

(No Model.)

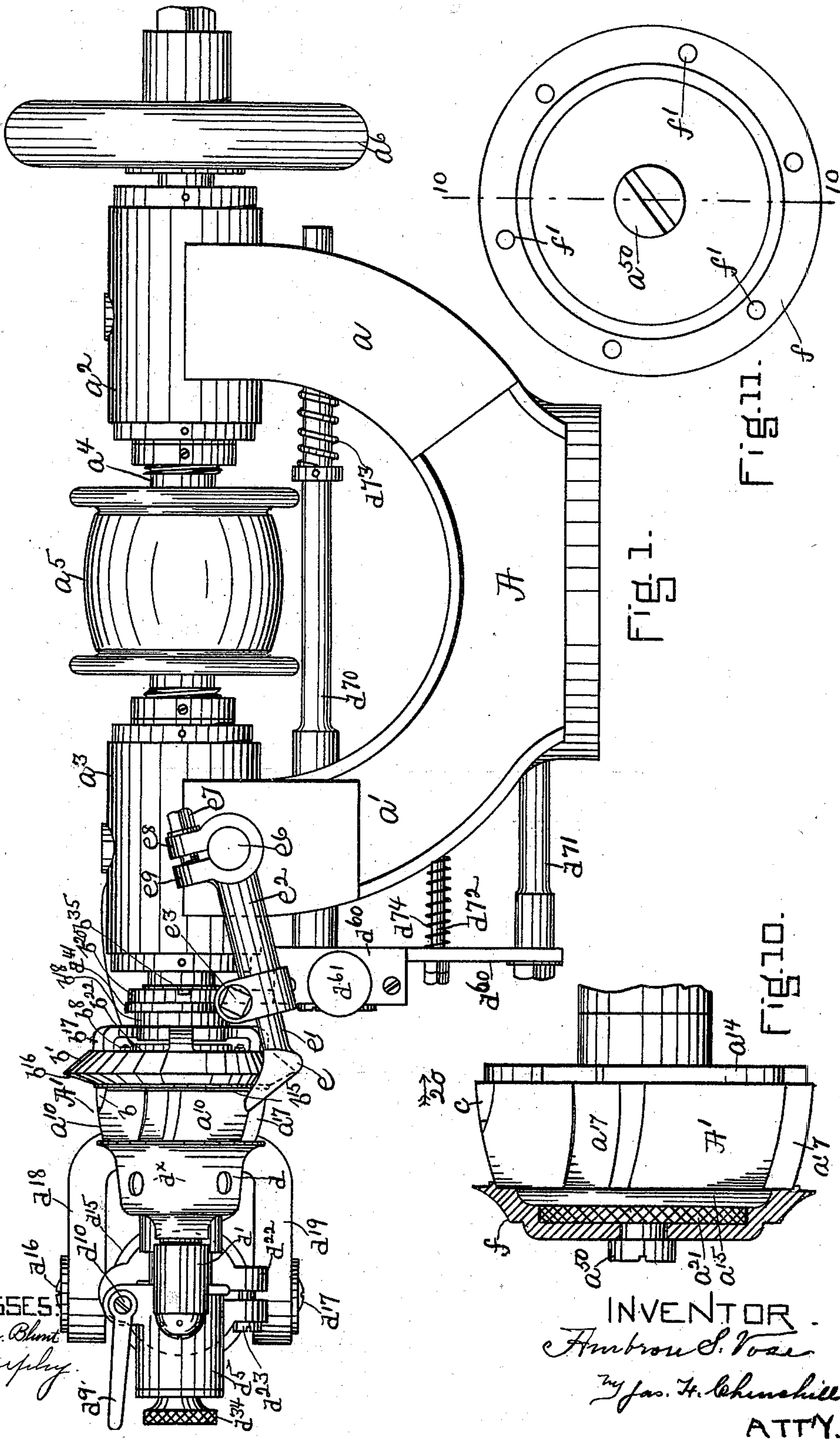
3 Sheets—Sheet 1.

A. S. VOSE.

HEEL TRIMMING AND RANDING MACHINE.

No. 560,825.

Patented May 26, 1896.



WITNESSES
Matthew M. Blunt
J. Murphy

INVENTOR
Ambrose S. Vose
By Jas. H. Chishill
ATTY.

(No Model.)

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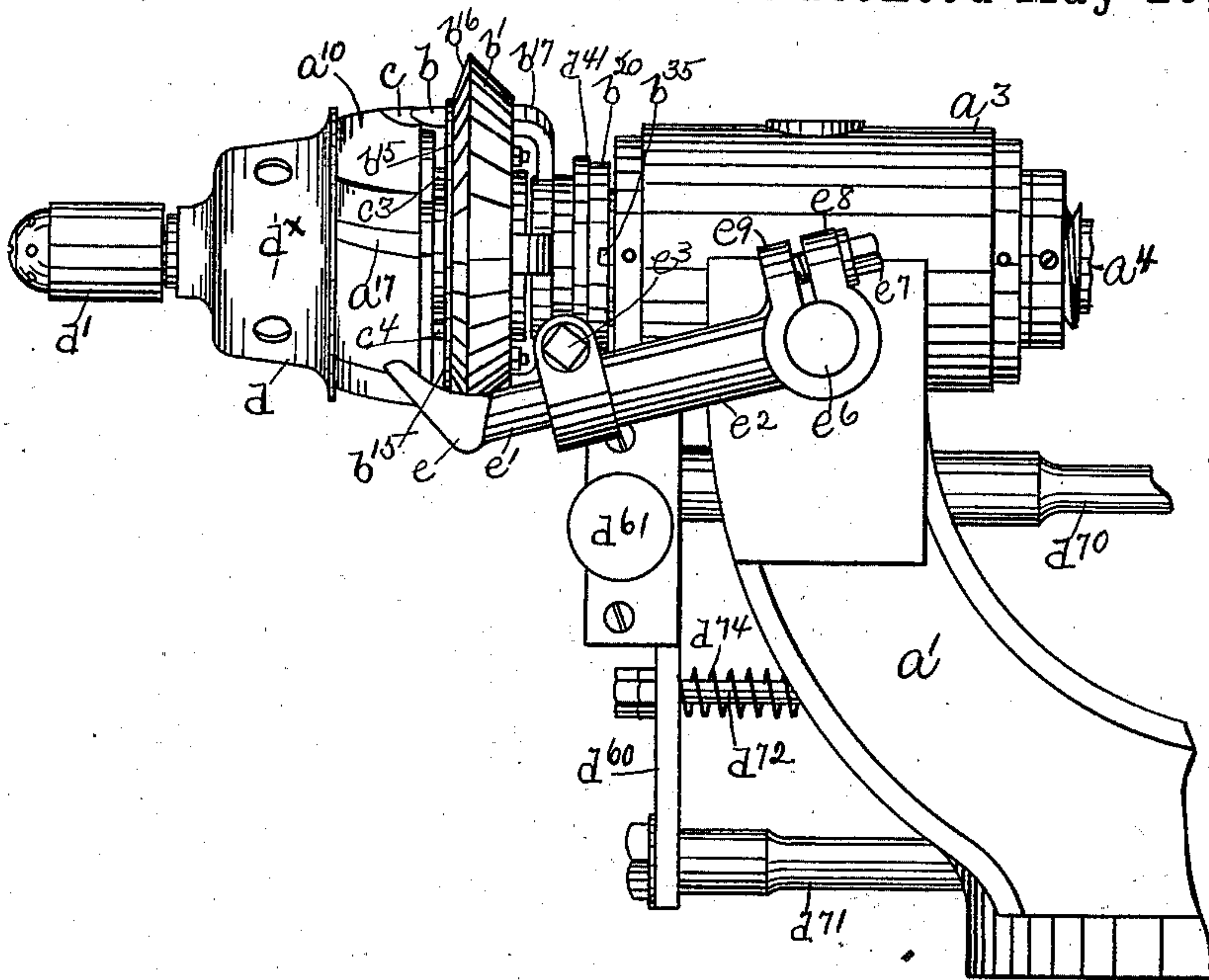


Fig. 2.

