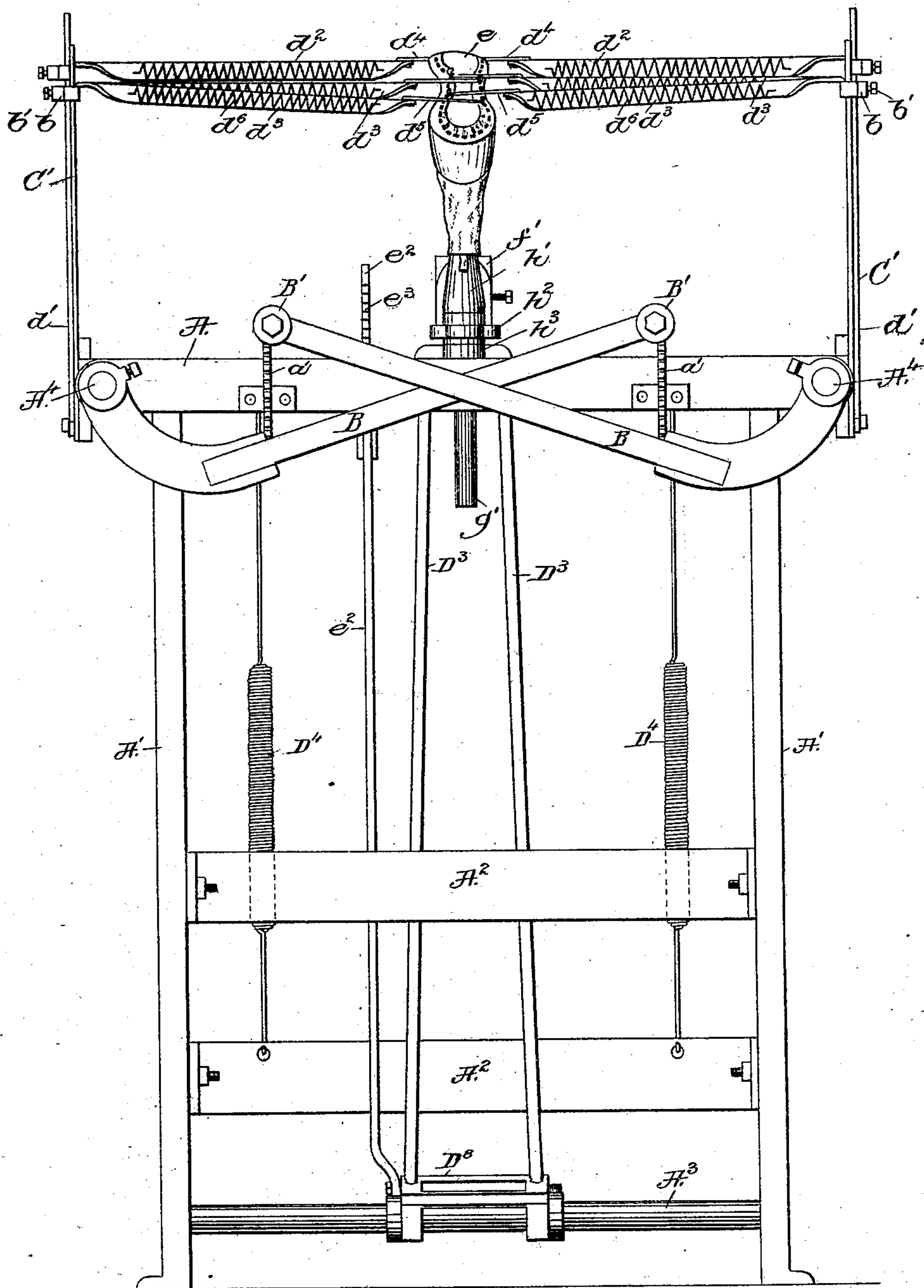


3 Sheets—Sheet 1.

LASTING MACHINE.

Fig: 1. Patented Dec. 4, 1888.



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(No Model.)

