(No Model.) 5 Sheets—Sheet 1.

A. L. F. MITCHELL.

HEEL BURNISHER.

No. 452,032. Patented May 12, 1891.

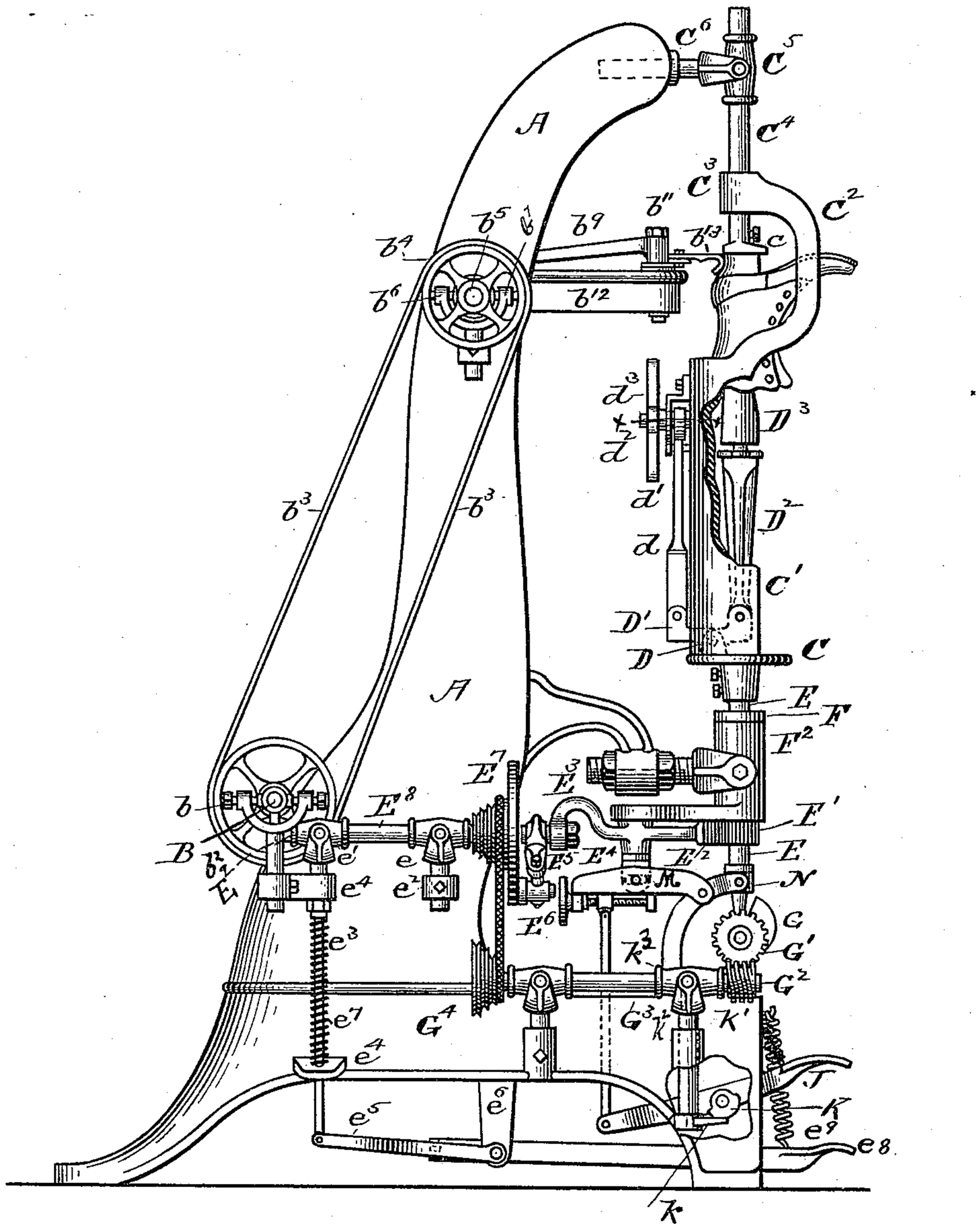

Fig. 1.

WITNESSES.

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HEEL BURNISHER.