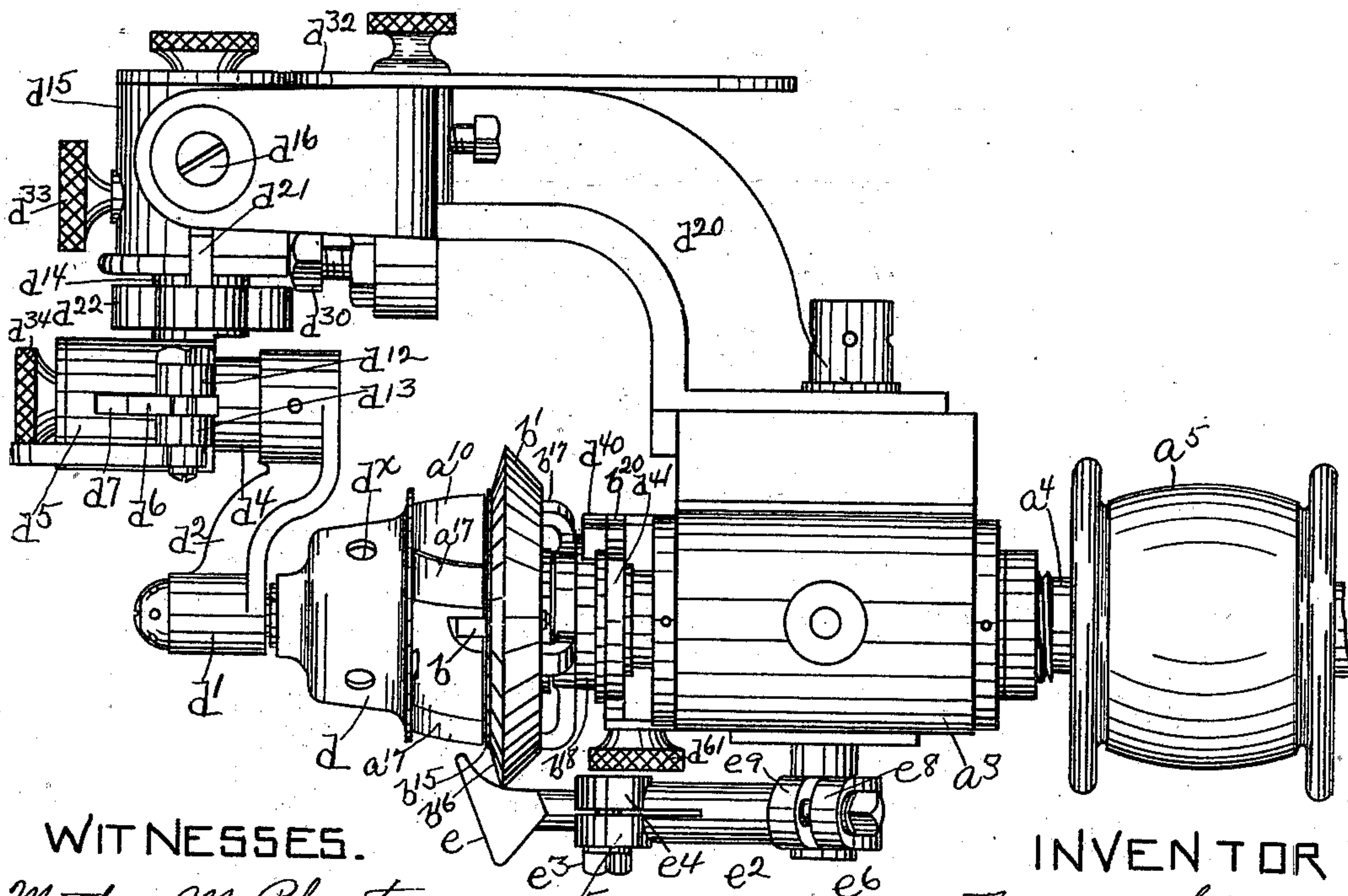


Fig. 3.

