

No. 658,547.

Patented Sept. 25, 1900.

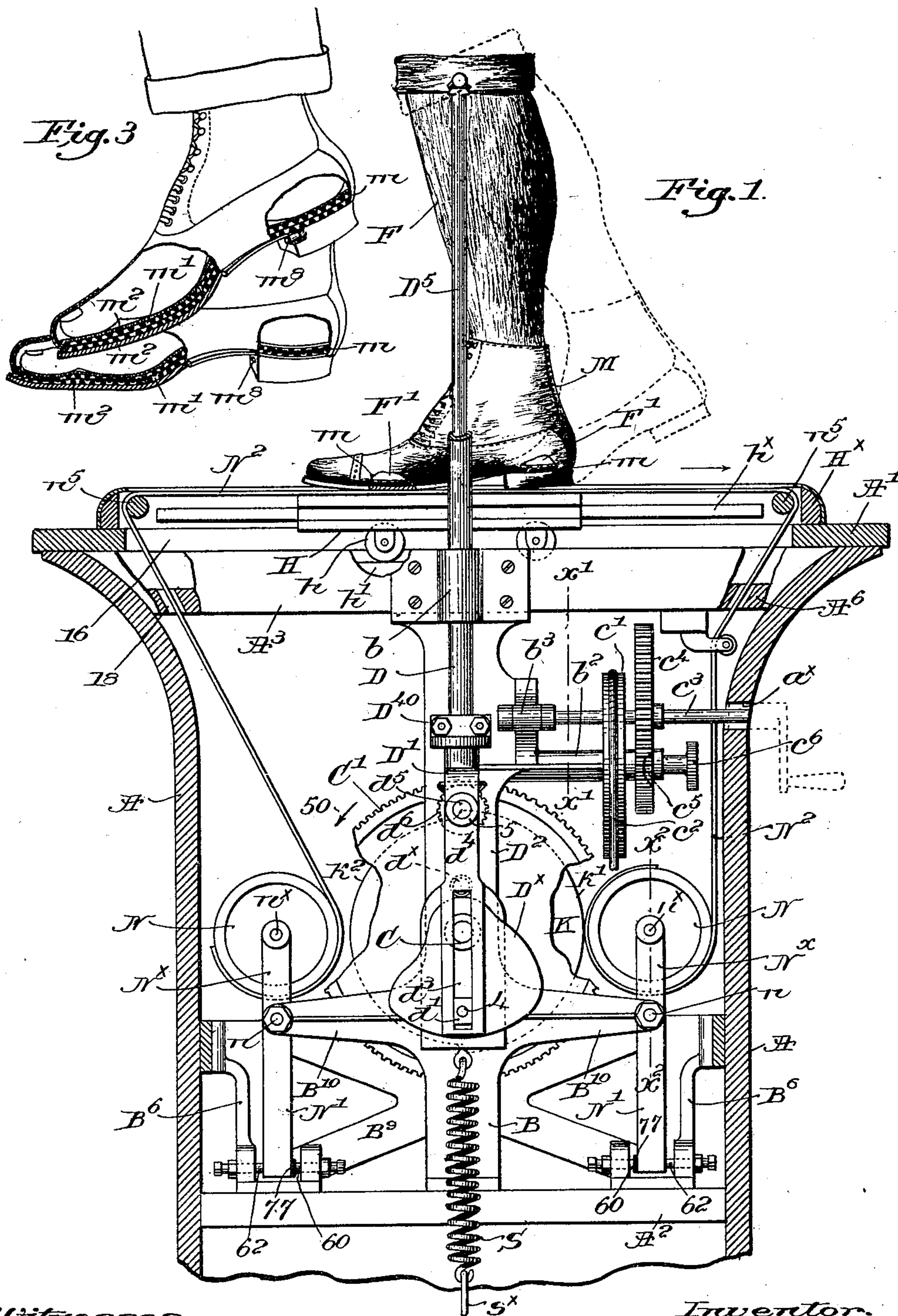
M. A. KENNEDY.

