(No Model.) 10 Sheets—Sheet 1.

F. F. RAYMOND, 2d & C. H. FOGG.

HEEL ATTACHING MACHINE.

No. 581,039. Patented Apr. 20, 1897.

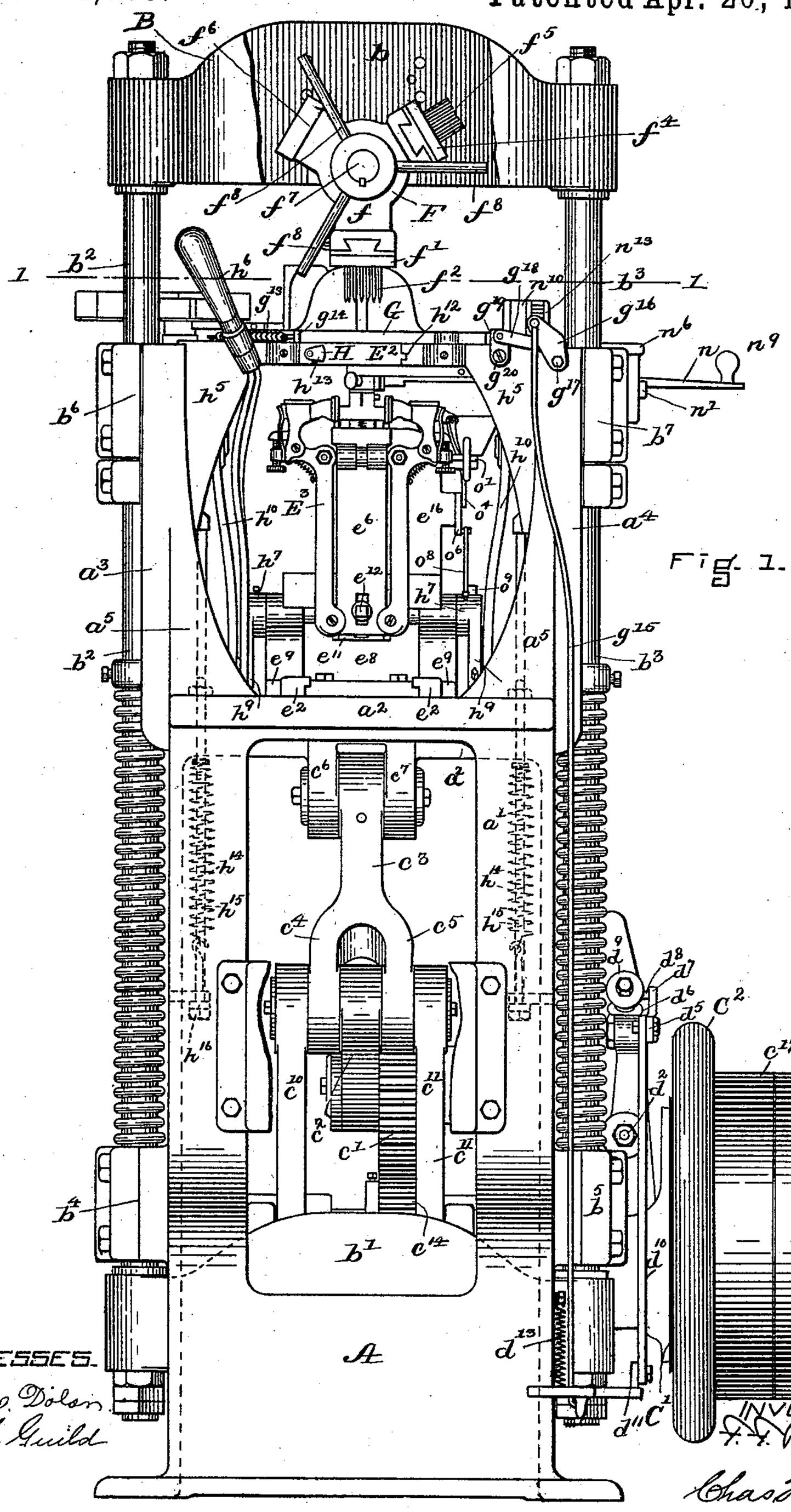

Fig. 1.

WITNESSES.
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Chas H. Fogg.

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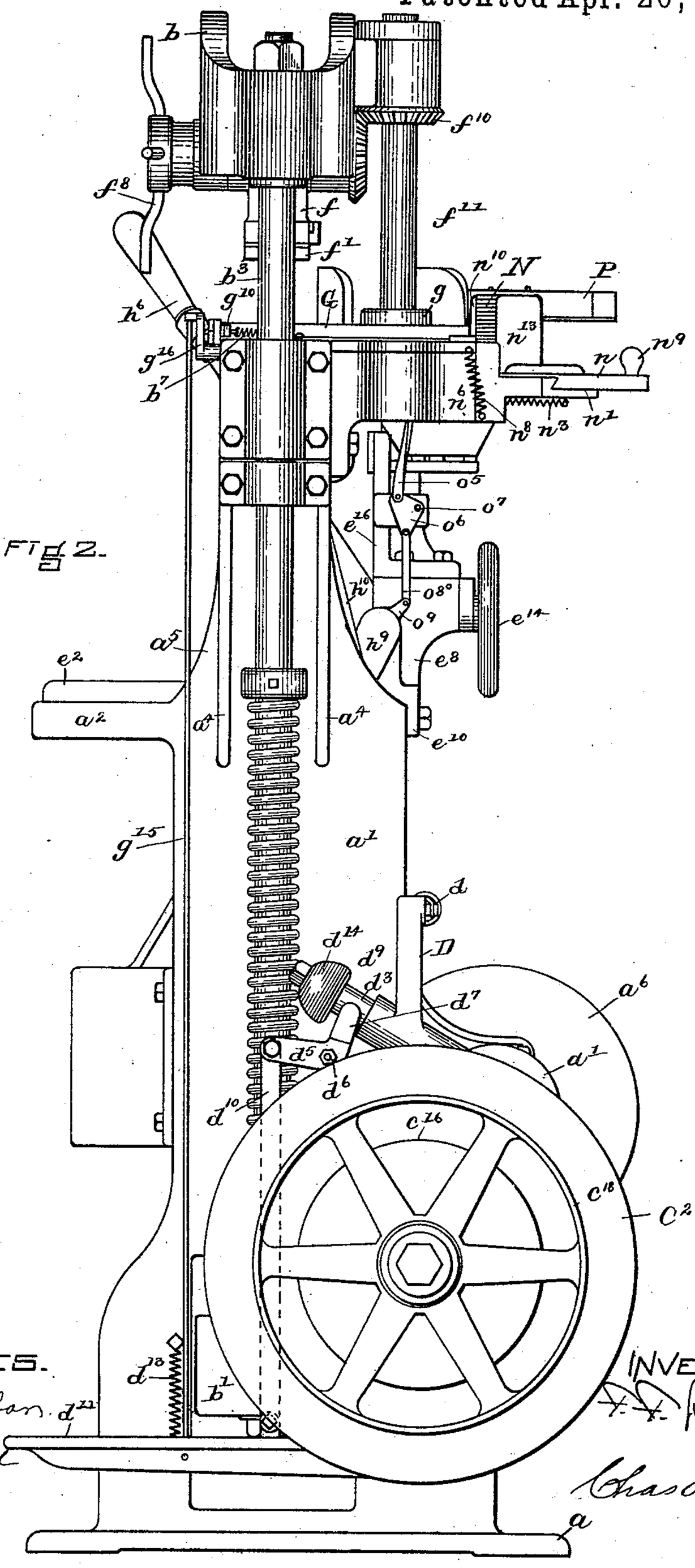
FIG 2.



WITNESSES.

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F. F. RAYMOND, 2d & C. H. FOGG.

HEEL ATTACHING MACHINE.

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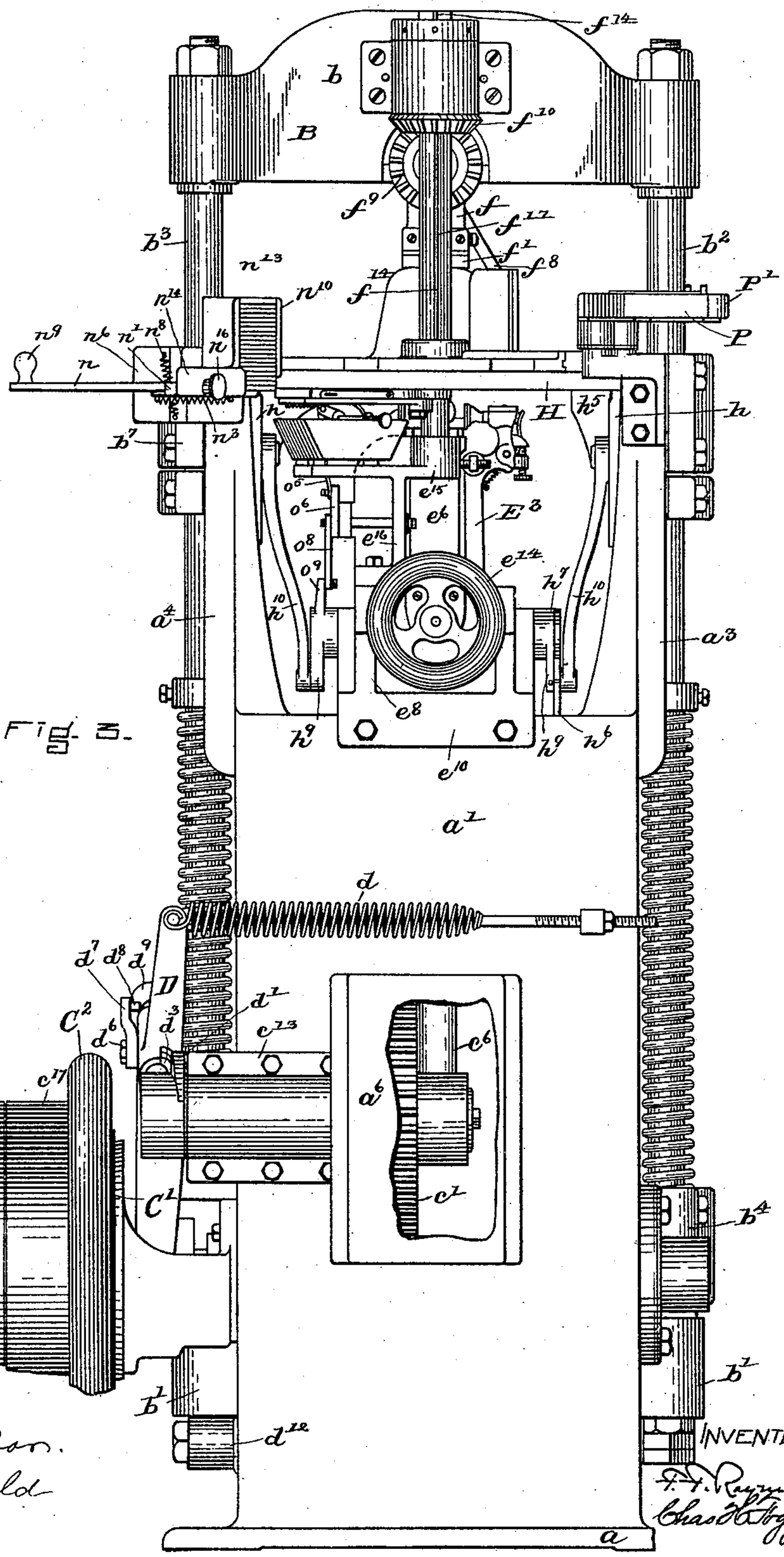

FIG. 5.

WITNESSES.

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HEEL ATTACHING MACHINE.

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Fig. 4.

WITNESSES.

