

(No Model.)

6 Sheets—Sheet 1.

F. CHASE.
LASTING MACHINE.

No. 571,429.

Patented Nov. 17, 1896.

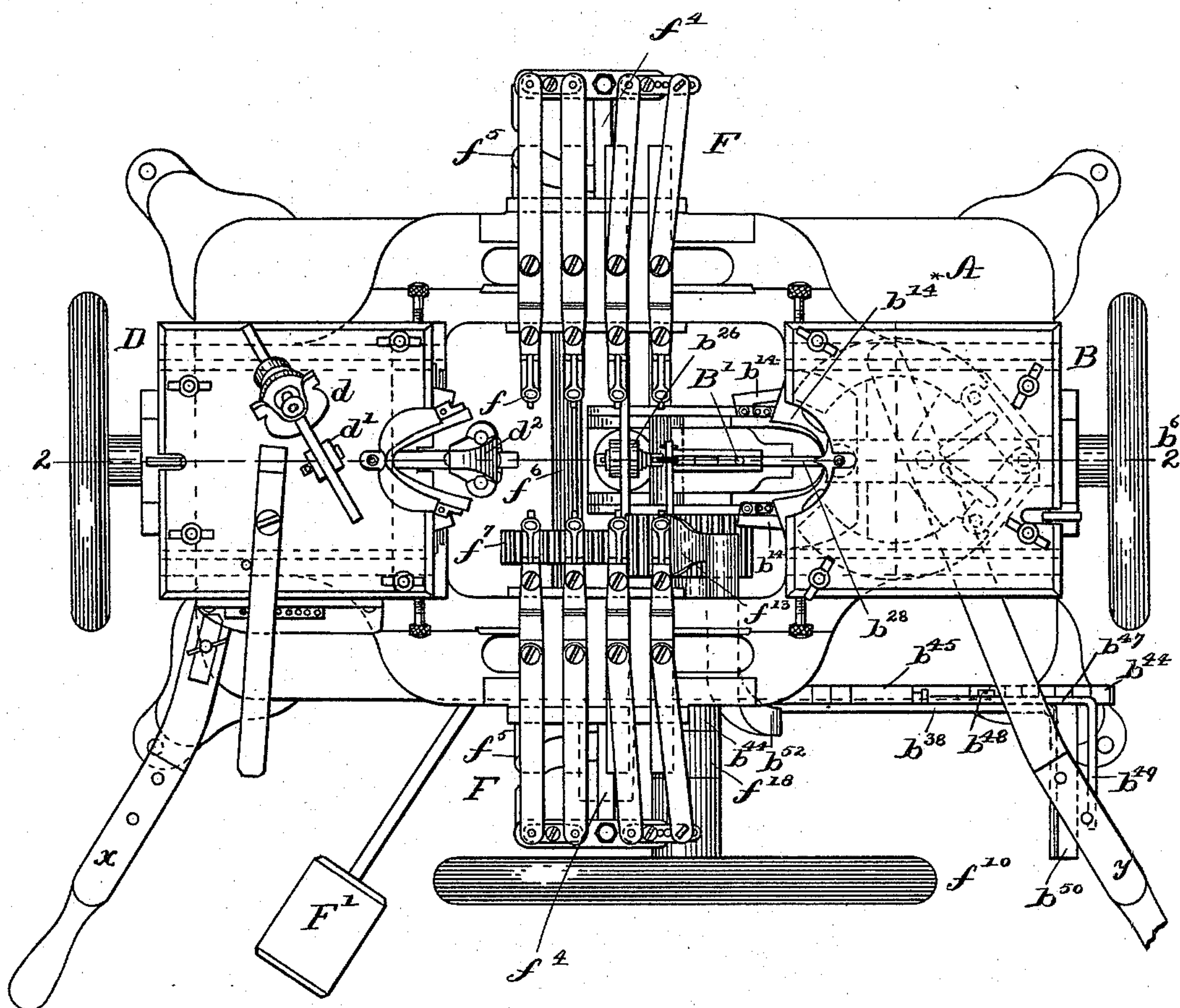


FIG. 1.

WITNESSES.

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INVENTOR

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Edward S. Beach.

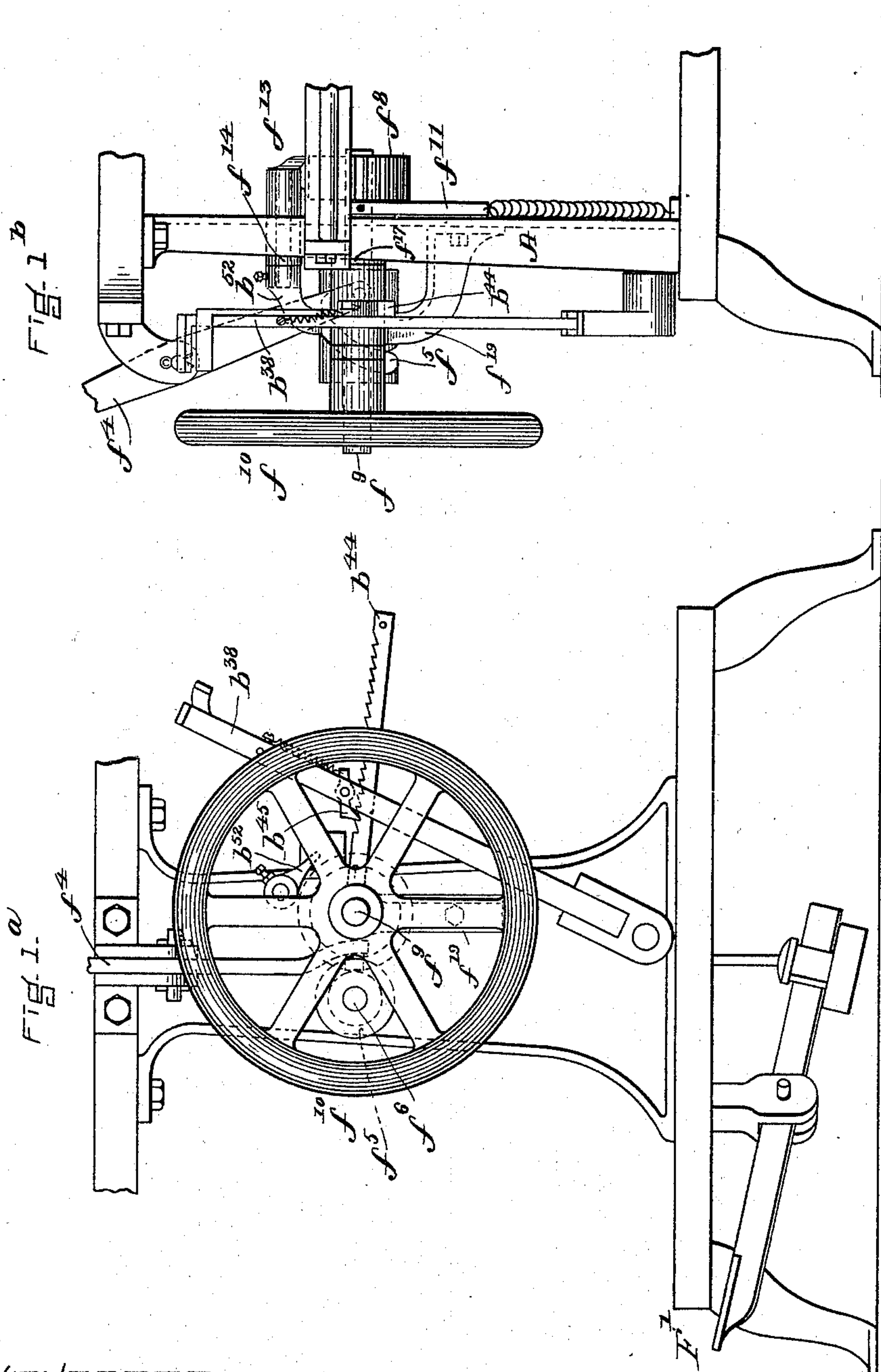
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6 Sheets—Sheet 2.

