D. N. PRIME.

FASTENER SETTING MACHINE.

APPLICATION FILED JUNE 14, 1911.

1,136,166.

Patented Apr. 20, 1915.

4 SHEETS—SHEET 1.

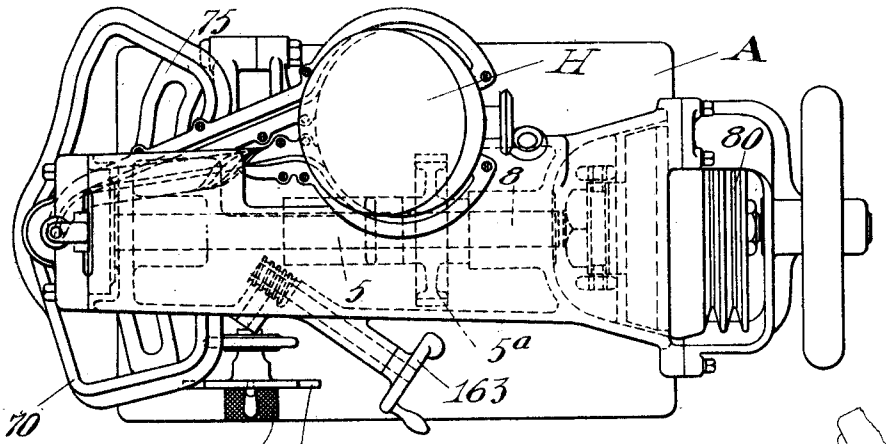


Fig:1.

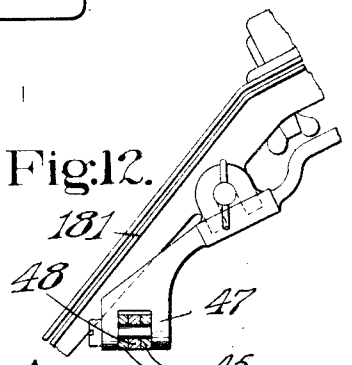


Fig:12.

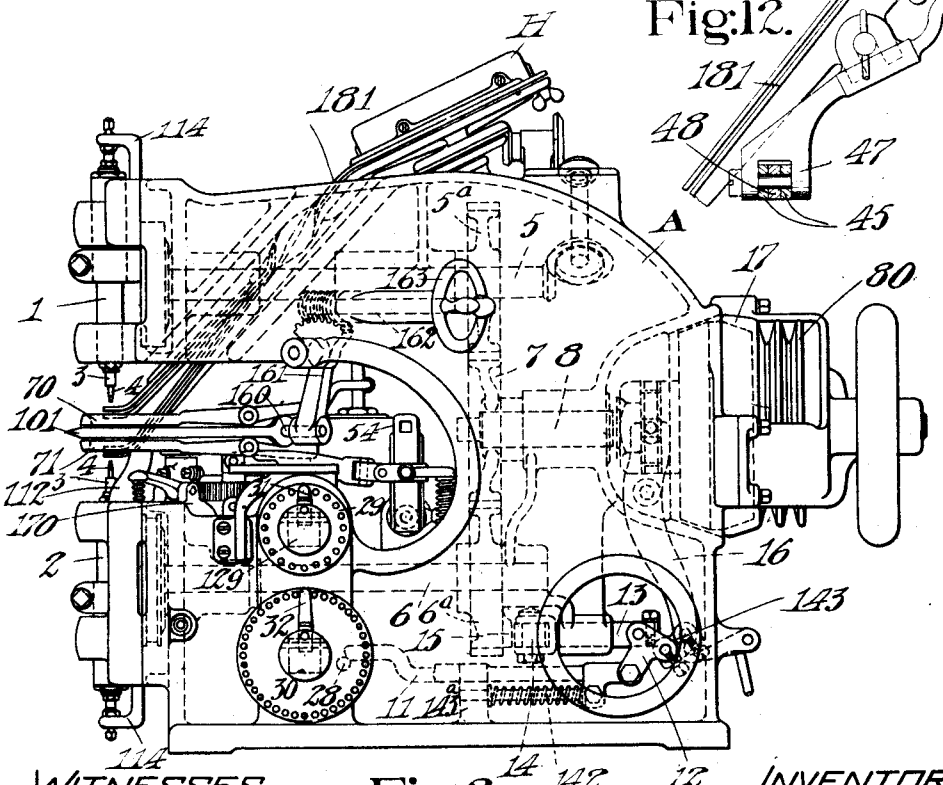


Fig:2.

WITNESSES

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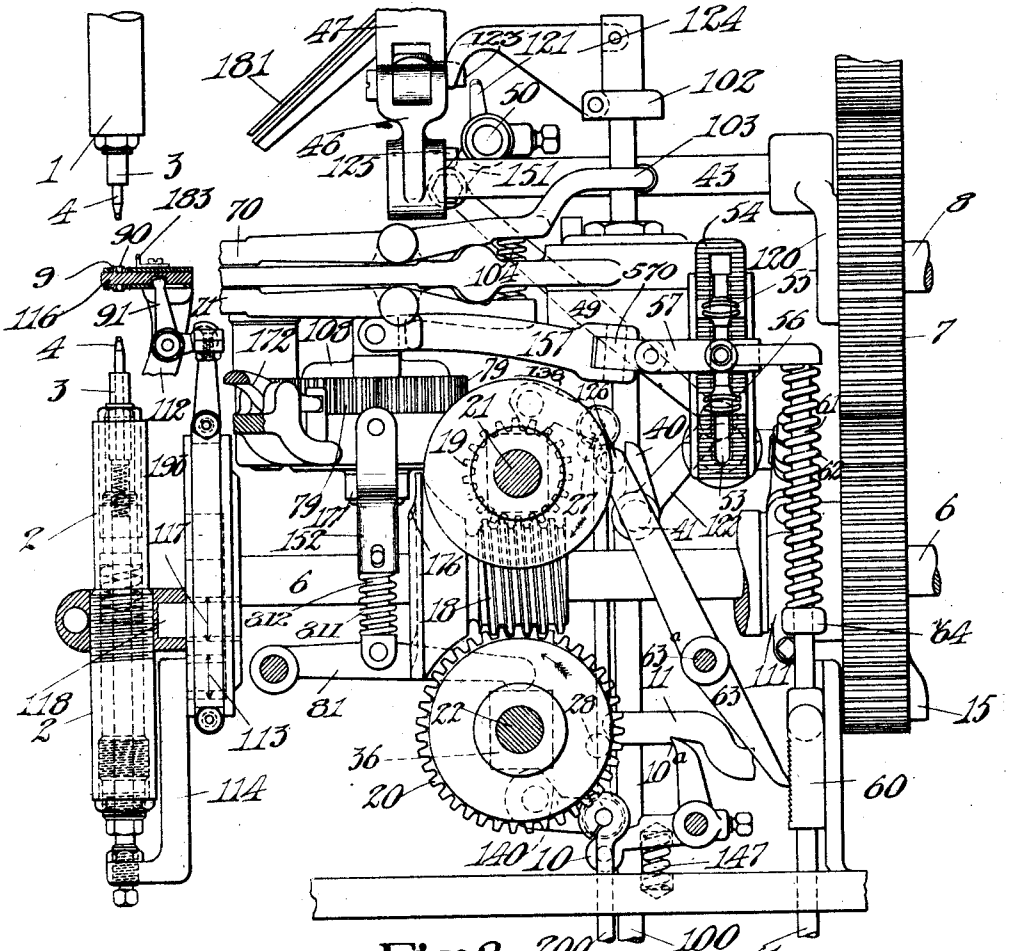


Fig. 3.

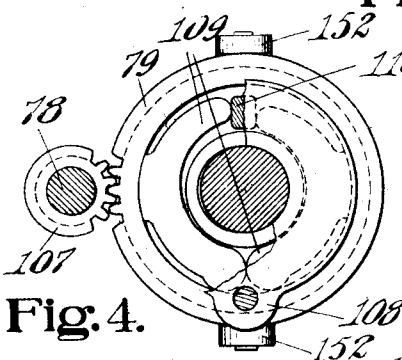


Fig. 4.

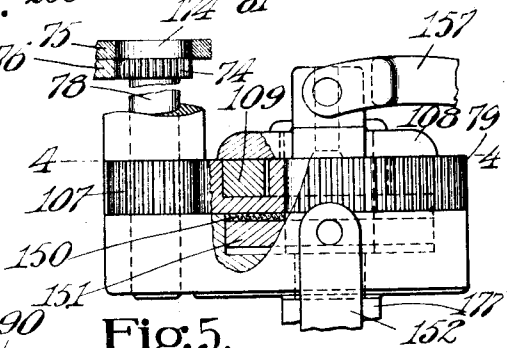


Fig. 5.

