

No. 722,659.

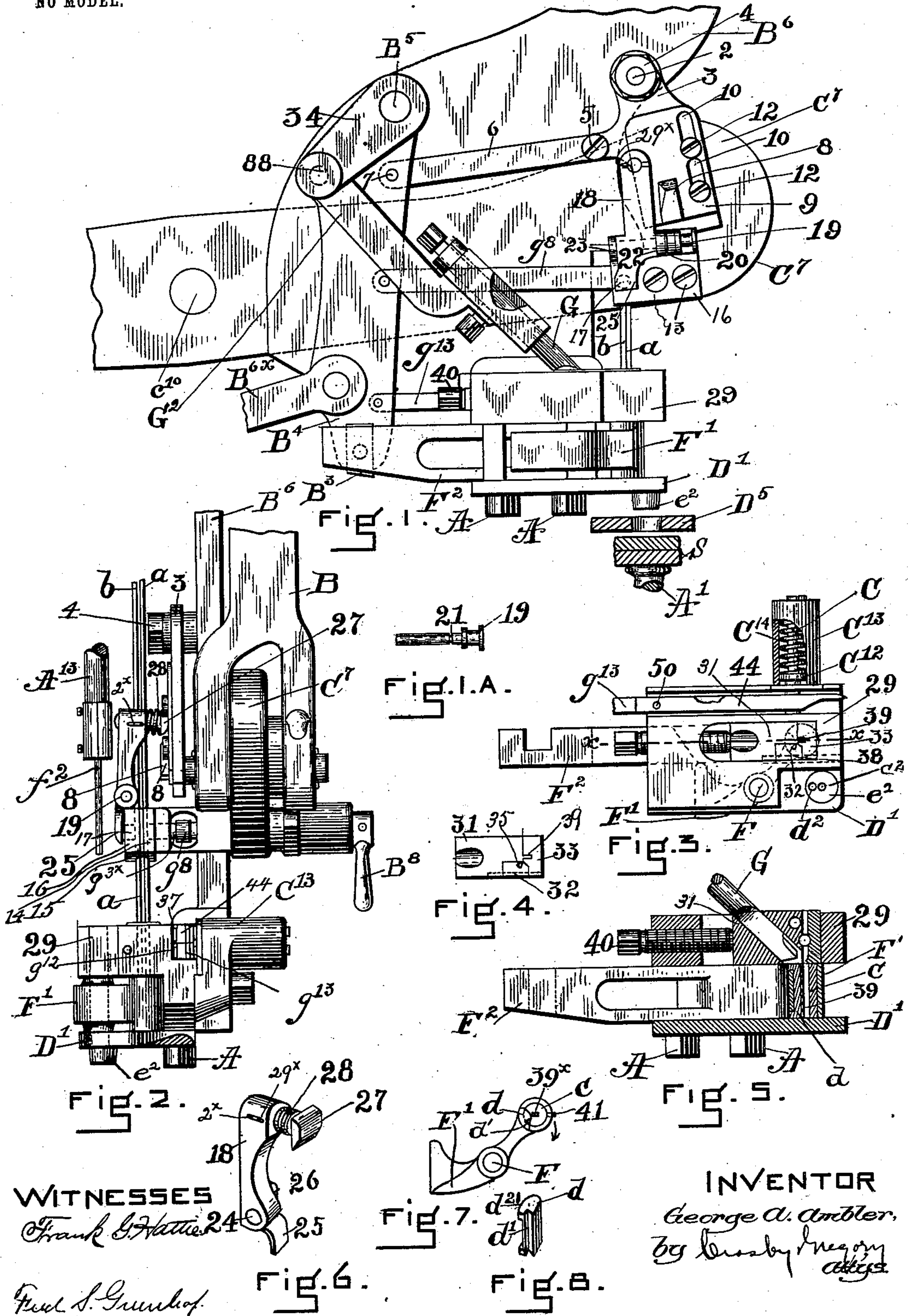
PATENTED MAR. 17, 1903.