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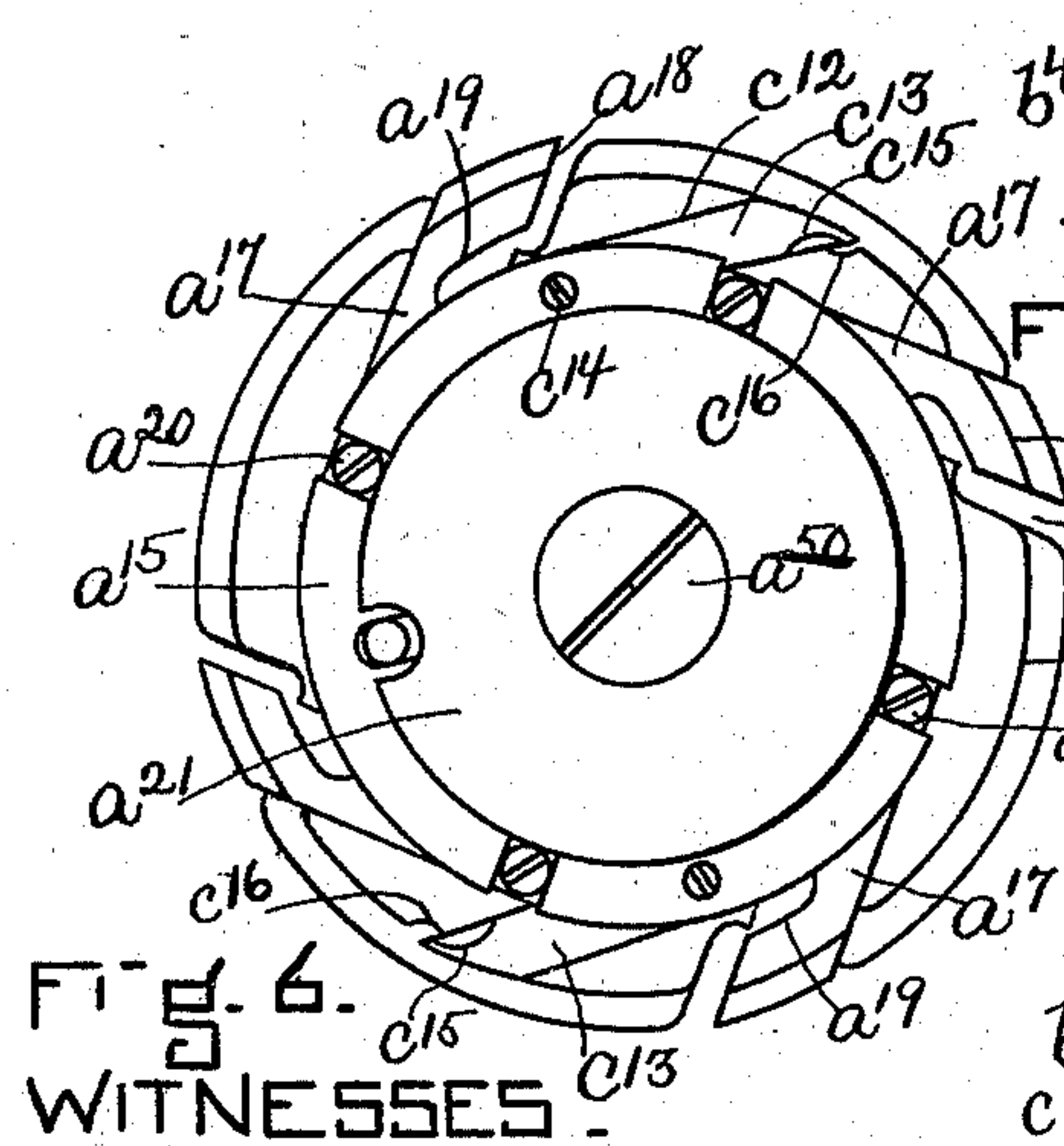
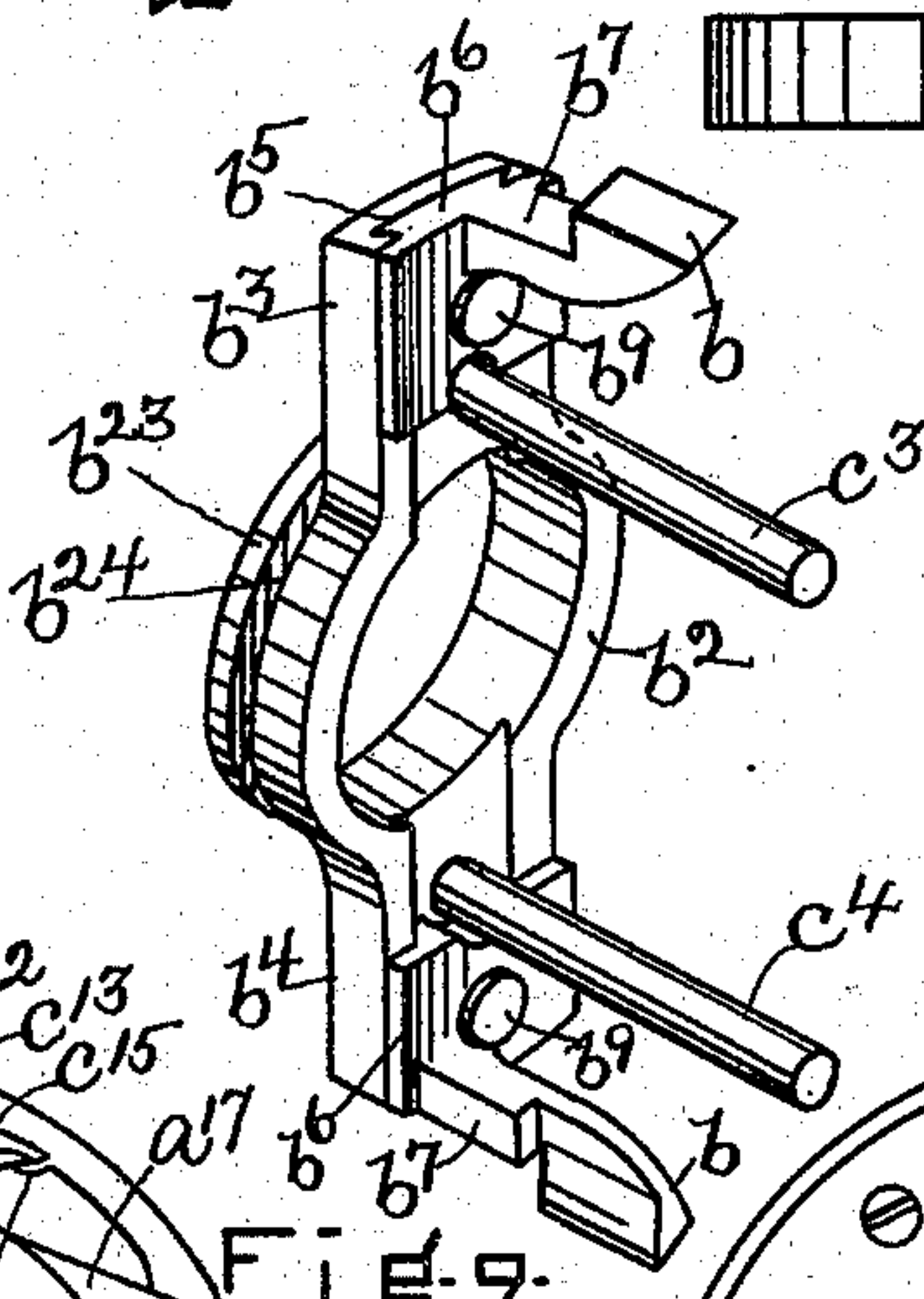
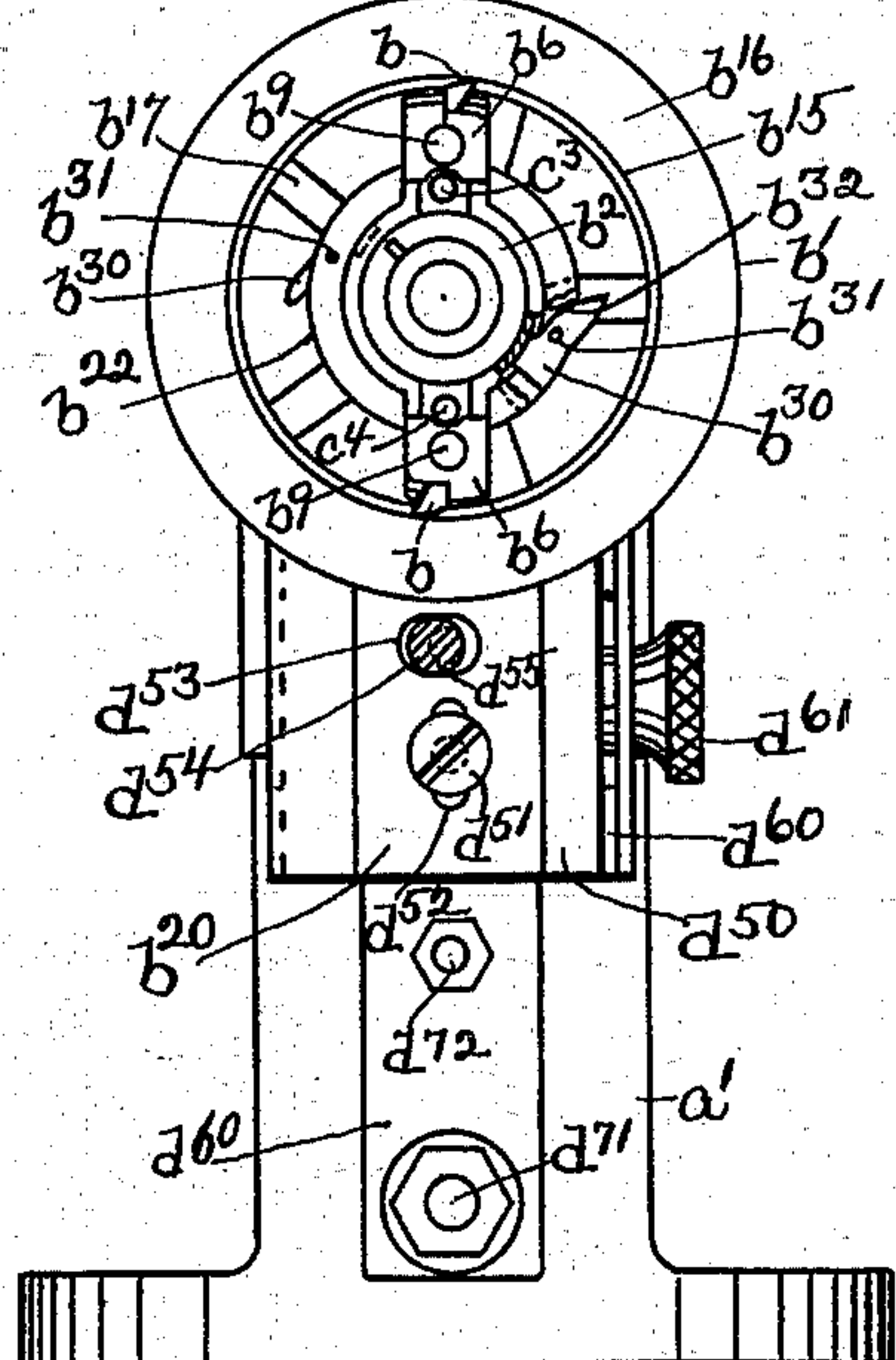
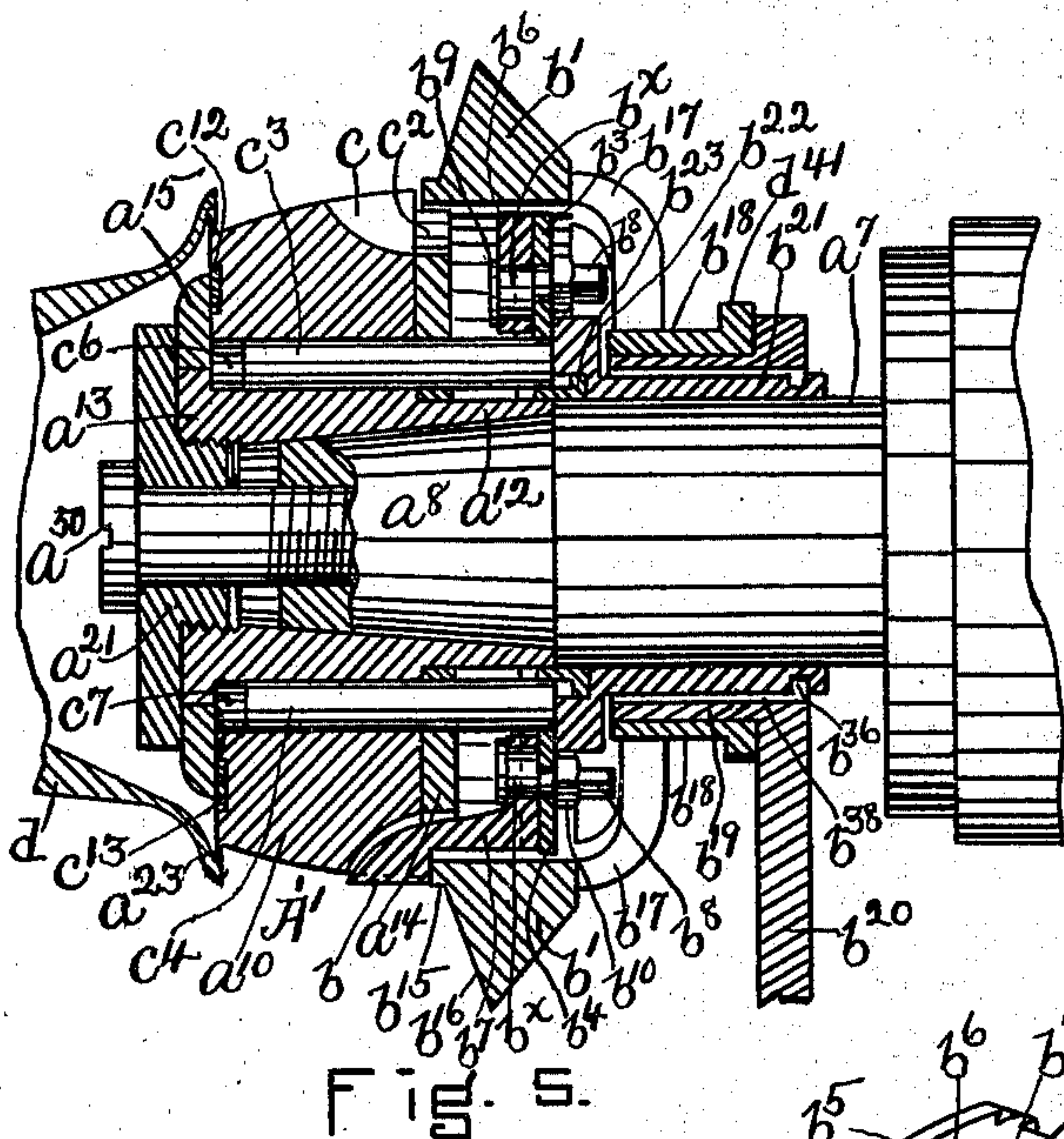