F. CHASE.
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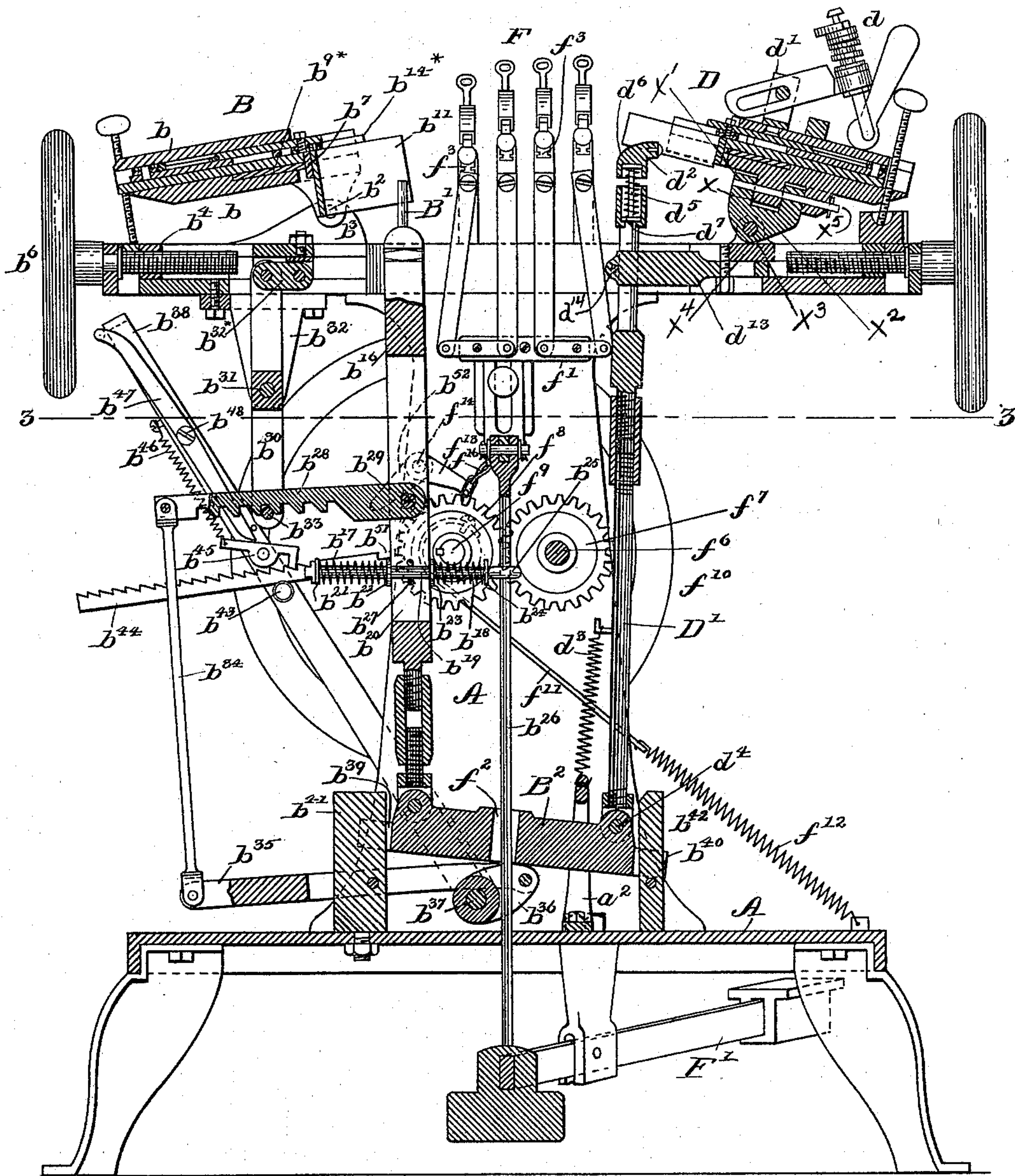
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6 Sheets—Sheet 3.