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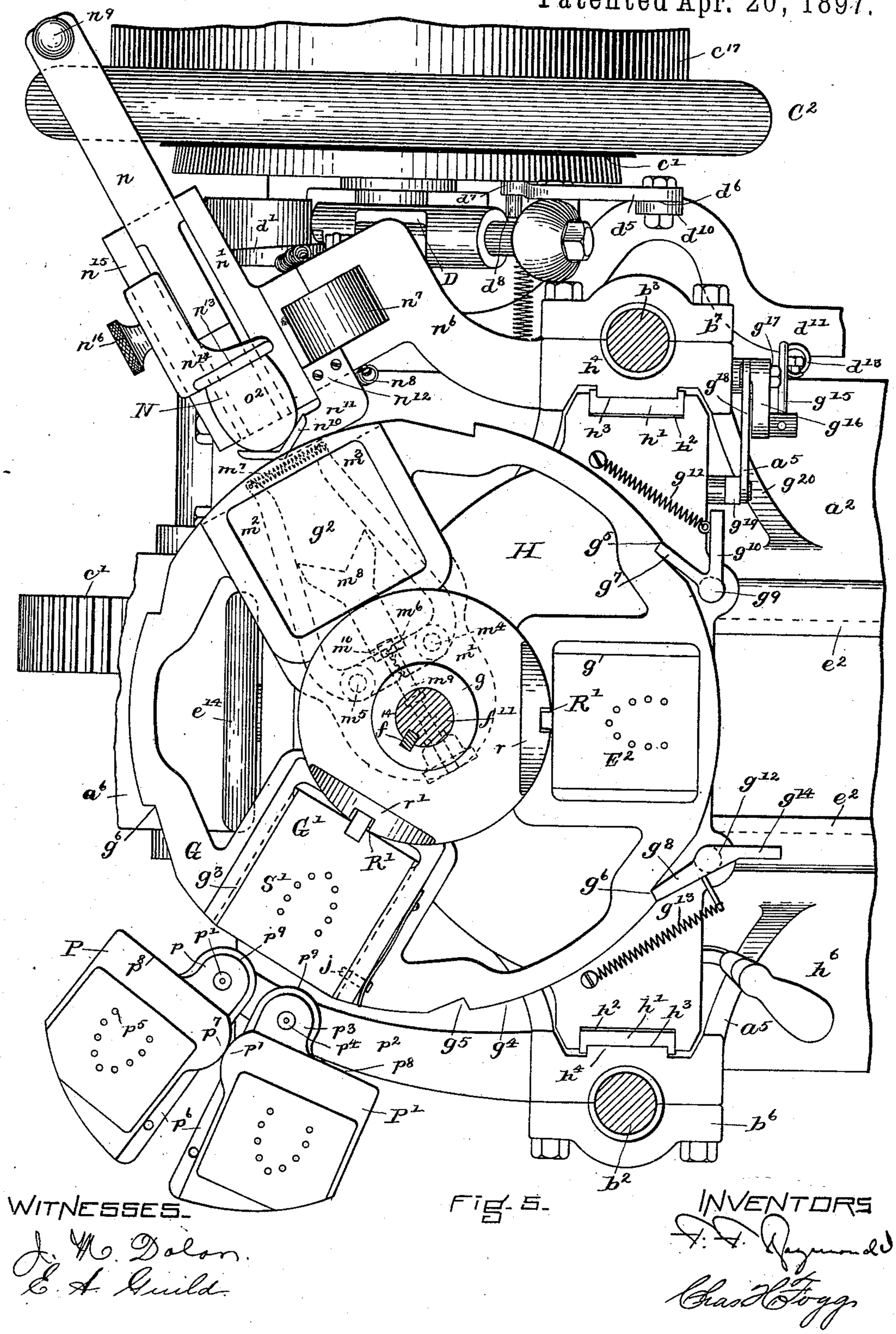

FIG. 5.

WITNESSES.

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HEEL ATTACHING MACHINE.

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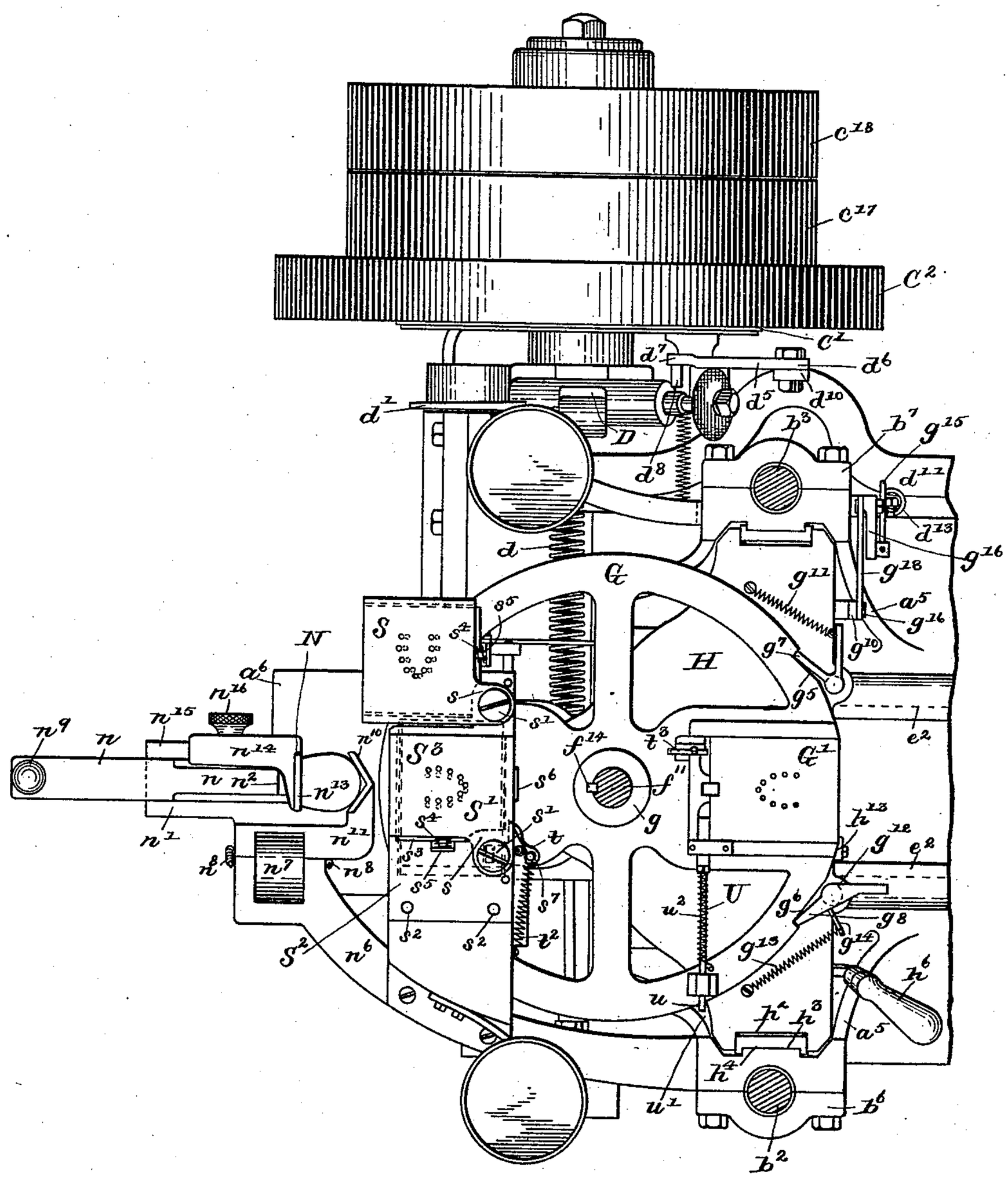

Fig. 6.

WITNESSES.

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HEEL ATTACHING MACHINE.

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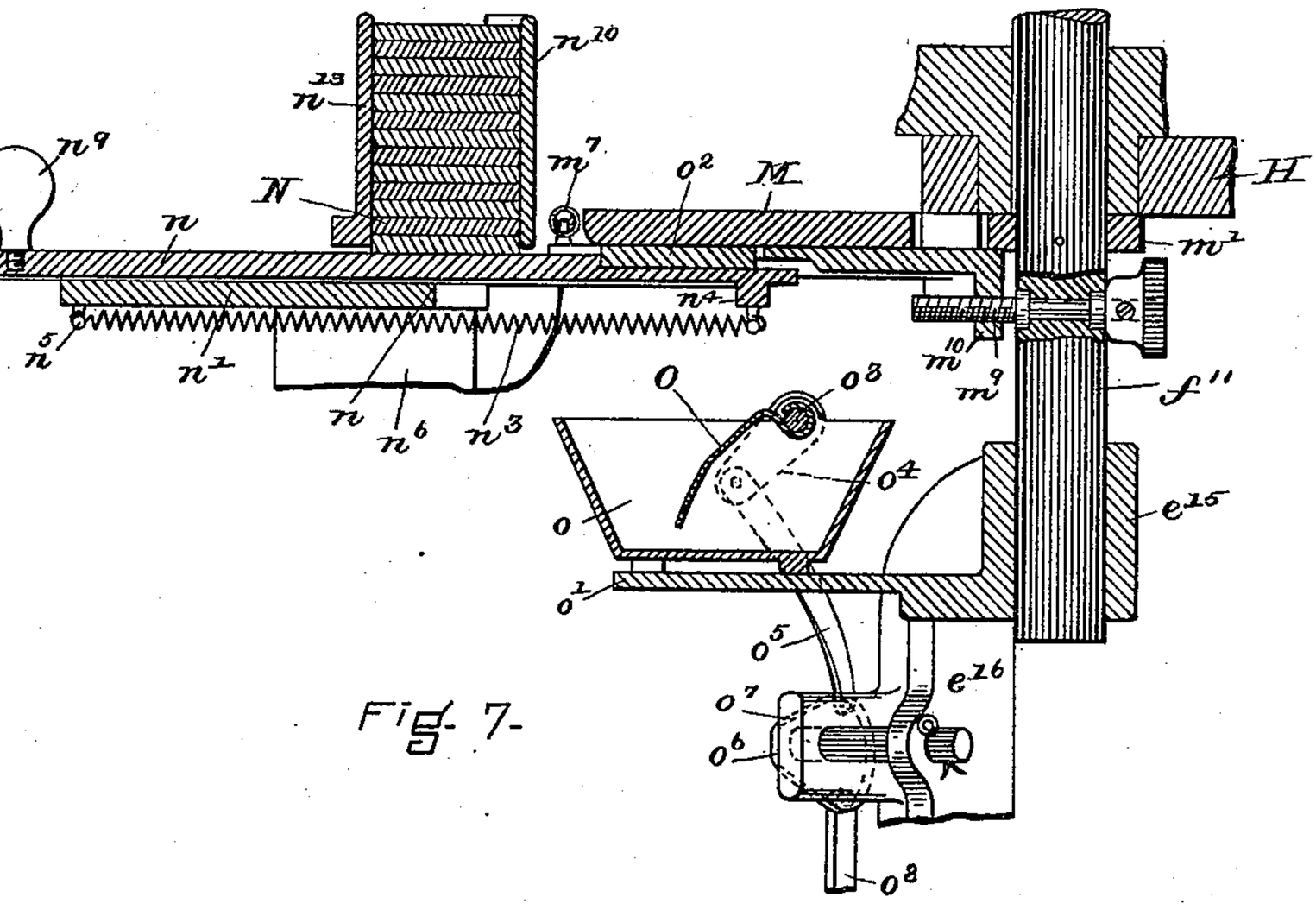

Fig. 7.

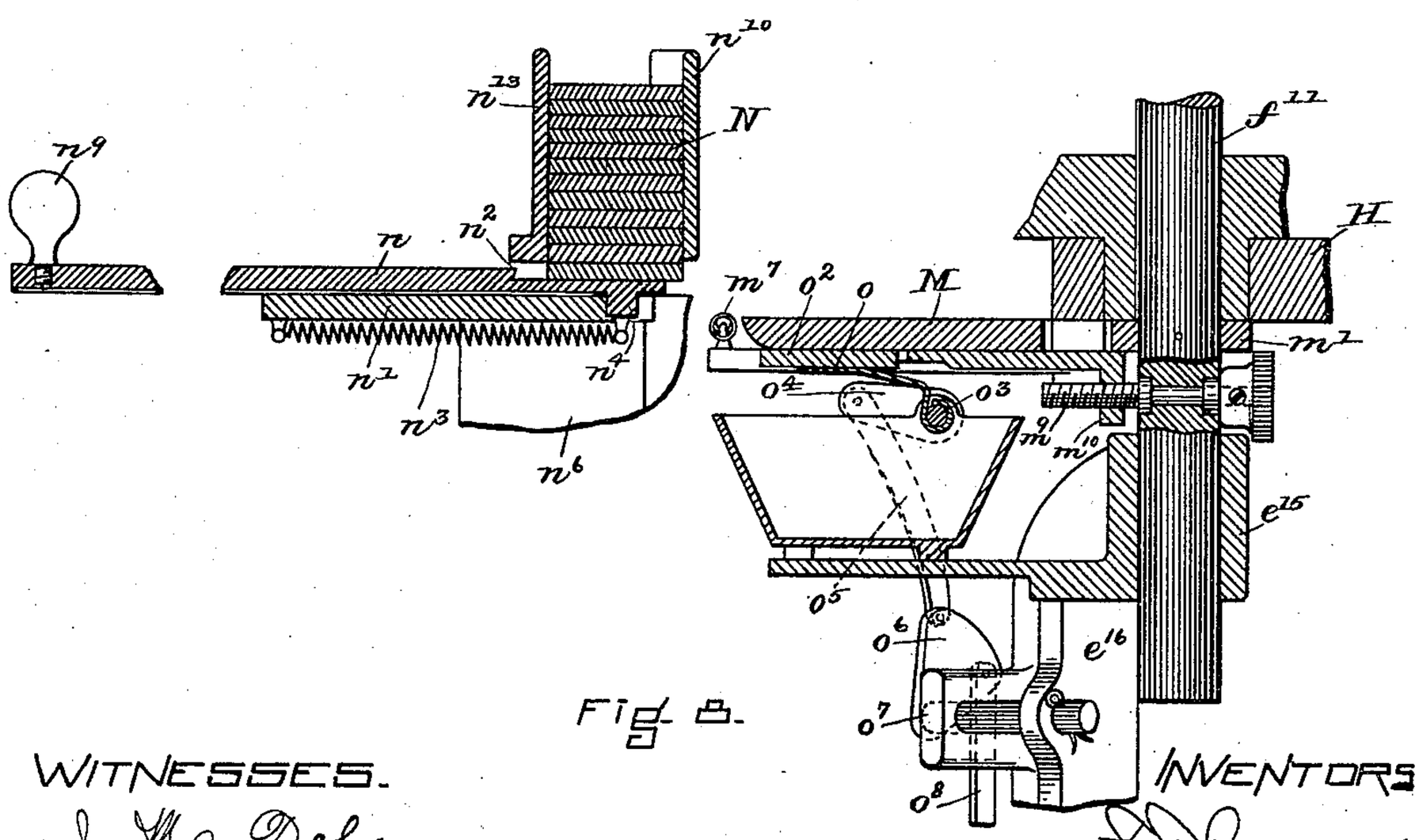

Fig. 8.

