G. GODDU.

MACHINE FOR DRIVING FASTENINGS INTO WORK.

APPLICATION FILED AUG. 27, 1898.

950,693.

Patented Mar. 1, 1910.

6 SHEETS—SHEET 1.

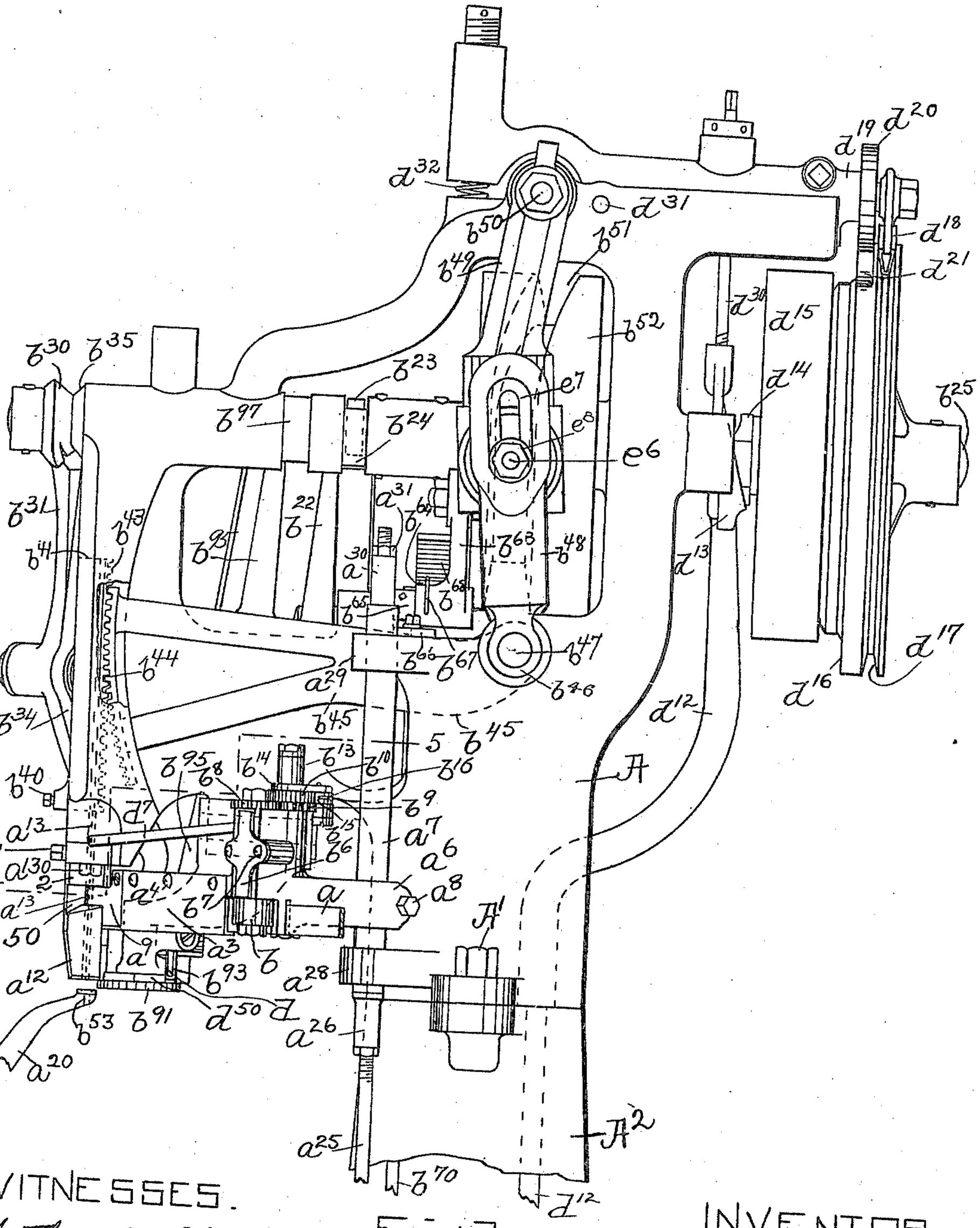

Fig. 1.

WITNESSES.

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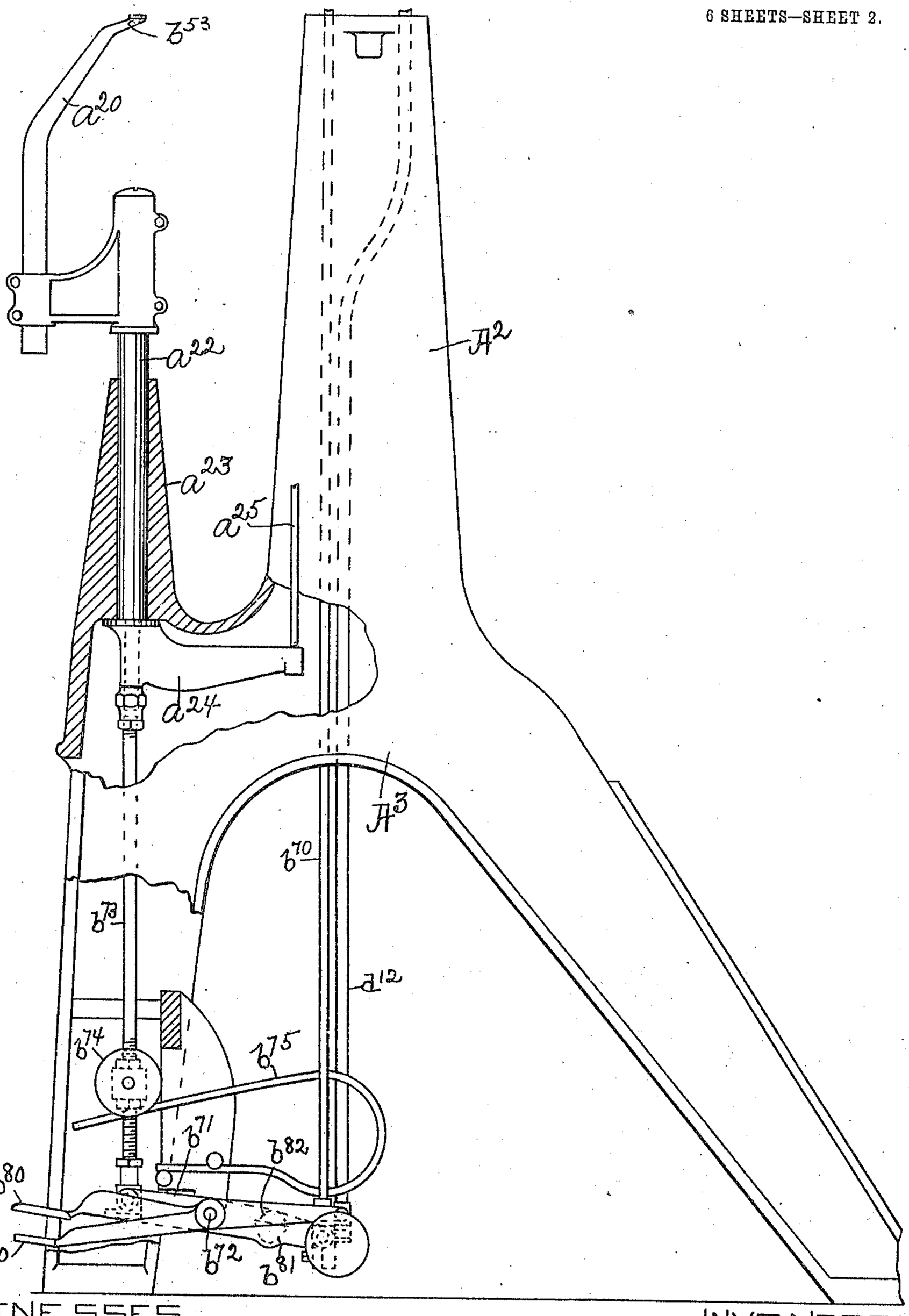

Fig. 2.

WITNESSES.