Fig. 6.
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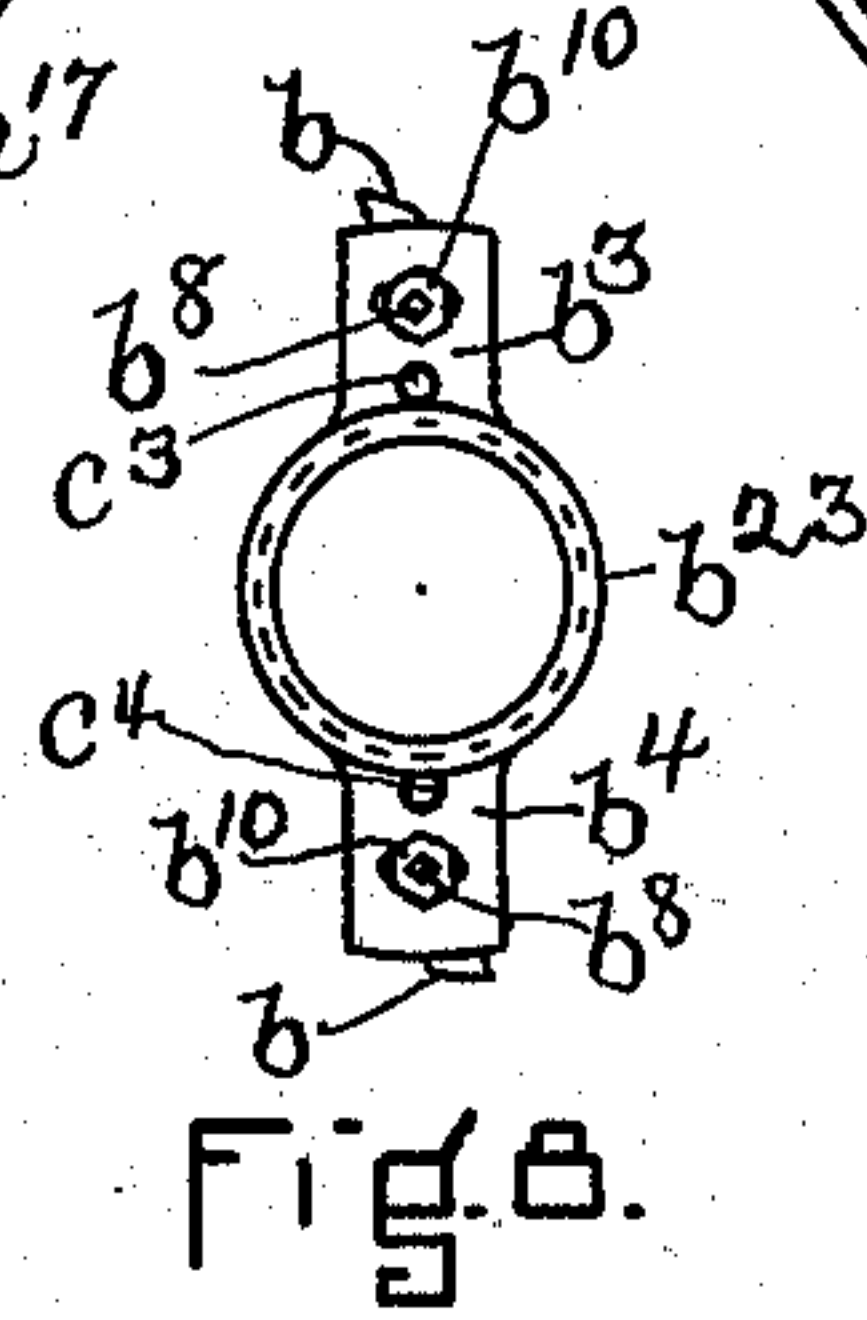


Fig. 7.
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UNITED STATES PATENT OFFICE.

AMBROSE S. VOSE, OF BOSTON, MASSACHUSETTS.

HEEL TRIMMING AND RANDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,825, dated May 26, 1896.

Application filed January 11, 1896. Serial No. 575,071. (No model.)

