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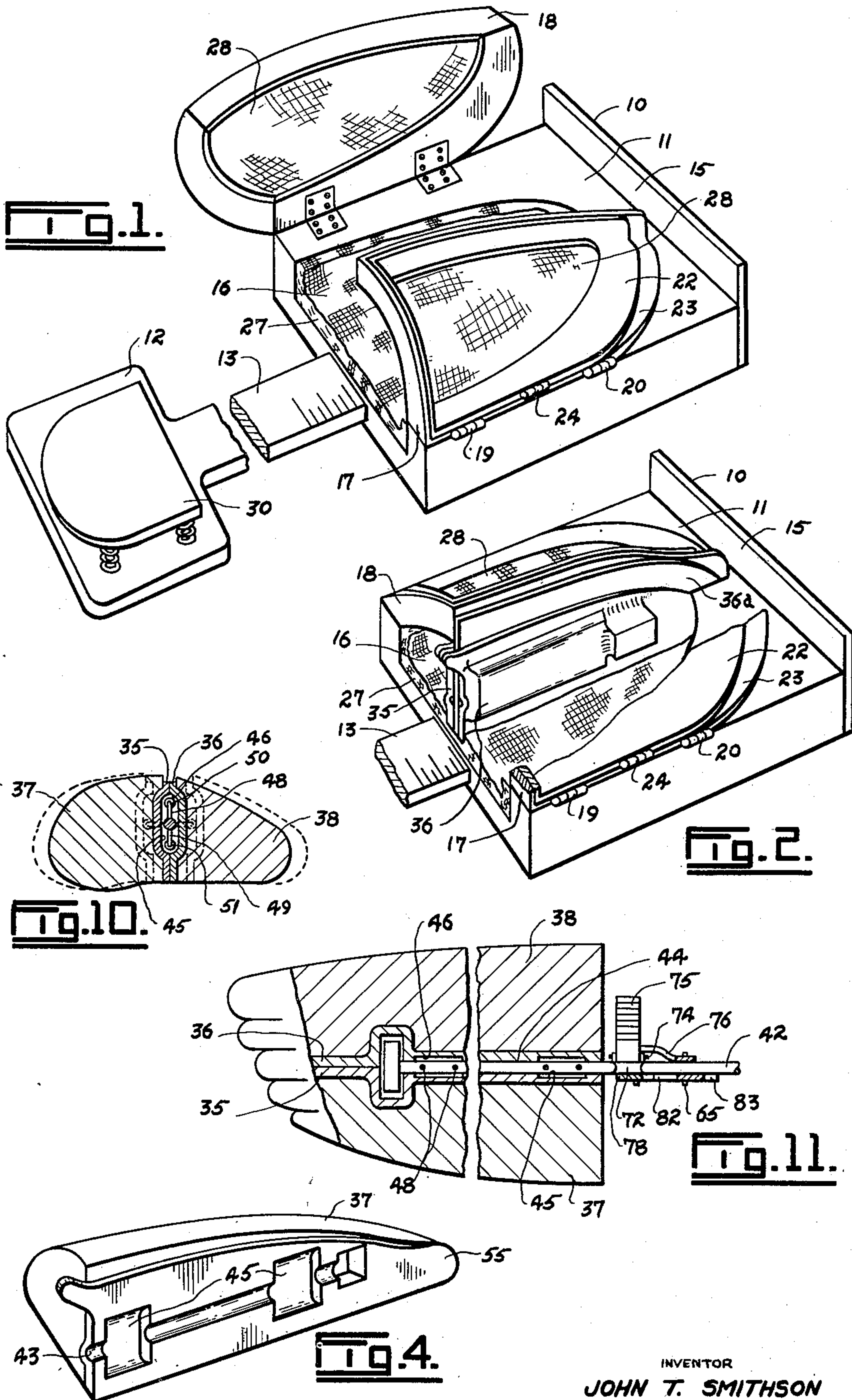
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LATERAL AND LONGITUDINAL ADJUSTABLE SHOE TREE

