

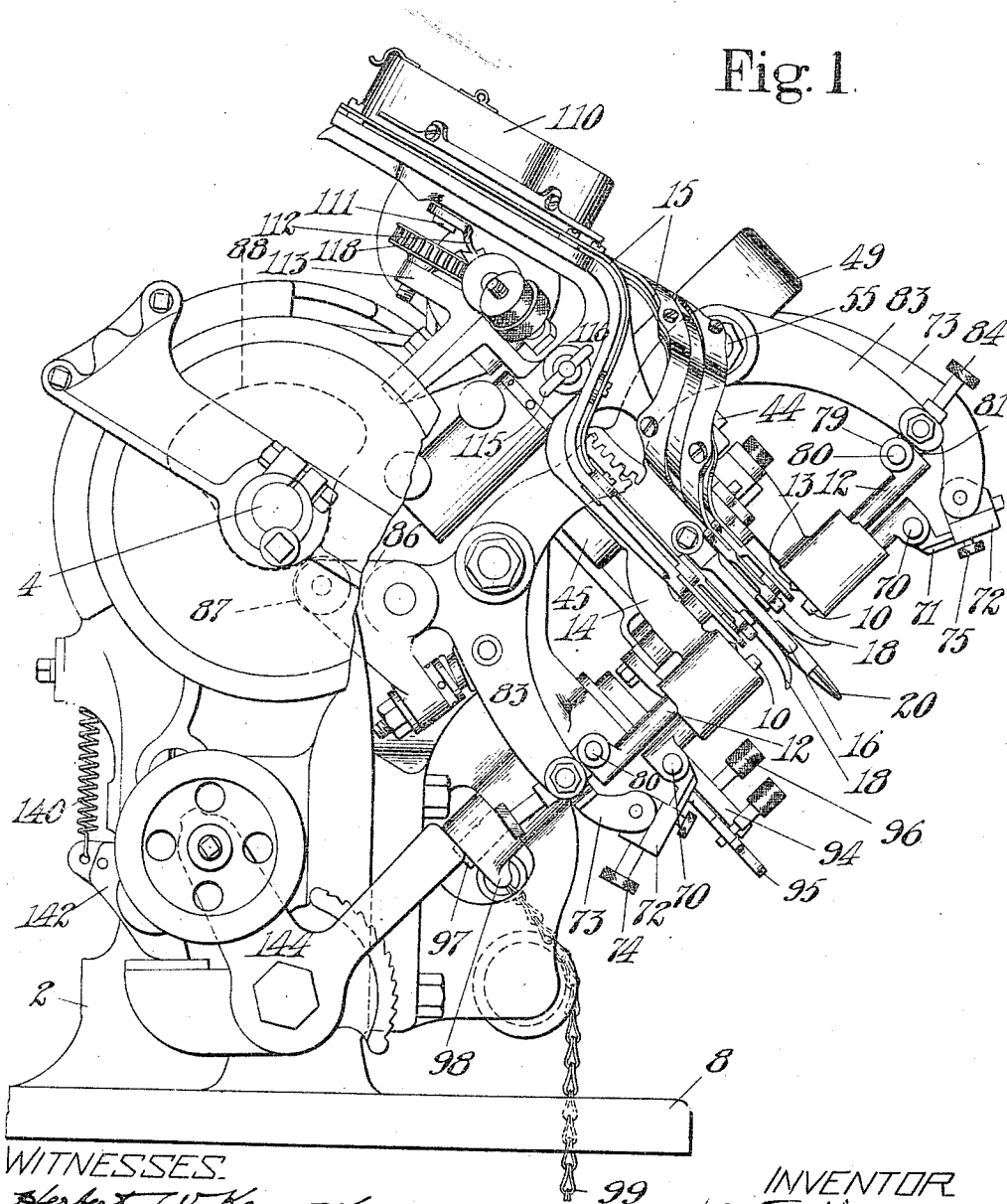
W. SHAW.
EYELETING MACHINE.
APPLICATION FILED DEC. 20, 1909.