To all whom it may concern:

Be it known that I, AMBROSE S. VOSE, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Heel Trimming and Randing 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 a machine especially designed and adapted for trimming and randing the heels of boots and shoes in one operation. The heels of boots and shoes are usually of unequal length from the heel-seat to the tread of the heel and are longer at the back of the heel than at the breast of the same, and this inequality in the length of the heel varies in different styles or shapes of heels. Furthermore, the heels of shoes of the same lot, when made of supposedly uniform thickness or length, vary in different shoes of the same style or shape.

It has long been desired to obtain a machine with which the heels of boots and shoes may be completely trimmed in one operation irrespective of the difference in the length of the heel at its various parts, and prior to this invention I am aware that attempts have been made to accomplish this result; but so far as I am aware these attempts have not been productive of practical and commercially-successful machines for the purpose desired.

35 In the machines known to me with which the result desired has been attempted two knives or sets of knives and a movable rand-guard have been employed, one knife or set of knives, called the "rand" knife or knives, being used in connection with the rand-guard, which is movable bodily away from the top lift or tread end of the heel and which guard normally covers the heel-seat portion of the heel-cutter, the said rand-knife being axially movable between the knives or blades of the main or heel cutter.

45 This invention has for its object to provide a heel-trimming machine with which the heel may be trimmed and randed in one operation; and in accordance with this invention I employ a rotary cutter provided with knives or blades, preferably of substantially the width of the heel edge at its narrowest portion—namely, at its breast—and with rand-knives,

an automatically yielding top-lift guide, one or more auxiliary knives suitably connected to the top-lift guide to be moved therewith, so as to practically form extensions of the main heel-trimming knives or blades, and a rand-guard, which enters the rand-crease and forms a solid abutment for the heel-seat end of the heel, so that as the said heel is turned in the operation of trimming the top lift or tread end of the heel will force backward the top-lift guide and move the auxiliary knives or cutters into a different plane of rotation, farther removed from the rand-guard, whereby the longer portions of the heel may be trimmed by the conjoint action of the main and auxiliary knives or blades occupying different positions with relation to each other, so that the entire edge of the heel may be trimmed in a smooth and finished manner in one operation. The automatically yielding top-lift guide may and preferably will be adjustably supported, so as to be moved radially with relation to the cutter-carrying shaft in two directions substantially at right angles to each other, and the said auxiliary knives are also preferably individually adjustable for a purpose as will be described. The main heel-trimming blades or knives may and preferably will be provided with rand-knives, and the cutter-head may and preferably will be provided with additional rand knives or blades attached to the cutter-head between adjacent heel-trimming knives or blades, and the said additional rand-knives may be of a novel construction, as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

90 Figure 1 is a front elevation of a heel-trimming machine embodying this invention, showing the various parts in what may be termed their "normal" position; Fig. 2, a front elevation of the left-hand part or half of the machine shown in Fig. 1, with the top-lift guide and the auxiliary knives moved back into the position occupied by them when the back of the heel is being trimmed; Fig. 3, a top or plan view of the left-hand portion or half of the machine shown in Fig. 1; Fig. 4, a detail in end elevation with the cutter removed from Fig. 1, looking toward the right; Fig. 5, a detail in section and elevation and

on an enlarged scale to be referred to; Fig. 6, a front or side elevation of the rotary cutter shown in Fig. 5, looking toward the right; Fig. 7, a rear side elevation of the rotary cutter shown in Figs. 5 and 6; Fig. 8, a detail in front elevation of one form of holder or carrier for the auxiliary knives or blades; Fig. 9, a perspective of the holder or carrier and its auxiliary knives shown in Fig. 8 and on an enlarged scale, and Figs. 10 and 11 modifications to be referred to.

In the machine herein shown as embodying this invention, A represents a yoke-shaped frame provided with arms a a' , having bearings a^2 a^3 for a main or cutter shaft a^4 , provided with a pulley a^5 intermediate of the said bearings and with a fly or balance wheel a^6 , the said shaft being preferably provided with oppositely-extended tapering journals, substantially as shown and described in United States Patent No. 538,055, granted to me April 23, 1895. The shaft a^4 beyond the bearing a^3 is preferably provided with a cylindrical extension a^7 and a tapered end a^8 , upon which latter is fitted a rotary heel-cutter A', preferably of a construction herein shown and as will now be described.

The rotary heel-cutter A' consists of a cutter-head or annular body or wheel a^{10} , provided with a central bore made tapering for a portion of its length to fit the tapered end a^8 of the shaft a^4 , the said body or wheel having cylindrical flanges or hubs a^{12} a^{13} , (see Fig. 5,) upon which are fitted rings a^{14} a^{15} . The body or wheel a^{10} of the cutter is made, as herein shown, of a width substantially equal to the thickness or height of the heel at its breast, and its outer circumference or periphery is made of a curvature or shape which substantially conforms to the shape it is desired the finished heel should have, and the said periphery is provided with transverse or axial slots a^{16} , which extend into the body or wheel a^{10} , and into which are inserted heel-trimming knives or blades a^{17} .

The knives or blades a^{17} are provided with a cutting edge a^{18} and preferably with a re-entrant portion a^{19} , which coöperates with the slots a^{16} to form an enlarged clearance for the leather or other chips trimmed off from the heel. The knives or blades a^{17} may and preferably will be simultaneously and individually adjustable out and into their slots a^{16} after the manner shown and described in United States Patent No. 547,098, granted to me October 1, 1895—namely, by means of the ring a^{15} , having suitable openings or slots into which extend screws a^{20} , eccentrically mounted in the blades or knives a^{17} . The knives are held in their adjusted position, as herein shown, by means of a flanged nut a^{21} , having a screw-threaded shank, which engages screw-threads on the interior of the hub a^{13} , as clearly shown in Fig. 5.

The knives or blades a^{17} may be adjusted by unscrewing the clamping-nut a^{21} and turning the ring a^{15} , so that their cutting edges a^{18}

will be substantially flush with or project slightly beyond the periphery of the body or wheel a^{10} , which preferably constitutes a bed for the rotary cutter. The blades or knives a^{17} constitute what may be designated the "main heel-trimming knives," and, if desired, each of the said knives may be provided at one end with a lip a^{22} , constituting a rand cutter or knife, and the periphery of the body or wheel a^{10} may also be provided with a lip a^{23} , which in practice constitutes a bed for the rand knife or cutter a^{22} . The cutter-head A' may be secured to the cutter-shaft a^4 by the threaded bolt a^{50} .

The body or wheel a^{10} and the main trimming-knives a^{17} carried thereby may and preferably will be made of a width substantially equal to the length of the heel at its narrowest point—namely, at its breast—and in order that heels of varying shapes and sizes, which usually are made longer at the back of the heel than at the breast, may be trimmed and randed in one operation I have provided one or more auxiliary heel-trimming knives or blades b , coöperating with that portion of the main knives a^{17} which acts upon the top lift or tread end of the heel, the said auxiliary knives being automatically adjustable or movable with relation to the rotary cutter A', so as to compensate for a variation in the height of the heel. In the present instance the auxiliary heel-trimming knives or cutters b (herein shown as two in number, but which may be of any desired number) are secured to a carrier or holder which is automatically movable with the top-lift guide or guard b' in a manner as will now be described.

In the present instance the carrier or holder for the auxiliary heel-trimming knives is shown as a ring b^2 , provided with radially-extended arms b^3 b^4 , to which the auxiliary heel-trimming knives b are removably and adjustably secured. In the present instance the arms b^3 b^4 of the carrier are represented as each provided with a dovetailed slot b^5 , (see Fig. 9,) into which is fitted a dovetailed base b^6 , from which projects an arm or shank b^7 , having secured to or forming part of it the auxiliary cutter b . The bases b^6 of the auxiliary cutters or knives may and preferably will be adjustably secured to the radial arms b^3 b^4 of the carrier by means of threaded pins or screws b^8 , provided with an eccentric collar or hub b^x , (see Fig. 5,) which rotates within an opening or hole in the base b^6 , the said pin or screw being provided with a head b^9 at one end, which bears against the base b^6 , and with a nut b^{10} at its opposite end, which bears against the radial arm, as clearly shown in Figs. 5, 8, and 9. By unloosening the nut b^{10} the screw or pin b^8 may be turned so as to rotate the eccentric hub b^x and thereby move the base b^6 for the auxiliary cutter toward and away from the center of the ring b^2 . The carrier for the auxiliary heel-cutting knives b , as above stated, is movable bodily with relation to the rotary heel-cutter A' and this

result may be effected, as herein shown, by connecting the said carrier to the top-lift guard or guide b' , which connection may be effected after the manner herein shown and as will now be described.

