be so organized and related that the various operations of the machine shall be effective in securing the proper manipulation of the boot or shoe. These and other characteristics of the invention will best be understood from the following description and accompanying drawings disclosing one of the various means that may be employed in putting the invention into practical operation, the invention itself being definitely pointed out by the claims.

In the drawings: Figure 1 is a side elevation of one form of machine embodying the characteristics of the present invention, some of the parts being broken away and others shown in section to more clearly represent the relation thereof; Fig. 2 is a sectional side elevation of a boot tree embodying the features of the present invention and showing the tree in unjacked or unexpanded position; Fig. 3 is an end view of the part shown in Fig. 2, looking in the direction of the arrow, Fig. 2; Fig. 4 is a section on the broken line 4-4, Fig. 2; Fig. 5 is a longitudinal section similar to Fig. 2, showing the tree in jacked or expanded position; Fig. 6 is a section on the line 6-6, Fig. 5; Fig. 7 is a detached detail sectional view on the line 7-7 of Fig. 2, showing the means for locking the tree in jacked or expanded position; Fig. 8 is a detached detail view showing parts of the jacking and unjacking lever, its lock and adjacent parts; Fig. 9 is a detached detail, partly in section, of the means

for locking the individual parts from individual rotation at times, and at other times to prevent collective rotation when a tree is individually rotated while in its working position; Fig. 10 is an enlarged sectional detail on the line 10-10 of Fig. 1; and Fig. 11 is a detached detail showing the co-acting faces of the unlocking trip for the jacking and unjacking lever.

The main supporting frame may be of any usual or desired character, and is herein represented as comprising an upright column 1 surmounting a base 2 and carrying the various operating parts of the machine.

In the present invention the boot or shoe trees are carried upon a rotatable head or turret which is mounted on the column 1, preferably to rotate in a vertical plane so that any one of the trees may be brought into upper or working position as desired, and when in said position it may be jacked or unjacked by simple treadle operated means, and when jacked, the rotatable head or turret may be turned smoothly and without shock to carry the jacked and treated boot or shoe into a non-working or drying position and bring a jacked boot or shoe into working position, the construction being such that as the jacked boot or shoe is brought into working position, it will engage the jacking and unjacking means and be by it automatically unjacked.

Mounted upon a stud 3, properly secured to the column 1, Fig. 1, and so as to rotate thereon, is the rotatable head or turret 4, suitable washers 5 and 6 being disposed on said stud 3 to properly locate and position the rotatable head or turret. The turret 4 preferably turns in a vertical plane, as indicated in Fig. 1, and carries a plurality of boot or shoe trees, two of said boot or shoe trees being indicated in Fig. 1, and means are herein contemplated for turning the rotatable head or turret 4 to bring any one of said trees into upper or working position, said means in the form thereof, as herein illustrated, comprising the following.

Formed as part of or secured to the hub of the rotatable head or turret 4 is a turning member 7 provided with shoulders 8, said shoulders being adapted for engagement by a pawl 9, Fig. 10, pivotally mounted at 10 upon a bell-crank lever 11 and normally held with its upper end in position to engage

a shoulder 8 by means of a spring 12 secured to the bell-crank lever 11 at 13 and having one of its arms bearing against the pawl, as indicated in Fig. 10. The bell crank 11 is
 5 mounted upon a pin 14 carried by an arm 15 projecting from a slide 16, vertically movable in ways 17 connected to the column 1, the construction being such that upon upward movement of the slide 16, the pawl 9
 10 will be moved into engagement with the shoulder 8 and continued upward movement of the slide will cause the pawl to turn the member 7 and rotate the turret, as will be obvious.

15 Secured to the arm 18 of the bell crank 11 is an adjusting pin 19, to which is secured one end of a spring 20, the other end of said spring being attached to the slide 16 at 21, Fig. 10, and, to limit the movement of the
 20 bell crank 11 under the influence of the spring 20, said bell crank is provided with a pin 22 which engages a slot 23 formed in the bracket 15 projecting from the slide.

As a means for moving the slide 16, and
 25 consequently turning the rotatable head or turret, a treadle 24 is provided, pivoted at 25 near the base of the machine column and having its end 26 connected to a slide actuator 27, the upper end of said slide actuator
 30 27, as indicated in Fig. 1, being pivotally attached at 28 to the ears or lugs 29 connected to the slide 16. A spring 30, Fig. 1, having one end secured to the slide actuator 27 at 31 and the other end properly connected,
 35 as at 32, to the main frame, normally acts to depress the slide actuator and maintain it in lowered position, as will be apparent.

Upon depression of the treadle 24, the
 40 slide 16 will be actuated and the pawl 9 will move from its position, Fig. 10, into engagement with the shoulder 8 on the turning member 7, there being a certain amount of lost motion between the end of the pawl and
 45 the shoulder 8 when the parts are in normal position, and upon continued movement of the pawl 9 the turret will be turned, momentum of the turret being sufficient to carry it through the desired arc to bring a tree
 50 into working position after it has once been started by the means hereinbefore described. It is desirable to stop the turret when a tree reaches its upper or drying position and to lock the turret in such position.
 55 To this end the following means is employed, it being understood that it may be changed in form or character without departing from the spirit of the present invention.

