

W. H. HOOPER.
TREERING MACHINE.

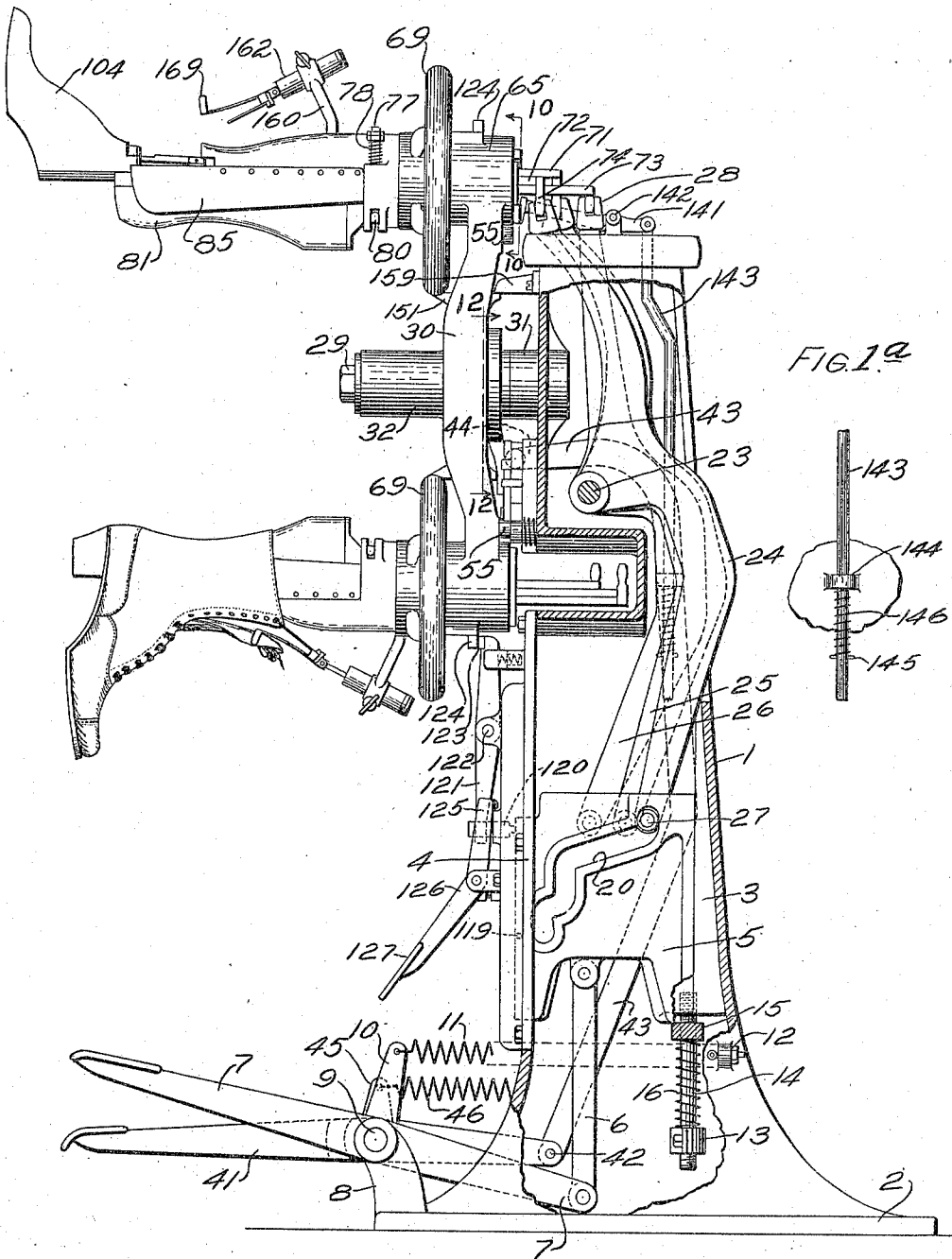
APPLICATION FILED NOV. 7, 1908. RENEWED FEB. 19, 1910.

957,962.

Patented May 17, 1910.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:
Roswell F. Hatch
Redfield Hallen

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BY *Robt. P. Hain*
ATTY

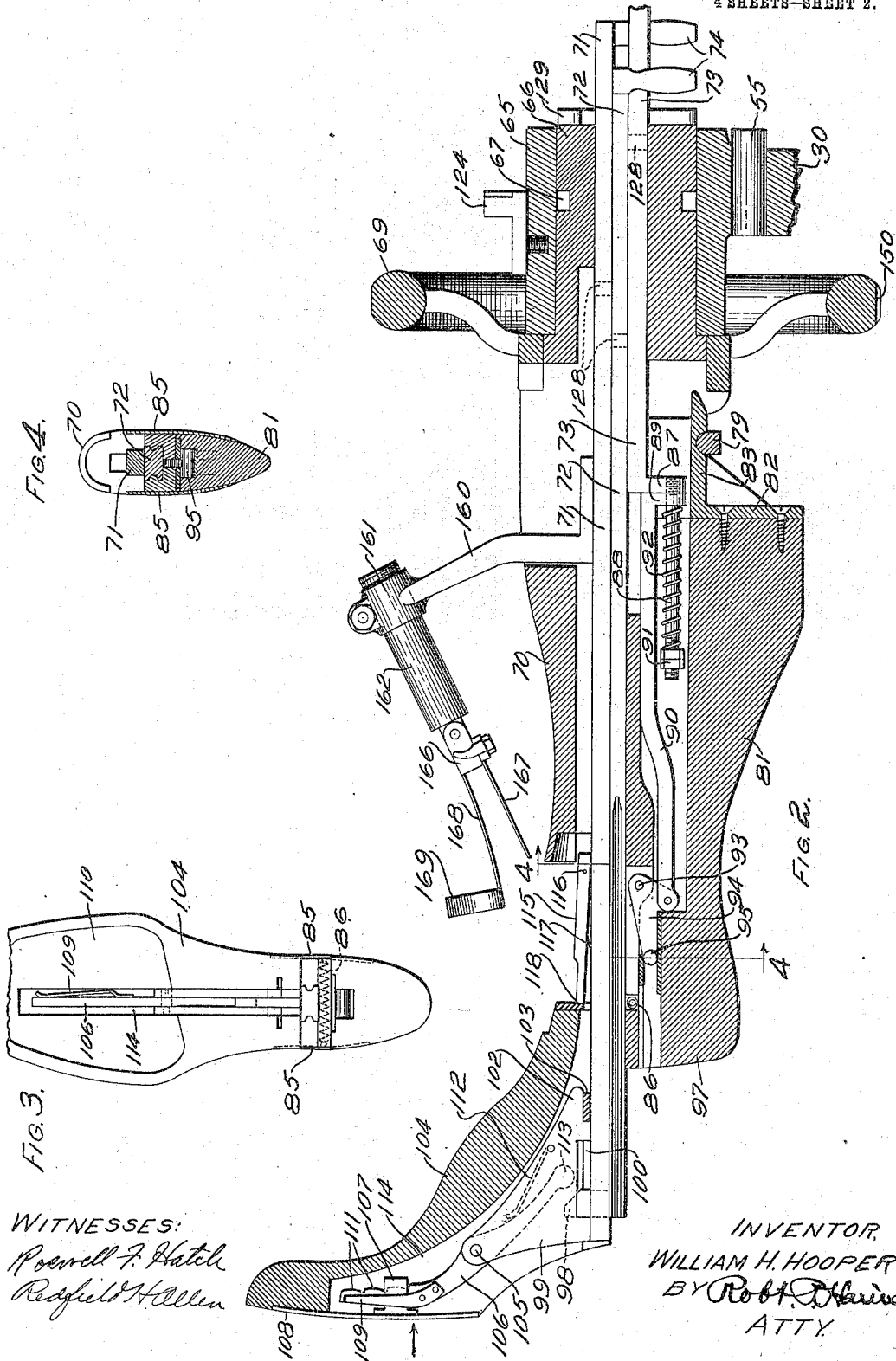
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4 SHEETS—SHEET 2.