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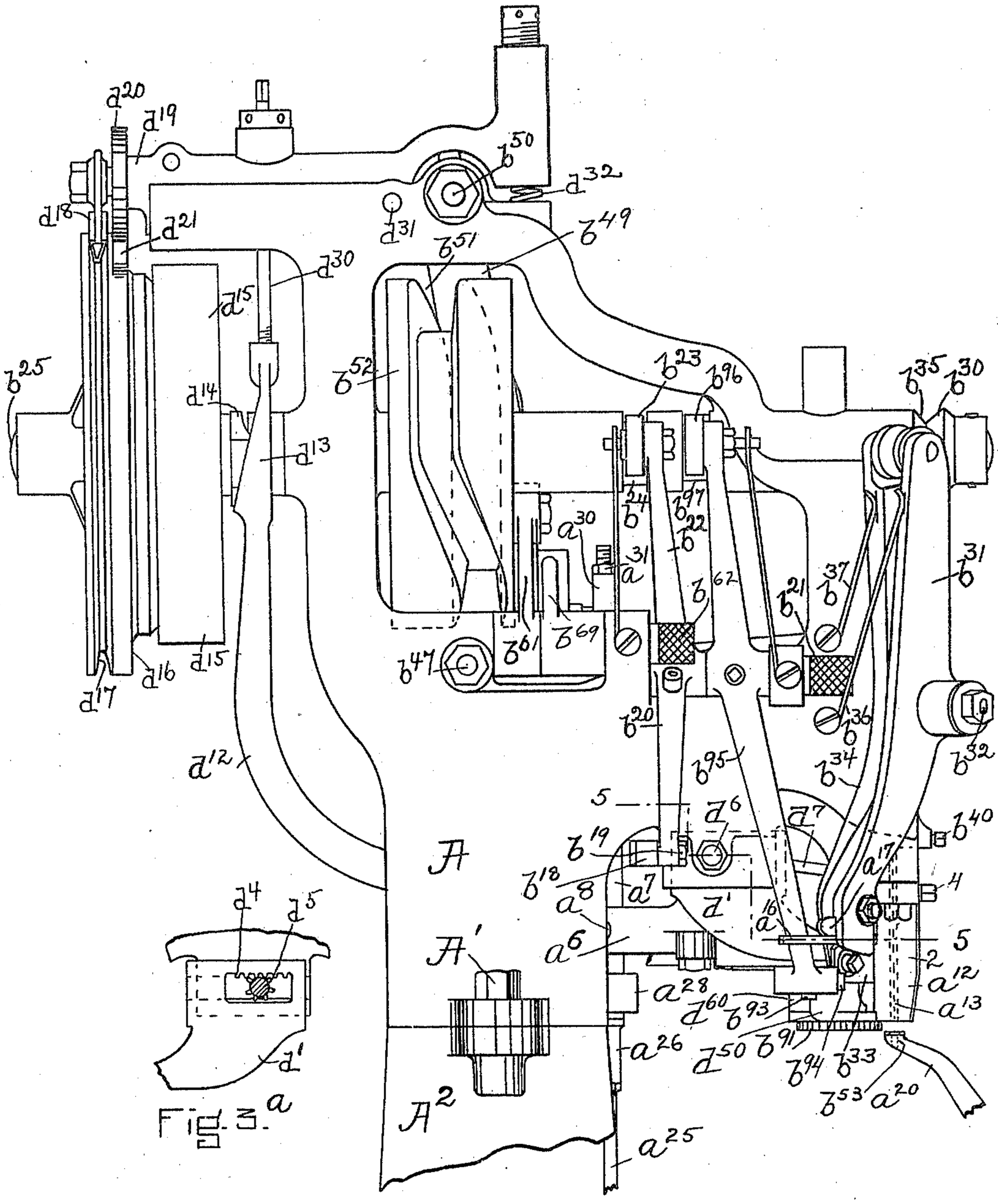

Fig. 3.

WITNESSES.

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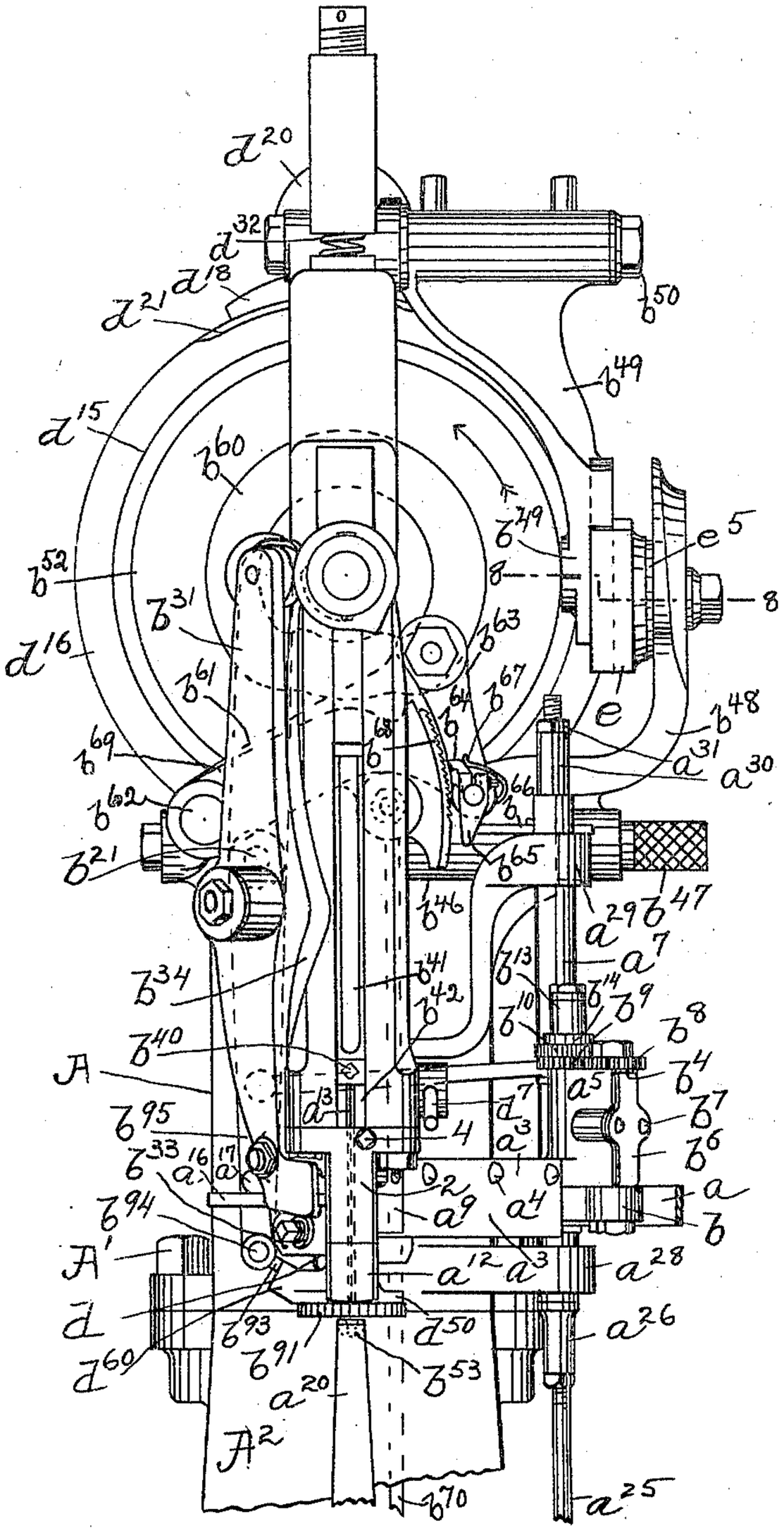

Fig. 4.

WITNESSES.

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6 SHEETS—SHEET 5.