APPARATUS FOR EXHIBITING BOOTS OR SHOES.

(Application filed Jan. 20, 1900.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.
Thomas J. Drummond,
Edward G. Allen

Inventor.
Michael A. Kennedy,
by Wesley Gregory, atty.

No. 658,547.

Patented Sept. 25, 1900.

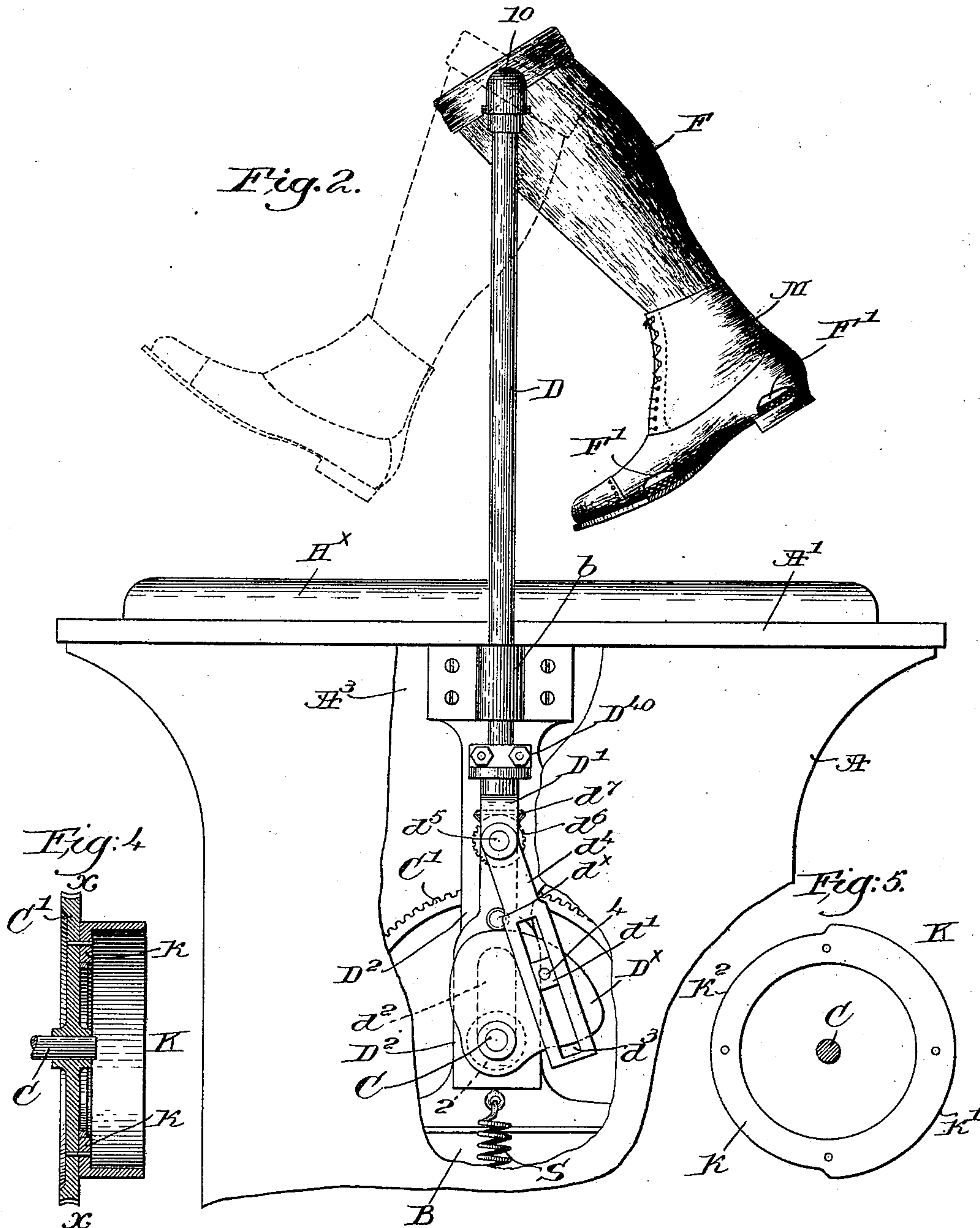
M. A. KENNEDY.