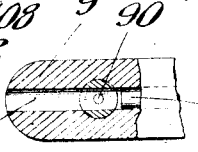


Fig. 13.

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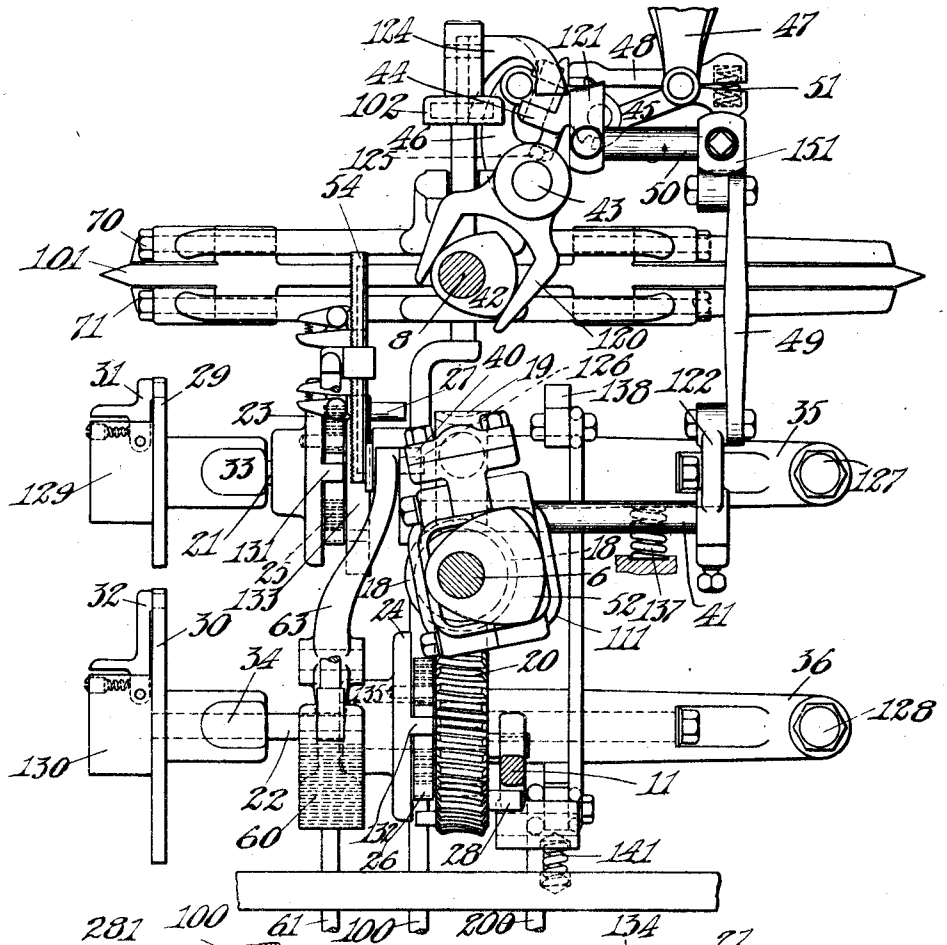


Fig.7.

Fig.8.

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4 SHEETS—SHEET 4.

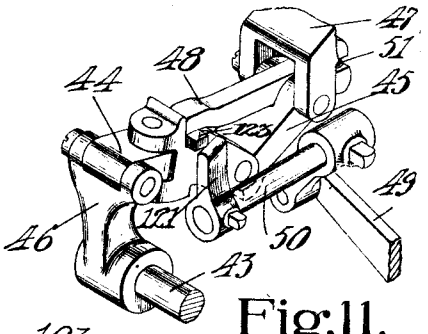


Fig:11.

Fig:9.

Fig:10.

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UNITED STATES PATENT OFFICE.

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FASTENER-SETTING MACHINE.

1,136,166. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed June 14, 1911. Serial No. 633,130.

To all whom it may concern:

Be it known that I, DANIEL N. PRIME, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Fastener-Setting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for setting fasteners in stock, and more particularly to machines for setting eyelets, lacing hooks or similar devices in the uppers of boots and shoes.

The invention will be shown and described herein as embodied in a machine of the duplex type by which two eyelets are set simultaneously in the opposite edges of an upper; some features of the invention, however, are not necessarily limited to use with this type of machine but are applicable to machines which set one or many eyelets, or other similar fasteners, at each operation.

One of the objects of the invention is to provide highly efficient mechanism for performing the various operations incidental to the use of a machine of the class referred to, which will be entirely automatic in its action and hence require a minimum amount of attention on the part of the operator, and which may be caused to run at a high rate of speed so as to materially increase the output of the machine as compared with others of its type.

With these and other objects in view, an important feature of the invention comprises mechanism for setting eyelets or similar fasteners in the uppers, and after a number of eyelets have been set, for automatically discontinuing the supply of eyelets and punching holes for the reception of lacing hooks, following which the machine is caused to stop. As it is usual to space the lacing hooks a greater distance apart on the upper than the eyelets are spaced, the machine herein shown is provided with means for determining one spacing for the eyelets, and another spacing for the holes which are to be punched to receive the lacing hooks, and the extent of each of these spacings is adjustable, and may be determined in advance of the operation of the machine in accordance with the requirements of the work. The setting devices are supplied with eyelets by raceways from the usual hoppers, and said raceways are given movements toward and from the setting devices to permit the spindles of such devices to pick off eyelets prior to the setting operations. When the change is made in the spacing, simultaneously therewith, the raceways have their paths of movement so altered that the reciprocations imparted to them do not cause them to move sufficiently far to supply eyelets to the sets. Upon the continued operation of the machine, therefore, while the punches form holes in the stock no eyelets will be set but the holes punched will be at an increased distance apart to receive the lacing hooks, the machine coming to rest when a predetermined number of such holes have been punched. All of the above described operations are performed automatically after the operator has started the machine. The lacing hooks are usually applied on a different machine, or by hand, in a subsequent operation.

In order to determine the number of eyelets which the machine will set before the supply of eyelets is suspended, and also the number of holes which will be punched for hooks subsequent thereto, another important feature of the invention is comprised in improved mechanism for enabling the operator to independently control these operations by simple adjustments prior to starting the machine.

Another important feature of the invention comprises an improved form of work clamp for holding the two quarters of an upper in position for the operation thereon of the punching and setting devices. As herein shown the two quarters of a folded upper are maintained by the work holder spaced apart with their edges oppositely disposed and in substantially parallel relation so that the corresponding fasteners may be set simultaneously in the two quarters in the precise opposite relation which it is so important to secure. It is believed that a work holder adapted to clamp both sides of a shoe upper and present them simultaneously in position to be operated upon by two alined pairs of punches, setting devices or other tools has never before been employed in a fastener setting machine, and it will be understood that its use is not limited to the particular machine herein illustrated.

The work clamp or holder in the preferred embodiment of the invention, comprises an intermediate member, and hinged clamping members on each side thereof which are provided with geared, or other connections, so as to open and close simultaneously to permit the insertion and removal of the work upon the actuation of one of said members, and are normally held in clamped relation to the intermediate member by a spring. As herein shown, the clamp or holder is advanced between the successive operations of the machine and to this end it is provided with a rack whose teeth are arranged in a path corresponding with the line of the edge of the upper along which the eyelets are to be set, and a driven pinion in mesh with the rack is provided for actuating the holder.

As it is usual to set the two lowermost eyelets with a greater "spread" than the others, an important feature of the invention consists in mechanism for so positioning the clamp, preliminary to the setting operation, that the first two eyelets in both flaps will occupy a greater distance from the edge of the upper than those eyelets which are set subsequently thereto.

Still another feature of the invention is comprised in an improved form of anvil or die for coöperating with both the punches and sets as they perform their respective operations upon the two flaps of an upper. This consists of a block having its two opposite faces formed as setting dies to cooperate with the axially alined eyelet sets, and also provided with a central bore which serves as a punching die and communicates with a transverse passage into which the punchings are forced. The transverse passage contains a plunger which is actuated appropriately to eject the punchings from said passage.

Other features of the invention, including important details of construction and combinations of parts, will be hereinafter more particularly described and claimed.

