

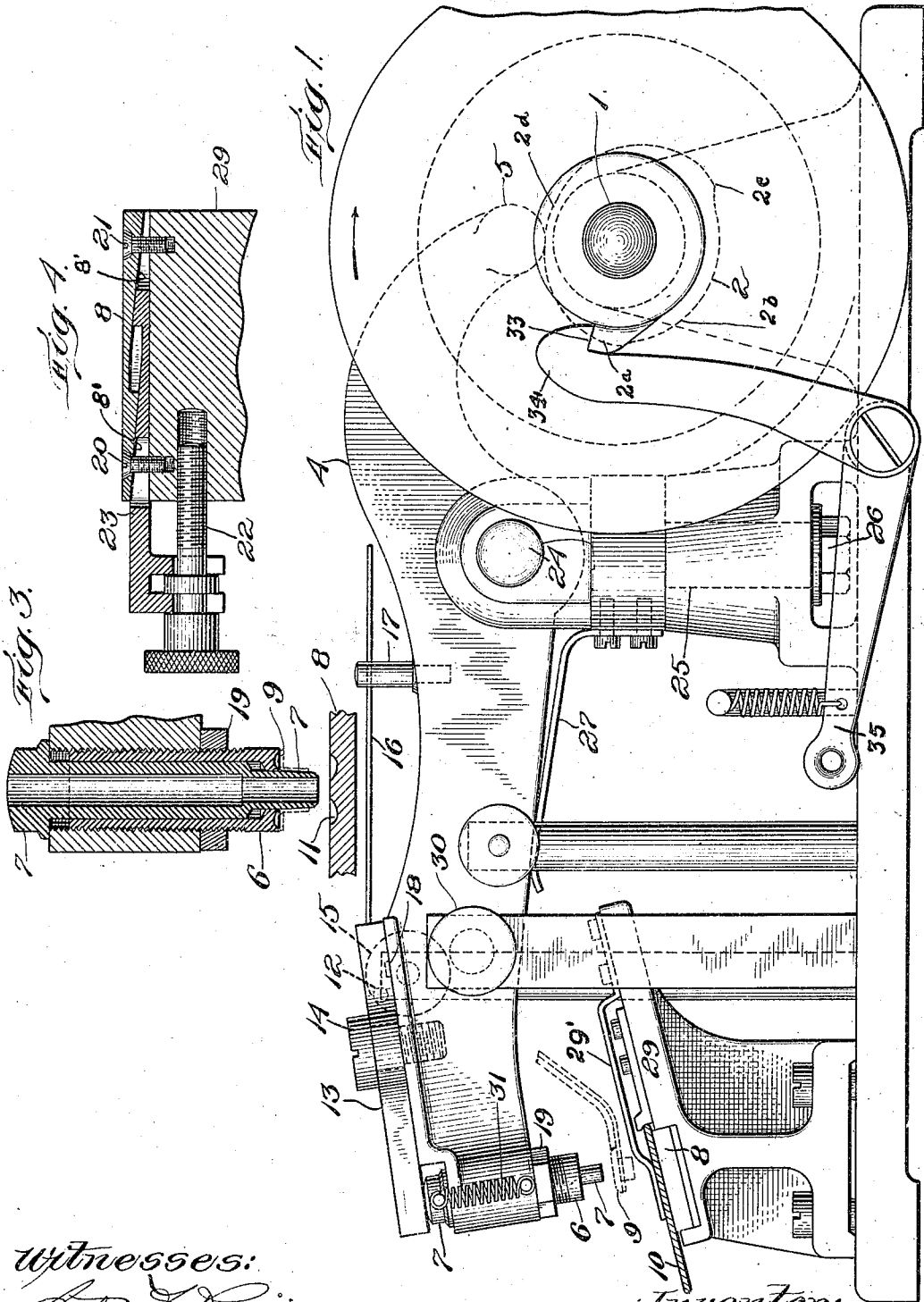
F. L. HARMON.
EYELETING MACHINE.