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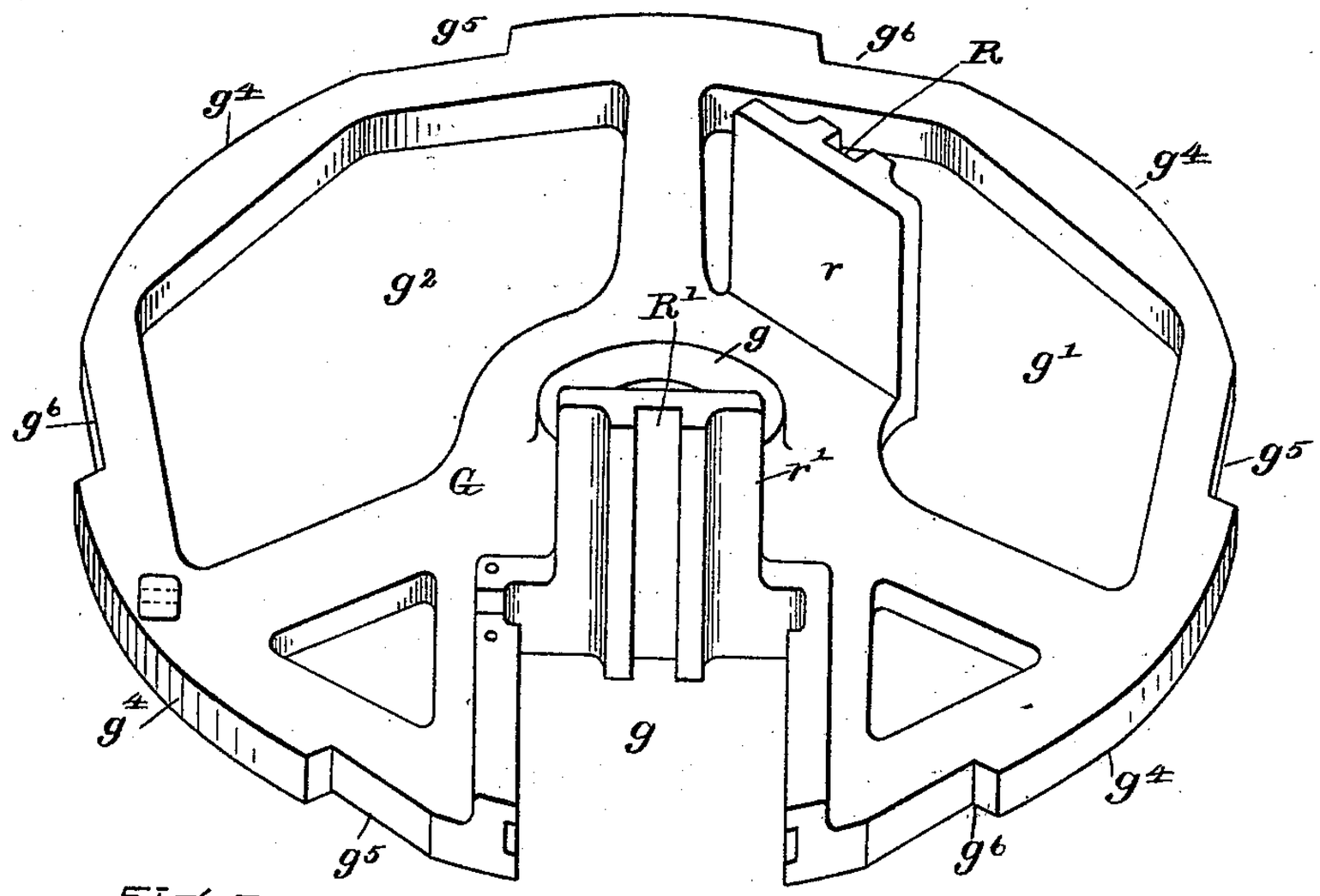

FIG. 9.

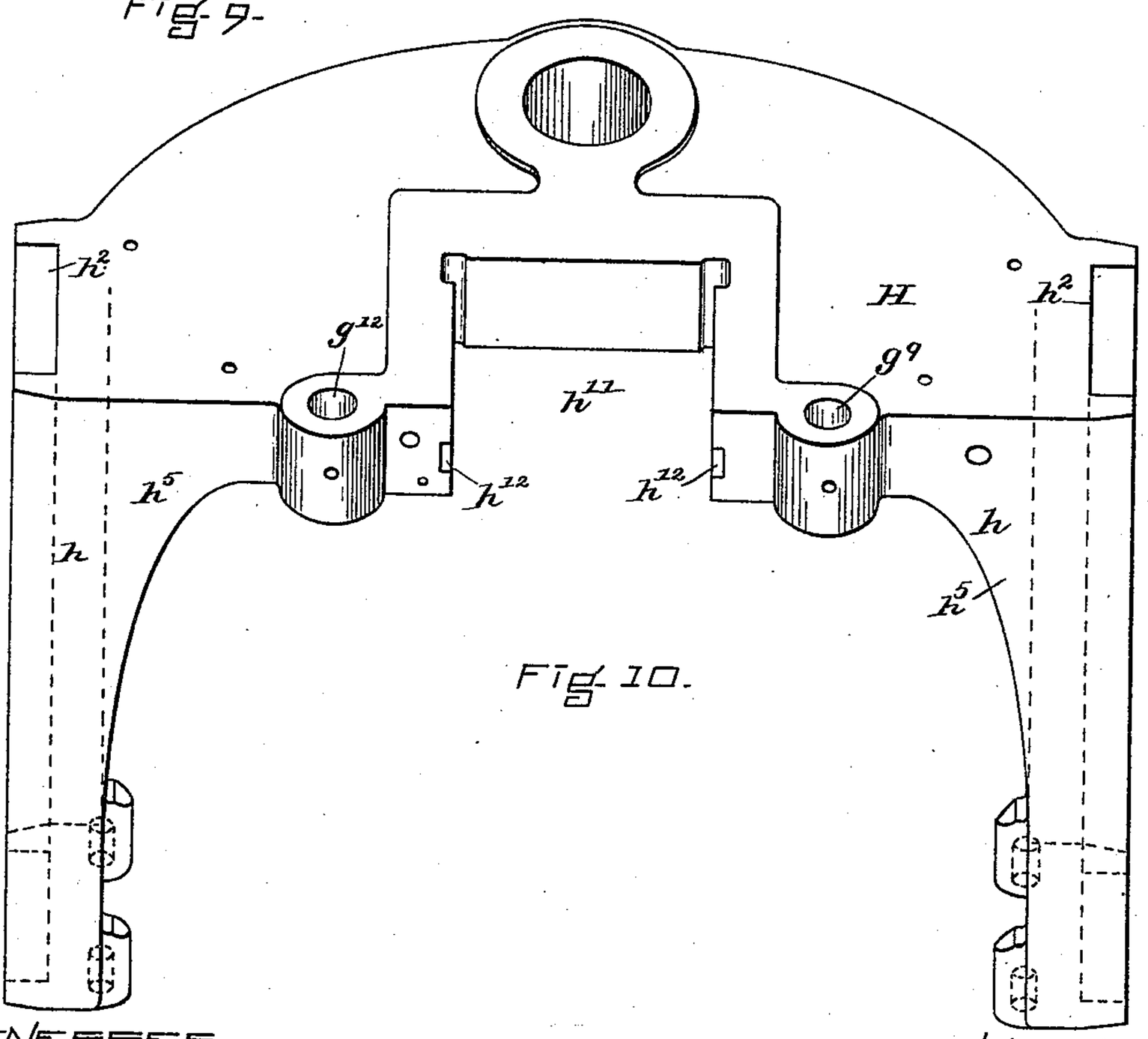

FIG. 10.

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HEEL ATTACHING MACHINE.

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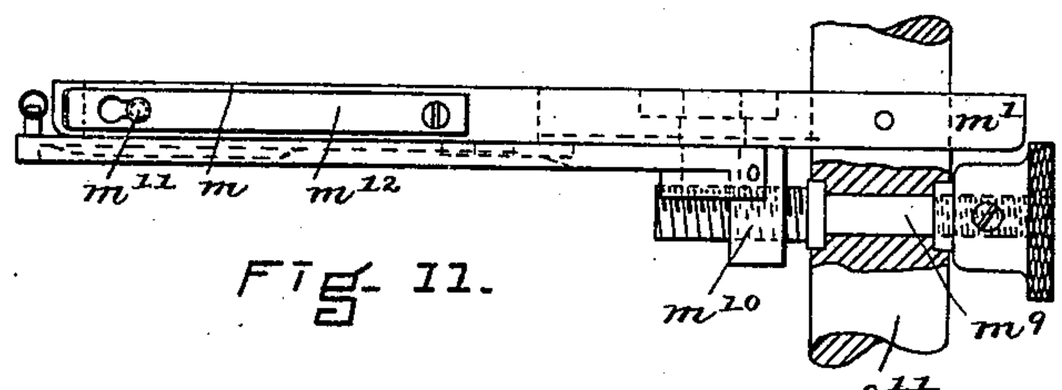

Fig. 11.

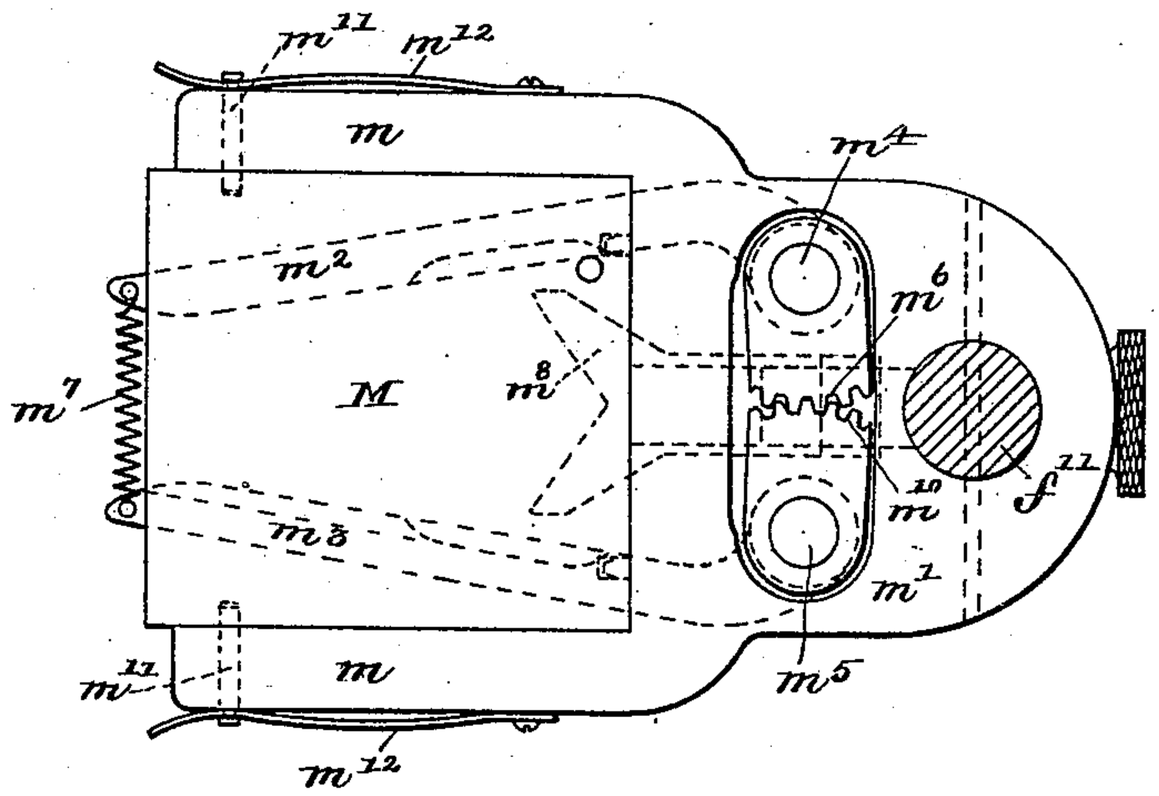

Fig. 12.