WITNESSES:
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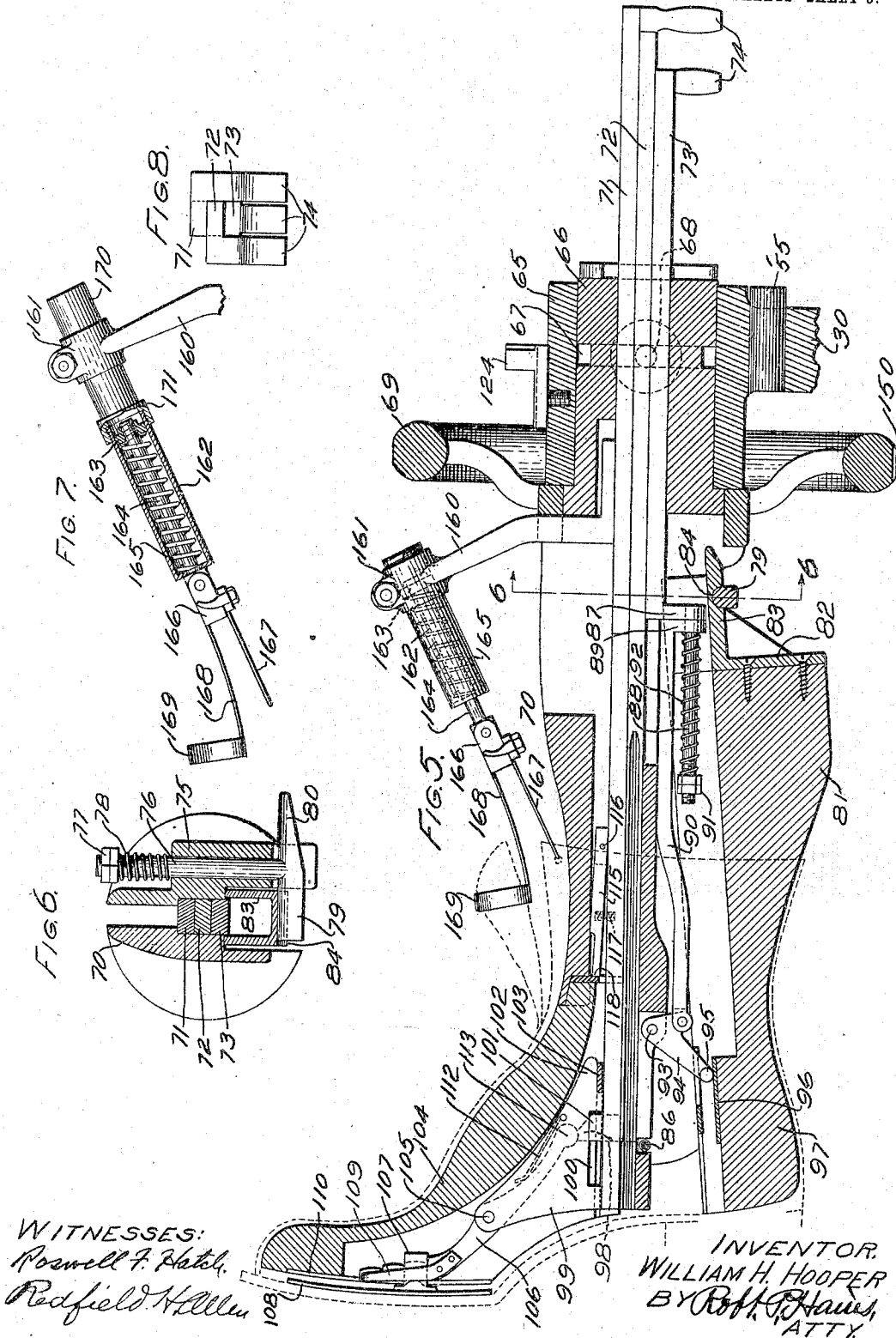
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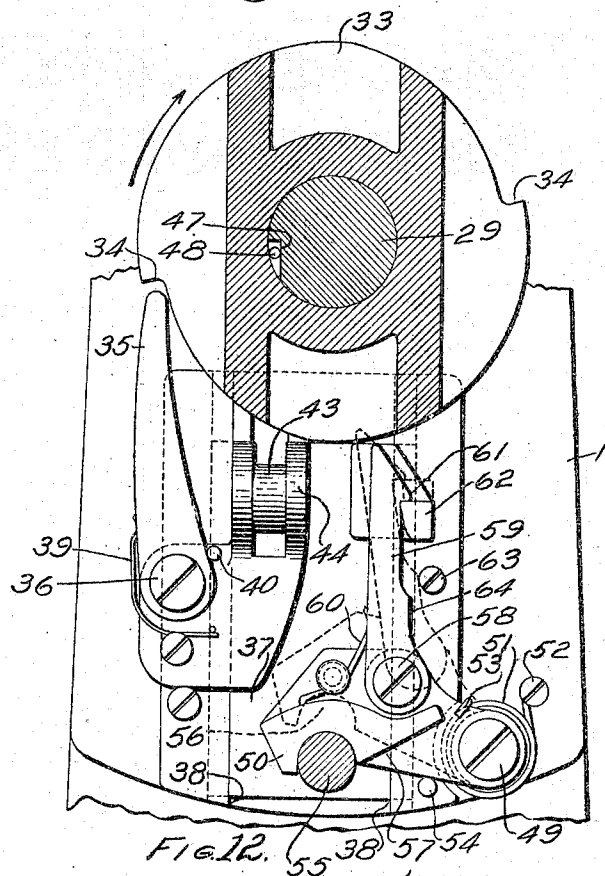
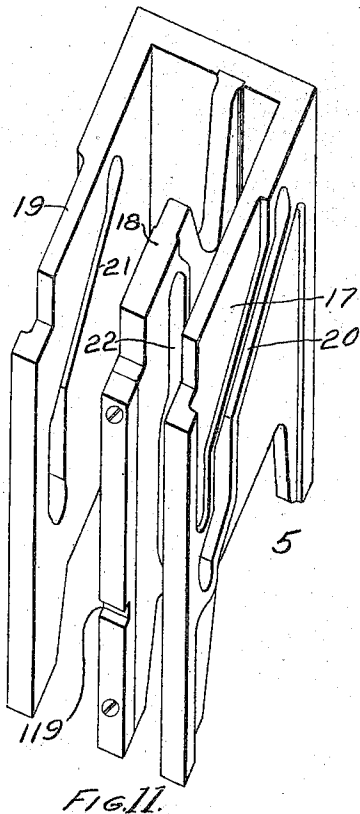
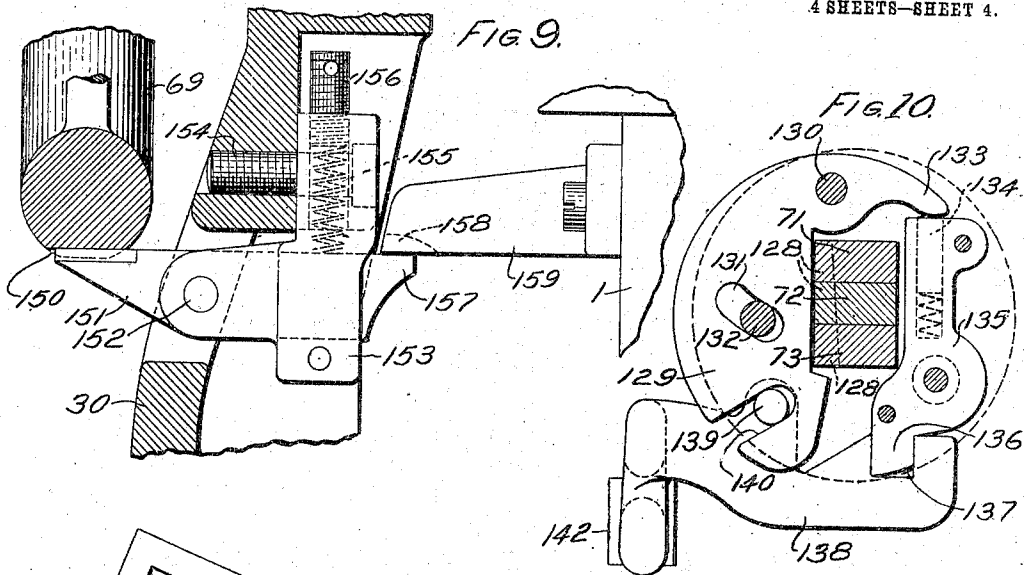
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4 SHEETS—SHEET 4.