APPARATUS FOR EXHIBITING BOOTS OR SHOES.

(Application filed Jan. 20, 1900.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses.
Edward F. Allen
Thomas J. Drummond.

Inventor.
Michael A. Kennedy,
by Dorby & Gregory Attys.

No. 658,547.

Patented Sept. 25, 1900.

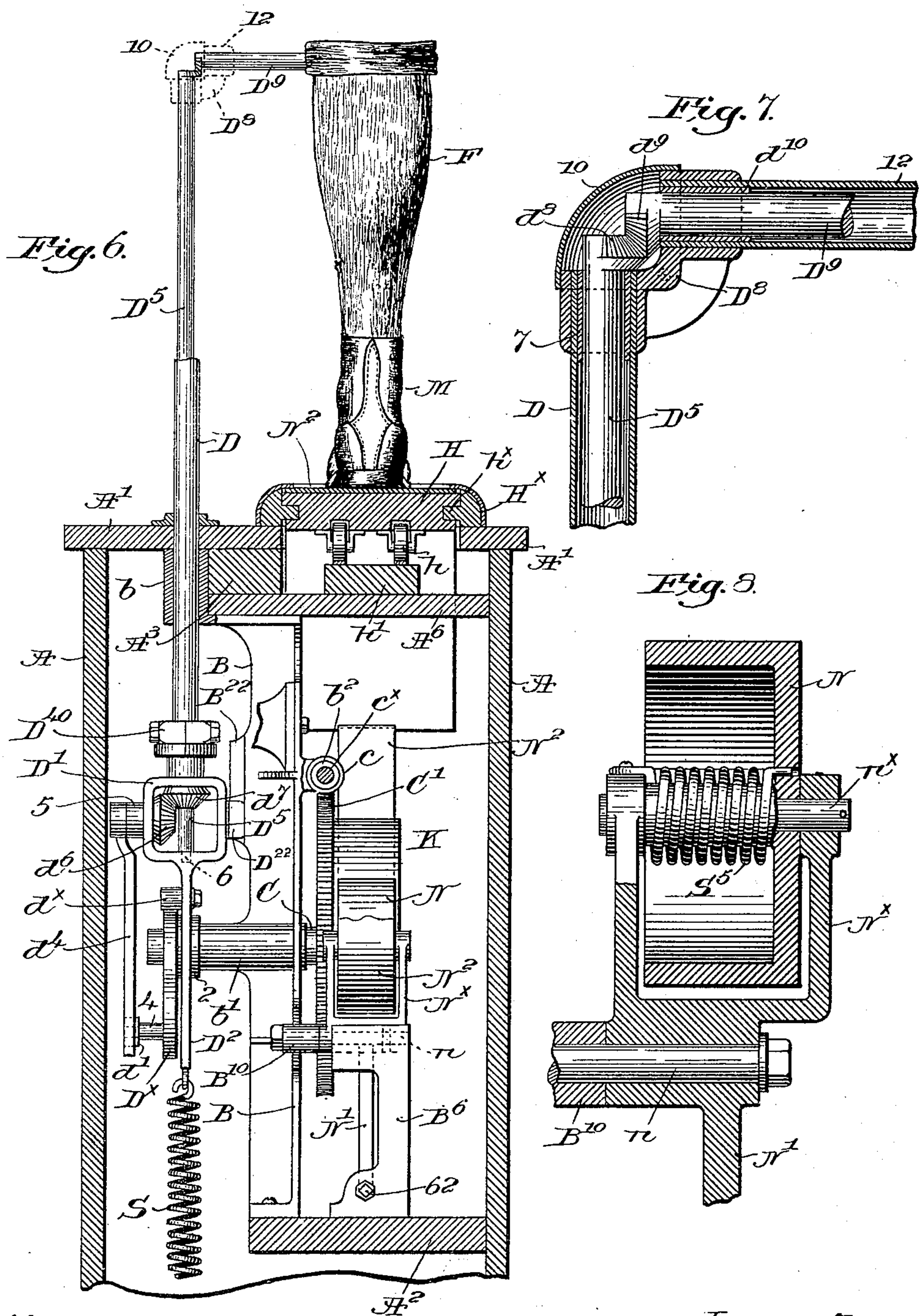
M. A. KENNEDY.