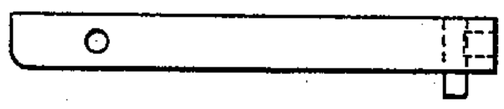

Fig. 14.

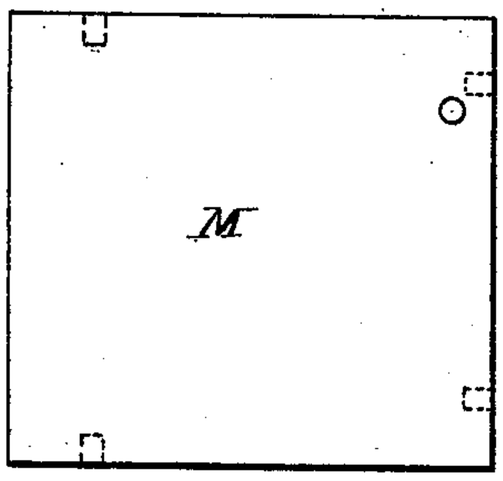

Fig. 15.

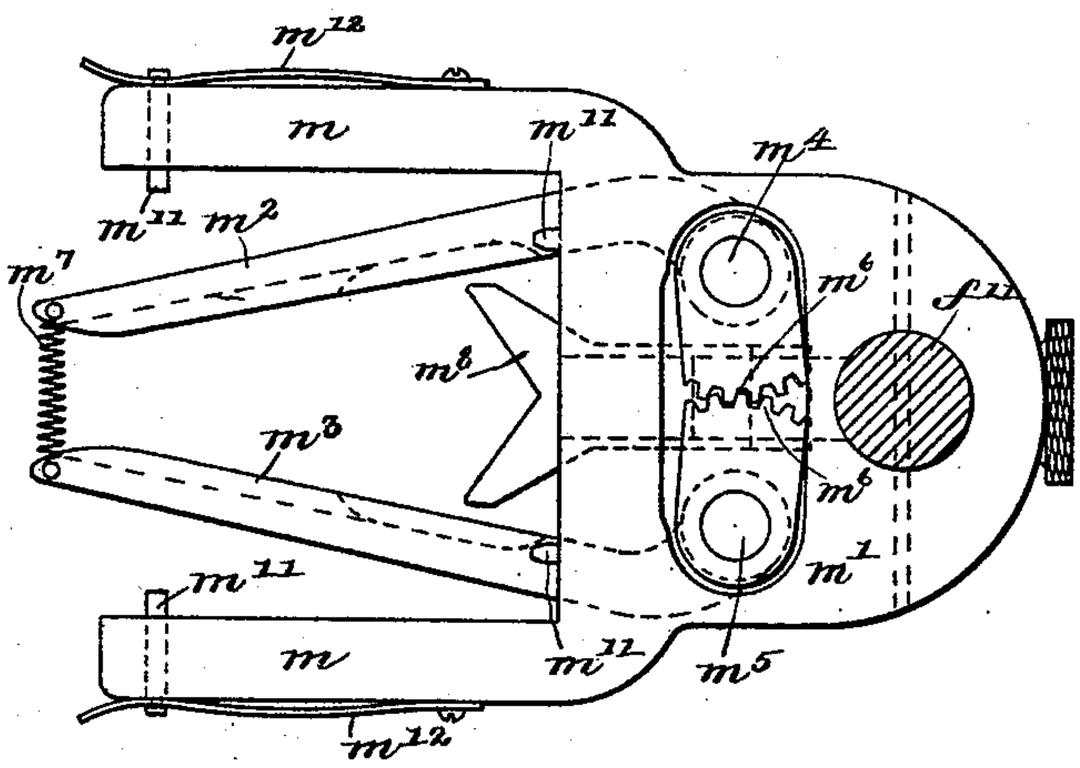

Fig. 13.

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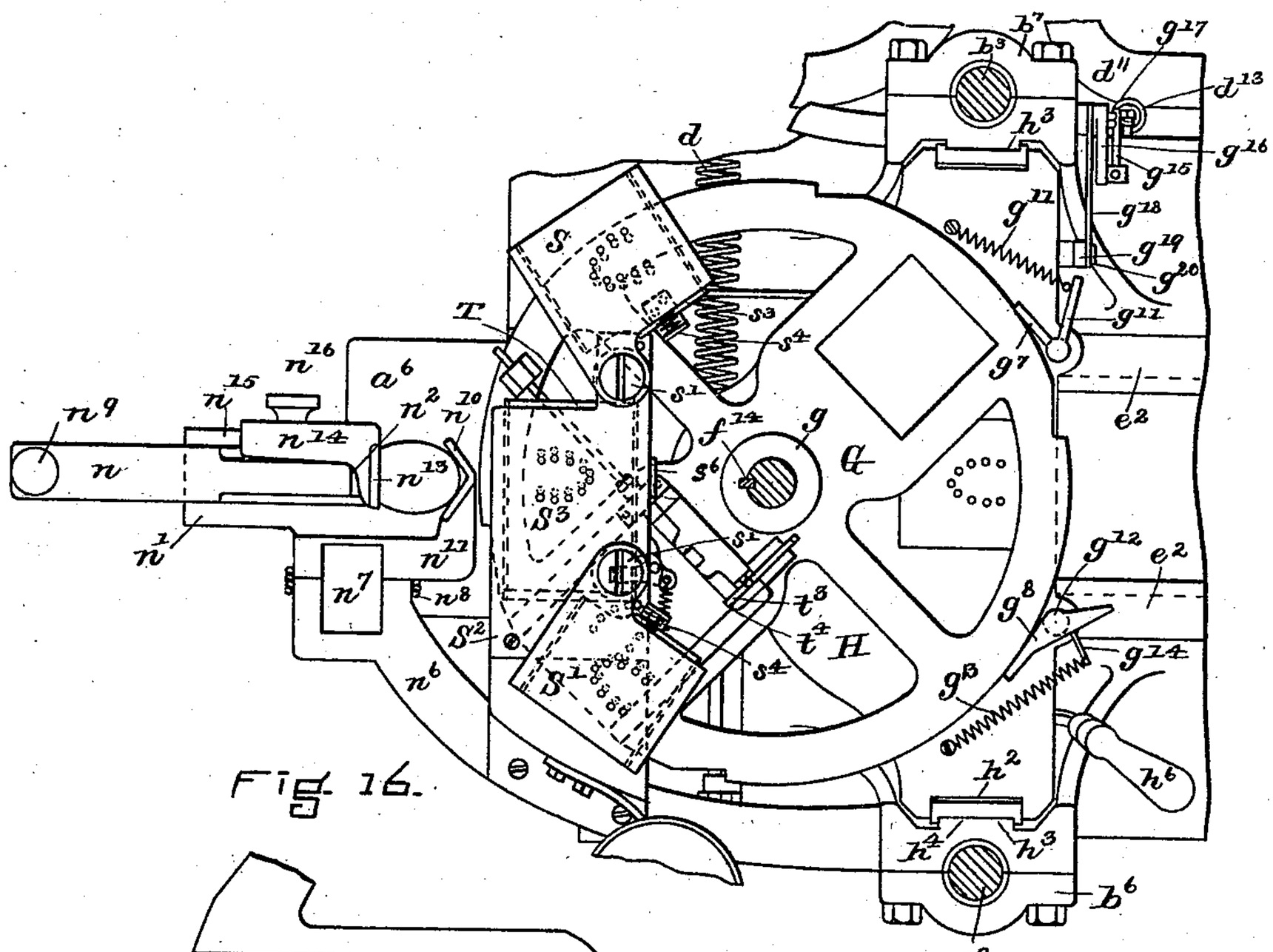

Fig. 16.

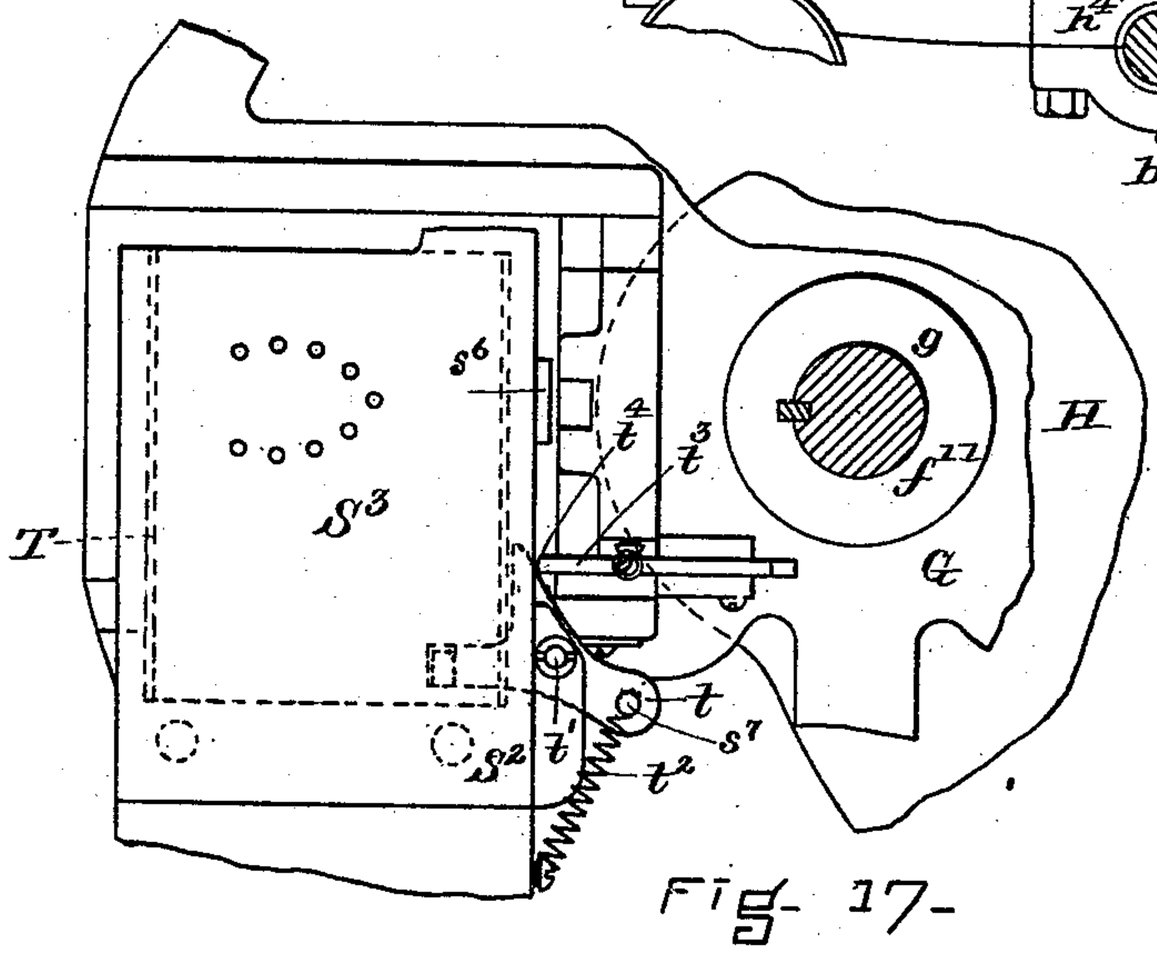

Fig. 17.