WITNESSES:
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UNITED STATES PATENT OFFICE.

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TREEING-MACHINE.

957,962.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed November 7, 1908, Serial No. 461,450. Renewed February 19, 1910. Serial No. 544,896.

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 type of such machines wherein a head or turret carries two or more trees and is brought into position for the treeing operation by rotative movement of the head or turret.

The aims and general objects of the present invention will best be made clear by the following description and accompanying drawings which disclose one form or embodiment of the invention, it being understood that the characteristic features of the invention in its proper scope are definitely pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a boot treeing machine embodying the present invention, some of the parts being broken away to more clearly illustrate the construction of parts beyond; Fig. 1^a is a detached detail of Fig. 1; Fig. 2 is a central, longitudinal, vertical section through one of the boot trees with the parts thereof in contracted or non-expandible position; Fig. 3 is an end view looking in the direction of the arrow, Fig. 2, and showing the bottom of the foot-piece, the end of the heel and slides, the bottom expansion plate being removed; Fig. 4 is a section on the line 4—4 of Fig. 2; Fig. 5 is a central longitudinal section similar to that of Fig. 2, but showing the boot tree in boot or shoe expanding position; Fig. 6 is a section on line 6—6 of Fig. 5; Fig. 7 is a detached detail, partly in section, of the upper and tongue engaging device; Fig. 8 is an end view of the slide bars, looking from the right in Fig. 5; Fig. 9 is a detached detail view of the lock for holding a boot tree from rotative movement on its axis and for locking the head or turret from rotation when the boot tree is rotated from the position indicated; Fig. 10 is a detailed sectional view on the line 10—10, Fig. 1; Fig. 11 is a detached perspective view of the

treadle or cam block; and Fig. 12 is a detached detail view on an enlarged scale on the line 12—12, Fig. 1.

The main supporting frame for the machine may be of any usual or desired construction and is shown as comprising an upright column 1 supported upon a flaring or enlarged base 2 and carrying the operative parts of the machine.

The standard or column 1 is preferably hollow and is provided with ways 3, 4 in which slides the treadle or cam block 5. In order to raise the treadle or cam block 5, the same is connected by a link 6 to a treadle 7 pivoted to a treadle support 8 at the point 9, and provided with a toe 10 to which one end of a spring 11 is secured, the opposite end of said spring being attached at 12 to the column or main frame 1, whereby the treadle 7 is normally held in its raised position as indicated, and the treadle or cam block 5 is retained in its lowered position.

In order to cushion the downward movement of the treadle or cam block 5, the main frame or standard 1 is provided with suitable guide rods 14, having the adjustable clamps 13, and a sliding cushion bar 15, a suitable spring 16 being disposed between the clamps 13 and cushion bar 15, and normally acting to hold the bar 15 in raised position to meet the lower surface of the cam block as it descends.

The treadle or cam block 5, Figs. 1 and 11, preferably comprises three cam carrying portions 17, 18 and 19, said portions being either formed integral or assembled in integral relation to move in unison. Extending downwardly and toward the front from near the rear portions of the cam carrying parts 17 and 19 are the cam grooves or slots 20 and 21, the characteristic shape and direction of which are such as to impart to the respective levers, the ends of which are engaged thereby, movements as will hereinafter more fully appear. The central cam carrying portion 18 is likewise provided with a cam groove 22 which will be of such shape as to impart to its appropriate lever the desired movement as will hereinafter be more fully pointed out.