APPARATUS FOR EXHIBITING BOOTS OR SHOES.

(Application filed Jan. 20, 1900.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses.
Thomas J. Drummond.
Edward G. Allen.

Inventor.
Michael A. Kennedy,
by Wesley Gregory, Attys.

UNITED STATES PATENT OFFICE.

MICHAEL A. KENNEDY, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR EXHIBITING BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 658,547, dated September 25, 1900.

Application filed January 20, 1900. Serial No. 2,094. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL A. KENNEDY, a subject of the Queen of Great Britain, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Apparatus for Exhibiting Boots or Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of an apparatus for exhibiting and demonstrating the action of the human foot upon the sole and heel portion of a boot or shoe, and more particularly to illustrate the action of a ventilated boot or shoe comprising in its construction a collapsible center or intermediate sole by means of which ventilation in the interior of the boot or shoe is effected, such a structure being shown in United States Patents, Reissue No. 11,694, dated September 20, 1898, and No. 616,112, dated December 20, 1898. In the use of a center sole, such as embodied in said patents the weight of the user is brought to bear as the shoe is placed upon the ground or surface walked upon and as the sole collapses air is forced therefrom up around the foot and out of the top of the shoe, and when the foot is lifted and pressure removed from the collapsed center sole it regains its normal position and external air is drawn in through a suitable inlet. As this operation is peculiar and novel, it can only be thoroughly demonstrated by imparting to such a boot or shoe movements similar to those of the human foot in walking, the boot or shoe being cut away at appropriate parts in order that its interior and the operation of the collapsible or ventilating sole may be seen, and one form of apparatus for effecting such demonstration is herein illustrated and described.

While I have herein shown one practical embodiment of my invention, however I am not restricted thereto, as I have not attempted to show or describe the various modifications or changes which might be made without departing from the spirit and scope of my invention.

Figure 1 is a front elevation of one form of apparatus embodying my invention, the casing inclosing the mechanism being shown in

section, the motor being omitted, and the boot or shoe to be exhibited is shown as firmly resting upon a tread-rest. Fig. 2 is a similar view showing the boot or shoe as about to begin its forward swing, the front of the casing being partly broken out. Fig. 3 is an enlarged view of two shoes in the positions assumed by the shoe in Figs. 1 and 2 to more clearly illustrate the action of the apparatus. Fig. 4 is a diametral sectional view of a portion of the means for effecting the movement of the tread-rest. Fig. 5 is a section on the line $x x$, Fig. 4, looking to the right, and showing the ring-controlling cam detached. Fig. 6 is a right-hand side elevation of the apparatus shown in Fig. 1 with the casing, tread-rest, and some of the adjacent parts in section, the parts at the right of the line $x' x'$, Fig. 1, being omitted for the sake of clearness. Fig. 7 is an enlarged vertical sectional view of the head of the rising and falling carrier and the connections mounted thereon for imparting a forward and back swinging movement to the boot or shoe to be exhibited; and Fig. 8 is an enlarged sectional detail on the line $x^2 x^2$, Fig. 1, of a portion of the means for moving the tread-rest.

In the act of walking the foot is placed upon the supporting-surface, the body moves forward, the foot is lifted, swung forward in advance of the body, and then lowered again to the supporting-surface; but in my present invention the tread-rest, which corresponds to the ground or floor, is moved relatively to the means which support the shoe, said means, corresponding to the human body, being of course fixed in my apparatus.