G. A. AMBLER.
MACHINE FOR INSERTING FASTENINGS.

APPLICATION FILED SEPT. 11, 1899.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

Frank G. Hattie

Paul S. Grunhof

INVENTOR

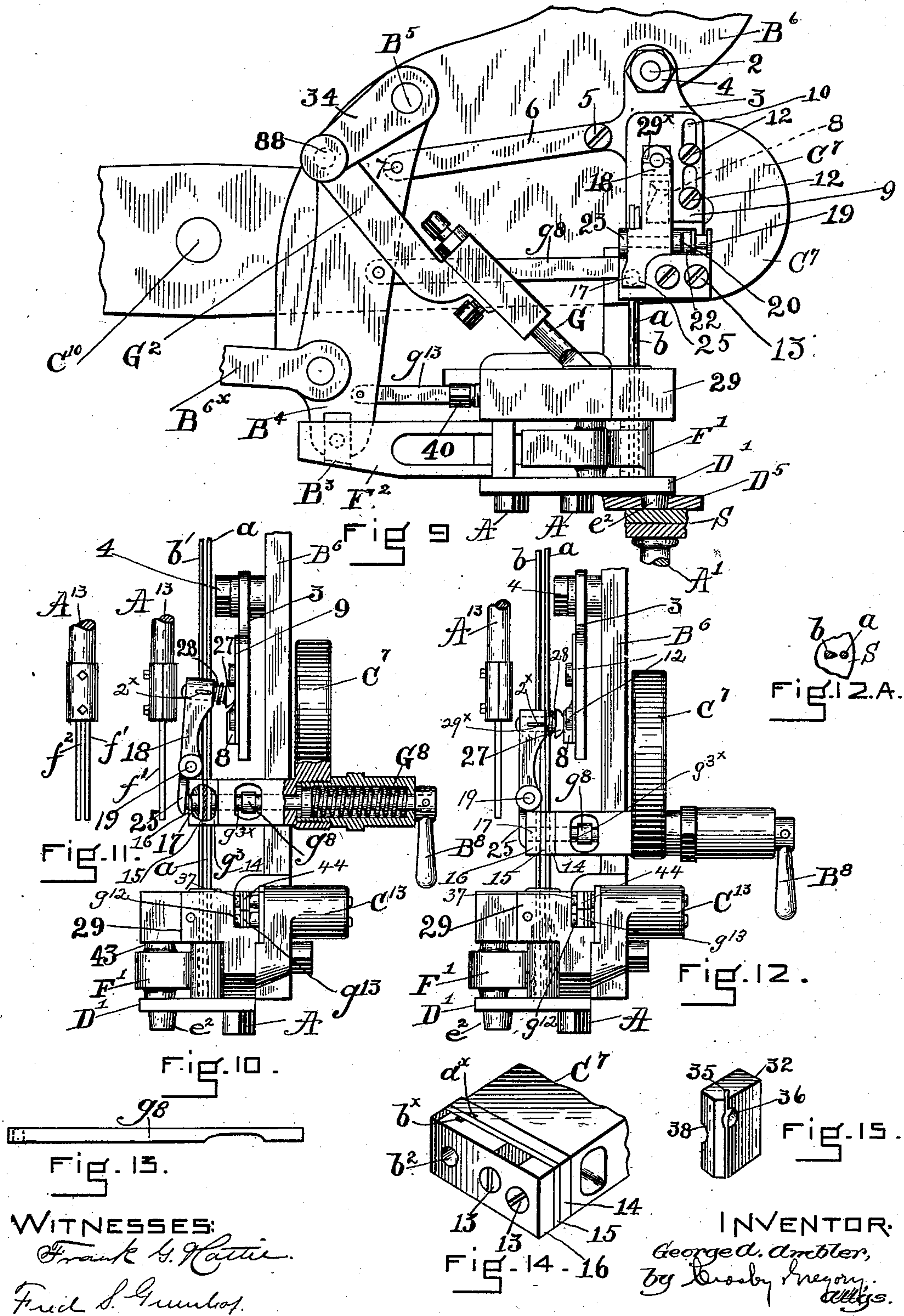
George A. Ambler,
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WITNESSES:
Frank G. Hattie.
Fred S. Grumbot.