The top-lift guide or guard b' is provided with an annular ledge or rim b^{15} and with a beveled annular surface b^{16} , against which the top lift rests, and the guide or guard in the present instance is connected by arms b^{17} to a hub b^{18} , which is loosely mounted on an annular projection or sleeve b^{19} , secured to or forming part of an upright support or bar b^{20} , which is preferably radially movable in two directions with relation to the cylindrical extension a^7 of the cutter-carrying shaft a^4 in a manner as will be described.

The top-lift guard b' is not connected to the cutter-carrying shaft to revolve therewith, but is mounted to turn independent of the said shaft on a separate support, which is adjustable, so as to enable the guard to be adjusted with relation to the cutting edges of the main heel-trimming knives.

The sleeve b^{19} encircles a sleeve b^{21} , (see Fig. 5,) which is loosely fitted upon the cylindrical extension a^7 of the cutter-shaft, and which, as herein shown, is provided at one end, termed the "inner" end, with an annular flange b^{22} , which annular flange is of reduced diameter at its front end to form an annular groove into which is extended an annular ring b^{23} , secured to or forming part of the ring b^2 of the auxiliary-cutter carrier, as clearly shown in Fig. 9, the ring b^{23} being separated from the ring b^2 to leave an annular groove b^{24} , located in its operative position under the flange b^{22} on the sleeve b^{21} , and into which groove locking devices are adapted to project to secure the auxiliary-cutter carrier to the sleeve b^{21} , so that when the sleeve b^{21} is moved longitudinally on the cylindrical extension a^7 of the cutter-shaft, the auxiliary-cutter carrier will also be moved with it, but which annular groove b^{24} permits the auxiliary-cutter carrier to be rotated without producing rotation of the sleeve b^{21} . The auxiliary-cutter carrier may be locked to the sleeve b^{21} in any suitable or desired manner, and in the present instance I have represented the same as locked by means of pawls or levers b^{30} , herein shown as two in number, (see Fig. 4,) and located substantially diametrically opposite to each other, and pivoted, as at b^{31} , in suitable slots or openings in the flange b^{22} of the sleeve b^{21} , the said pawls or levers being adapted to be pressed forward so as to project into the groove b^{24} of the auxiliary-cutter carrier, as represented in Fig. 4, by means of suitable springs b^{32} or in any other suitable manner. The pawls b^{31} are capable of being moved on their pivots so as to disengage the cutter-carrier from the sleeve b^{21} , when it is desired to remove the auxiliary-cutter carrier from the machine—as, for instance, for the purpose of grinding or replacing the auxiliary cutting blades or knives b . The sleeve b^{21} is designed

to be moved longitudinally on the cutter-shaft, or rather on the cylindrical extension a^7 of the same, and to effect this result the said sleeve is connected in a suitable manner with the sleeve b^{19} . This connection may be effected in any suitable or desired manner, and in the present instance it is represented as effected by means of keys or pins b^{35} , (see Figs. 1 and 2,) which extend through slots in the support b^{20} , and into an annular groove b^{36} in the end of the sleeve b^{21} . The fastening-pins b^{35} do not project into the said annular groove b^{36} its entire depth, but only sufficient to effect a positive connection between the sleeve b^{21} and the support b^{20} , and so as to leave an opportunity for the support b^{20} and its sleeve b^{19} to be moved radially with relation to the cylindrical extension a^7 and the sleeve b^{21} , which latter is normally separated from the inner circumference of the sleeve b^{19} by an annular space b^{38} .

The radial movement of the sleeve b^{19} , and thereby of the hub b^{18} for the top-lift guide, may and preferably will be effected as will be hereinafter described. In order that the auxiliary cutters b may be moved back away from the heel-seat of the shoe simultaneously with the top-lift guide b' , the auxiliary cutters b in the normal position of the top-lift guide b' , which normal position is represented in Figs. 1, 3, and 5, extend into suitably-shaped slots, cavities, or pockets c , made in the body or wheel a^{10} of the rotary cutter A' , preferably between the slots in which are located the main blades or knives a^{17} , which pockets or openings c , as shown in Figs. 3 and 5, extend from the rear face or side of the cutter head or body a^{10} , but partially across the periphery of the same.

The cutting edges or cutters proper of the auxiliary knives extend outwardly above or beyond their arms b^7 , so that the top-lift guide b' may encircle the said arms and bring the annular flange b^{15} substantially flush with the cutting edges of the main cutter a^{17} and the auxiliary cutters b , when the latter are in their operative position, which may be when they are in their sockets c , so that they act upon the heel when in the said sockets and continue to act upon the said heel when drawn out of their sockets into the position represented in Fig. 2. The ring a^{14} , which is secured to the body or wheel a^{10} by the screws c' , (see Fig. 7,) and which is employed to confine the knives a^{17} in their slots against side movement, is also provided with a cut-out portion c^3 , which registers with and practically forms part of the sockets or pockets c in the cutter head or wheel a^{10} . The auxiliary knives and their carrier are rotated in unison with the rotary cutter A' , and this result may be effected, as herein shown, by means of pins or rods c^3 c^4 , (see Figs. 5 and 9,) fast to the radial arms b^3 b^4 of the carrier and extended into sockets c^6 c^7 in the cutter-head, the said rods also extending through suitable holes c^8 c^9 in the plate a^{14} , which holes are in line with

the sockets c^6 c^7 . The pins or rods c^3 c^4 also serve as guide-pins, to guide the carrier and its cutting-knives in the longitudinal movement of the carrier away from the cutter head or wheel a^{10} . The cutter-head on its front or heel seat end may and preferably will be provided in its outer face with suitably-inclined slots c^{12} , (see Figs. 5 and 6,) into which are placed rand-knives c^{13} , which may and preferably will be connected to the adjustable ring a^{15} by an eccentric screw or connection c^{14} of a similar construction to the eccentric connection a^{20} , and the said rand-knife on its front face may be cut out, as at c^{15} , and the front wall of the slot c^{12} may also be cut out, as at c^{16} , to form a clearance for the chips. The rand-knives c^{13} may alone be relied upon to do the randing, in which case the rand knife or edge a^{22} on the main cutting knife or blade a^{17} may be dispensed with, or both may be employed as herein represented, or the auxiliary rand-knife c^{13} , while preferred, may also be dispensed with and the rand edge or knife c^{22} be relied upon.

