No. 713,285. Patented Nov. 11, 1902.

C. CARR.

MACHINE FOR SCORING, RIVETING, AND PRINTING CLOTHES PINS.

(Application filed Jan. 10, 1902.)

(No Model.) 7 Sheets—Sheet 1.

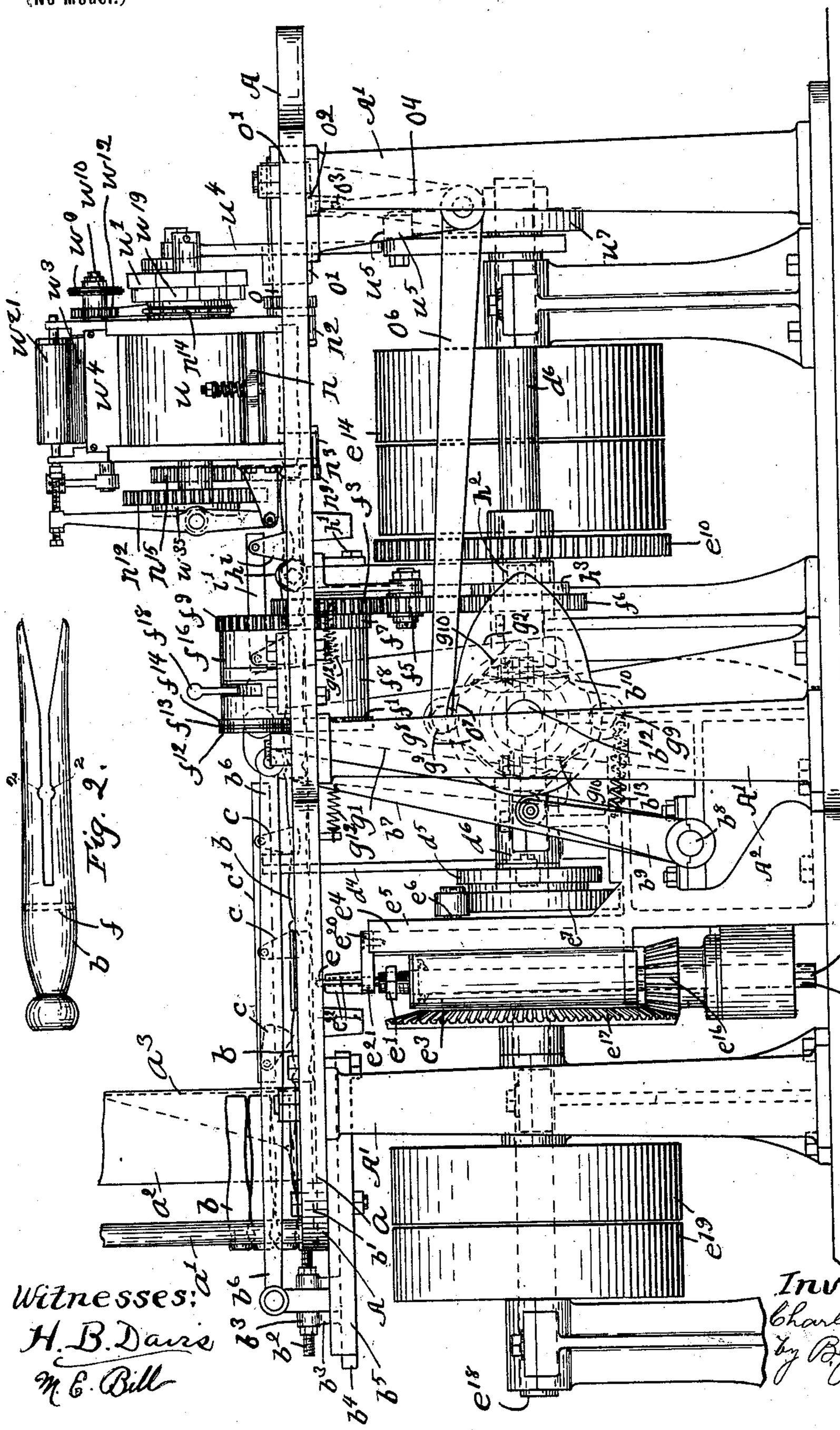

Fig. 1.

Fig. 2.

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(No Model.) 7 Sheets—Sheet 2.

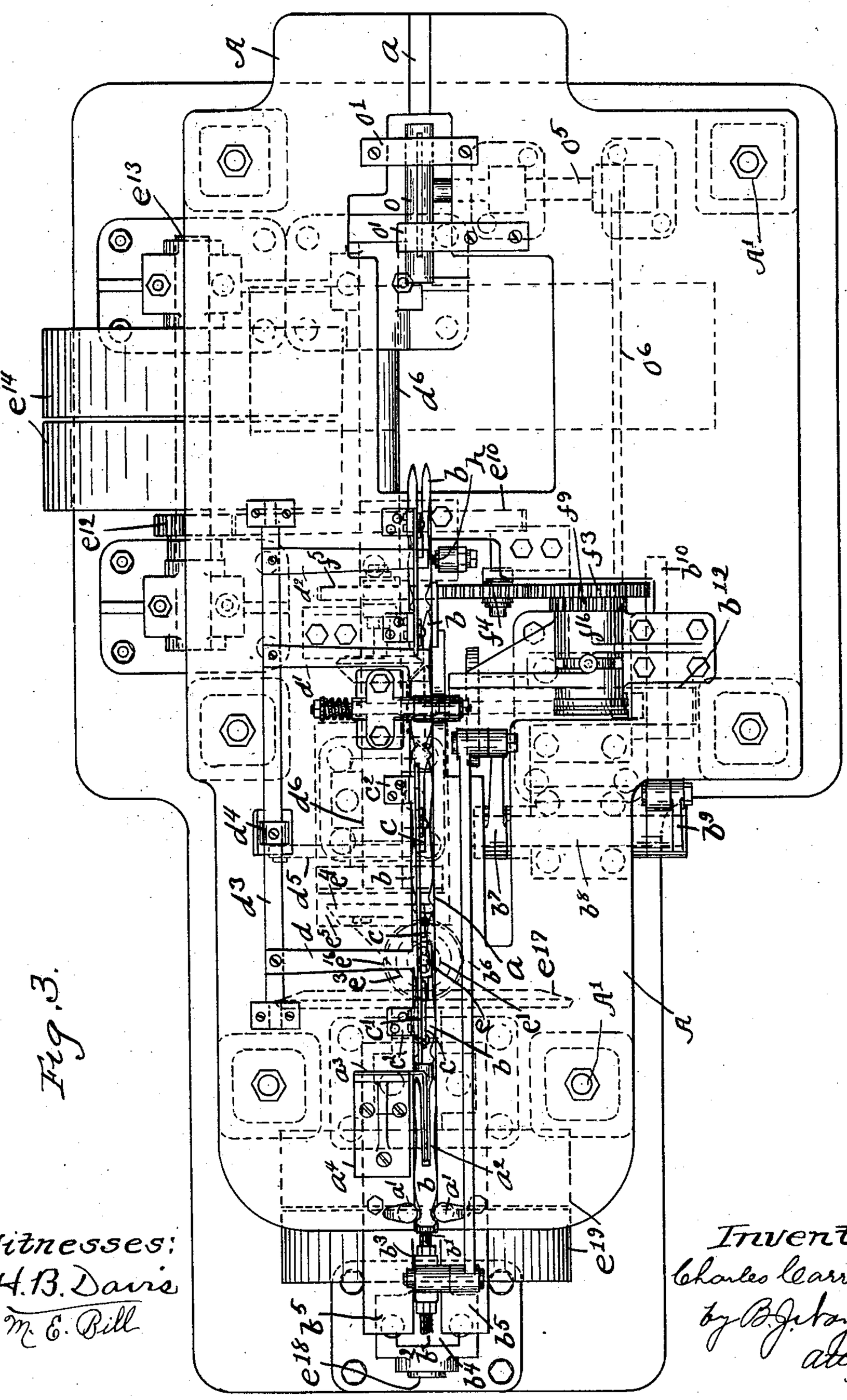

Fig. 3.

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(No Model.) 7 Sheets—Sheet 3.

Fig. 4.