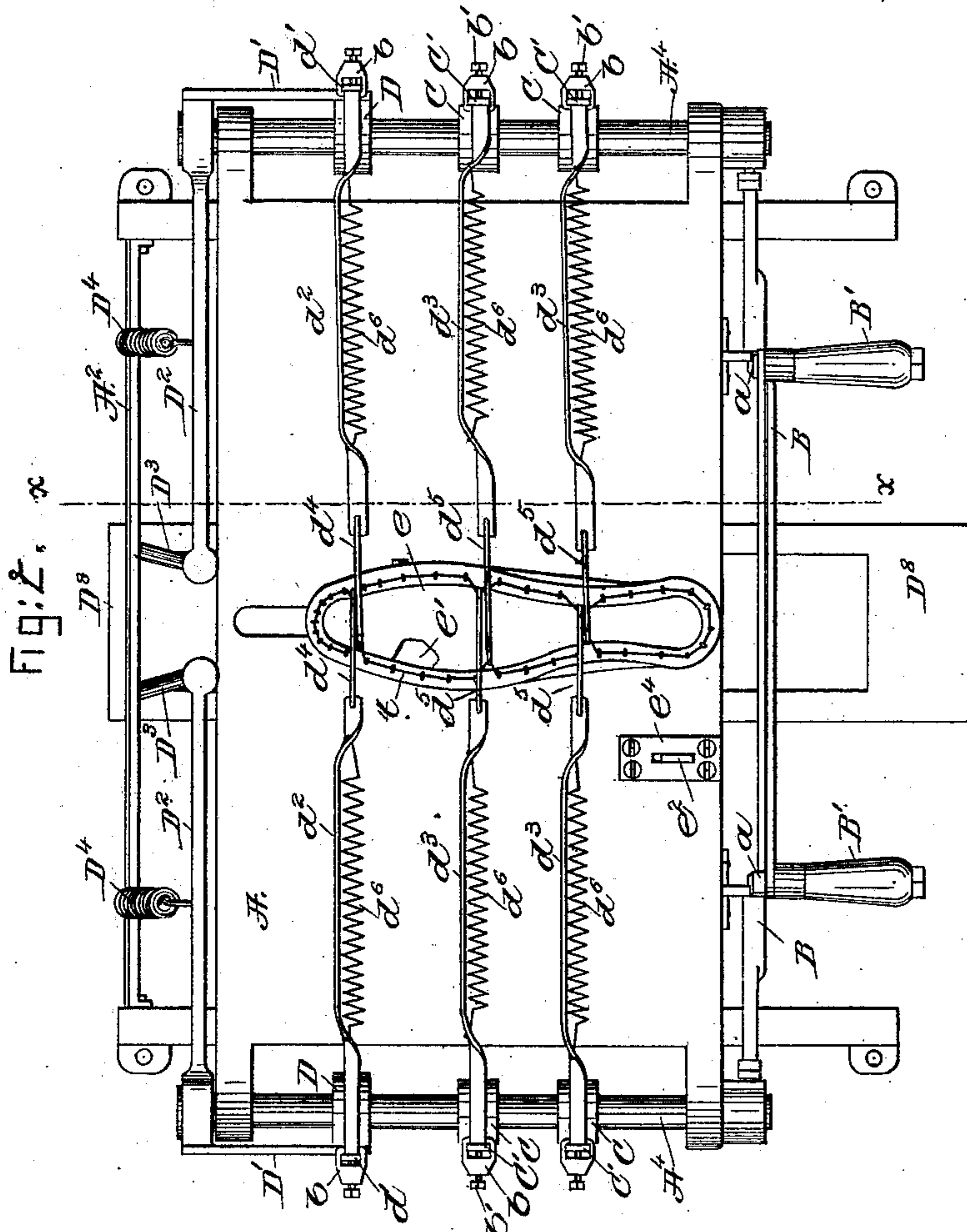
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R. HATHAWAY & E. G. PAULL.

LASTING MACHINE.

No. 393,760.

Patented Dec. 4, 1888.