By means of the eccentric connection c^{14} the rand-knife c^{13} may be adjusted independently of the main heel-trimming knives a^{17} , and it also may be adjusted simultaneously with the said heel-trimming knives. The rand-knives a^{22} c^{13} may have coöperating with them a hollow rand-guard d , the edge of which is designed to run in the rand crease or space between the heel-seat and the upper, and when in its operative position the said rand-guard is stationary with relation to the rotary cutter A' and forms an abutment for the heel-seat end of the heel as the latter in the operation of trimming a shoe is turned so as to present its complete edge to the operating or cutting knives. The hollow or recessed rand-guard has its body portion provided with suitable openings or chip-outlets d^x . The rand-guard d is supported so as to be capable of being removed from proximity to the rotary cutter A' when it is desired to gain access to the said cutter, and in the present instance the rand-guard d is shown as rotatably supported in a hub or sleeve d' , attached to the arm d^2 , (see Fig. 3,) secured to or forming part of a piston d^4 longitudinally movable in a cylinder d^5 , the said piston being provided with a key or projection d^6 , which is extended up into a slot d^7 in the cylinder d^5 , the said piston being adapted to be firmly held in its adjusted position axially with relation to the rotary cutter A' , by means of the walls of the slot d^7 gripping the upright or key d^6 , which clamping action is effected, as herein shown, by means of a lever d^9 on the end of a threaded rod d^{10} , extended through ears d^{12} d^{13} . The cylinder d^5 is provided with a cylindrical rod or arm d^{14} , extended substantially at right angles to it, (see Fig. 3,) which constitutes a piston movable in a cylinder d^{15} , pivotally supported upon centering-screws d^{16} d^{17} in arms d^{18} d^{19} (see Figs. 1 and 3) of a bracket d^{20} , secured to the arm a'

of the main frame. The piston d^{14} is guided in its longitudinal movement in its cylinder d^{15} by means of a key or guide-arm d^{21} , secured to or forming part of a split collar d^{22} , which embraces the piston d^{14} and is securely clamped thereto by a screw d^{23} , extended through the ends of the yoke or split collar, as shown in Fig. 1. The cylinder d^{15} is held from turning on its centering-screws d^{16} d^{17} when in its proper or adjusted position by means of a front stop, shown as a threaded bolt d^{30} , and a back stop, shown as an eccentrically-mounted lever d^{32} . The piston d^{14} is secured in its adjusted position within the cylinder b^{15} by a set-screw d^{33} , and the piston d^{14} may be moved longitudinally in its cylinder d^{15} by the adjusting-screw d^{34} . The particular construction of support for the rand-guard is not herein claimed broadly, as it forms the subject-matter of another application filed on the 24th day of September, 1895, by myself and another, and bearing Serial No. 563,485. The rand-guard d may be moved backward, so as to obtain access to the rotary cutter A' , by turning the handle or lever d^{32} , so as to unclamp the cylinder d^{15} and permit it to be turned on its centering-screws d^{16} d^{17} . The top-lift guard b' is free to rotate on the sleeve b^{19} , but is secured thereto by a segmental clamping section or piece d^{40} , (see Fig. 3,) which, while permitting rotation of the sleeve b^{18} , engages the flange d^{41} of the sleeve below the transverse center of the sleeve b^{18} , and holds the same firmly up from contact with the sleeve b^{21} , the clamping-segment d^{40} being secured to the support b^{20} .

The support b^{20} , as above outlined, is radially movable in two directions with relation to the axis of the cutter-shaft, and this adjustment or movement may be effected after the manner herein shown and as will now be described.

Referring to Fig. 4, the support b^{20} is represented as fitted into a vertical slot in a bar or block d^{50} , and is secured thereto, as herein shown, by means of a clamping-screw d^{51} , which extends through a vertical slot d^{52} into the block or piece d^{50} . The bar or support b^{20} is provided, as shown, with a horizontal slot d^{53} , in which is located an eccentric collar or hub d^{54} on a stud or pin d^{55} , (represented by dotted lines in Fig. 4,) the said stud or pin turning in the block d^{50} and being provided on the front face of the bar or support b^{20} with a suitable head, (not shown,) by which the pin d^{55} may be turned so as to raise and lower the bar b^{20} in its guideway, and thereby effect a vertically-radial movement with relation to the axis of the cutter-shaft, which movement raises and lowers the top-lift guard with relation to the cutter A' . The block d^{50} on its rear side is provided with a dovetailed piece, which is fitted into a dovetailed guideway in a supporting-frame d^{60} , which frame has extended through it an adjusting-screw d^{61} , entering a suitably-threaded socket in the block or piece d^{50} , so that by turning the adjusting-

screw d^{61} the piece or block c^{750} may be adjusted laterally in its guiding-frame d^{60} , and thereby move the supporting-bar b^{20} radially in a transverse or horizontal direction with relation to the axis of the cutter-shaft. The frame d^{60} is supported, as herein shown, in the main framework A of the machine, and in the present instance the said frame has secured to or forming part of it a guide rod or bar d^{70} , (see Fig. 1,) located near its upper end, and a guide rod or bar d^{71} , located near its lower end, and a further guide rod or bar d^{72} , located intermediate of the guide-rods d^{70} d^{71} . The guide-rods d^{70} d^{71} d^{72} extend through suitable openings or holes in the main frame of the machine and, as herein shown, (see Fig. 1,) the guide-rods d^{70} d^{72} are encircled by spiral springs d^{73} d^{74} , which are compressed when the support b^{20} for the top-lift guide is moved backward or in the direction indicated by the arrow 20, Fig. 1, and which restore the supporting-frame d^{20} and the top-lift guide to their normal position when pressure is relieved from the beveled or front face b^{16} of the said guide.

In the operation of my improved apparatus the heel of the shoe may be placed in position to be operated upon with the breast end of the heel in position to be acted upon by the main heel-trimming knives a^{17} , and in placing the shoe in its operative position the rand-crease is applied to the edge of the rand-guard, and the top lift at such time bears against the beveled edge b^{16} of the top-lift guide b' , with the latter in its normal or substantially normal position. (Represented in Figs. 1, 3, and 5.) As the operator turns the heel from its breast end toward the back the edge of the rand-guard d follows or remains in the rand-crease, and as this guard is practically stationary the top-lift guide b' yields as the heel lengthens from its breast to the center of its rear part, and as the top-lift guide b' yields or moves away from the rand-guard it carries with it the carrier for the auxiliary cutters or heel-trimming knives b , which are drawn out of their sockets or pockets c of the cutter head or body a^{10} , and are moved so as to practically form extensions of the heel-trimming knives a^{17} , the said auxiliary knives acting upon the top-lift end of the heel.

The auxiliary knives b are made of such length that in the extreme outer position of the top-lift guide they are preferably never completely withdrawn from their sockets, but overlap, as it were, the main heel-trimming knives, and therefore it will be seen that a smooth and finished cut or trimming of the heel is effected, which leaves nothing to be finished by hand. As the heel is turned by the operator the rand-knives a^{22} c^{13} rand the heel at the same time its edge is being trimmed by the heel-trimming knives a^{17} and b , so that both operations of randing and trimming of the heel are simultaneously accomplished and in one operation. In practice the contour of the body of the rotary cutter A' and the shape

of the heel-trimming knives a^{17} and b may be adapted to any particular style or shape of heel, the auxiliary knife b being so shaped that when in its operative position its cutting edge will form a continuation of the cutting edge of the main heel-trimming knife.

In the operation of trimming the heel it is desirable that the annular flange b^{15} of the top-lift guide b' should be brought into a position substantially in line with the top-lift end of the heel-trimming knives, and this adjustment, as above described, may be effected by adjusting the movable support b^{20} for the top-lift guide. By making the auxiliary cutters b adjustable on their carrier they may be accurately positioned, both when first applied to the machine and also after they have been removed and ground.

From the above description it will be seen that the upper of the boot or shoe is fully protected by the rand-guard, and owing to the fact that this is substantially stationary while in its operative position and does not move away from the rotary cutter during the act of trimming the heel of the boot or shoe, danger of injuring the upper is entirely avoided or at least reduced to a minimum.

In some instances, if desired, the rotary cutter A' may be provided with a cap or shield f , (see Fig. 10,) secured to it by the threaded bolt a^{50} , after the manner shown in United States Patent No. 528,311, granted to me October 30, 1894, in which case the shield f protects the upper from the rand-knives. When the shield referred to is used, it may be provided with clearance-openings f' for the passage of chips cut by the rand-knives. (See Fig. 11.)

I have herein shown one form of carrier for the auxiliary heel-trimming knives, and while I may prefer this construction I do not desire to limit my invention to the particular construction of carrier shown. The machine herein shown is provided with a heel-rest e , which may be of any suitable or usual construction, but preferably that herein shown, it consisting of the heel-rest proper, e , provided with a shank e' , fitted into a split sleeve e^2 , in which it is longitudinally movable and adapted to be clamped by means of a clamping-bolt e^3 , extended through ears e^4 e^5 of the said sleeve, the sleeve e^2 being adjustably mounted on a stud e^6 , extended from the framework of the machine, the hub of the sleeve e^2 being split, as herein shown, and clamped on the stud e^6 by the clamping-bolt e^7 , extended through the ears e^8 e^9 . The heel-rest e is in this case made extensible and also adjustable with relation to the rotary cutter A'.