Filed Oct. 17, 1949

2 SHEETS—SHEET 1



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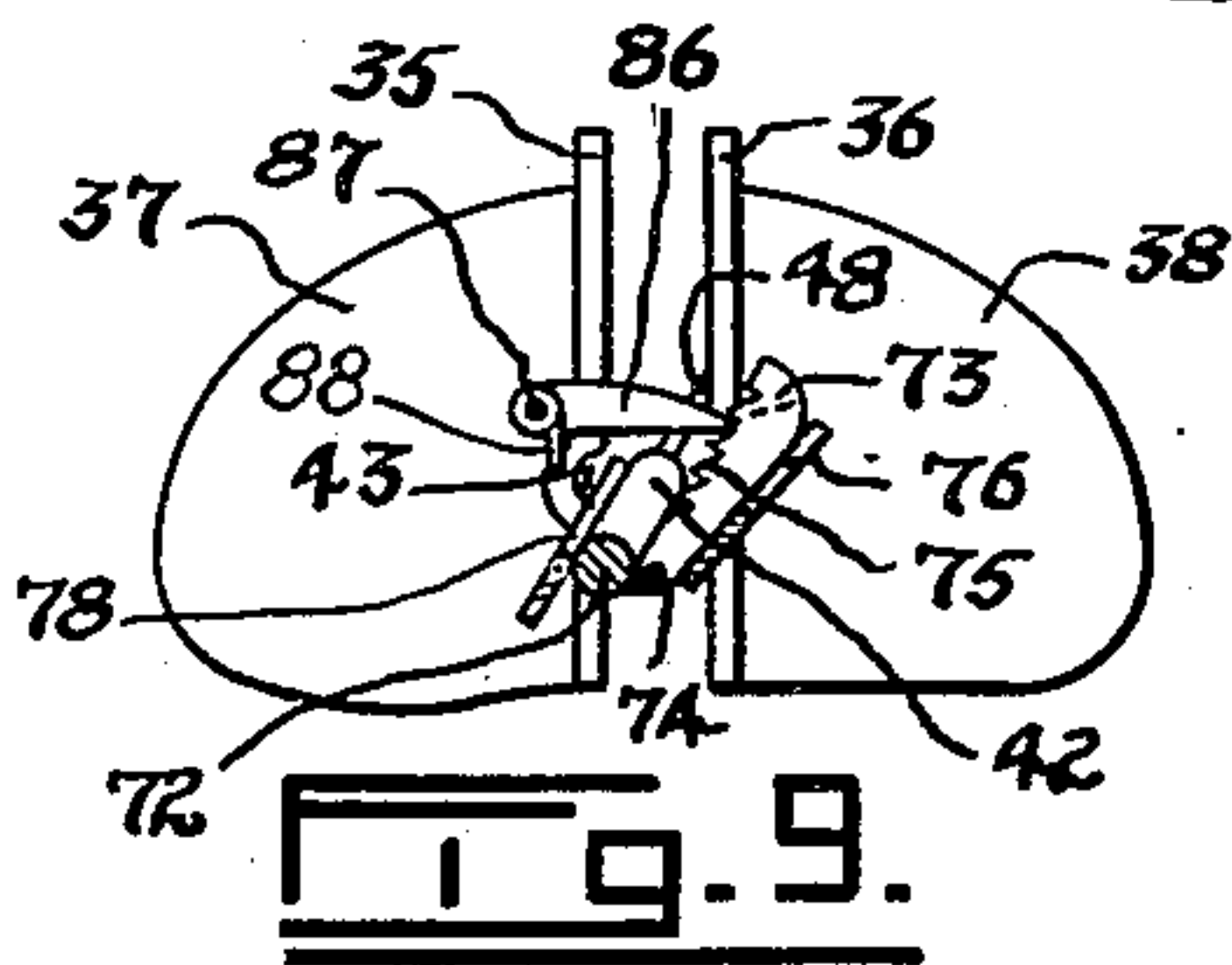
