

A. E. JERRAM.
PUNCHING AND EYELETING MACHINE.
APPLICATION FILED JAN. 2, 1908.

Patented Dec. 31, 1912.

4 SHEETS-SHEET 1

1,048,836.

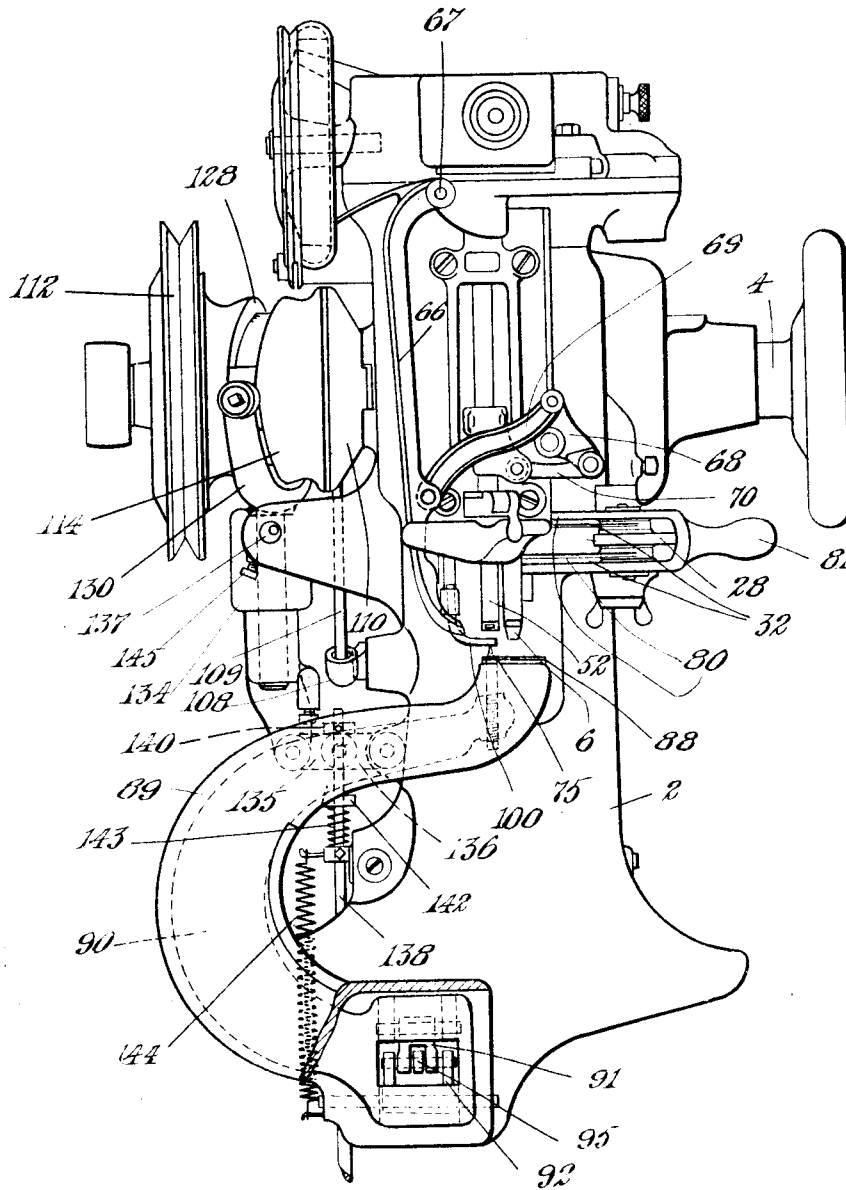


Fig 1.

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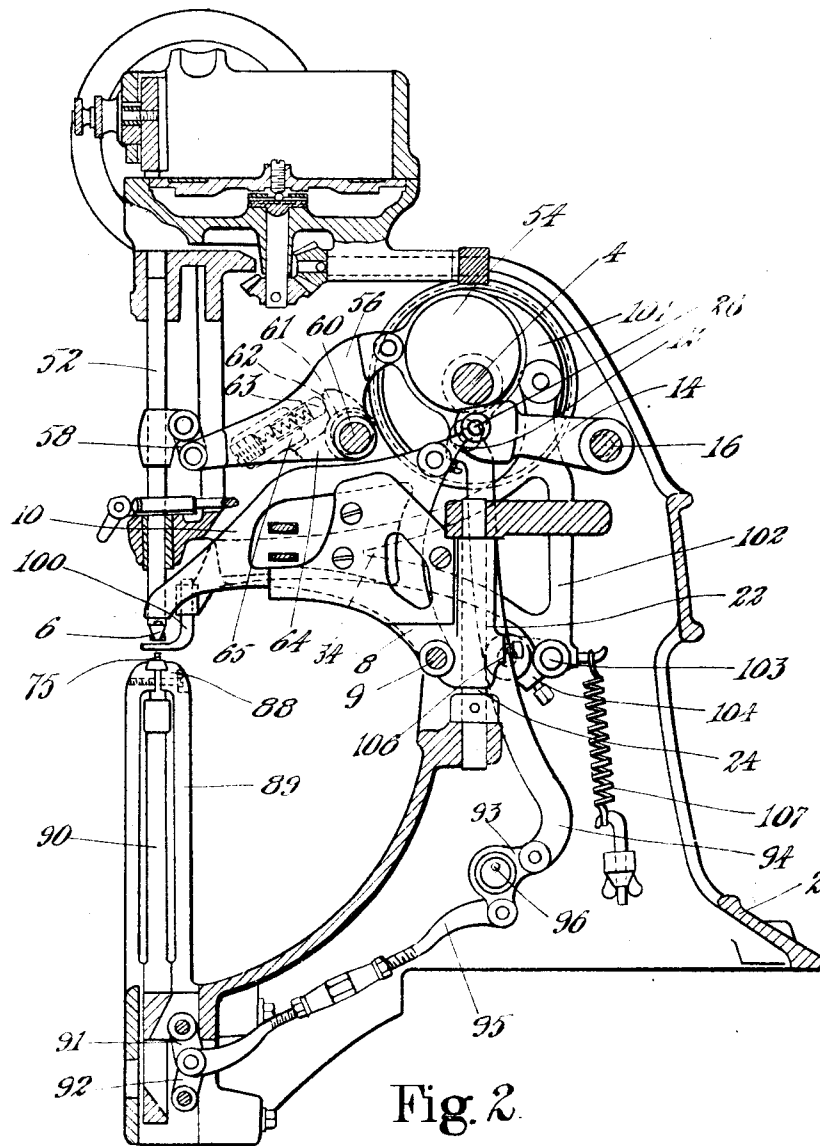