60 The rotatable head or turret 4 is provided with a series of stop pins 33, one for each boot or shoe tree, Figs. 1 and 10, said pins being adapted for engagement with a positioning catch 34, Fig. 10. The positioning
 65 catch 34 is provided with a seat correspond-

ing to the shape of the stop pins 33 and is pivoted at 35, Fig. 10, to a catch carrier 36, and pivoted at 37 to the column 1 and having a seat 38 for a spring 39, one end of which bears against a part stationary
 70 with the column 1, Fig. 10, and normally acting to turn the catch carrier 36 counter-clockwise, viewing Fig. 10. A pin 40 secured to the column 1 limits the swinging movement of the catch carrier under the
 75 actuation of its spring 39. The positioning catch 34 is normally depressed by a spring 41 secured at 42 and having an arm thereof bearing on the positioning catch, as indicated in Fig. 10, and a pin 43 carried by
 80 the slide 16 acts to properly position the catch 34 so that as the turret is rotated, as hereinbefore stated, the catch 34 will be in position to have its shoulder 44 engage one of the pins 33 on the turret as the latter is
 85 rotated to bring a boot or shoe tree into working position, and as the pin 33 moves into the holding notch of the positioning catch, the latter will act through the spring 39 to stop the turret with a cushioning or
 90 yielding action, thereby preventing shock calculated to injure or otherwise disturb the working parts and also obviate objectionable noise.

It will be noted, as hereinbefore mentioned, that there is a certain amount of
 95 lost motion between the end of the pawl 9 and the shoulder 8 on the turning member 7 when the parts are in normal position, as indicated in Fig. 10. The purpose of this
 100 will now be clear to one skilled in the art, because, prior to any turning movement of the turret, the positioning catch 34 must be disengaged from its co-acting pin 33, and since the pin 43 is mounted on the slide 16,
 105 it follows that the positioning catch will be raised by the pin 43 from engagement with the turret pin 33 to thereby free the turret to rotation, before the pawl 9 engages the shoulder 8 to turn the turret.
 110

In machines of the general type herein disclosed, the rotatable head or turret is of considerable weight and should, therefore, be started and stopped without shock or by
 115 some yielding action of the starting and stopping instrumentalities. In the present invention this characteristic is furnished as to the stopping action by the yielding positioning catch 34, as hereinbefore noted. In starting the turret rotation, the spring controlled bell-crank 11 on which the actuating
 120 pawl 9 is mounted will yield against the tension of its spring 20, and especially is this the case should the operator suddenly depress the treadle 24, the construction being
 125 such that the actuating means for rotating the turret operates yieldingly and obviates shock or sudden objectionable action.

As a simple form of jacking and unjacking means there is mounted upon the stud 45
 130

carried by the column 1, Fig. 1, the lever 46 which may, for identification, be known as the jacking and unjacking lever. The upper end of this lever 46 is provided with a notch 5 47 to engage a projection 48 carried by a slide 49, which slide, through the lever 46 and the means hereinafter to be described, effects the jacking and unjacking of the boot or shoe. The lower end of the jacking and unjacking lever 46, Figs. 1 and 8, is provided with a slot 50 which loosely engages a roller or stud 51 carried by the lever actuator 52 which is preferably of the general form indicated, and pivoted on a stud 15 53 carried by the column 1. The arm 54 of the lever actuator 52 is connected at 55, Fig. 8, with a link 56, the lower end of which is jointed at 57 to the treadle 58 pivoted on the stud 25. The lever actuator 52 has connected thereto, as by its hub 59, Fig. 8, an arm 60 to which is connected at 61 the upper end of a spring 62, the lower end of such spring being connected to the pin 32, Fig. 1, the construction of the parts so far described being such that upon depression of the treadle 58 the lever actuator 52 will be turned on the rod 53 against the action of the spring 62 and cause the lower end of the jacking and unjacking lever 46 to be 30 moved to the left, Figs. 1 and 8, such movement being utilized to expand a tree, the slide 49 of which is at the time being in engagement with the upper end of the jacking and unjacking lever. Likewise, when the lever actuator 52 moves in the opposite direction in response to its spring 62, the lower end of the jacking and unjacking lever will be moved to the right, thereby causing its upper end to be moved to the 40 left and to contract the tree, the slide 49 of which is for the time being in engagement with the upper end of the jacking and unjacking lever.

It will be clear to one skilled in the art 45 that if the jacking and unjacking lever is in its jacking or expanding position, that is, with its upper end moved to the right, Fig. 1, and is maintained in this position as the turret or rotatable head is turned to 50 bring another tree into working position, the down-turned end 48 on the slide 49 of said last mentioned tree will engage the upper end of the lever 47, and if at this time the jacking and unjacking lever be freed so as to respond to its actuating spring 62, the slide 49 will be moved to the left, thus unjacking or contracting the tree, as will hereinafter more fully appear.