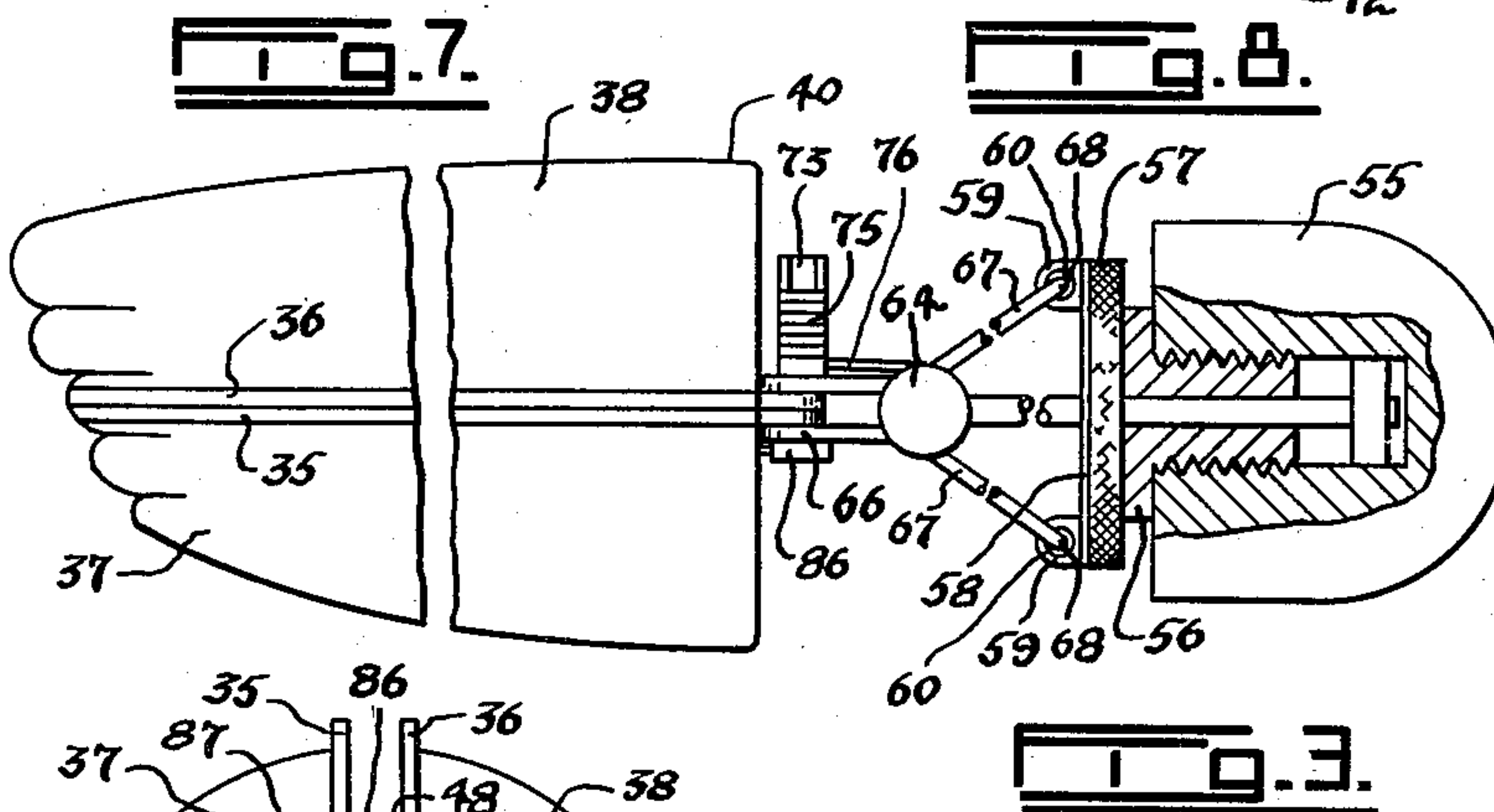
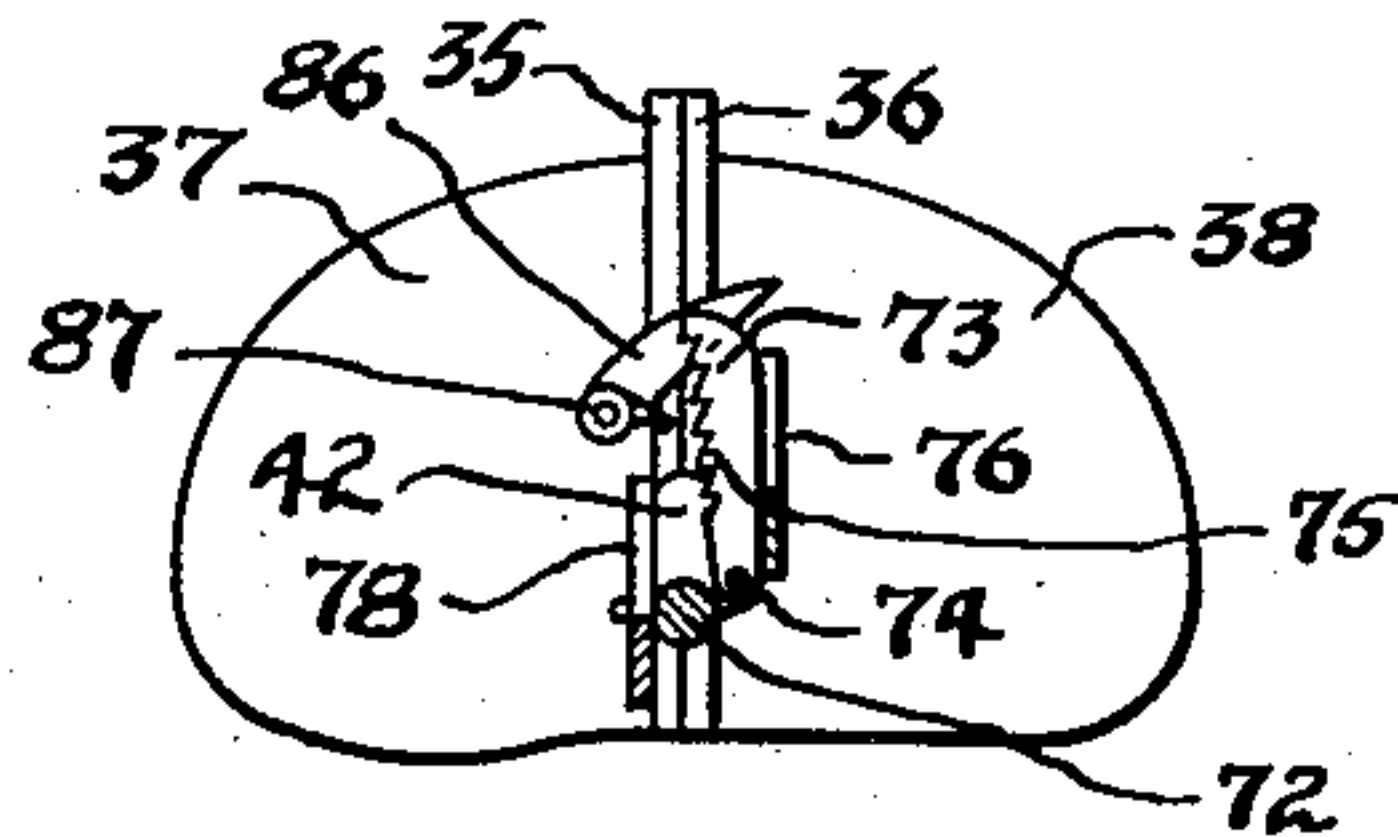
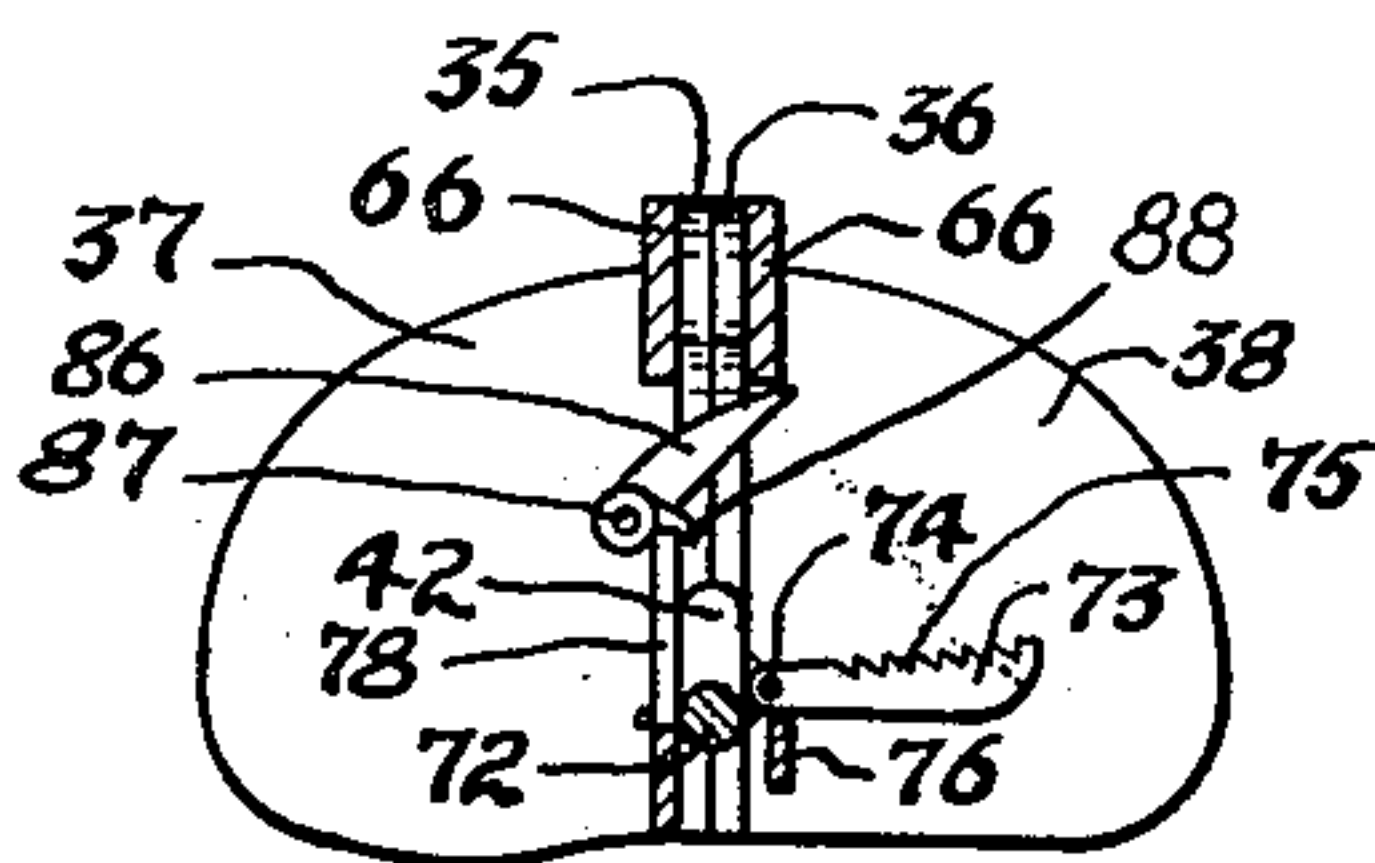