F. CHASE.
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FIG. 2.

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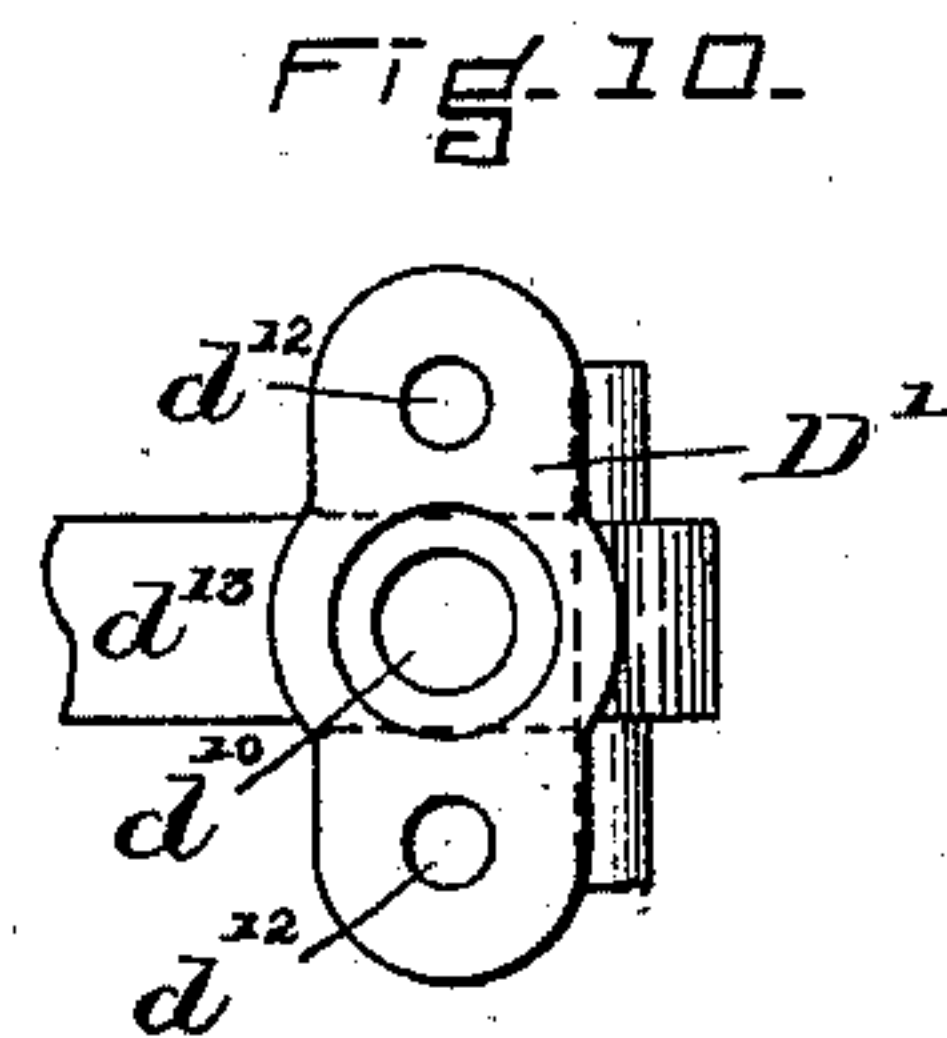
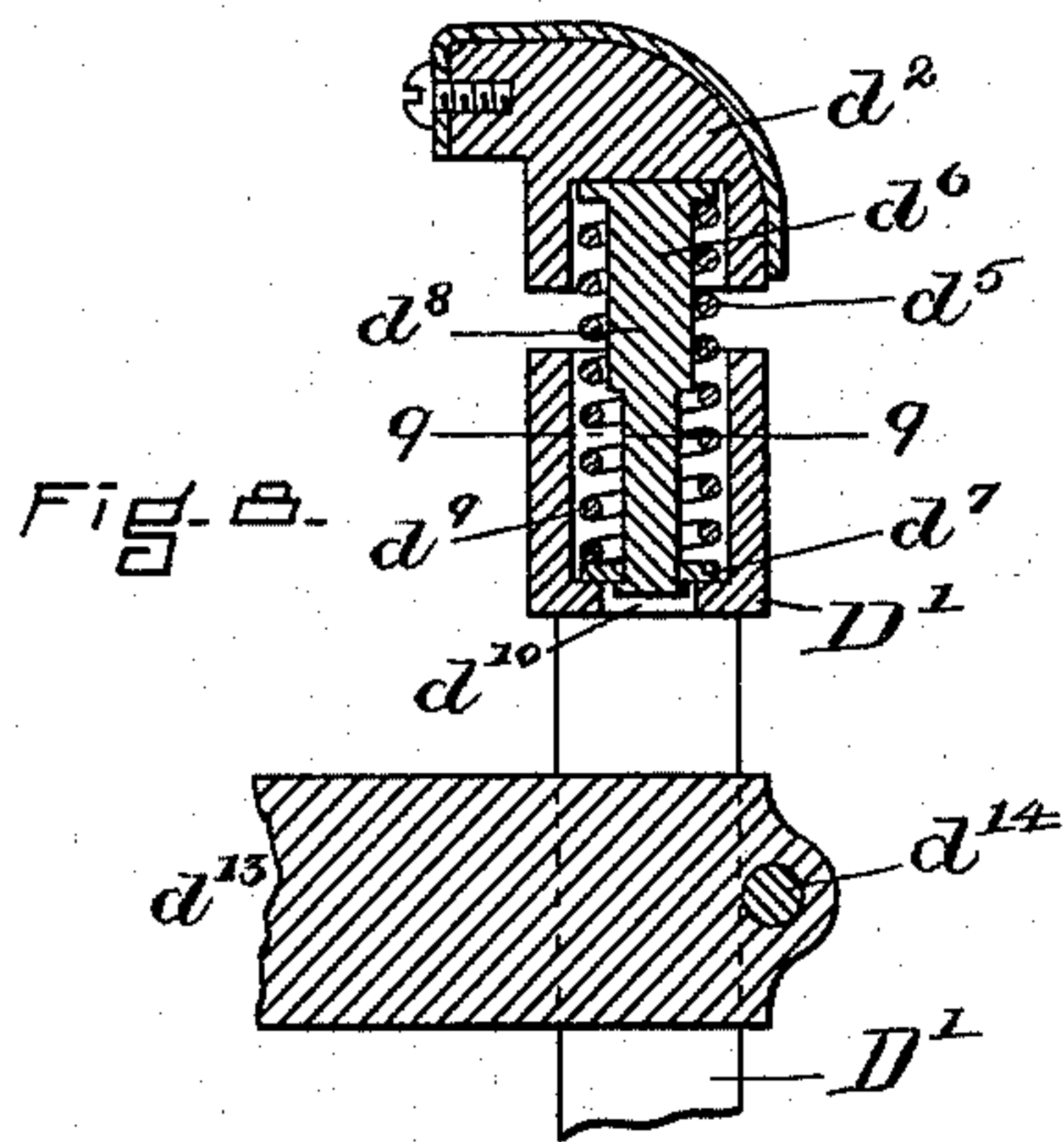
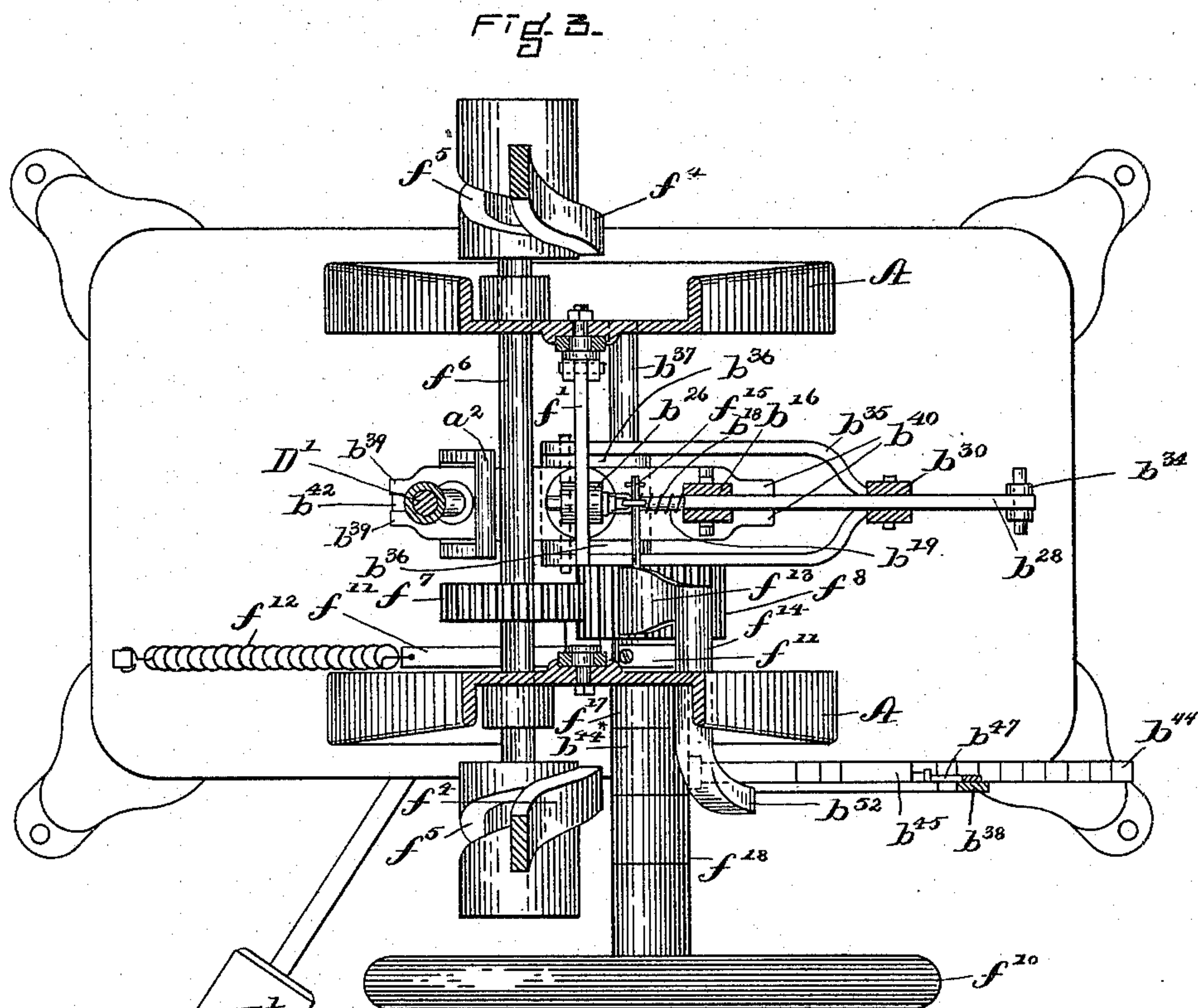
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6 Sheets—Sheet 4.