As one means of locking the jacking and 60 unjacking lever in its jacking or expanding position, the lever actuator 52 is provided with a lug or stop 63, Figs. 1 and 8, adjustably held in position on said lever actuator by a clamping bolt and nut 64, said lug or 65 stop being adapted to co-act with a sliding

catch or trip 65, the outer end of which engages the lower end 66 of a catch or trip actuator 67 pivoted at 68, the construction being such that movement of the catch or trip actuator 67 on its fulcrum 68 will move 70 the catch or trip 65 into and out of engagement with the lug or stop 63 on the lever actuator. The upper end of the catch or trip actuator 67, see Fig. 1, bears against a spring 69 carried by a suitable seat 70, Fig. 75 1, and normally acting to throw the upper end of said catch or trip actuator 67 to the left and cause the catch or trip 65 to engage with the lug or stop 63 on the lever actuator. The upper end of the lever actuator 67, Fig. 80 11, is preferably provided with a beveled face 71 adapted to co-act with the beveled face 72 on lugs 73, said lugs 73 being carried by the rotatable head or turret and one of such lugs being provided for each boot or 85 shoe tree carried by the turret or rotatable head.

From the construction thus far described it will be noted that upon depression of the jacking treadle 58 the jacking and unjacking 90 lever 46 will be moved by its actuator 52 to expand or jack a boot or shoe tree, the slide 49 of which is, for the time being, in engagement with the upper end of said jacking and unjacking lever, and when said treadle 95 shall have been sufficiently depressed, the lug 63 will engage the catch or trip 65, so that when the operator removes his foot from the treadle 58, said lug and catch or trip will maintain the lever actuator, and perforce 100 the jacking and unjacking lever, in the position to which they have been moved by the operator. If, now, the rotatable head or turret 4 be rotated to bring another boot or shoe tree into working or upper position, 105 it will be noted that the beveled face 71 of the catch or trip actuator 67 will be engaged by a lug 73 as a boot or shoe tree reaches working position, so that at such time the catch or trip 65 will be withdrawn from 110 engagement with the lug 63 and free the lever actuator 52 to movement responsive to its actuating spring 62, thereby throwing the slide 49, at the time being in engagement with the lever 46, into contracting or un- 115 jacking position.

It may be desirable at times to hold the lever actuator 52 in different positions, or to adjust it to the varying character of work being treated, so that the jacking and un- 120 jacking lever shall be moved varying distances in accordance with the work to be done. To readily effect this adjustability, the catch or trip 65 is carried by an adjusting member or slide 74, Fig. 8, one end of 125 said adjusting member being provided with an elongated slot 75 engaged by a screw bolt or other means 76 to hold and clamp said slide in any position to which it may be adjusted. As one means of effecting the 130

adjustment of the adjusting member or slide 74, the upper portion thereof is socketed and screw-threaded as at 77 and is engaged by an adjusting screw 78, the head 79 of which engages a suitable slot 80 in the column 1 to maintain said adjusting screw in fixed position with relation to the column. The head 79 is preferably provided with holes 81 for a capstan member or turning rod. From the construction described it will be noted that upon loosening the screw bolt 76, the adjusting member or slide 74 may be raised or lowered by turning the adjusting screw 78, thereby positioning the catch or trip 65, and that after such adjustment the screw bolt 76 may be tightened to clamp the parts in adjusted position.

It will be noted that the catch or trip 65 will maintain the lever actuator and its lever 46 in tree expanding position and will only free these parts to permit the boot or shoe to be unjacked as the turret is turned to bring another boot or shoe tree into working position. It is desirable at times, however, to be able to jack and unjack without turret rotation, and to this end there is pivoted to the adjusting member or slide 74 a manually operated catch or trip actuator 82, Fig. 8, said actuator 82 being mounted at 83 and having its end 84 intumed, Fig. 8, to engage beneath the lower end of the catch or trip actuator 67, the other end of said manually operated catch or trip actuator 82 being provided with a piece 85, Fig. 1, adapted to be engaged by the operator to move the catch or trip 65 at his pleasure.

Means are herein provided to prevent rotation of the rotatable head or turret in the manner hereinbefore pointed out, when the jacking and unjacking lever is in unjacking position, it being obvious that, if the turret or rotatable head were turned at such time, the projection 48 of the boot or shoe tree coming into position would not engage the slot 47 in the upper end of the jacking and unjacking lever and consequently the tree would remain in expanded or jacked position. As one means of securing the desired ends, there is pivoted at 86, Fig. 1, on the column 1, a turret actuator lock 87, the lower end of which is provided with a slot 88 which engages the pin 57 of the jacking treadle 58. The lock 87 is also provided with a shoulder 89, Fig. 1, adapted to engage a stud or roller 90 on the treadle 24, the construction being such that when the jacking lever 58 is depressed and the upper end of the jacking and unjacking lever 46 is thrown outward to expand a boot or shoe tree, the shoulder 89 on the turret actuator lock 87 is removed from the roller or stud 90 on the treadle 24, thus freeing said treadle to movement and permitting rotation of the turret through the means hereinbefore described. When, however, the jacking treadle 58 is

raised and the jacking and unjacking lever 46 is in consequence in unjacking position, as indicated in Fig. 1, the shoulder 89 of the turret actuator lock is thrown into engagement with the stud or roller 90 on the treadle 24, thus preventing depression of said treadle.