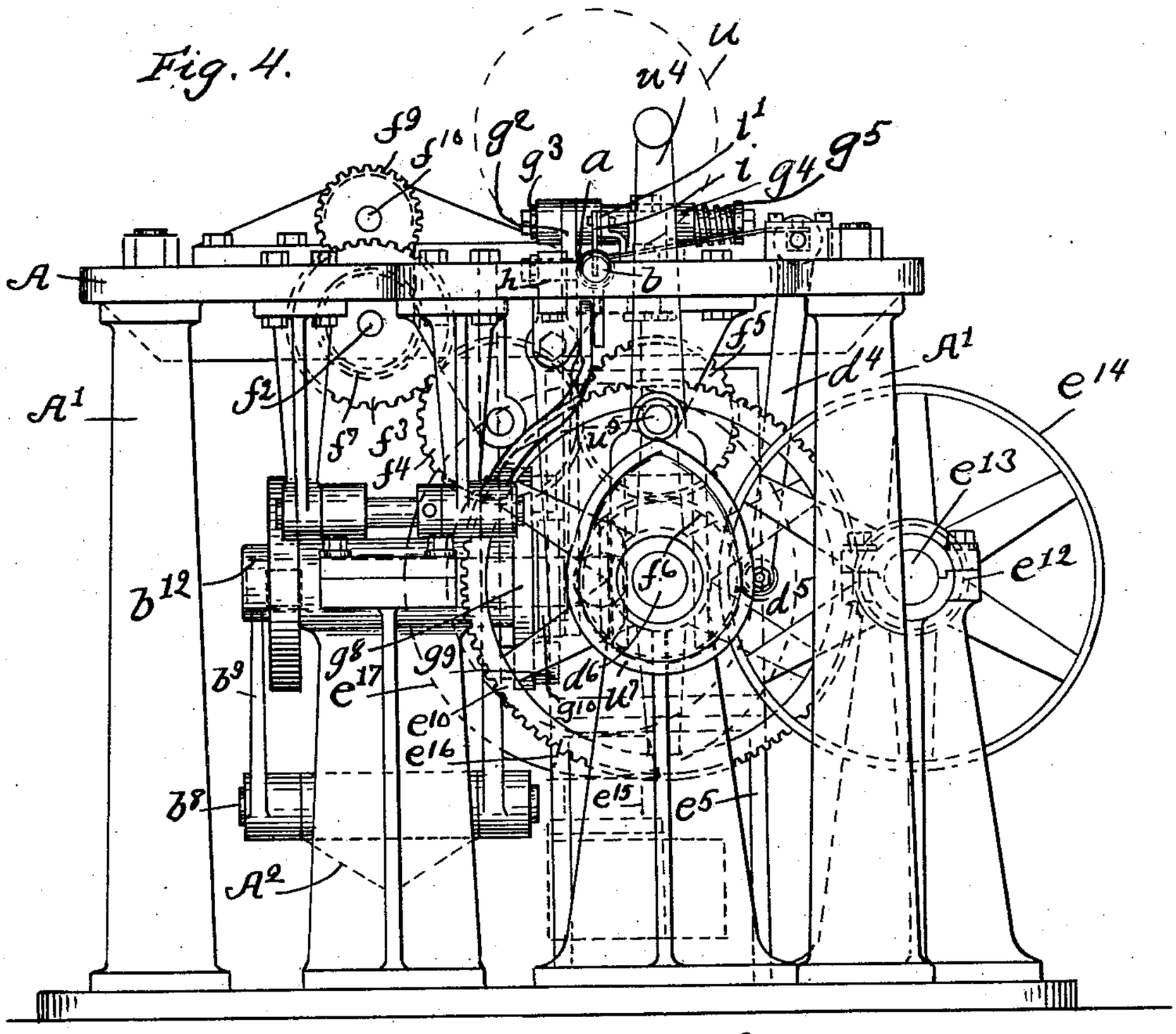
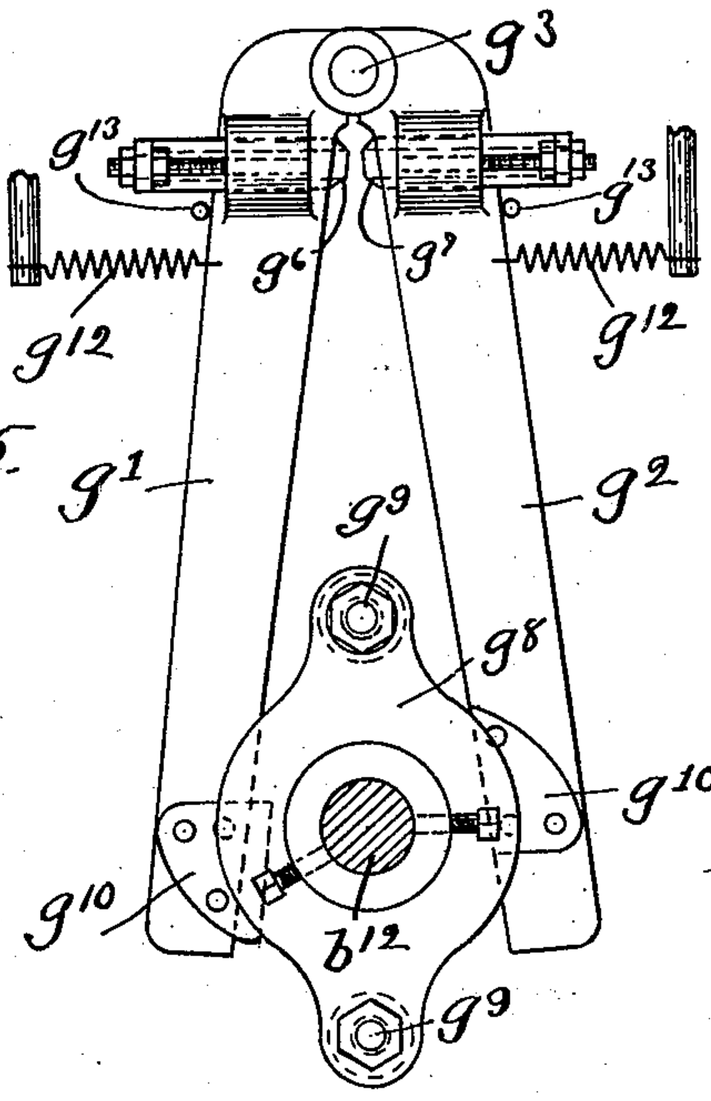


Fig. 5.



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(No Model.) 7 Sheets—Sheet 4.

Fig. 6.

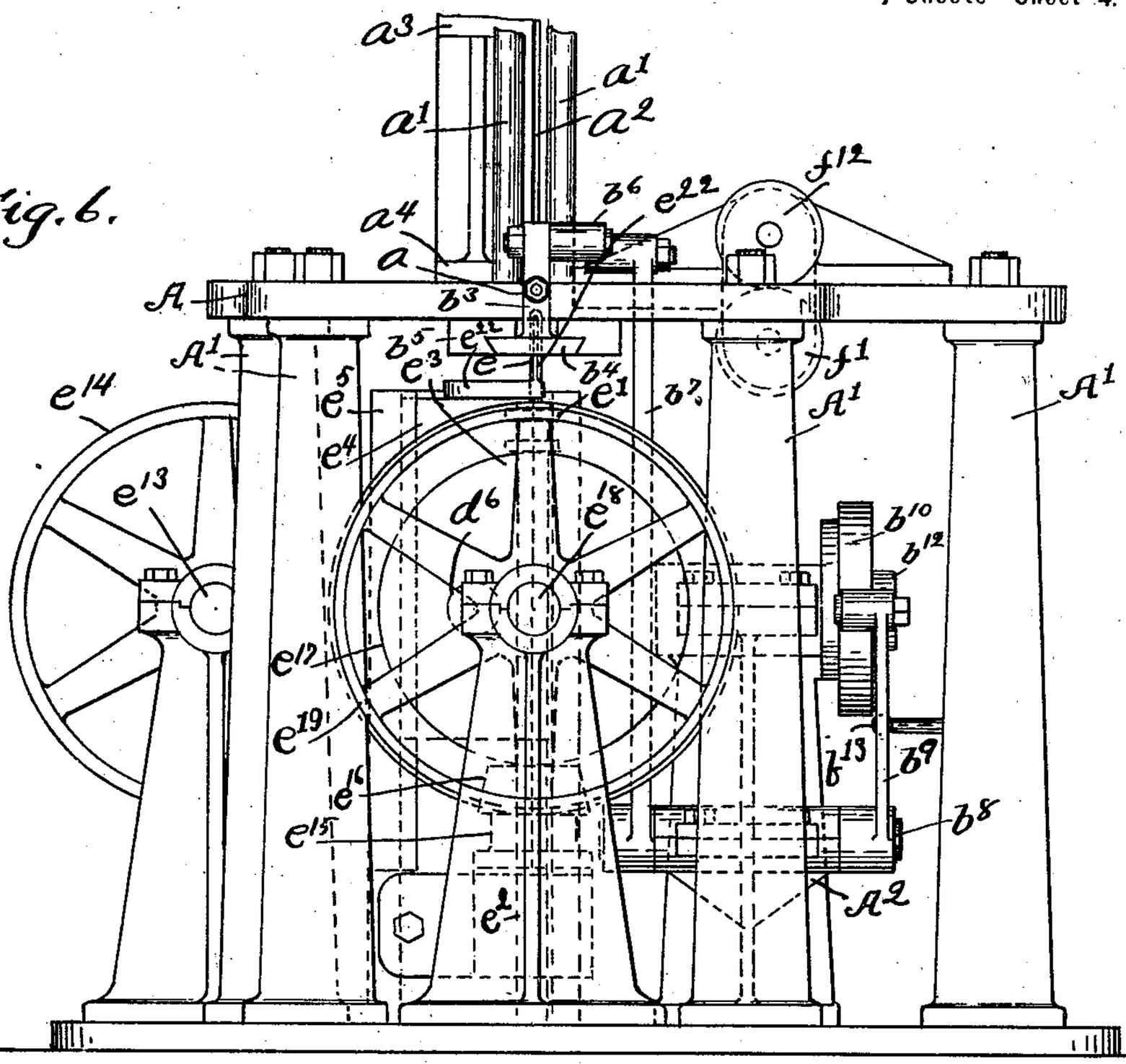


Fig. 7.

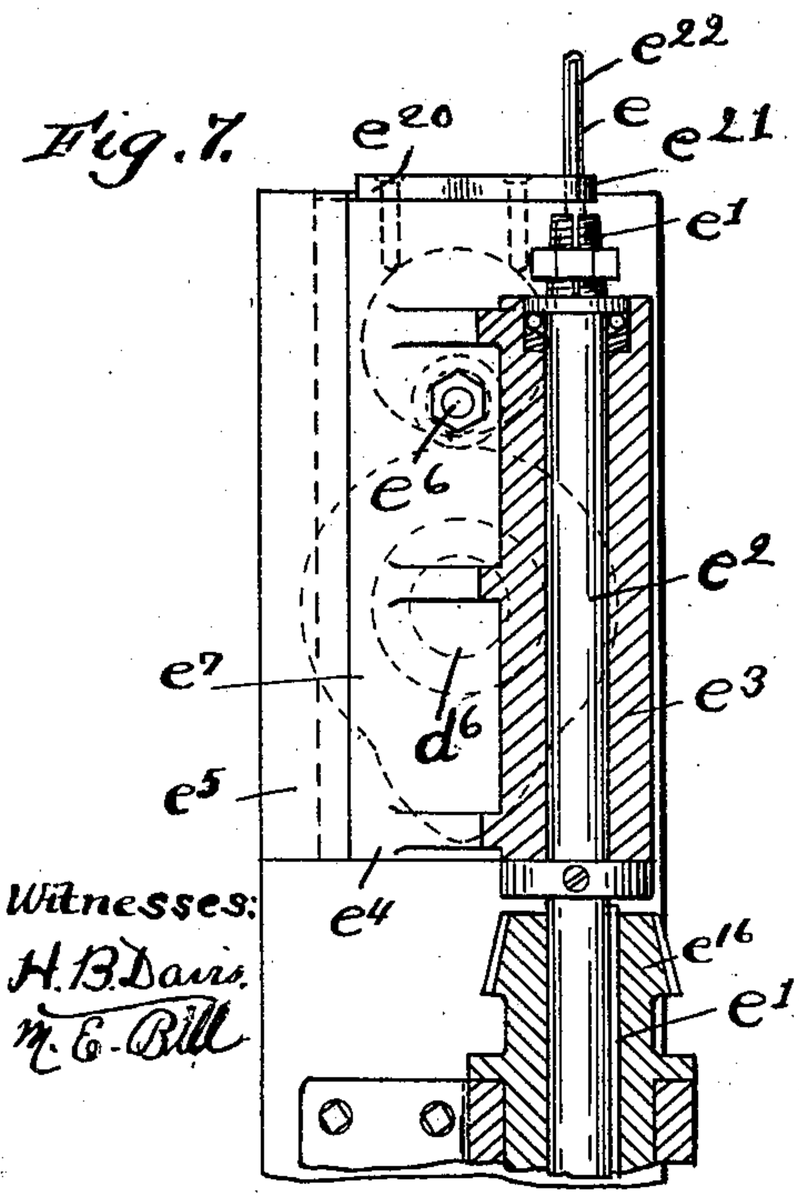


Fig. 8.