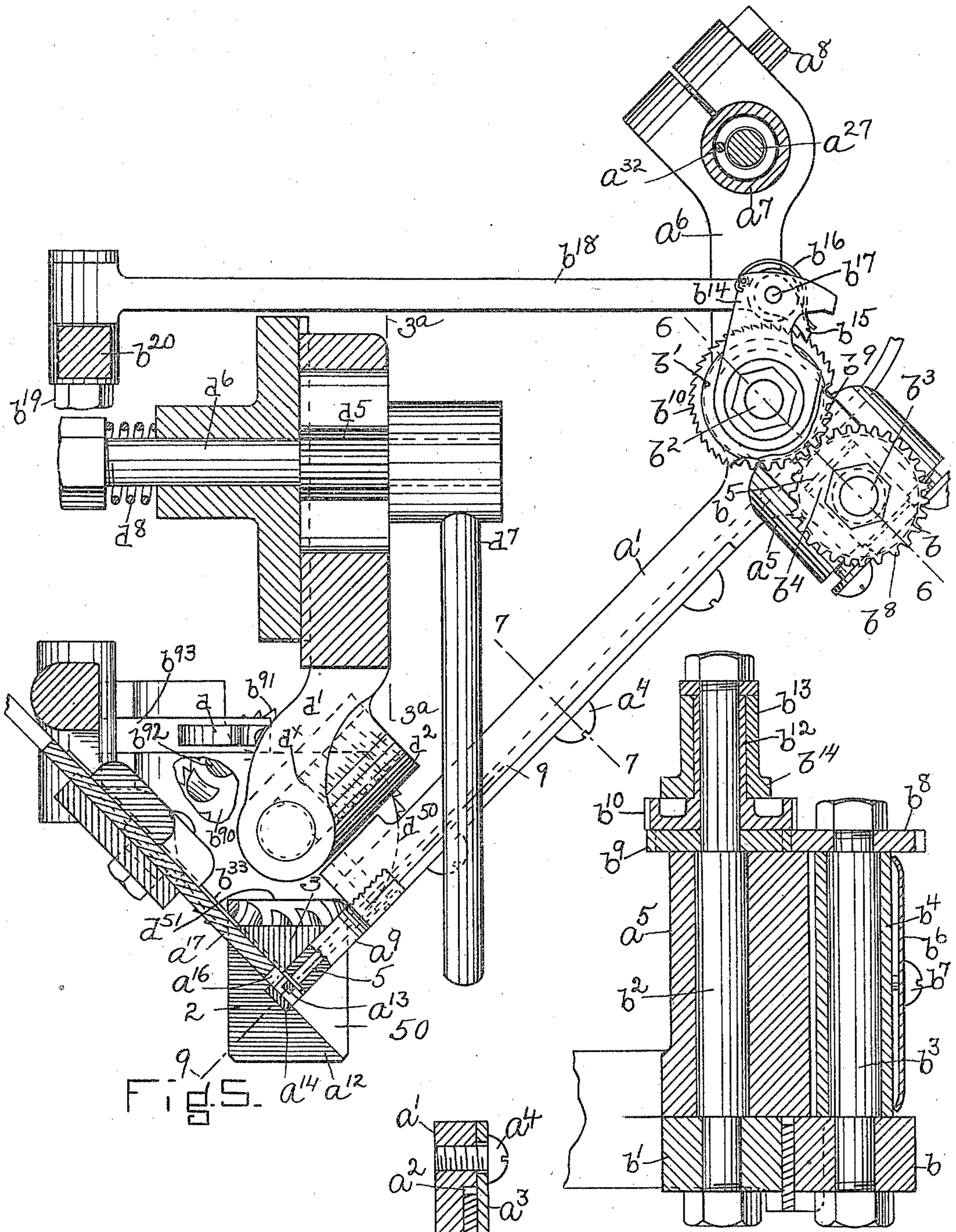

Fig. 5.

Fig. 7.

Fig. 6.

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6 SHEETS—SHEET 6.

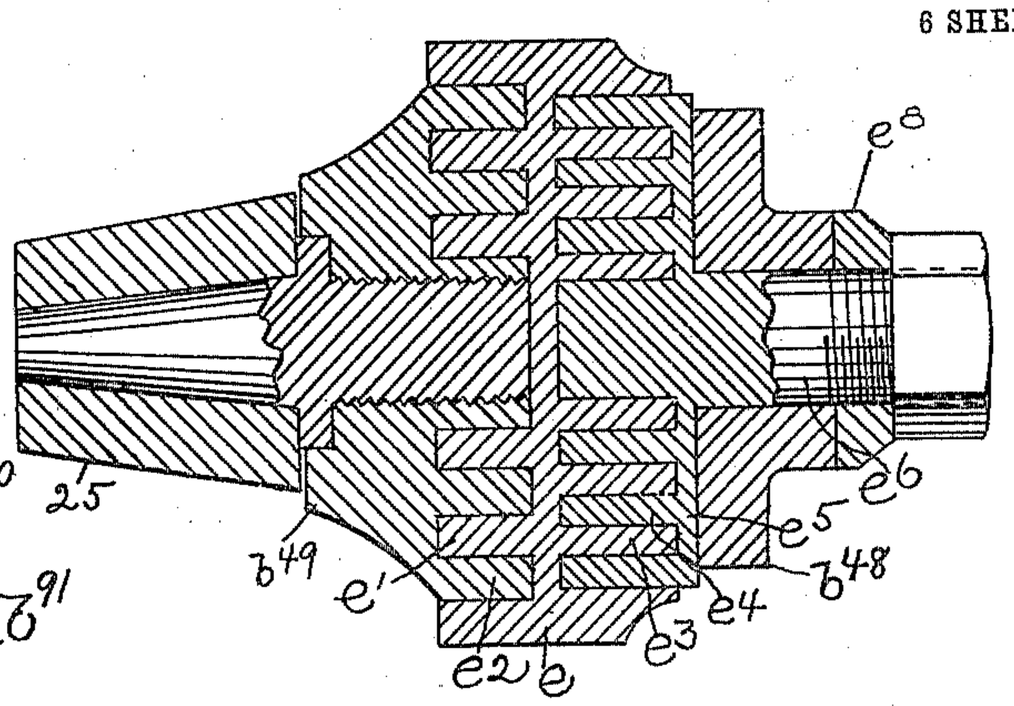

Fig. 8.

Fig. 14.

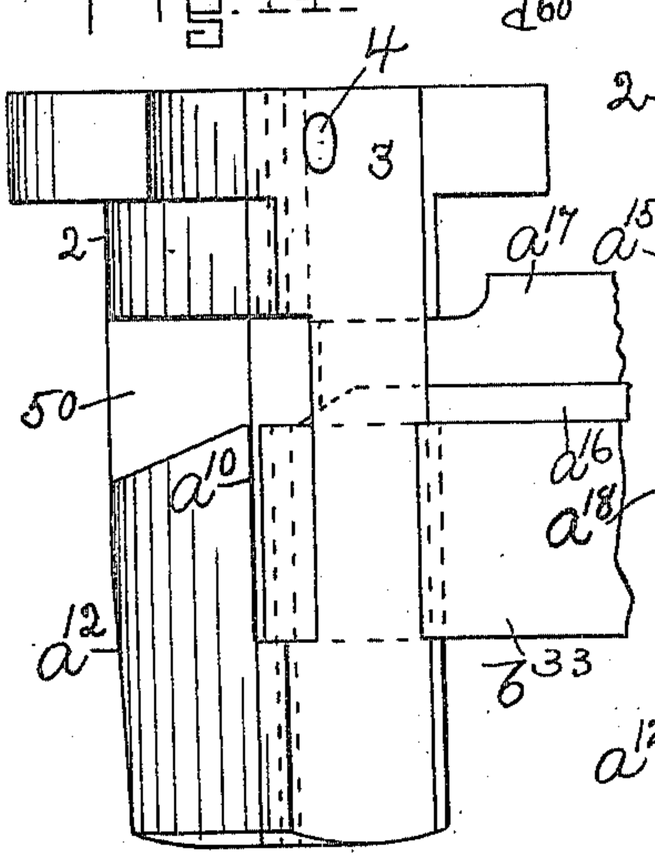

Fig. 10.