1,006,011.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

Herbert W. Kenway
Elizabeth C. Coyle

INVENTOR

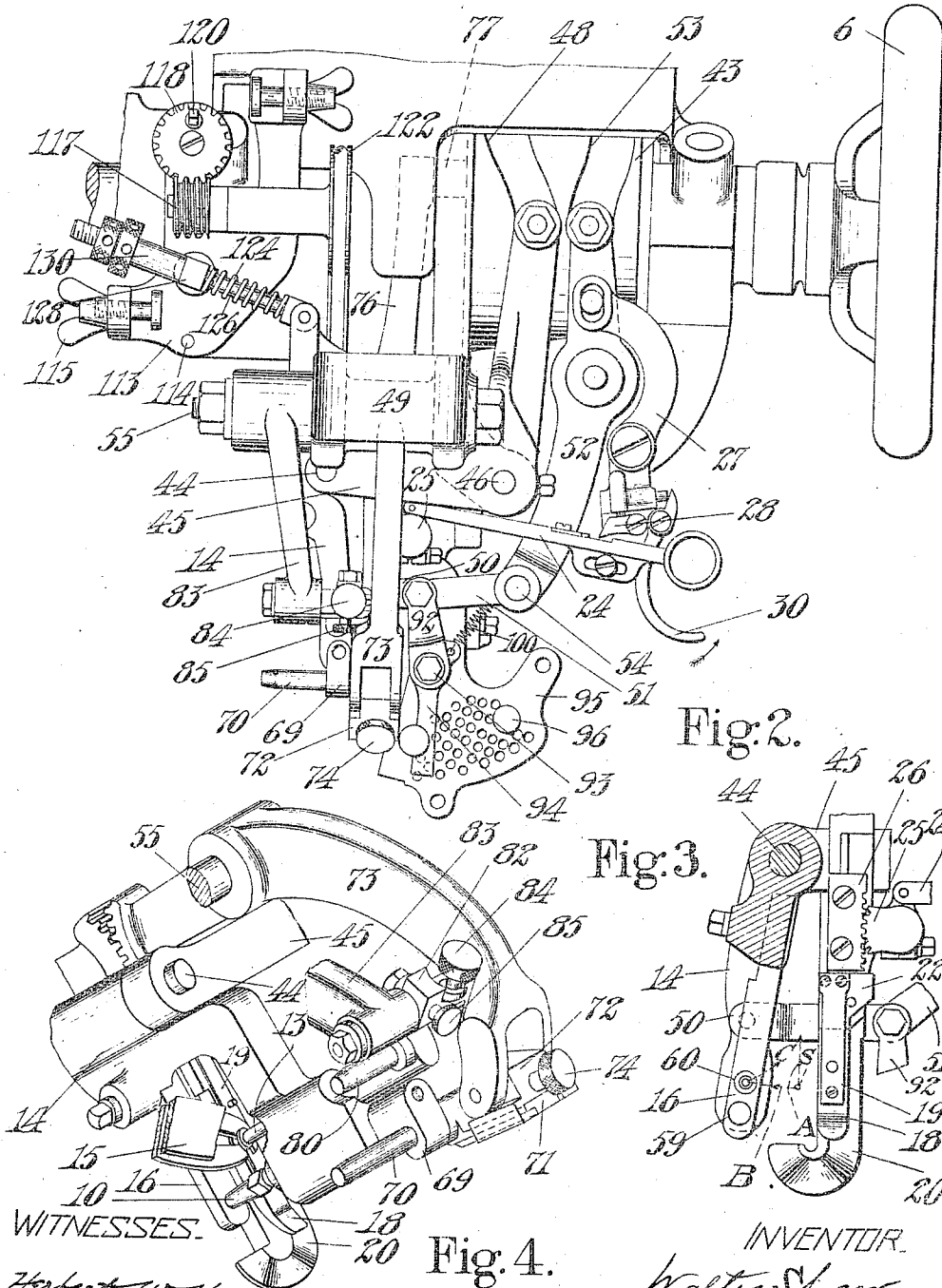
Walter Shaw
By his Attorney
Nelson W. Howard

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2 SHEETS-SHEET 2.



WITNESSES.

Herbert W. Kenway
 Elizabeth C. Coupe

Fig. 4.

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UNITED STATES PATENT OFFICE.

WALTER SHAW, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

EYELETING-MACHINE.

1,006,011.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed December 20, 1909. Serial No. 534,091.

To all whom it may concern:

Be it known that I, WALTER SHAW, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in 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 machines for setting eyelets, hooks or other fasteners in sheet material, such as leather, cloth, or the like, and relates more particularly to eyeletting machines of the type illustrated and described in Letters Patent of the United States No. 934,066, Sept. 14, 1909, granted upon the application of George Goddu.