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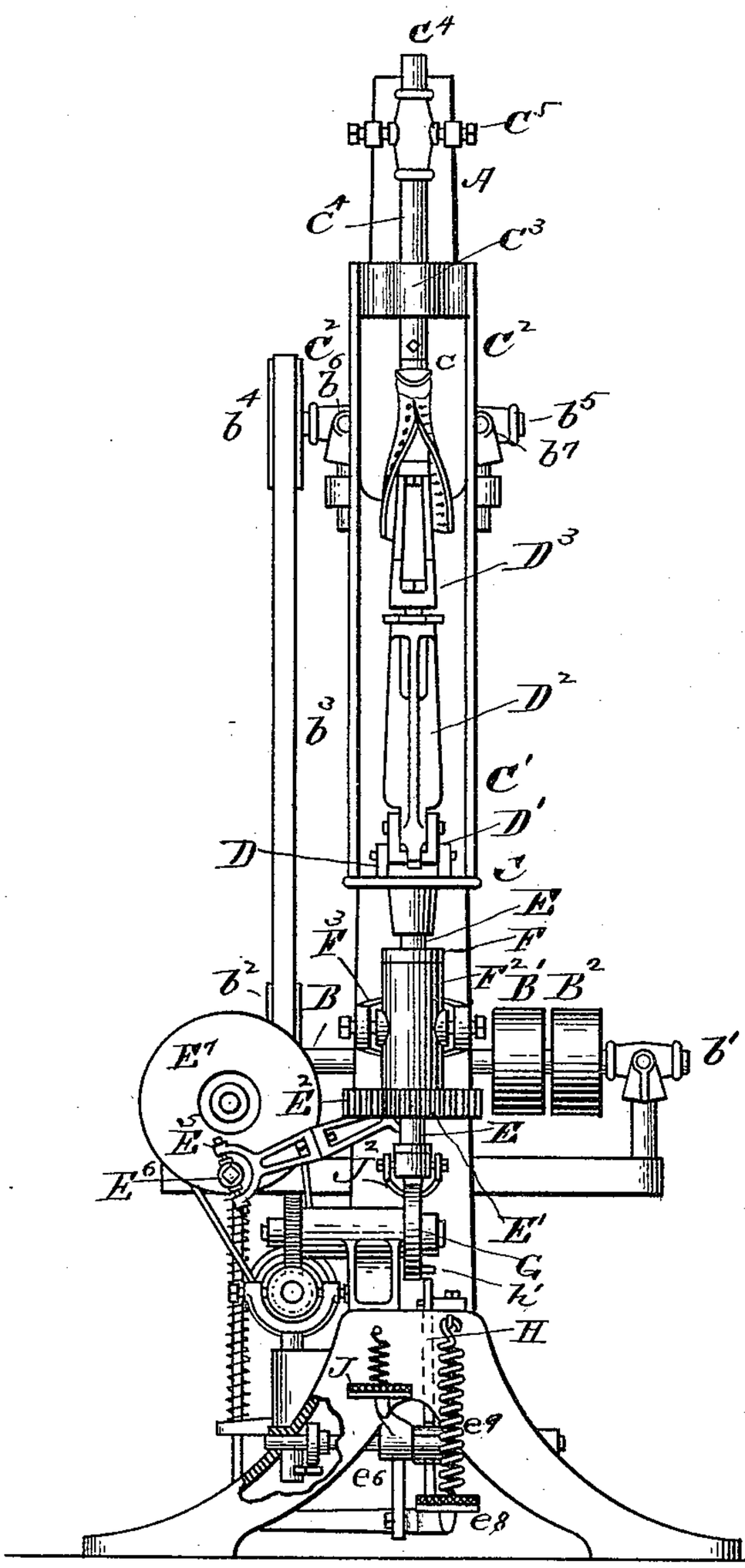

Fig. 2.

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HEEL BURNISHER.

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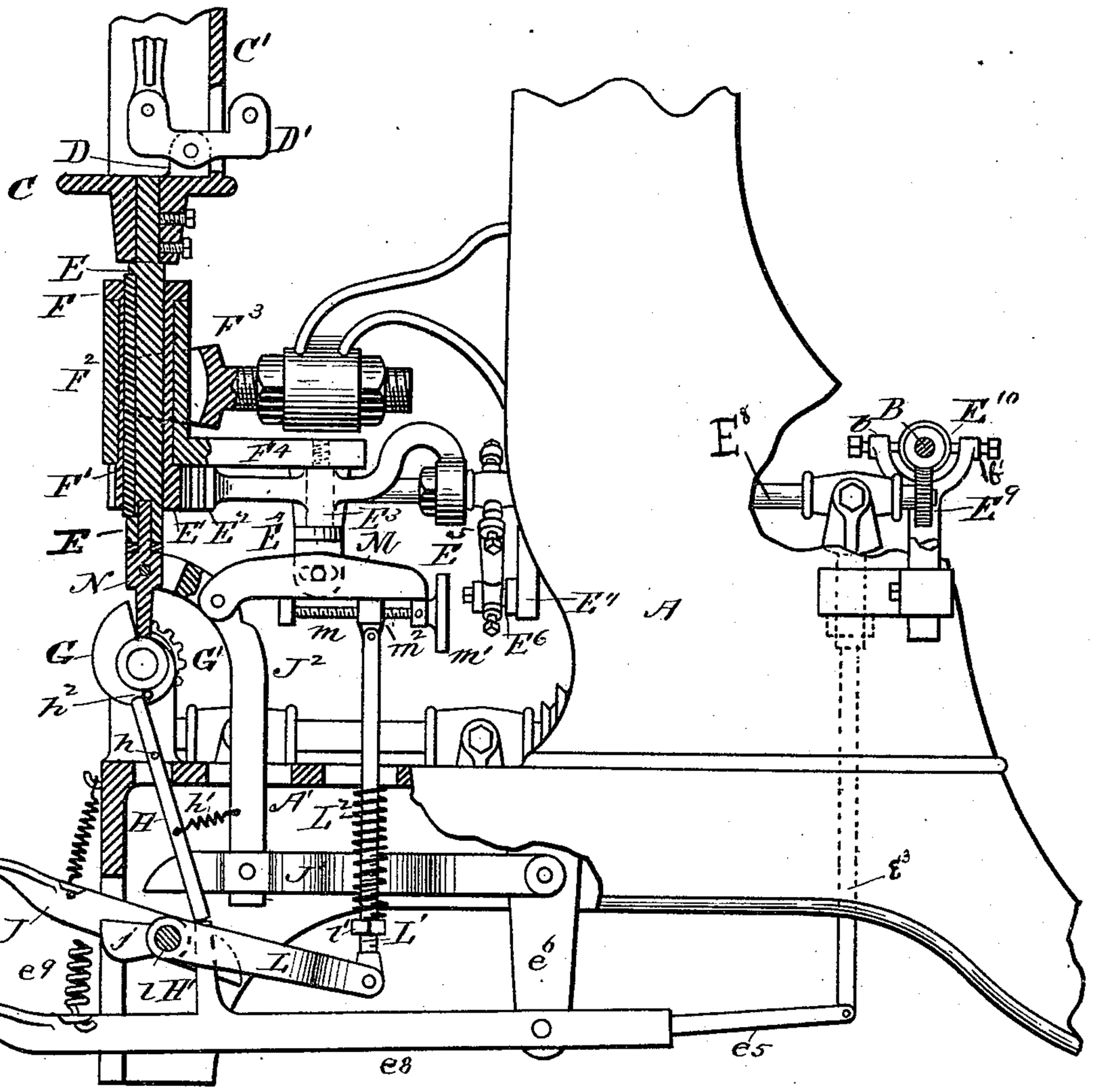