I prefer to inclose the actuating mechanism herein shown, as by a casing A, which is provided with a longitudinally-slotted top A' and a transverse shelf A^2 in its lower portion, the latter having secured to it an upright standard B, provided at its upper end with a vertical bearing b and secured to a cross-girt A^3 of the casing. A sleeve-like bearing b' projects from the front of the standard and supports a shaft C, having fast upon it a large worm-gear C' in mesh with a worm c , fast on a shaft c^x , mounted in a lateral bearing b^2 on the standard B, said shaft also having fast upon it a pulley c' , to receive a band or belt c^2 from any suitable source of

power (not shown) by which the worm and the worm-gear C' are rotated.

As it is sometimes desirable to operate the apparatus by hand, I have provided a crank-shaft c^3 , (shown only in Fig. 1,) its end projecting through a hole a^x in the casing to receive a crank or other suitable device to rotate it, said shaft c^3 having fast thereon a gear c^4 in mesh with a pinion c^5 , normally loose on the worm-shaft. When the latter is to be rotated by hand, the pinion c^5 is clamped on the shaft c^x by any suitable clamping-nut c^6 . The crank-shaft is shown in Fig. 1 as mounted in a bearing b^3 on the standard. A rising and falling carrier (herein shown as a tube D) is mounted to rise and fall in the bearing b , the lower end of the carrier having coupled thereto, as at D^{40} , the open head D' of a depending extension D^2 , the latter being shown as a flat plate slotted at d^2 to embrace the bearing b' , a collar 2 on the latter serving to guide the extension, a stout spring S being attached at its upper end to the extension and fixedly secured at its lower end by a link s^x to the casing A. A carrier-controlling cam D^x is secured to the shaft C in front of the extension D^2 , the cam-hub acting as a guide in front of the latter, a roller or other stud d^x on the extension traveling on the edge of the cam and drawn toward the latter by the spring S. The shape of this cam is shown in Figs. 1 and 2, and in the former the carrier is in its lowest position, while in Fig. 2 it is shown fully elevated, the carrier being raised and lowered at each complete revolution of the cam. A wrist-pin 4 on the cam carries a swivel-block d' , which enters and slides in a longitudinal slot d^3 in an arm d^4 , secured to a short shaft d^5 , mounted in a bearing 5 on the head D' , a bevel-pinion d^6 being secured to said shaft within the head and meshing with a similar pinion d^7 , fast on a shaft D^5 , extended up through the carrier and having a step-bearing 6 in the head. (See dotted lines, Fig. 6.) The head D' and the parts mounted thereon partake of the rising and falling movement of the carrier D, the shaft D^5 moving longitudinally with the latter; but the rotation of the cam D^x operates through the wrist-pin connection to also rock the arm d^4 and shaft d^5 , the partial rotation of the pinion d^6 in turn acting through the pinion d^7 to rotate the shaft D^5 first in one and then in the other direction.

Referring now to Fig. 7, the carrier, at its upper end, has a bushing 7, which forms a bearing for the shaft D^5 , the latter above said bearing having fast upon it a bevel segment-gear d^8 , which meshes with a similar segment-gear d^9 , fast on the end of a shaft D^9 , mounted in a bearing d^{10} on a bracket D^8 , secured to the carrier, the shafts D^5 D^9 being substantially at right angles to each other. A hood 10, carried by the bracket, protects the gears, and the shaft D^9 is inclosed, as herein shown, by a tubular casing 12, and it will be mani-

fest that rotative movement of the upright shaft D^5 will be transmitted to the overhanging shaft D^9 , which projects over the top of the case A. The overhanging shaft D^9 is attached to the upper end F of a form shown as leg-shaped, its lower end F' being shaped like a foot and made, preferably, of rubber to secure the requisite flexibility and to conform as much as possible to the movement of the human foot in the act of walking, the shoe or boot to be exhibited being mounted on the form, a shoe M being herein illustrated.