Fig. 2.

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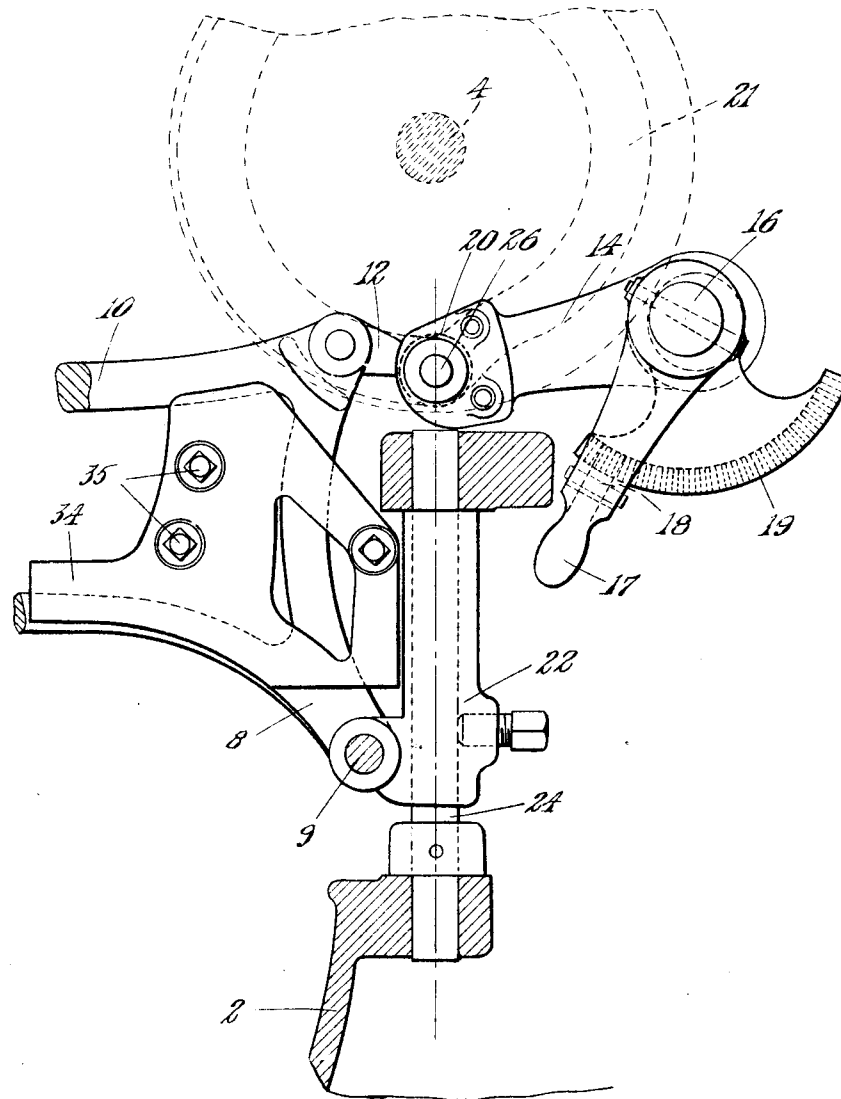


Fig. 3.