The objects of the present invention are to reorganize and improve the construction, organization and mode of operation of eyeletting machines of the type above identified.

One important feature of the present invention lies in arranging the working parts of an eyeletting machine in such a manner that the raceway may be located at the rear of the punching and setting devices, thereby affording the operator an unobstructed view of the work and leaving the front of the machine clear for a free manipulation of the work. To this end the punch may be mounted in front of the setting die and the eyelets removed from the raceway by a movement of the setting dies from a position at the delivery end of the raceway to the setting position which is the position previously occupied by the punch.

It is a further object of this invention to provide an eyeletting machine of the type under discussion with separate cams and actuating levers for the punches and sets, to the end that a high rate of speed may be rendered possible and at the same time the movements of the various elements made easier and the machine itself more quiet in operation. In this connection, the present application discloses a novel mechanism for connecting the punches and sets with their operating levers, which mechanism is so designed as to insure a positive movement of the punches and sets both for approach-

ing the work to operate upon it and in moving away from it, the mechanism also allowing the lateral movement of these devices necessary for feeding the work, and having convenient provision for adjusting the pressure of the punches and sets upon their respective cutting blocks and upsetting dies.

A further feature of the present invention relates to the construction and arrangement of the raceway which, in accordance with my invention, may be made stationary and extended to a point in the rear of the setting position where it is provided with a delivery opening from which the setting dies extract the eyelets prior to each setting operation.

These and other features of the invention will be best understood and appreciated from the following description of my invention as embodied in an eyeletting machine of the type referred to and shown in the accompanying drawings in which,—

Figure 1 is a side elevation; Fig. 2 is a partial plan view, the raceways being removed; Fig. 3 is a plan view of the anvil plate and work guiding means; Fig. 4 is a fragmentary view in perspective with the parts as arranged for the punching operation.

The present machine, like the machine of said patent, is organized and arranged to punch two holes in the opposite sides of the upper of a shoe and then to set two eyelets in those holes and to feed the work.

Before proceeding to a detailed description of the various parts of the machine it will be convenient to refer to the principal operative parts and their general mode of operation and relative arrangement and then to proceed with a detailed description of their operating mechanisms and their connections therewith.

The machine illustrated in the drawings has a frame 2 which is provided with bearings for the main shaft 4 adapted to be connected at one end with a pulley which receives a belt by which the machine may be driven from any convenient source of power and provided upon its other end with a hand wheel 6. The frame is provided with a base 8 which is adapted to be secured to a bench.

The present machine is arranged to operate upon work presented thereto at an inclination of about 45° which has been found to be the most convenient position of the work for the operator. Oppositely disposed punches 10 and oppositely disposed setting dies or sets 12 are arranged in bearings in a support or feed frame 14 with the anvil or die plate 16 also supported by said feed frame and arranged between the oppositely disposed punches and sets.

The yielding presser feet 18 are arranged upon opposite sides of the guide plate 20 and act to hold the two quarters of a shoe in contact with the guide plate. In presenting work to the machine, the presser feet are displaced from the guide plate by the work and the opposite sides of the upper are laid against the opposite sides of the guide plate with their edges against the edge guide mounted upon said guide plate. The machine is set in operation by tripping a clutch which may be of any suitable type, preferably such a clutch as that disclosed in the patent above mentioned. The punches thereupon are actuated to punch holes in the opposite sides of the upper in alinement with each other and then the feed frame 14 is moved forwardly and downwardly to bring the sets into the position previously occupied by the punches. The sets are provided with center spindles 13 which are projected into the lowermost eyelets in the raceways 15 during the punching operation and which extract the eyelets to be set from the raceway upon the forward movement of the feed frame. When the sets have carried the eyelets into alinement with the previously punched holes they are actuated for clenching the eyelets in coöperation with the upsetting dies mounted in the anvil plate 16. After the eyelets have been set, the sets are released slightly but still held in engagement with the eyelets and then the feed frame 14 is moved transversely to feed the work the desired distance between two successive eyelet holes. The setting dies then disengage the work and finally the feed frame is moved rearwardly and transversely in the opposite direction, bringing the punches back to their original positions and the operations may then be repeated. When it is desired to punch holes in the upper without setting the eyelets in such holes as, for example, holes to receive lacing hooks, the raceways may be moved manually to an inoperative position so as to prevent them from delivering eyelets to the sets, the only difference in the operation of the machine being that the sets operate merely to feed the upper without setting eyelets therein.