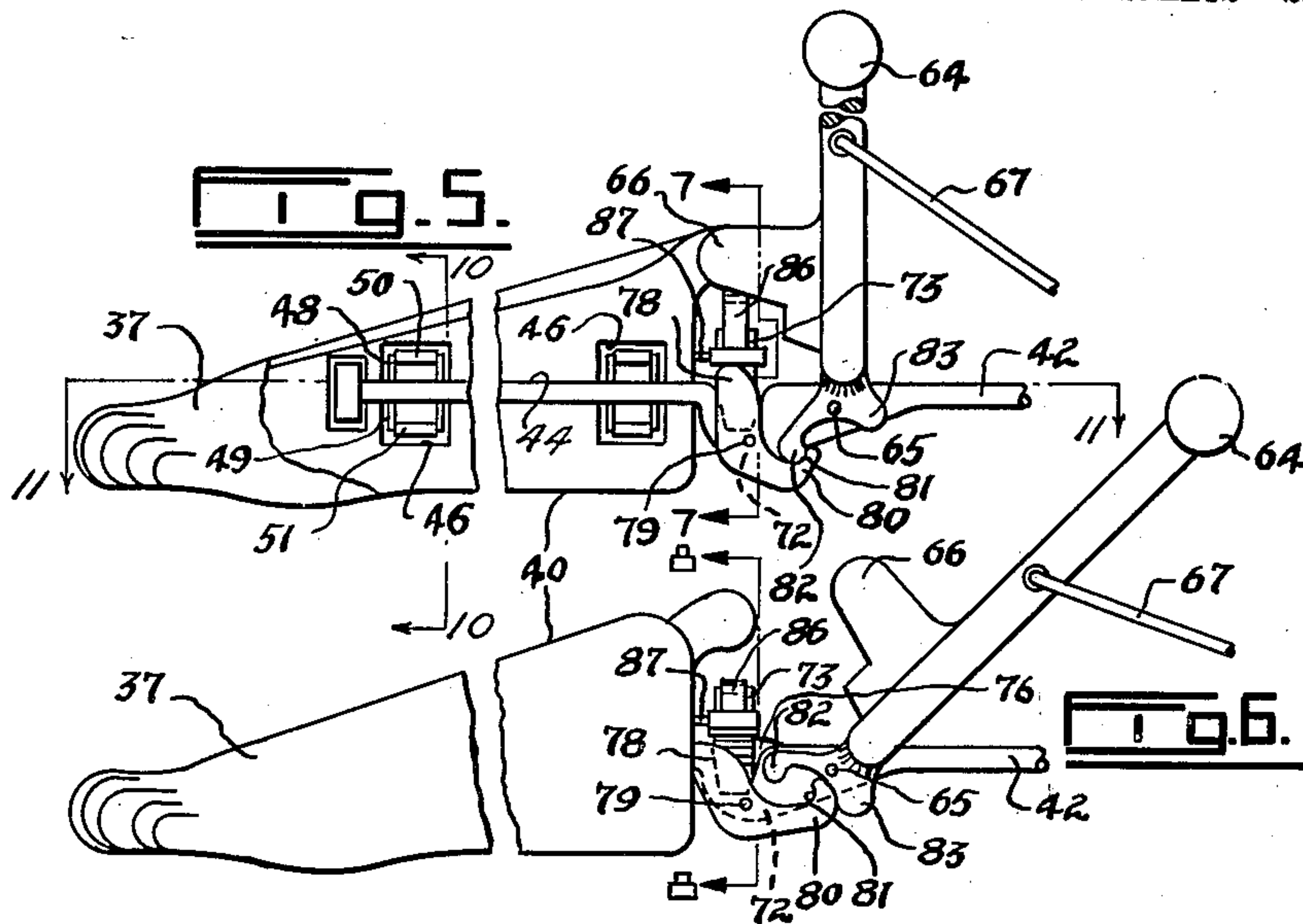
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LATERAL AND LONGITUDINAL ADJUSTABLE SHOE TREE