In the drawings: Figure 1 represents a plan view of a machine embodying the present invention; Fig. 2 shows the machine in side elevation; Fig. 3 is a view in side elevation, somewhat enlarged, showing the principal operating parts of the machine, the frame being omitted for clearness of illustration; Fig. 4 is a sectional plan view of the one-way clutch on the dotted line 4—4, Fig. 5; Fig. 5 is a side elevation, partly in vertical section, of the clutch shown in Fig. 4; Fig. 6 is a sectional elevation, taken at right angles to Fig. 3, and looking toward the left; Fig. 7 is a detail view in vertical longitudinal section through the pivotal support of the clamp, on the dotted line 7—7, Fig. 9. Fig. 8 is a detail view of the devices for controlling the spacing and the position of the raceways; Fig. 9 is a plan view of the work clamp, and associated parts; Fig. 10 is a side elevation of the parts shown in Fig. 9; Fig. 11 is a detail perspective view, illustrating the toggle for the raceway support, its latch, and the tripping means therefor; Fig. 12 is a detail view of the raceways and their support; and Fig. 13 is a detail sectional view of the die plate and ejector.

The frame A of the machine carries bearings for supporting the main driving shaft 8 upon which is a loose pulley 80 for receiving power through a belt from any suitable source. The pulley 80 is formed with a conical recess to coöperate with one face of a cone clutch 17, which is keyed to the shaft 8 so as to slide thereon while constrained to rotate with the shaft. The opposite face of the clutch is shaped to fit a tapered recess in the frame of the machine with which it engages when out of clutching engagement with the loose pulley, and a suitable spring bears upon the clutch and normally tends to move it into engagement with the pulley, in a manner common with clutches of this type. The clutch is operated through a shipper lever 16, which is fulcrumed to the frame and has pivotal connection at its lower end with one member 143 of a toggle. The other member 12 of the toggle is pivoted to one end of a rod 13 which is slidably mounted in the machine frame and carries at its other end a cam roll 14, to be operated by a cam projection 15 carried by a gear 6^a, which is fast to a shaft 6 carried by bearings in the frame. The toggle member 12 also has an arm to which is pivotally connected a bar 11, and an arm on this bar carries a rod 142 which slides through a perforation in a bracket 143^a and is surrounded by a spiral spring which bears against the bracket and normally tends to force the bar 11 to the right, as these parts appear in Fig. 2.

The main shaft 8 carries at its inner end a gear 7 which meshes with a gear 5^a carried by a shaft 5 which is supported by bearings in the machine frame, and said gear 7 also meshes with the gear 6^a, heretofore described. The forward ends of the shafts 5 and 6 carry cam blocks which are provided with cam ways 113 and 117, as indicated by dotted lines in Fig. 3 on the cam block carried by the shaft 6. Two hollow plungers 1 and 2 are guided in vertical alinement for reciprocating movements in suitable brackets carried by the frame A, and carry cam rolls 118 which fit the cam grooves 117, said grooves being shaped to effect reciprocating movements of the plungers when the shafts 5 and 6 are rotated. The plungers contain the eyelet sets 3, 3, which are mounted to slide in passages therein and are normally pressed outward by springs which are

adapted to yield in the usual manner of such sets. Slidably mounted in the sets 3, 3, are the punches 4, 4, which are also yieldingly supported, and arms 114 connected with the punches carry cam rolls which enter the cam ways 113 and are thereby reciprocated in proper time relation to the reciprocating movements of the sets 3, 3, the punches being arranged in vertical alinement. The cam ways are so designed that the punches will be advanced first to pick off two eyelets from the ends of the raceways and then to punch two holes in the opposite edges of the quarters, following which the punches will be held stationary while the sets advance and set the eyelets in the opposite edges of the two flaps of an upper. As shown in Figs. 3 and 13, a bracket 112, fast to the frame A, supports a stationary anvil plate 9 having upon its upper and lower faces upsetting dies to coöperate with the sets 3, 3, in clenching the eyelets, and passing centrally through these dies is a bore 90 which serves as a die for the punches. A transverse passage 115 in the anvil intersects the bore 90, and a plunger 116 is connected through a bell crank 91 with a yoke cam 190 on the shaft 6, and is thereby reciprocated to eject the material which is forced by the punches through the bore 90 into the passage 115.

The eyelets are contained in a hopper H which may be provided with any desired rotary agitating and discharging mechanism to be driven by geared connections from the shaft 5, as indicated by dotted lines in Fig. 2. Two raceways 181 conduct the eyelets from the hopper to the sets, the end of one of said raceways being located below the anvil 9 in position to supply eyelets to the lower set, and the end of the other raceway being located above the anvil in position to supply eyelets to the upper set, as shown in Fig. 2. The raceways are supported by a bracket 47 which is pivotally connected at its lower end to a toggle link 45, as shown in Figs. 6 and 11. The other link 44 of this toggle is pivotally connected to the upper end of an arm 46 which is carried by the forward end of a rock shaft 43, sustained by bearings in the frame of the machine. At its rear end the shaft 43 is provided with a forked lever 120, which embraces a cam 42, fast on the shaft 8, and is thereby oscillated. The oscillation of the shaft 43 and arm 46 serves to move the raceways toward and from position for delivering eyelets to the punches 4, which act as spindles for the eyelet sets and pick eyelets from the ends of the raceways prior to the setting operation. Under normal conditions, the toggle 44, 45, is held rigidly in a broken condition by a spring-pressed latch bar 48 which extends from the pivotal support of the bracket 47 and engages a slot in the link 44, as shown in Fig. 11. The latch bar is pressed into engagement with the slot by a compression spring 51, which also acts upon an extension of the link 45 and tends to straighten the toggle. When the toggle is permitted to straighten, by means to be hereinafter described, the bracket 47 and raceways 181 are moved bodily toward the right and, while the oscillation of the raceways continues, their paths are so altered that they do not come into alinement with the sets. The latch bar 48 is provided with a lateral lug 123, and a rock shaft 50 carried by bearings in the frame A is provided with a rigid finger 121 which has a rounded upper surface, and is so located that when the shaft 50 is turned in the proper direction the finger will engage the lug and lift the latch bar 48 out of locking engagement with the link 44, thus permitting the toggle to straighten under the influence of the spring 51. The shaft 50 is provided with a rigid arm 151 to which is pivotally connected a link 49 which is in turn pivotally connected with the outer end of an arm 122 of a rock shaft 41, supported by suitable bearings in the frame of the machine. The rock shaft 41 also carries a rigid arm 40 which is arranged to be engaged by a pin 126 on an arm 63, which is pivoted at 63^a to the machine frame, and has its lower end formed as a pawl which engages the teeth of a ratchet 60 carried by a rod 61, which is guided for vertical movements by a lug 64 on the frame A. The upper end of the rod 61 is connected with a link 57, and a spiral spring 62 is confined between said link and the lug 64 and acts normally to raise the rod. The lower end of this rod is connected with a treadle, and the functions of these several parts will be more fully described hereinafter.

The work clamp, which is best shown in Figs. 9 and 10, comprises an intermediate member 101, and two separable jaws 70 and 71 which are respectively located on opposite sides of the intermediate member and are pivotally connected thereto by the pins 70^a, and 71^a. Intermeshing segmental gears 105 are carried by the jaws 70 and 71, and a spring 104 is confined between the rear portions of the jaws beyond their pivots to hold them in clamped relation to the intermediate member 101. The jaw 70 is shown as having two upwardly and rearwardly extending arms 103 which may be provided with anti-friction rolls, and a rod 100 to be operated by a treadle, passes between the arms 103 and is provided with a collar 102 which contacts with the arms when the treadle is depressed, and through the geared connection 105, effects a separation of the two clamping jaws to enable the operator to insert the work. The rod 100 is also provided at its upper end with an arm 124 which when the rod moves downward engages a projection

125 (see Fig. 3) on the link 44 of the toggle through which the raceways are actuated, and breaks the toggle to render the raceways operative. Upon a release of the pressure on the treadle, the rod 100 is raised by a suitable spring (not shown) to the position shown in Fig. 3, and the jaws of the clamp are automatically closed by their spring. The rod 100 has an offset and above this offset it slides vertically through a bore formed in a nut 72 (Fig. 7) which is in threaded engagement with an aperture in a rigid part of the frame A, and the nut is surrounded by a collar 106. The intermediate member 101 of the work clamp has a rearwardly extending arm which rests upon that portion of the frame to which the nut 72 is fastened, and said arm has a slotted portion which surrounds the collar 106, the connection between the arm and collar being such as to permit the clamp to swing about the rod 100 as a center during the feeding of the work, and also to have a slight forward and backward movement to correspond to the curvature of the slotted cam path 75, and hence to the line along which the eyelets are to be set. A spiral spring 82 connects the arm of the intermediate clamp member with the nut 72, or other fixed part, and acts normally with a tendency to return the clamp to the position which it occupies preliminary to the feeding of the work, as will be referred to later.