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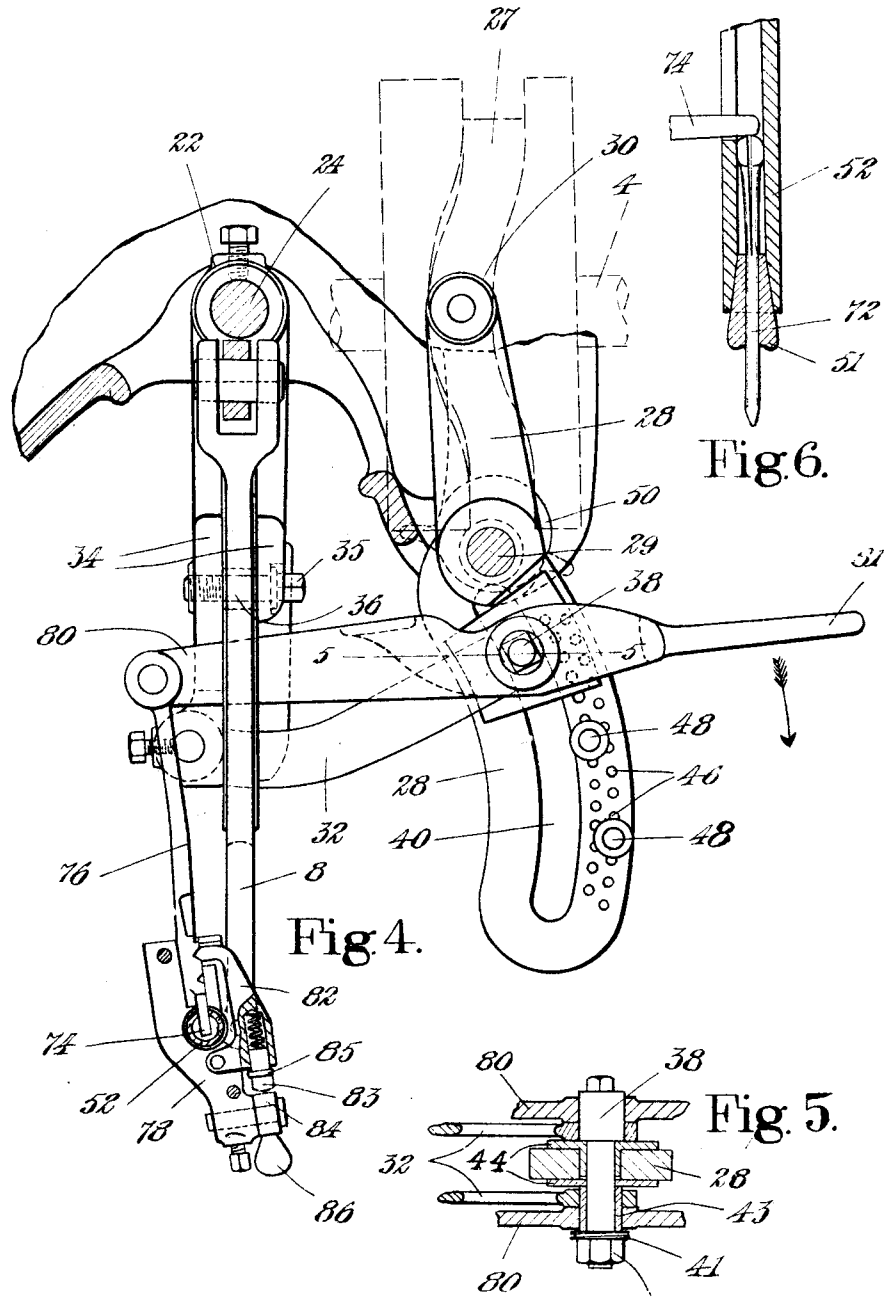
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ARTHUR E. JERRAM, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PUNCHING AND EYELETING MACHINE.

1,048,836.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed January 2, 1908. Serial No. 408,942.

To all whom it may concern:

Be it known that I, ARTHUR E. JERRAM, a subject of the King of England, residing at Leicester, in the county of Leicester, England, have invented certain Improvements in Punching and Eyeletting 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 an improvement in machines for punching holes in stock and inserting fasteners in the holes so punched, and is shown as embodied in a machine for setting eyelets, although certain features thereof may be applied to machines for inserting other fasteners, and other features are applicable to machines which serve to punch a series of holes in stock in which fasteners may, if desired, be subsequently inserted.

One feature of this invention relates to the employment of a toggle or other articulated mechanism in a construction where the member which is connected therewith and operated thereby is given two distinct movements at an angle to each other. In the specific structure disclosed the toggle is shown as provided with a universal joint which moves, when the toggle is straightened, substantially in the line of the axis about which the toggle operated member swings during its other movement which takes place at an angle to the movement caused by straightening the toggle. By employing this construction in a machine such as above indicated, the powerful, positive and otherwise advantageous operation of a toggle is secured, for the purpose of imparting to the member carried thereby its operative movement toward or away from the work, while a work-feeding movement of said member is permitted without disturbance of the relationship between the toggle and its operating device, and therefore without any liability of the said member releasing the stock prematurely or striking the work support. Preferably also the toggle will be moved a little past the center or "broken" slightly immediately after being straightened, thereby causing it to release the extreme pressure which it has caused

the member which it carries to exert on the cooperating support when straight. This is preparatory to the lateral movement of said member for the purpose of feeding the stock and constitutes another and important feature of this invention.

Another feature of this invention relates to the provision in a machine for setting fasteners of novel means for operating one of the setting dies in a yielding manner so as to accommodate varying thicknesses of stock. As shown, this means comprises a pivoted support for the fulcrum of the lever that operates the die and means which normally holds said pivoted support in its normal position but which permits said support to yield when the degree of pressure necessary to set the fastener is exceeded.

A further feature of this invention is especially applicable to that type of eyeletting machines in which a nipple pin is projected beyond the face of the die to receive an eyelet, which eyelet is subsequently set in the stock by the die, and relates to novel means for projecting the pin to receive an eyelet and also to novel means for moving the pin projecting means to inoperative or operative positions at will so as to suspend or resume the presentation of eyelets to the setting dies. Preferably these last-mentioned means will be connected with the means for determining the length of the feeding movement of the work so that both will be operated by a single device, by means of which the suspension of the presentation of eyelets to the setting dies coincides with a change in the length of the feed or in the spacing of the holes punched. This is especially advantageous when operating upon men's upper wherein it is usual to insert a series of eyelets in holes punched in the stock a given distance apart and then to punch a second series of holes at a greater distance apart in which latter series of holes lacing hooks are subsequently inserted. A locking device may preferably be provided for locking the means for controlling the presentation of eyelets in either operative or inoperative position.

A further feature of the invention is the provision of a presser foot which is automatically moved upon stopping the machine to a distance from the work support which

is greater than the distance said presser foot is moved therefrom during the operation of the machine to permit the feeding of the work. This movement facilitates the removal of the completed work from the machine and the insertion of a new piece to be operated upon. Preferably this increased separation between the presser foot and work support will be effected by means of a connection from the starting and stopping mechanism of the machine which acts upon stopping the machine to move the fulcrum of the presser foot lever, and the employment of the starting and stopping mechanisms actuated thereby constitutes another important feature of this invention.

