

L. W. G. FLYNT.
PERFORATING MACHINE.

APPLICATION FILED JAN. 31, 1905.

Patented Nov. 30, 1909.

4 SHEETS—SHEET 1.

941,704.

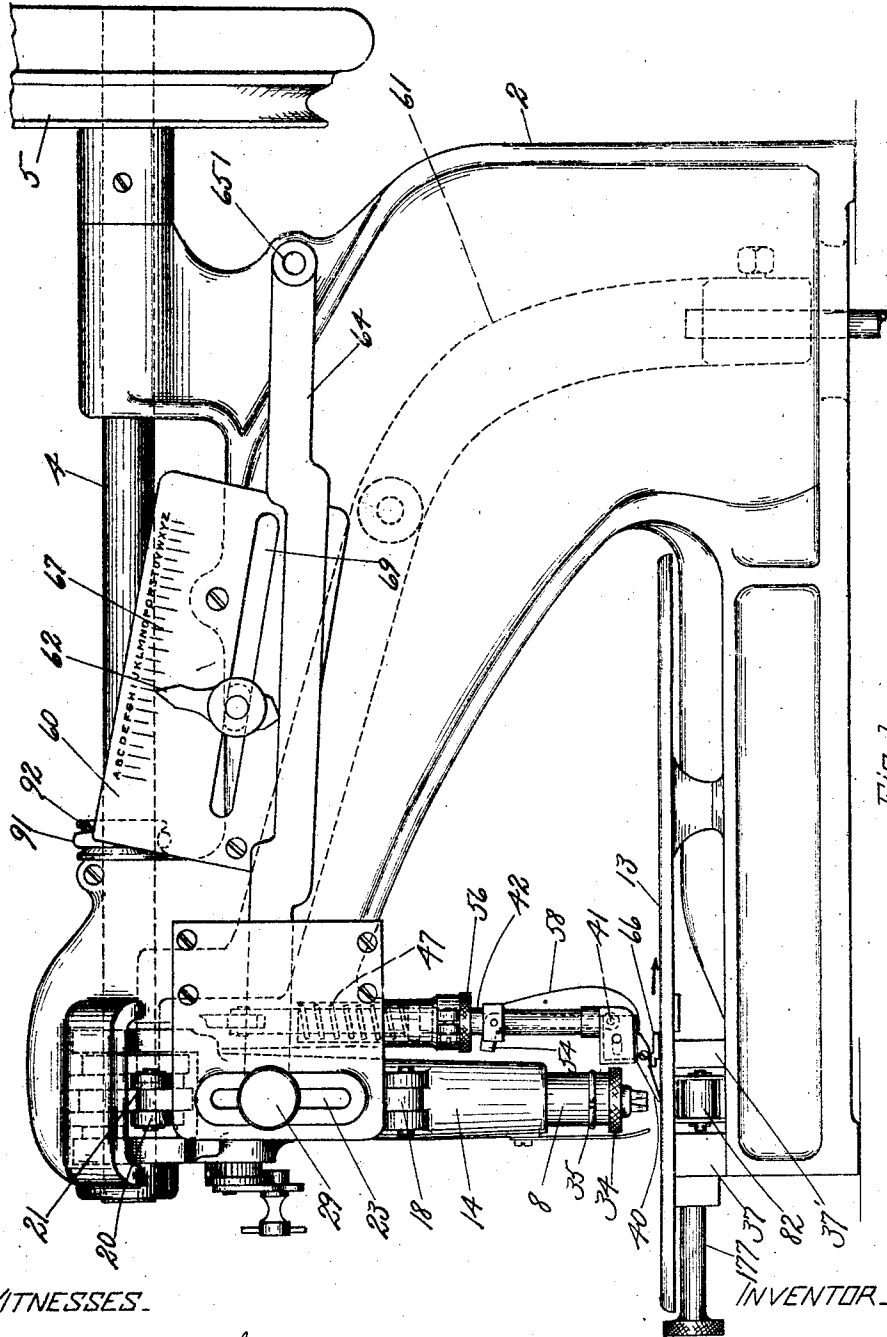


Fig. 1.

WITNESSES.

Nicholms & Houser
Wells L. Church.