Extending transversely of the column 1 is a pin or shaft 23 upon which are loosely mounted the three levers 24, 25 and 26, Fig. 1, each of said levers being provided at its lower end with a pin or roll 27 to engage its

appropriate cam slot in the treadle or cam block 5. That is to say, the lower end of each of said levers 24, 25 and 26 has a pin or roller connection with a cam slot in a treadle or cam block 5, whereby, upon upward or downward movement of said cam block, said levers will be appropriately moved about their fulcrum 23.

The upper end of each of the levers 24, 25 and 26 is provided with a slot or opening 28, to be engaged at suitable times by downwardly projecting toes or fingers on certain slide rods which serve to expand and contract the tree, as will be presently described. Mounted upon a stud 29 projecting from the column 1, Fig. 1, is a rotatable head or turret 30, said turret being preferably held in proper position by means of suitable washers or sleeves 31, 32, disposed on opposite sides thereof, as indicated in Fig. 1. The hub of the turret 30, Fig. 12, has secured thereto or formed integral therewith a turning cam or part 33 having suitable shoulders 34, one corresponding to each of the boot trees carried by the turret, and said shoulders being adapted for engagement by a pawl 35, Fig. 12, pivotally mounted at 36 upon a block 37 mounted for vertical movement in suitable ways 38 in the column 1, a spring 39 normally acting to hold the pawl 35 in the position indicated by Fig. 12 so that the end thereof will, upon upward movement of the slide 37, engage one of the shoulders 34, a pin 40 serving to limit the turning movement of the pawl 35 under the action of the spring 39.

Mounted upon the support 8, preferably coincident with the axis 9 of treadle 7, is a treadle 41 having pivotally connected to its inner end at 42 a turret actuator 43, which, in the present form of the invention, is represented as a slide link, the upper end of which is connected at 44, Figs. 1 and 12, with the slide block 37, whereby, upon depression of the treadle 41, the said slide block 37 and the turret turning pawl 35 carried thereby will be actuated to turn the turret, the momentum thereof acting, after the turret has been started, to bring one or another of the trees into operative position. The treadle 41 has a toe or projection 45 to which is connected one end of a spring 46, which tends normally to keep the treadle 41 raised and the treadle actuator 43 in its lowered position.

In order to prevent rotation of the turret in the opposite direction a suitable stop is employed between the turret and the stud or shaft 29, Fig. 12, said stop in the present form of the invention comprising an angular recess 47 formed in the stud or shaft 29 and containing a stop roller 48, the construction being such that the pawl 35 may rotate the turret freely in the direction of the arrow, as will be clear to those skilled in the art,

but reverse rotation of the turret will be prevented by the roller 48 binding between the stud or shaft 29 and the interior wall of the turret hub.

It is desirable, when the turret has been rotated to bring a boot or shoe tree in position for treating the boot or shoe thereon, that the turret be locked from further rotative movement, and it is likewise desirable that, on actuation of the turret turning means, the turret be unlocked so as to be free for movement about its supporting stud or shaft 29. To this end there is mounted upon the main supporting frame or column 1 at 49 a lock 50 which is normally held in the full line position indicated by Fig. 12 by a spring 51, the end of which is secured to the column at 52 and engages the lock 50 at 53, whereby said lock 50 is normally held resting upon a pin 54 and in position to be engaged by a stud 55 on the turret, one of said studs being disposed on the turret adjacent each of the boot trees, as indicated in Fig. 1.

By reference to Fig. 12 it will be noted that the lock 50 has a circular recess 56, best shown by dotted lines in said Fig. 12, and that the part 57 of said lock is inclined, whereby, upon rotation of the turret by the means substantially as hereinbefore described, a pin 55 will ride along the incline 57, lift the lock 50 until it arrives opposite the circular recess therein, whereupon the spring 51 will automatically throw the lock into locking position.

In order that the lock may be automatically freed when the turret actuator is operated to rotate the turret, said lock 50 has pivoted thereto at 58 a lifting pawl 59 normally acted upon by a spring 60 to maintain the hooked end 61 of said pawl in engagement with a projection 62 on the slide 37, so that upon raising the slide 37 the lifting pawl 59 will raise the lock 50 out of engagement with the pin or lug 55 before the pawl starts the turret by reason of a slight lost motion between the pawl and cooperating shoulder 34.

In order that the lock 50 when thus disengaged from the pin 55 may be returned to its lowered position, as indicated by full lines in Fig. 12, before a pin 55 on the turret arrives in position to be engaged by it, the column 1 is provided with a trip pin 63 which, upon upward movement of the lifting pawl 59, meets the cam surface 64 on said pawl and trips its end 61 from the catch 62, whereby the spring 51 at once returns the lock 50 to its normally locking position, so that, as the turret rotates and the pin 55 is brought into position to be engaged by the lock, said pin will ride along the incline 57, lift the lock 50, and the spring 51 will return the lock into engagement with the pin 55 when the latter reaches a point opposite the locking recess 56 therein.

From the construction described it will

be noted that the characteristic of the present invention with regard to this feature of the turret rotation is, that means are provided for rotating the turret, and when a boot tree has been brought into proper position for the operator to perform his work thereon, the turret is automatically locked in said position, and when the operator desires to rotate the turret to bring another boot or shoe tree into position for treatment the turret is unlocked by depression of the treadle 41, and by the same movement the turret is given its desired rotation until the next boot or shoe tree reaches proper position, whereupon the lock automatically stops and locks the turret.

Having reference more particularly to Figs. 1, 2 and 5, it will be noted that the turret is provided with two, or it may be more, boot or shoe trees, and said turret is suitably formed with boot tree supporting members 65, each of which forms a bearing for the cylindrical portion 66 of the boot tree, said cylindrical portion being provided with a circular recess 67 engaged by the end 68 of a usual retaining screw, dotted lines Fig. 5, whereby the boot tree may be readily turned in its member 65 by means of a hand wheel 69 to bring all parts of the boot or shoe into operative position convenient for the operator.

Extending from the cylindrical portion 66 of the tree is the leg portion 70 provided with a central slot in which are mounted the slides 71, 72 and 73, each of which is provided with a toe or downwardly projecting finger 74 for engagement with the slotted upper ends 28 of the several levers 24, 25 and 26 hereinbefore referred to.

Passing through a lug 75, Fig. 6, formed as part of the leg portion is a pin 76 surmounted by a nut 77 between which and the head of the lug 75 is the spring 78 normally tending to lift said pin 76. At its lower end the pin carries a toe or rest 79 and a finger piece extension 80.