Fig. 3.

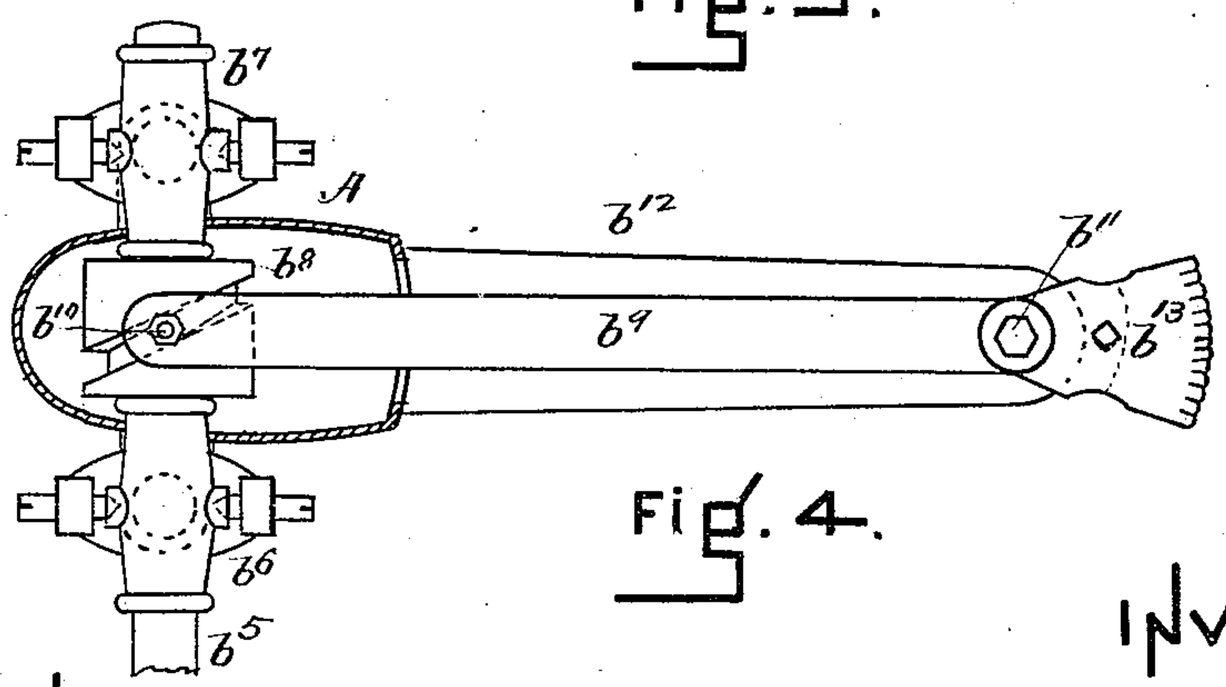

Fig. 4.