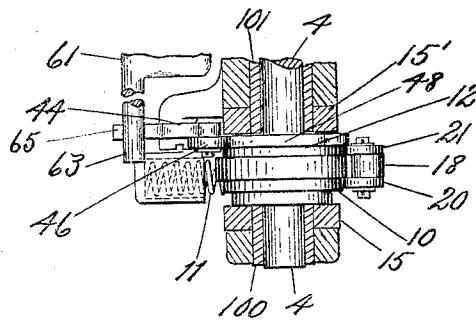
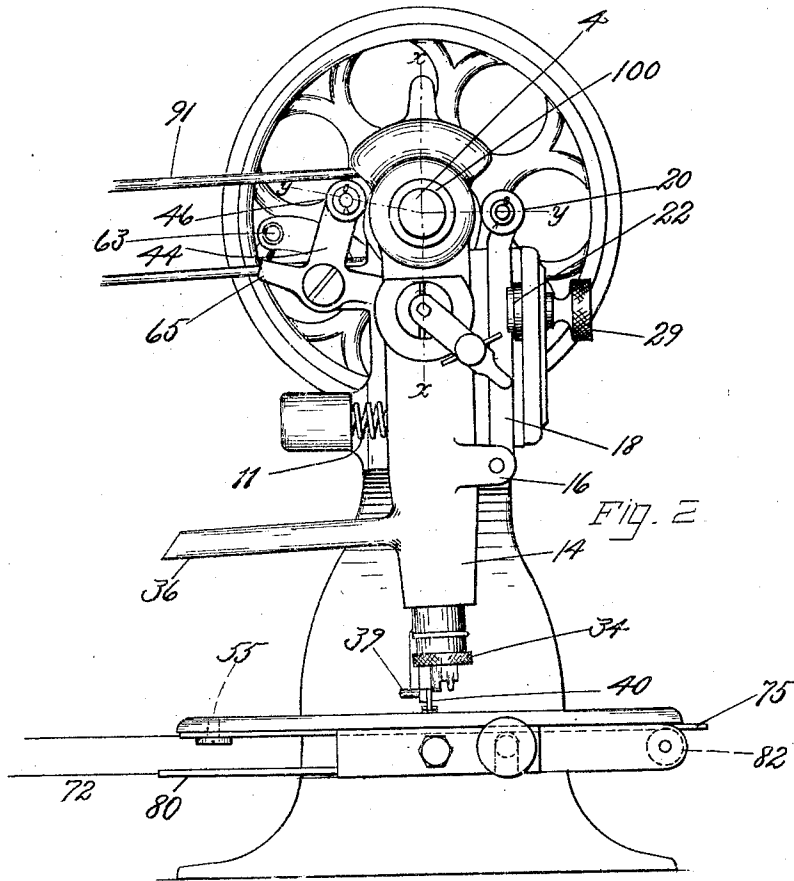
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Louis W. G. Flynt
By his Attorney
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4 SHEETS—SHEET 2



WITNESSES.

Wilhelm C. Heuser.
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FIG. 3.

INVENTOR.

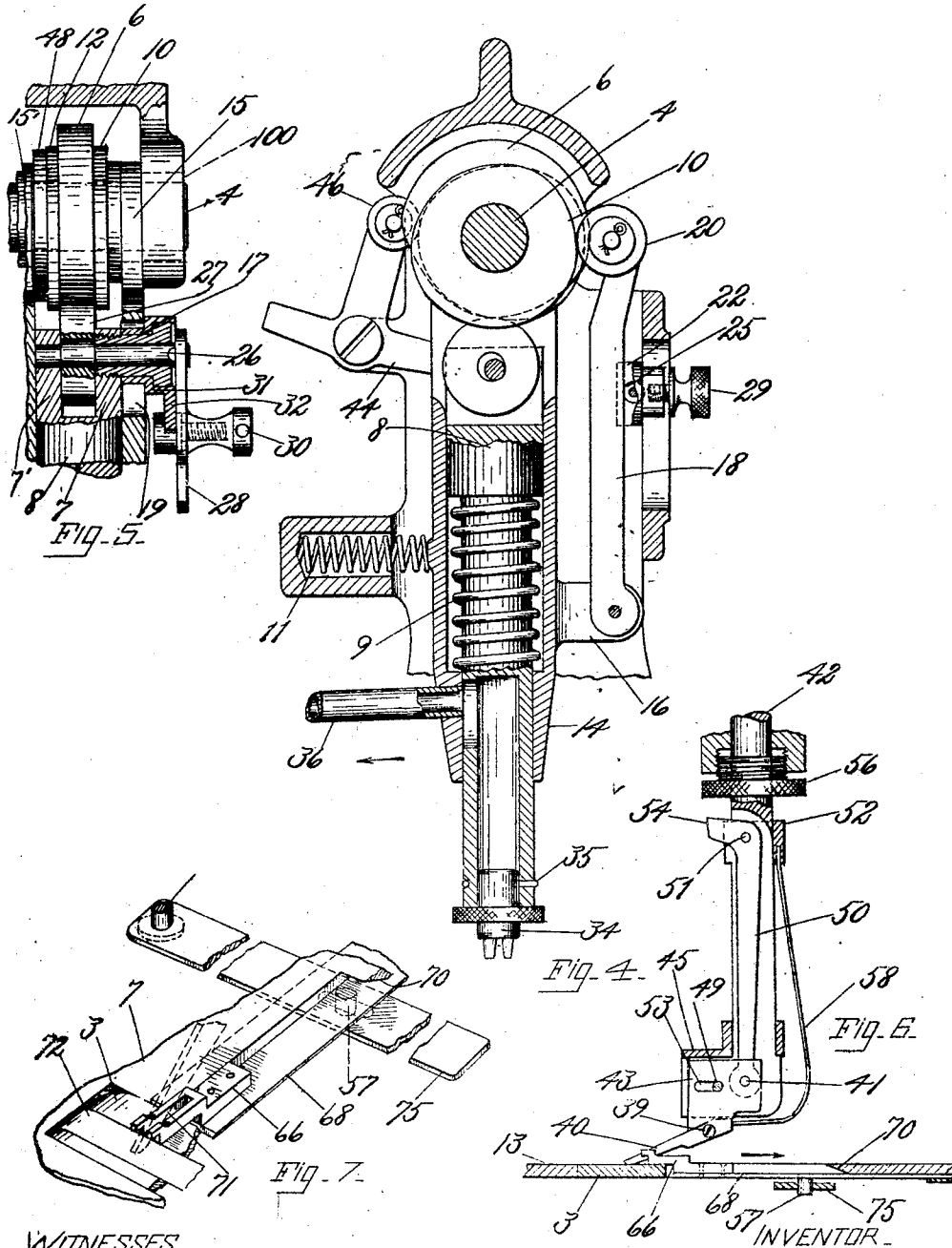
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4 SHEETS—SHEET 3.



WITNESSES.