The back of the leg portion 81 has secured, at its end remote from the heel, a plate 82 having a projection 83 formed with a recess or seat 84 adapted to engage the toe or rest 79 carried by the pin 76, the construction being such that upon depression of the pin 76 the back 81 may be readily placed in position or removed.

Secured to the back 81 are the wings 85, 85, Figs. 3 and 4, the free ends of which are adapted to embrace the leg front 70 in the usual manner and, to maintain said wings 85 in close relation with the front of the leg, said wings 85 have a transverse flexible connection 86, preferably formed as a spiral spring, Figs. 2, 3 and 5.

As hereinbefore indicated, each tree is provided with three slide bars 71, 72 and 73, the lower one of which, 73, Figs. 2 and 5, has

a depending lug 87 to which is secured a pin 88 extending longitudinally of the tree. Said pin 88 passes through a lug or projection 89 of a heel actuator 90 and is surmounted by suitable nuts 91 between which and the lug or projection 89 is interposed the spring 92, whereby, upon movement of the slide 73 the actuator 90 will be given longitudinal but yielding movement, as will be clear.

Pivoted to the central portion of the tree leg at 93 is a lever 94 having one arm connected to the actuator 90 and carrying a pin 95 which travels in a suitable seat or recess 96 in the heel portion 97 of the tree, as best shown in Figs. 2 and 5. The construction is such that upon longitudinal movement of the actuator 90 to the right, the pin 95 will be turned outward and carry with it the heel 97 of the leg back 81, the action being a yielding one by virtue of the spring 92, as hereinbefore indicated.

Disposed above the slide 73 is the slide 72 which is guided in suitable ways in the tree leg, as indicated, and carries at its front end portion a cam lug 98 having its forward edge inclined, as indicated, for a purpose that will presently appear.

Surmounting the slide 72 is a third slide 71 which extends into the tree leg and carries at its forward end a support 99, said support being preferably slotted at 100 to receive side extensions 101 of the projection 98 carried by slide 72. The support 99 at its front portion 102 is raised somewhat above the surface of the slide 71 to receive beneath it, and between itself and the slide 71, a bridge piece 103 secured to the forepart 104 of the last, said last being substantially of the character of my prior application, Ser. No. 324,314, filed July 2, 1906.

Pivotally mounted at 105 on the support 99 is the sole plate carrier 106, the upper end of which is adapted to receive a loop 107 of the sole plate 108, a spring 109 serving to hold the loop in desired position. The end of the carrier 106, regardless of its construction, serves as a support for the sole plate 108, which, as indicated in Fig. 3, may normally rest in a recess 110 made in the forepart 104 of the last or foot piece. The end of the support or carrier 106 is preferably provided with separate step portions 111, whereby, in the use of different size or character of boot tree feet or lasts, and different size and character of sole plates 108, the latter may be properly supported.

Secured to the support 99 attached to the upper slide member 71 is a spring 112, the end of which spring normally rests upon the lower portion of the support 106 to maintain the plate 108 within the recess 110 of the foot piece, and the lower end 113 in position to be engaged by the cam projections 98 of the middle slide bar 72.

The foot piece or forepart 104 is provided with the recess 114, Figs. 2, 3 and 5, and has the bridge piece 103 extending transversely of this recess in position to engage under the end 102 of the support 99 as hereinbefore stated. Obviously the foot piece 104 is detachable by simply sliding it to the right, Fig. 2, to remove the bridge piece 103 from under the end 102 of the support 99, and is likewise capable of being put in position, when the parts are disposed as indicated in Fig. 2. In order to hold the foot piece 104 in position on its slide 71, Fig. 2, there is secured to the slide 71 a detaining finger 115 pivoted at 116 and normally held in raised position, as indicated in Fig. 2, by a spring 117, the construction being such that when the foot piece forepart 104 is placed upon its slide bar 71 and the bridge piece 103 under the end 102 of the support 99, the end 118 of the detaining finger 115 will engage the crown or top of the foot piece, as indicated, and hold the bridge piece in locking connection with the support 99. In Fig. 2 the parts of the boot tree are shown with the foot piece 104 placed upon its supporting and operating bar 71 and the parts in unexpanded relation whereby a boot or shoe may be readily placed upon the foot piece. When the slide bars 71, 72 and 73 are moved longitudinally, the first action is to move the foot piece toward the leg 70 by means of its slide bar 71, and then to move the heel 97 away from the foot piece, and thereafter to move the sole plate 108 directly outward from the sole of the foot piece 104, as indicated in Fig. 5. This expanding movement of the slides 71, 72 and 73 results from a depression of the treadle 7, which raises the treadle or cam block 5 and causes the ends of the levers 24, 25 and 26 to travel in their cam grooves 20, 21 and 22, moving the upper ends of said levers, at the time in engagement with the projections or toes 74 of the slides, outwardly or to the right.

In order to maintain the levers 24, 25 and 26 in their outward or expanding position, as indicated, the treadle or cam block 5 is provided with a notch 119, Figs. 1 and 11, adapted to be engaged by a catch 120 carried by the lower end of a lever 121 pivoted at 122 to the column 1, the upper end of said lever being provided with a beveled end 123 which is adapted to be engaged by a lug 124 on each of the barrels 65 of the turret or head 30, the construction being such that, when the turret or head 30 is rotated and a tree is brought into upper position to receive a boot or shoe, the said lug 124 will meet the inclined end 123 of the lever 121 and withdraw the catch 120 from the notch 119 of the treadle or cam block 5, thereby permitting said cam block to drop into the position indicated in Fig. 1, and to move

the ends of the levers 24, 25 and 26 inward, as indicated in Fig. 1, ready for the next expanding operation of the boot tree. The lever 121 has its lower end disposed above a flange on the arm 125 of a lever 126 having a foot operating portion 127, so that should it be desirable at any time to drop the treadle or cam block 5 and permit the upper ends of the levers to move to the left, Fig. 1, thereby releasing the parts from the expanded position, this can be done readily by a foot operation of the lever 126.

In order to maintain a boot tree in expanded position, that is to say, with the slides 71, 72 and 73 in their position, as indicated in Fig. 5, there is provided in each of the slides 71, 72 and 73 a slot 128, Figs. 2 and 10, which are adapted to be engaged by a locking piece 129 pivoted at 130, Fig. 10, on the rear face of the tree cylinder 66, said locking piece being provided with a slot 131 embracing a guide pin 132 projecting from the face of said cylinder. The toe end 133 of the locking piece 129 rests upon the upper end of a spring actuated pin 134 carried by a suitable support 135 mounted on the face of the tree cylinder, the lower end of said support 135 being formed with a toe 136 adapted to be engaged by the slotted end 137 of a lever arm 138, whereby when the parts are in engagement, as indicated by Fig. 10, the lever arm 138 prevents rotative movement of the boot or shoe tree. The arm 138 also carries a pin 139 which engages a slot 140 in the locking piece 129, the construction being such that when the arm 138 is depressed from position, as indicated in Fig. 10, the pin 139 will ride down the recess 140 and move the locking piece 129 into engagement with the slots 128 in the slides 71, 72 and 73, and simultaneously therewith the toe 136 will be released by the slotted end 137 of the arm 138. Thus when the arm 138 is moved from engagement with the locking piece 129 and toe 136, as indicated, not only will the slides 71, 72 and 73 be locked in their retracted or expanding position, but the boot tree itself will be free to rotate in its barrel 65.