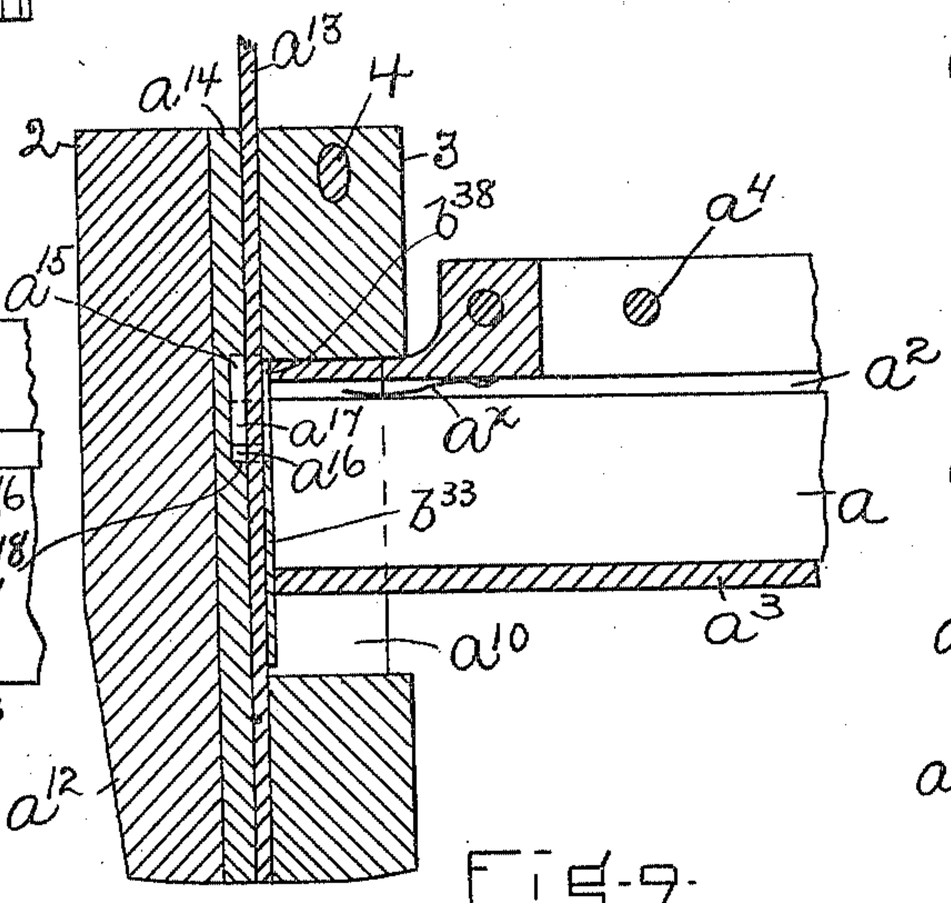

Fig. 9.

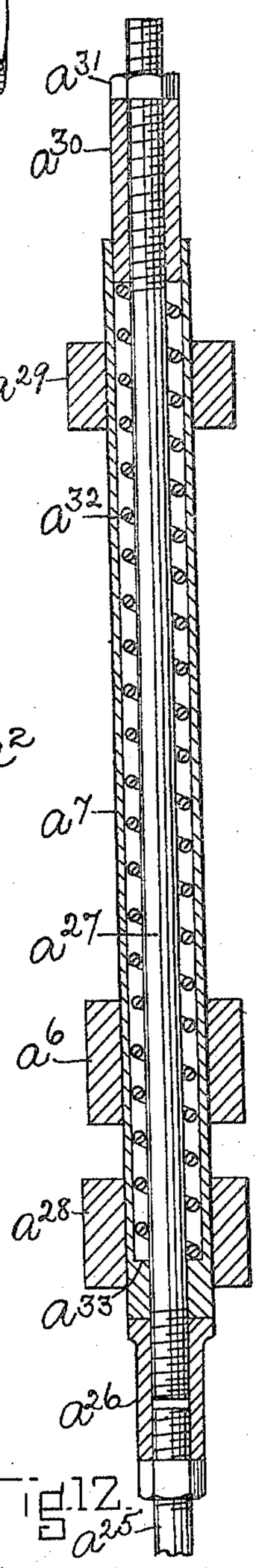

Fig. 12.

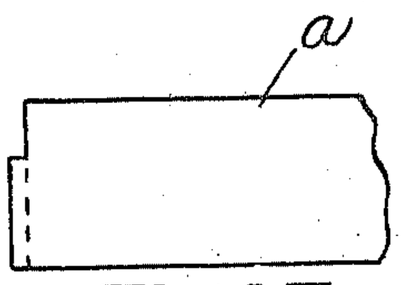

Fig. 13.

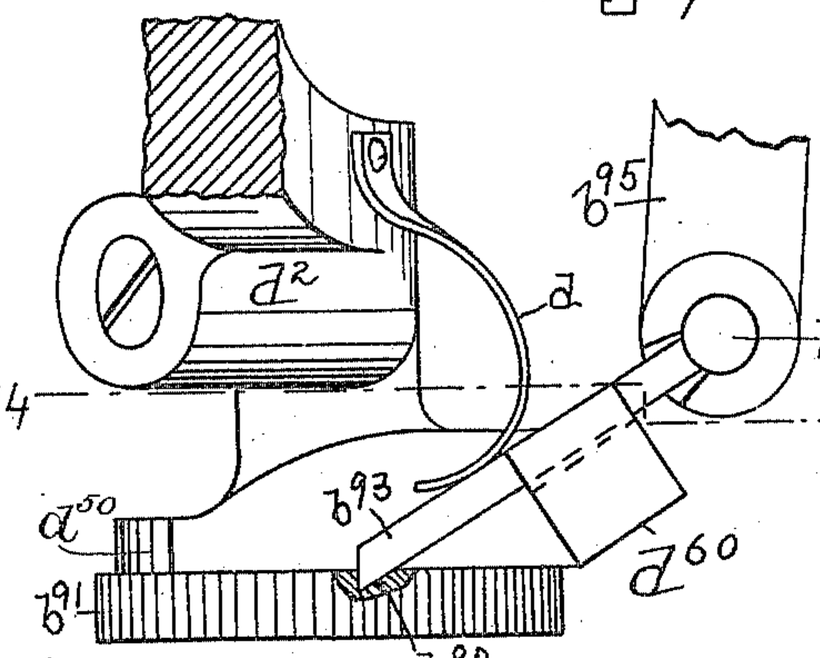

Fig. 11.

WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE GODDU, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, A CORPORATION OF NEW JERSEY.

MACHINE FOR DRIVING FASTENINGS INTO WORK.

950,693. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed August 27, 1898. Serial No. 689,656.

To all whom it may concern:

Be it known that I, GEORGE GODDU, a citizen of the United States, residing in Winchester, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Machines for Driving Fastenings into Work, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to machines for driving fastenings into work and is especially applicable to machines used in the manufacture of boots and shoes for securing the outer and inner soles together.

As herein described, the invention is embodied in a machine which forms, from a continuous strip or ribbon, pegs of a length corresponding to the requirements of the work being pegged, but some of the features of the invention may be utilized in other types of machines for inserting fastenings.

The invention is preferably embodied in a machine of the type in which the work is fed by a rotary wheel or other device, rather than by an awl, and this wheel also may serve to determine the distance from the edge of the work at which the fastenings are to be inserted.

By reason if its function as a gage, the feeding device is made adjustable with reference to the other parts of the machine and particularly to the fastening inserting mechanism. Accordingly, one feature of the invention relates to mechanism for rotating the feeding device and comprises an actuating member engaging the feeding device and both supported and actuated directly by a lever pivoted on a stationary part of the machine. Such a lever will not move in and out with the feeding device when the latter is adjusted for varying the position of the work with reference to the fastening inserting mechanism, and hence the connection between the lever and the feeding device must be such as will permit this in and out movement of said device. In the particular embodiment of the invention illustrated, the lever, which is actuated at the proper times for feeding the work by a cam, carries a pawl which acts upon a work engaging feed wheel and this pawl is slidably mounted in the lever and movable in and out with the feed wheel while still remaining in operative relation to the lever.