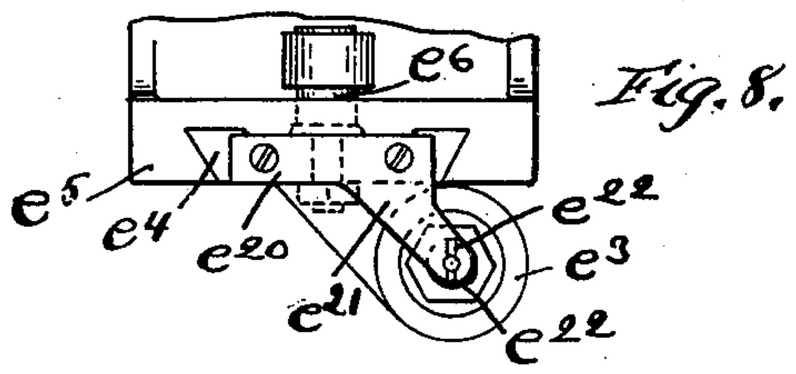
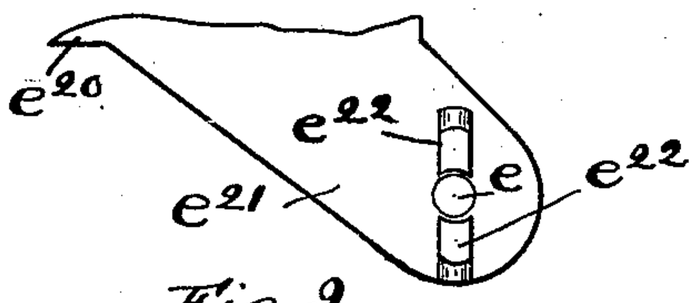


Fig. 9.



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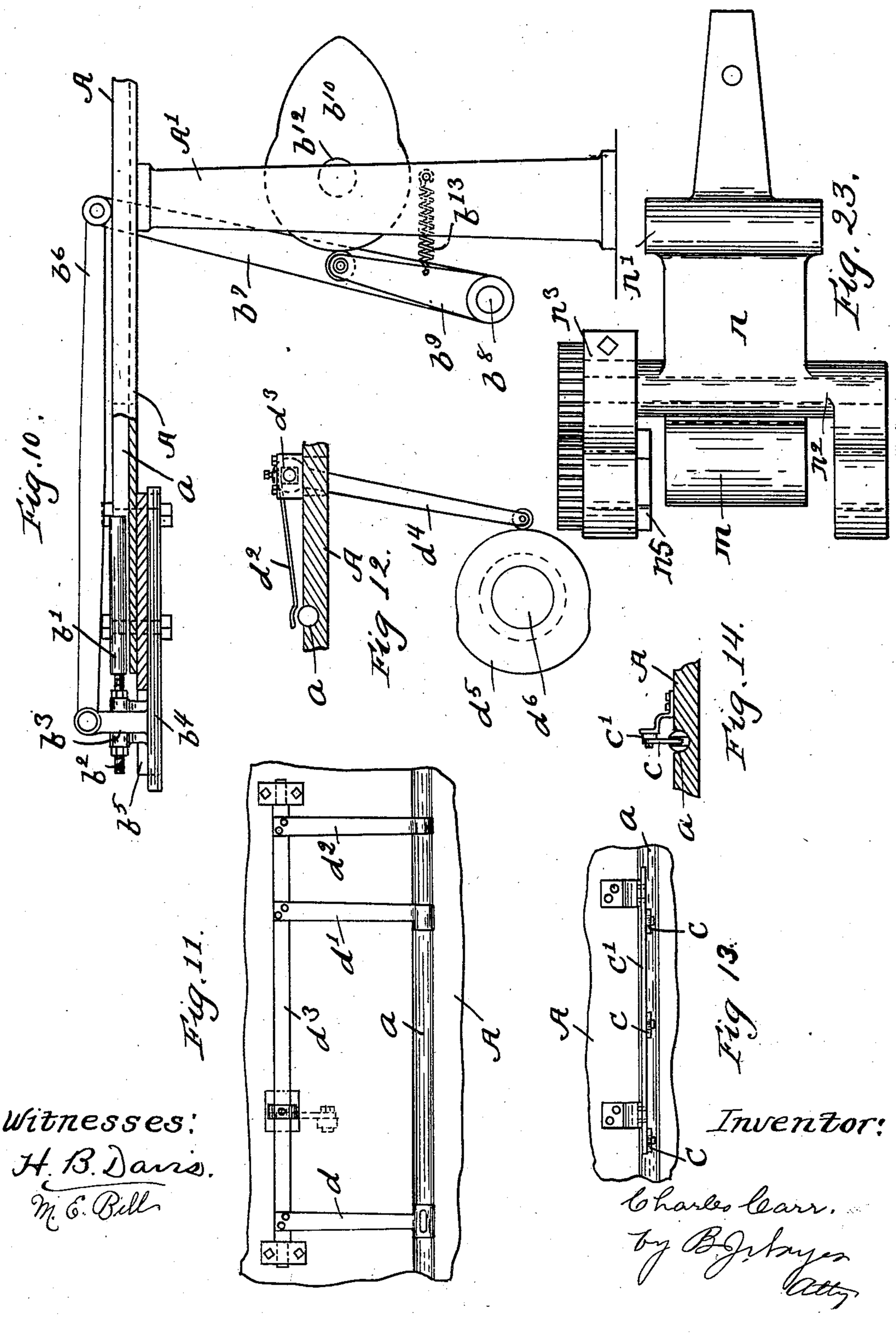

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(No Model.) 7 Sheets—Sheet 6.

Fig. 15.

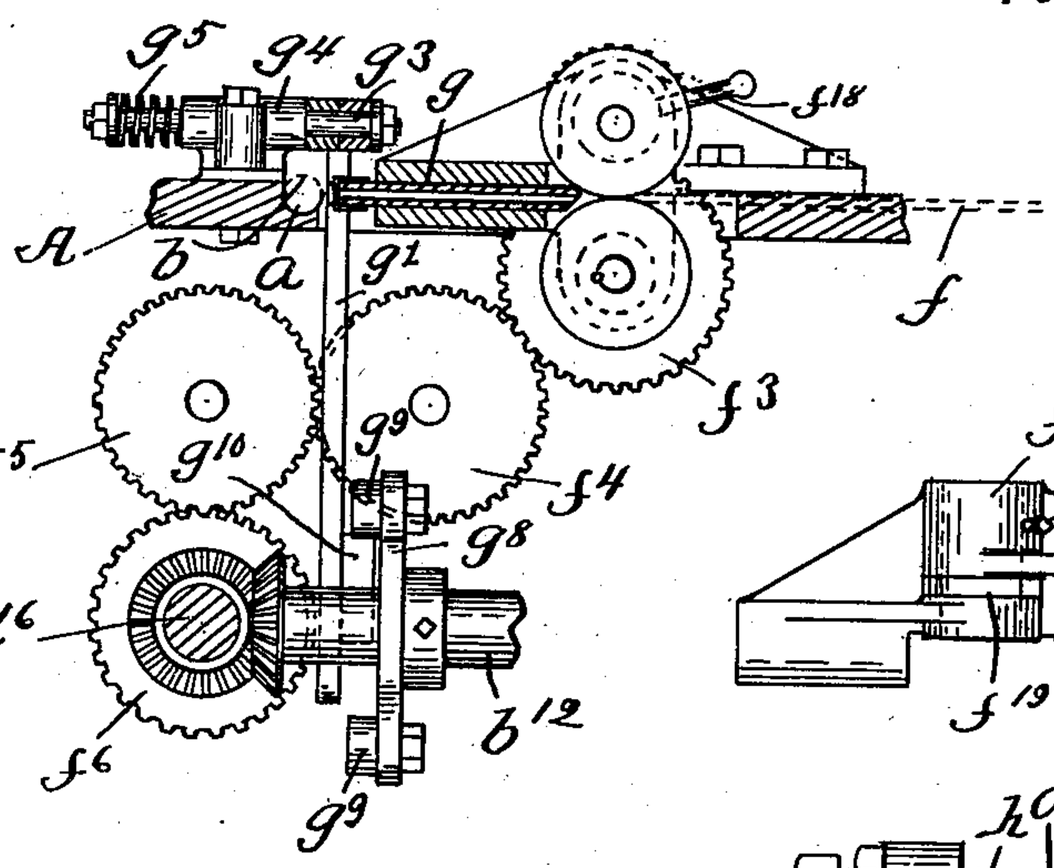


Fig. 18.

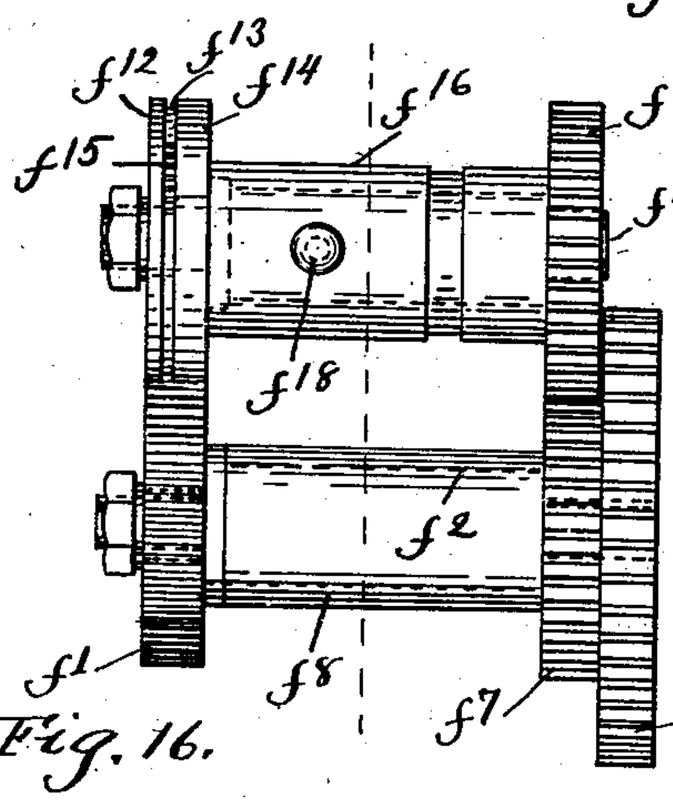


Fig. 16.