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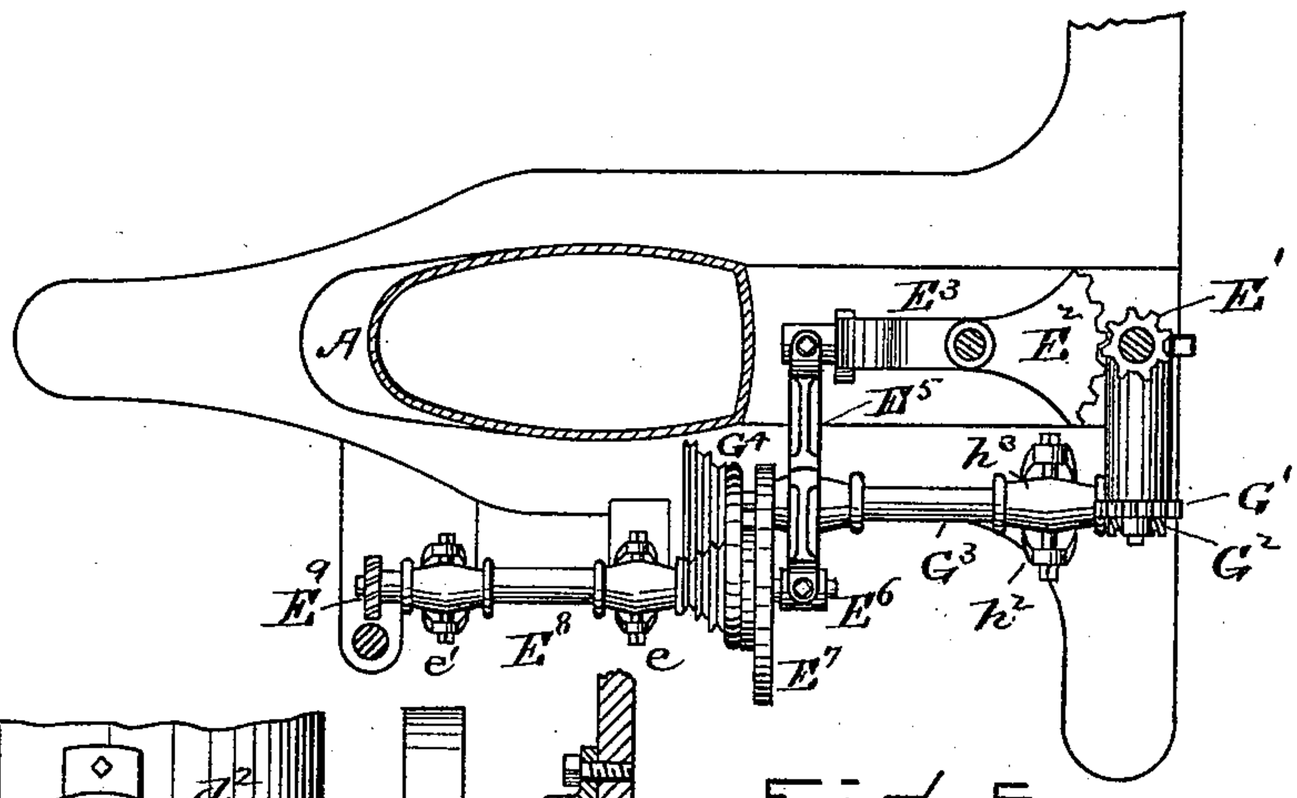

Fig. 5.

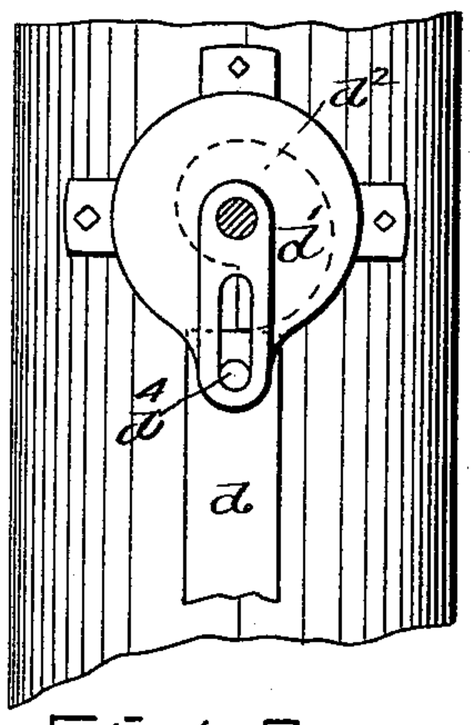

Fig. 7.

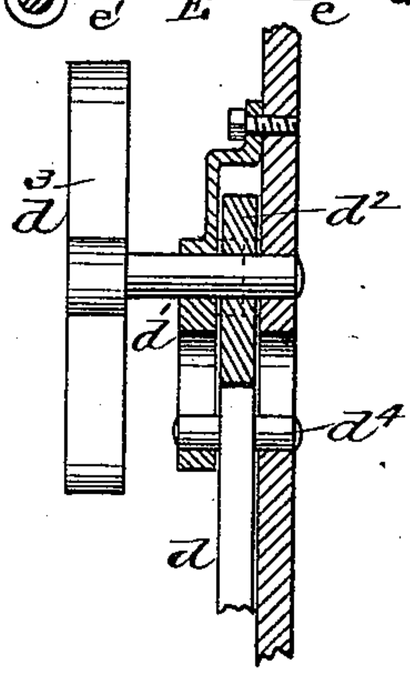

Fig. 8.