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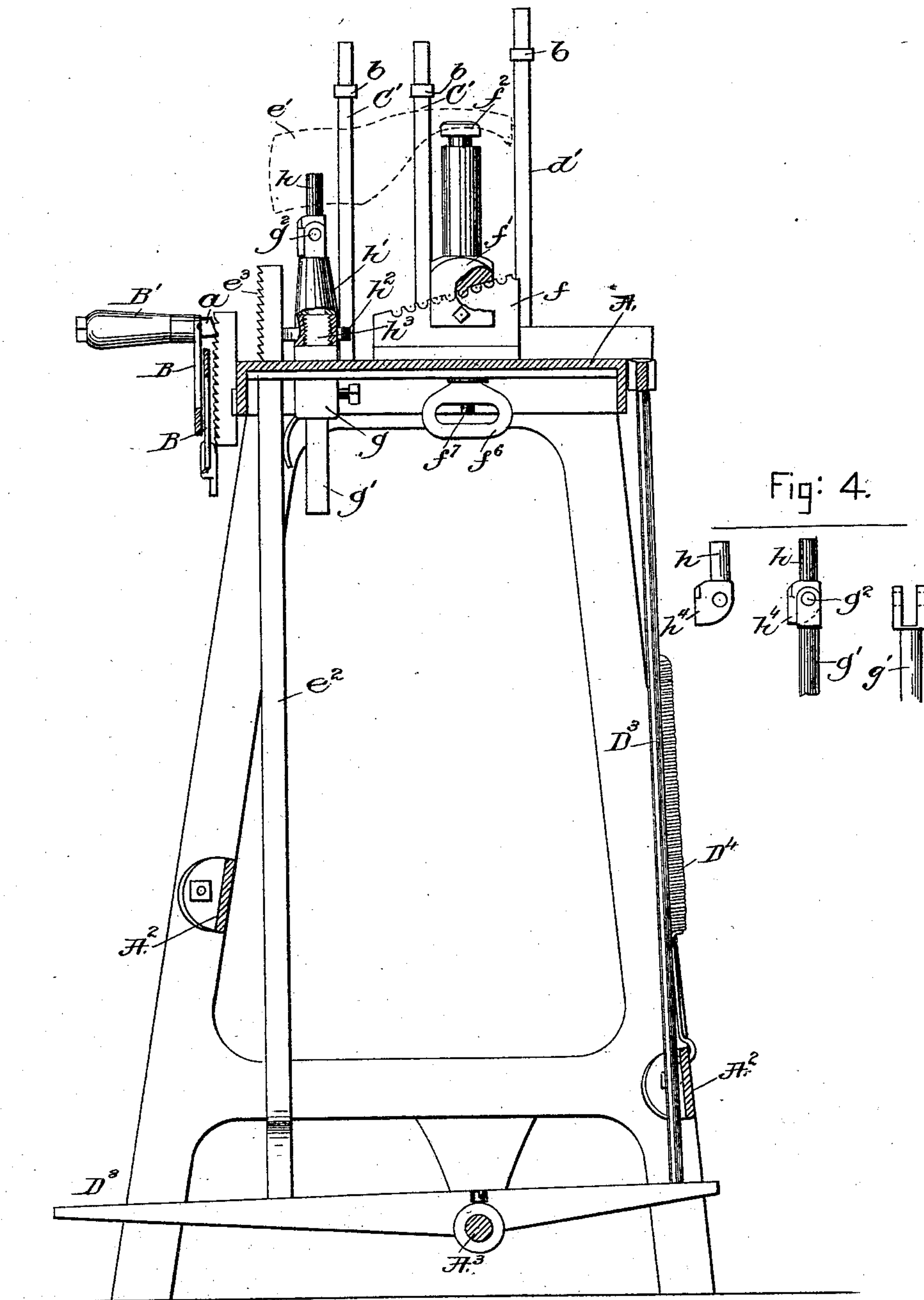
3 Sheets—Sheet 3.