Another feature of the invention is that the throat block of the machine through which the fastenings are driven into the work normally overlaps and at its lower end substantially rests upon the upper side of the feed wheel. With such a construction, no space is left between the inner side of the throat block and the circumference of the feed wheel so that the sole edge, pieces of peg wood or other material cannot get between the wheel and block and thus interfere with the proper operation of the feeding and gaging device. Preferably also a plate is arranged above the feeding device, or otherwise in suitable relation thereto, so as to serve as a shield or guard to protect its upper surface which, if a pawl is used for actuating it as above suggested, may be provided with teeth or recesses to be engaged by the pawl. The plate may be slotted to embrace the throat block in order that the latter shall serve to guide and support the feeding device during its in and out movement.

The machine here illustrated is of that type in which the work is clamped in one position while a hole is formed in the work and a fastening is inserted therein and in which, more specifically, a single device has both the function of an awl to form an opening in the work for a fastening and also the function of a driver to insert a fastening into the opening. When such a device is operating to make an opening in the work, it should project beyond the throat block, against which the work is held, a sufficient distance to reach approximately the lower side of the work. On the other hand, when operating as a driver, it should not ordinarily enter the work but in its lowest position should be substantially flush with the lower face of the throat block. Since, however, the machine may be required to operate upon work of varying thicknesses, it is desirable to provide means by which the lower limit of the puncturing stroke may be regulated without affecting the lower limit of the driving stroke. According to one feature of the invention, therefore, the machine com-

prises a driver which is given successively two operative strokes with means for varying relatively the limits of said strokes and more specifically for varying the lower limit of one stroke, for example the puncturing stroke, without varying the lower limit of the other or driving stroke.

Still another feature of the invention relates to automatic mechanism for forming pegs of a length corresponding to the varying thickness of the work from a continuous peg strip which has a width at least equal to the length of the longest peg required. The preferred embodiment of this feature of the invention comprises means for leading the end of the peg strip through a suitable carrier or support and through a slot in a stationary throat block into the driver passage in combination with means, movable in another slot in the throat block located at right angles to said first slot, for severing from the end of the strip a peg of the proper length. Connections from the work support to the peg strip carrier or to the peg shortening means compel the peg strip and the shortening means to move relatively to each other with any change in position of the work support so that the length of each peg formed will be made automatically to correspond with the thickness of the work being pegged.

In addition to the features, already specifically mentioned, the present invention comprises also certain other combinations and arrangements of parts which are hereinafter fully described and are defined in the appended claims.

Referring to the accompanying drawings,—Figure 1 is a side elevation of the upper part or head of a machine embodying this invention. Fig. 2, a side elevation of the base with parts in section and broken away, and which is to be read in connection with Fig. 1. Fig. 3, an opposite side elevation of the head of the machine shown in Fig. 1. Fig. 3^a, a sectional detail on the line 3^a—3^a, Fig. 5, to be referred to. Fig. 4, a front elevation of the machine shown in Fig. 1. Fig. 5, a transverse sectional detail on an enlarged scale taken on the irregular line 5—5, Fig. 3. Fig. 6, an enlarged sectional detail taken on the line 6—6, Fig. 5. Fig. 7, a sectional detail on the line 7—7, Fig. 5. Fig. 8, an enlarged sectional detail on the line 8—8, Fig. 4. Fig. 9, an enlarged sectional detail on the line 9—9, Fig. 5. Fig. 10, an enlarged detail in elevation to be referred to. Fig. 11, an enlarged detail of the work feed mechanism to be referred to. Fig. 12, an enlarged sectional detail to be referred to. Fig. 13, a detail of the peg strip, showing the same with a portion removed to form a peg of the desired length, and Fig. 14, a sectional detail on the line 14—14, Fig. 11, to be referred to.

The framework of the machine herein shown as embodying this invention comprises a head A fastened as by screws A^1 to the hollow upright or post A^2 forming part of the base A^3. The machine herein shown is especially designed and adapted for forming pegs from what is known as a peg strip *a* (see Figs. 1 and 13), the said strip being of wood and of any desired length, and being normally of a width substantially equal to or in excess of the length of the longest peg to be driven. The peg strip *a* as herein shown is supported by and movable through a carrier, preferably of the construction herein shown (see Figs. 5 and 7) and consisting of a bar a^1 provided with a longitudinal channel a^2, with which coöperates a removable angle iron side plate a^3 secured to the bar a^1 as by screws a^4 to form a guideway for the strip *a*, which normally rests upon the bottom of the L-shaped side a^3 and which may be held down in contact therewith by a suitable spring a^x within said guideway. The bar a^1 is secured to or forms part of a hub or casting a^5 having an arm a^6 through which is extended a sleeve a^7, to which the arm a^6 is fastened as by the screw a^8. The carrier bar a^1 has secured to its front end as herein shown a slotted nose piece a^9 (see Figs. 1 and 5) which projects into a vertical slot a^{10} (see Figs. 9 and 10) in a throat block a^{12} fastened as by screws a^{130} to the front of the head A. The throat block a^{12} is preferably made in two parts 2—3 fastened together as by a screw 4 (see Figs. 9 and 10), and the said throat block is provided with a vertical longitudinal passage for a driver a^{13} (see Fig. 5), and preferably the passage for the driver is made in a removable throat or guide a^{14} fitted into the longitudinal passage in the throat block a^{12} and forming a part of said block. The throat block a^{12} is provided with a transverse slot or opening a^{15} (see Fig. 9) substantially at right angles to the slot or opening a^{10} and into which is extended a cutter or knife a^{16} and a push bar or clearer a^{17} for a purpose as will be described.

The throat or guide a^{14} for the driver a^{13} is cut away for a portion of its length substantially in line with the slot or opening a^{15} as shown in Figs. 5 and 9, so that the knife a^{16} and clearer a^{17} may be moved across the passage in the said throat or guide. The passage for the driver bar in the throat or guide a^{14} may and preferably will be of the same shape in cross section, being shown substantially square, as the guideway 5 in the nose piece a^9 (see Fig. 5), and the bottom wall a^{18} of the transverse slot in the throat a^{14} coöperates with the knife or cutter a^{16} to cut or shear from the peg strip *a*, under conditions to be described, that portion of the peg strip within the passageway of the throat a^{14} which

projects above the bottom wall a^{18}, to thereby form a peg indicated in Fig. 13, which is of a length less than the full width of the strip a, and which is of a length corresponding to the thickness of the material into which the peg thus formed is to be driven. The amount of material removed from the peg strip a to form the peg of the desired or required length is governed by the thickness of the material supported upon a work support or horn a^{20} and held pressed up against the bottom surface of the throat block a^{12}. This result may be effected by making the carrier a^1 movable bodily with relation to the knife a^{16} or vice versa, and in the present instance I have shown the carrier a^1 as movable bodily with relation to the knife, and this movement automatically effected by the thickness of the work through the connection between the carrier and the horn a^{20} as will now be described.

The horn a^{20}, which is bent or curved as shown in Fig. 2, is revolubly mounted upon a horn shaft a^{22} having bearings in an upright a^{23} forming part of the base A^3, and below the upright a^{23} the horn shaft a^{22} has extended from it an arm a^{24} to which is fastened a rod a^{25}, connected by a threaded sleeve a^{26} (see Fig. 12) to a rod a^{27} extended loosely through the sleeve a^7, the latter being movable in guiding lugs a^{28} a^{29} attached to the head A. The rod a^{27} has screwed upon its upper end a sleeve a^{30} (see Fig. 12) and a check nut a^{31}, and the sleeve a^{30} is extended into the sleeve a^7, where it rests upon a spiral spring a^{32}, which is seated upon a shoulder a^{33} of the sleeve a^7.

The parts just described form a connection between the horn a^{20} and the peg strip carrier a^1 which normally will be unyielding but which may yield if necessary, so that the carrier moves bodily simultaneously with the horn, that is, as the distance between the horn a^{20} and the bottom of the throat block a^{12} varies according to the thickness of the work interposed between the said horn and throat block, the peg strip carrier is moved downward and varies its position with relation to the knife a^{16}, and as a result, more or less of the upper portion of the peg strip a in the passageway in the throat a^{14} may be presented to the action of the knife a^{16}, which results in more or less surplus material being cut from the strip a according to the thickness of the work, into which the peg is to be driven.