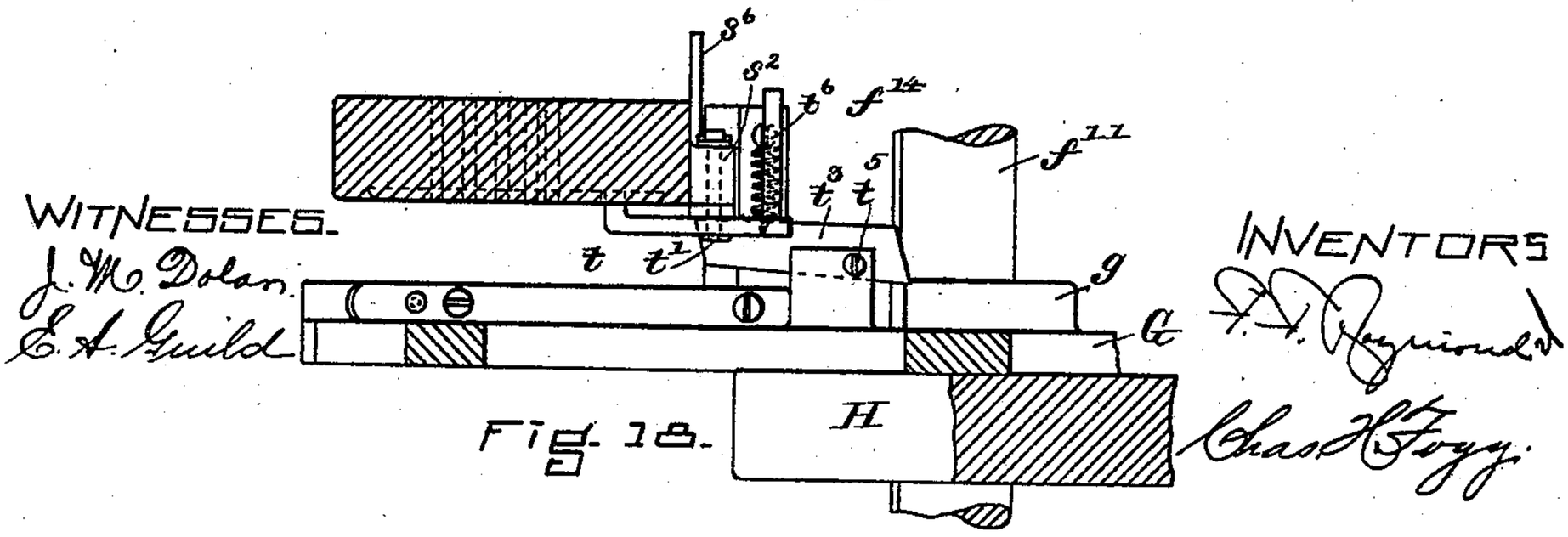

Fig. 18.

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Chas. H. Fogg.

UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, AND CHARLES H. FOGG, OF HYDE PARK, MASSACHUSETTS, ASSIGNORS TO JAMES W. BROOKS, PRINCIPAL TRUSTEE, OF PETERSHAM, AND JOHN BROOKS, ASSOCIATE TRUSTEE, OF BOSTON, MASSACHUSETTS.

HEEL-ATTACHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,039, dated April 20, 1897.

Application filed February 6, 1896. Serial No. 578,279. (No model.)

To all whom it may concern:

Be it known that we, FREEBORN F. RAYMOND, 2d, of Newton, in the county of Middlesex, and CHARLES H. FOGG, of Hyde Park, in the county of Norfolk, in the State of Massachusetts, have invented a new and useful Improvement in Heel-Attaching Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in explaining its nature, wherein—

Figure 1 is a view in front elevation of a machine having our improvements. Fig. 2 is a view in right-side elevation thereof. Fig. 3 is a view of the machine in rear elevation. Fig. 4 is a view in vertical central section of the machine from front to rear. Fig. 5 is a view in plan of parts below the dotted line 1 1 of Fig. 1. Fig. 6 is a view similar to that of Fig. 5, representing a modified form of the invention. Fig. 7 is a detail view in section representing devices for feeding top lifts from a stack to top-lift-carrying devices, also showing means for applying paste, glue, or other adhesive material thereto. Fig. 8 is a view representing a different position of the parts shown in Fig. 7. Fig. 9 is a view in perspective of a rotary plate removed from the machine adapted to hold and carry the nail-carrier and to provide means whereby the rotary head, nail-carrier, and top-lift carrier are locked in their various operative positions. The plate represented is that used with a three-motion machine. Fig. 10 is a view in perspective of a table removed from the machine and which supports the templet and the rotary plate of Fig. 9 and has vertical movements imparted to it. Fig. 11 is a view in side elevation of the top-lift carrier and spanker. Fig. 12 is a view principally in plan thereof. Fig. 13 is a view in plan thereof, the spanker-plate being removed. Fig. 14 is a view in side elevation of the spanker-plate removed; Fig. 15, a view in plan thereof. Fig. 16 is a view principally in plan to further illustrate the modification represented in Fig. 6, which comprises slight variations in the nail-loading devices and in the relation of the top-lift loading and nail-loading devices to each other and the rest of the machine. Figs. 17 and 18 are detail views of the nail-loading devices represented in Fig. 16, to which reference is hereinafter made.

A is the frame of the machine. It has a wide base a, a box-frame lower section a', a table a^2, and upwardly-extending sides a^3 a^4, which are braced by ribs a^5, extending from the table. There is mounted on this frame a gate B, which comprises an upper cross-head b, lower cross-head b', and rods b^2 b^3, which connect the two heads. The gate is attached to the frame by lower side-boxes b^4 b^5 and upper side boxes b^6 b^7.

A reciprocating movement is imparted to the gate by means of the toggle C, crank-pin c on the side of the gear-wheel c', and link connecting the crank-pin with the toggle. The toggle preferably has a single upper link c^3, (see Fig. 1,) having the forked lower end c^4 c^5. Its upper end is attached to the under side of the table or bed a^2 by the ears c^7 and a cross-pin c^8. (See Fig. 4.) The forked ends c^4 c^5 of the upper link have extending through them a pin c^9, which carries at its outer ends the upper ends of the links c^{10} c^{11}, which connect the upper link with the lower cross-head b', the lower ends extending into a cavity b^6 in the lower cross-head and being united to the lower cross-head by a pin b^7, which extends through them, and partitions b^8 formed across the lower cross-head.

Between the ends c^4 c^5 of the upper link the outer end of the link c^6 extends, and the pin c^9 passes through it. This arrangement of toggle-links and connecting-links is very strong and a very desirable one. The crank-gear c' is carried by a short shaft c^{12}, supported by the box c^{13}, attached to the back of the box-frame. The cap of this box-frame is represented in Fig. 3 and the crank-gear c' is also shown in said figure by the breaking out of a portion of the gear-casing a^6. The crank-gear is rotated by the pinion c^{14} (see Fig. 4) on the main shaft c^{15}, which carries at its outer end a member C′ of a friction-clutch, the member

being fast to the shaft. It also supports the fly or balance wheel C^2, in the inner face of which is the other section or face c^{16} of the clutch.

The clutch-section C′ is movable lengthwise the shaft to engage and disengage the clutch-section of the balance or fly wheel. The fly or balance wheel has the belt-section c^{17}, and beyond it upon the said shaft c^{15} is a loose belt-wheel c^{18}. The member C′ is moved into engagement with the other member by a spring d (see Fig. 3) and out of engagement therewith by a cam d' at the end of the shaft c^{12}, the spring and cam operating through a lever D, which is pivoted at d^2 and the lower end of which is forked to engage a recessed hub of the said clutch member C′.

The lever is connected with the cam d' by a stud d^3, supported by the lever, forced outwardly therefrom toward the cam by a spring, and held in said outward position by said spring and removed from the cam to permit the spring d to move the driven member of the clutch into engagement with the driving member by the bell-crank lever d^5, (see Fig. 2,) pivoted at d^6 to a moving link or part D′, the arm d^7 of which has a pin or roll d^8 upon its side, which is adapted to be brought into contact with the head d^9 of said stud d^3 in moving it outwardly and to then ride by the same to a position above or beyond it in order that it may not be held by said stud-head from returning to a position to be immediately engaged by the stop-cam d' at or near the end of one full revolution thereon. This bell-crank lever is connected by a rod d^{10} with the treadle d^{11}, pivoted at d^{12} to the outer side of the frame and having a spring d^{13} to resist the downward thrust and to restore it after its removal. The head d^9 preferably has the rounded surface d^{14}, over which the pin d^8 will ride after the stud d^3 has snapped back to its original or normal position. It will be seen that by means of this construction the connection of the bell-crank lever with the stud-head is broken and a repetition of the action of the machine is prevented, or, in other words, the machine can make but one reciprocation, even if the foot be kept upon the treadle, but after the removal of the foot from the treadle the bell-crank lever and stud-head are immediately engaged, so that the machine can be again started. The tension of the clutch-spring d may be varied to close the clutch with any desired force or stress desired.

The table or bed a^2 supports the jack E, which, broadly speaking, comprises a last or work-support (not shown) mounted upon the upper end of a spindle e, vertically movable in a stand e'; which is adapted to slide in the ways e^2 inward or outward upon the bed or table. It has an adjusting-screw by which the height of the spindle in relation to the stand and the height of the work-support can be varied, and when in operative position the lower end of the spindle is above a pressure-head E′, also carried by the bed or table, contained in a hole therein above the pivot-point c^8 of the upper toggle-link, and adapted to have a slight vertical movement imparted to it by a cam e^3, formed on the upper side of this link, and which may be integral therewith or may be made separate and attached thereto. The object of this cam is to enable the heel-blank to be brought against the templet or pressure plate E^2 with any degree of pressure or force immediately before the awls touch the upper surface of the heel or the nails are fully driven therein.

The pressure-head has a shoulder e^4, which rests upon a shoulder e^5. The shoe-centering devices or receiver E^3 also comprise a part of the jack and are represented in front elevation in Fig. 1. They are like those described in the patent to Krewson, No. 514,852, with the exception hereinafter noted, and they provide means for centering the heel end of the shoe upon the last or work-support and a back-stop for the heel. They are mounted by their common supporting-plate e^6 upon a slide e^7, which is in turn supported by and movable upon a bracket e^8, attached to the table or bed by the sections e^9 e^{10}, one extending upon the upper part of the table and one against the back of the frame and each taking a fastening or bolt.

The slide e^7 has a downward-extending front e^{11}, against which the lower part of the plate e^6 is held by a fastening-screw e^{12}, the plate e^6 having a vertical slot by which it may be vertically adjusted in relation to the slide. The slide is horizontally adjusted by means of the screw e^{13}, which screws into the bracket from behind and is operated by the hand-wheel e^{14}, the stud or shank of the screw being connected with the slide by a forked piece. The upper cross-head has a revolving head F, having the arm f, supporting a block f', carrying a gang of awls f^2, an arm f^3, supporting a block f^4, carrying a gang or group of drivers f^5, and an arm f^6, the under surface of which is a spanker.

The rotary head is carried by the shaft f^7 and is turned by handles f^8. (See Fig. 1.) The shaft at its rear end is connected by a bevel-gear f^9 (see Figs. 3 and 4) with a bevel-gear f^{10} on the vertical shaft f^{11}. The bevel-gear f^{10} has a long hub f^{12}, which extends through the box f^{13}, fastened to the upper cross-head b, being attached to the box by a nut. The gear and hub move upwardly and downwardly on the shaft f^{11} in unison with the movement of the cross-head, and the connection between the gear, hub, and the shaft is maintained by a spline or fast feather f^{14} on the shaft, which enters a corresponding recess or groove in the gear-hub. The shaft f^{11} and its spline extend through the hub g of a skeleton plate G, (see Figs. 4 and 9,) which supports the nail-carrier G′, the plate being attached to or connected with the shaft to be turned thereby and being adapted to fall and rise with it. The lower end of the shaft f^{11} is supported in

an upward extension e^{15} of the bracket e^8. The skeleton plate G rests upon the upper surface of the table H, (see Figs. 4 and 10,) which supports the templet E^2. This table spans the space between the two uprights a^3 a^4 of the frame and has at each side a downwardly-extending section h, which is arranged to slide upon the inner sides of said uprights. The connection between the side sections of the table and the uprights we prefer to establish by gib-plates h', set into the recesses h^2 in the side sections, (see Fig. 5,) which gib-plates have the recesses h^3 to receive the outwardly-extending sections h^4 of the uprights, upon which the gibs and table are vertically movable. The gibs loosely fit their holding-recesses h^2, and by means of suitable adjusting-screws, which extend through the sections h against them, serve to fit, locate, and adjust the table in respect to the stationary sections of the frame sides. Braces h^5 connect the side sections of the table with its top. Vertical movement is provided the table by means of the lever h^6, (see Figs. 1, 2, and 3,) connected at h^7 to a rock-shaft h^8, carried by the bracket e^8, and having at each end the arm or lever h^9, the ends of which are connected by links h^{10} with the sides h of the table. These arms are so formed or arranged that upon being moved into a vertical position they not only serve to move downward the table H, but also to lock it in its lowest position. The table has a recess h^{11}, (see Fig. 10,) opening from its front edge, which is substantially square in shape, for the reception of the templet E^2, which is removable therefrom, being held therein by tongues which enter grooves h^{12} in the sides of the recess, (see Figs. 1 and 10,) and a button h^{13} serves to lock the templet therein. The upper surface of the templet E^2 and table H are plane or level and the skeleton plate G is adapted to rest and turn upon it.

To enable the invention to be better understood, we will say that in the operation of the machine the shoe, having been placed upon the last or work-support, is moved into the shoe-receiver beneath the templet E^2, which is then in its highest position, (see Fig. 1,) and the heel-blank which is to be attached is placed upon the heel end of the outsole of the shoe against the back-stop and beneath the templet. The templet is then moved down upon the heel-blank, (see Fig. 4,) pressing it against the sole, by the lever h^6 and locked in its lowest position by the straightening of the arms h^9, and this locking movement of the lever gages or establishes the pressure to be applied to the heel, as if the lever cannot be moved down to its lowest position it is an indication that more pressure for attaching the heel will be required than is desirable. If, on the other hand, the lever goes down too easily, it will indicate that the heel will not be compressed enough. If the lever is gently forced down, it will indicate that the templet has been brought into contact with the heel-blank and that in the subsequent operation of the machine the proper pressure will be applied to it.