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2 SHEETS—SHEET 2



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LATERAL AND LONGITUDINAL
ADJUSTABLE SHOE TREEJohn T. Smithson, Vancouver,
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8 Claims. (Cl. 12—128.3)

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This invention relates to improvements in apparatus for maintaining shoes in the desired shape.

An object of the present invention is the provision of apparatus for stretching and maintaining shoes in the exact shape of the wearer's feet.

Another object is the provision of shoe tree apparatus designed to conform to the shape of each foot of the person who wears the shoes in which the apparatus is used.

A further object is the provision of apparatus for taking an impression of each foot of a person which is used to produce shoe trees corresponding to said feet.

Yet another object is the provision of shoe tree apparatus capable of shaping and maintaining shoes to fit feet which are misshapen by bunions, corns or any other defect.

According to this invention a mould is provided which is made up of a main body portion and a heel portion adjustably connected thereto. The main body portion is designed to receive a clay pack upon which the forward part of a person's foot rests. Cover sections are mounted on the opposite sides of the body portion, and each is designed removably to retain a clay pack. These cover sections may be closed over the top of the person's foot and the clay packs therein are pressed down on to the top and sides of the foot. The mould may then be opened to permit the withdrawal of the foot, after which the cover sections are again closed. A pair of specially designed separating plates are inserted vertically in the mould and extended longitudinally thereof substantially midway between its sides and are slightly spaced apart by a filler plate. Suitable material, such as plaster of Paris, is poured into the cavities on each side of the special plates and allowed to harden. The hardened material on each side of the mold is connected to one of the plates and when it is removed from the mould, it forms a toe block which is exactly the shape of one-half of and slightly less in width than the forward part of a person's foot.