The yielding connection between the peg strip carrier and the horn above referred to, is provided, in order that the horn may be lowered a distance beyond what would be effected by the variation in the thickness of the material or stock, for the purpose of putting on and removing the work without causing the strip carrier to be moved to the same extent; for, by reference to Figs. 1 and 12, it will be seen that when the horn is lowered, the arm a^6 will be brought in contact with the lug a^{28} and further movement of the strip carrier will be prevented by said lug, but owing to the fact that the rods a^{25} a^{27} may be moved independent of the sleeve a^7, the horn may be moved still farther away from the throat block, which further movement will compress the spring a^{32} within the sleeve a^7.

The peg strip a is automatically fed forward into the passage in the throat a^{14}, and this may be effected by means of feed wheels or rollers b b^1 (see Fig. 6). The feed roller b^1 is mounted upon a shaft or spindle b^2 extended through the hub a^5 attached to the strip carrier, and the feed roller b, is mounted on a shaft b^3 extended through a block b^4, which is fitted into a slot b^5 in the hub a^5 (see dotted lines, Fig. 5), and which is adjustable in said slot to compensate for variations in the peg strip and to permit the use of peg strips of varying thickness. The block b^4 is normally forced into the said slot so as to obtain the proper grip or bite upon the peg strip of the feed rolls b b^1, by a metal spring b^6 secured as herein shown by screws b^7 to the hub a^5 on opposite sides of the slot b^5.

The shaft b^3 at its upper end is provided with a gear wheel b^8 in mesh with gear wheel b^9 fast on the shaft b^2 above the hub a^5, and the gear wheel b^9 has fast to it a ratchet wheel b^{10} having a substantially long bearing b^{12}, on which is loosely mounted a hub b^{13} provided with an arm b^{14}, having pivotally attached to it a pawl b^{15} held in engagement with the ratchet wheel b^{10} by a spring b^{16}. The pawl b^{15} is mounted on a stud or pin b^{17}, to which is loosely connected one end of a rod b^{18}, having its other end pivotally mounted on a stud or pin b^{19} carried by the lever b^{20}, mounted on a pivot pin b^{21} and having its arm b^{22} provided with a roller b^{23} adapted to be operated by a cam b^{24} at the proper time, to effect the forward feed of the peg strip a, the cam b^{24} being mounted upon the main shaft b^{25} of the machine, which has its bearings in the head A.

The knife a^{16} and the pusher or clearer a^{17} are adapted to be operated by a cam b^{30} on the main shaft, acting on a lever b^{31} pivoted as at b^{32} to the main frame of the machine. The portion of the peg strip a inserted into the guideway in the throat a^{14} and which has been cut by the knife a^{16}, is adapted to be severed from the peg strip in the nose piece a^9 by a knife b^{33}, which may be termed the slicing knife and which is fastened to the end of a lever b^{34} mounted on the pivot b^{32} and acted upon by a cam b^{35} on the main shaft, the levers b^{31} b^{34} being held in operative engagement with their cams by suitable springs b^{36} b^{37}. The slicing knife b^{33} is mov-

able in a suitable slot b^{38} in the member 3 of the throat block a^{12} (see Fig. 9), and the knife b^{33} is made substantially thin and passes into a space between the end of the nose a^{9} on the strip carrier and the front face of the throat a^{14}, and when in its forward position, the said knife closes the passage in the throat a^{14} and forms one wall of the passage in said throat.

The peg automatically measured to correspond to the thickness of the work and cut from the peg strip, may and preferably will be driven into the work by a driving tool a^{13}, which, in the present instance, has the double function of an awl to make a hole through the material, and that of a driver to drive the peg cut from the strip a into the hole previously formed. In the present instance, this double function is imparted to the driver by mechanism as will now be described. The driver as herein shown is fastened as by a screw b^{40} to a driver bar b^{41}, vertically movable in a suitable guideway or slot b^{42} in the head of the machine. The driver bar b^{41} is provided on its rear face with a rack b^{43} with which meshes a segmental gear b^{44}, attached to an arm b^{45} of an elbow lever b^{46} loosely mounted on a stud or pin b^{47} extended transversely through the head A. The lever b^{46} is provided with an arm b^{48}, adjustably connected as will be described, to a crank or arm b^{49}, pivotally mounted on a stud or pin b^{50} extended from the head A. The crank or arm b^{49} is provided with a suitable stud or roller 25 (see Fig. 8) which enters a cam groove b^{51} in the periphery of a cam disk or hub b^{52} fast on the main shaft b^{25}, and the cam groove b^{51} is properly shaped to effect the downward movement of the driver different distances during one revolution of the main shaft, that is, the said cam groove is so shaped as to cause the driver to project through and beyond the end of the throat block a^{12} through the work, and if necessary through the passageway b^{53} in the end of the horn, to thereby impart to the driver the function of an awl; and for another portion of the revolution of the main shaft, the cam groove b^{51} may effect the downward movement of the driver only as far as the end of the throat block, so as to drive the peg in the throat substantially flush with the upper surface of the work.

After the peg has been driven into the work as above described, the horn a^{20} may and preferably will be lowered as herein shown by means of a cam groove b^{60} in the face of the cam hub b^{52}, which groove acts on a stud or roller carried by a lever b^{61} mounted on a pivot pin b^{62} and having an arm b^{63}, in the lower end of which is pivoted a pawl b^{64}, having clamped to its pivot a dog b^{65} adapted to engage a knock-off b^{66}, shown as a bar attached to the frame of the machine, the pawl b^{64} being acted upon by a spring b^{67}, which is adapted to engage the said pawl with the segmental ratchet b^{68} on the end of a lever b^{69} mounted on the pivot b^{62}, the lever b^{69} being joined by a rod b^{70} to one end of a lever b^{71}, pivoted as at b^{72} and connected at its other end to a rod b^{73} attached to the horn shaft a^{22}, the said rod being provided with suitable disks or rollers b^{74}, which are acted upon by suitable springs b^{75} to normally elevate the horn shaft and the horn.

The lever b^{71} is adapted to be positively turned by a foot treadle b^{80} (see Fig. 2), having a lug b^{81} which engages a similar lug b^{82} on the lever b^{71}. The segmental ratchet b^{68} is automatically positioned by the thickness of the work with relation to the pawl b^{64}, and the engagement of the pawl with the ratchet is controlled by the adjustment of the dog b^{65} with relation to the controlling device or knock-off b^{66}, to thereby determine the extent to which the horn shall be lowered while the feed of the work is taking place.

The work, such as a boot or shoe, may be fed forward by a feed mechanism as will now be described, and which consists essentially of a disk or wheel b^{90} provided on its periphery with teeth or serrations b^{91} and on its upper face near its circumferential edge with concavities or ratchet teeth b^{92} (see Fig. 5). The teeth b^{91} are adapted to engage the work, while the ratchet teeth b^{92} are adapted to be engaged by a pawl or arm b^{93} (see Figs. 1 and 11), the said pawl having its pivot b^{94} mounted in a socket in the end of a lever b^{95}, pivoted on the pin b^{21} and provided with a roller b^{96} adapted to be operated by a cam b^{97} on the main shaft b^{25}. The pawl b^{93} is normally held in engagement with the ratchet teeth b^{92}, by a spring d. The ratchet wheel b^{90} is provided with a central upright stud suitably mounted in an arm d^{1} and vertically held in said arm against rotation until positively moved, by a friction device $d^{\times}$ located in a boss d^{2} on the arm d^{1}, which at its upper end (see Fig. 3^{a}) has a longitudinal slot provided with teeth d^{4} adapted to be engaged by a gear d^{5} mounted on a shaft d^{6} having bearings in the frame of the machine (see Fig. 5), the shaft being provided with a handle d^{7} by which the wheel carrying arm d^{1} may be adjusted positively to position the feed wheel with relation to the work, and the said shaft is held in its adjusted position by the spring d^{8} until positively moved.

The arm d^{1} is provided at its lower end with an enlargement or plate d^{50} constituting a guard or shield, and having a slot d^{51} of substantially the width of the throat block a^{12} (see Fig. 14) so as to normally embrace the said throat block, and form a guide

for the guard or shield when the latter is adjusted toward and from the driver passage in the throat block.