It is necessary that the templet and the table H be locked down preparatory to starting the machine, because the first operation of the machine is to move upward the last or work-support, and consequently the shoe and the heel, and the heel is compressed or solidified to any desired extent by being pressed upwardly against the templet. This compression is produced by the cam e^3 working through the pressure-head E′ and the jack-spindle e, and its purpose is to solidify the heel and hold it solidified and clamped in advance of the pricking and nailing operations, that the heel will not be displaced during such operations and that better nailing will be done, as it is desirable that the heel be held compressed or partly compressed during the pricking of the holes therein and during the driving of the attaching-nails. The machine being started, the pressure to the heel above indicated is given, and is immediately followed by a descent of the awls through the holes in the templet E^2 into the heel and their withdrawal and the stopping of the machine with the cross-head b in its highest position. The operator, without releasing the table H and templet E^2 from their lowest position, then turns the rotary head, thereby causing the shaft f^{11} to be turned and the nail-carrier G′ to be moved into position over the templet, the nails being then automatically discharged from the holes of the nail-carrier into the holes of the templet and the drivers to be brought into operative position. The operator then causes another reciprocation of the gate by which the drivers drive the nails from the nail-carrier and templet into the heel, the cross-head stopping, as before, in its highest position. The operator then moves the lever h^6 upward, releasing the table H and the templet, which are forced upward and held in their highest position by the springs h^{14}, (represented in Figs. 1 and 4,) and which are fastened at their upper ends, preferably to a take-up, and at their lower end to downward extensions from the table sides, comprising the rods h^{15} and cross-pieces h^{16}. The operator then again turns the head F, moving the drivers and nail-carrier out of position and the spanker-arm f^6 into position over the templet H, and by so doing turns the shaft f^{11}, which moves the top-lift carrier and top-lift-spanking plate M below the templet E^2, thereby moving a top lift over the attached heel-blank to a position to be spanked upon its downward movement to the ends of the attaching-nails which have been left protruding to receive it, and the machine is again reciprocated and the top lift applied to the heel, the machine coming to rest with the cross-head in its highest position. The operator again turns the rotary head, moving the spanker-plate out of operative position over the heel to an operative relation to a

loader and cement-applying device and the nail-carrier to a position to be filled directly by a boy or helper who is stationed back of the machine or from a previously-filled loader. The operator then removes the completed shoe and substitutes an unheeled shoe and heel-blank, while the assistant or boy loads the nail-carrier and feeds the top lift.

The top-lift devices comprise a plate M, (see Figs. 11 to 14,) which is detachably secured to the arms m of a rotary holder m', attached to the shaft f^{11}, a top-lift receiver, and a top-lift holder. The plate M is a spanker-plate—that is, it spanks the top lift upon the attached heel-blank of the boot or shoe. It may be used for applying a top lift or for spanking the top of a flush-nailed heel, when a thicker plate would be used than for blind-nailing, or it may be used for spanking the heel end of a spring-heel shoe, when a plate having a cavity of the shape of the spring-heel would be employed. Ordinarily for blind-nailing there are attached to the rotary plate m' the top-lift holders m^2 m^3. (Shown in dotted lines in Figs. 5 and 12 and full lines in Fig. 13.) These are pivoted at m^4 m^5, respectively, to the under surface of the plate m', and they are connected together in line with their pivots by the gear-teeth m^6, formed on each. They are closed and held closed by the spring m^7, connecting their forward ends. The plate m' also carries the back-stop m^8, which is adjustable thereon between the fingers by means of the adjusting-screw m^9, which screws in the threaded section m^{10} of the stop and which turns in and is supported by the shaft f^{11}. (See Figs. 7 and 8 and 11 to 14.) The plate M is attached to the arms m and plate m' by pins m^{11}, which enter holes in the edge, the pins in the arms m being movable outwardly and being pressed and held closed by springs m^{12}, attached to the arms. These top-lift holding and transferring devices are movable from a position in line with the top-lift holding and feeding devices to a position under the templet E^3 and upon the turning of the revolving head to move the awls and drivers out of operative position.

A top lift is fed to the fingers or holders m^2 m^3 from the top-lift stack N by the feeding plate or slide n, which is moved inward upon the table or support n' between the top-lift-holding fingers m^2 m^3. The top lift opens the arms or fingers and passes between them until its back end comes into contact with the V back-stop m^8. This feeding-plate has the shoulder n^2, preferably slightly undercut, against which the breast of the top lift rests as it is being fed from the stack to the fingers, and the spring n^3, attached at n^4 to the inner end of the feeding-plate n and to table n', serves to withdraw automatically the feeding-plate at the end of its inward feeding movement, or from the position shown in Fig. 7 to that shown in Fig. 8.

The nail-carrier and top-lift devices at the end of the attaching operation are by the operator moved to the position represented in Fig. 5 or Fig. 6—that is, the top-lift spanker and receiver and the nail-carrier are in a position to receive a top lift and be loaded—and this is done by the boy or attendant, who pushes in the slide n to feed the top lift and places the nails directly into the holes of the nail-holding plate G′ or supplies them with nails from a secondary nail-holder previously loaded.

It is desirable that the support n', the slide n, and top-lift stack N be downwardly yielding in order that no damage be done the parts in case the slide n should not have been withdrawn from under the top-lift-spanking plate before the templet is moved down, and we have represented the support n' as attached to the bracket n^6, projecting from one of the uprights of the frame, by means of a link n^7 and springs n^8. (See Fig. 5.) The link forms a joint which permits the support to move downwardly and in opposition to the springs n^8. The springs serve to move the support upwardly and hold it in its highest position. These springs may also yield slightly upon the feeding of the top lifts to the arms or fingers m^2 m^3, especially if they are of extra thickness. The slide n is made long and provided with a handle or knob n^9, by which it is adapted to be moved by hand.

We have represented in Fig. 5 the top-lift stack at the back of the machine, but not at the extreme back. This is the position which it should occupy when the machine is adapted to prick the heels, as well as to drive the attaching-nails and apply a top lift, as this requires an additional set of implements, namely, awls. If the heel does not require to be pricked, the awls may be dispensed with and the cross-head may then have but two reciprocations to attach the heel and spank the top lift, and, being so organized, the top-lift stack N and feed n and the nail-supplying devices will then be in line with each other and at the extreme back of the machine, or as represented in Figs. 6, 16, 17, and 18. The top-lift stack N is composed of the back plate n^{10}, which is preferably in the form of a V and cast integral upon the end of its holding-arm n^{11}, (see Fig. 5,) the arm being bent at its end to a right angle and being fastened at n^{12} to the support n^6. The stack also has the front plate n^{13}, which projects upward from a bracket n^{14}, (see Figs. 3, 5, and 14,) arranged upon the side n^{15} of the support n' to slide thereon, being fastened thereto in any desired position by the fastening-screw n^{16}.

Paste, glue, or other adhesive material is supplied on the under surface of the top lift automatically during the downward movement of the table H to clamp the unattached heel upon the shoe preparatory to starting the machine. This downward movement, as above stated, also moves downwardly the top-lift spanking plate and holding devices, and during this downward movement a glue-apply-

ing device O is caused to be moved upward from a glue-pan held upon a shelf o', extending outward from the bracket e^8, and from the position represented in Fig. 7 to the position represented in Fig. 8, where it is represented in contact with the under surface of the top lift o^2, held by the top-lift arms m^2 m^3. This applies anything contained in the pan in the nature of an adhesive substance to the under surface of the top lift. We prefer to use a glue-applying device made of a metal having some spring, like sheet-brass, and in the form of a curved tongue, as represented in Fig. 7. It is attached to a shaft o^3, extending across the top of the pan, and is operated by means of an arm or lever o^4, extending from this shaft, link o^5, and sector o^6, pivoted at o^7 and connected by the link o^8 with the arm o^9, extending from the shaft h^8, to which the table-moving lever h^6 is secured.

The plate G has a circular rim that means may be provided whereby the nail-carrier and top-lift spanker and awls, drivers, and spanker may be respectively locked in operative position as well as in the loading positions of the nail-carrier and top-lift carrier. For the sake of lightness we prefer to make the plate open, or in the form of a skeleton, and to form in it the square or other-shaped holes g' g^2, (see Figs. 5 and 9,) into which the awl-carrying block and the spanker-block descend when they are in operative position.

The nail-carrier G′ is in the form of a movable block, and is adapted to slide into its holding recess or space g^3, and it is held therein by tongues formed upon its sides, which enter grooves on each side of the said recess g^3, and locked in position by a spring-pin j. (See Fig. 5.)

The outer edge g^4 of the plate is circular, and it has cut in it three pairs of reversely-arranged notches g^5 g^6, which receive the ends of the oppositely-acting pawls g^7 g^8, respectively. (See Fig. 5.) The pawl g^7 is pivoted at g^9 to the table H, and has the rearward-extending arm g^{10}, the office of which will be later explained, and a closing-spring g^{11}, and it is automatic in its action, closing into the notch g^5 as the notch is moved up to it. The pawl g^8 is pivoted to the table H at g^{12}. It has the closing-spring g^{13} and the thumb-piece g^{14}. It will be understood that this pawl automatically latches the plate in connection with the pawl g^7, the plate being positively held between them, but to unlatch the plate the pawl must be moved from contact with the shoulder g^6. It will also be understood that these pawls also lock the rotary head F in operative position, and that to turn it and the nail-carrier and top lift it is necessary to move the pawl g^8 from contact with the shoulder g^6. After it has been so moved and the plate G turned slightly the pawl may be released and the turning continued until both pawls g^7 g^8 make automatic engagement with the next pair of notches, fastening in operative position the next set of operating devices.

Where there are three sets of operative devices, as in Fig. 5, there are three sets of notches. Where there are two sets, as in Figs. 6 and 16, there are two sets only of the notches. It is desirable that the machine should not be started unless the parts which so operate are in operative relation—that is, unless the pawls have each engaged their respective notches—and to prevent the machine from being operated when the parts are not in operative relation we have provided the pawl g^7 with the arm g^{10} and have connected the treadle therewith by means of the rod g^{15}, (see Figs. 1 and 2,) the bell-crank g^{16}, pivoted at g^{17}, a link g^{18}, and a latch g^{19}, pivoted at g^{20} to the front of the table H, and which is in line with the said arm g^{10} if the pawl g^7 is not seated in its notch. It can only be seated in its notch when the machine is in operative position. At all other times the arm g^{10} is in front of the latch g^{19} (see Fig. 16) and acts as a barrier to prevent the treadle being depressed and the machine operated. Nails may be fed to the holes in the nail-carrier G′ directly or from either of the loaders P P′. (See Fig. 5.) Each of these holders is in the form of a plate. The plate P has the ear p, which removably secures it to a pivot p' at the end of the bracket p^2, and the plate P′ has an ear p^3, which removably connects it with a similar pivot. These loaders are located as represented in Fig. 5, and they are each adapted to be moved over the nail-carrier G′ to feed nails thereto. Each plate may be removed from its pivot by being lifted therefrom, and each plate may have the nail-holding holes p^5 arranged directly therein or may be shaped to receive a detachable nail-holding block. Each nail-loader has on its under surface a slide p^6, which is adapted to be drawn out to release the nails after the loader has been moved over the nail-carrier. Each of the nail-loaders P P′ has an ear P^7, (see Fig. 5,) which are so placed as to come in contact with each other when the loaders are in position to be loaded or as represented in Fig. 5.

It will be understood that each loader is adapted to be turned upon its pivot to a position over the nail-carrier G′ when the nail-carrier is opposite them or in the position shown in Fig. 5, and the registering or proper position of each loader is determined by the contact of the edge p^8 of one with the surface p^9 of the other about its pivot-point. Each loader being swung around on its pivot over the nail-carrier G′ until the part p^8 comes in contact with the part p^9 will bring the holes into registering position with the holes of the nail-carrier.

It will be further understood that these loaders are generally loaded by the attendant in advance and that the last movement by the operator before removing a heeled shoe

and jacking an unheeled one is to move the nail-carrier to the position represented in Fig. 5, and that the attendant then turns one or the other of the two loaders upon its pivot over the nail-carrier and removes the slide cover-plate, permitting the nails to fall into the nail-carrier.

It will be understood that nails may be directly fed to the holes of the carrier if the loaders are not used and that by the use of two loaders two attendants can be employed in sticking nails therein. This is of advantage when a relatively large number of nails is used for attaching each heel. The rotary plate G is also adapted to lock in succession two of the arms of the rotary head F, namely, the arm carrying the awls and the arm carrying the drivers, during the lower part of the reciprocation of each, by means of the locking extensions R at the back of said arms and the locking-recesses R′ in the uprights r r', extending upward from the plate to a position sufficiently high to permit an engagement to take place between the said locking extension and the locking-recesses before the awls or drivers enter the holes of the templet or nail-carrier.