Still another feature of this invention is the provision in a machine of the above class of a single eccentric and a plurality of mechanisms operated thereby and so disposed relatively thereto as to actuate in different phased relationship certain of the operating instrumentalities of said machine. This is exemplified in the machine herein-after described by the actuation of the two setting dies, said dies being both actuated from the same eccentric and having their actuating mechanisms so disposed relatively to said eccentric that the lower die remains approximately stationary in its raised position after inserting an eyelet or other fastener in the stock while the upper die is retreating therefrom, thereby assisting in holding and guiding the work during a part of the cycle of operations of the punch actuating means.

Referring to the accompanying drawings, which represent the various features of my invention as embodied in the form which I at this time believe to be the best and united in a machine for punching holes in stock and inserting eyelets therein:—Figure 1 shows a machine such as above indicated in front elevation; Fig. 2 is a sectional view of the machine taken on a vertical plane approximately central thereof; Fig. 3 is a detail view of part of the punch operating mechanism; Fig. 4 is a detail on an enlarged scale of the mechanism for varying the amount of feeding movement imparted to the work and for controlling the supply of eyelets to the setting dies; Fig. 5 is a sectional view on line 5—5 of Fig. 4; and Fig. 6 is a detail sectional view on an enlarged scale of the upper eyelet setting die and lower part of the supporting bar and the nipple pin.

In the machine illustrated 2 indicates the main frame which may be secured to any suitable support, not shown, and which in turn supports the various operating mechanisms of the machine. In bearings on this frame 2 is mounted a shaft 4 which through the medium of various cams and an eccen-

tric actuates the punching, work feeding and eyelet setting instrumentalities. The punch 6 co-acts with the punch bed or anvil 88 and is mounted upon one arm of a bell crank lever 8, pivoted at 9 and having approximately the form shown in Fig. 2, and, as shown in said figure, having a strut 10 extending across between the ends of the two arms for strengthening said lever. To the other arm of said bell crank lever 8 is pivotally secured one member 12 of a toggle, the other member 14 of which is pivotally connected to the machine frame, preferably being adjustable to vary the position of the punch by being pivoted eccentrically upon a stud 16 which is journaled in the main frame. The stud 16 is provided with a handle 17 by which it may be readily turned and to lock the handle in adjusted position a spring detent 18 mounted on said handle engages a toothed segment 19 secured to the machine frame.

The lever 8 is actuated to move the punch toward and from the stock by means of a cam 21 mounted on shaft 4 and a roller 20 on toggle member 14 engaging said cam. In each cycle of operations of the machine the toggle is straightened by the co-action between the said cam and roller to force the punch 6 through the stock supported on the bed 88 and by a continuation of the motion of the cam the toggle is moved slightly past its central or straightened position to release the pressure of the punch 6 on its bed 88 and permit the lateral movement of the punch to feed the stock, which is accomplished by means to be hereinafter described. Finally the reversing movement of the toggle withdraws the punch 6 from the stock by returning the lever 8 to its initial position.

To permit a lateral movement of the punch to feed the stock the pivot 9 of lever 8 is supported on a sleeve 22 mounted on a vertical shaft 24 which is journaled in the machine frame 2 and the toggle members 12 and 14 are connected by a universal or ball joint 26 so disposed that its path of movement, when the toggle is straightened to impart the punching motion to the lever 8, lies substantially in the path of the vertical shaft 24. To prevent binding, the toggle member 12 is so connected to lever 8 as to be capable of a slight movement along the axis of its pivotal connection therewith. The lever 8 is moved laterally by mechanism including a barrel cam 27 on the main shaft 4. A lever 28, Fig. 4, pivoted eccentrically upon a stud 29 which is journaled in the frame 2 of the machine carries a roll 30 that runs in contact with the cam 27 and a double link 32 connecting the lever 28 with one of the guide plates 24 which are arranged one on each side of the lever 8. One of the guide plates is preferably secured to or formed integral with the sleeve 22 and the other is at-

tached to its companion by means of bolts 35 and distance pieces 36.

By rotating the stud 29, the position of the path of feeding movement of the punch 6 may be adjusted, while to vary the amount of feeding movement of the punch the point of connection between the link 32 and lever 28 may be adjusted relatively to the pivotal point 29 of said lever. To this end the connection between said link and lever comprises a bolt 38 that extends through both portions of the link 32 and also through a curved slot 40 formed in said lever. A frictional means, such as a spring 41 compressed between the nut 42 and the sleeve 43, is employed to keep the said connection in the position to which it has been adjusted. In the particular friction device illustrated in Fig. 5 the pressure exerted by the spring 41 is utilized to force two friction plates 44 against the upper and lower surfaces respectively of lever 28. The lever has a series of holes 46 to receive stops 48 for limiting the extreme adjusted position of the bolt 38 and slot 40. Any suitable means may be provided to secure an adjustment finer than can be secured by the spacings of the holes 46, as, for instance, by mounting a cam 50 on pin 29 to engage the pin 38. It would of course be within the scope of the invention to mount said cam upon pin 38 and in engagement with any relatively stationary part of the machine, such as pin 29 or stop 48.

The upper eyelet setting die 51 is carried by a vertically disposed bar 52 that is reciprocated in its bearings in the frame of the machine by an eccentric 54 on the main shaft 4 through the medium of a lever 56 which is connected by a link 58 to said bar 52. The set may be actuated in a yielding manner to accommodate varying thicknesses of stock or for other purposes as by mounting the pivot 60 of the lever 56 yieldingly in the frame. As shown, said pivot 60 is formed eccentrically upon a pivot or stud 61 which is journaled in the frame 2 and has an arm 62 which bears against the spring pressed plunger 63 which may preferably be made adjustable. Said stud 61 has also an arm 64 that normally abuts against a fixed stop 65 under the action of plunger 63, thus determining the normal position of pivot 60. With this construction when the pressure exerted by the die upon the stock exceeds that necessary to overcome the strength of the spring in plunger 63, the plunger yields and permits the stud 61 to turn and the pivot 60 to move while the eccentric 54 is completing its throw. Thereafter the plunger 63 returns the pivot 60 to its normal position and the die is raised from the stock.