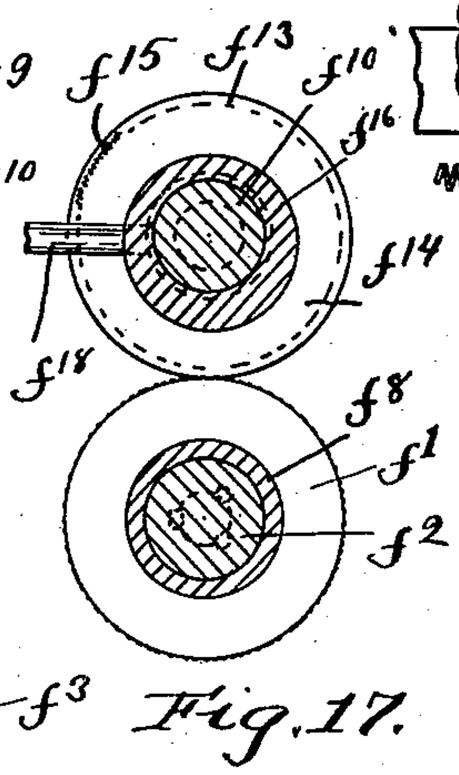


Fig. 17.

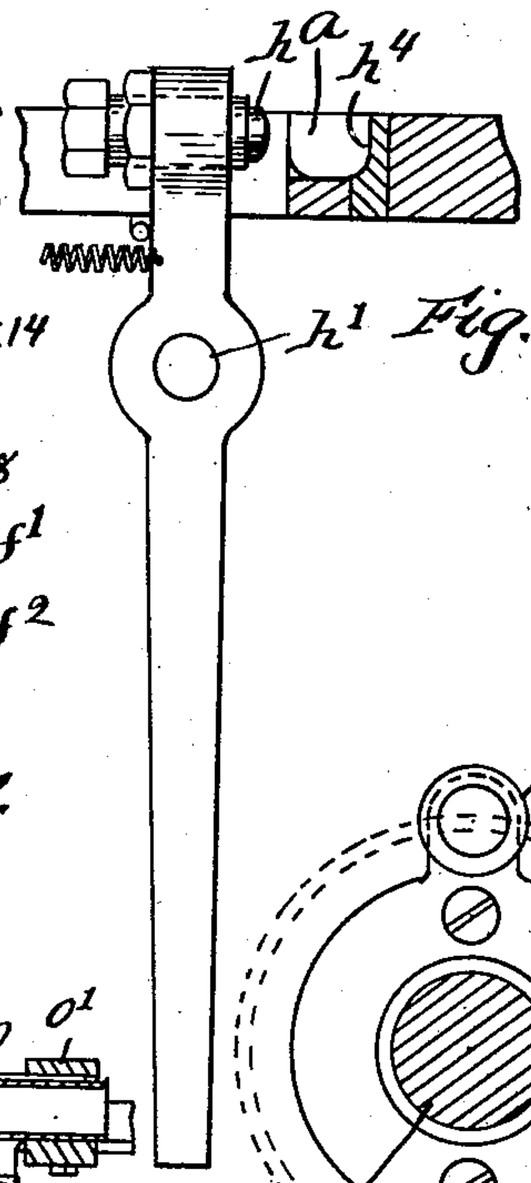
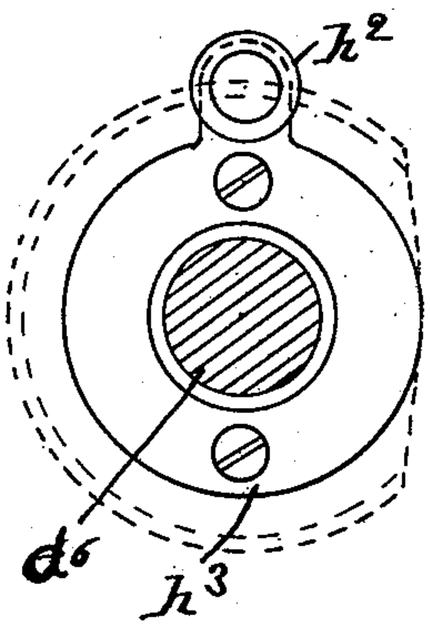


Fig. 19.



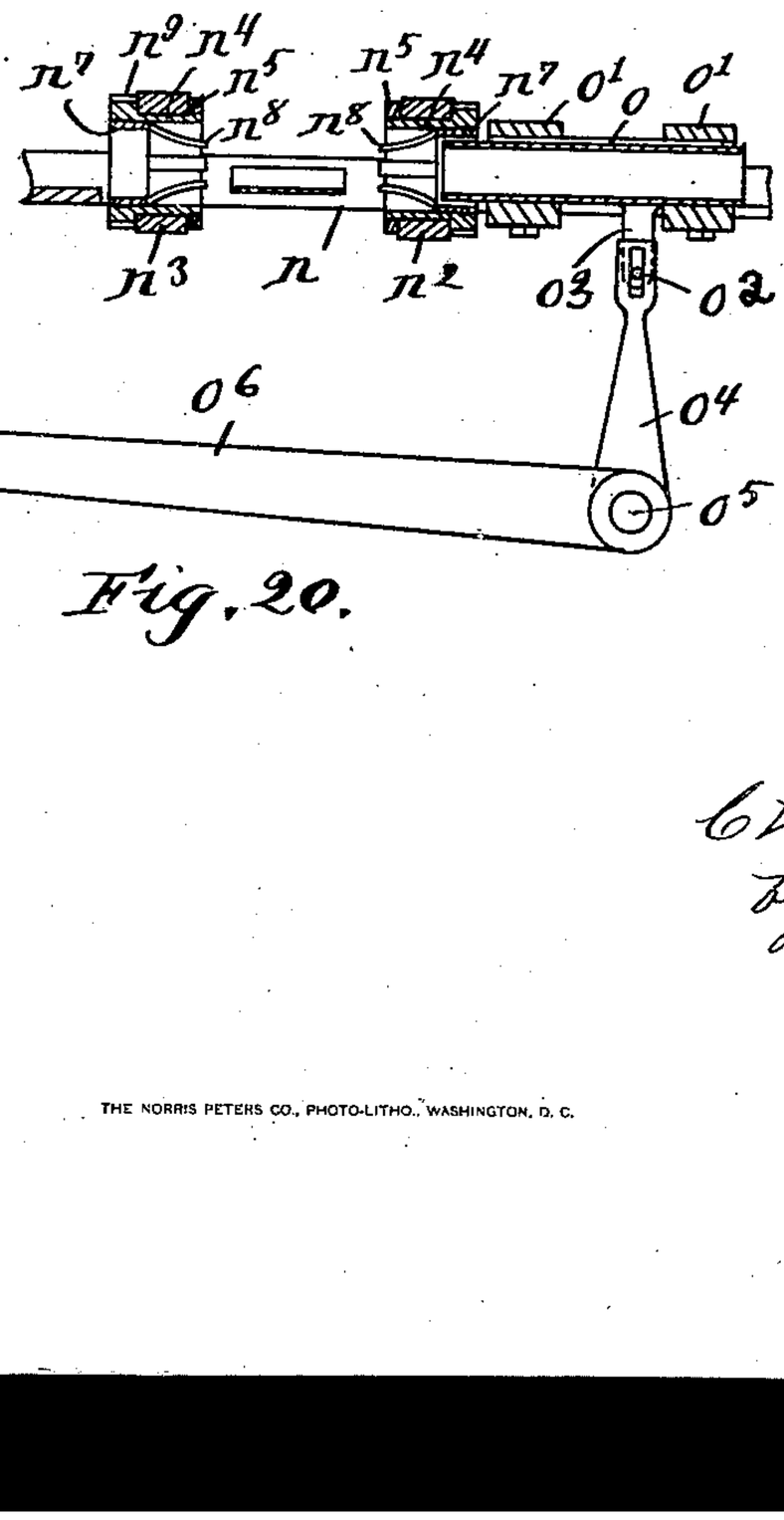


Fig. 20.

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No. 713,285. Patented Nov. 11, 1902.

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MACHINE FOR SCORING, RIVETING, AND PRINTING CLOTHES PINS.

(Application filed Jan. 10, 1902.)

(No Model.) 7 Sheets—Sheet 7.

Fig. 21.