APPLICATION FILED OCT. 25, 1913, RENEWED DEC. 3, 1914.

1,237,204.

Patented Aug. 14, 1917.

2 SHEETS—SHEET 1.



Witnesses:
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Fred W. Ardle

Inventor:
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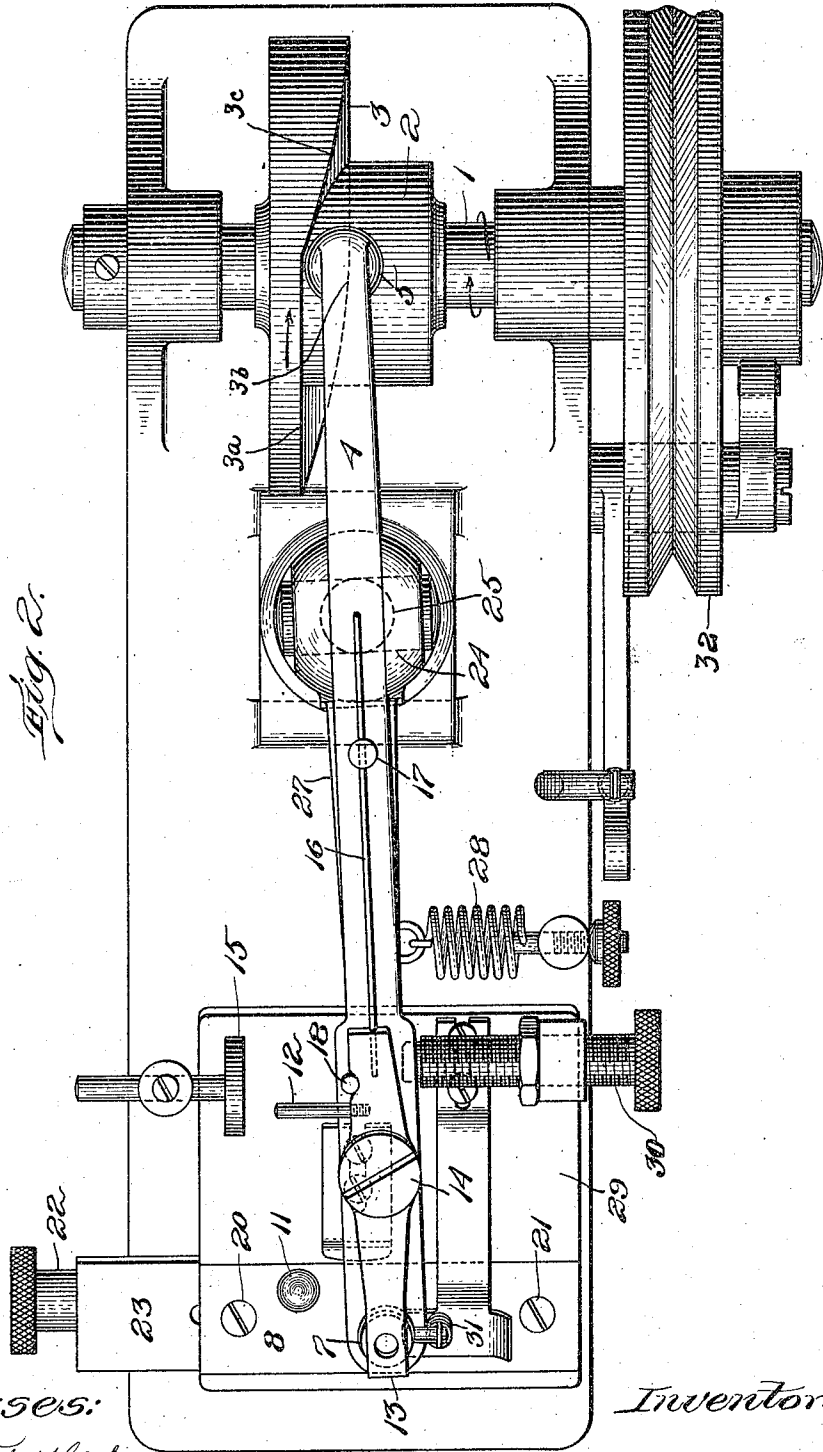
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK L. HARMON, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

EYELETING-MACHINE.