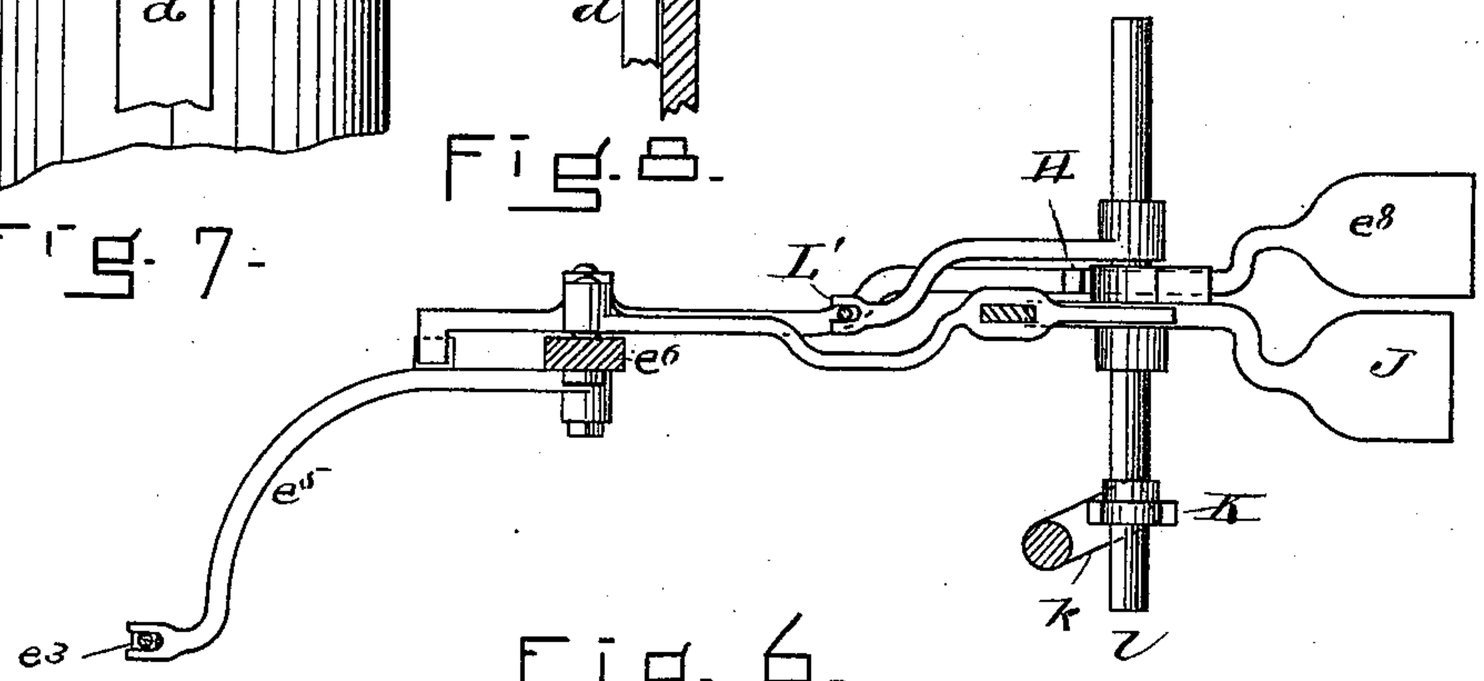

Fig. 6.

WITNESSES.

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A. L. F. MITCHELL.

HEEL BURNISHER.

No. 452,032. Patented May 12, 1891.

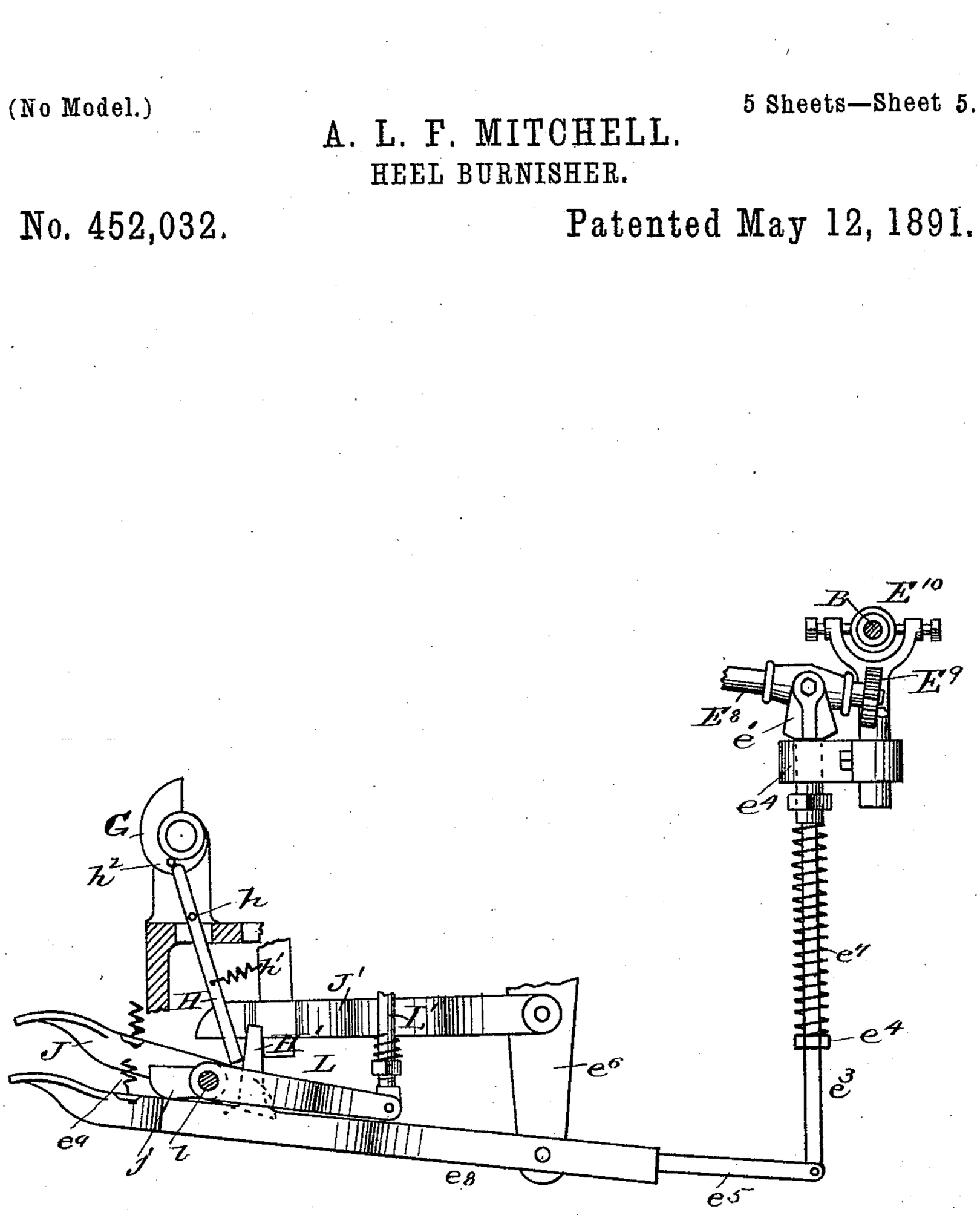

Fig. 9.