INVENTOR:
George A. Ambler,
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UNITED STATES PATENT OFFICE.

GEORGE A. AMBLER, OF NEWARK, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED SHOE MACHINERY COMPANY, A CORPORATION OF NEW JERSEY.

MACHINE FOR INSERTING FASTENINGS.

SPECIFICATION forming part of Letters Patent No. 722,659, dated March 17, 1903.

Application filed September 11, 1899. Serial No. 730,161. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. AMBLER, of Newark, county of Essex, State of New Jersey, have invented an Improvement in Machines for Inserting Fastenings, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention, relating to mechanism for inserting fastenings in stock supported upon a horn, is represented as embodied upon a form of machine represented in United States Patent No. 447,358, dated March 3, 1891, I having
15 chosen that machine as one well suited to illustrate my invention in one practical form.

My improved machine is adapted for inserting simultaneously not only a fastening to extend substantially through the stock, but also
20 a slug to extend partially through the stock, and herein the fastening and the slug material are of different shape in cross-section, and they may be fed for different distances to thereby form a fastening and a slug varying
25 in length one from the other. The blocks carrying the guideways for the fastening material and the slugging material are made separate, and each one is provided with a groove of suitable cross-section, one for the wire and
30 the other for the slug, and these blocks are confined in the working head. The working-head block contains two holding-grippers, one cooperating with and holding the fastening material and the other the slugging material,
35 while the feeding-grippers rise to grasp the material preparatory to feeding it for the proper length. Each of the holding-grippers in the head-block is operated by an independent actuating device under the control of a
40 lever deriving its movement from the usual feed-actuating lever. It is essential that the grippers be independent of each other in order that each may adapt itself to any variations in thickness of either the fastening material
45 or the slugging material, such variation at times existing in the fastening material and the slugging material. The gripper engaging and feeding the fastening material is substantially the same as described in said pat-

ent; but to feed the slugging material I have 50 added an extra gripper, which derives its movement from a gripper-actuator represented herein as an arm or device adapted to swing about a horizontal fulcrum, the lower end of said gripper-actuator being adapted to 55 meet the outer end of the gripper engaging the slugging material, the upper end of said actuator being represented as provided with a spring-controlled foot, the said gripper-actuator rising and falling with a main lever 60 common to said patent.

The present machine contains a main slide common to the patent referred to, provided with a switch or device which is adapted in its movements to operate at the proper time 65 the gripper-actuator, said switch having, as herein represented, a cam block or toe, which is made adjustable in its position to thereby adapt the gripper-actuator to move the gripper cooperating with the slugging material 70 sooner or later in the downward movement of the main lever, the higher the toe the longer the slug to be formed, and vice versa. The switch occupies its operative position when the main lever descends to feed the fastening 75 and the slugging material; but ordinarily the feeding-gripper which engages the slugging material acts later than the gripper which engages the fastening material. The main lever carrying the said feeding-grippers having 80 completed its downstroke and the holding-grippers having engaged the fastening and slugging material, the main lever must be raised to its starting-point, and at such time the switch referred to is automatically moved 85 aside into its inoperative position; so that the gripper-actuator referred to is not moved.

The machine herein to be described is adapted to insert a fastening of the proper length in the stock of varying thickness, such variation 90 in length being controlled, as provided for in said patent, by the descent of the main slide carrying the foot-plate. Said main slide descends upon and clamps the work preparatory to inserting a fastening or a slug therein, the 95 foot-plate resting in practice upon a so-called "foot-lift" common to said patent and against the under side of which may act any shoe-

feeding means, preferably such as provided for in said patent. The foot-plate is always raised a sufficient distance from the surface of the stock, resting, preferably, on a rigid horn or stock-support to enable the shoe-feed to operate.