I claim—

1. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter provided with a heel-trimming knife or blade and with a rand knife or blade, and having a socket or pocket for the reception of an auxiliary heel-trimming knife or

blade, a shaft upon which the said rotary cutter is mounted to rotate therewith, a top-lift guide movable with relation to the rotary cutter and disconnected from its shaft to revolve independently thereof, and the said auxiliary knife or blade cooperating with the said heel-trimming knife and movable axially with the said top-lift guide, the said auxiliary knife or blade being normally extended into the said socket or pocket, for the purpose specified.

2. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter consisting of a body or head of a width substantially equal to the height of the heel at its breast and provided with heel-trimming blades or knives of a width substantially equal to the width of the cutter head or body, a rand-knife carried by the said head or body, a rand-guard cooperating with the said rand-knife, a shaft upon which the said rotary cutter is mounted to rotate therewith, a top-lift guide movable axially away from the cutter head or body and disconnected from the said shaft, and an auxiliary heel-trimming knife movable axially with the said top-lift guide to act on the top-lift end of the heel not acted upon by the main heel-trimming knives, substantially as described.

3. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter of a width substantially equal to the height of the heel at its breast, a heel-trimming knife of a width substantially equal to the width of the said rotary cutter, and a rand-knife carried by said cutter, a rand-guard cooperating with the said rand-knife, a shaft upon which said rotary cutter is mounted to rotate therewith, a top-lift guide movable bodily axially and radially with relation to the said rotary cutter and disconnected from said rotary shaft, and an auxiliary heel-trimming knife movable axially with the top-lift guide to act on the top-lift end of the heel not acted upon by the main heel-trimming knife, substantially as described.

4. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotatable shaft, a rotary heel-cutter mounted on said shaft and having a fixed position thereon, a rand-knife movable with the said rotary cutter, a rand-guard cooperating with said rand-knife, a top-lift guide movable on the said shaft with relation to the rotary cutter and disconnected therefrom, an auxiliary knife-carrier independent of and detachably secured to the said top-lift guide, and an auxiliary knife secured to said carrier and cooperating with said rotary heel-cutter, substantially as and for the purpose specified.

5. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter provided with heel-trimming knives, a rotatable rand-knife having a fixed relation to the heel-trimming knives, a rand-guard having a fixed position with relation to the heel-trimming knives in its operative position and cooperating with the said rand-

knife, provided with a shank or arm and an auxiliary heel-trimming knife cooperating with the main heel-trimming knife to form an extension of the top-lift end thereof, and a movable hollow or recessed top-lift guard normally close to the top-lift end of the main heel-trimming knife and extended over the shank or arm of the auxiliary knife, substantially as described.

6. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary heel-cutter provided with a heel-trimming knife or blade, a shaft on which said cutter is mounted to rotate therewith, a top-lift guide loosely mounted on the said shaft to revolve independent of said shaft and movable axially with relation to the said cutter and provided with an annular ledge or rim substantially in line with the cutting edge of the heel-trimming knives, and an auxiliary heel-trimming knife having its cutting edge in substantially the same line or plane as the cutting edge of the main heel-trimming knife and automatically movable axially with the top-lift guide and connected to the said rotary heel-cutter to rotate therewith, substantially as described.

7. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter consisting of a head or body having its periphery of substantially the same contour as the finished heel, and provided with slots in its periphery, a plurality of main heel-trimming knives inserted in said slots and having their cutting edges of substantially the contour of the finished heel, a rand-knife revoluble with the said rotary cutter, a rand-guard cooperating with said rand-knife, a hollow or recessed top-lift guide movable bodily with relation to the rotary cutter, and an auxiliary heel-trimming knife having its shank or arm extended into the hollow or recessed top-lift guide and secured thereto to move therewith, and having its cutting edge adapted to form a continuation of the cutting edge of the main heel-trimming knife, substantially as described.

8. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter consisting of a body or wheel provided with heel-trimming knives or blades, and a rand-knife inserted into a slot in the side or face of the said body or wheel and provided with a clearance-notch c^{15} , and means to move the said knife to adjust it with relation to the said body or wheel, substantially as described.

9. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary heel-cutter, a rand-cutter, an auxiliary heel knife or blade cooperating with said heel-cutter, a carrier for said auxiliary heel knife or blade connected to the rotary heel-cutter to revolve therewith and movable bodily with relation to said rotary cutter, and means to adjust said auxiliary heel-knife in its carrier, substantially as described.

10. In a heel-trimming knife, the combination of the following instrumentalities, viz: a rotary cutter consisting of a body or wheel provided with peripheral knife-receiving slots, knives or blades inserted in said slots, a socket or pocket in the said body or wheel intermediate of the said knife-receiving peripheral slots, a shaft on which the said body or wheel is mounted to revolve therewith, an auxiliary knife or blade inserted into said socket or pocket, and a carrier for said auxiliary knife or blade loose on the said shaft but connected to said body or wheel to revolve therewith and movable bodily away from said body or wheel, substantially as described.

11. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter consisting of a body or wheel provided with a peripheral knife-receiving slot extended across the said body or wheel, a main heel-trimming knife inserted in said peripheral slot, a shaft on which said body or wheel is mounted to revolve therewith, a separate and auxiliary heel-trimming knife cooperating with the main heel-trimming knife, and a carrier for said auxiliary knife loose on said shaft but connected to said body or wheel to revolve therewith and movable bodily away from the main heel-trimming knife, substantially as described.

12. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter consisting of a body or head provided with a heel-trimming knife having its cutting-edge of a width substantially equal to the height of the heel at its breast, and of a shape substantially the same as the contour of the finished heel, a rand-knife, a rand-guard cooperating therewith, a shaft on which said body is mounted to rotate therewith, an auxiliary heel-trimming knife separate from the main heel-trimming knife but cooperating therewith, a hollow or recessed top-lift guide movable bodily with relation to the rotary cutter and disconnected from the cutter-shaft, and means to connect the auxiliary heel-trimming knife to the said body or wheel and to the top-lift guide, substantially as and for the purpose specified.

13. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary cutter provided with a heel-trimming knife, a rand-knife, a rand-guard cooperating therewith, a shaft on which said cutter is mounted to rotate therewith, an auxiliary heel-trimming knife, a carrier for said auxiliary knife loose on said shaft and movable with relation to the rotary cutter, and means to connect the said carrier with the rotary cutter to cause the same to rotate simultaneously therewith and to guide the carrier in its movement away from the rotary cutter, substantially as and for the purpose specified.

14. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary heel-cutter provided with a heel-trimming knife, a shaft on which said cutter is mounted to rotate therewith, a top-lift guard loose on said shaft and movable axially on said shaft with relation to the cutter fast thereon, an auxiliary heel-trimming knife, a support for the said knife loose on said shaft but connected to said rotary cutter and to the top-lift guard, to revolve with the cutter without imparting rotation to the said top-lift guard, and yet axially movable with the said guard, for the purpose specified.

15. In a heel-trimming machine, the combination of the following instrumentalities, viz: a rotary heel-cutter provided with a heel-trimming knife or blade, a shaft on which said cutter is mounted to rotate therewith, a top-lift guide loosely mounted on said shaft and radially and axially adjustable with relation thereto, and an auxiliary heel-trimming knife cooperating with the main heel-trimming knife and connected to the rotary heel-cutter to rotate therewith and to the top-lift guide to move axially with relation to the heel-cutter and to permit the top-lift guide to be adjusted radially without moving the auxiliary knife, substantially as described.

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

AMBROSE S. VOSE.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.