The rotatable head or turret 4 carries a series of bearings 91 to receive the barrels 92 of the boot or shoe trees, Figs. 1, 2 and 5, each of said barrels 92 being provided with a circular recess 93 which is engaged by the end of a pin 94, dotted lines Fig. 2, extending through the bearings 91 so that said trees and their barrels 92 may be readily turned axially by means of hand wheels 95.

Mounted within the barrel 92 of each tree is the slide 49 which, when moved axially or longitudinally by the jacking and unjacking lever, serves to operate the expanding or jacking elements, as will be presently described.

In order to hold the boot or shoe trees expanded or jacked, each barrel 92 has pivoted thereto at 96, Fig. 7, a lock 97, the edge 98 of which is adapted to engage a notch 99 in the slide 49 of the boot or shoe tree, said lock 97 being normally under the influence of a spring 100, Fig. 7, tending to turn the lock 97 into locking engagement with the notch 99. When the slide 49 is withdrawn by the jacking and unjacking lever 46 and the slot 99 of the slide 49 meets the lock 97 at the end of the barrel, the spring 100 throws the lock into locking engagement with the slot 99 and the parts remain in this position until tripped or disengaged, as will now be described.

The lock 97 is preferably in the form of a ring or disk slotted and pivoted, as indicated in Fig. 7, but it is to be understood that the invention is not circumscribed by this detail of structure.

Mounted at 101, Fig. 1, on the top of the column 1, is an unlocking lever 102, the end 103 whereof is adapted to meet the lock 97 at one side of its pivotal connection 96 with the barrel 92, and lift said lock or turn it about its fulcrum 96, said unlocking movement of the lever 102 being under the influence of a spring 104 which surrounds a rod 105 connected to the lever 102 at 106 and bearing at one end against a pin 107 and at its opposite end against a suitable abutment on the column head, as indicated in Fig. 1, the construction being such that when freed to the actuation of the spring 104, the lever 102 will move the lock 97 into unlocking position.

The rod 105 extends down inside the column 1 through a bearing 108, see dotted lines Fig. 1, the lower end 109 of said rod, Figs. 1 and 8, being in position to be engaged by a lifting toe 110 operatively connected to the lever actuator 52, the construc-

tion being such that upon depression of the jacking treadle 58 the toe 110 is raised and strikes the end 109 of the rod 105, thereby turning the locking lever 102 and freeing the lock 97 so that it will engage with the slot 99 of the slide 49 as the latter, by said movement of the jacking treadle 58, is drawn outward by the jacking and unjacking lever 46. Since the jacking and unjacking lever 46 and its actuator 52 are locked in this position, it follows that the lever 102 will be held from engagement with the lock 97, so that with the parts in this position and the turret or rotatable head free to be turned upon its supporting stud 3, the lock 97 will maintain the tree expanded or jacked. As the next boot or shoe tree is brought into upper or working position, it is necessary to unlock the slide 49 of said boot or shoe tree and to therefore actuate the jacking and unjacking lever to move the slide to effect unjacking. This sequence of action is secured by the lost motion between the slot 50 in the jacking and unjacking lever and the roller 51 on the lever actuator, so that, see Fig. 8, when the lever actuator 52 first moves in response to its spring 62 when the catch or trip 65 is withdrawn, the toe 110 is first lowered, thereby permitting the spring 104 to throw the lock 97 into unlocking position before the lever actuator 52 actuates the jacking and unjacking lever 46 to contract or unjack the tree.

To assist the movement of the jacking and unjacking lever 46 a spring 111 is provided, Fig. 1, one end of which is connected to the head of the column 1 at 112 and the other end at 113 to the jacking and unjacking lever 46.

As will be readily understood by those skilled in the art, it is desirable that the turret be not permitted to rotate on its supporting stud 3 when the boot or shoe tree, at the time being in working position, is turned individually on its own axis. To this end each of the hand wheels 95 on the boot and shoe trees is provided with a slot 114, Fig. 9, adapted to engage the end 115 of a lock 116 pivoted at 117 to the rotatable head or turret 4, said slot 114 and end 115 registering when the boot or shoe tree is in the position it occupies when the turret or rotatable head is being turned to bring another boot or shoe tree into working position, so that during such collective rotation of the boot and shoe trees the individual trees are locked from rotative movement.