The toe blocks thus formed are now incorporated into a shoe tree. This shoe tree may then be inserted into a shoe, and it is provided with means for expanding the toe blocks laterally to stretch the shoe and to maintain it in exactly the shape of the foot of the person who wears it. The shoe tree is provided with a lever which may be moved to expand the shoe tree longitudinally. The lever may then be rotated towards one side of the shoe to expand the toe blocks laterally. Suitable locking means is pro-

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vided for releasably retaining the lever in this position. The lever may be moved to release the locking means and then rotate it back to its normal position to allow the shoe tree to contract for easy removal from the shoe.

Examples of this invention are illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of a foot mould ready for use,

Figure 2 is a perspective view of the mould with one cover section closed and a separating plate in position,

Figure 3 is a plan view of a shoe tree before it is expanded in a shoe,

Figure 4 is a perspective view of part of the shoe tree before it is inserted into a shoe,

Figure 5 is a fragmentary side elevation of the device shown in Figure 3 in the retracted position, with part thereof broken away,

Figure 6 is a fragmentary view similar to Figure 5 with the shoe tree extended longitudinally before the lever is moved to lock it in this position,

Figure 7 is a cross section taken on the line 7—7 of Figure 5,

Figure 8 is a cross section taken on the line 8—8 of Figure 6 when the lever is in a vertical plane,

Figure 9 is a view similar to Figure 8 when the lever is moved laterally to the locking position,

Figure 10 is a vertical section taken on the line 10—10 of Figure 5, and

Figure 11 is a horizontal section taken on the line 11—11 of Figure 5.

An example of apparatus to be used for forming the toe blocks is illustrated in Figures 1 and 2 of the drawings, in which 10 is a mould having a body portion 11 and a heel portion 12 which is connected to the body portion by an extension 13 slidably extending into said portion. The body portion 11 is formed with a plate 15 at one end, and with a cavity 16 in its upper surface. Cover sections 17 and 18 are connected to the sides of the body portion by hinges 19 and 20. These cover sections extend substantially the length of the body portion and each consists of an inner frame 22 and an outer frame 23 which is connected to the former by hinge 24. A clay pack 27 wrapped in gauze or the like may be placed in the cavity 16, said pack being larger than the forward part of a foot. Another clay pack 28 also wrapped in gauze or the like, is placed in each of the cover sections. The gauze of each of the latter packs extends beyond the edges thereof and is clamped between the inner

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and outer frames 22 and 23 of the cover section. If desired, a spring loaded platform 30 may be mounted on top of the heel portion 12.

When a pack 27 is placed in the cavity 16, and a pack 28 is placed in each of the cover sections 17 and 18, the mould is ready for use. The heel of the foot to be moulded is placed on the platform 30 and the forward part of said foot rests on the pack 27. Then the cover sections are closed over the top of the foot. When the person bears down on the forward part of his foot, it sinks into the pack 27 and the latter assumes the shape of the bottom and sides of the foot. Then the packs 28 are pressed down on to the top and sides of the foot in any convenient manner so that each of said packs assumes the shape of the top and one side of the forward part of the foot, including the toes.

After the cover sections have been opened and the foot removed, two specially designed separating plates 35 and 36 are placed on edge centrally of the mould and extend longitudinally thereof with a thin filler plate 36a therebetween. The lower edges of these plates are pressed down into the pack 27 and the cover sections are closed to hold the upper edges of these plates in position. The mold 10 may now be turned up on end to rest on the plate 15, so that the openings through which the foot extended into the mould are facing upwardly. At this time, a suitable material, such as plaster of Paris, may be poured into the cavities between the separating plates and the cover sections. When the material has hardened, it is removed from the mould in the form of toe blocks 37 and 38 which have the plates 35 and 36 imbedded in or secured to their adjacent edges. When placed side by side, the toe blocks form a block which is the exact shape of the foot which had been placed in the mould 10, said block being slightly narrower than the foot as a result of the filler plate 36a having been removed from between the plates 35 and 36.

The toe blocks 37 and 38 are now incorporated into the shoe tree 40, see Figure 3. A shaft 42 extends longitudinally of the shoe tree and into the space between the separating plates 35 and 36. These plates are provided with longitudinal grooves 43 and 44 for receiving this shaft. The plates are also provided with a plurality of spaced curved recesses 45 and 46 in their inner surfaces. Each recess 45 of one plate is opposite a recess 46 of the other plate. The shaft 42 is provided with a pair of diametrically opposed lugs 48 and 49 for each pair of recesses 45 and 46. These lugs are provided with rollers 50 and 51, respectively, at their outer ends. Each pair of lugs fits into a pair of recesses and when said lugs are in a vertical position, the plates 35 and 36 bear against each other. When the shaft 42 is rotated, one lug moves one way and the other lug the opposite way into the adjacent recesses to spread the plates and, consequently, the toe blocks apart.