The eyelet assorting and delivering mechanism is substantially the same as that dis-

closed in the pending application of Pearson and Jerram, Serial No. 237,861, filed December 21, 1904, and entitled machine for assorting articles, except that the raceway 66 is detachably pivoted at 67 to the frame 2 and is moved to present eyelets in position to be moved by the sets by means of a lever 68 pivoted on the frame of the machine and connected by links 69 and 70 to the raceway and bar 52 respectively. The raceway is thus actuated positively directly from said bar to present eyelets in the proper position relative to the sets.

For taking the eyelets from the lower end of the raceway preparatory to inserting them in the stock a nipple pin 72 (Fig. 6) is mounted within a tubular portion formed at the lower end of bar 52. The upper end of this nipple pin is split so as to engage frictionally the inner wall of said tubular portion so that said pin will remain therein in any position into which it may be moved. A finger 74 extends through the slot in the side of the bar 52 and into the tubular portion thereof where it engages the top of the nipple pin 72 as said bar rises after being depressed to set an eyelet in the stock. This engagement stops the upward movement of pin 72 so that as the bar 52 and die 51 carried thereby continue to rise said pin 72 is caused to project through a hole formed in the center of the die into readiness to engage, on the next downward movement of the bar and pin together, the lowermost eyelet in the raceway 66 which will by that time have been moved by the mechanism above described immediately under said pin. As the bar 52 and pin 72 descend the latter passes through the hole in the eyelet and then engages the lower setting die 75 which at this time extends through the hole previously formed in the stock by the punch 6. As the raceway 66 is moved back on the descent of bar 52 the eyelet is left strung on the nipple pin 72. On the continued descent of said bar 52 the upper die carried thereby coöperates with the lower die 75 to set the eyelet in the hole in the stock, the descent of the nipple pin 72 having been arrested by its engagement with the lower setting die 75 so that it is forced within the tubular portion of bar 52 as said bar descends. The bar 52, die 51 and nipple pin 72 now rise together until the finger 74 engages the pin when the cycle of operations above described is repeated.

It is clear that if the upward movement of bar 52 is permitted to take place with the pin 72 therein, said pin will fail to engage the eyelet on the next descent of the bar and consequently no eyelet will be set in that cycle of operations. To accomplish this result the finger 74, as shown in Fig. 4, is mounted upon a slide 76, the forward end of which is guided in a recess in a block

78 which loosely surrounds the bar 52. To the other end of bar 76 is pivoted a lever 80 fulcrumed upon the bolt 38 and provided with a handle 81. With this construction the movement of handle 81 in the direction indicated by the arrow in Fig. 4 first moves the bolt 38 in slot 40 to a position determined by the location of stop 48, thereby changing the amount of feeding movement of the stock. If movement of handle 81 is continued the fulcrum of lever 80 shifts from its pivotal point of engagement with slide bar 76 to its point of engagement with stop 48 so that such continued movement causes the finger 74 to be withdrawn from the path of nipple pin 72, thereby allowing said pin to remain within the tubular portion of bar 52 so that the eyelets will not be removed from the lower end of raceway 66, and consequently will not be set in the stock.

Means may preferably be employed to enable the finger 74 to be locked in either inoperative or operative position, and said means may comprise, for example, a detent 82 pivoted on block 78 and adapted to engage one or the other of two notches formed in the slide bar 76. A spring pressed plunger 83 is seated in the detent and abuts against a cam device 84 normally maintaining the plunger in yielding engagement with one of said notches but adapted to depress the plunger and bring a flange 85 thereon in engagement with the detent and lock said detent against rearward movement, thereby insuring that finger 74 shall be maintained either in operative or in inoperative position according to which one of the notches on bar 76 is in engagement with said detent. The cam device 84 preferably has a finger piece 86 for convenience in operating it.

As shown in Figs. 1 and 2 the lower setting die 75 extends through a guide hole in an anvil or bed plate 88 which may be secured to any suitable support such as the horn 89 and which extends below the punch 6 and upper setting die. The lower setting die 75 may be mounted on the upper end of a U-shaped frame 90 situated within the horn 89 and movable upward to permit the lower die to cooperate with the upper one in the setting operation by means of two links 91 and 92 connecting said frame 90 and the frame 2 of the machine respectively, and together forming a toggle which is operated from the eccentric 54 on main shaft 4 of the machine through the medium of bell crank lever 93 and links 94 and 95 connecting said lever with said eccentric and toggle respectively. Provision for adjustment of the lower die may be afforded by making one of said links adjustable in length, for instance, by a turn buckle as shown in Fig. 2 or by mounting the pivot 96 of lever 93 eccentrically on a rotatable stud. It will be noted that the upper and lower dies are con-

nected to be operated by the same eccentric and are so disposed with relation to the eccentric that the lower die remains stationary or approximately stationary in its raised position to hold the work while the upper die is retreating from it, thereby assisting in guiding and holding the work. When the punching mechanism has been operated to punch a hole in the stock, the lower die is lowered below the surface of the anvil 88 so that the said die will not interfere with the feed of the stock when the latter is moved to bring the hole punched in the stock into alinement with the upper and lower setting dies.