Figure 1 represents a left-hand side elevation of a sufficient portion of the machine referred to in said patent with my improvements added to enable my invention to be understood, said figure also showing a part of the usual rigid horn or stock-support and a portion of the usual foot-plate, the main slide carrying the working head and foot-plate being in its most elevated position; Fig. 1^A, a detail showing the stud 19 removed. Fig. 2 is a front elevation of the parts represented in Fig. 1. Fig. 3 is a detail showing in plan view the chief part of the working head and parts carried by it, a sleeve thereof being in section to represent the parts within it. Fig. 4 is a detail in top view of the removable blocks for guiding the fastening and the slugging material, said blocks being removed from the slot of the head. Fig. 5 is a section in the line *x*, Fig. 3. Fig. 6 is a perspective view of the actuator for the gripper which holds the slugging material while the main lever descends to feed said material. Fig. 7 is a detail showing the carrier or transferrer for taking the cut-off fastening and slug and putting them into driving position. Fig. 8 is a much enlarged detail showing a part of a slugging-material guide-block which is carried by the transferrer. Fig. 9 is a view similar to Fig. 1, it being supposed that the main slide has descended to meet the stock on the horn, the switch having been put into its operative position ready to move the gripper-actuator during the further descent of the main lever. Fig. 10 is a front view of the part represented in Fig. 9, some of the parts being partially broken out, said figure, as also Fig. 2, showing the driver-bar and one of the drivers. Fig. 11 is a separate detail showing part of the driver-bar with its two drivers. Fig. 12 is a view similar to Fig. 10, showing the main lever C⁷ as moving down or to have substantially completed its downstroke, the position of the foot of the gripper-actuator varying with relation to the cam carried by the switch according to variations in the thickness of the stock. Fig. 12^A is a horizontal cross-sectional detail of the slug and the fastening device. Fig. 13 is a top view of the cam-slide *g*⁸ for actuating the feeding-gripper which engages the fastening material. Fig. 14 is a detail showing the guide for holding and feeding the fastening and slugging material, together with a part of the main lever, the ear supporting the gripper-actuator shown in Fig. 6 being in section; and Fig. 15 shows detached from the head-plate that one of the guide-blocks which receives and controls the slugging material.

Referring to the drawings, B⁶ represents a part of the main slide, to the lower end of

which are connected, by suitable bolts A, the foot-plate D' and the working head-block 29, the carrier or transferrer F', mounted upon the stud F, rising from the foot-plate and entering the said block; the cam-slide F² for moving said transferrer and deriving its movement from the loose block B³, pivoted on a lever B⁴, fulcrumed at B⁵ on the main slide B⁶, the said block entering a notch in the cam-slide F² and said lever B⁴ deriving its movement from a suitable link B^{6x}, attached in practice to a suitable moving device—as, for instance, a lever, (not shown)—for moving the shoe-feed; the cam-bars *g*¹³ and *g*⁸ for actuating, respectively, the holding-gripper *g*¹² and feeding-gripper *g*^{8x}, cooperating with the fastening material *a*; the driver-bar A¹³, having suitable drivers, to be described; the main lever C⁷ and the foot-lift D⁵, (partially shown in Figs. 1 and 9,) the pointing-tool G and its carrying-arm G², pivoted at 88, and the horn A' are and may be all substantially as described in said patent, with the exception of the lever B⁴, pivoted at B⁵ and actuated by the link B^{6x}. The devices herein referred to do not depart, essentially or materially, therefrom, with the exception of the lever B⁴, pivoted at B⁵ and actuated by the link B^{6x}; but said parts are not herein claimed. The devices so far referred to specifically may be operated all as provided for in said patent, and inasmuch as such devices and one form of operative means therefor are fully disclosed in said patent I need not herein more specifically describe the same. In practice it will be understood that the foot-lift D⁵ rests on and clamps the stock between it and the horn while the fastening and slug are being driven into the stock, and at the same time the foot-plate rests on the upper side of the foot-lift, a feeding device having a feeding movement imparted to it engaging intermittently the edge of the stock and feeding it over the horn after the foot-lift has been raised from the stock to unclamp the same, all as provided for in said patent. The foot-plate connected with the main slide is or may be raised by such mechanism to a defined point no matter what the thickness of the stock, and at such time the foot-plate breaks contact with the foot-lift, but said main slide and foot-plate descend upon and meet the upper side of the foot-lift after each feeding operation, thereby to adapt the foot-plate to the thickness of the stock which is about to receive fastenings or slugs and which at such time is lying between the foot-lift and the top of the horn. The main lever C⁷, which carries the feeding-grippers, may have imparted to it a uniform downstroke, and it will act to feed the end of the fastening material and slugging materials into the respective guideways of the working head-block for a greater or less distance, that depending upon the position occupied by the working head, which in turn is determined by the thickness of the stock, the said material being fed for