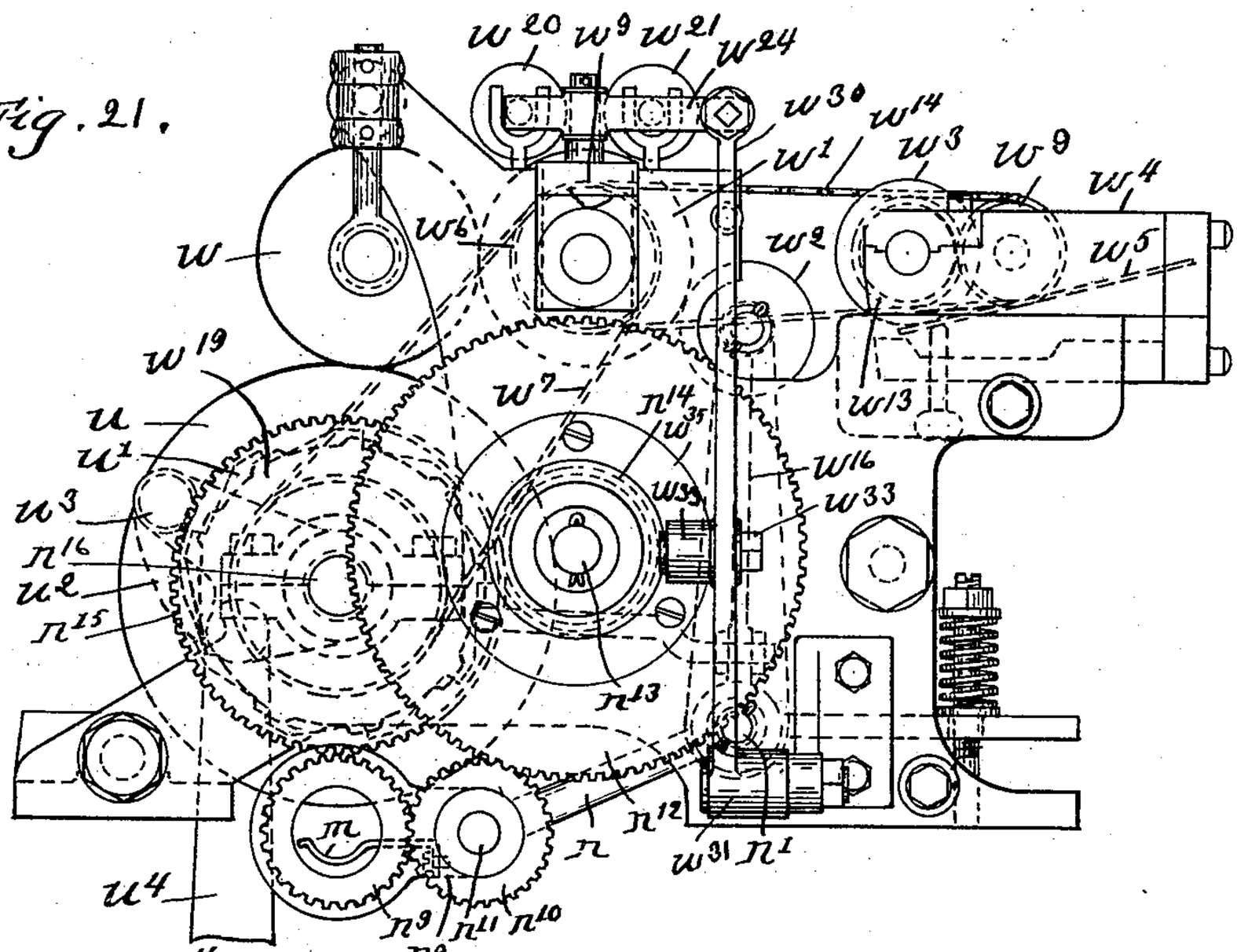
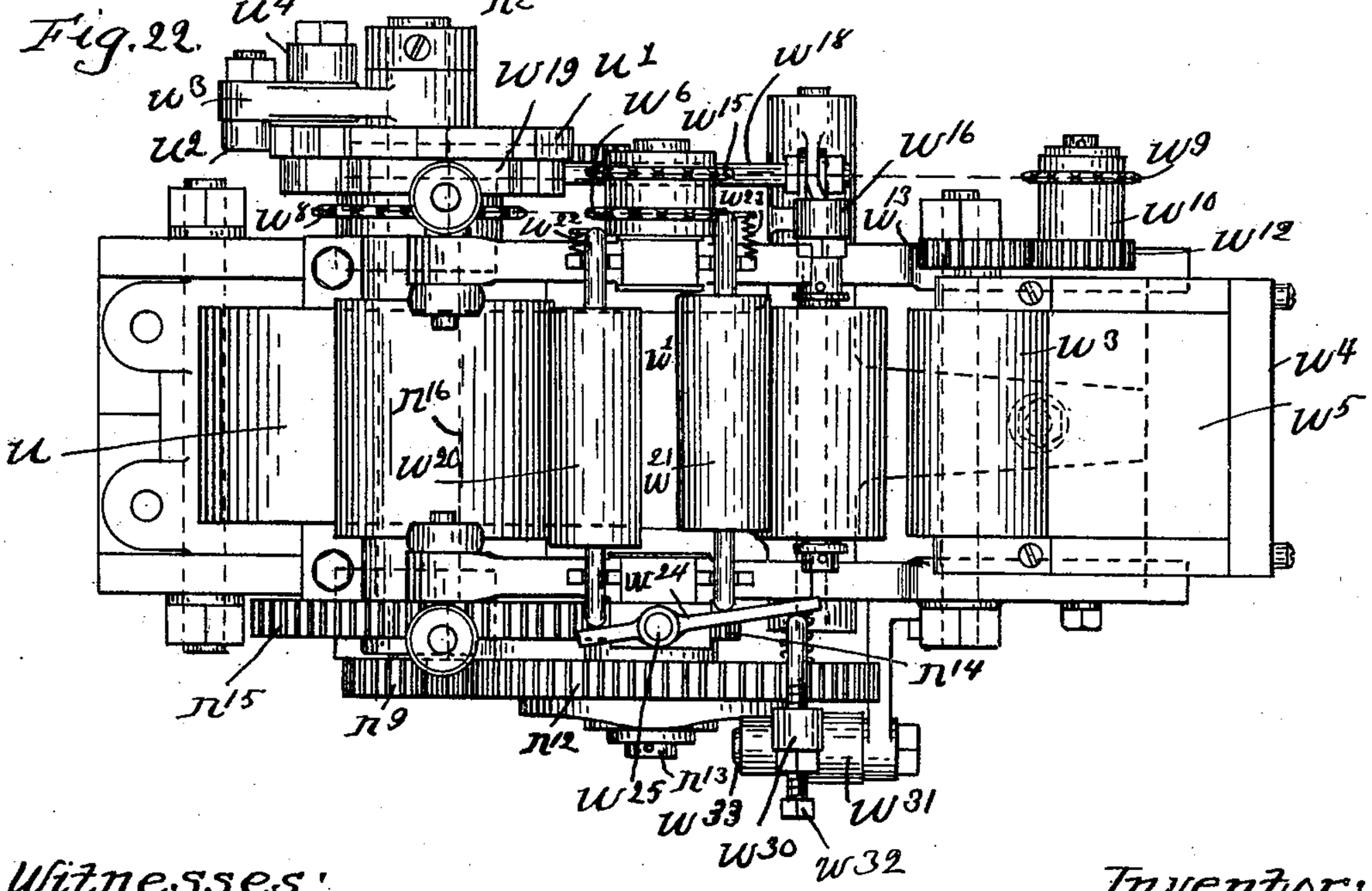


Fig. 22.



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UNITED STATES PATENT OFFICE.

CHARLES CARR, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE J. G. AND F. CLOTHES PIN CO., A CORPORATION OF MAINE.

MACHINE FOR SCORING, RIVETING, AND PRINTING CLOTHES-PINS.

SPECIFICATION forming part of Letters Patent No. 713,285, dated November 11, 1902.

Application filed January 10, 1902. Serial No. 89,177. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARR, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Scoring, Riveting, and Printing Clothes-Pins, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of this invention is the production of an organized machine for scoring, riveting, and printing clothes-pins.

By "scoring" I mean forming grooves or recesses in the inner sides or faces of the legs of the pin at a proper location to receive the line. By "riveting" I mean driving a wire or rivet transversely through the body of the pin to reinforce or strengthen it, and by "printing" I mean printing any suitable inscription—such, for instance, as a name or advertising matter of any kind—on the pin, either on the body of the pin or on either or both legs thereof.

The invention also has for its object to construct and arrange the scoring, riveting, and printing mechanisms so that either one of said mechanisms may be prevented from operating on the pin, whereby the pin may be scored or riveted or printed, or scored and riveted, or scored and printed, or riveted and printed, or scored, riveted, and printed, as occasion may require.

The invention consists in the combination of scoring mechanism for the clothes-pin, feeding mechanism for feeding the pin to the scoring mechanism, and guiding mechanism for preventing rotary movement of the pin as it is fed along, whereby it is presented to the scoring mechanism in proper relative position thereto to be scored; also, in the combination of riveting mechanism for the clothes-pin, feeding mechanism for feeding the pin to said riveting mechanism, and guiding mechanism for preventing rotary movement of the pin as it is fed along, whereby it is presented to the riveting mechanism in proper relative position thereto to be riveted; also, in the combination of printing mechanism for the clothes-pin, feeding mechanism for feeding the pin to the printing mechanism, and guiding mechanism for preventing rotary movement of the pin as it is fed along, whereby it is presented to the printing mechanism in proper relative position thereto to be printed; also, in the combination of two or more of said mechanisms—as, for instance, the scoring and riveting mechanisms, or the scoring and printing mechanisms, or the riveting and printing mechanisms, or the scoring, riveting, and printing mechanisms—and feeding mechanism for feeding the pin successively to said mechanisms and guiding mechanism for preventing rotary movement of the pin as it is fed along, whereby it is presented to the different mechanisms in proper relative position to be operated upon.

The invention also consists in means for holding the pin firmly in a position of rest while it is being operated upon by either one of the different mechanisms.

The invention also consists in scoring mechanism comprising a rotating boring-tool and means for moving it up and down in line with the slot of the pin while said pin is held with its slot in a predetermined plane and also in means, operating in conjunction with said scoring mechanism, for removing the burs or fins produced by the boring-tool.

The invention also consists in riveting mechanism for driving a rivet transversely through the body of the pin comprising, essentially, a pair of wire feeding and driving rolls, a cutting-off device for the wire, and an upsetting device for the ends of the rivet.

The invention also consists in printing mechanism for the pin having a rotatable pin-holder by which the pin is held in proper position relative to the printing mechanism to be printed and in means for assisting the discharge of the pin from the rotatable pin-holder and in a type-carrier having means for rotating it step by step simultaneously with the pin-holder and in means for delivering the ink to the type-carrier.

Figure 1 shows in front elevation a machine embodying my invention for scoring, riveting, and printing clothes-pins. Fig. 2 is a view of a clothes-pin after it has been scored and riveted. Fig. 3 is a plan view of the machine shown in Fig. 1, the printing mechanism being removed. Fig. 4 is a right-hand end elevation of the machine shown in Fig. 3.

Fig. 5 is a detail showing the upsetting device for the rivet, which forms a part of the riveting mechanism. Fig. 6 is a left-hand elevation of the machine shown in Fig. 3. Figs. 7, 8, and 9 are detail views of the scoring mechanism for the pin. Fig. 10 is a detail showing the feeding device for the pin. Figs. 11 and 12 are details showing the clamping mechanism for the pin. Figs. 13 and 14 are details showing the guiding mechanism for the pin. Figs. 15, 16, 17, and 18 are details showing the riveting mechanism for the pin. Fig. 19 is a detail of the upsetting device for the ends of the rivet. Fig. 20 is a detail of the rotatable pin-holder by which the pin is held while being printed, and Figs. 21, 22, and 23 are details of the printing mechanism for the pin.

A represents the bed-plate of the machine, which is made as a flat table of any suitable shape and size, and said plate is mounted on upright columns or supports A′. This bed-plate is formed or provided with a longitudinal groove *a*, extending from end to end thereof, of suitable size and shape in cross-section to receive a number of clothes-pins in alinement, and said groove serves as a raceway for said pins, along which they are moved by suitable feeding devices to be described.

The clothes-pins, a number of which, as *b*, are herein shown, are fed to the raceway *a* in such a manner that they will be disposed therein with the legs always projecting in the same direction and the slot which is formed between the legs of the pin always occupying a vertical plane. To thus feed the clothes-pins *b* to the raceway *a*, two upright posts a' a' are erected on the base-plate side by side, one on each side of the raceway, and with sufficient space between them to receive the contracted neck of the pin. A vertical plate a^2 is erected on the bed-plate, which is located above the middle of the raceway and in a plane in parallelism therewith, said plate being formed of suitable width and length to enter the slot of the pin, and thereby serve as a guide for the pin to direct it to the raceway *a*, with its slot occupying a vertical plane.

The guide-plate a^2 is formed as an arm integral with and projecting at right angles from an upright plate a^3, rising from a base-plate a^4, which is secured to the bed-plate. The lower end of the plate a^2 terminates above the raceway *a*, so that as the pin thereon, which is at the same time held in position between the upright posts a' a', falls into the raceway it will occupy a position therein entirely below and free from said plate a^2, so as to be moved along in the raceway beneath it.