F. CHASE.
LASTING MACHINE.

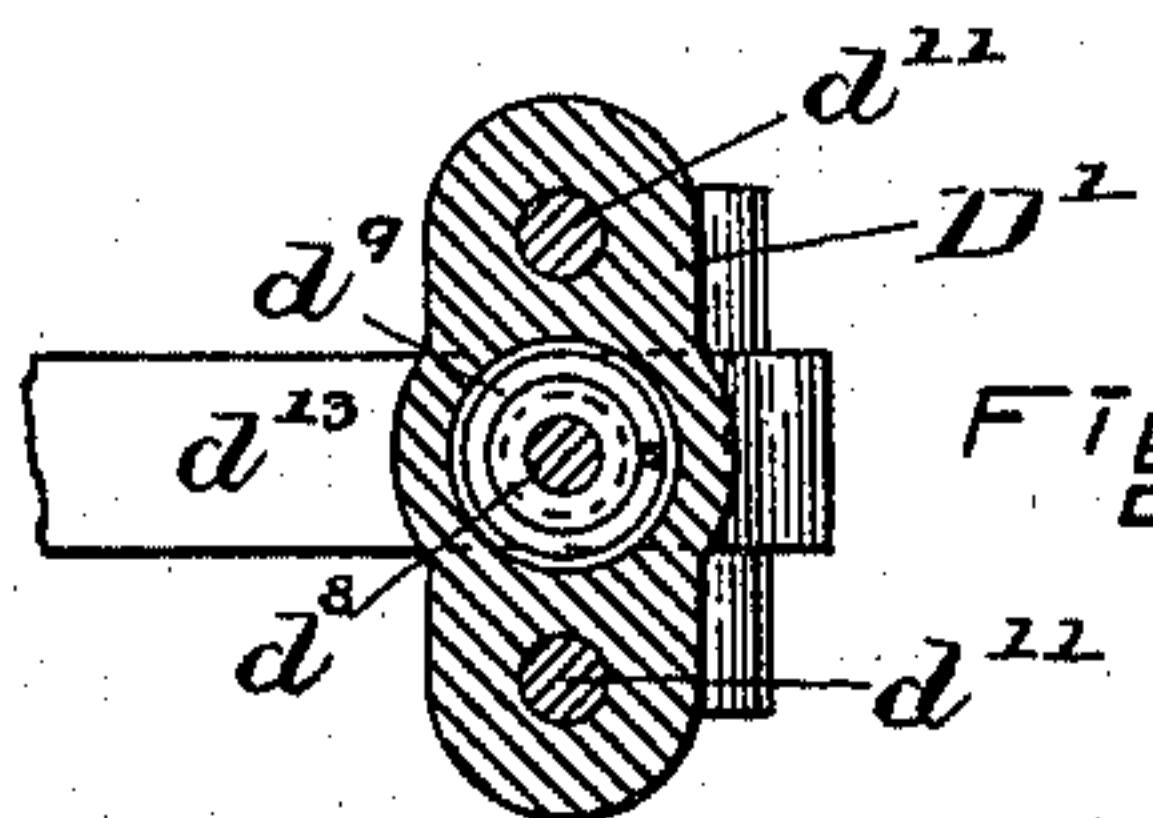
No. 571,429.

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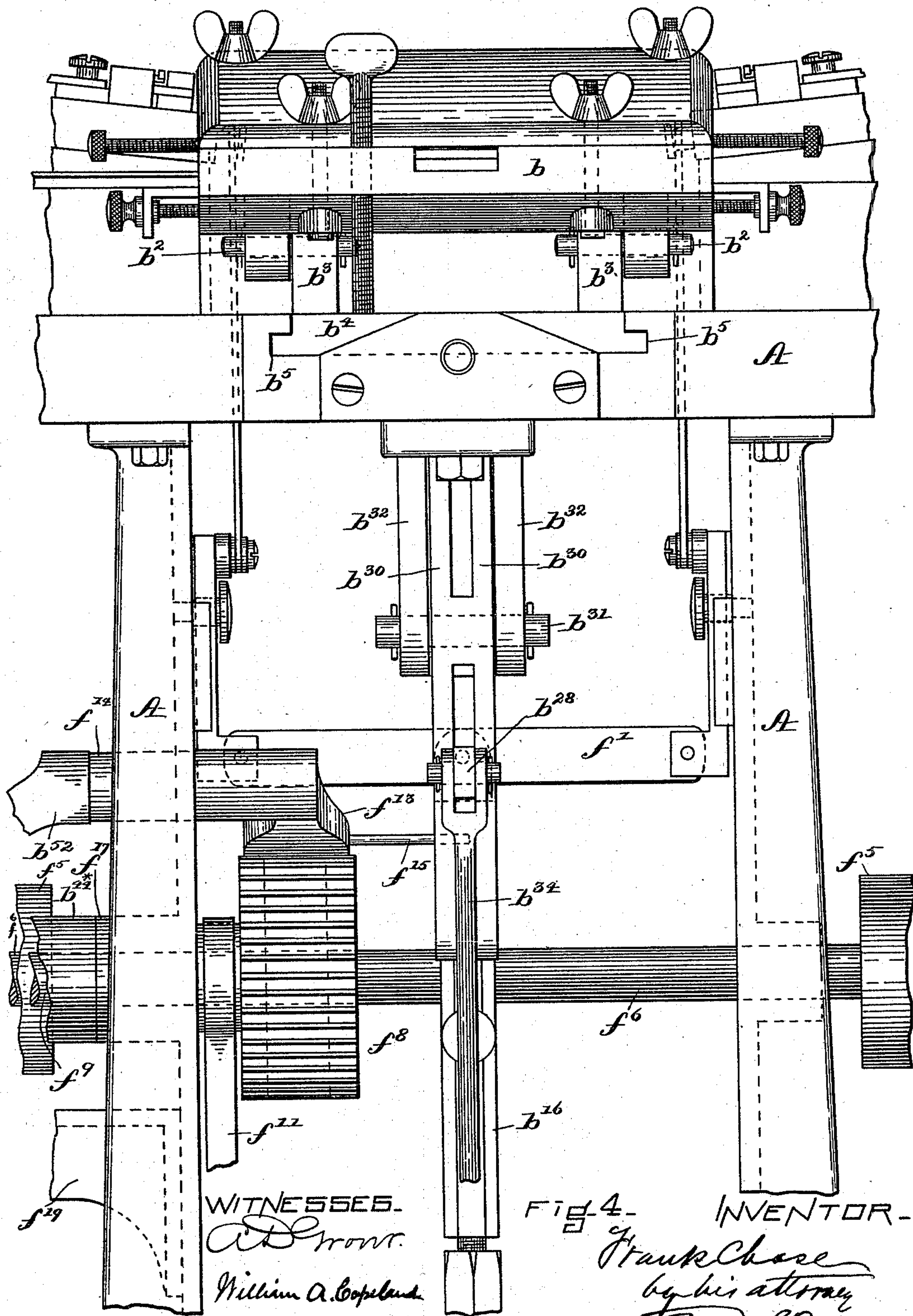
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6 Sheets—Sheet 5.

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WITNESSES.

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FIG. 4.