The arm 138 is carried by a lever 141 pivoted at 142, Fig. 1, upon the top of the column 1, and has depending therefrom an actuating rod 143, which, near its lower end passes through a guide lug 144, Fig. 1^a, projecting from the standard 1, and between said lug and a suitable pin 145, or other means, is disposed a spring 146, normally acting to depress the rod 143 and hold the end 138 in the position indicated in Fig. 10, that is, with the locking piece 129 out of engagement or free from the slide bars, and the slotted end 137 in engagement with the toe 136 to thereby prevent rotation of the boot tree.

The lower end of the rod 143 is disposed,

see Fig. 1, so as to be met by the treadle or cam block 5 when the treadle 7 is depressed, so that upon depression of the treadle 7 and corresponding rearward or expanding movement of the slides 71, 72 and 73, the rod 143 will be lifted, thereby permitting the locking piece 129 to engage the slots 128 in the slides and also withdraw the slotted end 137 from the toe 136 so that the boot tree, while the parts are in expanded position, may be turned in its barrel 65.

As hereinbefore stated, when the treadle 7 is depressed, the treadle or cam block 15 is raised and the slides 71, 72 and 73 are drawn outward to "jack" the boot or shoe, said slides at such times having been moved from the position shown by Fig. 2 to that of Fig. 5, and locked in said position by the locking piece 129. With the parts in this position and the treadle or cam block 5 also locked in its raised position by the locking pin 120, it is desirable that the tree be permitted to rotate on its axial mounting in the head or turret 30, and it is likewise desirable, when the tree has been thus rotated, that the turret be not allowed to turn, as will be readily understood by those skilled in the art.

To the above ends suitable automatic locking and unlocking devices are employed, one form of which is shown in detail by Fig. 9, wherein the hand wheel 69 is provided with a locking recess 150, which, when the tree is in boot or shoe receiving or discharging position, as indicated by the upper tree in Fig. 1, engages a lock or catch 151 pivoted at 152 on a bracket 153 secured, as by screw bolt 154, to the turret or head 30. Bearing upon the lock or catch 151, so as to normally raise its outer end into locking engagement with the hand wheel 69, is the spring 155, seated in a suitable socket of the bracket 153, and adjustable as to its effective action by an adjusting screw 156. The locking engagement between the lock or catch 151 and recess 150 in the hand wheel is such, that, while it suffices to position the hand wheel and tree with respect to rotative movement, yet a little force exerted by the operator on the hand wheel will disengage the lock or catch and permit the tree to be turned, and when the tree is thus turned the outer end of the lock or catch 151 rides upon the periphery of the hand wheel.

In order to prevent rotative movement of the turret 30 when the tree is turned, as stated, the inner end 157 of the lock or catch 151 is adapted to engage a locking recess 158 in an arm 159, projecting from the standard or column 1, but when the tree has been turned on its axis into initial position, at which time the toes or fingers 74 of the slide rods 71, 72 and 73 will engage the slot 28 in their operating levers, the lock or catch 151 will rise at its outer end into engage-

ment with the notch 150, thereby freeing the turret to rotative movement.

Mounted on the slide bar 71 which serves to move the foot piece or forepart toward the leg is a bracket or arm 160, Fig. 5, having a split bearing 161 for a tubular part 162 in which works a plunger 163 carrying a stem 164, said plunger being yieldingly retained in its retracted position within the tubular part 162 by means of a spring 165. At its end exterior to the part 162 the stem 164 is provided with a block 166 pivoted thereto, said block carrying the spring arms 167, the ends of which are adapted to engage lacing eyelets in the shoe being treated, as indicated in Fig. 5. Also secured to said block 166 are the spring arms 168, preferably two in number, connected at their outer ends by a tongue engaging loop 169, the construction being such that the tongue of a shoe being treated may be held by the spring loop 169 clear of the treeing tool and out of the way of the operator.

It is sometimes desirable to treat shoes of a different character from that indicated by dotted lines, Fig. 5, as for instance, so-called "low" shoes, in which case the arms 167 and tongue holder 169 would not extend far enough for such purpose. To meet this condition, the end of the tubular part may be provided with an extension 170, Fig. 7, to the lower end of which the tubular part 162 may be connected, as by screw threads and coupling sleeve 171.

From the construction described as one form of means embodying the present invention it will be noted that with the parts in position as indicated in Fig. 1, and the foot piece forepart 104 connected to its slide, the operator can place a boot or shoe upon the foot piece forepart and engage the lacing eyelets and tongue with their holders 167 and 169 respectively. The treadle 7 is then depressed, thereby raising the cam block 5 and turning the levers 24, 25 and 26 upon their fulcrum or support 23, and withdrawing the slides 71, 72 and 73, the cams 20, 21 and 22 being so formed that the upper slide 71 will first move the forepart toward the leg 70, the middle slide 72 at such time moving with it but not relatively thereto, so that the cam projection 98 remains in position as indicated in Fig. 2. When the forepart reaches the limit of its movement toward the leg 70, the appropriate cam slot acts upon its lever to move the lower slide 73, thereby moving the heel part or member of the leg back outwardly from the forepart, and the middle slide is then similarly actuated to expand or enlarge the forepart by moving the sole plate 108 from the sole thereof.

It is to be noted that the expansion of the forepart is not a bodily movement thereof

away from the heel member, but rather an increasing of its dimension, which may be characterized as a movement to enlarge the forepart.