a greater distance in the said guideways, as the stock S, resting on the horn, is of increased thickness, as thereby the working head occupies a position farther from the top of the horn. I will now proceed to specifically describe my improvements added to said well-known machine.

I have provided the main slide with a suitable screw-stud 2, upon which I have mounted a switch or device 3, it being free to swing on said stud, but being prevented from escaping therefrom by a nut 4, screwed onto said stud. The switch 3 has jointed to it at 5 a link 6, in turn pivoted at 7 to the lever B⁴. The switch has mounted upon it adjustably a cam or toe 8, represented as extended from a plate 9, slotted at 10 to receive suitable set-screws 12, said slots providing for adjustment of said toe vertically on or with relation to said switch, such adjustment being required in order to control the length of the slug to be made, the adjustment of the plate and toe downwardly from the position shown in Figs. 1 and 9 increasing the length of the slug to be made.

The main lever C⁷ has a laterally-extending lug, to which are connected by screws 13, as herein represented, (see Figs. 2, 10, 12, and 14,) three steel plates 14, 15, and 16. The plate 14 has a guideway a^x for the fastening material and a hole intersecting said guideway, through which may operate the usual gripper g^{3x} for engaging said fastening material to cause it to be fed by the lever C⁷. The gripper g^{3x} is common to the patent referred to and is actuated by the cam-shaped end of the cam-bar g⁸. The plate 16 has a guideway b^x for the slugging material b, which has a different cross-section from that of the fastening material. Herein the fastening material is represented as round, (see Fig. 12^A,) and alongside of it the slugging material is represented as triangular in cross-section; but it will be understood that the cross-section of the slugging material may be varied at will, according to the necessities or requirements of the user of the machine, so that the slug can be readily distinguished from the fastening, the slug being used ordinarily for ornamenting the work, although it possesses other advantages in more securely fastening the work and adding to the wearing qualities of the stock. The plate 15 is interposed between the plates 14 and 16, said plate covering the otherwise open side of each guideway a^x and b^x. The plate 16 has a hole b², (see Fig. 14,) in which is inserted the gripper 17 (shown in Fig. 10 by full lines and in other figures by dotted lines) for feeding the slugging material, said gripper having a loose fit in said hole, the inner end of the gripper bearing against the slugging material, while the outer end of said gripper is acted upon intermittingly by a gripper-actuator 18, (shown detached in Fig. 6,) said actuator being pivotally mounted upon a removable pin 19, said pin having a head, as