Having briefly outlined the general construction and operation of the present machine, its mechanical features and construction will now be more specifically described.

The guide plate 20 against the opposite sides of which the work is adapted to be held and across which the work is drawn as it is moved to the setting position, is normally stationary but may be shifted transversely to the line of feed and in such movement carries the edge gages 22 by the shifting of which relative to the setting devices the spread of the eyelets may be varied. The guide plate is normally frictionally maintained in its forward and lowest position corresponding to the minimum spread required in the eyelets. The guide plate and edge gages may be shifted rearwardly for increasing the spread of the eyelets by swinging the lever 30 acting through the link 24 which is connected to a segmental gear 25 meshing with a rack 26 formed on the shank of the guide plate 20, as shown in Fig. 3. In order to decrease the spread of the eyelets, the link 24 may be actuated automatically from the main shaft by the lever 27 carrying the pawl 28 which is adapted to engage a notch in the link 24 as explained at length in Patent No. 934,066 above mentioned. By means of the arrangement above described the operator may set the edge gages for a wide spread before starting to eyelet each shoe and, through the lever 27, the gages are automatically shifted to a position for less spread after the first two or lower eyelets have been set. In this way it is possible conveniently to set the lowest eyelets with a wide spread and the remaining eyelets uniformly with a lesser spread.

The presser feet 18 comprise yielding presser members attached to the leaf springs 19 which are mounted on the edge gages 22 and which serve to hold the presser members yieldingly against the faces of the guide plate 20 or the work thereon. The presser members engage the work at all times, both during and between the feeding movements, and serve to position it correctly and smoothly upon the guide plate. They also act with the guide plate, when the latter is shifted for varying the spread of the eyelets, to carry the work bodily forwardly or rearwardly relative to the punching and setting devices.

The feed frame 14 constitutes a support for the punches, eyelet sets, anvil and associate parts. The feed frame carries upon its rear end a journal spindle 44, the extended ends of which are received in bearings in the forked bell crank lever 45 pivoted at 46 on a bracket extending from one side of the U-shaped frame 49 which in turn is bolted to the main frame 2 of the machine. The rearwardly extended arm of the bell crank lever 45 carries a cam roll which engages in a cam track 48 formed in a cam drum 43 on the main shaft 4. The above described arrangement is such that after the holes have been punched in the work by

the punches, the lever 45 is oscillated to advance the feed frame in order to bring the sets to the position previously occupied by the punches. The feed frame 14 is connected by means of the links 50 and 51 with the feed cam lever 52 in a manner substantially similar to that disclosed in said patent except that in the present case the pivot pin 54 between the link 51 and the cam lever 52 is made removable for a purpose to be hereinafter explained. The feed cam lever 52 is pivotally mounted upon a portion of the frame of the machine, its arm carrying the cam roller which engages in a cam track 53 in the cam drum before mentioned. This arrangement and the shape of the cam track are such that after the feed frame has been advanced to move the eyelet sets along the path A to the setting and punching position, indicated in Fig. 3 by the reference character S, and the eyelet sets have been operated to set eyelets in the upper, the feed frame is moved to the left, as viewed in Figs. 2 and 3, carrying the setting dies along the path B to feed the work the desired distance and after the setting dies have released the work the feed frame is moved toward the right and retracted to its original position along the path C.

The anvil or die plate 16 is mounted between the oppositely disposed punches and sets being provided with a shank which is received in the feed frame 14 being secured in place by any suitable means. The anvil plate 16 is provided with a movable double faced punch block 59 and a movable double faced upsetting die 60 which are retained within said die plate.

The punches 10 are oppositely disposed in the feed frame 14 being mounted in bearings on opposite sides of the anvil plate 16. The setting dies 12 are also oppositely disposed with relation to the anvil or die plate 16 being mounted in bearings in the feed frame adjacent to and in the rear of the punches. The punches are provided on one side with projecting lugs 69 which are each apertured transversely to receive a horizontally disposed spindle 70 rigidly mounted in the end of a slide 71. Each slide 71 is adjustably mounted in ways formed in a block 72 pivotally mounted in the forward end of the punch actuating lever 73. By means of an adjusting screw 74 the slide may be moved and the punch accurately adjusted relative to the anvil in order to operate with the proper amount of pressure and a set screw 75 is provided in the slide 71 to lock the slide in adjusted position. It will be seen that the slide 71 and block 72 act as a link connecting the punches with their respective actuating levers and thus permit the punches to be moved forwardly and rearwardly without affecting the operative connection. When the feed

frame is moved transversely the punches slide outwardly upon the spindle 70 but not far enough to disengage the latter. The working pressure of the machine is transmitted to the punches through the spindles 70 when the punches are in position closely adjacent to the slides 71 whereby there is little bending stress imposed on the spindles. The punches are also retracted while adjacent the slides 71.