The following mechanism imparts the feeding movements to the work clamp, and controls the extent of such movements in order to determine the spacing of the eyelets, and of the holes which are to be punched for the eyelets and for the lacing hooks: The shaft 6 carries a cam 52 which actuates a yoke 111 connected with one arm of a bell crank lever 54, pivoted at 53 to a fixed part of the frame. The lever 54 has a vertical arm (see Fig. 10) which is provided with a slot 154 to receive two adjustable stops 55 and 56, having movable latches which are spring-actuated, so that the stops may be slid along the slot and locked in different positions by engaging teeth on the vertical arm. The link 57, heretofore referred to, is connected through a stud 190[a] which passes freely through the slot 154, with the bell-crank lever, the spring 62 acting to hold the link against the upper stop 55 except when restrained by the engagement of the pawl end of lever 63 with the ratchet 60. The link 57 is connected through a second link 570 with a third link 157, the pivots joining the links 57 and 157 with the link 570 being arranged at right angles, as shown in Figs. 3 and 9. The link 157 also has pivotal connection with an ear which extends upwardly from one edge of a cover plate 108 of a one-way clutch (see Figs. 4 and 5). The cover plate is loosely journaled upon a central stud and has a downwardly extending lug 110 which is located between the free ends of two separable friction members 109, which are housed in a recess of a driving gear 79 and may be caused to grip the gear, or be released from engagement therewith, according to the direction of movement of the cover plate. The construction and arrangement of these parts are such that when the cover plate moves in a contra-clockwise direction the lug 110 acts to expand the friction members which clutch the cover plate to the gear and impart movement to the latter in the same direction, while on a reverse movement of the cover plate the friction members are disengaged from the gear and no movement is imparted thereto. By reason of the loose fit of the cover plate 108 and its journal, a slight twist occurs in the cover plate initially in each oscillation and it is this twisting, transmitted to the lug 110, which effects first the expansion and then the contraction of the friction members 109. The gear 79 meshes with a pinion 107 which is fast on a vertical shaft 78, rotatably supported in bearings carried by the casing of the one-way clutch. A cam roller 174, carried by the upper end of the shaft 78, is arranged to run in the slotted cam-way 75 which is formed in a plate removably secured to the intermediate member 101 of the work clamp, as shown in Fig. 9, and controls the path of movement of the clamp. A pinion 74 is mounted below the cam roller 174 upon the shaft 78 and meshes with a rack 76 on the intermediate clamp member which is of the same form as the cam-way 75, and said cam-way and rack correspond with the line along which the eyelets are to be set in the opposite edges of an upper. In Figs. 1 and 9 the clamp is shown in intermediate position, that is, the position which it would occupy after four or five eyelets had been set. In its initial position the upper end of the cam-way 75 would be approximately opposite to the actuating pinion 74.

From the above description of the feeding mechanism, it will be understood that the oscillating movements which are imparted by the cam 52, the bell-crank lever 54, the one-way clutch, and their connections, will effect a step-by-step rotation of the pinion 74, and hence of the work clamp which will be advanced with the work along a line corresponding with the cam-way, and in time relation to the movements of the setting devices.

The machine is provided with two transverse controlling shafts 21 and 22 which are journaled in levers 35, and 36, respectively, pivoted at 127 and 128 to fixed parts of the main frame A. The shaft 21 supports mechanism for automatically effecting an increase in the spacing, and for moving the raceways into inoperative position after a predetermined number of eyelets have been

set in order that holes for lacing hooks may thereafter be punched in the parts of the upper. The shaft 22 supports mechanism for automatically disengaging the main driving clutch, and also the one-way clutch through which the work clamp is actuated, after a complete cycle of the machine's operations.

The outer ends of the controlling shafts carry, and are fitted to turn in, index plates 29 and 30 having hubs which are squared off on opposite vertical sides, as indicated at 33 and 34 in Fig. 6 to fit slots in the frame of the machine, whereby the plates are held against rotation but are permitted to swing vertically when the shafts 21 and 22 are respectively swung upwardly and downwardly, as hereinafter explained. Secured to the outer end of each controlling shaft is a hand wheel, 129 and 130, and a spring-pressed locking detent 31 and 32 by which each shaft may be preliminarily set in accordance with the number of eyelets to be set, or holes to be punched. Each shaft has a disk 23, 24, rigidly secured thereto and each disk has a stop lug 131, 132 projecting from its inner face. Rotatably mounted upon the shaft 21 is a worm gear 19 having an elongated hub with a disk or flange 133 fast thereon, and a stop lug 134 projects from the front face of this disk. The gear 19 is arranged to mesh with, and is driven by, a worm gear 18, fast on the shaft 6 as shown in Fig. 3, or may be carried out of mesh with the gear 18 when the lever 35 is swung upward. A torsion spring 25 extends between a pin on the disk 23 and a pin on the disk 133 and acts to rotate the gear 19 and disk 133, reversely to the direction in which they are driven by gear 18, until the lug 134 engages the lug 131, after the shaft 21 has moved upwardly about the pivot 127 of its supporting lever to carry the gear 19 out of mesh with the gear 18. Projecting from the rear face of the disk 133 is a pin 27 which is so arranged that when the disk reaches a certain point in its rotation, the pin will engage the upper end of the lever 63, as shown by dotted lines in Fig. 3, and move the pawl at the lower end of the lever out of engagement with the rack 60, and permit the spring 62 to raise the rod 61 and move the link 57 against the upper stop 55. This movement of the lever 63 will also cause the pin 126, heretofore mentioned, to actuate the arm 40 and through the described connections move the finger 121 under the latch bar 48, which will be lifted and thus permit the toggle 44, 45, to straighten under the influence of the spring 51. It will be seen, therefore, that the extent to which the shaft 21 is rotated by the hand wheel 129, reversely to the direction in which the gear 19 is rotated by the gear 18, will control the initial position of the disk 133 and hence regulate the number of rotations the shaft 6 will make before the pin 27 acts upon the arm of the lever 63 to release the ratchet 60 and oscillate the arm 40 of the rock shaft 41.

The worm gear 20 is rotatively mounted on the controlling shaft 22, and is connected to the disk 24 by a torsion spring 26 in such manner that the spring tends to rotate the worm gear 20 reversely to its direction of rotation by the gear 18, when the lever 36 swings downward and said gears are out of mesh, until a lug 135 on the gear 20 engages the lug 132 on the disk 24. The construction of the several parts carried by the shaft 22 is similar to those carried by the shaft 21, except that the lug 135 is supported directly upon its gear, instead of upon a disk, as 133, which is connected by a short sleeve with its gear.

The lever 35, in which the shaft 21 is journaled, is held in its lowered position against the action of a compression spring 137 by a cam face on a lever 138 which is fulcrumed at its forward end to a fixed point on the frame, and at its rear end is pivotally connected to the upper end of a treadle-actuated rod 200. The lever 36 is held in raised position by a cam face on a lever 140, which is fulcrumed at its forward end to a fixed point on the frame, and is also connected at its rear end to the rod 200. When the treadle which is connected with this rod is depressed the cam faces on the levers 138 and 140 will force the levers 35 and 36 toward the shaft 6 and cause the gears 19 and 20 to mesh with the gear 18; and upon a release of the treadle the lever 35 will be raised by the spring 137 and the lever 36 will drop by its own weight, thus carrying the said gears out of mesh. The treadle rod 200 is also connected to one arm of a bell crank lever 10, which is pivoted to the frame of the machine, and has an upwardly extending arm terminating in a tooth 10^a which engages a notch in the bar 11 and holds this rod to the left, as viewed in Fig. 2, against the stress of the spring 142 during the time that the treadle remains depressed. A spring 147 is compressed between a rigid part of the frame and the horizontal arm of the bell crank lever 10, and acts to raise the rod 200 and move said lever reversely when the treadle is released. When the parts are as shown in Figs. 2 and 3, the toggle 12, 143, remains broken and the rod 13 is forced to the right, thus holding the cam roll 14 out of the path of the cam projection 15, and permitting the clutch member 17 to be held in engagement with the recess in the loose pulley 80.