1,237,204.

Specification of Letters Patent.

Patented Aug. 14, 1917.

Application filed October 25, 1913, Serial No. 797,225. Renewed December 3, 1914. Serial No. 875,386.

To all whom it may concern:

Be it known that I, FRANK L. HARMON, of Beverly, in the county of Essex and State of Massachusetts, have invented an Eyeletting Machine, of which the following is a specification, reference being had to the accompanying drawings.

Eyeletting machines for boot and shoe manufacture are well recognized in the art as falling into two general classes, viz: so-called "gang eyeleters" which insert and clench a series of eyelets at each operation of the machine without feeding the material; and single and duplex eyeleters which insert and clench only a single eyelet or a pair of eyelets at once and feed the material step by step to position it for the successive eyelets. The former of these classes of machines is of very limited utility for the reason that the line or series of punches and sets in the machine being of course formed and arranged for a particular size and shape of shoes, are hence adapted for only one shape of material, and thus a different shaped line and arrangement of punches and sets would have to be provided for each of the many different shapes and sizes of shoes. The latter of the above classes of machine on the other hand is adapted to produce any desired form of eyelet line by merely varying the direction of material feed or the spacing of same, or both and is therefore the one in general use, and in this type of machine it will be understood that as the material is intermittently fed step by step between the punching and setting operations, to space and position the same correctly for the succession of eyelets, it is necessary to provide means whereby after the hole is punched in the stock and the stock fed, it be accurately spaced and alined with the eyelet also precisely positioned, for the action of the setting tool to clench the eyelet in the hole. To attain this end in all machines of the prior art known to me it has been considered necessary to employ devices actuated from both sides of the material. In other words, the holes are punched by a punch actuated from above the material and its support, while the eyelets are inserted and clenched therein, by a spindle and set, actuated from below the material. This spindle-and-set mechanism arranged op-

posite the punch with provision for automatic actuation at intervals up into operative position and then back out of the way in proper sequence and timed relation to the other parts, along with provision for automatic step by step feed of the material has made the machine a very complicated and expensive one with a multitude of parts apt to get out of order and relatively limited as to capacity even when working at best. It is to be understood where the expression "machines of this class" or similar language is used herein that it refers generally to the second named type of machine, viz: where single or duplex eyeletting is performed with a step by step feeding of the material for spacing the eyelets as distinguished from gang or multiple eyeleters, while where the expression "eyelet the material" is used, I mean the work of punching holes, inserting eyelets therein and clenching them without regard to feeding the material. I have discovered that by a novel relative arrangement and sequence of movements of the punch and set, it is possible to construct an exceptionally simple and rapid working machine of this class wherein a separate spindle combined with the set is entirely dispensed with and all the working parts disposed at one side of, *e. g.*, above, the material support, the material being fed step by step for spacing the same for successive eyelets and being accurately positioned in alinement with the setting tool by a novel combination and operative arrangement of the punch and set themselves without requiring any other active instrumentalities.

According to my invention there is no device below the material or opposite the punch that in the least coöperates with the punch and set, in the eyeletting of a material except a punch-block, and an eyelet clenching surface, which co-act with said actuated punch and set in eyeletting a material by their resistance only. I believe this to be the first machine of this class that does not contain said spindle-and-set, and means by which they are actuated from beneath the machine. A prime object of my invention is to abolish the spindle-and-set mechanism by providing means consisting in a punch and set operatively combined and actuated wholly from one side of the material to do