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Nells L. Church.

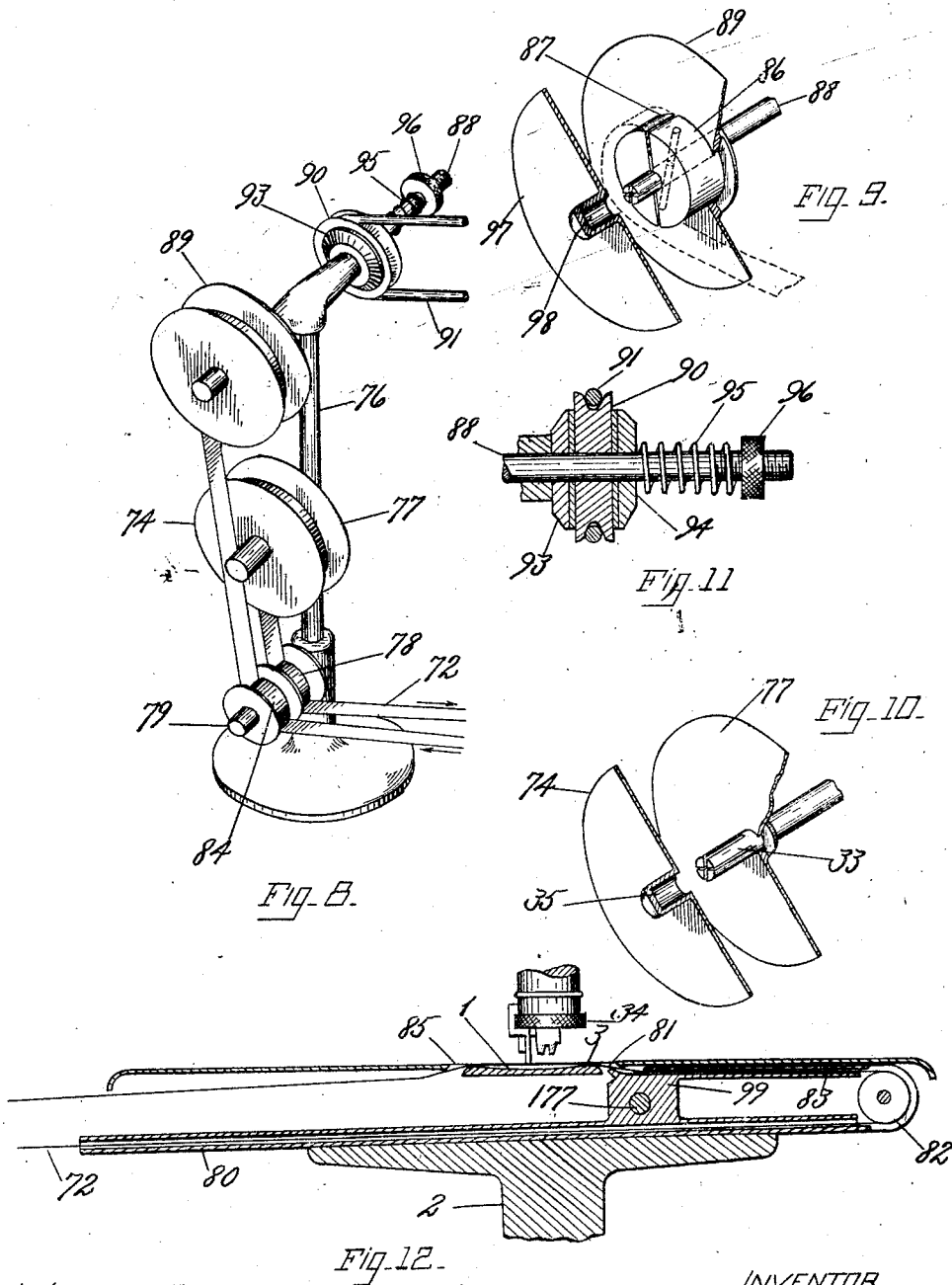
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4 SHEETS—SHEET 4.



WITNESSES.
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UNITED STATES PATENT OFFICE.

LOUIS W. G. FLYNT, OF ROCHESTER, NEW YORK, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PERFORATING-MACHINE.

941,704.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Application filed January 31, 1905. Serial No. 243,504.

To all whom it may concern:

Be it known that I, LOUIS W. G. FLYNT, a subject of the King of Great Britain, residing at Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Perforating-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 punching machines, and particularly to punching machines for forming ornamental perforations in stock, such, for example, as toe-caps and other parts of boots and shoes. The machines which are generally used for this purpose are provided with a punch which penetrates the stock intermittently, a presser foot which engages the stock at a point at one side of the line in which the perforations are being formed, and mechanism for feeding the stock to bring different portions of it successively into position to be acted upon by the punch. For forming perforations in a curved or irregular line the stock is turned relatively to the direction in which it is being fed, and the fulcrum about which it is turned is the presser foot. Machines of this type have not proved satisfactory for forming perforations in both straight and curved lines because the spaces between the perforations formed in a curved line are not of the same length as those between the perforations formed in a straight line. This is due to the fact that the point about which the stock is turned is located at one side of the line in which the perforations are formed, so that when the stock is turned about the presser foot in one direction to produce a curved line of perforations the point at which the last perforation was made will be moved slightly in the direction in which the stock is being fed, thereby increasing the length of the spaces between the perforations, and when it is turned about the presser foot in the other direction that point will be moved slightly in the opposite direction to that in which the stock is being fed, thereby decreasing the length of the spaces between the perforations.