Referring to Figs. 3 and 5, the gear 79, which constitutes the driven member of the one-way clutch, is moved intermittently in one direction with the plate 108, and is held

against reverse rotation with the plate by a friction disk 150 which is forced yieldingly against the lower face of the gear. The friction disk is supported upon a plate 151 which is pivotally connected with the arms of a yoke 152, whose shank or stem is bored to receive a spindle 812, which is pivotally connected with a lever 81. The spindle 812 is connected through a slot and pin with the shank of the yoke, as shown in Fig. 3, so as to have a limited amount of sliding movement therein, and a spring 811 surrounds the spindle and is confined between the lever 81 and the lower end of the yoke. The lever 81 is fulcrumed to the frame of the machine at one end, and its opposite end rests upon the lever 36, and is sustained thereby in position to hold the friction disk 150 yieldingly against the face of the gear 79, when the parts are as shown in Fig. 3, thus maintaining the operative condition of the one-way clutch. When the pressure of the operator's foot upon the treadle connected with the rod 200 is relieved the spring 147 will cause the rod 200 to rise and the lever 36 will fall, and with it the lever 81, thereby releasing the pressure on the friction disk 151, and permitting the spring 82 to return the work clamp to the position it occupies prior to the feeding of the work. This initial position of the work clamp is determined by an adjustable stop 160, shown in Fig. 2, which stands in the path of the intermediate member 101 when the clamp is swung by the spring 82 reversely, as described, to the direction of its feeding movement. The stop 160 projects from the lower end of a pivoted lever 161 having its upper end provided with a segmental worm gear which meshes with a worm on the inner end of a shaft 162, which is provided with a hand wheel 163, and turns in a bearing in the main frame of the machine. By turning the wheel 163 the lever 161 is swung about its pivot and the position of the stop varied, at will.

When the rod 200 is moved downwardly by depression of its treadle, the lever 36 will be raised and the lever 35 lowered to effect an intermeshing of the gears 20 and 19 with the gear 18, and the lever 81 will be elevated to cause frictional engagement of the disk 150 with the gear 79. The same movement of the rod 200 moves to the left the pawl arm 10^a of the bell crank 10 and permits the main clutch to connect the pulley 80 with the drive shaft.

The rear face of the gear 20 carries a pin 28, and the free end of the bar 11 extends over and intersects the path of movement of this pin when the bar is drawn to its position as shown in Fig. 3. When, therefore, the gear 20 has been rotated by its driving gear 18 to a point to cause engagement of the pin 28 with the bar 11, the main clutch will be tripped and the machine brought to a stop.

In order to set the two lowermost eyelets on the upper with a greater spread than the others, when desired, provision is hereby made for transversely shifting the work clamp bodily toward the right in Fig. 9 to carry the edge of the lacing slit inwardly with relation to the setting dies, and means are also provided for automatically restoring the clamp to normal position after the first two eyelets have been set. These movements of the work clamp are effected, in the illustrated embodiment of the invention, by forming the casing of the clutch 79, 108 and the bearings of the shaft 78 as part of a lever 170, which is supported by a pivot 171, located at the left hand side of the machine. A spring-actuated detent lever 172 is pivotally sustained by this lever and carries a bolt 172^a at its inner free end which normally projects into a hole in the frame and locks the lever in position. When it is desired to set the first two eyelets with a spread, the detent is actuated to withdraw the bolt 172^a from the hole in the frame, and the lever being then freed may be swung toward the right, as seen in Fig. 9, carrying with it the clutch and the controlling roller 174, and through the latter pressing the work clamp rearwardly. An adjustable stop 173 is in threaded engagement with a fixed part of the frame, and serves to limit the rearward movement of the lever 170 in accordance with the increase desired in the spread of the eyelets. The pivotal connections between the yoke 152 and the one-way clutch, and between the yoke and the lever 81 permit the clutch to be shifted relatively to the lever 81, while the shifting of said clutch relatively to its actuating link 157 is taken up in idle reverse turning of the cover plate 108. After the first pair of eyelets have been set, a cam 176 on the shaft 6, Fig. 3, acts upon a roller 177 journaled in the shank of the yoke 152 and moves the lever 170, and work clamp toward the left, the bolt 172^a on the detent lever 172 then being forced by its spring into the hole which it normally occupies in the frame, and holding the lever 170 in normal position during the time that the remaining eyelets are being set in the upper.

The gages for preliminarily locating the upper in the work clamp are best shown in Fig. 9. The numeral 180 indicates an end gage which is pivotally connected with the intermediate clamp member 101 at a point to the rear of the setting position, and normally occupies the position shown by dotted lines beyond the stationary die plate 9, at the beginning of the feeding movements of the clamp. The gage 180 is connected at one side of its pivot to one end of a link 281, whose opposite ends is pivotally connected

to a plate 182 which surrounds the nut 72 and is clamped by said nut in fixed position. As the clamp has imparted to it the feeding movements the gage 180 is swung from the position shown in dotted lines in Fig. 9, to that shown in full lines, and finally to a position where it will be entirely out of the way of the operator, and the moving parts of the machine. As the radius of the path of the gage member 180^a is much shorter than the radius of the path of the edge of the work carried by the work holder, the gage will be moved sufficiently to clear the work when the first step of the feeding operation takes place. A second gage 183 is adjustably supported on the plate 9, and acts to position the edge of the uppermost quarter in the clamp. The third gage 184 is adjustably supported upon the intermediate member of the clamp by a bolt 185, and serves to determine the position of the front edge of the quarters adjacent to the top edges. The gages 180 and 184 are respectively provided with adjustable work-engaging portions 180^a, and 184^a, as shown in Fig. 9.

From the foregoing description it is believed that the operation of the machine will be clearly understood. Prior to starting the machine the operator folds an upper along the median line of the back with its front edges even, applies pressure to the treadle connected with the rod 100 which opens the work clamp and breaks the toggle 44, 45, and simultaneously applies pressure to the treadle connected with the rod 61 which moves the link 57 against the stop 56. The upper is then inserted in the clamp, and the edges of the uppermost flap positioned against the gage members 180^a, 183, and 184^a, the gage 180 at this time being located in the position shown by dotted lines in Fig. 9, and the work clamp in its extreme right-hand position with the cam roll 174 at or near the left hand end of the cam-way 75, Fig. 9. The initial position of the work is indicated by dotted lines in Fig. 9. Pressure upon the treadles of rods 100 and 61 is then removed and the jaws 70, 71, are closed by their springs against the intermediate member 101, thereby holding the upper in position to receive eyelets, while the pawl at the lower end of rod 61 retains the link 57 against the stop 56. The operator then applies pressure to the treadle connected with the rod 200 which breaks the toggle 12, 143, and permits the main clutch 17 to move into engagement with the pulley 80 and start the machine, and the same movement of this treadle rod effects movements of the levers 35 and 36 toward the shaft 6 to cause the gears 19 and 20 to mesh with the gear 18. The hand wheels 129 and 130 have been previously turned, in directions reverse to those in which their gears are driven by gear 18, the proper distances to adjust the positions of the pins 27 and 28, to respectively control the number of eyelets to be set, and the number of holes to be punched before the machine comes to a stop. The punches will then be advanced simultaneously toward the anvil and pick off two eyelets from the ends of the raceways, will then punch holes in the two flaps of the upper, and the sets will thereafter simultaneously set the eyelets in the upper flaps, at each reciprocation, the clamped upper being advanced between each setting operation a distance determined by the position of the link 57 against the stop 56. This distance will be shorter than that determined by the upper stop 55, by reason of the fact that the former stop is nearer to the fulcrum of the bell crank lever 54 than the latter. The setting of eyelets with this spacing will continue until the disk 133 has rotated to that point where the pin 27 engages the upper end of the lever 63, whereupon the ratchet 60 will be tripped and the spring 62 will force the link 57 against the upper stop 55, which determines the longer spacing. The same movement of the upper end of lever 63 will also effect movement of the finger 121 into the path of the projection 123 and raise the latch 48, thereby permitting the toggle 44, 45 to straighten and move the raceways out of position to deliver eyelets. The machine will thereafter continue to feed the clamped work the increased distance between each operation of the punches and sets which is appropriate for the spacing of lacing hooks, the punches forming holes in the flaps of the upper, but, of course, no eyelets being set therein, and these operations will continue until the pin 28 on the gear 20 engages the free end of the bar 11. The bar will then be disengaged from the pawl end 10^a of the bell crank lever 10, and the spring 142 will force the bar in a direction to straighten the toggle 12, 143, thereby positioning the roll 14 in the path of the cam 15 which will effect movement of the clutch 17 away from the loose pulley and into engagement with the frame, and bring the machine to a stop. The operator then removes his foot from the treadle connected with the rod 200, which will be raised by the spring 147, permitting the shafts 21 and 22 to separate, and releasing the one-way clutch so that the spring 82 may return the work clamp to its original position in front of the operator. The eyeleted upper may then be removed and another upper inserted in the clamp, and the cycle of operations above described repeated.