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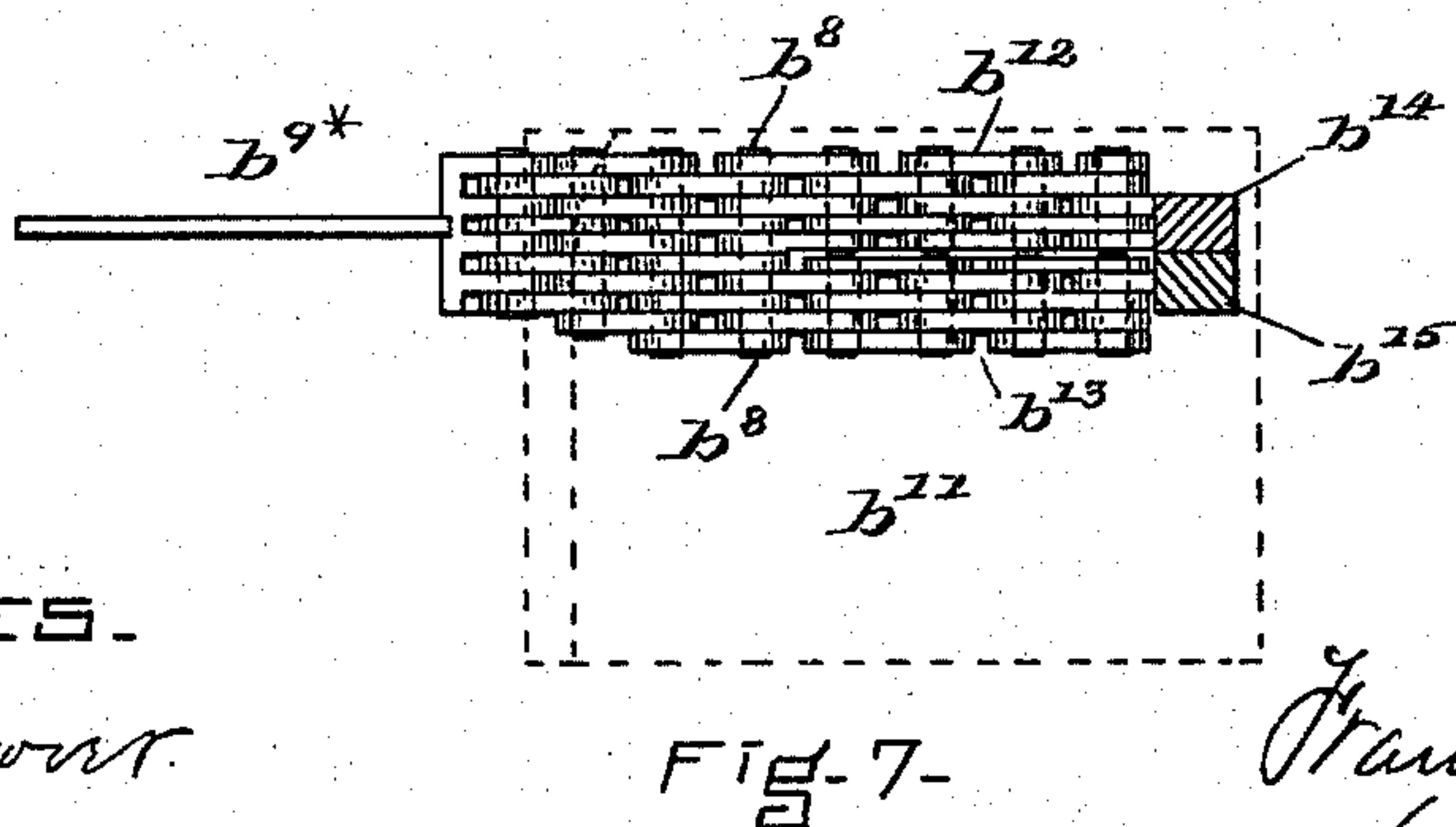
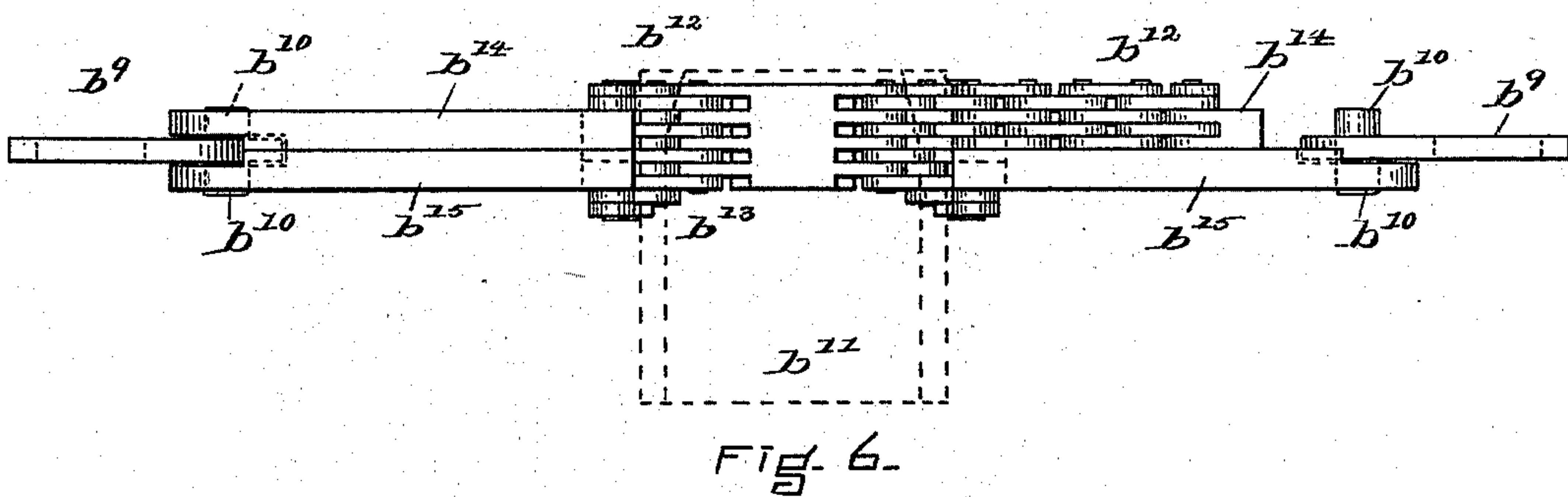
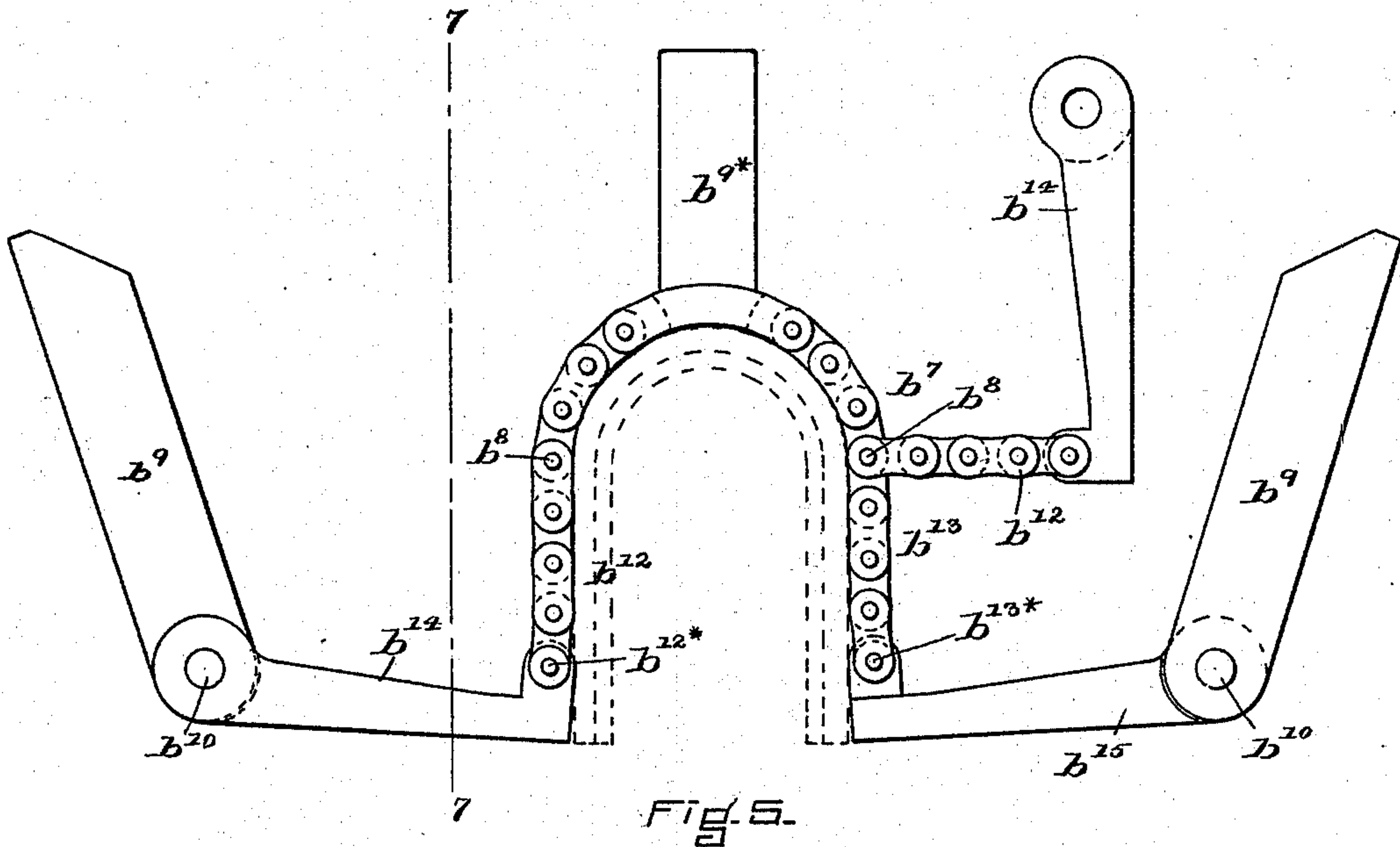
(No Model.)

6 Sheets—Sheet 6.

F. CHASE.
LASTING MACHINE.

No. 571,429.

Patented Nov. 17, 1896.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 571,429, dated November 17, 1896.

Application filed September 23, 1895. Serial No. 563,454. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHASE, of Waterville, in the county of Kennebec and State of Maine, have invented a new and useful Improvement in Lasting-Machines, of which the following is a specification.