The actuating lever 73 for the upper punch is mounted on a horizontal pivot pin 55 extending through the U-shaped frame 49 and the lower arm of the lever is provided with gear teeth meshing with teeth 80 on the upwardly extending arm of the corresponding actuating lever for the lower punch as shown in Fig. 4. The lower punch actuating lever is provided with a rearwardly extending arm 76 (see Fig. 2) which carries a cam roller 77 running in a cam track formed in one face of the cam drum 43. The cam track is so designed as to oscillate the punch actuating levers for punching the work and for retracting the punches at the proper points in the cycle of the machine.

The setting dies 12 are provided with lugs 79 also apertured, as in the case of the lugs on the punches, to receive the horizontal spindles 80. Each of the spindles 80 is rigidly mounted on the end of a slide 81 adjustably mounted in a block 82 pivoted to the forward end of the set actuating lever 83.

An adjusting screw 84 is provided by means of which the slide 81 may be shifted for accurate adjustment of the sets relative to the upsetting die and a set screw 85 is also provided for locking the slide 81 in any adjusted position. It will be seen that the slide 81 and block 82 act as a link connecting the setting dies with their respective actuating levers and thus permit relative forward and rearward movement of the setting dies and actuating levers without affecting the operative connection. When the feed frame 14 is moved transversely the setting dies slide outwardly upon the spindles 80 but not far enough to disengage the latter. The working pressure of the machine is transmitted to the setting dies through the spindles 80 when the setting dies are in position closely adjacent to the slides 81 whereby there is little bending stress imposed on the spindles. The setting dies are moved away from the work while in position on the outer ends of the spindles but for this movement very little power is necessary and the spindles are therefore subjected to no serious bending stress in this operation.

The actuating lever 83 for the upper set is journaled at one side of the U-shaped frame 49 on the same spindle 55 as the punch actu-

ating lever 73 and as in that case its downwardly extending arm is provided with gear teeth which mesh with corresponding teeth formed on the end of the upwardly extending arm of the lower set actuating lever. The lower set actuating lever has an articulated rearwardly extending arm 86 carrying the cam roller 87 which is actuated by a cam 88 rigidly mounted on the main shaft of the machine. The arm 86 is pivotally connected with the lower actuating lever 83 and a stiff compression spring is interposed between a lug on the arm 86 and the lever 83 which may allow a yielding movement between the parts of the lever in case the dies encounter an obstruction. The cam 88 is so designed as to actuate the setting dies toward the die plate to a limited extent simultaneously with the punching movement of the punches. This movement is sufficient in extent to allow the center spindles 13 of the setting dies to impale the lower eyelet in each raceway. The setting dies are maintained in this position during the forward movement of the feed frame and extract the impaled eyelets from the raceways and carry them into alinement with the previously punched holes. The setting dies are then further actuated to clench the eyelets in cooperation with the upsetting dies 60 mounted in the anvil plate and are then slightly retracted in order to relieve the pressure on the elements of the machine but not enough to release the clenched eyelets, and the sets remain in this position during the transverse feeding movements of the frame 14.

In order to remove the punches or setting dies from the feed frame for replacement, the pivot pin 54 may be removed and the link 51 disconnected from the cam lever 52. The feed frame 14 may then be moved to the left an amount sufficient to carry the punches and sets off the ends of the spindles 70 and 80 so permitting the punches and sets to be withdrawn by hand.