The presser foot 100 is adjustably secured in the forward end of a bell crank lever 102 that is strengthened by a strut in the same manner as is lever 8 and is actuated by a cam 101 on shaft 4 as indicated in Fig. 2. The pivot 103 of lever 102 is mounted upon an arm 104 of a rockshaft 106 journaled in the frame 2 and is maintained when the machine is running in its lowermost position by a spring 107. With the pivot of the lever in this position, the cam 101 once in each cycle of operations of the machine raises the presser foot 100 a distance from the anvil 88 just sufficient to permit the stock to be readily fed by the punch 6. When the machine comes to rest it is desirable to raise the presser foot 100 a relatively greater distance from the anvil 88 to facilitate the removal of the completed work therefrom or the insertion of new stock of the machine. As shown, this may be effected by providing the rockshaft 106 with another arm 108 that is connected by a thrust rod 109 to the brake mechanism 110 which may be used with a starting and stopping mechanism of any preferred or improved type.

As indicated in Fig. 1 the starting and stopping mechanism may comprise a driving pulley 112, a clutch member 114 mounted to turn with the shaft and to move lengthwise thereof for communicating the motion of said pulley to said shaft and to brake member 110 mounted on the frame of the machine and into engagement with which said clutch member 114 is moved when it is desired to stop the machine. The means for so moving the clutch member comprise a cam groove 128 obliquely disposed to the axis of rotation of said clutch member and engaged at two points located in a line passing below or at one side of said axis of rotation by the two arms of a forked lever 130. This lever 130 has a shank which is journaled in a socket in a pendent lever 134 which is pivotally supported from eccentric pin 137, a set screw 145 serving to clamp said pin in adjusted position. With this construction rotation of the clutch member imparts to the forked lever 130 a movement of

oscillation about the axis of its shank which is journaled in lever 134 and also a movement of oscillation about pivot 137 of lever 134 caused by the movement of translation of the two arms of the lever 130 together longitudinally of the axis of the clutch member, such movement of translation being due to the fact that the line connecting the two points of engagement of lever 130 with cam groove 128 formed in clutch member 114 does not pass through the axis of said member. So long as lever 130 is permitted to have this movement of oscillation about pivot 137 it will not act to move the clutch member which remains in contact with driving pulley 112, but if this oscillation is interrupted the action of the cam groove 128 on the arms of lever 130 will cause the clutch member to be forced away from the driving pulley 112 and into contact with the brake 110. The particular means as shown for arresting this movement of oscillation about pivot 137 comprise two links 135 and 136 pivoted to lever 134 and the frame of the machine respectively and together forming a toggle which is operated by rod 138 having a rigid collar 140 and a movable collar 142 supported by the spring 143 and connected to suitable actuating means such as a treadle (not shown). Spring 144 serves to return rod 138 to a position in which toggle 135 and 136 is straightened, thereby causing the clutch member to move out of contact with the pulley and into contact with the brake on its next revolution, and stopping the revolution of shaft 4. No claim is made in the present application to the structure or advantages of the specific form of clutch shown as said clutch forms the subject of copending application Serial No. 408,941, filed January 2, 1908.

Brake 110 is mounted so as to have the capacity for a limited rotary motion about the same axis as the clutch member 114 so that when the clutch member is thrust in contact therewith in stopping the machine said brake member 110 is moved through a small angle until stopped positively by abutting against the frame of the machine. This movement of the brake member acts through thrust rod 109 and arm 108 to move rock-shaft 106 against the tension of spring 107 thereby bodily lifting the bell crank 102 and presser foot 100 from anvil 88 to an extent greater than that to which the presser-foot is lifted when the machine is running thus leaving ample space for the insertion or removal of the stock.

In operation the stud 29 is rotated to bring the punch 6, when at the end of its stock feeding movement, into exact alinement with the setting dies and the handle 81 is moved to adjust the bolt 38 in the position corresponding to the desired feed of the stock and to place the finger 74 in the path of nipple

pin 72. The turn buckle in the link 95 or the pivot of lever 93, or both, are adjusted to insure the proper coöperation of lower setting die 75 with the upper die and the stud 16 is turned to shift the pivot of toggle member 14 and adjust the position of punch 6 relative to anvil 88. This adjustment having been made if necessary or desirable the operator starts the machine by moving clutch member 114 out of contact with brake member 110 and into contact with pulley 112. This allows the brake member 110 to be returned by the spring 107 to the position in which the presser foot is in contact with the work. The punch 6 next punches a hole in the stock and then feeds the stock and the eyelet is set in the punched hole by the upper and lower dies as hereinbefore described, it being understood that the stock is clamped upon the anvil by the presser foot during the punching and setting operations, but is released by a slight movement of the presser foot to permit the stock feeding movement. If the stock being operated upon is a boot or shoe upper in which lacing hooks as well as eyelets are to be set, the operator moves handle 81 after the desired number of eyelets have been set, thereby through the connections above described changing the feed of the work by the punch and in consequence the spacings between the punched holes, and at the same time finger 74 is moved out of contact with pin 72 so that the holes that are more widely spaced are not provided with eyelets. They may be filled subsequently with lacing hooks either by hand or another machine if desired. The operation of setting eyelets and punching holes in the stock being completed the operator moves clutch member 114 out of contact with pulley 112 and into engagement with brake 110, thereby stopping the machine, and simultaneously raising the presser foot a greater distance than usual from the work in order to facilitate the removal of the completed work from the machine and the insertion of new.

Having 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 of a tool carrying lever having movement about two axes, and means for actuating said lever, comprising means located in line with one axis and permitting movement about said two axes.

2. In a machine of the class described, the combination of a tool carrying lever having movement about two axes, and means for actuating said lever comprising a toggle arranged to permit said two movements.

3. In a machine of the class described, the combination of a tool carrying lever having movement about two axes, and actuating means therefor, comprising a toggle for moving said lever about one of said

axes, said toggle being constructed and arranged to permit movement of said lever about the other of said axes.

4. In a machine of the class described, the combination of a work support, a tool for acting upon the work supported thereon, a tool carrying lever, and means comprising a toggle for actuating the said lever about an axis parallel to the plane of the stock to be acted upon, and separate means for actuating said lever about an axis perpendicular to the plane of the stock.