Referring to the accompanying drawings, Figure 1 is a top plan view of a lasting-machine embodying my invention. Fig. 1^a is a partial side view, and Fig. 1^b a partial end view, of the hand-wheel and other actuating mechanism of my machine. Fig. 2 is a central vertical section on line 2 2 of Fig. 1. Fig. 3 is a horizontal section looking down, taken at line 3 3 of Fig. 2. Fig. 4 is a partial rear elevation of the machine. Fig. 5 is a top plan view of the split pad-holder and attached parts, one portion being thrown back out of position to more clearly indicate the principle of the device. Fig. 6 is a front view of what is shown in Fig. 5. Fig. 7 is a side elevation of the split pad-holder, one pair of links being sectioned on line 7 7 of Fig. 5. Fig. 8 is a vertical sectional detail of the toe-rest, toe-post, &c. Fig. 9 is a transverse sectional view on line 9 9 of Fig. 8. Fig. 10 is a top plan view of the toe-post with the toe-rest removed.

My invention is an improvement in lasting-machines of the class shown in various patents heretofore granted me, of which No. 337,925, dated March 16, 1886, is a convenient example. The features of my present invention are applicable in other makes, kinds, and types of lasting-machines, the object of my present invention being to increase the speed of lasting-machines and to improve the quality of work done by them. The main points or features of the invention herein set forth are, first, mechanism which holds the last rigid during the operation of the nippers; second, mechanism for positioning the heel part of the last with reference to its forward and back movement; third, reciprocating or fore-and-aft moving toe-supporting mechanism to prevent abrasion of the upper; fourth, mechanism which automatically retracts the upper-stretching mechanism; fifth, a toe-retarder which is movable out of the way of the adjusting mechanism; sixth, compound

quartering mechanism, members of which act independently (at heel or toe) to properly smooth the upper-leather at sides of the last; seventh, last-holding mechanism comprising a rigid heel-clamp and a rocking toe-clamp; eighth, a combined rigid heel-clamp and movable toe-post; ninth, a combined toe-retarder, toe-post, and toe-post spring mounted under compression.

Other features of my invention are pointed out hereinafter.

In the drawings, which show the best form of my invention now known to me, A is the main frame; B, the heel-clamping mechanism; D, the toe-lasting mechanism, and F the upper-stretching mechanism, these four groups constituting the principal mechanisms of the organized machine. Carriage *b*, containing the heel-clamp, is journaled at *b*² to ears *b*³ of the slide-plate *b*⁴, moving in ways *b*⁵ in main frame A. Carriage *b* is a tilting carriage, as heretofore, to raise and lower the pad-support in relation to the heel part of an inserted last, but has no sidewise movement, rocking or otherwise. Slide-plate *b*⁴ is reciprocated in any suitable manner conveniently by the hand-wheel *b*⁶ and connected mechanism, all of which is set forth in prior patents. Carriage *b* is provided with a heel-clamp *b*⁷ (see Figs. 2, 5, 6, and 7) of a wholly new kind; that is, a heel-clamp which is effective to properly lay the upper at the heel and adjacent shank portion by acting on the portions with differential pressure.

The great importance of a differential-pressure heel-clamp will be apparent when it is considered that the leather not only varies in thickness, but is apt to wrinkle more or less at the shank and requires to be nicely smoothed at the shank portion for the best results, especially in connection with high-grade shoes.

My new differential heel-clamp is a striking novelty, and while it may be made in many different forms and ways I prefer, on the whole, to use the sprocket-chain construction herein described as the best mode in which I have contemplated applying the principle of my new differential-pressure heel-clamp. In this particular embodiment of this feature of my invention the pad-support *b*⁷

comprises a sprocket-chain which is split from suitable points forward of the middle of the clamp, say at b^8 , to its outer ends. The links which connect the outer ends of the pad-support b^7 with the usual guide-bars b^9 are also each split or made in two parts and pivotally attached to the guide-bar b^9 at b^{10} . Pad b^{11} is attached to pad-support b^7 in any desired manner. While both members b^{12} b^{13} of each pad-support end and both members b^{14} b^{15} of each link in this particular embodiment are moved simultaneously inward to press the ends of pad b^{11} against the opposed upper on the last, yet the pressure so exerted is differential or discriminating, because the clamp members b^{12} b^{13} are pivoted at b^{12*} and b^{13*} , and consequently tend to adapt themselves to inequalities in the leather, while at the same time pressing inwardly and nicely smoothing the upper at the shank and adjacent heel portion. The slides or guide-bars b^9 are mounted as shown in my Patent No. 376,368, which is loosely mounted to permit the shifting for rights and lefts, and the pad-support b^7 has a centering extension b^{9*} . The heel-wipers b^{14*} are operated by instrumentalities set forth in my patent No. 364,088 and now indicated by dotted lines in Fig. 1. On some grades of work other forms of pad-supports (that is, the sprocket-chain construction is not necessarily used) may be used, and the first broad feature of my invention is a heel-clamping mechanism which grips the heel of the lasted shoe and holds it rigidly while the carriage is moved inwardly.

Heretofore time has been lost by the operator, (unnecessarily, as I have discovered,) owing to the fact that the heel-pin has not been kept at all times in position for jacking without manipulation. To keep the heel-pin B' in position for jacking and in definite position with reference to the inner end of the heel-clamping mechanism B , its post b^{16} is centered between springs b^{17} b^{18} , whose pressures are exerted in the direction of the length of the last, these springs being mounted in this instance on a rod b^{19} , which passes through a slot b^{20} in the heel-pin post b^{16} . Spring b^{17} is confined between a head b^{21} at an end of rod b^{19} and a washer or the like b^{22} , which bears against a side of the post b^{16} . Spring b^{18} is similarly mounted on the rod b^{19} between washers b^{23} b^{24} , the inner end of the rod having an eye b^{25} , through which the nipper-lifting rod b^{26} passes. Rod b^{19} is conveniently held in slot b^{20} by pins b^{27} . The heel-pin post b^{16} , the lower end of which is fulcrumed on the rocking bar B^2 , is connected with the heel-clamping mechanism B through the rack-bar b^{28} , which is fulcrumed at b^{29} to the heel-pin post, and the swinging forked dog-bar b^{30} , which is fulcrumed at b^{31} to bracket b^{32} in the main frame, with its upper end fulcrumed to link b^{32*} , which is loosely pinned to the slide-plate b^4 of the heel-clamping mechanism B .

The lower part of the dog-bar b^{30} has a dog b^{33} , which engages the teeth of the rack-bar b^{28} . To the free end of rack-bar b^{28} is pinned a connecting-rod b^{34} , loosely pinned to the yoke-lever b^{35} , whose inner ends are pivoted to the cam b^{36} on rock-shaft b^{37} , provided with an upwardly-extended handle b^{38} . The rocking bar B^2 , which also supports the toe-rest post D' , as hereinafter explained, rests on this cam b^{36} , the rocking bar B^2 having end extensions b^{39} and b^{40} , which work with the guide-posts b^{41} and b^{42} , respectively. Handle b^{38} is provided on its side with a projection b^{43} , which supports the projecting end of the rack-bar b^{44} , and is also provided with a pawl b^{45} , held against the rack by a spring b^{46} , which connects the tail of the pawl b^{45} with the handle b^{38} . Pawl b^{45} is lifted out of engagement with the teeth of the rack-lever b^{44} by the auxiliary handle b^{47} , fulcrumed at b^{48} to handle b^{38} , and having conveniently a side-wise extension or grip b^{49} in line with the side-wise extension or grip b^{50} of the handle. When the grip b^{49} is moved toward the grip b^{50} of the handle b^{38} , the lower end of the auxiliary handle b^{47} pushes against the tail of pawl b^{45} (see Fig. 2) and carries the pawl out of engagement with the rack-bar b^{44} , which is also provided with a notch b^{51} , with which the pawl b^{45} engages when the handle is swung inwardly to engage the rocker-arm b^{52} , (see dotted lines in Fig. 2 and Figs. 1 and 4,) for a purpose hereinafter explained.