represented in Figs. 1 and 9, which may be engaged by the operator when it is desired to withdraw the pin and remove the actuator, said pin (see Fig. 1^A) having an annular groove 21, which may be entered by a suitable locking device, (represented only in Figs. 1 and 9,) as a spring 20, said locking device holding said pin in its operative position. The pin is extended through suitable ears 22 and 23 of the plate 16, (see Fig. 1,) said ears being in section in Fig. 14. The gripper-actuator 18 (see Fig. 6) has a hole 24 for the reception of its pivot-pin 19, and below said hole there is a short arm 25, which coöperates with the outer end of the gripper 17, said actuator at its rear end, near said hole, being cut away, as at 26, to afford a free passage for the slugging material. The upper end of the actuator 18 is bored and receives the shank of a plunger 27, cam-shaped at its face and surrounded by a spring 28, the shank of the plunger being retained in the upper end of the actuator by a suitable pin 29^x, (see Figs. 1, 6, and 9,) which extends from the plunger through slots 2^x in the actuator. The working head-block 29 (see Fig. 3) is slotted and receives in it three steel blocks 31 32 33. The block 31 is bored diagonally and receives the lower end of a pointing-tool G, the purpose of which is to provide with a point the leading end of the fastening material a, from which the next fastening is to be made. After the fastening has been made it is cut off from the strand of the fastening material by a movement of the transferrer, and when the fastening is driven the point is clenched on the top of the horn. The pointing-tool G, which is common to the patent hereinbefore referred to, is adjustably secured in a tubular part of a lever G², which is mounted loosely upon the stud 88, contained in an arm 34, which forms part of the lever B⁴. The block 32 (shown detached in Fig. 15, see also Fig. 4) has in one face a longitudinal groove 35, which is substantially the same shape as the slugging material. The block has also a hole 36 intersecting said slot and in which works the gripper 37, employed to hold the slugging material from upward movement while the main slide and feeding-grippers, the latter being at such time released from the material, are being raised preparatory to reengaging the material and feeding it again. Said gripper 37 is actuated by a cam-bar 44, shown as pivoted at 50 on the bar g¹³, and reciprocated in unison therewith. The block 32 has at one side a keying-groove 38, which receives a key 38^x. (Shown by dotted lines in Fig. 3.) The block 33 (see Fig. 4) has a longitudinal groove 39 for the reception of the fastening material a, the said groove being closed by one end of the block 31, before referred to. This block 33 also has at one side a groove like the one 38 in the block 32, in which is also entered the said locking-key 38^x. The blocks 31, 32, and 33 are further clamped in position by means of a suitable set-screw 40, Fig. 5.

The transferrer F' in external shape substantially resembles the transferrer in the said patent; but herein the outer end of the transferrer is provided with a bore which receives in it two die-blocks c and d . The die-block c is provided with a passage 39^x for the reception of the free end of the fastening material to be made into a fastener, while the block d has a groove d' , shaped to receive the slugging material, here shown as V-shaped, said die-blocks being held in the bore of the transferrer by a suitable set-screw, as 41, block d having a lip d^2 to rest on the transferrer. These die-blocks may be changed when desired to adapt them to the size or shape of wire to be used. The ends of the fastening material and the slugging material having been fed into the passages of the die-blocks in the transferrer F' , the latter is at the proper time moved in the direction of the arrow, Fig. 7, the upper ends of the die-blocks in the transferrer during such movement cooperating with the lower ends of the blocks 32 and 33 to cut the wire-like materials and form therefrom fastenings and slugs, they being of the same or of differing length, as may be desired, and in the further movement of said transferrer the openings in the said die-blocks containing the fastening and the slug are brought, respectively, over the openings c^2 and d^2 , respectively, in the usual nose e^2 , carried by the foot-plate, and thereafter in the regular operation of the machine the driver-bar A^{13} is thrown down, as provided for in said patent, causing the two drivers f' and f^2 , they entering, respectively, the passages 39^x and d' , to drive the fastening and slug therefrom through the holes c^2 and d^2 into the stock S , which may be a part of a boot or shoe, said stock being supported upon the horn or post A' .

The machine herein described will have an awl-bar such as provided for in said patent, it containing suitable awls to penetrate the stock and pass through the holes c^2 and d^2 in the nose e^2 when the transferrer is in the position Fig. 3.

Fig. 1 shows the main lever C^7 in its elevated position, and also it will be supposed that the main slide B^6 is in its elevated position, and at such time the switch 3 is in its inoperative position. Now as the machine is started the foot-lift D^5 descends on the stock, and at the same time or immediately thereafter the main slide B^6 descends until the nose e^2 contacts with the stock S through the usual hole in the foot-lift D^5 , and during this movement the switch is turned to the left, as represented in Fig. 9, putting the upper cam-shaped end of the toe 8 in a position immediately under the cam-shaped end of the plunger 27, as represented in Fig. 10. During this movement the lower end of the lever B^4 will be moved to the left from the position Fig. 1 into the position Fig. 9, removing the cam-shaped end of the slide-bar g^{13} from its operative contact with the outer end of the