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

1. In a machine of the class described, the combination with means for setting eyelets in stock, of means for automatically discon-

tinuing the supply of eyelets and thereafter punching holes for lacing hooks, and means for automatically controlling the number of holes punched.

2. In a machine of the class described, the combination with means for setting eyelets in stock, of means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a predetermined number of holes for lacing hooks.

3. In a machine of the class described, the combination of means for setting eyelets in stock and for thereafter punching holes for lacing hooks, and means for varying the spacing of the punched holes from the spacing of the eyelets, the operation of said means being initiated automatically when the last eyelet is set.

4. In a machine of the class described, the combination with means for setting eyelets in stock, of means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a predetermined number of holes in the stock, and means for automatically varying the spacing of the eyelets from the spacing of the punched holes.

5. In a machine of the class described, the combination with means for setting eyelets in stock, of means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a plurality of holes in the stock having a different spacing from the eyelets.

6. In a machine of the class described, the combination of means for setting eyelets in stock, means for determining the spacing for the eyelets, means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a plurality of holes in the stock, and means for determining the spacing for the punched holes.

7. In a machine of the class described, the combination of means for automatically setting eyelets in stock having one spacing, means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a plurality of holes in the stock having a different spacing, and means for independently adjusting the extent of said spacings.

8. In a machine of the class described, the combination of means for punching holes in stock, means for supplying eyelets, means for setting eyelets, mechanism for imparting feeding movements to the work between the setting operations, means for discontinuing the supply of eyelets and for thereafter punching holes in the stock, and means for effecting a change in the extent of the feeding movements, the operation of said means being initiated automatically when the supply of eyelets is discontinued.

9. In a machine of the class described, the combination of means for punching holes in stock, means for supplying eyelets, means for setting eyelets, mechanism for imparting feeding movements to the stock between the setting operations, means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching holes in the stock, and means for automatically effecting a change in the extent of the feeding movements when the supply of eyelets is discontinued.

10. In a machine of the class described, the combination of means for punching holes in stock, means for supplying eyelets, means for setting eyelets, mechanism for imparting feeding movements to the stock between the setting operations, means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and for thereafter punching a predetermined number of holes in the stock, and means for effecting a change in the extent of the feeding movements when the supply of eyelets is discontinued.

11. A machine of the class described having, in combination, eyelet setting devices, actuating mechanism therefor, regulating means for determining the number of consecutive eyelets to be set, said regulating means initially being in inoperative condition, and manually operated means, including a single controlling member, for setting in operation the actuating mechanism and for rendering the regulating means operative.

12. In a machine of the class described, the combination of means for supplying eyelets, means for setting the eyelets in stock, means for imparting feeding movements to the stock between the setting operations, means for automatically discontinuing the supply of eyelets when a predetermined number of eyelets have been set and simultaneously varying the extent of the feeding movements, and means for thereafter punching a plurality of holes in the stock.

13. In a machine of the class described, the combination of a punch, a setting device and actuating means therefor, a movable raceway for supplying eyelets to said device, and means for automatically varying the path of movement of said raceway to suspend the supply of eyelets when a predetermined number of eyelets have been set in the stock.

14. In a machine of the class described, the combination of a punch, a setting device, and actuating means therefor, a movable raceway for supplying eyelets to said device, means for automatically varying the path

of movement of said raceway to suspend the supply of eyelets when a predetermined number of eyelets have been set, and means for thereafter punching holes in the stock to receive lacing hooks.

15. In a machine of the class described, the combination of a punch, a setting device, and actuating means therefor, a movable raceway for supplying eyelets to said device, means for automatically varying the path of movement of said raceway to suspend the supply of eyelets when a predetermined number of eyelets have been set, means for thereafter punching holes in the stock, and automatic means to stop the machine when a predetermined number of holes have been punched.

16. In a machine of the class described, the combination of a punch, a setting device, and actuating means therefor, a movable raceway for supplying eyelets to said device, means for imparting feeding movements to the stock, and means for automatically varying the path of movement of said raceway to suspend the supply of eyelets when a predetermined number of eyelets have been set and for simultaneously varying the extent of said feeding movements.

17. In a machine of the class described, the combination of a punch, a setting device, and actuating means therefor, a movable raceway for supplying eyelets to said device, means for imparting feeding movements to the stock, means for automatically varying the path of movement of said raceway to suspend the supply of eyelets when a predetermined number of eyelets have been set and for simultaneously varying the extent of said feeding movements, and means for thereafter punching a predetermined number of holes in the stock.

18. In a machine of the class described, the combination of a punch, a setting device, means for feeding the work relatively to said device including a lever having adjustable stops located at different distances from its fulcrum and a link connected with said lever and arranged to be positioned against the stop nearest the fulcrum of said lever while eyelets are being set, and means for positioning the link against the stop farthest from said fulcrum while holes are being punched for lacing hooks.

19. In a machine of the class described, the combination of a punch, an eyelet setting device, work holding means, feeding mechanism for the work including a lever having stops to determine the spacings, connections between said lever and work holding means including a member arranged between said stops, manual means for moving said member against the stop for controlling one spacing, and automatic means for moving said member against the stop for controlling a different spacing.

20. In a machine of the class described, the combination of a punch, an eyelet setting device, a work holder, and feeding mechanism therefor including a lever having stops to determine the spacing, connections between said lever and work holder including a member arranged between said stops, manual means for moving said member against the stop for controlling one spacing, means acting automatically to move said member against the stop for controlling a different spacing when a predetermined number of eyelets have been set, and means for thereafter punching holes in the stock for lacing hooks.

21. In a machine of the class described, the combination of a punch, an eyelet setting device, a work holder, and feeding mechanism therefor including a lever having stops to determine the spacing, connections between said lever and work holder including a member arranged between said stops, manual means for moving said member against the stop for controlling one spacing, means acting automatically to suspend the setting of eyelets and to move said member against the stop for controlling a different spacing, and means for thereafter punching holes in the stock for lacing hooks.

22. In a machine of the class described, the combination of a punch, an eyelet setting device, a work holder, and feeding mechanism therefor including a lever having stops to determine the spacing, connections between said lever and work holder including a member arranged between said stops, manual means for moving said member against the stop for controlling one spacing, means acting automatically to move said member against the stop for controlling a different spacing when a predetermined number of eyelets have been set, means for thereafter punching holes in the stock for lacing hooks, and automatic means to stop the machine when a predetermined number of holes have been punched.

23. In a machine of the class described, the combination of punching and setting devices, a movable raceway for supplying fasteners to said devices, means for imparting feeding movements to the work, mechanism for altering the path of movement of said raceway to suspend the supply of fasteners and for varying the extent of said feeding movements, a shaft having a driving gear, a second shaft having a driven gear loose thereon provided with means to effect the operation of said mechanism, and manual means to reversely rotate said driven gear and thereby control the time when said mechanism may operate.

24. In a machine of the class described, the combination of punching and setting devices, a movable raceway, means for imparting feeding movements to the work

mechanism for suspending the supply of fasteners and for varying the extent of said feeding movements, a shaft having a driving gear, a second shaft having a driven gear loose thereon and movable relative to said first shaft, said driven gear provided with means to effect the operation of said mechanism, a disk fast to said second shaft and provided with a stop, a coöperating stop on the driven gear, yielding means connecting said disk and gear, and manual means to reversely rotate the second shaft when said gears are out of mesh and thereby effect reverse rotation of the driven gear to control the time when said mechanism will operate.

25. In a machine of the class described, the combination of punching and setting devices, means for imparting feeding movements to the work, mechanism for suspending the supply of fasteners and for varying the extent of said feeding movements, a shaft having a driving gear, a second shaft having a driven gear loose thereon and movable relative to said first shaft, said driven gear being provided with means to effect the operation of said mechanism, a main driving shaft, a clutch, and tripping mechanism therefor, a third shaft having a driven gear loose thereon and movable relative to said first shaft, said driven gear provided with means to actuate the clutch tripping mechanism, and manual means to reversely rotate said driven gears to determine the times when the mechanisms which are respectively controlled thereby will be caused to operate.

26. In a machine of the class described, the combination of a driving shaft, setting devices, mechanism for supplying fasteners thereto, mechanism for feeding the work, a clutch, and connections with the driving shaft, a driving gear, pivoted shafts having gears to coöperate with said driving gear provided with means to control said mechanisms and clutch, respectively, and means to move said gears reversely to determine the times when the parts controlled thereby will be caused to operate.