The vertical posts a' a' and plate a^2 will be made long enough to receive a number of clothes-pins placed one above the other, and said pins will be placed between said posts by hand, each pin resting upon the pin below it, and the lowermost pin of the pile will rest in the raceway. Thus the pins are held correctly in a pile and are guided to the raceway in correct relative position—that is to say, with their slots occupying a vertical plane. The pins are moved along the raceway step by step, each pin moving the pin ahead of it, and to thus move the pins along the raceway-feeding mechanism is provided, which will now be described.

b' represents a plunger which is made as a cylindrical bar about the diameter of a clothes-pin, and said bar is located horizontally at one end of the raceway at one side of the pile of pins, and one end of said plunger is screw-threaded, as at b^2, and passes through or enters an upright stand or support b^3, erected on top of a dovetailed plate b^4, disposed horizontally in a dovetailed recess formed in a plate b^5, which is bolted to the under side of the bed-plate. The top of the plate b^5 is cut away or slotted to provide for said stand or support b^3, as well as for the movement of said stand or support to and fro. The plunger reciprocates to feed along the pins, and the stroke of the plunger b' will be about the same as the length of one of the pins, so as to engage the lowermost pin of the pile and move it from beneath the pile and along the raceway for a distance equal to its length and then return to repeat said action, and consequently the stand or support bearing said plunger will have a movement about the length of one of the pins. When the plunger returns to its normal position after having moved along one of the pins, the next pin of the pile will drop into the raceway in front of the plunger and the plunger by repeating the aforesaid action will move along said pin in front of it and will also move along the pin which is in front of the aforesaid pin as said pins abut together endwise in the raceway. Thus the plunger may be employed for moving along the pins in the raceway successively or step by step into correct position to be operated upon by the different mechanisms.

To move the plunger a distance equal to the length of one of the pins, a stand or support b^3 is connected by a link b^6 to the upper end of a long arm b^7, pivoted at its lower end at b^8, its pivot-shaft having suitable bearings in a framework A^2, and to said pivot-shaft a short arm b^9 is secured, projecting upward and preferably bearing a friction-roll which bears upon a heart-cam b^{10}, secured to a shaft b^{12}. The short arm is held in continuous engagement with said cam b^{10} by a spring b^{13}, which connects said arm with any fixed point. As the shaft b^{12} revolves, the cam will move the arm, and the plunger will be correspondingly moved.

As the pins are moved along the raceway from the bottom of the pile it is important that they shall be at all times held with their slots in a predetermined plane—as, for instance, in a vertical plane—and to accomplish this result I have provided a number of dogs *c*, any number being employed that may be deemed necessary, arranged in alinement

above the raceway and normally falling by gravity into said raceway, and these dogs are made as flat plates pivotally connected to a supporting-bar c', which is attached to suitable brackets c^2 on the bed-plate. The supporting-bar c' is arranged in parallelism with the raceway, so as to support the several dogs in proper position above the raceway to enable them to fall by gravity into said raceway. As the pins are moved along the dogs will enter the slots in the pins and will hold said pins in correct position—that is to say, with their slots in a vertical plane. These dogs therefore serve as and constitute guiding devices for the pins, which prevent rotary movement of the pins as they are fed along, whereby they may be presented to the different groups of mechanisms to be operated upon in proper relative position.

As the pins are fed along the raceway a to the different groups of operating mechanisms, to be described, it is important that they shall be held firmly at rest while said mechanisms are operating upon the pins—as, for instance, while the scoring mechanism is scoring them and while the riveting mechanism is riveting them—and to accomplish this result I have provided a clamping mechanism comprising, essentially, a number of presser-arms d d', three being herein shown, attached to a rock-shaft d^3, having suitable bearings in the bed-plate, said arms being disposed and adapted to bear directly upon the pins contained in the raceway. It is designed and intended that said arms shall bear firmly upon the pins when they are at rest and the scoring and riveting mechanisms are operating, then to disengage said pins in order that they may be fed along the raceway and thereafter again engage and hold the pins, and to accomplish this result the rock-shaft d^3 is provided with a depending arm d^4, which passes down through the bed-plate and bears upon a cam d^5, secured to a shaft d^6. The cam is shaped to operate the rock-shaft at the proper times to cause the presser-arms to engage and disengage the pins at the proper times in the raceway.

As the pins pass along the raceway the first group of mechanism which they are presented to is the scoring mechanism. This mechanism is designed to score the inner sides or faces of the legs of the pin, as indicated at 2 2, Fig. 2, to thereby form grooves or recesses to receive the line. I form these grooves or recesses by boring a circular hole through the slotted portion of the pin in line with the vertical plane of the slot, thereby cutting a semicircular groove or recess in the inner side or face of each leg, said grooves or recesses being located opposite each other and together forming a suitable line-receiving recess.

The scoring mechanism comprises, essentially, a drill or other boring-tool e and means for thrusting it through the slotted portion of the pin in line with the slot while said drill or boring-tool e is being rapidly rotated. The drill e may be of any suitable construction, and it is held firmly by a chuck or tool-holder e', secured to an upright shaft e^2, having its bearings in a suitable frame e^3, formed on or secured to a dovetailed bar or plate e^4, mounted to slide freely up and down in a stand or frame e^5. As a means of moving said slide e^4 up and down, a stud e^6 projects laterally from it through a slot or hole in the stand e^5, having thereon a friction-roll which bears upon a cam e^7, secured to the shaft d^6. The weight of the parts is ordinarily sufficient to hold the stud bearing the friction-roll in continuous engagement with the cam. The shaft d^6 is made quite long and serves as a driving-shaft for other parts of the machine and has secured to it a large toothed gear e^{10}, which is engaged by a pinion e^{12}, secured to a shaft e^{13}, upon which the belt-pulleys e^{14} are mounted. As the shaft d^6 rotates it will be seen that the drill will be moved up and down.

To rotate the drill e, the rotatable shaft e^2 is extended a considerable distance below the frame e^3 and is formed with a spline e^{15}, and said extension passes centrally through a beveled pinion e^{16}, formed with a splineway for said spline e^{15}, and said beveled pinion has suitable bearings and is engaged by a beveled gear e^{17}, secured to a horizontal shaft e^{18}, upon which the belt-pulleys e^{19} are mounted. As the shaft e^{18} is revolved the upright shaft e^2, bearing the drill, will also be revolved, and by reason of said shaft being splined to the pinion it may be moved up and down independently thereof as it is revolved.

The drill e is located at a point directly beneath the groove or raceway in the bed-plate, and a hole is made in said bed-plate, through which said drill passes to score the pin, and it is at a point just above this hole that one of the presser-arms, as d, is located, which acts to hold the pin firmly in the raceway while the drill is passing through its slotted portion, said presser-arm also having a hole through it for the drill.

In practice the drill by passing through the slotted portion of the pin in line with the vertical plane of the slot would form or produce burs or fins adjacent the semicircular grooves or recesses made by it and would also oftentimes split the pin if means were not provided for obviating this trouble. On top of the dovetailed plate e^4 a horizontal plate e^{20} is secured, having a horizontal arm e^{21} projecting from it, which has a hole through it for the drill e, and said arm has rising from it or erected upon it two vertical fingers e^{22} e^{22}, located one each side of the drill and as close to the drill as possible, yet removed therefrom sufficiently to allow the drill to rotate freely between them, and the sides of said fingers adjacent the drill are concaved concentric to the drill to thereby enable them to occupy positions very close to the drill, and said fingers are made long enough to project to a height almost flush with the end of the drill, yet just below the

end thereof, and said fingers are made of a thickness substantially equal to the width of the slot in the pin and are made of any suitable width. These fingers being borne by the dovetailed plate e^7 rise and fall with the drill, always occupying the same relative position thereto, and therefore pass through the slot in the pin as the drill bores the hole, and being located in close proximity to the drill they coöperate with said drill like unto shears, and any burs or fins which may be formed will be removed or cut off. Thus the pin is scored by the operation of the drill.

As the drill is removably connected to its chuck or holder like any ordinary drill, it may be removed whenever desired for the purpose of providing a new drill, or if it shall be desired to operate the machine and not score the pin the stud e^6 can be easily removed, if desired, which would prevent the scoring mechanism from being operated, or any of the other coöperative parts can be removed to thereby put said scoring mechanism out of action.

After the pin has been scored it is fed along the raceway step by step into position to be riveted, and the group of mechanism employed for riveting the pin will now be described.

The rivets employed are short pieces of wire of suitable stiffness, which may be cut off of a coil taken from any suitable reel. (Not shown.) f represents the wire, which may be taken from the reel, and said wire is brought into engagement with a pair of rolls, by which it is fed along and positively thrust directly through the body of the pin at a point above its slotted portion. As the means of feeding the pins to the riveting mechanism is intermittently operated, so the rolls are constructed and arranged and operated to advance and drive the wire at intermittent intervals. f' represents the under roll of the pair, which is provided with a milled edge, and said roll is secured to a shaft f^2, to which a toothed gear f^3 is secured, which is engaged by a toothed gear f^4, engaged by a toothed gear f^5, and in turn engaged by a toothed gear f^6, secured to the driving-shaft d^6. By this train of gears the under roll f' will be driven. A toothed gear f^7 is also secured to said shaft f^2, which engages and drives a toothed gear f^9, secured to a shaft f^{10} of the upper roll of the pair. The upper roll consists, essentially, of three circular disks f^{12} f^{13} f^{14}, secured together, the disks f^{12} and f^{14} being of the same diameter and formed with a smooth edge and one of them, as f^{12}, being much thinner than the other, and the disk f^{13} being located between said disks f^{12} f^{13} and made of less diameter to thereby form a groove or passage for the wire, and said disk f^{13} is formed or provided with the projecting milled portion f^{14}, which each time the disk revolves engages the wire between the disks f^{12} f^{14} and moves it along. The length of the projecting milled portion f^{15} is substantially equal to the diameter of the body of the pin through which the wire is to be thrust. The three disks constitute the upper roll and are rigidly secured together and also secured to the shaft f^{10}. The shaft f^{12} is contained in a bushing f^{16}, which is in turn contained in a suitable bearing f^{17}, which supports it. The hole through the bushing f^{16} is made eccentric to its axis, so that as said bushing is turned in the bearing f^{17} the shaft f^{10} will be raised and lowered. This bodily movement of the shaft is provided for the purpose of varying the position of the upper roll. To turn the bushing f^{16}, a pin f^{18} projects laterally therefrom, which passes through the slot f^{19} in the bearing f^{17}, being made long enough to be readily accessible in order that it may be engaged by the operator and moved to turn the bushing either way whenever desired. A set-screw f^{20} passes through the bearing f^{17}, which engages the bushing at a grooved portion thereof to hold said bushing in fixed position relative to the bearing. The bearing f^{17} is formed or provided with a lateral extension f^{21}, adapted to rest upon the bed-plate and be bolted thereto. The wire having been passed between the rolls is fed through a tube g to the pin. This tube will be made of any suitable length and will be supported by the frame of the bearing f^{17}, or it may be otherwise supported, and is disposed horizontally with one of its ends terminating close to the pin to be riveted and with its opposite end chamfered off and disposed close to the bight of the rolls, and when thus disposed the wire which is advanced by the rolls will be continued in a straight line to and through the pin. The parts will be timed so that each time a pin is brought into position in front of the tube g the wire will be fed along by the rolls and positively thrust transversely through its cylindrical body. It will be understood that the pin is held at rest in the raceway by the clamping mechanism while the wire is driven through it. The wire having been thrust through the pin by the feeding and driving rolls is then cut off as close to the pin as possible, and as a means of thus cutting off the wire a pair of shears are provided, comprising (see Figs. 4 and 5) jaws g' g^2, pivotally supported on a pivot-pin g^3, which is located above the pin and which is horizontally supported on a stand or frame g^4, said pin g^3 passing through the upper ends of the jaws and also through the stand or frame and made long enough to project beyond said stand or frame to receive upon it a spring g^5, which acts to hold one of the jaws with a yielding pressure against the other. The jaws g' g^2 pass down through a hole in the bed-plate each side of the wire, and as near their upper ends as possible to attain the greatest leverage the cutting-off blades g^6 g^7 are located, they being supported by the jaws in any suitable adjustable manner, so as to be adjusted whenever desired and also replaced. These cutting-off blades are