The chief object of this invention is to provide means for insuring that the spaces between perforations formed in a curved or

irregular line will be of the same length as those between perforations formed in a straight line and to this end I have devised a punching machine having a presser foot which engages the stock at a point in alignment with the line of perforations formed in the stock, so that when the stock is turned about the presser foot, the point at which the last perforation was made will not be moved either in the same or in the reverse direction to that in which the stock is being fed but will be moved at approximately a right angle to the direction of the feed.

I have herein shown the preferred form of my invention as embodied in a machine having a punch which penetrates the stock and then moves laterally for feeding the stock, the stock being engaged at a point in the plane of lateral movement of the punch by a presser foot which is moved automatically into and out of operative position. In order that the punch may penetrate the stock without being subjected to contact with a hard metallic bed surface, a facing strip of soft and preferably flexible material is interposed between the punch block and the stock being operated on, said strip being moved step by step as the stock is fed, so that a fresh portion of the strip will be presented to the punch each time it penetrates the stock, and one of the features of this invention consists in means for guiding said strip in its movement and, when flexible, for winding it into a coil as it passes from the punch block.

Other features of the invention consist in an adjustable work-gage which can be depressed below the surface of the stock-supporting table when said gage is not in use, novel mechanism for moving the punch laterally, and for varying the extent of reciprocating movement of the punch, and improved means for changing the degree of lateral movement of the punch.

In the drawings, which illustrate the preferred form of the invention, Figure 1 is a side elevation of a punching machine embodying features of my invention; Fig. 2 is an elevation of the left-hand end of the machine shown in Fig. 1; Fig. 3 is a plan view, partly in section, taken on the line $y-y$ of Fig. 2, showing the cams on the main shaft for actuating the punch, punch carrier, and presser foot bar; Fig. 4 is a view, partly in

section, of the punch bar, punch carrier, and the mechanism for moving it laterally; Fig. 5 is a detail side elevation, partly in section, taken on the line $x-x$ of Fig. 2, showing the cams on the main shaft and the mechanism for adjusting the roller on the end of the punch bar; Fig. 6 is a side elevation of the presser foot and the mechanism for moving it relatively to the presser foot bar; Fig. 7 is a perspective view of the work-gage against which the stock is held; Fig. 8 is a perspective view of the spools on which the facing strip is wound when flexible and the standard on which said spools are mounted; Figs. 9 and 10 are perspective detail views of said spools with the retaining plates removed; Fig. 11 is a detail sectional view showing the means for imparting movement to the shaft which carries one of the spools; and Fig. 12 is a vertical sectional view taken through the stock-supporting table showing the means for guiding the facing strip when flexible.

Referring to the drawings, 2 designates a frame which carries a main shaft 4 having a driving pulley 5 and provided with a cam 6 for depressing a punch bar 8 and with cams 10 and 12 for imparting lateral movement to a carrier 14 in which the punch bar is mounted. The main shaft is mounted in bushings 100 and 101 in the frame, and the carrier 14 is provided at its upper end with straps 15, 15' that are journaled on said bushings, as shown in Fig. 5, and pivotally connected to a bracket 16 on said carrier is a lever 18 provided with rollers 20 and 21 which coöperate with the cams 10 and 12 on the main shaft. A fulcrum block 22 is adjustably mounted in a slot 23 in a stationary part of the frame and is provided with a roller 25 which acts as a fulcrum for the lever 18, so that when the upper end of said lever is moved outwardly by the cams on the main shaft the lower end of said lever will be moved in the opposite direction, thereby swinging the punch bar carrier 14 in the direction of the arrow in Fig. 4 for causing the punch to feed the stock, said carrier being moved in the opposite direction, back to starting position, by a spring 11 confined in a stationary part of the frame and bearing against said carrier. By changing the position of the fulcrum block the extent of movement of the punch bar carrier in each direction will be varied and the distance which the punch feeds the stock will be changed. The punch bar is provided at its upper end with ears 7 and 7' in which a pin 26 is mounted, said pin having an eccentric portion which carries a roller 27 that coöperates with the cam 6 that depresses the punch bar, said bar being moved upwardly to withdraw the punch from the stock by means of a spring 9 that surrounds said bar, as shown in Fig. 4.

A headed bushing 17 surrounding a portion of the pin 26 is threaded into the ear 7 of the punch bar and extends outwardly through a slot 19 in the upper end of the carrier 14, and surrounding the extended portion of said bushing is the hub 31 of a clamping plate 32. A handle 28 is fastened to the end of pin 26 and is provided with a clamp screw 30 that engages the plate 32 for holding the pin 26 in adjusted position. By changing the position of the pin 26, the eccentric portion thereon moves the roller 27 relatively to the punch bar for varying the degree of downward movement of said bar.

A punch 31 is fastened to the lower end of the punch bar by a yielding pin 35, and said punch may consist of a single hollow punch tube or of a plurality of hollow punch tubes, as shown in Fig. 4, depending upon the style of perforations which are to be formed in the stock, the pieces of punched-out material passing up through an opening in the punch bar and out of a chute 36 fastened to the carrier 14.