In Figs. 6, 16, 17, and 18 we have shown the nail-feeding and top-lift-loading devices as applied to a two-motion machine, but before describing them we will say that in a three-motion machine the nail-carrier is not moved over the templet to feed the nails thereto until the templet has been depressed and the heel-blank lifted firmly against it, and it thereby becomes possible to discharge the nails from the nail-carrier into the templet by means of a slide-plate, which is actuated by pins upon the templet or table H to move it sufficiently to uncover the holes as the carrier approaches the templet and to move it to cover the holes as the carrier is moved away. In a two-motion machine the nail-carrier is moved over the templet before it is moved down, and consequently the nails must be held in the carrier until the templet is depressed, and this calls for a somewhat different mechanism for moving the cover-plate of the said nail-carrier, and we prefer to use the device represented in Fig. 6, which will move the cover-plate sufficiently to uncover the holes of the carrier during the downward movement of the templet and nail-carrier preparatory to driving the nails, the said cover-plate being closed upon the upward movement of the templet and nail-carrier by a spring.

The nail-loading devices which we prefer to employ with the two-motion machine comprises the pivoted loaders S S′. (See Figs. 6 and 16.) These loaders have ears through which screws or pivots s', attaching them to a plate S^2, extend. These ears are so arranged and pivots so placed that the two loaders may be moved away from each other to receive the nails, as represented in Fig. 16, and instead of delivering the nails directly to the nail-carrier they are adapted to deliver them to the nail-holder S^3, which preferably is formed in the plate S^2 and which is so located as to be over the nail-carrier when the top-lift plate has been moved into position beneath the templet and the machine comes to rest.

The two loaders S S′ are attached to the plate S^2 to be removable from the pins s^2, which hold the plate S^2 in registering or operating position, the three parts, namely, the two loaders and the holder, constituting a set which are removed to permit loaders and holders having a different arrangement of holes to be substituted.

Each of the loaders has a slide-hole-covering plate s^3, adapted to be moved in opposition to the spring s^4 by the extension s^5 in uncovering the holes when the loader is in discharging position or that represented in Fig. 6, the extension forming a sort of thumb or finger piece, against which pressure may be applied by the hand in moving the plate inward in opposition to the spring, and upon the removal of the pressure the spring returns the cover-plate to its original position, closing the holes.

The nail-carrier G′ takes its nails automatically from the nail-holder S^3, moving its cover-plate T automatically to uncover the holes as it comes to a registering position beneath it. This is accomplished by connecting the cover-plate T with a dog or lever t, (see Figs. 17 and 18,) which is pivoted at t' to the plate S^2 and which by means of the spring t^2, connecting one end of it with the said plate S^2, holds the cover-plate of the holder S^3 normally closed. This lever projects into the path of a tappet t^3, carried by the revolving nail-carrier plate, the end t^4 of which comes into contact with the side of the dog or lever t (see Fig. 17) and moves it sufficiently to cause it to operate the cover-plate. As the nail-carrier plate may be moved downward before the tappet is moved horizontally from engagement with the said lever or dog we have hinged or pivoted it at t^5, so that its end t^4 will move downwardly in opposition to the spring t^6, and therefore if the said nail-carrier plate is moved downward and again released, so that the tappet is disengaged from the lever or dog, the cover-plate of the holder will be closed by the movement of the lever, and the tappet, upon the upward movement of the nail-carrier plate, will come in contact with the under surface of the lever or dog instead of its edge and will then yield downwardly and will not operate the lever or dog.

The cover-plate of the nail-carrier G′ used upon a two-motion machine is adapted to be moved upon the downward movement of the nail-carrier to open the holes therein when the nail-carrier is in registering position with the templet by means of a rod U, carried by the nail-carrier plate, the end u of which (see Fig. 6) projects sufficiently to come into line

with a frame side at u' or some stationary projection, whereby during the vertical movement of the plate the rod is moved inward.

The rod is connected at its inner end with the slide cover-plate movable crosswise the nail-carrier in a dovetail recess in its under surface, the rod having an end entering a hole in said plate, and this movement is in opposition to the spring u^2, which surrounds the rod, and upon the movement of the nail-carrier from its position over the templet this spring serves to move the rod outward, and therefore the cover-plate to a closing position. It will be seen, therefore, that with the construction represented in Figs. 6, 16, 17, and 18 the nail-carrier is discharged automatically after the carrier has been moved into operative position over the templet by a downward movement thereof, that when moved from such position the cover-plate closes, that as the carrier is moved under the nail-holder s^3 a gang of nails is automatically fed to it, the movement of the carrier automatically opening the cover-plate of the holder, and that as the carrier leaves the holder its cover-plate is automatically closed, whether such leaving be by a downward movement of the carrier or an onward movement of it. The plate S^2 has a stop s^6, against which each of the loaders is adapted to be moved in registering them or their holes over the holes of the holder S^3. The dog or lever t, connected with the cover-plate of the holder S^3, has an upwardly-extending pin s^7, which serves as a handle by which the plate may be moved by hand to uncover the holes in said holder.

In Fig. 6 the loader S′ is represented in discharging position over the nail-holder, the nail-holder S being shown in receiving position. This form of holder can be used in connection with the three-motion organization or that represented in Fig. 5, if desired. The two-motion organization permits the top-lift loader N to be placed at the extreme back of the machine and in line with the nail-holder S^3 and nail-carrier, (see Figs. 6 and 16,) and this is considered to be a very desirable location for it, because it brings it into such close relation with the nail-loaders that they are all easily within the control of a single attendant. The top-lift loader is like the one already described, and varies from it only in point of location.

With the two-motion construction the same bracket supports both the nail-loading mechanism and the top-lift loader. (See Fig. 6.)

The operation of the machine has been fully described in connection with the description of its various parts.

In the operation of the machine the boot or shoe is mounted upon the last or work-support and moved into position beneath the pressure-plate or templet E^2 and over the pressure-head E′. The heel is placed upon the sole of a boot or shoe between it and the pressure or templet plate and said plate then moved toward it, clamping it against the sole upon the last or work-support with any desired stress. The machine is then set in operation and the heel-blank consolidated against the pressure or templet plate by the upward movement of the pressure-head E′, and the awls, if they be used, immediately enter the heel so compressed and form holes therein. If the awls are not used, the drivers act to drive the nails fed to the templet by the nail-carrier into the heel-blank, and the driver-holding block coming in contact with the top of the nail-carrier may serve to impart additional compression to the heel-blank while it is being nailed. The templet or pressure plate is then released, the nail-carrier moved out of operative position, and the top-lift carrier into operative position under the pressure or templet plate E^2 and over the templet and the top lift applied by the spanking action of the spanker f^6, acting through the templet and top-lift carrier.

We do not confine the invention herein described to heel-attaching machines, but may use it, or so much of it as can be used, in heel-loading machines, heel-compressing machines, and in applying gangs of fastening.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. The combination in a machine of the character specified of the frame having the outside boxes, the gate, comprising the upper and lower cross-heads b, b' and side rods b^2, b^3, which gate is connected to the sides of the frame as specified, the bed a^2, the toggle connecting the bed with the lower cross-head comprising the link c^3 pivoted to the bed-ears c^6, c^7 and having the divided lower end c^4, c^5, the pin c^9, extending through the holes in said divided end, the links c^{10}, c^{11} connecting the ends of said pin with the lower cross-head and the link c^2 laying hold of the pin between the said divided ends c^4, c^5 and means for imparting a reciprocating movement to said link.

2. The combination, in a machine of the character specified, of the frame, the cross-heads b, b', connected together, the toggle connecting the bed of the frame with the lower cross-head constructed as specified, the link c^2, the gear-wheel c' mounted upon the shaft c^{12} and having the crank-pin c engaging said link c^2, the main shaft c^{15} and the pinion c^{14} to engage said crank-gear.

3. In a machine of the character specified, the combination of a last or work-support arranged between a vertically-movable templet or pressure plate and a device like a cam for moving said last or work-support toward the pressure-plate and templet, said pressure-plate and templet and means for moving it vertically and said cam or a similar device for moving the last or work-support vertically.

4. The combination in a machine of the character specified of the templet or pres-

sure plate, hand-actuated means for moving it down and locking it at the end of said downward movement, a last or work-support and means for imparting to it an upward movement.

5. The combination, in a machine of the character specified, of the pressure or templet plate, a last or work-support, hand-actuated means for moving the pressure-plate or templet against a heel-blank to clamp it against the sole of a boot or shoe held upon the last or work-support, and means for locking it in said clamped position with a device for imparting movement of the last or work-support toward said templet or pressure plate so locked to compress the heel-blank or partially compress it substantially as described.

6. The combination of the vertically-movable pressure-plate or templet, means for moving it downward and holding it down, a last or work-support and means for moving it upward toward the templet or pressure plate while held in its depressed position.

7. The combination of the pressure or templet plate, its supporting-table, the links h^{10}, the rock-shaft h^7, arms h^9 connected with said links as specified, and the handle h^6, all arranged to operate to depress the pressure-plate or templet and to lock it with any desired preliminary pressure upon the heel.

8. The combination in a machine of the character specified, of the last or work-support, the pressure-head E′ and the cam e^3.

9. The combination, in a machine of the character specified, of the last or work-support, the pressure-head, a lever or link e^3 pivoted immediately below the pressure-head, and having a cam e^3 which acts against the pressure-head, and means for reciprocating the link or lever upon its pivot.

10. The combination in a machine of the character specified, of the vertically-movable templet or pressure plate E², the last or work-support, the vertically-movable pressure-head E′ and a reciprocating gang of awls.

11. The combination of the templet or pressure plate E², a last or work-support, the vertically-movable pressure-head E′, means for moving the templet or pressure plate vertically and locking it in its depressed position, and a reciprocating gang of awls.

12. The combination in a machine of the character specified, of a vertically-movable pressure-plate or templet, a last or work-support, a head for imparting a vertical movement to it and a reciprocating gang of drivers.

13. The combination of a pressure-plate or templet, a last or work-support, means for moving the pressure-plate or templet downward and for holding it in its depressed position, a vertically-movable pressure-head E′ below said last or work-support, and a reciprocating gang of drivers.

14. The combination of a last or work-support, a pressure-plate or templet, means for moving it downward and holding it depressed, the pressure-head E′ to move upward the last or work-support in relation to the locked-down templet or pressure plate, a reciprocating gang of drivers and an additional pressure-block to bear against the templet or pressure plate and move it farther downward at the end of the driving movement of the drivers.

15. The combination of a last or work-support, a pressure-plate or templet arranged to be moved downward to clamp the heel upon the last or work-support and to be locked in clamping position, a pressure-applying device for applying through the last or work-support a preliminary pressure to the heel and an additional pressure-block for applying additional pressure to the heel through the templet or pressure plate, after the application of the first-named pressure, as and for the purposes described.

16. The combination in a machine of the character specified, of the frame, having the upwardly-extending sides a^3, a^4, guideways in said sides, and the table H arranged to be moved vertically upon said sides.

17. The combination of the sides a^3, a^4 of the machine-frame, the vertically-movable table H supporting a templet or pressure plate, its sides h, the gibs h' connecting the sides of the table with the frame sides, as and for the purposes specified.

18. The combination in a machine of the character specified, of the supports a^3, a^4, the slideways h^4 therein, the table H supporting a templet or pressure plate, its sides h, each having a recess h^2, a plate h' contained in each of said recesses and each having a section to fit the slideway h^4, and means for laterally adjusting the table in relation to said plates h'.

19. In a machine of the character specified supporting a templet or pressure plate, the table H having a plane upper surface and the downwardly-extending sides h, as and for the purposes described.

20. In a machine of the character specified, the table H having the recess h^3 extending from its front edge adapted to receive and hold a templet or pressure plate, and also having the vertical sides h.

21. In a machine of the character specified, the table H adapted to receive and support a templet or pressure plate, having sides h integral therewith and the braces h^5.

22. In a machine of the character specified, the table H having integral sides h, a templet or pressure plate supported thereby, and a circular bearing back of the templet or pressure plate.

23. The combination, in a machine of the character specified, of the table H and a rotary nail-carrier plate G mounted thereon and combined therewith by means of a hollow hub thereon, extending through a bearing-hole in said table.

24. The combination, in a machine of the character specified, of the table H, a templet or pressure plate supported thereby, a bear-

ing in said plate near its back and back of the templet or pressure plate, a rotary nail-carrier plate mounted upon said table H, and pivoted to it upon a line with said bearing-hole in said table, all as and for the purposes described.

25. The combination, in a machine of the character specified, of the vertically-movable table H, a templet or pressure plate supported thereby, the said plate having a bearing in its back edge, and a rotary nail-carrier plate connected therewith at said bearing, and vertically movable with said table.

26. In a machine of the character specified, the combination of the table H, the templet, the rotary nail-carrier plate, the nail-carrier supported and moved thereby, and an automatic latching device attached to the table for latching the nail-carrier plate to the templet, substantially as set forth.