A heel block 55 is slidably mounted on the opposite end of the shaft 42. A sleeve 56 having a knurled head 57 is also slidably mounted on said shaft and is threaded into the inner edge of the heel block. A plate 58 is slidably mounted on the shaft and is adapted to bear against the head 57, said plate having lugs 59 projecting forwardly therefrom with holes 60 formed therein.

Suitable means is provided for expanding the shoe tree longitudinally, that is, for pressing against the heel block 55 when the latter is in a shoe to move the shaft 42 and the toe blocks out-

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wardly therefrom. This means may also be used to rotate the shaft to expand the toe blocks laterally. One way of doing this is to provide a lever 64 which is pivotally mounted at its lower end at 65 on the shaft just back of the toe blocks. This lever is provided with spaced forwardly extending fingers 66 which are adapted to overlap the outer surfaces of the plates 35 and 36 at their rearward ends when the lever is in a forward position.

A connecting link 67 extends rearwardly from the lever above its pivot point to the plate 58. This link may be in the form of a U-shaped wire having at its free ends downwardly projecting prongs 68 which extend through the holes 60 of the lugs 59 mounted on said plate. Thus, when the lever is moved forwardly, the plate 58 is also moved forwardly to free the heel block 55. The lever is left in this forward position when the shoe tree is not in use. When the lever is moved rearwardly, the fingers 66 clear the plates 35 and 36 to free the toe blocks, and the link 67 moves the plate 58 against the head 57 of the sleeve 56 which, in turn, moves the heel block rearwardly, thus expanding the shoe tree longitudinally. Actually, the heel block cannot move rearwardly when it is positioned within a shoe so that the shaft 42 and the toe blocks must move forwardly. Any longitudinal adjustment for the shoe for which the shoe tree is intended may be made by turning the sleeve 56 before the lever is moved rearwardly.

The shaft 42 may now be rotated by pressing the lever to one side. This moves the lugs 48 and 49 into the recesses 45 and 46 to expand the toe blocks. Suitable means is provided for locking the shaft and the toe blocks in this position. One way of accomplishing this is shown in Figures 5 to 9. The rod 42 is provided with a U-shaped section 72 between the lever 64 and the inner ends of the toe blocks. A keeper 73 is pivotally mounted on a pin 74 which extends longitudinally of the shaft to one side of the axis thereof. The keeper extends to one side of the shoe tree at the U-shaped section 72 thereof, and has locking teeth 75 on its upper surface. An arm 76 projecting forwardly from one side of the lever 64 adjacent its pivot underlies the keeper 73, and when the lever is in the position shown in Figure 5, this arm retains the keeper in a substantially horizontal position, as in Figure 7.

On the opposite side of the shaft 42, a trigger 78 is pivotally mounted at 79 on the side of the U-shaped section 72. This trigger normally projects upwardly and has a rearward extension 80 with a recess 81 formed in the upper edge thereof into which a lug 82 on the lower end of the arm 64 movably fits. Another lug 83 on the lower end of said arm overlaps the end of the trigger extension 80. A pawl 86 normally extends transversely of the shoe tree above the U-shaped section 72. This pawl is pivotally mounted on a pin 87 projecting rearwardly from either the plate 35 or the toe block 37. The pawl also is formed with a shoulder 88 on its lower surface adjacent its pivot.

When the lever 64 is in its normal position, the lug 82 maintains the trigger 78 in a vertical position, at which time its upper end engages the shoulder 88 of the pawl 86 to maintain the latter in a substantially horizontal position, see Figure 7. When the lever is moved rearwardly, as in Figure 6, the lug 82 releases the trigger extension 80, while the lug 83 raises said extension upwardly

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to pivot the trigger away from the pawl shoulder, thus freeing the pawl. At the same time, this movement of the lever raises the arm 76 which, in turn, pivots the keeper 73 into a substantially vertical position beneath the pawl. This prevents the pawl from dropping downwardly, see Figure 8.

When the lever is rotated to one side to rotate the shaft 42 and expand the toe blocks 37 and 38, the keeper is rocked to one side, thus allowing the pawl to drop down and engage its locking teeth 75, see Figure 9. When in this position, the pawl prevents the lever and shaft from being rotated back to their normal position. The toe blocks are now locked in their expanded position.

When the lever is moved forwardly, the arm 76 pivots downwardly to release the keeper so that it drops away from the pawl back into the horizontal position shown in Figure 7. There is now nothing to prevent the lever from being rotated into its normal vertical position to allow the toe blocks to retract or move towards each other.

With the arrangement just described, the rearward movement of the operating lever expands the shoe tree longitudinally to press the toe blocks into the toe portion of a shoe, and the lateral movement thereof expands the toe blocks laterally and locks them in this position. The forward movement of the operating lever from this position retracts the shoe tree longitudinally and unlocks the device which holds the toe blocks in their expanded position. When the lever is moved back to its vertical position, the toe blocks are retracted.