5. In a machine of the class described, the combination of a tool carrying lever, means comprising a toggle for actuating said lever to cause the tool carried thereby to act upon the work, said toggle being arranged to permit movement of said lever in a direction at an angle to the first-named movement thereof.

6. In a machine of the class described, the combination of a tool carrying lever, and means comprising a toggle for actuating said lever in one direction, said toggle being constructed and arranged to permit movement of said lever in another direction at an angle to the first-named movement.

7. In a machine of the class described, the combination of a tool carrying lever, and means comprising a toggle for actuating said lever in one direction, said lever being also movable in another direction at an angle to the first-named movement, and said toggle being provided with means located in the line of the axis about which the second-named movement takes place, for permitting such second-named movement.

8. In a machine of the class described, the combination of a tool carrying lever having movement about two axes at an angle to each other, and means for actuating said lever comprising means located in the line of one of said axes and permitting movement of said lever about the other of said axes.

9. In a machine of the class described, the combination of a work support, a tool for acting upon work supported thereon, together with means for positively moving said tool in opposite directions comprising articulated mechanism having at all times an operative relation with said tool for causing said tool to approach the work, to exert pressure thereon, and then to recede slightly to release its extreme pressure, and separate means for moving said tool laterally while still in contact with the work for the purpose of feeding the work.

10. In a machine of the class described, the combination with a work supporting bed, of a tool, and actuating means for said tool including articulated mechanism having at all times an operative relation with said tool and acting positively to move said tool to enter stock supported on said bed, and posi-

tively to move the tool reversely for releasing its extreme pressure, said mechanism including also means to move the tool laterally while still in contact with the stock for the purpose of feeding the stock.

11. In a machine of the class described, the combination of a work support, a tool for acting on the work, a toggle for actuating said tool to act on the work, said toggle having at all times an operative relation with said tool, actuating means for the toggle, and means for moving the said tool laterally to feed the work.

12. In a machine of the class described, the combination of a work support, a tool for acting on the work, a toggle for actuating the tool to act on the work, means acting to straighten said toggle whereby the tool is moved toward the work, said toggle having at all times an operative relation with said tool and being constructed and arranged to permit lateral movement of the tool, and means for moving the tool laterally to feed the work.

13. In a machine of the class described, the combination of a work support, a tool for acting on the work, a toggle for actuating the tool to act on the work, means acting to straighten the toggle whereby the tool is moved toward the support to act on the work, said means serving also to move the toggle slightly past its central position whereby the pressure of the tool on the support is reduced, and means for moving the tool laterally to feed stock while in said position.

14. In a machine of the class described, the combination of a work support, a tool for acting on the work, a toggle for causing said tool to act on the work, said toggle being provided with a universal joint to permit lateral movement of the tool, means for actuating the toggle to cause the tool to act on the work supported on the bed, and means for moving the tool laterally to feed the work.

15. In a machine of the class described, the combination of a work supporting bed, a tool, a toggle for operating said tool to enter stock, actuating means for the toggle, adjusting means constructed and arranged to move the toggle for determining the extent of the entering movement of the tool, and means for moving the tool laterally to feed the stock.

16. In a machine of the class described, the combination of a work supporting bed, a tool, a lever upon which said tool is mounted, a pivoted member on which said tool carrying lever is pivotally mounted, a toggle for operating said tool carrying lever for causing the tool to enter stock supported on the bed, said toggle having a universal joint to permit lateral movement of the tool and tool carrying lever, said universal joint be-

ing disposed substantially in the line about which said tool and tool carrying lever moves, means for actuating the toggle to cause the tool to enter stock supported on the bed, and means for moving the tool laterally to feed the stock.

17. In a machine of the class described, the combination of a work support, a tool for acting on the work, means for actuating said tool comprising a toggle, and means for moving said tool laterally in a curved path to feed the stock, said toggle having a joint disposed substantially in the axis about which said feeding movement takes place.

18. In a machine of the class described, the combination of a work support, a tool for acting on the work, means for actuating said tool comprising a toggle, means for moving the said tool laterally in a curved path to feed the stock, said toggle having a joint disposed substantially in the axis about which said feeding movement of the tool takes place, together with means for adjusting the tool operating means to vary the extent of movement of the tool.

19. In a machine of the class described, the combination of a main shaft, mechanism actuated therefrom, a starting and stopping mechanism for said shaft, and means actuated from said starting and stopping mechanism to vary the operation of said first-mentioned mechanism.

20. In a machine of the class described, the combination of a main shaft, mechanism actuated therefrom, starting and stopping mechanism for said shaft comprising a brake member having capacity for limited movement, and means actuated therefrom to vary the operation of said first-mentioned mechanism.

21. In a machine of the class described, the combination of a main shaft, mechanism actuated therefrom, a starting and stopping mechanism for said shaft, a brake member having capacity for limited movement, a fixed stop on the frame of the machine for limiting the movement of said brake member, and means actuated from said brake member for varying the operation of said first-mentioned mechanism.

22. In a machine of the class described, the combination of a presser foot, a work support, means for feeding the work over said support, means actuating said presser foot to release the work and permit feeding movement thereof, and means acting when the machine is being stopped to raise said presser foot to a greater distance than said presser foot is raised to permit the feed.

23. In a machine of the class described, the combination of a presser foot, a work support, work feeding means, means acting on said presser foot to permit feed of the work, a starting and stopping mechanism

for the machine, and means actuated therefrom to vary the normal movement of the presser foot.

24. In a machine of the class described, the combination of a presser foot, a work support, means for feeding the work, means actuating said presser foot to permit feed of the work, a starting and stopping mechanism for the machine having a brake member, said brake member being capable of a limited movement, and means connected to said brake member and operated therefrom in stopping the machine to vary the normal movement of said presser foot.