27. In a machine of the character specified, the rotary nail-carrier plate having a cylindrical rim in which are catches or latching-recesses g^5, g^6, and latch-bearing surfaces g^4 with latches g^7, g^8 supported by the table.

28. In a machine of the character specified, the movable nail-carrier plate, a nail-carrier supported thereby, the plate having latching-recesses g^5, g^6 and latches carried by the table H to engage said latching-recesses when the nail-carrier is in register with the templet.

29. The combination of a rotary nail-carrier plate having one or more pairs of latch-receivers and a pair of latches carried by the table H, which automatically engage the said latching-recesses to hold the rotary plate locked, and one only of which is required to be moved by hand to permit rotary movement to be imparted to said nail-carrier plate.

30. The combination of a nail-carrier plate, the nail-carrier carried thereby, a templet, its supporting-table H, and two locking devices for locking the nail-carrier to the table, one adapted to prevent its movement in one direction and the other to prevent its movement in a reverse direction, substantially as described.

31. The combination of a nail-carrier plate G, having a latching-recess with a latch to engage said recess and carried by the table H, and having the extension g^{14}.

32. The combination of a nail-carrier plate having the notch g^6, with registering device g^7 to engage said notch, the position of which is controlled by the edge of said nail-carrier plate, said registering device having an arm g^{10} which is movable into and out of line with a stop g^{19}, and said stop connected with the starting lever or treadle adapted to restrain the movement thereof, and prevent the operation of the machine by coming into contact with the arm g^{10} when the registering device is not in register with its receiving-notch, as and for the purposes described.

33. The combination of the nail-carrier plate G, having its notched edge, the spring-actuated latch g^7 pivoted to the table as described, and having the arm g^{10}, the stop g^2 pivoted to the table, the treadle d^{11}, the rocking arm d^{16}, pivoted to the table, the rod g^{15} connecting it with the treadle and a link g^{18} connecting the rocking arm with the stop, substantially as described.

34. The combination in a machine of the character specified, of the movable nail-carrier plate having one or more guides R′ for registering the awls and drivers or either by engagement with their supporting blocks or arms.

35. The combination of the nail-carrier plate G, having a recess g^3 for receiving a movable nail-carrier, and the openings g', g^2, or either.

36. The combination of the movable nail-carrier plate G, the nail-carrier carried thereby, a hole-covering plate for the nail-carrier and means carried by the nail-carrier plate for closing said plate and holding it closed during its rotation, and adapted to be moved only upon the downward movement of the nail-carrier plate when the nail-carrier is in operative position by contact with an operating device.

37. In a machine of the character specified, the combination of the movable nail-carrier, the nail-carrier plate carried thereby, its cover-plate, the push-rod U for moving it in one direction, the spring u^2 for moving it in a reverse direction and a stationary surface u' with which the end of the push-rod is brought into contact upon the downward movement of the nail-carrier when in operative position, as and for the purposes described.

38. The combination of the movable nail-carrier plate, the nail-carrier carried thereby, a stationary nail-loading plate, its hole-covering plate and a tappet carried by the nail-carrier plate to engage the cover-plate of the loader or a connection, and open it as the nail-carrier comes in line therewith, and also adapted to yield downwardly, as and for the purposes described.

39. The combination of the nail-carrier plate, its nail-carrier, the loader S^3, its cover-plate, the spring-actuated lever or dog t pivoted as described, and the downwardly-yielding tappet t^3 pivoted to the nail-carrier plate as specified, as and for the purposes set forth.

40. The combination of a rotary nail-carrier plate, the nail-carrier carried thereby, the stationary loader at the rear of the machine, its cover-plate, means for automatically opening the same as the nail-carrier is moved into registering position therewith, and latching devices for automatically locking said rotary plate with the nail-carrier in registering position with the nail-loader.

41. The combination of the rotary nail-carrier plate, the nail-carrier carried thereby, nail-loading devices adapted to feed nails to the nail-carrier, and latching devices for au-

tomatically locking the nail-carrier in operative relation with the nail-loading devices.

42. The combination, in a heel-attaching machine, of the stationary nail-loading plate S^3, its sliding cover-plate, the lever t to engage the sliding cover-plate, a spring to close the plate, and the pin or knob s^7 extending upward from the lever.

43. A nail-loading device comprising a plate S^3 having nail-receiving holes detachably secured to a stationary support, and one or more supplemental nail-loaders pivoted to said plate, substantially as described.

44. The combination of the nail-loading plate having an automatically-actuated cover-plate detachably secured to a stationary support with one or more auxiliary loaders attached to said plate to be movable thereon and to be removable therewith, and each of which has a hole-cover plate, as and for the purposes described.

45. In a machine of the character specified, the rotary plate m, having the removable spanker-section M.

46. In a machine of the character specified, a plate m with a removable spanker M, the spanker being held to the plate by its edges.

47. The combination of the plate m, spanker-section M and top-lift receiving, centering and grasping devices.

48. The combination of the rotary plate m attached to a rotary shaft, the back-stop m^8 and its adjusting screw or stud extending through the shaft and connected with the back-stop whereby it is adapted to be operated from the opposite side of the shaft.

49. The combination of the movable top-lift spanker and holder with a cement-applying device comprising the flat tongue O, and means for imparting to it an upward movement from a tray or vessel holding cement.

50. The combination of the vertically and horizontally movable top-lift spanker and holder, a cement-applying device and intermediate connecting devices substantially as specified, whereby upon the downward movement of the said top-lift spanker and holder the cement-applying device is provided with an upward movement.

51. The combination of the table H, the templet or pressure plate carried thereby, the horizontally-movable top-lift spanker and holder, means for moving the said top-lift spanker and holder vertically, a cement-applying device connected with the said means for moving downward the said top-lift spanker and holder, and actuated thereby to be moved upward during said downward movement, substantially as described.

52. The combination of the handle h^6 connected with the templet and top-lift spanker to move them downward and a cement-applying device O connected with said handle by means substantially as specified, whereby it is caused to be moved upward upon the downward movement of the handle.

53. The combination of the movable top-lift spanker and holder, with the top-lift feeding plate or slide, its support, a bracket to which the support is connected, and the link n^7 and springs n^8.

54. The combination of a bracket or arm n^6, a top-lift slide and slide-support connected with said arm or bracket by a link to be movable downward, and a yielding support for maintaining it in its highest position.

55. The combination in a machine of the character specified, of the rotary nail-carrier, and a rotary top-lift spanker and holder with a nail-loader and a top-lift feeder arranged behind the nail-carrier.

56. The combination in a machine of the character specified, of the rotary nail-carrier having an automatically-actuated cover-plate, a stationary nail-loader and its automatically-actuated cover-plate, the rotary top-lift carrier arranged radially in respect to the nail-carrier and upon the opposite side of the pivotal point thereof, and a top-lift loader arranged behind the nail-loader, all as and for the purposes described.

57. The combination of the rotary nail-carrier, the rotary top-lift-applying device and carrier connected with the nail-carrier to be movable therewith but arranged upon the opposite side of their common center, with a nail-loader and a top-lift-feeding device arranged in line with each other and registering or locking devices for locking the nail-carrier or top-lift-applying device in operative position to the boot or shoe, and the nail-carrier or top-lift-applying device in operative relation with their loaders.

58. The combination of the rotary nail-carrier, the rotary top-lift-applying device, the supplemental nail-loading device, the top-lift loader and a cement-applying device for applying cement to the top lift after it has been fed from the loader to the applying device.

59. The combination of the rotary nail-carrier, supplemental nail-loading devices, the rotary top-lift-applying device and a cement apparatus for applying cement to the under surface of the top lift.

60. The combination of the rotary nail-carrier, the rotary top-lift-applying device and a cement device for applying cement to the under surface of the top lift.

61. The combination of the rotary nail-carrier, the top-lift-applying devices, the supplemental nail-loading devices, the top-lift loader, the cement-applying devices and means for moving the nail-carrier and top-lift loader vertically.

62. The combination of the rotary nail-carrier, the rotary top-lift-applying device, its cover-plate, means for automatically actuating it and permitting vertical movement of

one portion of the actuating devices in relation to the other, a top-lift loader arranged to be movable downward with the top-lift-applying device to prevent injury thereto, as and for the purposes described.

63. The combination of the top-lift-applying device and top-lift loader horizontally movable in relation to the top-lift-applying device, and adapted to be vertically movable therewith when the top-lift slide has not been withdrawn.

64. The combination, in a machine of the character specified, of a reciprocating crosshead, a rotary head having arms supporting a gang of awls, a gang of drivers and a top-lift spanker, or a gang of drivers and top-lift spanker only, a rotary nail-carrier and a rotary top-lift-applying device connected with said rotary head to be turned therewith, and latching devices for latching the nail-carrier plate to the table H when the proper operative devices are in operative relation with each other, substantially as described.

65. The combination, in a machine of the character specified, of a gang of drivers and a top-lift spanker adapted to be successively brought into the same operative position and having a reciprocating movement, a nail-carrier and a top-lift spanker arranged upon opposite sides of a common pivotal point, and a connection between the nail-carrier and top-lift-applying devices and the movable supports for the drivers and spanker, whereby the movement of the drivers into position will move the nail-carrier into operative position therewith, and the movement of the spanker-arm into position will reverse the positions of the nail-carrier and top-lift-applying devices, bringing the top-lift-applying device into operative relation therewith, as and for the purposes described.

66. The combination, in a machine of the character specified, of a reciprocating gang of drivers and a reciprocating spanker movable alternately into the same operative position, a rotary nail-carrier and a rotary top-lift-applying device arranged upon opposite sides of a common center, nail-loading devices and top-lift-loading devices back of the nail-loading devices and means connecting the nail-carrier and top-lift-applying devices with the movable nail-driving devices and the top-lift spanker, all as and for the purposes described.

67. The combination, in a machine of the character specified, of a nail-driving device and a top-lift spanker, a vertically-movable rotary nail-carrier, vertically-movable rotary top-lift-feeding devices connected with the nail-driving devices and spanker, a vertically-movable table H and its templet, a last or work-support and means for imparting to it upward movement, as and for the purposes described.

68. In a machine of the character specified, the combination of the rotary head, the rotary nail-carrier plate, the rotary top-lift-applying plate, the shaft f^{11} connecting the rotary head and the nail-carrier and top-lift-applying plates as specified, and a support for the shaft below the top-lift-applying plate.

69. The combination, in a machine of the kind indicated, of the table H, the rods h^{15}, h^{16} extending downwardly therefrom through the bed a^2, the cross-bars at the lower ends of the rods and the springs h^{14} connecting the cross-bars with the bed.

70. In a heel-nailing machine the combination of a block having holes for receiving nails and adapted to be moved from a nail-receiving position to a nail-driving position with two nail-loading blocks pivoted back of said nail receiver and holder when in its receiving position and each of which holders is adapted to be moved or swung upon its pivot to a position over said nail holder or receiver to deposit nails therein and to then be swung backward therefrom leaving the surface of said nail holder or receiver free or unobstructed, as and for the purposes described.

71. The combination in a heel-nailing machine of a nail-receiving block having holes for holding nails, and which block is adapted to be moved from a nail-receiving position to a nail-driving position, with a stationary support back of said block when in a nail-receiving position, a nail-feeding block pivoted to said stationary support and having holes for receiving nails of the arrangement of the holes of the nail-receiving block, and which block is moved or swung upon its pivot from a position back of a said nail-receiving plate over the same to deliver nails thereto and then backward therefrom, as and for the purposes described.

72. The combination in a heel-nailing machine of a nail holding or receiving block having holes for the reception of the heel-attaching nails, adapted to be moved from a nail-receiving position to a nail-driving position and also having a yielding vertical movement, with a stationary support back of said nail receiving and holding plate when in its receiving position, and a swinging nail loading or carrying plate pivoted to said stationary support, whereby it is adapted to be moved or swung into position over said nail receiving or holding block to deliver nails thereto when said nail receiving or holding block is in its highest position, and to then be moved out of operative position with said block, back of the same, leaving the face of the block uncovered, substantially as described.

73. The combination in a heel-attaching machine of the stationary support and two swinging nail-carriers P, P′, each of which has a stop for stopping the other when in delivering position, as and for the purposes described.

74. The combination in a heel-attaching machine of the stationary support p^2 and the nail-loading blocks pivoted thereto to be

swung in opposite directions thereon and each to the same delivering position.

75. The combination in a heel-attaching machine of the support p^2, the pivoted nail-loading blocks P, P′ pivoted to said support as specified, and each having the stops p^8, p^9, as and for the purposes described.

76. The combination in a heel-attaching machine of the arm p^2, the pivoted nail-carrier blocks pivoted thereto in opposed relation to each other and the stops p^8, p^9.

F. F. RAYMOND, 2D.
CHAS. H. FOGG.

In presence of—
J. M. DOLAN,
E. A. GUILD.