all the active work of a machine of this class, viz: eyeleting a material, feeding the material and spacing the eyelets. In a preferred embodiment I telescopically combine the set and punch by slidably fitting the punch within the set with provision whereby it may occupy a relatively telescoped position within the set while the set operates, while being held relatively advanced for punching the material and for engaging the same to feed it laterally. In accordance with my invention the punch, and preferably the set within which it is slidably fitted, are mounted for periodic lateral movement while the punch is engaged through the material, to feed the same laterally for spacing the eyelets, along with separate punching and setting impulses which are imparted to the punch and set respectively at the proper intervals. By virtue of this arrangement it will be seen that since the punch is itself the material feeding and spacing instrumentality, and since it is telescopically combined with the set, the material as fed by the punch engaging through the eyelet receiving hole is certain to be precisely and accurately positioned for the action of the setting tool when it descends to clench the eyelet. Thus considered from one aspect, by virtue of my improved arrangement the punch combines in itself, the threefold functions of punching the eyelet receiving holes, feeding the material, and serving instead of the separate underneath spindles heretofore employed for accurately positioning and alining the eyelet in the punched hole for the setting operation. My invention therefore requires a material support equipped with a punch-block and a clenching surface or their equivalents, in combination with a punch and set operatively mounted on the same side of the material to act on the material on said support for punching the same and setting the eyelets inserted in the punched holes, with provision for feeding the material and spacing the eyelets which may be by the action of said punch alone, the operative parts acting wholly from one side of the material to do all the active work of eyeleting the material, feeding the material and spacing the eyelets by co-acting with the punch-block and clenching surface below the material. This central feature of my invention, by avoiding the former spindle and set mechanism not only makes the machine vastly simpler to construct, reducing the cost of machines of this class over seventy per cent., but also makes the machine more precise and accurate in operation and less apt to get out of order. I consider this combination to be broadly new and I desire the present embodiment to be considered as illustrative and in no wise restrictive, referring rather to the broader ones of the appended claims to indicate the scope of the invention. The in-

vention will be better understood from the following detailed description in connection with the accompanying drawings wherein a single eyeleter is selected for exhibition.

Referring to the drawings, wherein like reference numerals indicate the same parts on each of the several views,

Figure 1 is a side elevation of the machine;

Fig. 2 is a plan thereof;

Fig. 3 is a sectional view of the telescopic punch and the set combined, showing also the end of the operating lever in section and also a sectional detail of the clenching surface; and

Fig. 4 is a part sectional view of a punch-block whereon the clenching surface is also formed showing means whereby it may be adjusted relatively to the punch and set.

The operating shaft 1 is suitably journaled at one end of the base of the machine and it has fixed thereto a peripheral cam 2, and a lateral cam 3 for effecting the working movements. A punch and set carrying lever is indicated at 4 with a ball shaped inner end 5 engageable with both of the cams 2 and 3 for periodic movement in both vertical and horizontal planes as hereinafter described. To permit these movements the lever is pivoted on an intermediate horizontal axis 24, the journal bearing of which is itself carried on a vertical axis 25 mounted to turn in a post upstanding from the frame work, there being a nut 26 holding the parts assembled. The outer portion of the lever is pressed upon by a spring 27 fixed to the frame work to hold the ball 5 against the peripheral cam surface, and a tension coil spring 29 engages the outer portion of the lever laterally, tending to hold the ball against the lateral cam surface 3, this spring being adjustable as to tension by a usual nut and bolt device. The outer end of lever 4 has fitted therein a set 6, the set being shown as threaded into the lever end for adjustment toward and from the clenching surface, with a lock nut 19 to hold the same securely in adjusted position. The upper end of the set 6 is shown as terminating short of the top of lever 4 to permit the requisite range of adjustment without coming above the top of the lever to interfere with the punch head to be now described. The punch 7 is shown as a tubular one slidably fitted concentrically in the set 6 to telescope therewith. The punch has an enlarged head at its top adapted to rest on the top of the lever when the punch is projected downward into punching position as seen in Figs. 1 and 3, and it is normally held in this position by a tension spring 31 having its respective ends engaged with the punch head and with the side of the lever. The punch-block is indicated at 8 fitted to a base 29, this block having a smooth face