A presser foot 40 is conveniently secured, as by a screw 39, to a block 43 slidably mounted in a bearing 45 on the lower end of a presser foot bar 42 which is mounted in the central longitudinal plane of the machine and which is connected at its upper end to an elbow lever 44 pivoted to a stationary part of the frame and provided with a roller 46 that is engaged by a cam 48 on the main shaft for moving the presser foot bar upwardly, the presser foot bar being moved downwardly by a coiled spring 47 which surrounds said bar between a shoulder thereon and a stationary part of the frame, as shown in dotted lines in Fig. 1. As shown in Fig. 1, the presser foot is adapted to engage the stock at a point directly in the path in which the punch moves laterally for feeding the stock, so that when the stock is turned about the presser foot to produce a curved or irregular line of perforations the point at which the last perforation was made will be moved at approximately a right angle to the direction in which the stock is being fed, the fulcrum about which the stock is turned being located in the same vertical plane as that in which the punch moves laterally. The presser foot is preferably provided with a contact face which is shaped to engage a small portion only of the stock at a point in alinement with the perforations being formed. The stock may thus be turned readily about the presser foot as a center and without liability of producing unequal spacing between the perforations. The block 43 which carries the presser foot is connected by a pin 41 to the end of an actuating lever 50 mounted in the presser foot bar, which may be slotted to receive it, and pivotally connected at 51 to a sleeve 52 on said bar, the movement of said block in its bearing being

limited by a pin 49 which enters a slot 53 in the block, as shown in Fig. 6. The lever 50 has a toe 54 at its upper end, and when the presser foot bar 42 is moved upwardly said toe will engage a stop 56 adjustably mounted in a stationary part of the frame of the machine, thereby rocking the lever 50 on pin 51 and moving the block 43 in the direction of the arrow in Figs. 1 and 6 to carry the presser foot 40 out of the path of lateral movement of the punch. After the punch has penetrated the stock and has moved laterally for feeding the stock, the presser foot bar is moved downwardly, and as the toe 54 moves out of engagement with the stop 56, a spring 58 rocks lever 50 and moves block 43 into its former position so as to carry the presser foot into engagement with the stock at a point in alinement with the perforations being formed therein and approximately midway between the extreme positions occupied by the punch in its lateral movements, said presser foot remaining in engagement with the stock during the time the punch is being withdrawn from the stock and moved back to starting position. As the presser foot engages the stock at a point approximately midway between the positions occupied by the punch when it penetrates the stock and when it is withdrawn from the stock, the presser foot will never interfere with the movements of the punch, and will not need to be adjusted into a different position when the extent of lateral movement of the punch is changed.

For raising the presser foot from the stock when the machine is not in operation, a treadle-actuated lever 61 is pivoted to the frame of the machine, as shown in dotted lines in Fig. 1, and is provided with an arm 63 that engages an arm 65 on lever 44 whenever lever 61 is actuated, thereby rocking lever 44 and elevating the presser foot bar. The punch bar carrier, as herein shown, swings about the main shaft as a center to effect the lateral movement of the punch, and for insuring that the cutting edge of the punch will be the same distance from the punch block 3 in all points of its lateral movement, said punch block is provided with a curved surface 1 concentric with the center of the main shaft, see Fig. 12.

In order that the operator may accurately adjust the fulcrum block in the position required for producing the desired degree of lateral movement of the punch, any convenient means may be provided for governing the position of said fulcrum block with relation to the lever 18. One means comprises the following instrumentalities: A bar 64 is pivoted at 651 to the frame of the machine and is connected at its other end to the fulcrum block which is held in adjusted position in the slot 23 by a screw 29. A plate 60 provided with a scale 67 and a

slot 69 formed at an acute angle with relation to the bar 64 is fastened to the frame of the machine, and adjustably mounted in said slot is a stop 62 that is adapted to be engaged by the bar 64 and thereby determine the position of the fulcrum block. When it is desired to vary the degree of lateral movement of the punch bar so as to change the length of the spaces between the perforations which are formed in the stock, the screw 29 is loosened and the bar 64 is moved out of engagement with stop 62, said stop being then adjusted in the slot 69 to the position indicated by the scale 67 for producing the desired degree of lateral movement of the punch, and the lever 64 is again moved into contact with said stop, the screw 29 being then tightened to hold the fulcrum block in position. By locating the slot at a slight angle to the bar 64 the stop 62 has a large component of movement longitudinally of the scale and a small component of movement vertically when it is shifted. This allows the use on the scale of characters which can be readily seen for indicating the adjustment of the stop.

A work gage 66 for guiding the stock is movably mounted in a slot in the table 13, said gage being fastened to one end of a spring strip 68 that moves in a guideway formed in the underneath surface of said table. The gage has a slot 71 which acts as a guide for the presser foot and said gage is moved toward and from the path of movement of the punch by a manually-controlled lever 75 pivoted at 55 to the table and provided with a slot which receives a downwardly projecting pin 57 on the spring strip. When it is desired to depress the gage below the surface of the stock-supporting table, said gage is moved into contact with an inclined face 70 formed in the table at one end of the slot in which the gage moves, the spring strip yielding to permit the inclined face to force the gage downwardly.

For insuring an effective work-punching movement of the punch without causing it to contact with the metallic engaging surface of the punch block 3, a facing strip 72 of soft and preferably flexible material, for instance paper, is interposed between the stock and the punch block 3, said strip being engaged by the punch and fed with the stock, so that a fresh portion of said strip is presented to the punch each time it penetrates the stock, and in order that the strip may be fed easily the punch is retracted slightly just prior to its lateral movement, so as to relieve the pressure on said strip. The strip in the form of a coil is supported on a stud 33 fastened to a standard 76 that is mounted at one side of the frame of the machine, to the left of Fig. 2, and said stud has a split end which enters the socket 35 of a retaining plate 74, a cooperating retain-

ing plate 77 being fastened to said stud. The strip passes under a guide-roller 78 mounted on a stud 79 carried by the standard, through a guideway formed by a flat tube 80 mounted on the frame of the machine below the table, over a guide roller 82 mounted at the end of said tube and thence in the opposite direction through a tube 83 extending parallel to tube 80. From the tube 83 the strip passes up through a slot 81 formed in the table, over the punch block 3, and then below the surface of the table through a slot 85 to a guide roller 84 mounted on the stud 79, and from said roller up to a receiving spool 86 which is fastened to a shaft 88 carried by the standard 76. The receiving spool 86 is provided with a slot 87 in which the end of the strip is inserted, said strip being confined between the retaining plate 89 and cooperating plate 97 provided with a socket 98 which receives the split end of shaft 88, as shown in Fig. 9.