R. HATHAWAY & E. G. PAULL.

LASTING MACHINE.

No. 393,760.

Fig: 3. Patented Dec. 4, 1888.



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UNITED STATES PATENT OFFICE.

RUSSELL HATHAWAY AND ELBRIDGE G. PAULL, OF FAIRHAVEN, MASSACHUSETTS, ASSIGNORS TO THE APPLGATE BOOT AND SHOE LASTING COMPANY, OF PORTLAND, MAINE.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 393,760, dated December 4, 1888.

Application filed January 27, 1888. Serial No. 262,148. (No model.)

To all whom it may concern:

Be it known that we, RUSSELL HATHAWAY and ELBRIDGE G. PAULL, of Fairhaven, county of Bristol, and State of Massachusetts, have
5 invented an Improvement in Lasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.
10 This invention relates to that class of lasting-machines which is adapted to lay the edge of the upper over upon the inner sole or bottom of the last through the action of a shirring cord, thong, or wire connected with the
15 edge of the upper, the said cord, thong, or wire being drawn upon and acting as a puckering or shirring device to gather the upper into a smaller space. The shirring cord, thong, or wire is preferably connected with
20 the upper through a pocket or channel, and, as herein shown, the said pocket or channel consists of a series of loops of thread pushed through from the inner side of the upper outward a short distance from its edge; but instead of the particular shirring cord, thong,
25 or wire herein shown we may employ any other well-known or equivalent cord, thong, or wire, as, for instance, in United States Patent No. 248,566, dated October 25, 1881.
30 The machine herein to be described contains a toe-rest and heel-pin adjustable one with relation to the other to constitute a jack by which to hold the last and shoe-upper thereon firmly in position while the cord,
35 thong, or wire is being drawn, as described, to lay the edges of the upper over upon the inner sole or last bottom. The cord, thong, or wire is engaged near the toe and at two or more points between the ball of the foot and
40 the heel by hooks or draw-bars attached by flexible connections to the ends of arms or levers set in motion by rock-shafts under the control of suitable levers to be moved by the hand or by foot, each of the said levers having
45 co-operating with them suitable means by which to retain them in the positions in which they may be left by the operator.

Our invention consists, essentially, in the combination, with a jack to hold the shoe and
50 arms or levers and means to move them, of

hooks or draw-bars and intermediate connections between the said hooks or draw-bars and the said arms, whereby by turning the said rock-shafts or the said arms or levers the said
hooks or draw-bars will be made to pull upon 55 and draw the said cords, thongs, or wires in such manner as to lay the edges of the upper snugly over upon the inner sole or bottom of the last.

Other features of our invention will be 60 pointed out in the claims at the end of this specification.

Figure 1 in front elevation represents a lasting-machine embodying our invention; Fig. 2, a plan view thereof; Fig. 3, a section 65 in the line *x*, Fig. 2, looking to the left, the shoe and the hooks or draw-bars and their connections being omitted, the rotating nut co-operating with the heel-pin being broken out, the toe-rest carriage being also broken 70 out on the track; and Fig. 4 is a detail of the heel-pin.

The bed-plate A, supported upon suitable legs, A', joined together by cross-bars A² and a cross-rod, A³, has at its ends suitable bearings for like rock-shafts, A⁴. 75

Each rock-shaft A⁴ has attached to it a lever, B, (herein shown as provided with a handle, B',) each handle having a suitable projection, as *a*, to engage the teeth of a rack, *a'*, 80 the said projection and rack forming a locking device for the lever to retain it in the position in which it is left by the operator.