WITNESSES.

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UNITED STATES PATENT OFFICE.

ALBION L. F. MITCHELL, OF LYNN, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO WILLIAM SHUTE, T. DEXTER NUTTING, JAMES R. MITCHELL, AND WINFIELD J. MITCHELL, ALL OF SAME PLACE.

HEEL-BURNISHER.

SPECIFICATION forming part of Letters Patent No. 452,032, dated May 12, 1891.

Application filed July 3, 1890. Serial No. 357,690. (No model.)

To all whom it may concern:

Be it known that I, ALBION L. F. MITCHELL, of Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Heel-Burnishers, of which the following is a specification.

In the drawings is shown a machine embodying my invention. Figure 1 is a side elevation, partly in section. Fig. 2 is a front elevation. Fig. 3 is an enlarged side elevation of the base of the machine partly in section, and Fig. 4 is a detail showing the burnishing-machine. Fig. 5 is a section on line $x\,x$ of Fig. 1. Fig. 6 is a detail showing the treadles, partly in plan and partly in section. Figs. 7 and 8 are details showing the means for raising the jack, and Fig. 9 is a detail showing the treadles when the machine is out of gear.

In my machine, as illustrated by the drawings, are shown means for operating the burnishing-tool, means for supporting the shoe, and means for giving the shoe an up-and-down as well as a rotary motion, the feeding mechanism being so connected with the motive power that when the entire heel has been presented to the burnishing-tool the feeding mechanism is disconnected from the source of motion.

A is the post. B is the main shaft, on which are mounted fast and loose pulleys B′ B². This shaft is mounted in swinging bearings b b', and carries a pulley b^2, which is connected by a belt b^3 with the pulley b^4 for moving the burnisher-carrier.

The burnishing mechanism will be understood by reference to Fig. 4, b^5 being the shaft on which pulley b^4 is mounted. This shaft is mounted in swinging bearings b^6 b^7 and passes through the post A, and on it is the spirally-grooved cam b^8. b^9 is an arm having at one end a pin b^{10}, which moves in the cam-groove as the cam revolves. The other end is pivoted at b^{11} to the outer end of the arm b^{12} and carries the burnishing-tool b^{13}, so that the tool b^{13} and arm b^9 together form a lever, which has its fulcrum at b^{11}, so that as the arm b^9 is moved from side to side by the cam b^8 the burnisher will have a corresponding motion.

The shoe-jacking mechanism is as follows: C is a plate mounted on a socket, which fits over an oscillating shaft E in a way to be described. On the plate C is cast the shell C′, semi-cylindrical in cross-section and ending in the arms C², which join together above, forming a bearing C³ for the hanging shaft C⁴. This shaft C⁴ is hung from a pivoted bearing C⁵, which is supported on the end of a stud C⁶, passing into the top of a post A, so as to slide in and out from the post. On the lower end of the hanging shaft C⁴ is the plate c, against which the bottom of the heel is to be pressed. This plate c is attached to the shaft C⁴ by means of a set-screw, and may be removed and another plate of different shape be substituted, if desired. Upon a pair of ears D on the plate C is mounted the lever D′. d is a connecting-rod, one end of which is pivoted to one end of the lever D′, the other end lying against a cam d^2 on a shaft carrying a hand-wheel d^3, being held in place by a slotted link d', attached to the part C′, and pin d^4, which lies also in a slot in the post. (See Figs. 7 and 8.) Upon the other end of the lever D′ is pivotally mounted a spindle D², carrying a jack D³, the upper end of which furnishes a support for the last of the shoe to be burnished.

The spindle and jack are adjustable in length, so that the machine may be used to burnish heels of different heights. The spindle and jack, being swung forward through an arc of thirty degrees to receive the shoe, are then swung back into position. (Shown in Fig. 1.) The hand-wheel d^3 is then turned to so operate the cam d^2 as to depress the end of the lever D′, to which the connecting-rod d is attached, thus elevating the spindle and jack D² D³ and binding the heel against the plate c and holding it fast, the reverse motion of these parts allowing the shoe to be removed.

The mechanism for giving the shoe a rotary motion is as follows: The shaft E, on which the plate C is mounted, passes through a sleeve F, to which it is splined at F′, so as to rotate with the sleeve but move vertically in it, and it sets upon a stud N, so that the sleeve and shaft will oscillate together there-

on. (See Fig. 3.) The stud N is mounted upon the cam G, by means of which it and the jack and its supporting mechanism are raised and allowed to fall, in order to present the entire height of the heel to the burnishing-tool. The sleeve F lies within a bearing F^2, which is hung in a yoke F^3, so that the jack may swing out from the tool as the diameter of the heel increases. This yoke is adjustably attached to the post A, so that the position of the jack with reference to the tool may be adjusted according to the sized heel to be burnished.