A pulley 90 is loosely mounted on shaft 88 and is driven by means of a belt 91 that passes over a pulley 92 on the main shaft, the pulley 90 being confined between two friction washers 93 and 94 splined to the shaft 88. A coiled spring 95 surrounds the shaft 88 between washer 94 and a nut 96 on said shaft and operates to force said friction washers and pulley into engagement with each other for causing rotary movement to be imparted to said shaft. The tension of spring 95 can be varied by adjusting the nut 96 and in practice the tension of said spring is so regulated that it will cause rotary movement to be imparted to shaft 88 only when the punch is feeding the stock and the strip, thereby taking up the slack in the strip. After the strip has passed through the machine once and has been wound into a coil on the spool 86, the coil is removed from said spool and is again placed on the stud 33, the coil being reversed so that the opposite edge of the strip will be acted upon by the punch when it is again fed through the machine.

In order that the strip 72 may be used a number of times, the guideway formed by the tubes 80 and 83 is adapted to be adjusted transversely of the punch block so that different portions of the width of the strip can be brought into position to be acted upon by the punch, said tubes being fastened to a block 99 which is engaged by the threaded end of an adjusting screw 177 rotatably mounted in upwardly projecting lugs 37, 37' on the base of the machine.

The operation of the machine is as follows: As the main shaft revolves, the cam 6 forces the punch through the stock and into the strip of flexible material which is interposed between the strip and the punch block. Thereafter the punch is retracted slightly but is not withdrawn from the

stock or strip, and the cams 10 and 12 operating upon the lever 18 swing the punch carrier laterally in the direction of the arrow in Fig. 4 for causing the punch to feed the stock and also the strip of flexible material, said strip being wound onto the spool 86 as it is fed step by step with the stock. When the punch arrives at the end of its lateral movement, the presser foot bar moves downwardly and the spring 58 moves the presser foot 40 into position to engage the stock at a point in alinement with the line of perforations being formed in the stock, the presser foot remaining in engagement with the stock while the punch is being withdrawn from the stock and strip by the spring 9 surrounding the punch bar, and moved back to starting position by the spring 11 acting upon the punch bar carrier. As the punch is again forced into the stock the cam 48, operating on lever 44, moves the presser foot bar upwardly and during the upward movement of the presser foot bar the toe 54 on lever 50 comes into engagement with the stop 56, thereby rocking said lever and moving the presser foot in the direction of the arrow in Fig. 6 out of the path of lateral movement of the punch. These operations are repeated for forming successive perforations in the stock, and so long as the stock is not turned about the presser foot the perforations will be formed in a straight line. By turning the stock about the presser foot as a fulcrum, the point at which the last perforation was made will be moved at approximately a right angle to the direction in which the stock is being fed and a different portion of the stock will be moved into alinement with the punch, so that the next perforation which is formed will be out of alinement with those formed in a straight line, the operator continuing to turn the stock after each feed movement so as to form a curved or irregular line of perforations.

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, a punch, means for actuating said punch to form successive perforations in stock, a presser foot having a contact face shaped to engage a small portion of the stock only at a point in alinement with the perforations being formed therein and arranged to facilitate turning of the stock about itself, and means for feeding the stock.

2. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving the punch laterally to feed the stock, a presser foot for engaging the stock at a point in the plane of lateral movement of the punch, and means for moving said presser foot out of the path of movement of said punch.

3. In a machine of the class described, a punch, means for actuating said punch to form successive perforations in stock, means for moving said punch laterally to feed the stock, and a presser foot for engaging the stock at a point in alinement with the perforations being formed therein and approximately midway between the extreme positions occupied by the punch in its lateral movements.

4. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving said punch laterally to feed the stock, a presser foot having a contact face shaped to engage a small portion of the stock at a point in alinement with the perforations being formed therein, and arranged to facilitate turning of the stock about itself, and mechanism for actuating the presser foot to engage the stock intermittently only at a point in alinement with said perforations.

5. In a machine of the class described, a punch, means for forcing it into stock, means for moving said punch laterally to feed the stock, a presser foot for engaging the stock at a point in the plane of lateral movement of the punch, and automatic means for moving said presser foot into and out of operative position relatively to the stock and out of the path of lateral movement of said punch.

6. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving said punch laterally to feed the stock, means for withdrawing said punch from the stock, means for returning said punch to its starting position, and a presser foot having a contact face shaped to engage a small portion of the stock only at a point in the plane of lateral movement of the punch while the punch is being withdrawn from the stock and moved back to starting position, said presser foot being arranged to facilitate turning of the stock about itself.

7. In a machine of the class described, a punch bar provided with a punch, means for actuating said bar to cause the punch to penetrate stock, a swinging carrier for supporting the punch bar, a lever pivoted to said carrier, an adjustable fulcrum block for said lever, means for actuating said lever to move the carrier to cause the punch to feed the stock, a presser foot for engaging the stock at a point in the plane of movement of the punch for feeding the stock, and means for moving said presser foot out of the path of movement of said punch.