5 As the slides reach the limit of their expanding or jacking movement the cam block 5 meets the end of the rod 143, frees the lock piece 129 for engagement with the recesses 128 in the slides to lock the same in
10 expanded position, and withdraws the slotted end 137 of the lever arm 138 from the toe 136, so that the tree can be rotated on its axis, to enable the operator to treat all parts of the boot or shoe. At such time the
15 turret is held from rotation on the axis 29 by the lock 50 engaging a pin 55 on the turret. The operator, however, might depress the treadle 41 and by mistake attempt to turn the turret or head when the tree has
20 been turned on its own axis from the position indicated in Fig. 1, but under such conditions the catch 151 has its end 157 in engagement with the recess 158 in the arm 159, and such action is prevented.
25 It may be the operator desires to unjack a shoe after having fully depressed the treadle in order to adjust the boot or shoe or for other reasons, to do which he may depress the treadle 127, thus tripping the catch 120
30 and permitting the cam block 5 to drop and operate the levers to push in the slides 71, 72 and 73, and when he has adjusted matters satisfactorily he may again depress the treadle 7 and expand the tree as before.
35 Having finished a boot or shoe, and turned the tree on its own axis into initial position, the operator depresses treadle 41, whereupon the actuator 43 unlocks the turret and turns it to bring another tree into
40 position. As the tree reaches working position, the ends 74 of the slides engage the notches 28 in the levers, and the trip or lug 24 on a tree moves the end 123 of lever 121 backward, thereby withdrawing the catch
45 120 and permitting the cam block 5 to drop, thus permitting the rod 143 to withdraw the lock piece 129 from engagement with the slides 71, 72 and 73, and the slotted end 137 to engage the toe 136, and simultaneously
50 therewith actuating the levers 24, 25 and 26 to unjack the boot or shoe now brought into working position.

It will be noted that the turret and trees carried thereby are rotatable on substantially parallel axes, or, in other words, that
55 the trees are collectively and individually rotatable about substantially parallel axes; that when a tree is rotated on its own axis from normal or initial position the turret or head is locked so that the trees cannot be
60 collectively rotated; that the head or turret is turned or rotated by treadle action which also controls a turret block; that the jacking and unjacking is under treadle controlled means; and that the entire action of

the machine is facilitated by simple treadle operations leaving the hands of the operator free for manipulating the work.

What is claimed is:

1. In a boot and shoe treeing machine, 70 the combination of a supporting frame, a tree leg sustained thereby, an independent expansible foot-piece forepart having a forepart enlarging member movable with relation to the forepart to enlarge said forepart, 75 a heel member, and means for moving the forepart and enlarging member toward the leg, for causing relative separation of the forepart and heel members, and for moving the forepart enlarging member with relation 80 to the forepart to enlarge the same.

2. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, an expansible foot-piece forepart formed independent of 85 the leg, a forepart enlarging member movable with relation to the forepart to enlarge said forepart, a heel member, and slides for moving the forepart toward the leg, for causing relative separation of the forepart 90 and heel members, and for moving the forepart enlarging member with relation to the forepart to enlarge the same.

3. In a boot and shoe treeing machine, the combination of a supporting frame, a 95 tree leg sustained thereby, an independent expansible foot-piece forepart, a slide for moving said expansible forepart toward and from the leg, a forepart enlarging member movable with relation to the forepart to 100 enlarge the same, a second slide for operating said enlarging member, and means for operating said slides.

4. In a boot and shoe treeing machine, the combination of a supporting frame, a 105 tree leg sustained thereby, an expansible foot-piece forepart formed independent of the leg, a slide for moving said forepart toward and from the leg, a forepart enlarging member movable with relation to the fore- 110 part to enlarge the same, a second slide for operating said enlarging member, a treadle, and detachable connections between said treadle and slides for operating the latter.

5. In a boot and shoe treeing machine, 115 the combination of a supporting frame, a tree leg sustained thereby, an expansible foot-piece forepart formed independent of the leg, a slide for moving the forepart toward and from the leg, a forepart enlarging member movable with relation to the fore- 120 part to enlarge the same, a slide for moving the forepart enlarging member, a heel member, a slide for moving the heel member, and means for moving said slides. 125

6. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, an expansible foot-piece forepart formed independent of 130 the leg, a slide for moving the forepart to-

ward and from the leg, a forepart enlarging member movable with relation to the forepart to enlarge the same, a slide for moving the forepart enlarging member, a heel member, a slide for moving the heel member, means for moving said slides, and a lock for holding said slides in position for the treeing operation.

7. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, an expansible foot-piece forepart formed independent of the leg, and a heel member, said expansible foot piece and heel member being movable relatively to each other, means in the leg for relatively moving the forepart and heel member in a direction of separation and for moving the forepart toward the leg, and means in the leg for enlarging the forepart.

8. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, an expansible foot-piece forepart formed independent of the leg, a heel part, means in the leg for moving the independent foot-piece forepart toward the leg and for expanding the forepart substantially perpendicular to the sole thereof.

9. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, a foot-piece forepart having a sole expanding member and formed independent of said leg, a slide in the leg for moving the forepart and expanding member toward the leg, and a second slide in the leg for moving the sole expanding member away from the forepart.

10. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, a foot-piece forepart having a sole expanding member, a slide in the leg for moving the forepart toward the leg, a second slide in the leg for moving the sole expanding member away from the forepart, slide operating means mounted in said frame, and a treadle for moving said means.

11. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, a heel member, an expansible forepart, slides in the leg for operating the heel member and forepart, slide actuating means having detachable connection therewith, a lock for holding the slides with the parts in expanding relation when disconnected from their actuating means, and a cam for operating the actuating means.

12. In a boot and shoe treeing machine, the combination of a supporting frame, a head carrying boot and shoe trees, slides in said trees for expanding the same, lever means carried by the frame for moving said slides, a lock for holding the lever means in expanding position, and means for tripping

said lock to permit the lever means to move to opposite position and permit contraction of a tree when moved into operative relation with said lever means.

13. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of boot or shoe trees sustained thereby, said trees being individually and collectively movable about substantially parallel axes, means for locking the trees from collective rotation with one of the trees in working position, and means for locking a tree from individual rotation when it is removed from working position.

14. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for individual and collective rotation about substantially parallel axes, means for collectively rotating said trees about their common axis of rotation, and means for locking the trees from individual rotation on their individual axis during such collective rotation.

15. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for individual and collective rotation about substantially parallel axes, treadle operated means for collectively rotating said trees about their common axis of rotation, and means for locking the trees from individual rotation on their individual axis during such collective rotation.

16. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and individual rotation, locking means for preventing individual rotation of the trees during their collective rotation, and means for preventing their collective rotation when a tree is individually rotated from the position it occupies during the collective rotation.

17. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and individual rotation about substantially parallel axes, locking means for preventing individual rotation of the trees during their collective rotation, and means for preventing their collective rotation when a tree is individually rotated.

18. In a treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and individual rotation, means to prevent individual rotation of the trees during their collective rotation, a treadle operated actuator for collectively rotating the trees, and a lock operated by said actuator for releasing the trees to the operation of the actuator.

19. In a treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and indi-

vidual rotation, a treadle operated actuator for so moving the trees, a lock operated by said actuator for releasing the trees to the operation of the actuator, and means to prevent reverse movement of the trees when freed from the said lock.