To the sleeve F is fastened a gear E′, into which meshes a segment-gear E^2, which turns on a stud E^3, mounted on the lever M in a way to be described. This stud passes up and screws into the arm F^4, which is cast onto the bearing F^2. (See Fig. 3.) The segment-gear is oscillated by means of a connecting-rod E^5, which connects it with a crank-pin E^6, mounted on a disk E^7, this disk being on the end of a shaft E^8, which also carries at its farther end a gear E^9, meshing into a worm E^{10} on the main shaft B. This shaft E^8 is mounted in a swinging bearing *e* at the end nearest the disk E^7, and at its other end is mounted in a swinging bearing *e′*. The bearing *e* is pivoted in a yoke mounted in an eye e^2, projecting from a post A The bearing *e′* is pivoted in a yoke mounted on the rod e^3, which passes through two guides e^4 and is mounted on the end of a lever e^5, hung from the end of the hanger e^6. e^7 is a spring which is so located as to keep the gears E^9 E^{10} in mesh. This lever e^5 is operated by means of a treadle e^8, fulcrumed on the hanger e^6, as shown, this treadle being held by means of the spring e^9. This treadle is locked down on being depressed by means of the lever H, fulcrumed at *h*, which is so mounted that it may stand upon the projection H′ on the treadle e^8, as shown in Fig. 3. *h′* is a spring, which tends to draw this lever into position on top of projection H′.

The cam G, which is operated and is for the purpose to be described, carries a pin h^2, which as the cam rotates trips this lever H, so as to throw it off from the projection H′, and consequently allow the spring e^9 to act and separate the gears E^9 and E^{10}, thus stopping the action of the parts which derive their motion from the shaft E^8.

The cam G is operated by means of a gear and worm G′ G^2, the worm being mounted on the end of a shaft G^3, carrying a pulley G^4, belted to the pulley E^7, so that when the shaft E^8, which carries the pulley E^7, is operated the cam G will be rotated, this rotation lifting stud N, carrying the jack D^3, so as to present the entire vertical surface of the heel to the burnisher in succession, while the segment E^2 is operating to oscillate the heel. When this cam G has rotated from the position shown in Fig. 3 to such a position that the stud N is mounted upon its outer surface near its greatest radius, it will be seen that the pin h^2 will have passed around from the position shown in Fig. 3 to a position where it will strike the other side of the upper end of the lever H. The further motion of the cam G in the same direction will cause the pin h^2 to trip the lever H, thereby releasing the treadle e^8 in the manner referred to above and throwing the entire rotating and lifting mechanism out of operation at the instant when the stud E drops from the highest part of the cam to the lowest. (See Fig. 9.)

A second treadle J, mounted on the shaft *l*, is provided, in order to feed a particular part of the heel to the burnisher-tool, so as to touch it up in case it needs going over the second time. When such operation is to be accomplished, the treadle e^8 has been released, as above described, and has been acted upon by the spring e^9, so that these parts will be in the position shown in Fig. 9. Depressing the treadle J will bring the cam-piece *j*, mounted on a collar attached thereto, in contact with the treadle e^8, so as to depress it, and consequently bring the gears E^9 E^{10} in gear and so operate the segment-gear E^2. At the same time, however, it is necessary to raise the jack, and consequently the heel, to the proper height and hold it there, and also disengage the automatic jack-raising mechanism—viz., the cam—from its operating mechanism. To raise the jack, the outer end of the treadle J strikes the end of the lever J′, on which is mounted the hanger J^2, which straddles the stud N and is pinned to it, so that by lifting the lever J′ the jack is lifted. By this means the heel may be raised to any desired height and so brought to the burnishing-tool. In order, however, to disengage the cam mechanism so that under these circumstances the cam G will not operate the heel, I provide on the shaft *l* a cam K, which, when the shaft *l* is rotated by the depressing of the treadle J, depresses an arm *k*, attached to a stud *k′*, provided at its upper end with a yoke k^2, carrying a bearing k^3, in which the shaft G^3 is journaled. Depressing the treadle J, therefore, depresses also the worm G^2, so that it is no longer in gear with gear G′. By this means the automatic rotary motion of the jack is prevented, but its vertical motion is made to depend upon the will of the operator and is not automatic. I also provide means for adjusting the pressure on the various parts of the heel, so that the pressure on the heel-seat will be less than the pressure at the top lift. This I accomplish by mounting a lever L on the shaft *l* and connecting the end of this lever L by means of connecting-rod L′ with a second lever M, suitably connected to the lower end of the jack-support. I prefer to make use of a portion of the hanger J^2 as a link to connect this lever M with the jack-support; but the parts may be connected in any other suitable manner, provided they are enabled to move pivotally with respect to each other. The upper end of the connecting-rod L′, I prefer to provide with a collar m^2,

which is moved on a screw *m*, carrying the hand-wheel *m'*, so that its position under the lever M may be adjusted. This lever M is pinned to the bottom of the piece carrying the stud E^3, which is screwed into the arm F^4. This arm F^4 therefore supports not only the segment, but the entire system of levers below it. L^2 is a spring lying between a nut *l'* and the under side of the base-plate A', so that by turning the nut *l'* the pressure of this spring may be adjusted. The purpose of this spring L^2 is to press the heel against the burnishing-tool, and by adjusting its strength that pressure may be adjusted. A further adjustment may be had by altering the position of the collar m^2 under the lever M. It is observed that by changing the shape of the cam G the length of time during which the tool will dwell on any portion of the heel will be changed.