The toe-lasting mechanism D is much the same as in my prior patents, with the exception of the features of improvement now to be pointed out.

In my present machine the toe-lasting mechanism not only moves back and forth in the direction of the length of the last, (as heretofore,) but it also has a rocking movement sidewise, which is a new feature. This side-wise-rocking movement is obtained, preferably, by forming the upper part of carriage D with dependent ears x , which alternate with ears x' on the tilting support x^2 , that is journaled by the transverse pin x^3 in the plate x^4 . Ears x x' are interlocked, and a pin or shaft x^5 passes through them in a direction lengthwise of the carriages, so that carriage D may be rocked sidewise. Heretofore the heel-clamping and toe-lasting mechanisms have each moved inwardly and outwardly in the direction of the length of the last, the toe-lasting mechanism being rigid, so far as sidewise-rocking motion was concerned, and the heel-clamping mechanism rocking sidewise. In my present machine the to and fro movements are, of course, present; but the toe-lasting mechanism has a sidewise-rocking movement, and the heel-clamping mechanism is rigid in that respect. Heretofore the toe-retarder d has been mounted on a rigid upright, (lettered d' herein;) but in the present improvement this upright or toe-retarder sup-

port d' is rotatable, (see Fig. 2,) so that the toe-retarder is readily swung (see Fig. 1) out of the way of the tacking mechanism (not shown) and especially out of the way of the adjusting mechanisms.

Toe-support post D' , as above stated, is supported by the tilting bar B^2 , which rests on cam b^{36} and is held with its toe-rest d^2 normally inward by a spring d^3 , connected to the inner side of the post (above its fulcrum d^4 with the tilting bar B^2) and to, in this instance, an upward yoked projection a^2 of the main frame A. Heretofore the toe-post has been held with its toe-rest normally outward, or as near as possible to the toe-lasting mechanism when that mechanism was in its extreme outward position, and the spring has been mounted at the outside of the toe-support post, so as to pull the top of the post outward. The toe-rest d^2 has been heretofore supported by a spring on which the toe rested directly. To secure more effectual operation of the spring-support for the toe-rest, I now mount a somewhat compressed spring d^5 between heads d^6 d^7 , head d^6 being rigid on the shank d^8 and head d^7 being movable on the reduced portion or foot d^9 thereof, the foot being upset after the spring is partly compressed on the shank and the movable head d^7 mounted in place. Toe-rest d^2 rests on head d^6 , and if forced downwardly during the lasting operation the foot d^9 moves into the recess d^{10} , with which the toe-post is provided. Toe-support d^2 is provided with guides d^{11} , moving in ways d^{12} in the post D' , whereby the toe-support is kept from oscillating. The toe-post D' is connected with the reciprocating toe-lasting carriage by means of an arm d^{13} , which passes through a slot in post D' and has a pin d^{14} , that not only prevents the post D' being pulled too far inwardly by spring d^3 , but also engages post D' when the toe-lasting mechanism D is moved outwardly, whereby the toe-rest d^2 is moved backwardly with the toe-lasting mechanism.

The leather-stretching mechanism F is in most respects the same as shown in my prior patents, but now contains one very important feature of novelty. The nippers f , as heretofore, are connected with a vertically-reciprocating frame f' , supported by the rod b^{26} , which passes through an opening f^2 in tilting bar B^2 and connects with the treadle F' , cam b^{36} being forked to permit direct passage of the rod b^{26} from the treadle to the nipper-frame f' . Depression of treadle F' lifts the nippers. The nippers or stretching mechanism are on slide-supports f^3 and are moved inwardly and outwardly by the swinging levers f^4 , the lower ends of which work in the cams f^5 at the ends of shaft f^6 . Shaft f^6 is provided with a gear f^7 , which meshes with a gear f^8 on shaft f^9 , (shown in Figs. 2 and 4,) to which the hand-wheel f^{10} is secured outside of frame A. The inner end of shaft f^9 carries the gear f^8 and also takes up the strap

f^{11} , one end of which is secured to the shaft f^9 and the other end of which is attached to any suitable strap-pulling device, such, for example, as the spring f^{12} , attached to the frame A. When shaft f^6 is rotated to move the nippers (or any other form of leather-stretching instrumentalities) inwardly, strap f^{11} is taken up or wound on shaft f^9 against the resistance of the strap-pulling device f^{12} . A pawl f^{13} on the shaft f^{14} , which is mounted in frame A and carries the arm b^{52} , above referred to, works with gear f^8 and is normally in position (shown in Fig. 1) to prevent back motion of shaft f^9 . Pawl f^{13} is provided with a sidewise extension f^{15} , Fig. 4, which is connected conveniently by a chain f^{16} with the vertically-reciprocating rod b^{26} , so that depression of the treadle F' lifts pawl f^{13} out of engagement with gear f^8 and permits the strap-pulling device f^{12} to unwind strap f^{11} and consequently to rotate shaft f^9 backwardly and withdraw the leather-stretching instrumentalities from the last. This automatic withdrawal of the leather-stretching instrumentalities is a novelty and contributes to the desired increased speed of my new machine. Pawl f^{13} may be lifted out of engagement with gear f^8 by means of handle b^{38} , which, when in its extreme inward position, strikes the free end of arm b^{52} and so rocks shaft f^{14} and lifts pawl f^{13} . When handle b^{38} is in its extreme forward position, dog b^{45} engages notch b^{51} in rack-bar b^{44} , and pawl f^{13} is thereby kept in its lifted position. Rack-bar b^{44} is loosely mounted at its enlarged and bored end b^{44*} on shaft f^9 between boss f^{17} on frame A and the end f^{18} of bracket f^{19} , in which shaft f^9 has one of its bearings.

The operation of my machine is as follows: Ordinarily the parts rest in the position shown in Fig. 2, the heel-pin B' being adjusted to the proper height for the size of shoe to be lasted and the heel and toe lasting mechanisms being moved the proper distance apart. The last, having on it the upper to be lasted, is placed on the heel-pin B' with the toe on the toe-rest d^2 , and the handle b^{38} is then moved outwardly to raise the heel of the last to the proper height in relation to the heel-pad b^{11} , and the hand-wheel b^6 is then turned, carrying the heel-pin backward and causing the extreme point of the heel to press against the pad, whereupon the heel-clamp is tightened automatically around the heel and the heel rigidly gripped. The toe-lasting mechanism D is then moved forward to engage the toe of the shoe and the toe-retarder d brought down in place. Shaft f^6 is then rotated to move the nippers or other leather-stretching mechanisms properly inward for application to the edges of the upper. The nippers f being applied at both sides of the last, treadle F' is depressed to raise the nippers above the bottom of the last, thereby applying and stretching the leather properly upon the last, and shaft f^6 is then rotated to carry the nip-

wipers inwardly to fold the margins of the upper over the bottom of the last.

At the completion of the movement of the nippers or other leather-stretching instrumentalities the lever of the toe-retarder is brought over, so that the toe-retarder throws the toe of the last down under the toe-wipers when the wipers are brought into place by the hand-lever x and the toe-retarder thrown back.

The heel-wipers are then brought inwardly by means of their lever y , the toe-lasting mechanism D tightened up, and the handle b^{38} is swung back as far as possible, thereby lifting the toe and heel parts firmly up against the wipers, so that the leather is laid nicely upon the bottom of the last. The nippers are then released, the handle b^{38} moved inwardly, thereby taking the pressure off the wipers by allowing the last to fall slightly, and pressure is then applied to treadle F' , raising the nippers, which are then moved back automatically, as already described. The heel-clamping mechanism B is then moved back and the heel and toe wipers carried from over the lasted shoe and the shoe removed. When the toe-lasting mechanism is moved into operative position, the toe-rest b^2 remains stationary, arm d^{13} playing freely through the slot in the post D' , which supports the toe-rest. The toe-rest is held in fixed position in reference to the shoe by contact therewith to prevent abrasion of the upper, and is a highly important feature of my invention. The notches in the rack-bar b^{28} correspond to different sizes of shoes. When a very small shoe is to be lasted, the heel-clamping mechanism is moved inward and the dog-bar b^{30} swung outward, so that its pin b^{33} engages the outermost tooth of the rack-bar b^{28} . Heel-pin B' is thus locked in its rearward position in relation to the face of the pad. While the handle b^{38} is in a rearward position, the heel-pin B' remains in locked position with reference to the heel-clamping instrumentalities, and to unlock the heel-pin the handle b^{38} is carried forward.