27. In a machine of the class described, the combination of a work holder supported for feeding movements, feeding mechanism including a one-way clutch for actuating said holder, yielding means for reversely moving said holder, a friction device to normally prevent reverse movement of said clutch, and means to release said device.

28. In a machine of the class described, the combination of a work holder and feeding mechanism therefor including a one-way clutch, yielding means for reversely moving said holder, a friction device to normally prevent said reverse movement, and means to release said device when the machine comes to a stop.

29. In a machine of the class described, the combination of a work holder and feeding mechanism therefor including a one-way clutch, yielding means for reversely moving said holder, a friction device engaging one member of the clutch to normally restrain it against reverse rotation, a main driving clutch and connections to control the operation of the machine, and means to simultaneously release said friction device and trip said main driving clutch.

30. In a machine of the class described, the combination of a work holder and feeding mechanism therefor including a one-way clutch, yielding means for reversely moving said holder, a friction device engaging one member of the clutch to normally restrain it against reverse rotation, a pivoted lever having yielding connection with said device, a pivoted shaft sustaining said lever, and a treadle and connections to raise said shaft, and apply the friction device to said member, or to permit said shaft to fall and release the friction device.

31. In a machine of the class described, the combination of a work holder and feeding mechanism therefor including a one-way clutch, yielding means for reversely moving said holder, a friction device engaging one member of the clutch to normally restrain it against reverse rotation, a pivoted lever having yielding connection with said device, a pivoted shaft sustaining said lever, a main clutch, and treadle-actuated mechanism to raise said shaft and apply the friction device to said member and to simultaneously actuate the main clutch to start the machine, or to permit said shaft to fall and release said device and to trip the main clutch and stop the machine.

32. In a machine of the class described, the combination of a work holder and mechanism for advancing said holder in the line of feed including a one-way clutch, yielding means for reversely moving said holder, a friction device engaging one member of the clutch to normally restrain it against reverse rotation, a pivoted lever having yielding connection with said device, a pivoted shaft sustaining said lever, a main clutch, tripping mechanism therefor, a driven gear on said shaft having means to actuate said tripping mechanism, a shaft having a driving gear thereon, and treadle-actuated mechanism arranged to raise said pivoted shaft and thereby bring said gears into meshing engagement and also apply said friction device to the clutch member.

33. In a machine of the class described, the combination of a main shaft having a loose pulley thereon, a clutch member arranged to effect engagement of said shaft and pulley, a shipper lever connected with said member, a toggle connected with said lever, a rod connected with the toggle, a cam arranged to actuate said rod and effect disengagement of the clutch when the toggle

is extended, a spring-controlled bar acting to extend the toggle, and manual means acting on said bar to break the toggle.

34. In a machine of the class described, the combination of a main shaft having a loose pulley thereon, a clutch member arranged to effect engagement of said shaft and pulley, a shipper lever connected with said member, a toggle connected with said lever, a rod connected with the toggle, a cam arranged to actuate the rod and effect disengagement of the clutch when the toggle is extended, a spring-controlled bar acting to extend the toggle, a treadle-actuated detent to engage said bar and hold the toggle in broken condition, and automatic means to trip the bar and thereby effect disengagement of the clutch when the machine has performed a predetermined number of operations.

35. In a machine of the class described, the combination with a setting device, of a raceway, means to reciprocate the raceway, and a toggle connecting said means and raceway and arranged to be broken or extended to alter the path of movement of the raceway.

36. In a machine of the class described, the combination with a punch and a setting device, of a raceway, means to reciprocate the raceway, a toggle connecting said means and raceway, a latch for holding the toggle broken to cause the raceway to deliver fasteners to the setting device, and mechanism to trip said latch and extend the toggle, and thereby so alter the path of movement of the raceway that no fasteners will be delivered to the setting device.

37. In a machine of the class described, the combination with a setting device, of a raceway, means to reciprocate the raceway, a toggle connecting said means and raceway, yielding means acting normally to extend said toggle, a latch to hold the toggle broken in opposition to said yielding means to cause the raceway to deliver fasteners to the setting device, and mechanism to trip said latch and permit the toggle to be extended, thereby so altering the path of movement of the raceway that no fasteners will be delivered to the setting device.

38. In a machine of the class described, the combination with a setting device, of a raceway, means to reciprocate the raceway, a toggle connecting said means and raceway, yielding means acting normally to extend the toggle, manual means to break the toggle, a latch to hold the toggle broken, and automatic mechanism to trip the latch and permit the extension of the toggle so that the path of movement of the raceway is so altered that fasteners will not be delivered to said device.

39. In a machine of the class described, the combination with a setting device, of a raceway, means to reciprocate the raceway, a toggle connecting said means and raceway, yielding means acting normally to extend the toggle, manual means to break the toggle, a latch to hold the toggle broken, automatic mechanism to trip the latch and permit the extension of the toggle, and manual means to control the time of operation of said mechanism.

40. In a machine of the class described, the combination with devices for setting two fasteners in the opposite edges of an upper, of a work holder comprising two oppositely moving clamping jaws, means for effecting simultaneous movements of said jaws to engage or disengage the work, and means for moving the work holder to feed the work to the setting devices.

41. In a machine of the class described, the combination with devices for setting two fasteners in the opposite edges of an upper, of a work holder comprising an intermediate member and two clamping jaws connected with said member and having means to insure their simultaneous opening and closing movements, means to operate said jaws, and means to move the work holder to feed the work to the setting devices.

42. In a machine of the class described, the combination with devices for setting two fasteners in the opposite edges of an upper, of a work holder comprising an intermediate member, two clamping jaws pivoted to said member, positive means for effecting simultaneous opening movements of the jaws, and yielding means for closing the jaws.

43. In a machine of the class described, the combination with devices for setting two fasteners in the opposite edges of an upper, of raceways for supplying fasteners to said devices, means for reciprocating the raceways, connections including a toggle between said raceways and means arranged to vary the path of movement of said raceways, a work clamp, and means for breaking the toggle to cause the raceways to deliver fasteners and for opening the work clamp, at a single operation.

44. A machine of the class described having, in combination, devices for setting two fasteners in the opposite edges of an upper, a work holder comprising an intermediate member movable between the setting devices to present the work thereto, and jaws carried by the intermediate member for clamping one quarter of the upper on one of its faces and the other quarter on its opposite face.

45. A machine of the class described having, in combination, devices for setting fasteners, punching devices, actuating mechanism for said devices, controlling means for governing the number of alternate punching and setting operations, and separate controlling means for governing the number of consecutive punching operations.

46. A machine of the class described having, in combination, actuating mechanism, a device operated thereby to perform a series of setting operations, another device operated thereby to perform a series of punching operations, means for governing the number of alternate punching and setting operations performed by both devices, and other means for governing the number of consecutive operations performed by one of said devices.

47. An eyeletting machine having, in combination, two alined setting devices adapted to simultaneously set two eyelets in the flaps of an upper, punches located concentrically in said devices, reciprocatory raceways for supplying fasteners to said punches, actuating mechanism for said parts, and an intermediate anvil to clench the fasteners.

48. An eyeletting machine having, in combination, two alined setting devices adapted to simultaneously set two eyelets in the flaps of an upper, punches located concentrically in said devices, actuating mechanism for said parts, and an intermediate anvil having alined holes to receive the punches and concentrically arranged dies to coöperate with said devices in clenching the eyelets.

49. An eyeletting machine having, in combination, a setting device, a punch carried thereby, an anvil having a hole to receive the punch and a transverse passage, and a plunger reciprocating in said passage to eject the punched stock.

50. An eyeletting machine having, in combination, alined setting devices, punches carried by said devices, an intermediate anvil having holes to receive the punches and a transverse passage, and a plunger reciprocating in said passage to eject the punched stock.

51. In a machine of the class described, the combination of means for setting fasteners in an upper, a work holder, feeding means therefor, a lever supporting said work holder and arranged for preliminary adjustment to cause the fasteners to be set a predetermined distance from the edge of the stock, and automatic means to return said lever to normal position to cause fasteners to be set nearer to the edge of the stock.

52. In a machine of the class described, the combination of means for setting fasteners in an upper, a work holder, feeding means therefor, a lever for supporting said work holder and arranged for manual adjustment to so position the upper that the first fasteners will be set with a spread, and automatic means to return the lever to normal position after a predetermined number of fasteners have been set.