Each rock-shaft A⁴ has fast upon it two hubs, C, provided with upright arms C', each 85 arm having upon it a clamp, as *b*, which is held in position by a set-screw, *b'*. Each rock-shaft A⁴ has also mounted upon it loosely a hub, D, which is connected with a projection, D', of a lever, D², loosely fulcrumed upon the 90 said rock-shaft. The inner ends of the like levers D² are joined by like connecting-rods D³ to the rear end of a treadle, D⁸, or foot-lever having its fulcrum upon the rod A³, the said levers D² being normally acted 95 upon by spiral springs D⁴, connected therewith and with the cross-girt A², the said springs acting normally to keep the front end of the lever or treadle D⁸ elevated, as shown in Fig. 3. Each hub D has rising from it an 100

arm d' . The arms C' and d' have attached to them like clamps b . Each clamp in connection with the said arm holds the inner end of a flexible connection, d^2 or d^3 , the opposite end of which has attached to it a draw-bar or hook, d^4 or d^5 , the said connections, as herein shown, having co-operating with them spiral springs, as d^6 , which act normally to shorten the effective length of the said connections, so that when the operator grasps a hook or draw-bar and passes it across the shoe and engages it with the draw-cord, thong, or wire t at the opposite side of the shoe and then releases the hook or draw-bar the said spring assumes control of the connection and hook or draw-bar and maintains it in engagement with the said cord, thong, or wire.

In practice the hooks or draw-bars may be engaged with the draw-cords, thongs, or wire, as t , at different places with relation to the length of the shoe, as shown in Fig. 1, and the shoe having been properly jacked, as will be described, the operator will preferably first put his foot upon the treadle D^8 and operate the two arms d' to cause the hooks or draw-bars d^4 to draw the cord, thong, or wire in and about the toe of the upper, so as to lay the edge of the upper snugly over upon the inner sole, e , laid upon the bottom of the last e' , the treadle D^8 when depressed being retained in its depressed position through the agency of the locking-bar e^2 , having a series of notches e^3 , which engage the edge of a plate, e^4 , herein shown as attached to the bed-plate A by screws. (See Fig. 2.) The toe having been lasted, or substantially so, the operator will then grasp the handles B' or in any other usual or suitable way move the levers B , turning the rock-shafts A^4 , and with them the arms C' , thus, through the connections d^3 , pulling the hooks or draw-bars d^5 , so that they then, in engagement with the draw-cord, thong, or wire t , will draw the upper about the last and over upon the inner sole thereon along the ball of the foot and into the shank and more or less about the heel, as necessity may require.

In practice there may be as many arms C' as may be desired, that depending upon the length of the shoe and the class of work to be done.

The bed-plate A has mounted upon it an inclined track, f , provided at its upper end with a series of notches, the said track receiving upon it the lower end of a carriage, f' , having at its upper end a toe-rest, f^2 , which may be padded in any usual manner.

The lower end of the carriage is slotted to embrace the track, and in the slot there is a projection, (see Fig. 3,) which may enter in one of the notches and retain the carriage in position upon the inclined track. The bed-plate has at its lower side a hollow hub, g , in which is placed a rod, g' , to the upper end of which is pivoted at g^2 the heel-pin h , the lower end of the heel-pin (shown separately in Fig. 4) being beveled or inclined to be acted upon by

the upper end of a loose ring, h' , which rests upon the upper end of a nut, h^2 , made adjustable upon a threaded sleeve, h^3 , secured to the bed-plate above the hub g , but surrounding the rod g' .

In practice the upper, having the draw-cord, thong, or wire incorporated with it near its edges, so as to be drawn upon by the hooks or draw-bars, as described, is placed upon a suitable last, as e' , and an inner sole, e , is laid upon the same, and the last is then placed upon the heel-pin in usual manner, the forward part of the last or its top portion resting upon the toe-rest, substantially as indicated by dotted lines in Fig. 3. In this condition the nut h^2 will be rotated, thus elevating the loose collar h' , and the latter as it rises will act upon the inclined end h^1 of the heel-pin h and will cause the upper end of the said heel-pin, in engagement with the last, to be moved forward toward the toe-rest, forcing the top of the last near its toe firmly down upon the toe-rest. The rotation of the nut is continued until the heel-pin has been thrown forward to thoroughly confine or lock the last in position upon the jack composed of the said heel-pin, its adjusting devices, and the toe-rest, and after this the hooks or draw-bars will be engaged with the cord, thong, or wire to draw the same in the manner before described.