What I claim is—

1. The herein-described improvement in lasting-machines, consisting in the combination of a leather-stretching mechanism and a toe-lasting mechanism with a reciprocating heel-clamping mechanism which automatically grips and holds the last rigidly by the heel prior to operation of the leather-stretching and toe-lasting mechanisms, substantially as and for the purpose set forth.

2. The herein-described improvement in lasting-machines, consisting in the combination of a leather-stretching mechanism with a reciprocating, sidewise-rocking toe-lasting mechanism and a reciprocating heel-clamping mechanism having no sidewise-rocking movement, substantially as and for the purpose set forth.

3. The herein-described improvement in lasting-machines, consisting in the combination of a leather-stretching mechanism; a toe-support; means for holding the toe-support yieldingly toward the heel-post; a heel-post, and a heel-clamping mechanism, substantially as and for the purpose set forth.

4. The herein-described improvement in lasting-machines, consisting in the combination of a reciprocating heel-clamping mechanism and a heel-post connected therewith, the heel-post having, in respect to the said mechanism, an initial movement toward the same, substantially as and for the purpose set forth.

5. The herein-described improvement in lasting-machines, consisting in the combination of a reciprocating heel-clamping mechanism with a movable heel-post and connections to move the heel-post inwardly when the heel-clamping mechanism is moved outwardly and outwardly when the heel-clamping mechanism is moved inwardly, substantially as and for the purpose set forth.

6. The herein-described improvement in lasting-machines, consisting in the combination of a heel-clamping mechanism with a heel-pin post which has a back-and-forth motion between the heel and toe lasting mechanisms and a vertically-reciprocating motion, with means which prevent the heel-pin post from moving sidewise transversely, substantially as and for the purpose set forth.

7. The herein-described improvement in lasting-machines, consisting in the combination of a heel-clamping mechanism with a movable heel-pin post and a yielding support for the heel-pin post at the front and back thereof, substantially as and for the purpose set forth.

8. The herein-described improvement in lasting-machines, consisting in the combination of a reciprocating heel-clamping mechanism the inner end of which is tiltable on transverse bearings but which is rigid during its inward movement, with a reciprocating sidewise rockable toe-lasting mechanism the inner end of which is tiltable on transverse bearings, substantially as and for the purpose set forth.

9. For lasting and other machines, the herein-described pad-support having longitudinally split ends, substantially as and for the purpose set forth.

10. For lasting and other machines, the herein-described pad-support having split ends in combination with split links, substantially as and for the purpose set forth.

11. For lasting and other machines, the herein-described pad-support having split ends; split links connected therewith, and a pivotally-attached guide-bar for each set of split links, substantially as and for the purpose set forth.

12. For lasting and other machines, the

herein-described pad-support having a flexible body portion and longitudinally split ends, substantially as and for the purpose set forth.

13. In a lasting-machine, the combination of a pad with a pad-support having independently-movable longitudinal sections at each end, substantially as and for the purpose set forth.

14. In a lasting-machine, the combination of a pad with a pad-support an end of which has a plurality of inward-moving longitudinal sections, substantially as and for the purpose set forth.

15. In a lasting-machine, the combination of a driving-gear; a pawl to prevent back motion thereof; rising and falling leather-stretching mechanism; and means which connect the pawl with said mechanism to lift the pawl out of connection with the gear when said mechanism is lifted, substantially as and for the purpose set forth.

16. In a lasting-machine, the combination of a reciprocating heel-clamping mechanism with a lever pivotally connected therewith; a movable heel-pin post; an arm pivotally connected with the heel-pin post and with said lever, to move the heel-pin post inwardly, substantially as set forth.

17. In a lasting-machine, the combination of a reciprocating heel-clamping mechanism with a lever pivotally connected therewith and provided with a lug; a heel-pin post; a rack-arm pivotally connected with the heel-pin post and engaged by said lug, whereby the said post is moved backwardly when the heel-clamping mechanism is advanced, substantially as set forth.

18. In a lasting-machine, the combination of a heel-clamping device a heel-pin automatically movable toward the clamping device, and means for locking the heel-pin in relation to said device when a last is in place, substantially as and for the purpose set forth.

19. In a lasting-machine, the combination of an oscillating heel-pin and heel-clamping mechanism with means, substantially such as described, for connecting the heel-pin and said mechanism at different points corresponding to different sizes of lasts inserted, substantially as and for the purpose set forth.

20. In a lasting-machine, the combination of movable toe-rest and reciprocating toe-lasting mechanism, the toe-rest moving with the shoe in the direction of the length of the shoe when the toe-rest is reciprocated, substantially as and for the purpose set forth.

21. In a lasting-machine, the combination of a leather-stretching mechanism with heel and toe supports which are rigid in relation to the shoe during the operation of the leather-stretching mechanism and with heel and toe lasting instrumentalities, the heel-support having an initial movement toward the heel-clamp, substantially as and for the purpose set forth.

22. In a lasting-machine, the combination of a heel-clamping mechanism with a heel-pin and means for simultaneously moving the heel-pin and heel-clamping mechanism toward each other whereby the last is held by pressure between the heel-pin and said mechanism during the operation of the leather-stretching mechanism, substantially as and for the purpose set forth.

23. In a lasting-machine, the combination of a vertically and to-and-fro moving heel-pin; a toe-rest which is held stationary in relation to the shoe by contact therewith; a movable support for the heel-pin and toe-rest and means, substantially such as described for moving the said support, substantially as and for the purpose set forth.

24. In a lasting-machine, the combination of a heel-clamping mechanism; a heel-pin having a to-and-fro movement in relation to the heel-clamping mechanism, and a size-adjusting mechanism connecting the heel-pin with the heel-clamping mechanism, substantially as and for the purpose set forth.

25. In a lasting-machine, the combination of a heel-clamp having independently-movable end sections with a loosely-mounted centering extension to permit shifting for rights and lefts, substantially as and for the purpose set forth.

26. In a lasting-machine, the combination of an end lasting mechanism with a toe-rest which moves with the shoe in the direction of the length thereof by contact therewith, substantially as and for the purpose set forth.

27. In a lasting-machine, the combination of a heel-clamp with a heel-pin and means for moving the heel-clamp and heel-pin toward each other in the direction of the length of the shoe to cause the heel-clamp to automatically clamp a jacked shoe, substantially as and for the purpose set forth.

28. In a lasting-machine, the combination of a reciprocating heel-clamping mechanism and a heel-pin movable from and toward said heel-clamping mechanism with a notched bar connected with the heel-pin and a swinging tooth-bar connected with the reciprocating heel-clamping mechanism and engaging with notches of said bar.

29. In a lasting-machine, the combination of a reciprocating heel-clamping mechanism with a heel-post; an oscillating support therefor; a cam cooperating with said support and having a handle; a dog on said handle; a swinging rack with which said dog cooperates; a lever pivotally connected with said cam; a toothed bar from the heel-post; a connection between said lever and toothed bar; and a lug-carrier connected with the heel-clamping mechanism and arranged with its lug in cooperating position with the toothed bar, substantially as described.

30. In a lasting-machine, the combination of a reciprocating toe-clamping mechanism

with a toe-post longitudinally adjustable and an arm from the clamping mechanism, said arm and toe-post being engaged when the toe-clamping mechanism is moved backward, 5 substantially as described.

31. In a lasting-machine, the combination of a heel-post with centering-springs on each side in the direction of the length of the last-recess, substantially as described.

10 32. In a lasting-machine, the combination of a reciprocating heel-clamping mechanism and a heel-pin movable from and toward said heel-clamping mechanism with a notched bar

connected with the heel-pin and a tooth-bar connected with the reciprocating heel-clamp- 15 ing mechanism, and engaging with notches of said bar.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 16th day 20 of September, A. D. 1895.

FRANK CHASE.

Witnesses:

WALTER SAFFORD,
EDWARD S. BEACH.