The lock 116 has its rear end 118 projecting, as indicated in Fig. 9, into the path of a stop 119 carried by the column 1, the construction being such that when the end 115 of the lock engages the slot 114 on the hand wheel 95, thus locking the individual tree from rotation, the end 118 of the lock is disengaged from the stop 119, thereby freeing

the trees to collective rotation; but, when the individual tree is turned on its axis, the end 115 rides out of the recess or slot 114, depressing the end 115 of the lock against the tension of its actuating spring 120, Fig. 9, thus lifting or raising the end 118 into engagement with the stop 119, and thus preventing collective rotation of the trees. The lock 116 is preferably carried by a bracket 121 which is secured to the rotatable head or turret 4 by means of a screw bolt 122, Fig. 9, and has an arm 123 to support the fulcrum 117 of the lock 116. The spring 120 is preferably seated in a recess in the upward extending portion 124 of the bracket 121 and is adjustable as to its tension by means of an adjusting screw 125.

Secured to or extending from the cylindrical portion 92 of each tree is a leg or front portion 126 provided with a longitudinal slot affording a proper slide bearing for the slide 49. It will be noted that the slide 49 extends to the foot portion of the tree and has loosely mounted thereon a slide 127 which, for identification, may be termed the foot slide. The foot slide 127 carries at its foot end an upwardly projecting foot support 128 adapted to engage the slot 129 formed in the foot piece 130, said slot preferably extending, as indicated in Figs. 2 and 5, from the crown portion of the foot piece toward the toe thereof. The foot piece 130 is likewise provided with a bridge piece 131 extending transversely of the slot leading from the crown toward the sole of the foot piece, and the foot support 128 has its toe portion 132 adapted to engage above the bridge piece 130. Pivotaly mounted on the foot slide at 133 is a finger or catch 134, the end 135 of which is normally held in raised position by a spring 136 so as to engage the top portion 137 of a foot piece and hold the same with its bridge 131 under the toe portion 132 of the foot support 128, the construction being such that a foot piece 130 may be applied to the foot support, and as the foot piece is moved to bring the bridge 131 under the toe 132, into the position indicated in Fig. 2, the finger or catch 134 will rise and its end 135 will engage with the end 137 of the foot piece to hold the latter in position on its foot slide 127.

The catch or finger 134 is provided with a trip or cam portion 138 adapted to contact with the end 139 of the leg front piece 126 and disengage the end 135 of the finger or catch from the crown of the foot piece when the foot slide 127 has been moved to bring the foot piece 130 sufficiently close to the leg front portion 126, the action being such that when the catch or finger 134 is thus disengaged the foot piece may be moved on the foot slide and independent thereof, as will presently appear.

The slide 49 is provided at its foot end 130

with an upwardly projecting portion 140, Figs. 2 and 5, which passes upwardly through a slot in the foot slide 127 and is provided with a forwardly projecting portion 141 to engage behind the bridge piece 131, the construction being such that upon movement of the slide 49, with the parts in position as indicated in Fig. 2, the foot piece 130 and the foot slide 127 will be moved toward the leg front portion 126, but, as the cam portion 138 of the finger or catch 134 meets the shoulder 137 of the leg front portion 126, it will free the foot piece to movement with the slide 49 independent of the foot piece slide 127.

The foot support 128 carried by the foot slide 127 is provided with a socketed portion to receive the end 142 of the sole supporting member 143, the upper portion of this sole supporting member being provided with shouldered extensions or supports 144 to engage and hold a yoke 145 secured to the sole expanding member 146, a spring 147 normally acting to hold the yoke 145 in proper position on the sole supporting member. The end 142 of the sole supporting member is provided with a notch 148 adapted to engage the toe of a catch 149, see Fig. 2, the end 150 of which is seated in a recess of the foot support 128 and has bearing upon it a spring 151, the construction being such that the sole supporting member 143 may be disengaged from the catch 149 and another sole supporting member substituted therefor; or the sole plate 146 may be detached from the sole supporting member 143 and another sole plate substituted.

Mounted upon a part or fulcrum 152, Figs. 2 and 5, is a yielding stop 153, the lower end of which projects outward into the path of the end 154 of the foot slide 127. The upper end of the yielding stop 153 is bifurcated to embrace a stud 155 secured at 156 to the tree leg, and said bifurcated end has resting thereupon the sliding collar 157 between which and the end 158 of the stud 155 is a spiral spring 159 which normally acts upon the upper bifurcated end of the yielding stop 153, the construction being such that as the slide 49 is drawn to the right, Fig. 2, and carries with it the foot slide 127, in the manner hereinbefore pointed out, the lower end of the yielding stop 153 will meet the end 154 of the foot slide, as the finger or catch 134 disengages its end 135 from the top of the foot piece 130, whereupon the foot piece will continue to move with the slide 49 by reason of the projection 141 engaging the bridge piece 131, but the foot slide will be yieldingly restrained from movement by the yielding stop 153, thereby stopping the foot support 128 and the sole expanding plate 146 yieldingly, while the foot piece continues to move into contact with the leg front portion 126, as indicated in Fig. 5.