brought together to cut off the wire by a movement of the jaws toward each other, and, as herein shown, the means provided for this purpose consists of a cross bar or plate g^8, secured to the shaft b^{12}, having laterally-projecting pins g^9 g^9 thereon, which as said bar or plate revolves with the shaft engage a cam g^{10} g^{10}, secured to the sides or faces of the jaws g' g^2 at or near their lower ends. Upon each revolution of the shaft b^{12} a cross bar or plate will be operated to move the jaws toward each other and cut off the wire. The jaws are moved away from each other by means of springs g^{12} g^{12}, attached thereto, said outward movement of the jaws being limited by the fixed pins g^{13} g^{13}. The wire having been driven through the body of the pin and cut off has its ends rough cut, and it is important that these ends shall be smoothed off, and to accomplish this result means are provided whereby said ends are upset, as by striking them with a hammer. The means herein shown for accomplishing this result consists, essentially, of a hammer h, the arm of which is pivoted at h'. The arm is extended outwardly for a suitable distance into position to be engaged by a pin h^2, projecting laterally from a disk or plate h^3, which is rigidly secured to a toothed gear f^6 on the shaft d^6. The head of the hammer projects up through a hole in the bed-plate and occupies a position opposite a lateral recess in the raceway which opens into said hole in the bed-plate, so that the hammer-head will be disposed directly opposite the rivet on the pin when the pin is brought into position in front of it. In the raceway opposite said lateral opening an anvil block or plate h^4 is placed, which resists the blow of the hammer. When the pin is brought into position to receive the blow of the hammer and the hammer is operated, the ends of the wire will be upset, and thereby smoothed off.

The pin having been scored and riveted is next brought into position to be printed, the feeding mechanism heretofore described being employed for moving the pin along the raceway and a series of dogs i, pivotally attached to a bar i', similar to the dogs c, being employed for holding the pin with its slot in a predetermined plane.

The coöperating parts of the printing mechanism (see Figs. 20, 21, 22, 23) are supported by a suitable frame which is mounted on the bed-plate A, and the particular printing mechanism herein employed is of the rotary type, and the means provided for holding the pin while being printed is adapted to be rotated simultaneously with the rotating type-carrier of the printing mechanism.

n represents an arm pivoted to the frame at n'. One end of this arm is bifurcated or made as a yoke to support the rotating pin-holding devices, and one of the arms of the yoke, as n^2, is herein shown as formed integral with the arm n, and the other arm, as n^3, is made independent thereof, but attached thereto in any suitable manner. The arms n^2 n^3 are each formed with a circular hole through it, and said holes are disposed in line with each other and in line with the movement of the pin along the raceway. Thimbles n^4, Fig. 20, of a diameter to loosely fit the circular holes in the arms n^2 n^3, are placed in said holes, they being made long enough to project through said holes beyond the arms for a short distance, and upon the projecting ends of said thimbles nuts n^5 are placed, which hold the thimbles in position. These thimbles by loosely fitting the holes in the arms are free to rotate. Each thimble is formed with an internally-screw-threaded portion, and a ring n^7, externally screw-threaded, is screwed into each thimble, and each ring n^7 bears a number of spring-acting prongs or fingers n^8, and said sets of prongs are so supported by the rings as to project toward each other and occupy positions in line with the movement of the pin, and as the springs are thus connected to the thimbles they will be rotated therewith. One of the thimbles has formed on it gear-teeth n^9, (see Fig. 21,) which are engaged by an intermediate toothed pinion n^{10}, mounted on the shaft n^{11}, which is engaged by a large toothed gear n^{12}, secured to a shaft n^{13}, to which a pinion n^{14} is secured, which is engaged and driven by a toothed gear n^{15}, secured to a shaft n^{16}, which is adapted to be intermittently rotated by means to be described. As the shaft n^{16} is intermittently rotated one of the thimbles bearing the gear-teeth n^9 will be correspondingly rotated. The yoke bearing the two thimbles is supported by the arm n at an opening in the bed-plate intersecting the raceway, so that a pin from the raceway is thrust through one of the thimbles and into the prongs of the other thimble, being at such time held by the prongs of the two thimbles, and it is when in this position that it is suitably supported to be acted upon by the printing device. The prongs hold the pin frictionally, but with sufficient force to firmly grip the pin, so that as one of the thimbles is rotated the pin and the other thimble will be correspondingly rotated. The pin is given one complete revolution as soon as it is thrust into engagement with the prongs of the thimbles, and it is then advanced through the other thimble and out of the machine by the next pin which is thrust forward by the feeding device. To assist in holding the pin in position, a curved plate m is located between the two arms n^2 n^3 of the yoke which is attached to the arm n and supported by it. The curvature of said plate conforms to the circular shape of the pin, and said plate is supported with its curved portion in line with the movement of the pin. The curved plate is made quite stiff to resist the pressure of the type-carrier as the pin is revolved. The spring-acting prongs n^8 are quite stiff, so as to securely hold the pin, and consequently considerable pressure is required to move the pin endwise when held by said

prongs and discharge it from the machine, and to facilitate this work I have provided means for assisting discharging the pin, which, as herein shown, consists of a tube *o*, supported horizontally by a frame *o'* in line with the movement of the pin, said tube being located close by the exit-thimble n^7, and one end of said tube normally projects into said thimble n^7 for a short distance, as shown in Fig. 20. The tube *o* is made with an internal diameter sufficient to receive the pin and allow said pin to be thrust through it longitudinally easily. The tube *o* is also made large enough in diameter so that when moved longitudinally, and thereby projected into the thimble farther than normal, its extremity will engage the spring-acting prongs or fingers n^7 and separate them sufficiently to relieve their grasp on the pin, and the pin at such time being held solely by the other set of spring-acting prongs can be easily moved along and into the tube *o*. The tube is reciprocated longitudinally to accomplish the aforesaid results, and, as herein shown, it has projecting from it a short arm o^2, bearing a laterally-projecting pin o^3, which enters a slot formed or provided at the upper end of an arm o^4, pivoted at o^5, the pivot-shaft having attached to it an arm o^6, with or without a roll thereon, which engages a cam o^7, secured to the shaft b^{12}. As said shaft b^{12} revolves the tube *o* will be moved back and forth.

While I desire it to be understood that printing mechanism of many different forms may be employed for printing on the pin, one form only is herein shown for the sake of illustrating this invention.

u represents a type-carrier which is made as a cylinder and secured to the shaft n^{16}, and said type-carrier is designed to bear the type for printing on the pin. The type-carrier is located above the rotatable pin-holder, so that its type may engage a pin carried by said pin-holder. The type-carrier is rotated to print upon the pin simultaneously with the rotation of the pin-holder, and as the cylinder *u* or type-carrier herein shown is quite large in diameter and the pin quite small the former will be given but a partial rotation to a complete rotation of the latter—as, for instance, herein the cylinder *u* is constructed to provide for nine parallel divisions or rows of type, each division or row being alike, and said cylinder is moved forward one-ninth of a rotation for each complete rotation of the pin, and to accomplish this result the shaft n^{16} has secured to it a ratchet-wheel *u'*, which is engaged by the pawl u^2, supported by a pawl-carrier u^3, mounted loosely on said shaft n^{16}, and a rod or bar u^4 is connected to said pawl-carrier, which extends downward through the bed-plate and is bifurcated at its lower end to straddle the shaft d^6, and said rod or bar has projecting laterally from it a pin u^5, with or without a roll thereon, which engages a heart-cam u^7, secured to said shaft d^6. As said cam u^7 is revolved by the shaft d^6 the type-carrier will be intermittently rotated, and by means of the aforesaid gearing, by which the pin-holder is rotated, said pin-holder will be rotated simultaneously with the type-carrier.

The type borne by the type-carrier is inked by suitable inking mechanism, which, as herein shown, comprehends an inking-roll *w*, bearing upon the type-carrying cylinder, an inking-roll *w'*, bearing upon or against said roll *w*, an ink-conveying roll w^2, bearing upon or against said roll *w'*, a doctor w^3, rotating in the fountain w^4 and acting upon the inclined plate w^5. The inking-roll *w* is supported by the frame to rest idly upon the type-carrying cylinder *u*, and the inking-roll *w'* is supported in proper relative position to the roll *w* to engage it, and said roll *w'* is positively rotated, it being herein shown as having a sprocket-wheel w^6 secured to one of its end journals, over which passes a sprocket-chain w^7, which passes around the sprocket-wheel w^6, secured to the intermittently-rotating shaft n^{16}. The doctor w^3 is also positively driven, it being herein shown as having a sprocket-wheel w^9, secured to a stud-shaft w^{10}, bearing a pinion w^{12}, which engages a pinion w^{13} on one of the end journals of the doctor, and a sprocket-chain w^{14} passes over said sprocket-wheel w^9, which also passes around the sprocket-wheel w^{15}, secured to the end journal of the roll *w'*, which bears the sprocket-wheel w^6. Thus as the shaft n^{16} is intermittently rotated the roll *w'* and doctor w^3 will be correspondingly intermittently revolved. The ink-conveying roll w^2 is journaled at the upper end of an arm w^{16}, which is vertically disposed and pivoted at its lower end upon a pivot-shaft *n'*, so that said roll may move back and forth into engagement with the inking-roll *w'* or doctor w^3, to thereby convey the ink from the doctor to the roll *w'*. The arm w^{16} has rigidly secured to it at a point near its lower end an arm w^{18}, which projects therefrom at approximately right angles, and said arm is made long enough to engage a cam-wheel w^{19}, secured to the shaft n^{16}, and as said shaft is intermittently rotated the cam-wheel will operate and move the arm w^{16} and ink-conveying roll borne by it back and forth. The ink on the surface of the inking-roll *w'* is spread more or less, as may be required, and to accomplish this result a pair of ink-spreading rolls w^{20} w^{21} are provided which bear upon said roll *w'*, and said rolls are reciprocated longitudinally with relation to the roll *w'* on which they bear to spread the ink thereon. As herein shown, the spreading-rolls w^{20} w^{21} are provided with quite long journals which rest in suitable bearings provided for them, and springs w^{22} w^{23} are connected to the journals at one end of said rolls, which normally thrust the rolls endwise, so that the journals at the opposite ends bear against the opposite ends of a rocking bar w^{24}, pivoted at w^{25} to the frame, and as said bar is rocked the spreading-rolls w^{20} w^{21} will move longitudinally and act to spread the ink on the roll

w'. To move the rocking bar, an upright arm w^{30} is provided, which is pivoted at its lower end at w^{31} and which bears at its upper end the pin w^{32}, preferably adjustable, which bears against one end of said rocking bar, and said arm has a laterally-projecting pin or stud w^{33}, with or without a roll thereon, which engages a cam w^{35}, secured to the shaft n^{13}, which is intermittently operated.