8. In a machine of the class described, a punch bar, a punch mounted thereon, means for forcing said punch into stock and thereafter moving it slightly in the opposite direction, a pivoted punch bar carrier, means for oscillating said carrier to cause the punch to feed the stock, a punch block having a surface concentric with the center of oscillation of said carrier, a strip of flexible

material passing over the punch block, a presser foot for engaging the stock at a point in the plane of movement of the punch for feeding the stock, and means for moving said presser foot out of the path of movement of said punch.

9. In a machine of the class described, a punch bar provided with a punch, means for actuating said bar to cause the punch to penetrate stock, a swinging carrier for supporting the punch bar, a lever pivotally connected to said carrier, a fulcrum block for said lever, means for actuating said lever to move the carrier and cause the punch to feed the stock, a presser foot for engaging the stock in the path of movement of said punch, and means for moving said presser foot out of said path.

10. In a machine of the class described, a punch bar provided with a punch, a shaft provided with a cam for depressing said bar to cause the punch to penetrate stock, a carrier journaled on said shaft for supporting the punch bar, a lever connected to said carrier, an adjustable fulcrum block for said lever, a cam for actuating said lever to move the carrier and cause the punch to feed the stock, a presser foot for engaging the stock in the plane of movement of the punch for feeding the stock, and means for moving said presser foot out of the path of movement of said punch.

11. In a machine of the class described, a laterally movable punch carrier, a punch mounted thereon, means for forcing said punch into stock, a lever pivoted to said carrier, an adjustable fulcrum block for said lever, means for actuating said lever to move the carrier to cause the punch to feed the stock, a stationary plate provided with a scale and a movable pointer for said scale, said pointer being arranged to regulate the adjustment of the fulcrum block.

12. In a machine of the class described, a punch bar provided with a punch, means for actuating said bar to cause the punch to penetrate stock, a movable carrier for supporting the punch bar, a lever fastened to said carrier, an adjustable fulcrum block for said lever, a cam for actuating said lever to move the carrier and cause the punch to feed the stock, a bar pivoted to the frame of the machine and connected to said fulcrum block, a stationary plate provided with a scale and a slot formed at an angle to said bar, and a stop adjustably mounted in said slot and adapted to be engaged by said bar for determining the position of the fulcrum block.

13. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving said punch laterally to feed the stock, a presser foot bar, a presser foot carried by said bar, means for reciprocating said bar, and means for moving said presser foot relatively to said bar

into and out of position for engaging the stock at a point in the plane of movement of the punch for feeding the stock.

14. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving said punch laterally to feed the stock, a presser foot bar, a lever pivotally connected to said bar and carrying a presser foot for engaging the stock at a point in the plane of lateral movement of the punch, means for reciprocating said presser foot bar, a stop adapted to actuate said lever as the presser foot bar is being moved upwardly to carry the presser foot out of operative position, and a spring for moving said lever in the opposite direction for carrying the presser foot into operative position as the presser foot bar is moved downwardly.

15. In a machine of the class described, a punch, means for forcing said punch into stock, means for moving said punch laterally to feed the stock, a presser foot bar provided at its lower end with a bearing, a block slidingly mounted in said bearing and having fastened thereto a presser foot adapted to engage the stock at a point in the plane of lateral movement of the punch, a lever pivotally mounted in a slot in said presser foot bar and connected at its lower end to said block, means for reciprocating said presser foot bar, and an adjustable stop for rocking said lever to move the presser foot out of operative position as the presser foot bar is being moved in one direction, and a spring for rocking said lever to return said presser foot to operative position as the presser foot bar is being moved in the other direction.

16. In a machine of the class described, a table, a work gage mounted in a slot in said table, means for moving said gage longitudinally of said slot, and means for depressing said gage below the surface of the table.

17. In a machine of the class described, a table, a gage mounted in a slot in said table, a flexible strip to which said gage is fastened, means for actuating said strip to move the gage in said slot, and an inclined surface formed in the table and adapted to depress the gage below the surface of the table when said gage is moved into contact therewith.

18. In a machine of the class described, a punch, a punch block, a strip of flexible material passing over said punch block, a guideway through which said strip passes, and means for moving said guideway to carry the strip transversely of the punch block, whereby different portions of the width of the strip are brought into position to be acted upon by said punch.

19. In a machine of the class described, a punch, a punch block, a stock-supporting

table, a strip of flexible material passing over said punch block, a guideway for said strip mounted below the table comprising parallel flattened tubes, a roller interposed between the tubes and mounted at one end thereof, and means for moving said strip transversely of said punch block whereby different portions of the width of the strip are brought into position to be acted upon by said punch.

20. In a machine of the class described, a punch, a punch block, a stock-supporting table, a strip of flexible material passing over said punch block, slots formed in the table at each end of the punch block to permit the passage therethrough of said strip, a guideway for said strip mounted below the table, and means for moving said strip transversely of said punch block whereby different portions of the width of the strip are brought into position to be acted upon by said punch.

21. In a machine of the class described, a punch, a punch block, a stock-supporting table, slots formed in the table at each end of the punch block, a strip of flexible material passing from beneath the table up through one of said slots over the punch block, and then through the other slot below the surface of the table, a guideway comprising flattened tubes mounted below the table for guiding said strip, a block fastened to said tubes and an adjusting screw rotatably mounted in stationary brackets and having a threaded end in engagement with said block.