portion against which the punch 7 is adapted to act for punching the eyelet holes, and a clenching surface 11 also imperforate, including an annular concave recess, this clenching surface being in the present embodiment spaced apart some little distance from the portion of the punch-block surface whereon the punch 7 acts. The present invention does not concern itself with any particular mechanism for supplying the eyelets, and for illustrative purposes I show in dotted lines a known form of delivery chute adapted to deliver an eyelet 9 to position where it is taken up by the descending punch to be pressed at the proper instant into the punched hole. The material is indicated at 10 resting on the punch-block and material support constituted by the face of the base 29 with a spring 29' carried by the base serving as a presser foot to yieldingly hold the lever against the support with a capacity for lateral shifting to space the eyelets; it will be understood that the spring 29' is merely illustrative to typify any suitable presser foot device to hold the material properly in place against the support.

The punch 7 is held in its advanced or projected position as seen in Fig. 1 not only by the spring 31 but also normally by a latch 13 pivoted at 14 to the lever 4 and held engaged over the head of the punch 7 by a spring 16 fixed to the end of said latch and movably engaged in a post 17 fixed on the lever, the action of said spring tending to move the inner end of the latch against a stop pin 18, in which position the outer end of the latch is over the punch. The punch 7 in this advanced position is moved to punch the hole by coming against the punch block through the action of a portion 2^a of peripheral cam 2 as it is turned in the direction of the arrow in Fig. 1. Thereupon as the cam moves farther a slightly receding portion 2^b permits the punch to move back a very little from the punch-block just enough to clear the same, the movement not being enough to move the end of the punch out of the material. While this peripheral cam portion 2^b is thus acting on the punch it is shifted laterally, by the action of a raised portion 3^b of the lateral cam 3 which follows a lower portion 3^a of said cam in the rotation thereof, the lever 4 then turning on vertical axis 25. Since the punch is still engaged through or in the material, the material is of course moved along with the punch and the parts are so proportioned that this movement as effected by the cam portion 3^b is sufficient to space the eyelets. Adjustable variation of such spacing distance is provided for by an adjustable stop screw 30 mounted in the frame work, which engaging the side of the outer portion of lever 4 determines the position to which it

may be moved by the spring 28 for the punching movement, *i. e.*, when the cam portion 3^a is opposite the ball 5; this thus varying the initial lateral position of the punch and therefore its extent of movement. In the described swinging of lever 4 on its vertical axis to move the punch laterally, a pin 12 projecting from latch 13 comes against an adjustable stop piece 15 fixed to the frame work whereby the further movement of the lever causes said latch to be swung so that its outer end uncovers the punch head, whereby the punch is no longer positively locked in advanced position but only yieldingly held advanced by the spring 31. With the parts in this position a further raised portion 2^c of cam 2 comes into action on the ball 5 moving the outer end of lever 4 farther down so that the set 6 acts to press upon the eyelet as positioned in the punched hole. The clenching surface 11 is so disposed that it is at this time directly beneath the eyelet so that the eyelet is properly and effectively clenched by the action of the set thereagainst. The punch 7 in this operation yieldingly recedes or telescopes within the set 6 and it is to be especially noted that it still presses, though yieldingly into the eyelet hole positively insuring absolute alignment and accuracy of the setting tool in its action on the eyelet, since it will be observed the punch at no time leaves the hole which it has punched until the set is in full operation. Thus my present improved construction is very much simplified by reason of the fact that the punch serves not only to punch the holes and feed the stock laterally, but also to engage the eyelet eliminating the need of a separate spindle fitted in the set for cooperation in the setting operation along with all the attendant mechanism required for moving said spindle at the proper intervals into and out of operative position, and also dispensing with the need of any separate mechanism for feeding and spacing the material; not only is the machine thus very greatly simplified in this way, but as will be apparent the cooperation of parts is rendered much more certainly precise and accurate since instead of being a case where a spindle for cooperation with the set has to be moved up to an eyelet hole which has been formed and positioned by other parts of the mechanism, it is to be observed that with the present construction, the punch serving in a sense the positioning function of the spindle heretofore used, does this merely as a continuation of its preceding functions wherein it was positioned in the eyelet hole so that there is absolutely no chance for the set to act in any way except precisely concentric with the punch and therefore with the eyelet. It will be understood that the foregoing is a point of special significance in the feeding and spacing type of machine in distinction