What I claim as my invention is—

1. The jacking mechanism above described, consisting of the lever D', mounted on a swinging standard, the jack-support hinged to one end thereof, and means whereby that end of said lever may be raised, in combination with said swinging standard and with the plate C, suitably mounted in a swinging bearing and capable of oscillation, as set forth.

2. The jack mechanism above described, consisting of the plate C and lever D', mounted thereon as described, on one end of said lever being hinged the jack-support and on the other end being hinged a connecting-rod *d*, in combination with the cam d^2, located in contact with one end of said rod *d* and adapted to operate it in the manner set forth.

3. In a burnishing-machine, in combination, a jack-support capable of an oscillating movement on its vertical axis, a jack mounted thereon, and means for giving said jack and jack-support a continuous oscillating movement—viz., a gear mounted on said jack-support and having its center coincident with the vertical axis thereof, a segment-gear located upon the fixed stud E^3 in mesh with said gear, and means whereby said segment-gear is rocked, all as set forth.

4. In a burnishing-machine, a post carrying a bearing F^2, a jack-support carrying a jack and mounted in said bearing, being capable of a vertical sliding movement and also an oscillating movement therein, and means whereby said jack-support is moved vertically—namely, a helical cam mounted with its axis horizontal in suitable bearings, the effective surface of said cam being in contact with the bottom of said jack-support, and mechanism whereby said cam is rotated, all in combination with mechanism, substantially as described, whereby said jack-support is oscillated, all as set forth.

5. In a burnishing-machine, the stud N, the shaft E, and sleeve F, said shaft E carrying the shoe-supporting mechanism and mounted in said sleeve F, in which it is capable of a vertical movement and being supported upon said stud N, said sleeve being capable of oscillation within a bearing pivotally mounted on the post, all in combination with means whereby said sleeve shall be oscillated, and during its oscillation said shaft and the mechanism connected therewith will swing to conform to the shape of the heel, all as set forth.

6. In a burnishing-machine, a cam for feeding the jack vertically, the gear G', a horizontal shaft on which said cam and said gear are mounted, the shaft G^3, hung in pivotal bearings and carrying the worm G^2, and means whereby the gear G' and worm G^2 may be instantly separated at pleasure, all as set forth.

7. In combination with the jack and mechanism whereby it is oscillated and raised, means whereby said mechanism is connected with and disconnected from the source of power, as follows—namely, the shaft E^8, suitably connected with said feeding mechanism and mounted in pivotal bearings *e e'*, said bearings *e'* being mounted on the end of a rod having a sliding motion, and means, substantially as described, whereby said rod may be elevated and gear and worm E^9 E^{10} thrown into gear, as set forth.

8. In combination with the jack and mechanism whereby it is oscillated, the levers e^8 e^5, spring e^9, rod e^3, on the upper end of which is mounted a journal-bearing, shaft E^8, mounted in said journal-bearing and carrying the gear E^9, the worm E^{10}, the post H', mounted on the lever e^8, the lever H, capable of being mounted upon said post, and the cam G, carrying the tripping-pin h^2, located and operating together substantially as and for the purposes set forth.

9. In a burnishing-machine, the vertically-movable jack, in combination with means whereby it may be raised automatically, and the treadle J, whereby it may be raised at will, said treadle being connected with the shaft G^3 and shaft F in the manner described, whereby when the treadle is depressed the jack will be raised and its oscillating mechanism brought into action, while the automatic jack-raising mechanism will be thrown out of gear, all as set forth.

10. In a heel-burnisher, the post carrying a yoke F^3, a jack-support pivotally mounted on a horizontal axis in said yoke, the lever M, suitably supported, one end of said lever being connected with the lower end of said jack-support, in combination with said lever and means, substantially as described, whereby the weight of said jack-support upon said lever M is counterbalanced, as set forth.

11. In a heel-burnisher, in combination, the post carrying a yoke F^3, a jack-support pivotally mounted on a horizontal axis in said yoke, the lever M, suitably supported, one end of said lever being connected with the lower end of said jack-support, the spring L^2, located with respect to said lever M to counterbalance the weight of said jack-support upon said lever M, and means, substantially

as described, whereby the relative positions of said spring and said lever may be adjusted, all as set forth.

12. In a heel-burnisher, in combination, the jack-support swinging on a horizontal axis and carrying the arm F^4, the lever M, pivotally hung to said arm F^4 and connected, as described, with the lower end of the jack-support, and means, substantially as described, whereby the weight of said jack-support upon said lever M is counterbalanced, as set forth.

13. In a heel-burnishing machine, in combination, a jack-support swinging in a horizontal axis, the lever J′, the rod J^2, mounted thereon and connecting said lever J′ with the jack-support, and the lever M, suitably mounted and connected at one end with said rod J^2 and assisting to support said jack-support, and means, substantially as described, whereby the weight of said jack-support upon said lever M shall be counterbalanced, all as set forth.

14. In a burnishing-machine, the post carrying a yoke F^3, a jack-support mounted in said yoke on a horizontal axis, a horizontal lever M, suitably supported, one end of said lever being suitably connected with the lower end of said jack-support, in combination with a spring suitably connected, as described, with the other end of said lever to counterbalance the weight of said jack, all as set forth.

In testimony whereof I have hereunto subscribed my name.

ALBION L. F. MITCHELL.

Witnesses:

FRANK G. PARKER,

GEORGE O. G. COALE.