usual gripper g^{12} , cooperating with the fastening material a , and at the same time the auxiliary cam-bar 44 will be retracted from its operative contact with the gripper 37, herebefore described, which acts to hold the slugging material. After the main slide has completed its descent, that varying according to the thickness of the stock, the main lever C^7 in the further movement of the machine is turned about its fulcrum c^{10} and its right-hand end is lowered. When the lever B^4 was put into its position Fig. 9, the slide-bar g^8 by its cam-face (see Fig. 10) met the usual feeding-gripper g^{8x} and caused it to be operated to grasp the fastening material, so that when the outer or right-hand end of the main lever C^7 is lowered said feeding-gripper engaging the fastening material will move the latter in unison with it and the free end of the fastening material will enter the guideway 39 in the block 33 and also the passage 39^x in the die-block c of the transferrer F' . The slugging material must also be fed during the downward movement of the right-hand end of the main lever C^7 ; but in the position which the toe 8 is herein shown as occupying the feeding of the slug material will not be commenced simultaneously with the feeding of the fastening material, but at a later period—that is, the feeding will not commence until the main lever C^7 shall have descended from the position Fig. 10 far enough for the plunger 27 to meet the upper or cam-shaped end of the toe 8; but as soon as said plunger meets said toe then the gripper-actuator 18 will be turned, as shown in Fig. 12, to cause the feeding-gripper 17 to meet the slugging material and thereafter feed it in unison with the fastening material, said slugging material entering the hole 35 in the block 32 and the groove d' in the die-block d . The ends of the fastening material and the slugging material having entered the transferrer for the required distances according to the lengths desired for the fastening and the slug, the movement of the transferrer, as stated, will cut off both said materials and put the fastening and slug in position to be driven, as stated. Fig. 12 shows the main lever in its lowest position and with the feeding-grippers in engagement with the fastening and slugging material. Now in the further operation of the machine, the fastener and the slug having been driven from the transferrer, the transferrer must return into its normal position, Fig. 3, and the fastening material and slugging material must be held clamped while the main lever C^7 is raised, taking with it the feeding-grippers 17 and g^{8x} , and at such time these upper or feeding grippers are loose on and slide over the said materials, which are then held by the lower or holding grippers g^{12} and 37. If the switch occupied the position represented in Figs. 9 and 12 when the main lever C^7 is raised to raise the feeding-grippers, the gripper for the slugging material could not be released, so to provide

for this the switch is thrown to the right, as represented in Fig. 1, as the position of the lever B^4 is changed to cause the lower grippers g^{12} and 37 to grasp and hold the said materials, and consequently the plunger, no longer held by the base of the toe 8, flies out toward the switch 3 at one side of the toe, leaving the gripper 17 free and unclamped with relation to the slugging material, and the slide-bar g^8 is moved also in the proper direction to enable it to free the feeding-gripper g^{3x} , coöperating with the fastening material. In this condition, Fig. 1, the plunger may rise to a point above the upper cam-shaped end of the toe 8, and thereafter the switch will again be moved, as hereinbefore described, from the position Fig. 1 into the position Fig. 9. This operation will be repeated while the machine is in action.

The back of each cam-bar g^{13} and g^8 , as well as the auxiliary bar 44, added by me to the bar g^{13} , will each be acted upon by a suitable spring-pressed pin, as C^{12} , said pin being extended through a suitable sleeve, as C^{13} , said sleeve receiving a spring or springs C^{14} , one for each pin. The cam-bar 44 is free to move laterally with relation to the cam-bar g^{13} , according to any variations in thickness of the slug material acted upon by the gripper 37.