The machine herein shown is provided with a starting and stopping device operated by a foot treadle d^{10} mounted on the pivot b^{72} (see Fig. 2) and connected by the rod d^{12} to one member d^{13} of a clutch, the other member d^{14} of which engages a normally loose pulley d^{15}, which coöperates with a disk or pulley d^{16} fast on the main shaft and having attached to it as shown a brake wheel d^{17} provided with an annular groove, with which coöperates a brake-shoe d^{18} on the brake lever d^{19}, the said lever having a roll d^{20} adapted to extend into a depression or recess d^{21} in the periphery of the disk d^{16} to permit the brake shoe d^{18} to engage the brake wheel d^{17}, and which roll is designed to engage the full periphery of the disk d^{16} when the machine is in operation. The clutch member d^{13} is positively connected by the rod d^{30} with the brake lever d^{19}, pivoted at d^{31} and having its rear end acted upon by a spring d^{32}.

The construction of the stopping and starting mechanism herein shown forms no part of my present invention, but said brake mechanism, is adjusted so as to stop the machine with the driver elevated out of the work. The pivot b^{94} for the pawl b^{93} is movable transversely with relation to the lever b^{95}, so that the said pawl may remain in engagement with the ratchet teeth b^{92} in the surface of the feed wheel and yet permit the said feed wheel to be adjusted back and forth toward the work or toward the throat block a^{12}. The pawl b^{93} is engaged by a suitable lug d^{60}, (see Figs. 4 and 11) on the shield d^{50} so as to move its pivot b^{94} in its bearing.

The operation of the machine herein shown as embodying this invention may be briefly described as follows, assuming the parts of the machine to be in the position they occupy after a peg has been driven into the work. In this case, the horn is lowered by the cam b^{60} sufficiently to permit the work to be fed by movement of the lever b^{95} acted upon by the cam b^{97}. When the work has been fed, the horn ascends and firmly presses the work against the bottom of the throat block a^{12}, and at the same time automatically positions the peg strip with relation to the knife a^{16}, so that more or less of the strip a may be removed by the knife according to the thickness of the work clamped between the horn and the throat block a^{12}. The driver is now moved downward beyond the bottom of the throat block and into and through the work and forms a hole therein, thus performing its function as an awl; after which it is elevated by its cam to the full extent of its up-stroke, thereby clearing the peg strip which is now fed forward into the passage in the throat a^{14} by the feed rolls operated as above described by the cam b^{24}. The knife a^{16} is now operated and that portion of the peg strip in the passage in the throat a^{14} and above the bottom wall a^{18} of the slot a^{15} in said throat, is severed by the said knife and pushed out of the throat through the clearance opening 50 in the throat block a^{12}. The slicing knife b^{33} is now operated and moved forward so as to sever the portion of the strip in the passage in the throat from the strip in the carrier, to form the peg, and the knife a^{16} and pusher a^{17} are withdrawn from the slot a^{15} to permit the driver to descend and drive the peg thus formed into the hole previously formed in the work, which is in perfect alinement with the driver because this work has not been moved subsequent to making the hole. The down-stroke of the driver in this case ends with the bottom of the throat block, so that the peg is driven substantially flush with the upper surface of the work while its lower end is substantially flush with the inner or under surface of the work. During the second down-stroke of the driver, the slicing knife b^{33} forms one wall of the throat passage through which the peg and driver descend. In feeding the work over the horn tip, the peg is removed from in line with the perforation in the horn and the throat in the throat block, and is brought between solid parts or surfaces of the horn and throat block, which solid surfaces on the next up movement of the horn serve to head or rivet the peg, thereby increasing the holding power of the same.

To adapt the machine for work of extreme differences in thickness, as for instance heavy work, such as men's shoes, and light work, such as children's shoes, the distance the driver projects beyond the bottom of the throat block when forming a hole in the work may be varied. This variation may be effected in the downstroke of the driver when performing the functions of an awl without disturbing the limit of the down-stroke of the driver when performing the functions of a driver, by an adjustable intermediate connection between the arm b^{48} of the driver actuating lever and the cam operated lever b^{49}. The adjustable intermediate connection referred to, may be made as herein shown and consists of a block e provided on one face with a series of substantially vertical ribs e^1, which mesh with corresponding ribs e^2 on the arm or lever b^{49}, and provided on its opposite face with a series of concentric ribs e^3, which mesh with corresponding concentric ribs e^4 on a flange e^5 of a stud e^6 secured to or forming part of the arm b^{48} of the driver actuating lever. The arm b^{48} is provided with a slot e^7 and the block e may be moved up and down the ribs

e^2 to adjust the throw or movement of the driver lever on the downstroke of the driver when performing the functions of an awl. When the ribs e^1 e^2 are in a vertical line or plane with the slot e^7, the block e may be moved to adjust the stud e^6 in said slot without producing any movement of the lever b^{45} on its pivot b^{47} and consequently without producing any movement of the driver, which is at such time flush with the bottom of the throat a^{14} as indicated by dotted lines Fig. 1. When the block e is fastened by the nut e^8 to the arm b^{48} with stud e^6 at the lower end of the slot e^7, the driver when operated upon by the cam b^{51} to perform the functions of an awl, is moved beyond the bottom of the throat the maximum distance. When the block e is fastened to the lever arm b^{48} with stud e^6 at the other end of the slot e^7, the arm b^{48} is practically lengthened and the driver when operated upon by the cam to perform the functions of an awl, is moved beyond the bottom of the throat a minimum distance. When the adjustments are made, the position of the driver with relation to the throat is not changed, and its lower end is at such time flush with the bottom of said throat.

By reference to Fig. 5, it will be seen, that the knives a^{16}, b^{33} move in planes substantially at right angles to the plane in which the strip a is fed, and that the passage in the throat which is substantially square is set diagonally, that is, so that the pegs may be driven into the work with their sides inclined to the edge of the work. Furthermore, it will be understood that, the shortening knife a^{16} is operated by its cam on each revolution of the main shaft, and that the said knife removes a piece of the peg strip at each revolution of the main shaft, providing the thickness of the material is such as will cause a portion of the strip to project above the bottom wall a^{18} of the slot in the throat, but if the thickness of the material is such as to require the entire width of the peg strip to form the peg, then the knife a^{16} will be moved by its cam across the slot in the throat a^{14} but will not remove any of the strip, the upper edge of which is at such time flush with or below the bottom wall a^{18} of the slot in the throat. The throat a^{14} is preferably made removable from the throat block a^{12}, so that it may be replaced by a throat having a passageway of a different width, to enable peg strips of different thickness within limits, to be used on the machine.

Having thus fully described in detail one embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a machine of the class described, the combination of the following instrumentalities, viz:—a stationary throat block having a substantially vertical passage and a substantially vertical slot in its side communicating with said passage, a peg strip carrier extended into said side slot and bodily movable vertically therein and automatically held at the proper height therein with its front edge substantially parallel to the vertical passage in the block to enable pegs of the desired length and of substantially uniform width to be formed from said strip, and a peg shortener, substantially as described.

2. In a machine of the class described, the combination of the following instrumentalities, viz:—a peg strip carrier, a slicing knife, a peg-shortening knife, and a throat block provided with a driver passage and with separate slots substantially at right angles to each other for the reception, respectively, of the said strip carrier and of the said slicing knife, said block having another slot extending transversely of the driver passage for the reception of the said peg-shortening knife, substantially as described.

3. In a machine of the class described, the combination of the following instrumentalities, viz:—a peg strip carrier, a peg shortening knife and clearer, a slicing knife, and a stationary throat block provided with a driver passage and with slots substantially at right angles to each other opening into said passage for the reception respectively of the peg strip carrier and the slicing knife and provided also with another slot extending transversely of the driver passage for the reception of the peg shortening knife and clearer, substantially as described.

4. In a machine of the class described, the combination of the following instrumentalities, viz:—a peg strip carrier, a knife or cutter movable transversely with relation to the said carrier to determine the length of the peg, one of said parts being bodily movable vertically with relation to the other, a throat block having a vertical passage, a vertical slot with which said passage communicates and into which said strip carrier extends, and a slot extending transversely of the vertical passage for the reception of the said knife or cutter and a horn or work-support connected to said bodily movable part for the purpose specified.