Mechanism for regulating the extent of the feeding motion transmitted to the feed frame may be provided of substantially similar type to that disclosed in the above mentioned patent. At the pivotal point of the links 50 and 51 is secured a link 92 which is pivoted at 93 upon the arm 94 arranged for movement over the face of the quadrant plate 95, stop pins 96 being provided to limit its movement. The arm 94 is mounted upon a shaft 97 (see Fig. 1) which is supported in bearings on the frame of the machine and carries upon its lower end an arm 98 which is connected by means of a chain 99 with a treadle, not shown. By depressing the treadle, the arm 94 is swung over the surface of the quadrant plate to increase the distance between successive eyelets and as shown in Fig. 2 the arm 94 is held

over in position for wide spacing. This arrangement is of great convenience when it is desired to punch holes for lacing hooks with a greater spacing than for the eyelets already set, the spacing being increased and the raceways simultaneously moved to inoperative position. The arm 94 is returned to its original position, that is to say, the position for minimum spacing, by means of the spring 100.

The means for delivering eyelets to the eyelet setting devices, comprises the hopper 110 and the raceways 15 which convey eyelets from the hopper to the setting devices. The hopper may comprise a cylindrical casing having its bottom arranged at an inclination to the horizontal and may be provided with the usual outlet ports for the eyelets and with an agitating device such as a brush which serves to sweep the eyelets out through the ports to the raceways. The brush is secured to a short shaft 111 extending through the bottom of the hopper and having mounted on its lower end a disk carrying a projecting lug 112.

A bracket 113 is pivotally mounted by a pin 114 on the frame of the machine and carries two upwardly extending lugs which are provided with clamping screws 115 for engaging downwardly extending lugs on the raceway frame 116. The bracket 113 is provided with bearings for a worm shaft 117 upon which is mounted a worm meshing with a worm wheel 118 journaled on a short pin projecting upwardly from the bracket. Upon the upper face of the worm wheel 118 is formed an upwardly projecting lug 120 into the pathway of which extends the lug 112 fast to the brush shaft. At its other end the shaft 117 is provided with a pulley 122 which is driven by a belt running in a groove formed in the periphery of the cam 88 mounted on the shaft 4. The above described arrangement is such that the agitating brush is driven from the main shaft of the machine whenever the machine is set in operation. The bracket is normally maintained in such position that the ends of the raceway are in alinement with the setting dies by the compression spring 124 encircling the spindle 126 which is pivoted to the frame of the machine and projects through the pivoted abutment 128 on the bracket. The normal position of the bracket is determined by the sleeve 130 which is adjustably mounted on the end of the spindle 126 and provided with a lock nut for holding it in any adjusted position. By means of this construction the raceway may be swung outwardly by hand into an inoperative position when it is desired to punch holes in the work for lacing hooks.

The pulley 122 and the corresponding pulley on the main shaft are grooved deeply for the reception of the round belt in order

that the belt shall not run off the pulley when the bracket is swung by moving the raceway into inoperative position.

It is important in the operation of eye-
 5 leting machines that the machine should always come to rest when the power is disconnected with the parts in such position that the work may be removed and new
 10 work entered therein and to this end various clutch mechanisms may be employed. A suitable clutch mechanism is described at length in the patent above mentioned, to which further reference may be had for its detailed construction, or reference may be
 15 had to the co-pending application of A. F. Littlefield No. 341,738 filed November 2, 1906, which covers an improvement on the clutch disclosed in said patent. The locking
 20 cam 142 shown in Fig. 1 is arranged to act on a clutch of this type being moved by the spring 140 into position for disengaging the clutch and applying a brake. An adjust-
 25 able belt tightening device 144 is also shown in Fig. 1 by means of which the tension on the driving belt may be regulated to suit the requirements of the work.

Certain features of the present invention are applicable to use in single eyeleting machines, as well as machines in which the eye-
 30 lets are set in the opposite sides of the shoe upper at one time and it is not intended by the claims that such features of the invention shall be limited to an employment in a duplex eyeleting machine of the character
 35 described.

No attempt has been made to illustrate the form of the cam tracks and surfaces which operate the several parts of the machine as from the description of the construction and
 40 mode of operation of the machine it will be clear to any person skilled in the art how such cams should be developed.

Having thus described my invention in a preferred form I desire to secure by Letters
 45 Patent of the United States and claim:—

1. An eyeleting machine having, in combination, opposed pairs of punches and sets and stationary raceways having their points of delivery located at a point in the rear of
 50 said punches and sets.

2. An eyeleting machine having, in combination, a pair of opposed punches, sets mounted parallel with said punches and located at the rear thereof, and raceways hav-
 55 ing their points of delivery located in the rear of said sets.

3. An eyeleting machine having, in combination, a punch, a set parallel with said punch and located at the rear thereof, and a
 60 raceway extending behind said set and having a delivery opening in its side.