When the shoe descends, as shown in Fig. 1, a firm rest must be provided for the sole and heel thereof, yet this rest must be capable of movement with the shoe when it is swung backward, and for this purpose I have herein shown the tread-rest as a carriage H, longitudinally grooved to engage guides h^x on bars H^x , secured to the casing top A' at the front and back of the slot 16 therein, the carriage preferably having supporting-wheels h , which travel on a track h' , carried by a transverse partition A' of the casing, the carriage moving very easily in the direction of the swinging movement of the shoe. Now when the cam D^x is in the position shown in Fig. 1 the spring S draws the carrier D down, until the shoe rests upon the tread-rest H, the form F F' then being in mid-position, and thereafter as the shaft C is rotated in the direction of the arrow 50 the cam will slowly elevate the carrier, while at the same time the wrist-pin 4 and coöperating portions, hereinbefore described, will effect the rotation of the shaft D^9 , so that the shoe will be swung back. In passing from the full-line position, Fig. 1, to dotted-line position the heel will be first raised from the tread-rest, but the sole will continue in engagement therewith, and the tread-rest or carriage H must move in unison therewith until the roll d^x engages the highest part of the cam D^x , as shown in Fig. 2, at which time the carrier will have raised the shoe to the highest point and completely out of engagement with the tread-rest, the backward swing also having been completed. As the cam D^x continues its rotation from the position shown in Fig. 2 the direction of rotation of shaft D^9 will be reversed, and the shoe will be swung forward into dotted-line position by the time the descent of the carrier begins, and while the backward swing begins the descent of the carrier will bring first the heel and then the sole of the shoe into engagement with the tread-rest, which must have been brought into the proper place.

Any suitable means may be employed to position the tread-rest, and herein I have shown one form of means for positively reciprocating said tread-rest, so that it will be moved in unison with the shoe when engaged by the tread portion of the latter and positively moved in the opposite direction when the shoe is lifted so that the tread-rest will

be in position to be engaged by the shoe when it is lowered and partly moved back from the dotted-line position illustrated in Fig. 2.

Referring to Fig. 4, the worm-gear C' has suitably secured to it the flange k of a ring-like box-cam K, the periphery of which has a high portion k' and a low portion k², Figs. 1 and 5, substantially semicircular each, the high portion being adapted to engage alternately two like drums N, each mounted to rotate on a pin n^x in a yoke N^x, Fig. 8, fulcrumed at n on a lateral arm B¹⁰ of the standard B, (see Fig. 1,) the yoke having a depending leg N', which is held in adjusted position by oppositely-acting set-screws 60 62, mounted in a bracket B⁶, secured to the casing. Each drum N has, as herein shown, one end of a web or flexible belt N² passed partly around its periphery and secured thereto at the extremity in any suitable manner, the yoke being adjusted so that when the high part k' of the cam K is opposite a drum it will frictionally engage the web thereon and rotate the drum, the right-hand drum in Fig. 1 being shown in operative engagement with the cam. The web or belt N² is shown as passed over the top of the tread-rest H, and it is secured thereto so that the aforesaid rotation of the right-hand drum will move the tread-rest in the direction of movement of the shoe M. Guide-rolls n⁵ are mounted at the ends of the guides k^x to support the belt, the latter passing down through the slot 16 in the top plate A' and through slots 18 in the shelf A⁶.

The timing of the cam K and the drums is such that when the shoe is in engagement with the tread-rest and moving backward the said tread-rest will be moved in unison therewith.

In order to hold the belt N² taut while unwinding from the free drum, each of the drums is provided with a spring S⁵, one end of which is secured to one of the arms of the yoke N^x and the other end to the drum, the latter being made hollow, as shown in Fig. 8, and open at its rear side, the spring being coiled about an enlarged portion of the spindle n^x. The spring is so coiled that when the drum is actuated by the pull of the belt the spring will be unwound, the tension thereof serving to keep the belt taut, and consequently when the drum, with the unwound spring, is oppositely rotated by the cam K the spring will be wound up again.