25. In a machine of the class described, the combination with a driving shaft of an upper set, a lower set, and mechanisms comprising a single shaft-actuated means for operating said two sets in different phased relationship.

26. In a machine of the class described, the combination of an upper set, a lower set, mechanisms comprising a single actuating means for operating said two sets in different phased relationship, and means for adjusting this relationship.

27. In a machine of the class described, the combination of upper and lower setting devices, and means operating said two devices so as to cause the upper device to advance and present a fastener in setting position, the other device then to advance and cooperate with said first device to set said fastener in the work and then to remain in said advanced position while said first device is retreating, said second device subsequently retreating before the first is again advanced.

28. In a machine of the class described, the combination of means for setting eyelets in stock, actuating means therefor, and eccentrically mounted means extending between said setting and actuating means and adapted to yield to permit said setting devices to yield to accommodate varying thicknesses of stock.

29. In a machine of the class described, the combination of setting devices and eccentrically mounted actuating means therefor adapted to yield to permit said setting devices to accommodate varying thicknesses of stock.

30. In a machine of the class described, the combination of setting devices, actuating means therefor, and connections between said setting devices and actuating means comprising a lever having an eccentrically mounted fulcrum which is adapted to yield to permit said setting devices to accommodate varying thicknesses of stock.

31. In a machine of the class described, the combination of setting devices, actuating means therefor, and connections between said setting devices and actuating means comprising a lever having a fulcrum eccen-

trically mounted and adapted to yield to permit said setting devices to accommodate varying thicknesses of stock.

32. In a machine of the class described, the combination of setting devices, actuating means therefor, connections between said setting devices and actuating means comprising a lever, a stud on which said lever is eccentrically pivoted, a projection on said stud, and a spring pressed plunger for engaging said projection and thereby holding said stud in position.

33. In a machine of the class described, the combination of setting devices, actuating means therefor, connections between said setting devices and actuating means comprising a lever, a stud on which said lever is eccentrically fulcrumed, a projection on said stud, a spring pressed plunger for engaging said projection and thereby holding said stud in position, and stops for determining such position.

34. In a machine of the class described, the combination of a setting device having an aperture, a holder therefor, a nipple pin adapted to be projected through the aperture in said set to receive a fastener, means for so projecting said pin, and means for rendering the last-mentioned means inoperative, said pin being held frictionally in either projected or retracted position.

35. In a machine of the class described, the combination of a setting device having an aperture, a holder therefor, a nipple pin adapted to be projected through said aperture to receive fasteners, means acting on the movement of the set away from the work to project said pin, and means adapted to withdraw said last-mentioned means out of the path of movement of said pin, whereby said pin is allowed to remain in the set.

36. In a machine of the class described, the combination of a setting device having an aperture, a holder therefor, a nipple pin adapted to be projected through said aperture to receive fasteners, means for so projecting said pin, means for feeding the work, and single means acting both to change the amount of feed of the work and to render said pin projecting means inoperative.

37. In a machine of the class described, the combination of a setting device having an aperture, a holder therefor, a nipple pin adapted to be projected through said aperture to receive a fastener, means for so projecting said pin, means for moving said last-mentioned means to inoperative position, and means for locking said pin projecting means in either operative or inoperative position.

38. In a machine of the class described, the combination of means for feeding fasteners, means for receiving the fasteners as fed and inserting them in holes punched in stock, means for feeding the stock between

the successive setting operations, together with a single device adapted to be moved about one pivot to vary the distance the work is fed and adapted to be moved about a second pivot to render the means for receiving fasteners inoperative.

39. In a machine of the class described, the combination of means for feeding fasteners, means for receiving the fasteners as fed and inserting them in holes punched in the stock, punching devices for punching said holes in the stock, means for feeding the stock between the successive setting operations, and a single device adapted to be moved about one pivot to vary the distance the work is fed and adapted to be moved about a second pivot to render inoperative the means for receiving fasteners.

40. In a machine of the class described, the combination of means for feeding fasteners, movable means for receiving the fasteners as fed, devices for setting them in holes punched in the stock, means for feeding the stock, and means for successively varying the amount of the feeding movement and for permitting the fastener receiving means to assume an inoperative position independently of the operation of the setting devices.

41. In a machine of the class described, the combination with a tool-carrying lever mounted for movement about angularly disposed axes, of means for actuating said lever, comprising a cam and connection arranged in line with one axis to permit movement of the lever about another axis.

42. A machine of the class described, having in combination, a tool-carrying lever, a vertical journal therefor about which said lever is mounted to swing, a connecting member between said lever and journal, a second journal carried thereby and actuating means in line with one journal for swinging said lever about the other journal.

43. A machine of the class described, having in combination, a work support, a tool for acting upon the work, a tool-carrying lever, a journal therefor about which said lever is mounted to swing, a connecting member arranged between said lever and journal, a guiding device fast to said connecting member, and actuating means connected to the guiding device for swinging said lever.

44. A machine for setting eyelets having, in combination, a tool for operating on the stock, a support for the stock, toggle links for actuating said tool, and adjusting means for bodily shifting the toggle to vary the action of said tool.

45. A machine for setting eyelets having, in combination, a work support, a tool movable toward and from said support to enter the stock thereon, toggle links for actuating said tool, a normally stationary journal pin

for one of said links, and means for shifting said journal pin to control the action of said tool on the stock.

5 46. A machine for setting eyelets having, in combination, cooperating setting dies, and a device for feeding the work to said setting dies comprising a tool, a tool carrying lever having movement about two axes, and actuating means for the lever acting in line

with one axis and arranged to permit movement of the lever about both of said axes. 10

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

ARTHUR E. JERRAM.

Witnesses:

GRACE HOLMES,

JOHN RICHARD LAW.