The back of the leg portion may be of any suitable construction enabling the heel part thereof to be moved from the foot piece as part of the jacking operation. The construction of this end, as illustrated in the drawing, comprises a back 160 having secured thereto a bracket 161 provided with a recessed supporting portion 162 to engage a supporting shoulder 163, carried by a pin 164, passing through a bearing 165, Fig. 6, carried by the leg and having interposed between the top of said bearing 165 and adjustable nuts 166 on said pin 164 a spring 167 normally holding the member 163 in position ready for engagement with the recessed portion 162 of the back 160. The pin 164 has a finger piece 168 by which it may be depressed to enable the back to be readily engaged with the supporting shoulders 163.

Pivotally mounted upon the stationary portion of the leg at 169, Figs. 2 and 5, is a heel expander 170 having a cross pin 171 in its end to engage a suitable guideway or recess 172 in the leg back. The heel expander is connected at 173 to a rod 174 extending longitudinally of the tree and having a down-turned and perforated end 175 through which passes a rod 176 secured to a slide 177, said rod 176 being provided with adjusting nuts 178, Figs. 2 and 5, and having a spring 179 interposed between said nuts and the down-turned portion 175, whereby movement of the slide 177 to the right will cause a yielding movement of the rod 174 to turn the heel expander in the manner that will be obvious to one skilled in the art.

The slide 177 has a slot 180 and is disposed preferably below the slide 49, a pin 181 on said slide 49 projecting into the slot 180, the construction being such that upon movement of the slide 49 to the right by the jacking and unjacking lever, as hereinbefore described, the pin 180 on the slide 49 will engage the end wall of the slot 180 and move the heel expander, as will be apparent. A pin 182 projecting downward from the slide 177 serves to limit the forward movement of said slide when the tree is expanded with no boot or shoe thereon.

From the construction described as one means for carrying out the invention, it will be apparent that with the parts in the position indicated in Fig. 2, a boot or shoe may be placed upon the foot piece 130, and upon depression of the jacking treadle 58 the slide 49 will be moved to the right, Fig. 2, thereby moving the foot piece 130 and foot slide 127 with its foot support 128 toward the leg front portion 126; and as the finger or catch 134 passes under the leg portion it will be tripped from engagement with the foot piece, thereby freeing the foot slide 127 so that the foot piece and foot slide may be moved independently, and as the foot slide meets the end of the yielding stop 153, the

foot piece at such time having its crown portion engaging a recess 183 in the front leg portion, the foot slide will be yieldingly restrained from further movement, thereby holding the foot support and its sole expanding member or plate 146 from further movement, while the foot piece itself continues into the position indicated in Fig. 5. As the pin 181 on the slide 49 reaches the wall of the slot 180 in the slide 177, the heel expander is actuated to move the heel of the tree into expanding position with reference to the foot piece. When the tree has been thus expanded and the rotatable head or turret is turned for presenting another tree to working position, the jacking and unjacking lever is freed, by the means hereinbefore described, to the action of its spring 62, and the projection 48 of the slide 49 being at such time in engagement with the upper end of the jacking and unjacking lever, the parts are returned to the position indicated in Fig. 2.

Connected to the foot slide 127 is a stand 184 having a perforation 185, Fig. 6, for the passage of the rod 155 and carrying at its upper portion a clamp 186. Said clamp supports a stem 187 carrying upper engaging arms 188 and normally held in the position indicated in Fig. 2 by means of a spring 189 interposed between the end of the casing 190 and a piston 191, the construction being such that upon placing the shoe in position upon the foot piece the eyelets or other portion thereof may be engaged with the arms 188 by slightly compressing the spring 189, and as the foot slide 127 moves, as hereinbefore stated, the upper stretching device will move therewith from the position indicated in Fig. 2 to that of Fig. 5, as will be apparent.

To those skilled in the art it will be noted that the jacking and unjacking of the trees is brought about by a simple combination of jacking and unjacking lever under treadle and spring control; that after a tree has been properly expanded by treadle actuation of the said lever, it will be locked in this expanded position, and the rotating head or turret may then be rotated to bring another tree into working position; that as the other tree moves into working position, the jacking and unjacking lever is tripped and the tree automatically contracted; that the rotatable head or turret is given rotative movement to bring successive trees into working position by the action of a yielding actuator, and is stopped with a tree in proper working position by means of a yielding stop or catch; that when a tree is in working position and contracted, the said rotatable head or turret is locked from rotative movement; that when a tree is in proper working position and expanded, and individually rotated or moved from its normal position, the turret is again locked from rotative movement; and

that when the turret is being rotated, the individual trees are locked from individual rotation. To those skilled in the art it will also be obvious that many changes may be made in the means embodying the present invention without departing from the spirit or characteristics thereof.

What is claimed is:

1. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, an expansible foot-piece formed independent of the tree-leg, a foot-piece enlarging member movable with and relative to said foot-piece, a heel member, a slide for moving the foot-piece and enlarging member toward the leg, then to move the foot-piece and enlarging member relatively and separate the foot-piece and heel member, and a jacking and unjacking lever for moving said slide.

2. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece and foot-piece enlarging member, a heel member, means for moving the foot-piece and foot-piece enlarging member together toward the leg and to then relatively move the foot-piece and foot-piece enlarging member and the heel member, and a single jacking and unjacking lever for operating said means.

3. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece and foot-piece enlarging member, a heel member, and means for moving the foot-piece and foot-piece enlarging member together toward the leg and to then arrest the movement of the enlarging member while the foot-piece continues its movement.

4. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece, a foot-piece enlarging member, slides carrying said foot-piece and foot-piece enlarging member, a heel member, means for moving said slides together to carry the foot-piece and enlarging member toward the leg, and to then yieldingly arrest the movement of the foot-piece enlarging member while the foot-piece continues its movement toward the leg.

5. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a relatively movable foot-piece and sole expanding member, slides for moving said foot-piece and sole expanding member toward the tree-leg and then relatively moving them to expand the foot-piece, and a single jacking and unjacking lever for moving said slides.

6. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece, a slide for moving the foot-piece toward said tree-leg, a foot-piece enlarging member, a support therefor, a slide for moving said sup-

port and enlarging member toward the tree leg, a yielding stop for the last named slide, and means for moving said slides.

7. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a jacking slide, a foot-slide and a heel-slide actuated by said jacking slide, a foot-piece, a foot-piece enlarging member, and a heel member, and connections between said slides to effect jacking movement of said foot-piece and members from the jacking slide.

8. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a jacking slide, a foot-slide and a heel slide actuated by said jacking slide, a foot-piece, a foot-piece enlarging member, and a heel member, connections between said slides to effect jacking movement of said foot-piece and members from the jacking slide, and a jacking lever for operating the jacking slide.

9. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a jacking slide, a foot-piece movable with said slide, a foot-slide having a foot support and carrying a sole expanding member, a heel slide, a heel member connected thereto, means for moving the foot slide and heel slide by movement of the jacking slide, and means to move the jacking slide.

10. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece, a slide for moving the foot-piece toward the tree leg, a sole member for said foot-piece, a slide for moving the sole member with the foot-piece toward the tree-leg, and a yielding stop to arrest the sole member to cause said sole member and foot-piece to move relatively.

11. In a boot and shoe treeing machine, the combination of a supporting frame, a head or turret carrying boot and shoe trees, a slide in each of said trees for expanding the same, a lever carried by the frame for moving said slides, a lock for holding the lever in tree expanding position, and means for automatically tripping said lock to permit the lever to move to opposite position and permit contraction of the tree when moved into operative relation with said lever.

12. In a boot and shoe treeing machine, the combination of a supporting frame, a head or turret carrying boot and shoe trees, a jacking slide in each of said trees, a foot slide, means for actuating the foot slide from the jacking slide, a jacking and unjacking lever for operating the jacking slide, a lock for holding said lever in tree expanding position, and means for tripping said lock to permit said lever to move to oppo-

site position and contract a tree when moved into operative relation with said lever.

13. In a boot and shoe treeing machine, the combination of a supporting frame, a head or turret carrying boot and shoe trees, a slide for expanding said trees, a single jacking lever for moving said slide to jack and unjack the trees, a lock for holding said lever in tree expanding position, and means for tripping said lock as said head is moved to bring a tree into working position.

14. In a boot and shoe treeing machine, the combination of a supporting frame, a rotatable head or turret mounted thereon and carrying boot and shoe trees, boot and shoe tree expanding means carried by each tree, a jacking and unjacking lever for actuating said expanding means, means for rotating the rotatable head or turret when the jacking lever is in tree expanded position, and means for preventing the turret from rotation when the jacking and unjacking lever is in unjacking position.

15. In a boot and shoe treeing machine, the combination of a supporting frame, a rotatable head or turret mounted thereon and carrying a plurality of boot and shoe trees, a jacking lever for expanding said trees, means for rotating said rotatable head or turret, and means for preventing said rotation of the rotatable head or turret when said lever is in unjacking position.

16. A machine of the character described, comprising, in combination, a supporting frame, a tree carrying head rotatably mounted thereon, a plurality of trees mounted on said head, means for expanding and contracting said trees, means for rotating the head to position a tree for the operator, and a lock for preventing rotative movement of the head when the tree expanding and contracting means is in tree contracting position.

17. A machine of the character described, comprising, in combination, a supporting frame, a tree carrying head rotatably mounted thereon, a plurality of trees mounted on said head, a lever for expanding and contracting said trees, a lock for holding the trees expanded, a lock-trip, and lever actuating means comprising lost motion connections to cause the lock-trip to be actuated to unlock a tree before the said lever is moved to contract said tree.

18. In a machine of the character described, the combination of a supporting frame, a tree carrying head mounted thereon, a plurality of trees on said head, a single lever for expanding and contracting said trees, a treadle to move said lever to expand a tree, and a spring to move said lever to contract a tree.

19. In a boot and shoe treeing machine, the combination of a supporting frame, a

tree-carrying head mounted thereon and carrying a plurality of trees, a lever for expanding and contracting said trees, a lock for holding the lever in tree expanding position, and means acting automatically to move said lever and cause it to contract a tree as said tree is brought into operative position.

20. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-carrying head mounted thereon and carrying a plurality of trees, a lever for expanding and contracting said trees, a lever actuator, means to lock said actuator with the lever in tree expanding position, and means acting automatically to trip said lock and permit the actuator to move said lever to contract a tree as said tree is brought into working position.

21. In a machine of the character described, the combination of a supporting frame, a tree carrying head mounted thereon to rotate in a substantially vertical plane, a plurality of trees on said head, a single lever for expanding and contracting said trees, a treadle to move said lever to expand a tree, and a spring to move said lever to contract a tree.

22. In a boot and shoe treeing machine, the combination of a supporting frame, a rotatable head carrying a plurality of boot and shoe trees and mounted on said supporting frame, a single lever for expanding and contracting said trees, a lever actuator connected to said lever, a treadle for moving the actuator to cause the lever to expand a tree, and a spring operating to cause said lever to contract a tree when said tree is in working position.

23. In a boot and shoe treeing machine, the combination of a supporting frame, a head 4 mounted thereon to rotate in a vertical plane and carrying a plurality of boot and shoe trees, a jacking and unjacking lever 46, a treadle for moving said lever to expand a tree, and a spring acting through said lever to contract a tree.

24. In a boot and shoe treeing machine, the combination of a supporting frame, a head 4 mounted to rotate thereon in a substantially vertical plane and carrying a plurality of boot and shoe trees, a jacking and unjacking lever for expanding and contracting said trees, treadle operated means for rotating said head, and a lock to prevent operation of said treadle operated means when the said jacking and unjacking lever is in tree contracting position.

25. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of boot and shoe trees, and means under control of the operator acting yieldingly in the direction for rotating said head to successively bring the trees into

working position and prevent shock or sudden starting movement of the head.

26. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of boot and shoe trees, yielding means under control of the operator acting yieldingly in the direction for rotating said head to successively bring the trees into working position and prevent sudden movement of the head, and a stop for arresting the rotative movement of the head with a tree in working position.

27. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of boot and shoe trees, a turning member connected to said head, and yielding actuating means co-acting with said turning member in the direction of turning movement to bring the trees into working position and prevent sudden starting movement of the head.

28. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot and shoe trees, a supporting frame on which said head is mounted to rotate in a substantially vertical plane, and means acting yieldingly to turn said rotatable head and prevent sudden starting movement of the head.

29. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot and shoe trees, a supporting frame on which said head is mounted to rotate in a substantially vertical plane, means acting yieldingly to turn said rotatable head, and a yielding stop acting in the direction of head rotation to arrest rotative movement of the head.

30. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot and shoe trees, a supporting frame on which said head is mounted to rotate in a substantially vertical plane, means to rotate said head to bring the trees into working position, and a stop yielding in the direction of movement of the head to stop the same.

31. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot and shoe trees, a supporting frame on which said head is mounted, and treadle actuated yielding means acting yieldingly in a direction to rotate said head and bring a tree into working position.

32. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot and shoe trees, a supporting frame on which said head is mounted, treadle actuated yielding means acting yieldingly in a direction to rotate said head and bring a tree into working position, a locking device to hold the head

from rotation with a tree in working position, and means to free the head from lock control prior to the active operation of the said yielding means.

5 33. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of boot and shoe trees, and a yielding lock to yieldingly stop rotation
10 of the head with a tree in working position.

34. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of boot and shoe trees, a
15 yielding lock to yieldingly stop rotation of the head with a tree in working position, and means for freeing the yielding lock from its locking control of the head and for thereafter turning said head.

20 35. In a boot and shoe treeing machine, the combination of a supporting frame, a rotatable head mounted thereon and carrying a plurality of boot and shoe trees, yieldingly acting means for rotating said head, a
25 yielding stop to bring the head to rest with a tree in working position, and a treadle for tripping said stop and operating said yieldingly acting means.

36. In a boot and shoe treeing machine, 30 the combination of a supporting frame, trees mounted thereon, a lever and actuating means therefor for expanding and contracting said trees, a lock for holding the lever

in tree expanding position, and means for adjusting the lock to different positions to
35 vary the expanding position of the said lever.

37. In a boot and shoe treeing machine, the combination of a supporting frame, trees mounted thereon, a lever and actuating
40 means therefor for expanding and contracting said trees, a lock for holding the lever in tree expanding position, means for adjusting the lock to different positions to
45 vary the expanding position of the said lever, and means to trip the lock in any of its positions of adjustment when a tree is moved into working position.

38. In a boot and shoe treeing machine, the combination of a supporting frame, a
50 rotatable head mounted thereon and carrying a plurality of trees, a slide for expanding each tree, a lock for holding the slide in expanding position, a lever for actuating said slide, a lock for holding the lever in
55 tree expanding position, and means for tripping said lock automatically to first unlock the slide and then permit the said lever to unjack or contract the tree.

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

WILLIAM H. HOOPER.

Witnesses:

THOMAS A. TIRRELL,
ROSWELL F. HATCH.