Referring to Fig. 1, the part k² of the cam K will leave the right-hand drum when the shoe is lifted into full-line position, Fig. 2, by the carrier, and thereafter the left-hand drum will be rotated positively to move the tread-rest H to the left into position to be engaged by the shoe on its descent, as has been described.

The brackets B⁶ are shown in Fig. 1 as connected by a crossed girt B⁹, strengthening the casing.

The spring S depresses the shoe in a yield-

ing manner upon the tread-rest and gives when necessary as the form F' is flexed or bent by the walking movement imparted thereto.

Referring to Fig. 3, the shoe M is supposed to be resting upon a supporting-surface, and it will be noticed that the ball of the foot and the heel are the main points of support and pressure and the toe to a lesser degree, so that the collapsible sole m is most completely collapsed beneath the heel and ball of the foot, which condition pertains when the shoe is in full-line position, Fig. 1.

The shoe M in Fig. 3 shows the foot as lifted entirely from the tread support or surface, so that the collapsible sole has resumed its normal condition, as will be the case when the shoe in the apparatus herein described is in both full and dotted line positions, Fig. 2.

Briefly, the collapsible sole m comprises a thin elastic web or integument m', Fig. 3, having projections m² on its upper and lower faces of much less elasticity, the projections on one face being located opposite the spaces between the projections on the other face, as in the patents hereinbefore referred to, and operating as therein set forth, a suitable valve m⁸ in the heel permitting the entrance of air when the foot is lifted. A vertical guide-rib B²² is made on the standard B to be engaged by a suitable ear D²² on the rear side of the open head D' (see Fig. 6) to prevent the latter from having any rotative movement during the operation of the apparatus.

In practice I prefer to interpose a spring or other yielding buffer between the end of the set-screw 60 and the depending leg N' of the yoke to provide for any inequality which might exist in the face of the cam K, and herein I have shown the inner end of each screw as provided with a buffer 77, of rubber, which bears against the leg N'.

It will be manifest that changes and modifications may be made in various particulars in respect to the apparatus herein shown and described without departing from the spirit and scope of my invention, and so far as I am aware it is broadly novel to simulate the movement of the human foot in the act of walking for the purpose of exhibiting or demonstrating the effect thereof upon a boot or shoe.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to impart movement thereto simulating the act of walking, and a tread-rest to be intermittently engaged by the tread portion of the boot or shoe and adapted to move in unison therewith when so engaged.

2. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to impart movement thereto simulating the act of walking, a tread-rest to be intermittently engaged by the tread portion of the boot or shoe and adapted to move in

unison therewith when so engaged, and means to thereafter move the tread-rest in the opposite direction.

3. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to raise, lower, and swing the same as in the act of walking, a tread-rest to be engaged by the tread portion of the boot or shoe upon its descent and to move in unison therewith during a portion of its swinging movement, and means to thereafter return the tread-rest into position to again be engaged by the boot or shoe upon its next descent.

4. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to raise, lower, and swing the same as in the act of walking, a tread-rest to be engaged by the tread portion of the boot or shoe upon its descent and to move in unison therewith during a portion of its backward swing, and means operative after the rise of the boot or shoe to return the tread-rest into position to be engaged by the boot or shoe upon its next descent.

5. In an apparatus of the class described, a rising and falling carrier, means operatively connected therewith to support the boot or shoe to be exhibited and to swing the same forward and back, and a tread-rest to be intermittently engaged by the tread portion of the boot or shoe as the carrier descends and adapted to move therewith when it is swung back, the rising of the carrier disengaging the boot or shoe from the tread-rest and permitting the former to be swung forward.

6. In an apparatus of the class described, a yieldingly-controlled rising and falling carrier to support the boot or shoe to be exhibited, means to intermittently swing the latter forward and back, a tread-rest to be engaged by the tread portion of the boot or shoe when the carrier descends, and to move therewith during the backward swing, and means to move the tread-rest in the opposite direction after the carrier has risen to disengage the boot or shoe therefrom.

7. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to impart movement thereto simulating the act of walking, a tread-rest to be intermittently engaged by the tread portion of the boot or shoe upon its descent, and means to move the tread-rest in unison with the backward-swinging boot or shoe when so engaged, and to thereafter move the tread-rest to its initial position.

8. In an apparatus of the class described, a flexible form for the boot or shoe, a rising and falling carrier, means movable therewith and connected with the form, to swing it back and forth, means to raise the carrier when the form is at the end of its backward swing and to lower it when the forward swing has been effected, and a tread-rest to be engaged by the tread portion of the boot or shoe when

the form is lowered and to move in unison therewith when it is swung backward.

9. In an apparatus of the class described, a flexible form for the boot or shoe, a rising and falling carrier, means movable therewith and connected with the form, to swing it back and forth, means to raise the carrier when the form is at the end of its backward swing and to lower it when the forward swing has been effected, a tread-rest to support the shoe when the carrier descends, and means to reciprocate the tread-rest in the direction of movement of the form when swung relatively to the carrier.

10. In an apparatus of the class described, an upright carrier, means to reciprocate it vertically, a form for the boot or shoe to be exhibited, an overhanging shaft mounted on the carrier and to which the form is attached, means mounted on the carrier to oscillate said shaft to thereby swing the form relatively to the carrier, and a movable tread-rest to support the shoe when the carrier descends.

11. In an apparatus of the class described, a vertically-movable, tubular carrier, an overhanging shaft mounted on the upper end of the carrier, a form attached to the said shaft, an upright shaft within the carrier and geared to the overhanging shaft, and means partly supported by the carrier to rotate the upright shaft first in one and then in the other direction, said means including a cam to control the vertical movement of the carrier.

12. In an apparatus of the class described, a vertically-movable carrier, a depressing-spring therefor, a cam to lift the carrier and to govern its descent, a form, means movable with the carrier to support the form and to swing it in opposite directions relatively to said carrier, and an eccentric connection between the cam and said means and actuated by the cam to operate the said means.

13. In an apparatus of the class described, a main shaft, a cam thereon, a vertically-movable carrier controlled by the cam, an overhanging shaft mounted on the carrier, a form attached to the shaft, and means actuated by said cam to rock the shaft in opposite directions and thereby swing the form attached thereto.

14. In an apparatus of the class described, a vertically-movable carrier, two shafts movable therewith and geared together, a form attached to one shaft, a bevel-pinion on the other, a meshing pinion supported by the carrier, a swinging arm to rock the latter pinion, a cam to control the vertical movement of the carrier, and a wrist-pin on said cam in sliding engagement with and to swing said arm as the cam rotates.

15. In an apparatus of the class described, means to support the boot or shoe to be exhibited and to impart movement thereto simulating the act of walking, a tread-rest reciprocable below the path of the boot or

shoe, guides for the tread-rest, and means to reciprocate the tread-rest during a portion of the movement of the boot or shoe.

16. In an apparatus of the class described,
5 a reciprocable tread-rest, guides therefor, two oppositely-rotatable drums, a flexible connection between each drum and the tread-rest, and means to rotate first one and then the other drum, to effect the reciprocation of
10 the tread-rest.

17. In an apparatus of the class described, a reciprocable tread-rest, two oppositely-rotatable drums, a spring to resist the rotation of each drum in one direction, connections
15 between the tread-rest and the drums, and means to rotate first one drum and then the other in the direction of its spring, to effect reciprocation of the tread-rest.

18. In an apparatus of the class described, a reciprocable tread-rest, two oppositely-rotatable drums, flexible connections between
20 the tread-rest and the drums, a rotatable shaft, a cam thereon having a high portion to engage said drums alternately and rotate them frictionally in opposite directions, to
25 thereby effect the reciprocation of the tread-rest, and means to adjust the drums relatively to the actuating-cams.

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

MICHAEL A. KENNEDY.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.