I claim—

1. In a machine of the kind described, a bed-plate having a raceway for the pins, pin-supports and an upright plate for holding a number of superimposed pins and for guiding them to said raceway with their slots occupying a predetermined plane, feeding mechanism for moving the pins along the raceway step by step, guiding devices which enter the slots of the pins contained in said raceway and prevent rotary movement of the pins as they are fed along and scoring mechanism for scoring the inner faces of the legs of the pins while held in the raceway with the guiding devices entering the slots thereof, substantially as described.

2. In a machine of the kind described, the combination of riveting mechanism for driving a rivet through the body of the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along the raceway to the riveting mechanism and guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, substantially as described.

3. In a machine of the kind described, the combination of printing mechanism for printing on the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along the raceway to the printing mechanism and guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, substantially as described.

4. In a machine of the kind described, the combination of the scoring mechanism and the riveting mechanism for scoring and riveting the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway successively to said scoring and riveting mechanisms and guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, substantially as described.

5. In a machine of the kind described, the combination of the scoring mechanism and the printing mechanism for scoring and printing the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway successively to said scoring and printing mechanisms, and guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, substantially as described.

6. In a machine of the kind described, the combination of the riveting mechanism and the printing mechanism for riveting and printing the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway successively to said riveting and printing mechanisms, and guiding devices entering the slot of the pin contained in the raceway as it is fed along, substantially as described.

7. In a machine of the kind described, the combination of the scoring mechanism, the riveting mechanism and the printing mechanism for scoring, riveting and printing the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway successively to said scoring, riveting and printing mechanisms, and guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, substantially as described.

8. In a machine of the kind described, a bed-plate having a raceway for the pins, pin-supports and an upright plate for holding a number of superimposed pins and for guiding them to said raceway with their slots occupying a predetermined plane, feeding mechanism for moving the pins along the raceway step by step, guiding devices which enter the slots of the pins contained in said raceway and prevent rotary movement of the pins as they are fed along and scoring mechanism for scoring the inner faces of the legs of the pins while held in the raceway with the guiding devices entering the slots thereof, a clamping mechanism for engaging the pins and holding them firmly in the raceway while being scored, substantially as described.

9. In a machine of the kind described, the combination of riveting mechanism for the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway to the riveting mechanism, guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, and clamping mechanism for engaging the pin and holding it firmly in the raceway while being riveted, substantially as described.

10. In a machine of the kind described, the combination of scoring mechanism and riveting mechanism for scoring and riveting the pin, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway successively to said scoring and riveting mechanisms, guiding devices entering the slot of the pin contained in the raceway for preventing rotary movement of the pin as it is fed along, and clamping mechanism for engaging the pin and holding it firmly in the raceway while being scored and riveted, substantially as described.

11. In a machine of the kind described, a bed-plate having a raceway for the pins, means for holding a number of superimposed pins and for guiding them to said raceway with the slot of each pin occupying a vertical plane

consisting of vertical pin-supports a', a' at opposite sides of said raceway, and a vertical plate a^2 above said raceway which the pins straddle, a feeding mechanism for engaging the lowermost pin of the pile and for moving the pins along the raceway step by step, substantially as described.

12. In a machine of the kind described, a bed-plate having a raceway for the pins, pin-supports and an upright plate for holding a number of superimposed pins and for guiding them to said raceway with their slots occupying a predetermined plane, and feeding mechanism for moving the pins along the raceway step by step, consisting of a horizontal plunger moving in the raceway which engages the lowermost pin of the pile, and means for reciprocating said plunger, substantially as described.

13. In a machine of the kind described, a bed-plate having a raceway for the pins, pin-supports and an upright plate for holding a number of superimposed pins and for guiding them to said raceway with their slots occupying a predetermined plane, a plunger for engaging the lowermost pin of the pile and for moving the pins along the raceway, means for reciprocating said plunger, and means for holding the pins with their slots in the same plane as they are fed along the raceway, substantially as described.

14. In a machine of the kind described, a bed-plate having a raceway for the pins, means for delivering the pins thereto with their slots occupying a vertical plane, means for feeding said pins along step by step, and means for holding said pins with their slots in a vertical plane as they are fed along the raceway, consisting of a number of dogs pivotally supported above the raceway and in parallelism therewith, adapted to enter the slots of the pins as the pins are fed along beneath them, substantially as described.

15. In a machine of the kind described, a bed-plate having a raceway for the pins, means for delivering the pins thereto, feeding mechanism for feeding the pins along the raceway step by step, an intermittent clamping mechanism for holding the pins in the raceway consisting of a number of presser-arms attached to a rock-shaft, and means for rocking said shaft, substantially as described.

16. In a machine of the kind described, the combination of means for holding the pin with its slot in a predetermined plane, with scoring mechanism consisting of a rotating boring-tool, and means for moving it, while rotating, in a line with the plane of the slot of the pin, to thereby pass through the slotted portion of the pin and form oppositely-disposed grooves in the inner sides or faces of the legs of the pin, substantially as described.

17. In a machine of the kind described, the combination of means for holding the pin with its slot in a predetermined plane, with scoring mechanism consisting of a rotating boring-tool and means for moving it, while rotating, in a line with the plane of the slot of the pin, and means, (as vertical fingers e^{22}, e^{22},) located at each side of and close to said boring-tool and movable up and down therewith, which coöperate with said boring-tool to prevent the formation of burs or fins, substantially as described.

18. In a machine of the kind described, the combination of means for holding the pin with its slot in a predetermined plane, with riveting mechanism for driving a rivet transversely through the body of the pin comprising a pair of feeding and driving rolls and a horizontally-disposed tube leading from the bight of said rolls to the raceway containing the pin, substantially as described.

19. In a machine of the kind described, the combination of means for holding the pin with its slot in a predetermined plane, with riveting mechanism for driving a rivet transversely through the body of the pin, comprising a pair of feeding and driving rolls, one of which has a milled edge and the other of which has a groove the bottom of which is milled for a length corresponding to the length of the rivet to be driven, and a horizontally-disposed tube leading from the bight of said rolls to the raceway containing the pin, substantially as described.

20. In a machine of the kind described, riveting mechanism comprising wire feeding and driving rolls, one of which is composed of three disks secured together, the middle disk being of less diameter than the outside disks, and said middle disk having a projecting milled portion of a length corresponding to the length of the rivet to be driven, substantially as described.

21. In a machine of the kind described, the combination of a raceway along which the pin is fed, feeding mechanism for feeding it along, guiding devices entering the slot of the pin contained in the raceway for holding the pin with its slot in a predetermined plane, and riveting mechanism for driving a rivet transversely through the body of the pin, comprising a pair of wire feeding and driving rolls and a cutting-off device for the wire, substantially as described.

22. In a machine of the kind described, the combination of a raceway along which the pin is fed, feeding mechanism for feeding it along, guiding devices entering the slot of the pin contained in the raceway for holding the pin with its slot in a predetermined plane, with riveting mechanism for driving a rivet through the body of the pin, comprising a pair of wire feeding and driving rolls, a cutting-off device for the wire, and an upsetting device for the ends of the rivet, substantially as described.

23. In a machine of the kind described, the combination of a rotating type-carrier and means for rotating it step by step, a rotatable pin-holder for holding the pin in position to be acted upon by said type-carrier, means for rotating said pin-holder at intervals, simul-

taneously with said type-carrier, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway to said pin-holder, and guiding devices entering the slot of the pin contained in said raceway, substantially as described.

24. In a machine of the kind described, the combination of printing mechanism for printing the pin, having a rotating type-carrier and means for rotating it step by step, a rotatable pin-holder for holding the pin with its slotted portion in a predetermined plane, means for rotating said pin-holder at intervals, simultaneously with the type-carrier, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway to said pin-holder and guiding devices entering the slot of the pin contained in said raceway, substantially as described.

25. In a machine of the kind described, the combination of printing mechanism for printing the pin having a rotating type-carrier and means for rotating it step by step, a rotatable pin-holder for holding the pin with its slotted portion in a predetermined plane consisting of rotating thimbles bearing spring-acting prongs which engage the opposite ends of the pin and means for rotating said pin-holder simultaneously with the type-carrier, substantially as described.

26. In a machine of the kind described, the combination of printing mechanism for printing the pin having a rotating type-carrier and means for rotating it step by step, a rotatable pin-holder for holding the pin with its slotted portion in a predetermined plane, means for rotating said pin-holder at intervals, simultaneously with the type-carrier, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway to said pin-holder, and guiding devices entering the slot of the pin contained in said raceway, and a discharging device for assisting the discharge of the pin from the rotatable pin-holder, substantially as described.

27. In a machine of the kind described, the combination of printing mechanism for printing the pin having a rotating type-carrier and means for rotating it step by step, a rotatable pin-holder for holding the pin with its slotted portion in a predetermined plane consisting of rotating thimbles bearing spring-acting prongs for engaging the opposite ends of the pin, means for rotating said pin-holder simultaneously with the type-carrier, a raceway along which the pin is fed, feeding mechanism for feeding the pin along said raceway to said pin-holder, and guiding devices entering the slot of the pin contained in said raceway, a discharging device for assisting the discharge of the pin from the rotatable pin-holder, consisting of a reciprocating tube disposed in alinement with the movement of the pin along the raceway and means for reciprocating it, substantially as described.

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

CHARLES CARR.

Witnesses:
B. J. NOYES,
H. B. DAVIS.