5. In a machine of the class described, the combination of the following instrumentalities, viz:—a driver, a stationary throat block provided with a passage in which said driver reciprocates, with a substantially vertical slot in the side of the block communicating with said passage and with a second slot substantially at right angles to the first slot and also communicating with said passage, a peg strip carrier movable bodily in a substantially vertical plane, a peg strip

feed mechanism to carry the end of the strip into the driver passage in the throat block, a knife or cutter movable in said second slot adapted to act upon the portion of the strip in said passage to reduce its width relatively to the width of the remaining portion of the strip, means to sever the portion of the strip in the driver passage from the remaining portion of the peg strip and a vertically movable horn or work-support connected to said strip carrier to determine automatically the width of the reduced portion of the strip, substantially as described.

6. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block provided with a longitudinal passage for the reception of a driver, with a lateral opening communicating with said driver passage and with a slot extending substantially at right angles to said driver passage, a peg strip carrier extending into said lateral opening, a peg-shortening knife or cutter movable in said slot across the driver passage, one of said parts being movable bodily with relation to the other, a vertically movable horn or work-support connected to said bodily movable part, means for feeding the peg strip through its carrier into the driver passage, means for slicing the peg from the peg strip, and a driver to expel the peg so formed from said passage, substantially as described.

7. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block provided with a driver passage open at one side to receive a peg strip, a carrier to support the peg strip, mechanism movable in said block across said driver passage to remove from the strip the wood not needed for the peg, means to change the relative positions of said carrier and said mechanism, a peg-forming cutter, and means for actuating it to sever a peg from the strip and then to close the open side of the driver passage, a driver, and means to actuate it to drive a peg from said passage into the stock.

8. In a machine of the class described, the combination of the following instrumentalities, viz:—means to caliper stock varying in thickness, a driver and a driver bar, actuating means therefor, means to feed a peg strip and put its end in position in the path of movement of the driver, peg-forming means adapted to cut the peg strip in the direction of both its width and its length to form therefrom pegs of varying length, means to move said peg-forming means toward and from the path of movement of the peg strip and the path of the driver, and a peg strip carrier co-acting with the upper and lower edges of the peg strip, the relative positions of the said peg strip carrier and the said peg-forming means being changed vertically in accordance with variations in thickness of the stock being calipered, thereby to insure the formation of a peg of the desired length to unite the stock then being calipered.

9. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block, a movable work support coöperating therewith, a peg strip carrier vertically movable in unison with the work support, a feeding mechanism for said strip, a peg slicing mechanism, a peg shortening mechanism, a mechanism to form a hole in the work and to drive a peg therein, and a work feed mechanism, substantially as described.

10. In a machine of the class described, the combination of the following instrumentalities, viz:—a peg strip carrier, a peg shortening cutter or knife movable transversely with relation to said carrier, one of said parts being bodily movable vertically with relation to the other, a slicing knife or cutter, a throat block provided with a driver passage into which said peg strip is inserted, a horn or work support vertically movable with relation to the throat block and connected to said bodily movable part, and a driver to prick a hole in the work and to drive a peg cut from the strip into the hole, substantially as described.

11. In a machine of the class described, the combination of the following instrumentalities, viz:—a driver, an actuator to impart to said driver two operative strokes during each cycle of operations of the machine and an intermediate adjustable connection between said actuator and said driver whereby the limits of said two strokes may be relatively varied, substantially as described.

12. In a machine of the class described, the combination of the following instrumentalities, viz:—a driver, means to give the driver successively two strokes toward the work, and means for varying the lower limit of one stroke while the lower limit of the other stroke is substantially unchanged.

13. In a machine of the class described, the combination with work clamping and calipering means of coöperating mechanisms acting automatically, between successive feeding movements and while the work is clamped, first to puncture the work, then to form from a continuous strip or line of material a fastening of a length corresponding to the thickness of the work being calipered and finally to insert the fastening into the hole punctured in the work.

14. In a machine of the class described, the combination of the following instrumentalities, viz:—a raceway to receive a peg strip, means to feed said peg strip longitudinally in said raceway, means to support

the peg strip, means to hold said peg strip vertically in said raceway and peg-forming means to cut directly from said peg strip pegs varying in length.

15. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block, a vertically movable peg strip carrier extending into the block and coöperating therewith and having a guideway for a peg strip, means in said guideway to exert a spring pressure upon one edge of the peg strip to insure its proper position, a work support vertically adjustable according to variations in the thickness of the work, and connections between the work support and the peg strip carrier, substantially as described.

16. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block, a vertically movable peg strip carrier coöperating therewith and having a guideway for a peg strip, feeding rollers mounted directly on the carrier, a work support vertically adjustable according to variations in the thickness of the work, and connections between the work support and the peg strip carrier, substantially as described.

17. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block, a vertically movable peg strip carrier coöperating therewith and having a guideway for a peg strip, a work support vertically adjustable according to variations in the thickness of the work, means for depressing the work support to permit the work to be fed, including a pivoted lever connected with the work support and provided with ratchet teeth, a cam-engaging and pawl-carrying lever and automatic devices for connecting and disconnecting said levers, together with connections between the work support and the peg strip carrier to cause them to move in unison normally but permitting independent movement, substantially as described.

18. In a machine of the class described, the combination of the following instrumentalities, viz:—a rotatable work feeding device, a stationary throat block having its lower end substantially in contact with the upper side of said device, and means for adjusting said device to vary the position of the work, substantially as described.

19. In a machine of the class described, the combination of the following instrumentalities, viz:—a rotatable work-feeding device, a guard therefor mounted concentrically above said device and provided with a slot or recess, means for adjusting said device to vary the position of the work, and a stationary throat block arranged to enter said slot to guide and support the device, substantially as described.

20. In a machine of the class described, the combination of the following instrumentalities, viz:—a throat block, a work feeding device, a carrier for said device adjustable toward and from said throat block, and a plate or guard movable with said carrier and embracing said throat block above the work feeding device whereby said device is guided and laterally supported, substantially as described.

21. In a machine of the class described, the combination of the following instrumentalities, viz:—a rotatable work feeding device, a carrier for said device adjustable to vary the position of the work, an actuating member arranged to engage said device to rotate it, and a lever pivoted on a stationary part of the machine and directly supporting and actuating said member, substantially as described.

22. In a machine of the class described, the combination of the following instrumentalities, viz:—a rotatable work feeding device, a carrier for said device adjustable to vary the position of the work, a pawl engaging the upper surface of the work feeding device to effect rotation thereof and movable with said device as it is adjusted with its carrier, and a lever to operate said pawl to rotate said feeding device, said lever having an elongated hub in which said pawl is movable, substantially as described.

23. In a machine of the class described, the combination of the following instrumentalities, viz:—a work feeding device comprising a rotary wheel having a roughened or toothed periphery adapted to engage the edge of a sole, a manually actuated device for adjusting said wheel to vary the position of the work, a lever swinging in a plane which is disposed at approximately a right angle to the plane of rotation of said wheel and substantially parallel to the line in which the work is fed and a single actuating member connecting said wheel and said lever for feeding the work, substantially as described.

24. In a machine of the class described, the combination of the following instrumentalities, viz:—a driver for inserting fastenings, a stationary throat block provided with a driver passage and two slots substantially at right angles to each other extending backwardly obliquely from said driver passage, a peg strip carrier and peg forming means located respectively in said slots, a sole edge engaging wheel rotatable about an axis approximately parallel to the line of movement of the driver for feeding a shoe but movable bodily toward and from the line of movement of the driver for gaging the distance from the edge of the sole at which fastenings are to be inserted, said wheel being located in the angle between

said slots, and automatically actuated devices constructed and arranged successively to feed the end of a peg strip into the driver passage, to detach a peg therefrom, to drive the peg, and then to feed the shoe, substantially as described.

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

GEORGE GODDU.

Witnesses:
JAS. H. CHURCHILL,
A. VAN WAGENEN.