4. An eyeleting machine having, in combination, oppositely disposed pairs of punches and sets, an anvil plate located in-
 65 termediate said pairs of punches and sets,

and a pair of raceways extending behind said sets and having delivery openings in the side toward said sets.

5. An eyeleting machine having, in combination, oppositely disposed pairs of
 70 punches and sets, a cam shaft, separate cam levers for actuating the pair of sets and the pair of punches, and separate cams on said cam shaft for operating said cam levers.

6. An eyeleting machine having, in combination, a parallel set and punch, a cam
 75 shaft, separate cam levers for actuating said set and punch, separate cams on said cam shaft for operating said cam levers, said levers being pivoted on an axis extending at
 80 right angles to the plane of the set and punch.

7. An eyeleting machine, having, in combination, a punch, a set parallel with said punch and located at the rear thereof, separate
 85 cams and separate cam levers for actuating said punch and set, said levers being oscillated in planes parallel with the punch and set.

8. A machine of the class described, hav-
 90 ing, in combination, a cam shaft, a pair of opposed punches, a pair of opposed sets, a cam actuated lever for operating one of said punches and a second cam actuated lever for
 95 operating one of said sets, separate actuating cams on said cam shaft, and levers actuated by said first mentioned cam actuated levers for operating the opposed punch and set of each pair.

9. A machine of the class described hav-
 100 ing, in combination, setting devices, punching devices arranged in front thereof, separate actuating levers for said devices, work guiding means, and means for moving said
 105 punching devices and setting devices forwardly to bring the setting devices into the proper position for setting a fastener in a previously punched hole.

10. A machine of the class described hav-
 110 ing, in combination, setting devices, punching devices, work guiding means, means for moving said setting devices transversely for feeding the work, and means for moving
 115 said punching devices simultaneously transversely and rearwardly after the feeding operation to their initial position.

11. A machine of the class described hav-
 120 ing, in combination, setting devices, cam actuated means for moving said devices forwardly to setting position, mechanism for actuating said devices longitudinally for
 125 clenching eyelets, and means for moving said devices laterally to feed the work, said means acting simultaneously with said cam actuated means after the feeding operation
 130 for moving said setting devices rearwardly and laterally to their initial position.

12. A machine of the class described hav-
 ing, in combination, setting devices, a sup-
 130 porting frame therefor, means for moving

said frame forwardly prior to the setting operation, then laterally for feeding the work and finally rearwardly and laterally to bring the setting devices into their initial position.

13. A machine of the class described having, in combination, punching devices, setting dies mounted at the rear thereof, means for moving said dies forwardly into the position previously occupied by said punching devices, then laterally for feeding the work, and finally rearwardly and laterally to bring the dies into their initial position.

14. A machine of the class described having, in combination, a punch, a setting die mounted at the rear thereof, a stationary raceway, separate means for actuating said punch and die for respectively punching the work and engaging an eyelet in said raceway, and means for moving said die forwardly for carrying an eyelet into alinement with the previously punched hole, the die being thereupon actuated to set the eyelet in the work.

15. A machine of the class described having, in combination, a punch, a setting die mounted in the rear thereof, a stationary raceway having its delivery end in alinement with said die when the die is in its initial position, means for actuating the punch and die for respectively punching the work and engaging an eyelet in said raceway, and means for simultaneously advancing said punch and die to carry the die into alinement with the previously punched hole.

16. A machine of the class described having, in combination, a punch, a setting die mounted in the rear thereof, a stationary raceway located in the rear of said punch, and means for moving said die forwardly to a setting position, then transversely for feeding the work and finally rearwardly and transversely to said raceway.

17. A machine of the class described having, in combination, oppositely disposed punches, oppositely disposed setting dies, and cooperating upsetting dies mounted in the rear of said punches, raceways having their points of delivery in the rear of the setting and punching position, and means for moving said setting dies and upsetting dies forwardly to the setting position, then transversely for feeding the work and finally rearwardly and transversely to said raceway.

18. An eyeleting machine having, in combination, devices for punching holes in the work, a stationary raceway having a delivery opening in its side, and means for extracting an eyelet therefrom, said means being movable for carrying said eyelet into alinement with a previously punched hole.

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

WALTER SHAW.

Witnesses:

MARY M. MACMULLEN,
HERBERT W. KENWAY.