The stretching operation is aided by heating up shoes in a warming oven before using the device. This softens up the leather and allows the toe blocks, which carry any foot distortions, such as bunions and corns, to leave a more permanent impression.

While the toe blocks and separating plates may be separate parts as shown and described, it is obvious that the filler plate alone may be used in the mould and the material poured into the cavities such that it is relatively hard when set. In this case, the filler plate would have protuberances in its opposite faces capable of forming the grooves and recesses in the inner surfaces of the blocks.

While the term "clay pack" has been used in connection with the above-described mould, it is to be understood that this term as used in the specification and claims is intended to include any mouldable substance which may be used for taking an impression of a foot.

What I claim as my invention is:

1. An adjustable shoe tree comprising a pair of toe blocks side by side which combine to form a block of exactly the shape of the forward part of the human foot for which it is designed, a shaft extending between the toe blocks and beyond the inner ends thereof, a heel block slidably connected to the opposite end of the shaft, an operating lever pivotally mounted on and extending upwardly from the shaft, means on the lever removably engaging portions of the toe blocks when the lever is moved forwardly to hold said blocks together, means connected to the lever and extending to the heel block to engage the latter, said lever being movable rearwardly to release the toe blocks and move the latter forwardly when the heel block is positioned in the back of a shoe and laterally to turn the shaft, and means on the shaft spreading the toe

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blocks apart in the shoe when said shaft is rotated laterally by the lever to maintain the shoe in the shape of said foot.

2. An adjustable shoe tree comprising a pair of toe blocks side by side which combine to form a block of exactly the shape of the forward part of the human foot for which it is designed, a shaft extending between the toe blocks and beyond the inner ends thereof, a heel block, a sleeve threaded into the inner edge of the heel block slidably mounted on the end of the shaft remote from the toe blocks, a plate slidably mounted on the shaft to bear against the sleeve, means connecting the plate to the lever, said lever being movable longitudinally of the shaft to move the toe blocks forwardly when the heel block is positioned in the back of a shoe and laterally to turn the shaft, and means on the shaft spreading the toe blocks apart in the shoe when said shaft is rotated to maintain the shoe in the shape of said foot.

3. An adjustable shoe tree comprising a pair of toe blocks side by side which combine to form a block of exactly the shape of the forward part of the human foot for which it is designed, said blocks having parallel inner adjacent surfaces, opposed longitudinal grooves in the inner surfaces of the blocks, opposed recesses formed in said inner surfaces at the grooves thereof, a shaft fitting in the grooves of the toe blocks and extending beyond the inner ends thereof, diametrically opposed lugs on the shaft in line with and fitting in each pair of opposed recesses in the blocks, said lugs normally being in a vertical plane, a heel block slidably connected to the opposite end of the shaft, an operating lever pivotally mounted on the shaft for pivotal movement longitudinally thereof, means connected to the lever and extending to the heel block to engage the latter, said lever being movable longitudinally of the shaft to move the toe blocks forwardly when the heel block is positioned in the back of a shoe and laterally to turn the shaft to move the lugs out of the vertical plane in the toe block recesses laterally to spread said blocks apart.

4. An adjustable shoe tree as claimed in claim 1 including means on one of the toe blocks and the shaft for removably locking the lever in its lateral position.

5. An adjustable shoe tree as claimed in claim 4 in which the lever locking means comprises an upwardly extending keeper pivotally mounted on the shaft to one side thereof, locking teeth formed on the inner surface of the keeper, means on the lever for moving the keeper into a substantially vertical position when the lever is moved rearwardly, and a pawl pivotally mounted on one of the toe blocks and resting on the upper end of the keeper when the latter is in a vertical position, said pawl dropping down to engage the keeper teeth when the lever is moved laterally to move the end of the keeper from beneath the pawl.

6. An adjustable shoe tree as claimed in claim 5 including a trigger pivotally mounted on the shaft beneath the pawl, and means on the lever for moving the trigger to raise the pawl clear of the keeper when the lever is moved into its forward position.

7. An adjustable shoe tree comprising a pair of toe blocks side by side which combine to form a block of exactly the shape of the forward part of the human foot for which it is designed, a shaft extending between the toe blocks and be-

yond the inner ends thereof, a heel block slidably connected to the opposite end of the shaft, an operating lever pivotally mounted on the shaft for pivotal movement longitudinally thereof, means connected to the lever and extending to the heel block to engage the latter, said lever being movable longitudinally of the shaft to move the toe blocks forwardly when the heel block is positioned in the back of a shoe and laterally to turn the shaft, and means on the shaft spreading the toe blocks apart in the shoe when said shaft is rotated laterally by the lever to maintain the shoe in the shape of said foot.

8. An adjustable shoe tree as claimed in claim 7 including means supported by the shaft removably locking the lever in its lateral position after it is moved therein.

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