If at any time it should be desired to remove the pressure of the feeding-gripper g^{3x} , acting on the fastening material, I may do so by turning the handle B^8 , represented as pivoted upon one end of the spring-pressed rod G^8 , which acts against the cam-bar g^8 . The pressure on this spring-pressed rod or pin is released when it is desired to introduce the fastening material, and to introduce the slugging material I preferably withdraw the pin 19 and remove the actuator 18. As already explained, this can readily be done, and by providing for the introduction of the slugging material in this way I am enabled to secure a greater compactness of parts than would otherwise be possible.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for driving fastenings and slugs, feeding-grippers to grasp the fastening and slugging materials, a suitable carrier therefor, and means arranged to cause said feeding-grippers to engage said materials at different times during the feeding stroke.

2. A machine for inserting fastenings and slugs formed from wire or like continuous material comprising a gripper for engaging and feeding the fastening material to make a fastening of a length to penetrate the stock, and a gripper for engaging the slugging material and feeding it for a less distance to form a slug shorter than said fastening combined with mechanism for simultaneously driving said fastening and said slug.

3. A lever carrying two feeding-grippers, one coöperating with fastening material and

one with slugging material, and means to effect the engagement of the former with the fastening material before engaging the latter with the slugging material, whereby the fastening material is fed for a greater distance than the slugging material.

4. In a machine for inserting fastenings, a feeding-gripper for the slugging material, a lever carrying said gripper, and an actuator for engaging said feeding-gripper; combined with a switch or device having a cam and made adjustable to cause said gripper to engage the slugging material at any desired part of the downstroke of said lever.

5. A main slide, a feeding-gripper for the slugging material, a carrier therefor, means to move said carrier, a gripper-actuator, and means movable with said main slide to cause said gripper-actuator to actuate said gripper to engage and feed the slugging material.

6. A feeding-gripper, a carrier therefor, means to move said carrier, a gripper-actuator, a cam and means to interpose it intermittingly in the path of the gripper-actuator as the latter is being moved to feed the material, said cam closing the gripper.

7. A feeding-gripper, a carrier therefor, means to move said carrier, a gripper-actuator, and a device having an adjustable cam adapted to be interposed in the path of movement of the gripper-actuator at each descent thereof to move said gripper-actuator.

8. In a machine for inserting fastenings, a feeding-gripper, a carrier for it, a gripper-actuator, a switch provided with an adjustable cam, and means to move said switch into its operative position to effect the closing of the grippers on the material to be fed during the descent of the carrier and then to put the switch into inoperative position as the carrier rises.

9. In a machine for inserting fastenings, a transferrer bored vertically at one end combined with two die-blocks fitted in said bore, one of said die-blocks having an opening for the reception of a fastening, the other of said die-blocks having a groove of a cross-section suitable to receive a slug, said last-mentioned die-block having a flange to rest upon and be supported by said transferrer.

10. In a machine for inserting fastenings and slugs, a movable carrier provided with two feeding-grippers, one to grasp fastening material and the other slugging material, a slide-bar to actuate the gripper for grasping the fastening material and an independently-moved actuator for closing the feeding-gripper on the slugging material, said grippers moving toward each other in their gripping movement.

11. A carrier, a plate mounted thereon having a guideway for slugging material, a feeding-gripper located on said plate and adapted to engage said slugging material; a lever to actuate said feeding-gripper, said lever being pivoted on said plate above the guideway for the slugging material and provided with

a spring-pressed head and adapted to be actuated to close said gripper upon said slugging material as said carrier is depressed in its feeding operation.

5 12. In a machine for inserting fastenings, a head-block provided with a plurality of holding-grippers adapted to engage fastening and slugging material, and two separate cam-bars, one to actuate each of said holding-
10 grippers whereby the latter are enabled to adapt themselves to any variations in thickness of the material engaged by them.

13. In a machine for inserting fastenings, a block provided with a guideway for slug-
15 ging material, a feeding-gripper movable in

said block to engage said material, a gripper-actuator made as a lever and a removable pivot upon which said gripper-actuator is mounted, the withdrawal of said pivot enabling the gripper-actuator to be removed 20 for the ready insertion of the slugging material in the guideway of said block.

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

GEO. A. AMBLER.

Witnesses:

JOHN C. EDWARDS,

FREDERICK L. EMERY.