The toe-rest carriage will be adjusted horizontally according to the length of the last, and in its adjustments will be raised or lowered, owing to the slope given to the inclined track f , thus adapting the toe-rest to the curvature of the top of the last. The inclined track f is held in place by means of a nut, f^6 , attached to the screw-threaded shank f^7 thereof.

Having described our invention, we wish it to be understood that we do not desire to limit our invention to the exact form of hooks or draw-bars and connections between them and the arms for actuating them, nor do we desire to limit our invention to the exact shape or form of the levers employed for actuating the rock-shafts A^4 , or to the springs for keeping the hooks in engagement with the cord t .

We do not herein claim nippers to engage the material of the upper, the said nippers being attached by flexible connections to levers, by which the upper is drawn over upon the inner sole; but in our invention the hooks or draw-bars in all instances will be so constructed as to engage the shir cord, thong, or wire, the strain put upon the upper to fit it upon the last and to draw its edge over upon the inner sole being done through the said cord t .

We claim—

1. In a lasting-machine, a jack containing an adjustable heel-pin and longitudinally-movable toe-rest to hold the last and upper thereon firmly, combined with one or more arms or levers, as C' , at each side the jack, rock-shafts to which the arms are attached,

means to operate them, and one or more hooks or draw-bars and connections between them and the said arms, to operate substantially as described.

5 2. In a lasting-machine, a jack consisting of a heel-pin and toe-rest, two arms, d' , levers D^2 , operatively connected therewith, and a lever or treadle to actuate the said levers D^2 , combined with hooks or draw-bars, as d^4 , and
10 intermediate connections between them and the said arms d^2 , to operate substantially as described.

3. In combination, a jack containing a heel-pin and a toe-rest, two rock-shafts having
15 connected arms g' , connecting devices and hooks or draw-bars, as d^5 , attached thereto, arms d' , levers and treadle to move them, hooks or draw-bars, as d^4 , and intermediate connections between them and the arms d' ,
20 combined with means to actuate the said rock-shafts independently of the levers D^2 , substantially as described.

4. In a lasting-machine, a jack to support the last and upper thereon, a series of hooks
25 or draw-bars arranged at each side of the last, arms C' and d' , and flexible connections to attach the said hooks or draw-bars to the said arms, combined with means to actuate the arms d' independently of the arms C' , as and
30 for the purposes set forth.

5. In a lasting-machine, the pivoted heel-pin, the loose collar, and nut to turn the said heel-pin upon its fulcrum, combined with the inclined track and with the toe-rest carriage
35 adjustably mounted thereon, substantially as described.

6. In a lasting-machine, a jack, a heel-pin and toe-rest, and an arm, as C' , combined with

a hook or draw-bar, flexible connections, and a loop or clamp, as b , adjustable on the said
40 arm, and with means to move the said arm, to operate substantially as described.

7. In a lasting-machine, the heel-pin composed of two parts, one pivoted on the other and provided with a beveled or inclined toe,
45 combined with a loose collar and with means for forcing the said collar against the said toe, substantially as described.

8. In a lasting-machine, a jack to hold the shoe firmly, a series of hooks or draw-bars
50 adapted to hook into or engage a cord or thong loosely connected with the edge of the upper, a series of arms and means to actuate them, and flexible connections between the arms and the said hooks or draw-bars, com-
55 bined with springs adjacent to said flexible connections to normally cause the said hooks or draw-bars to remain in engagement with the said cord or thong after the operator has engaged the said hooks or draw-bars there-
60 with by hand, substantially as described.

9. In a lasting-machine, a series of levers or arms and hooks or draw-bars and flexible connections, combined with longitudinally-adjustable loops or slides mounted on the said
65 levers or arms and to which one end of the said connections is attached, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of
70 two subscribing witnesses.

RUSSELL HATHAWAY.
ELBRIDGE G. PAULL.

Witnesses:

ELIZABETH B. GILLINGHAM,
JAMES L. GILLINGHAM.