from the gang eyeleter type wherein since there is no feed and spacing, there is no tendency for the eyelet as placed in the material to get out of alinement with the set before it operates. Referring further to the cams 2 and 3 it will be observed that the raised portion 3^b of cam 3 continues on an even plane past that part of shaft movement where the final raised or setting portion 2^c of the peripheral cam 2 acts, and then drops off as indicated at 3^c to permit return of the lever 4 to re-position the punch at the punching station; also that the cam 2 directly beyond the setting raise 2^c drops off to the lowest portion 2^a where the lever 4 will be raised by the spring 27 to lift the punch and set for the next operation. It is desirable to provide means whereby the punch-block may be adjusted toward and from the punch and set within small limits and for this purpose I mount the block 8 on screws 20, 21, and form the lower surface of this block with wedge faces 8' adapted to be engaged by corresponding faces on a wedge plate 23 which is adapted to be set up by a screw 22. Thus by loosening or tightening the screws 20, 21 in connection with a corresponding adjustment of screw 22 the punch-block 8 may be set firmly in the required position of adjustment. The adjustment of the punch-block thus provided permits it to be adjusted to a nicety so that the punch in its punching movement will press against the punch-block with a biting action on the material, while this adjustment in connection with the adjustment of the set 6 by its screw threaded engagement in the lever 4, permits the relative adjustment of the set and punch-block for the best action on the various different sizes of eyelets and thicknesses of leather.

In addition to the described advantages of the present organization in the way of simplicity and precision of action as compared with the separate spindle type of machine, it is to be pointed out that while having these utilities in a single machine as shown in the drawings, it has another and equally marked advantage in connection with a duplex machine, since all the operating instrumentalities for setting a line of eyelets are at one side of the material and merely require duplication for setting a similar mating line and without involving any complex problem as to the disposition of working parts as is the case where a separate spindle working in the set from the other side of the material is required. It will of course be understood that when the punch is returned over the punching station in the cycle of movement, the spring 31 will again move it outward to punching position, and the latch 13 will move back thereover under the action of spring 16 thus completing the cycle of movement. While I preferably

provide a suitably positioned eyelet supply chute so that an eyelet is slipped over the punch as it descends as indicated in Fig. 3, it is to be understood that this is merely illustrative and that any suitable means of supplying eyelets may be employed without departing from the essentials of the invention. The driving connection to the machine is shown as from a pulley 32 through a yielding connection and a stop device including a stop shoulder 33 on the shaft 1 adapted to be engaged by a pivoted dog 34 connected with a manual controlling arm 35 as is usual in this type of machine; being what is known as a Horton clutch. It is to be observed that by the provision of screw 30 which as described determines the distance the eyelets are spaced apart, the machine is adapted to set eyelets spaced in any required manner and in any required line determined by the feeding.

While in the more comprehensive embodiment of the invention as herein set forth, the punch 7 as noted combines in itself the three-fold functions of punching the eyelet receiving holes, feeding the material, and serving instead of a separate spindle to accurately position and aline the eyelet in the punched hole for the setting operation, it is to be understood that certain modifications of this arrangement are within the scope of the invention in its broader aspects. For example, the punch telescopically combined with the set as disclosed is valuable and useful in conjunction with a feeding and spacing means of any kind so long as the arrangement is such that the punch first acts to produce the eyelet receiving hole, and then serves as a positioning spindle to properly position the eyelet in such hole, this permitting all the working parts to be disposed at one side of the material support with an intermittent spacing feed of the material by any desired means. For this operation in a broader aspect it is only important that the punch be kept in alinement with the punched hole after the punching operation until the set operates, and that the punch be relieved from the punch block after it operates thereagainst. It is believed that the present machine is the first to employ a telescopically combined punch and set in combination with means for automatically feeding and spacing the material between operations.