22. In a machine of the class described, a punch, a punch block, a standard provided with a stud for supporting a coil formed of a strip of flexible material that passes over said punch block, a shaft mounted in said standard and having a spool onto which the strip of flexible material is wound after it has passed over said punch block, a driven pulley loosely mounted on said shaft, friction washers connected to said shaft on each side of said pulley, means for forcing said washers and pulley yieldingly into engagement for imparting rotary movement to said shaft, and means for moving said strip transversely of said punch block whereby different portions of the width of the strip are brought into position to be acted upon by said punch.

23. In a machine of the class described, a punch, a punch block, a standard provided with a stud for supporting a coil formed of a strip of flexible material that passes over said punch block, retaining plates for holding the coil on said stud, a shaft mounted in said standard and having a spool onto which the strip of flexible material is wound, retaining plates cooperating with said spool, a driven pulley loosely mounted on said shaft, friction washers fastened to said shaft on

each side of said pulley, a spring for forcing said washers and pulley yieldingly into engagement for imparting rotary movement to said shaft, means for varying the tension of said spring, and means for moving said strip transversely of said punch block whereby different portions of the width of the strip are brought into position to be acted upon by said punch.

24. In a machine of the class described, a punch, means for actuating said punch to form successive perforations in stock, means for moving said punch laterally to feed the stock, means for adjustably varying the extent of lateral movement of the punch, and a presser foot arranged to engage the stock at a point in alinement with the perforations being formed therein and approximately midway between the extreme positions occupied by the punch in any of its lateral movements.

25. In a machine of the class described, a punch, means for actuating said punch to form successive perforations in stock, a presser foot for engaging the stock at a point in alinement with the perforations being formed therein, and means for moving said presser foot into and out of operative position transversely to the line of perforations.

26. In a machine of the class described, a laterally-movable punch carrier, a punch mounted thereon, means for forcing said punch into stock, a lever fulcrumed in the machine frame having one end pivoted to said carrier, means for actuating the free end of said lever to move the carrier and cause the punch to feed the stock, a gage for determining the length of feed, and means operatively associated with said gage for controlling the position of the lever fulcrum.

27. In a machine of the class described, means for perforating stock, means for thereafter feeding the stock, means for retaining the stock in position during the period between the feed movements comprising a presser bar and a foot carried thereby, and means for moving said foot transversely with respect to said bar into and out of position for engagement with the stock.

28. In a machine of the class described, means for perforating stock, means for thereafter feeding the stock, means for retaining the stock in position during the period between the feed movements comprising a presser bar and a foot carried thereby, means for moving said foot relatively to said bar into and out of position for engagement with the stock, and means for controlling the extent of such movement.

29. In a machine of the class described, means for perforating stock, means for thereafter feeding the stock, means for retaining the stock in position during the pe-

riod between the feed movements comprising a presser bar and a foot carried thereby, means for reciprocating said bar, and means for moving said foot relatively to said bar and transversely to the line of feed into and out of position for engaging the stock.

30. In a machine of the class described, means for perforating stock, means for thereafter feeding the stock, means for retaining the stock in position during the period between the feed movements comprising a presser bar and a foot carried thereby, and means for reciprocating said bar, said bar and foot being so constructed and arranged that when the bar is reciprocated the foot is moved transversely with respect to said bar into and out of position for engaging the stock.

31. In a machine of the class described, means for perforating stock, means for thereafter feeding stock, means for retaining the stock in position during the period between the feed movements comprising a presser bar, a lever pivoted thereto and a presser foot carried by said lever, means for reciprocating said bar, means for engaging and actuating said lever as said bar is moved in one direction to carry the foot out of operative position, and means for moving said foot into operative position as the lever recedes from said actuating means when said bar is moved in the opposite direction.

32. In a machine of the class described, means for perforating stock, means for thereafter feeding the stock, means for retaining the stock in position during the period between the feed movements comprising a presser bar, a movable block carrying a presser foot attached to said bar, means for guiding said block in its movement and a lever fulcrumed to said bar having one end connected to said block, and means for engaging and actuating the free end of said lever to move the presser foot relatively to said bar for disengaging the foot from the stock.

33. In a machine of the class described, a laterally movable punch carrier, a punch mounted thereon, means for forcing said punch into stock, a lever fulcrumed in the machine frame and pivoted to said carrier, an adjustable fulcrum block for said lever, means for actuating said lever to move the carrier to cause the punch to feed the stock, and means for adjusting said fulcrum block to determine the amount of such feeding movement.

34. A machine of the class described having in combination a punch bar, means for reciprocating said bar, a carrier in which said bar is mounted, and means for laterally moving said carrier, said means comprising a lever and an adjustable fulcrum.

35. A machine of the class described having in combination a punch bar, means for

reciprocating said bar, and means for moving said bar laterally, said last named means comprising a pivoted lever, a fulcrum block, and means for adjusting the position of said block.

5 36. A machine of the class described having in combination a laterally movable punch carrier, a punch mounted thereon, means for forcing said punch into stock, a
10 lever connected with said carrier, an adjustable fulcrum block for said lever, and means for actuating said lever to move the carrier and cause the punch to feed stock.

15 37. A machine of the class described having in combination a laterally movable

punch carrier, a punch carried thereby, means for forcing said punch into stock, a lever one end of which engages said carrier to move it, means for actuating the opposite end of said lever, and an adjustable fulcrum block by which the extent of movement of said carrier by said lever may be varied.

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

LOUIS W.G. FLYNT.

Witnesses:

QUENTIN W. BOOTH,
JAMES C. CLEMENTS.