20. In a treeing machine, the combination of a supporting frame, a head or turret mounted to rotate thereon and carrying a plurality of trees, tree expanding and contracting means mounted on said supporting frame, a lock for holding said means in tree expanding position, and a trip carried by said head or turret to trip said lock and permit said means to contract a tree as the turret moves the tree into working position.

21. In a treeing machine, the combination of a supporting frame, a head or turret mounted for rotative movement thereon and carrying a plurality of trees, treadle operated means for expanding a tree when in working position, a lock for holding the tree expanded, a separate lock for holding the treadle operated expanding means in expanding position, and a trip for freeing said last mentioned means to contract the tree as said tree is brought into working position.

22. In a treeing machine, the combination of a supporting frame, a head or turret mounted for rotative movement thereon and carrying a plurality of trees, treadle operated means for expanding a tree when in working position, a lock for holding the tree expanded, a separate lock for holding the treadle operated expanding means in expanding position, and a treadle operated trip for freeing the last mentioned means to contract the tree.

23. In a treeing machine, the combination of a supporting frame, a head or turret mounted for rotative movement thereon and carrying a plurality of trees, tree expanding means carried by each tree, lever means for actuating said tree expanding means, a cam block for actuating said lever means, and a treadle for operating said cam block.

24. In a treeing machine, the combination of a supporting frame, a head or turret mounted for rotative movement thereon and carrying a plurality of trees, tree expanding means carried by each tree, levers for actuating said tree expanding means, said levers being adapted for detachable connection therewith, and a treadle actuated cam block for actuating said levers.

25. In a treeing machine, the combination of a supporting frame, a head or turret mounted for rotative movement thereon and carrying a plurality of trees, tree expanding means carried by the trees, locking means for locking the trees in expanded position, devices for actuating the tree expanding means, a lever for controlling the locking means, and a cam block for operating the said devices and lever.

26. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and individual rotation, and means controlled by the individual trees for preventing their collective rotation when a tree is individually rotated from the position it occupies during collective rotation.

27. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of boot or shoe trees sustained thereby, said trees being individually and collectively rotatable about their respective axes, means for locking the trees from collective rotation with one of the trees in working position, and means for locking a tree from individual rotation when it is removed from working position.

28. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for collective and individual rotation, and means controlled by individual rotative movement of a tree to lock and unlock the plurality of trees as to collective movement.

29. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for individual and collective movement, and means for preventing collective movement of the plurality of trees when a tree is individually moved from the position it occupies during collective movement and for preventing individual rotation of a tree during collective rotation and for freeing it to individual rotation when moved into operative position.

30. In a boot and shoe treeing machine, the combination of a supporting frame, a plurality of trees sustained thereby for individual and collective rotation on their respective axes, treadle operated means for collectively rotating said trees about their common axis of rotation, locking means to prevent individual rotation of the trees, and means to free a tree to individual rotation when brought into working position.

31. In a boot and shoe treeing machine, the combination of a supporting frame, a rotatable tree carrying head mounted thereon, a plurality of trees on said head, a head turning part having shoulders and pins corresponding to the trees carried by the head, a slide movable in the frame and carrying a pawl for acting on said shoulders, a catch having a seat and a shouldered portion to be engaged by said pins to lift the catch as the rotatable head brings a tree into working position, and treadle means for actuating said slide.

32. In a boot and shoe treeing machine, the combination of a supporting frame, a head rotatably mounted thereon and carrying a plurality of trees, stops on the rotatable head corresponding to the trees, a lock for engaging a stop as the head is rotated to

bring a tree into working position, means for freeing the lock from locking engagement with a stop and for thereafter rotating the head to bring another tree to working position, and means for tripping the lock from its freeing means after the head has started to rotate.

33. In a boot and shoe treeing machine, the combination of a rotatable head carrying a plurality of boot trees, a catch for holding the head fixed with a tree in working position, treadle operated means for freeing the head from control of the catch and rotating said head, and means for tripping the catch from treadle control to permit it to again engage and stop the head.

34. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, a foot-piece forepart independent of said leg, a slide for moving the foot-piece forepart toward and from the leg, and a detaining finger engaging the crown or top surface of the foot-piece forepart for holding the foot-piece forepart in position with respect to the slide.

35. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece forepart independent of said leg, a slide for moving the foot-piece forepart toward and from the leg, and a yielding detaining finger mounted on the slide and engaging the foot-piece forepart for holding the foot-piece forepart in position with respect to the slide.

36. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece forepart independent of said leg, a slide for moving the foot-piece forepart toward and from the leg, and a detaining finger mounted on the slide and movable relative thereto for engaging the crown or top of the foot piece for holding the foot-piece forepart in position with respect to the slide.

37. In a boot and shoe treeing machine, the combination of a supporting frame, a tree leg sustained thereby, a foot-piece forepart independent of said leg and having a slot extending from the cone or crown of the foot piece toward the sole and a bridge-piece extending over said slot, a slide, and means carried by the slide for engaging the bridge-piece.

38. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece forepart independent of the leg and having a slot extending from the cone or crown of

the foot piece toward the sole, a bridge-piece extending across said slot, a slide, a support carried by said slide to engage said bridge-piece, and means to operate the slide.

39. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece forepart independent of the leg and having a slot, a bridge-piece extending across said slot, a slide, a support carried by said slide to engage said bridge-piece, a detaining finger for maintaining the support and bridge-piece in operative relation, and means to operate the slide.

40. In a boot and shoe treeing machine, the combination of a supporting frame, a tree-leg sustained thereby, a foot-piece forepart independent of the leg and having a slot, a bridge-piece extending across said slot, a slide, a support carried by said slide to engage said bridge-piece, a detaining finger mounted on the slide for maintaining the support and bridge-piece in operative relation, and means to operate the slide.

41. In a boot treeing machine, a boot tree expansible in a plurality of directions, a support therefor and on which said tree as a whole is movable into and out of position, tree operating means for successively moving the foot-piece thereof toward the leg into treeing position and expanding said tree in a plurality of directions, the controlling member of said means being on said support, and means between said controlling member and the tree parts moved thereby for rendering said operating means effective and ineffective as said tree is moved into and out of said position.

42. In a boot treeing machine, a boot tree expansible in a plurality of directions, a support therefor and on which said tree as a whole is movable into and out of position, tree operating means for successively moving the foot-piece thereof toward the leg into treeing position and expanding said tree in a plurality of directions, the controlling member of said means being on said support, and means for automatically rendering said operating means effective and ineffective as said tree is moved into and out of said position.

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

WILLIAM H. HOOPER.

Witnesses:

AMELIA M. ROSS,
MARION F. KIMBALL.