53. In a machine of the class described, the combination of means for setting fasteners in an upper, a work holder, feeding means therefor, a lever for supporting said work holder and arranged for manual adjustment to cause the first fasteners to be set with a spread, an adjustable stop to determine the position of said lever, and automatic means to return the lever to normal position after a predetermined number of fasteners have been set.

54. In a machine of the class described, the combination of means for setting fasteners in an upper, a work holder, feeding means therefor, a lever for supporting said work holder, said lever being adjustable to so position the upper that the first fasteners will be set with a spread, automatic means to return the lever to normal position after a predetermined number of fasteners have been set, and a detent for holding the lever in said position.

55. In a machine of the class described, the combination of devices for setting fasteners in the edge of an upper, a work holder, mechanism for advancing the work holder relative to said devices on a line corresponding with the curved edge of the upper, and means for positively controlling the position of the work holder at all points in its path.

56. In a machine of the class described, the combination of devices for setting fasteners in the edge of an upper, a work holder provided with a guide shaped to correspond with the line on which the fasteners are to be set, means in said guide to cause the work holder to move in a path which corresponds with said line, and means for advancing the work holder relative to said devices.

57. In a machine of the class described, the combination of means for setting fasteners in the edge of an upper, a work holder provided with a cam slot shaped to correspond with the line on which the fasteners are to be set, a cam roller in said slot, a rack shaped to correspond with said slot, a pinion engaging said rack, and means for rotating the pinion to advance the work holder relative to the setting means.

58. In a machine of the class described, the combination of means for simultaneously setting fasteners in the opposite edges of an upper, a clamp for holding the upper having a guide shaped to correspond with the line on which the fasteners are to be set, means in said guide to cause the clamp to move in a path which corresponds with said line, and means for advancing the clamp relative to the setting means.

59. In a machine of the class described, the combination of means for setting fasteners in the edge of an upper, a work holder provided with a cam slot shaped to correspond with the line on which the fasteners are to be set, a rack shaped to correspond with said slot, a spindle carrying a pinion meshing with said rack and a cam roll to run in said slot, and means for rotating said pinion to advance the work holder relative to the setting means.

60. In a machine of the class described, the combination of devices for setting fasteners in the edge of an upper, a work holder provided with a rack shaped to correspond with the line on which the fasteners are to be set, a pinion meshing with said rack, means for imparting step-by-step rotation to the pinion to advance the work holder in timed relation to the movements of the setting devices, and means to return the work holder to its original position at the completion of the setting operation.

61. In a machine of the class described, the combination of devices for setting fasteners in the edge of an upper, a work holder provided with a rack shaped to correspond with the line on which the fasteners are to be set, a pinion meshing with said rack, a clutch for imparting step-by-step rotation to the pinion to advance the work holder in timed relation to the movements of the setting devices, a friction device acting on the clutch to prevent reverse rotation of the pinion, means to actuate said device to release the pinion, and yielding means to return the work holder to its original position at the completion of the setting operation.

62. In a machine of the class described, the combination of a work holder, feeding mechanism for the work holder, a gage on the work holder to preliminarily determine the position of the work, and means to move said gage into inoperative position as the work holder is advanced by said mechanism.

63. In a machine of the class described, the combination of a work holder, feeding mechanism for the work holder, a gage pivoted to the work holder, and a link connecting said gage with a fixed part of the machine and adapted to cause the gage to swing into inoperative position as the work holder is advanced by said mechanism.

64. In a machine of the class described, the combination of setting devices, a work holder comprising an intermediate member and two clamping jaws arranged to hold the flaps of an upper, feeding mechanism for the work holder, an end gage mounted on said intermediate member arranged to be moved into inoperative position as the work holder is advanced by said mechanism, a gage on said member to determine the position of the front edges adjacent to the top of the upper, and a gage arranged to determine the position of one edge of the upper at a point between said first-mentioned gages.

65. A machine of the class described having, in combination, devices for setting fasteners, means for feeding the work to the setting devices by moving it about an axis remote from the edge of the work, and a gage pivotally mounted to swing about an axis located between the edge of the work and the axis about which the work is moved.

66. A machine of the class described, having, in combination, actuating mechanism, a device operated thereby to perform a series of setting operations, another device operated thereby to perform a series of punching operations, and separate governing means for each device, one for determining the number of operations performed by both devices alternately and the other for determining the number of consecutive operations performed by one device.

67. A machine of the class described, having, in combination, setting devices for fasteners, a movable work holder having a cam slot shaped to correspond to the edge of the work in which the fasteners are to be set, a cam roll mounted upon a normally stationary axis and disposed within the cam slot to control the movement of the work holder, and means for imparting a feeding movement to the work holder.

68. A machine for setting fasteners in shoe uppers, having in combination, a movable holder arranged to receive a folded upper and maintain its opposite sides spaced from each other, a gage on the holder for positioning the edges of the two sides in parallelism, clamping means for maintaining the upper in the holder, oppositely disposed reciprocatory setting devices, and an anvil having upsetting faces disposed in opposite directions, said holder being bodily movable with the upper transversely to the path of the setting devices so to locate the upper that fasteners may be set simultaneously in its two edges at opposite points.

69. A machine for setting fasteners in shoe uppers, having in combination, a movable holder arranged to receive a folded upper and maintain its opposite sides spaced from each other, an anvil having oppositely disposed setting faces and arranged to lie between the edges of the folded upper, clamping means for maintaining the upper in the holder, and reciprocatory setting devices movable in opposite directions outside the holder, said holder being movable with the upper in the direction of the line along which the fasteners are set for positioning the upper in proper relation to said devices.

70. A machine for setting fasteners in shoe uppers, having in combination, a movable holder arranged to receive a folded upper and maintain its opposite edges spaced apart, an anvil having oppositely disposed setting faces arranged to lie between the edges of the folded upper, yielding clamping means arranged to bear upon the two sides of the folded upper and maintain the upper in the holder, and reciprocatory setting devices movable simultaneously from opposite faces of the holder and arranged to coöperate with the anvil in setting fasteners in the two sides of the upper, said holder being movable with the

clamped upper in the direction of the line along which the fasteners are set for positioning the upper relative to said devices.

71. A machine for setting fasteners in shoe uppers, having in combination, fastener inserting devices, and a work holder for a folded upper comprising an intermediate member arranged to support on its opposite faces the respective edges of the quarters in which the fasteners are to be set, said faces being of sufficient extent to maintain the edges in flat condition and spaced uniformly from each other throughout their entire extent, and a clamping device hinged on each side of the intermediate member.

72. A machine for setting fasteners in shoe uppers, having in combination, oppositely disposed pairs of setting devices relatively movable in alined paths to insert fasteners simultaneously in both sides of a folded upper, and a holder for a folded upper movable in the direction of the line along which the fasteners are set to present the upper in operative position, said holder comprising an intermediate member against the opposite sides of which the flaps of the upper are laid, a clamping device hinged on each side of the intermediate member and connections between said devices constructed and arranged to insure the simultaneous opening or closing of the clamping devices.

73. A machine for setting fasteners in shoe uppers, having in combination, a pair of fastener delivering raceways, a pair of oppositely disposed fastener inserting devices movable from the raceways to insert fasteners simultaneously in opposite sides of a shoe upper, and a holder comprising an intermediate member by which the holder is movably supported in the machine with its opposite faces free to be engaged by the opposite sides of the upper, and a clamping device coöperating with each face of the intermediate member and movable bodily therewith in a path which lies parallel with the edges of the clamped upper.

74. A machine of the class described having, in combination, a work holder for a folded upper, comprising an intermediate member for supporting on its opposite faces the edges of the upper in substantially parallel relation, a clamping device hinged on each side of the intermediate member, oppositely disposed tools arranged for movement toward and from the edges of the upper and dies arranged between the edges of the upper to coöperate with said tools, the work holder and clamps being mounted for bodily movement in a path parallel with the edges of the clamped upper to position the upper relatively to the tools.

75. A machine of the class described having, in combination, a work holder arranged to receive a folded upper and to maintain its edges spaced from each other, a die having oppositely disposed faces and arranged to lie between the edges of the folded upper, clamping devices arranged for movement toward and from the edges of the upper for maintaining the upper in the holder, reciprocating tools movable in opposite directions outside the holder and arranged to coöperate with said die, said holder and clamping devices being mounted for bodily movement in a path substantially parallel with the edges of the clamped upper to position the upper relatively to said tools and die.

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

DANIEL N. PRIME.

Witnesses:
CHESTER E. ROGERS,
RUTH E. WARD.