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

1. A machine of the kind described comprising a punch-block, and means whereon an eyelet may be clenched; means by which a material may be supported; a tubular punch and a tubular set telescopically combined and operatively mounted on one side of said material supporting means; and

mechanism for actuating said punch to punch a hole in the material, for actuating the set to set an eyelet and to give the punch and set a lateral movement to feed the material and space the eyelets.

2. A machine of the kind described comprising a material support having a punch-block and a clenching surface, punching and setting devices mounted for setting and punching movements and for bodily lateral movement while the punch is engaged through the material to space the eyelets, all from one side of said support, and means for imparting said movements.

3. A machine of the kind described comprising a material support, a punch and set telescopically combined and operatively mounted at one side of said support, and mechanism to impart punching and setting movements to the punch and set respectively and bodily lateral movement to the punch while engaged through the material, the punch and set telescoping to permit the set to operate and the punch serving both as an eyelet spacer by feeding the material and as an eyelet placing and alining spindle in the setting operation.

4. A machine of the kind described comprising a set with a punch slidably fitted therein, a punch-block and means whereon an eyelet is clenched, and mechanism for imparting punching and setting movements to the punch and set respectively and for moving the same laterally with the punch through the work between said movements for feeding and spacing the material, the punch being arranged to recede within the set as the set operates, and serving both as a material feeder and as an eyelet alining spindle in the setting operation.

5. A machine of the kind described comprising a material support having a face equipped with a punch-block and a clenching surface, a set and a punch mounted to move toward and from said face the punch being slidably fitted within the set, mechanism for imparting punching and setting movements to the punch and set respectively, and means for moving the punch laterally of said face while engaged through the material to feed the same and space the eyelets.

6. A machine of the kind described comprising a material support having a face equipped with a punch-block and a clenching surface, a set and a punch mounted to move toward and from said face the punch being slidably fitted within the set, mechanism for imparting punching and setting movements to the punch and set respectively, the punch being mounted to telescope within the set and to press upon the eyelet yieldingly as the set operates, and means for moving the punch laterally of said face while engaged through the material to feed the same and space the eyelets.

7. A machine of the kind described comprising a punch-block, and means whereon an eyelet is clenched, means by which a material may be supported, a tubular punch and a tubular set, telescopically combined, and operatively supported on one side of said material supporting means, and mechanism for actuating said punch and said set, wholly from said one side of the material as it rests on said material supporting means, to do all the active work of eyeleting the material by co-acting with said punch-block and said clenching surface on the other side of the material, and with provision to move laterally for feeding the material and spacing the eyelets.

8. A machine of the kind described comprising means for supporting a material, a punch-block and means whereon an eyelet is clenched on one side of said means for supporting a material, a tubular set and punch, telescopically combined, and operatively mounted on the other side of the material as it rests on said material supporting means, means for actuating said punch and set wholly from one side of the material to do all the active work of eyeleting a material by co-acting with said punch-block and said clenching surface, and means for moving the punch laterally for feeding the material and spacing the eyelets.

9. A machine of the kind described comprising a material support equipped with a punch-block and a clenching surface, a set and a punch slidably fitted therein mounted at one side of said support to move toward and from the same, mechanism for imparting punching and setting movements to the punch and set respectively, the punch and set telescoping to permit the set to operate, and means for moving the punch laterally of the support in an interval between said punching and setting movements while engaged through the work, to feed the same and space the eyelets whereby said punch and set serve as the sole active instrumentalities for acting on the work.

10. A machine of the kind described comprising a punch, a set, a common carrier for both, a stock support having a punch-block and a clenching surface, operating means arranged to move said carrier toward said stock support with separate impulses for punching and setting and also to move said carrier parallel with said stock support at intervals, for feeding the stock to space the eyelets, and means for holding the punch advanced and engaged through the stock in said feeding movement and permitting the punch to recede relative to the set as the set operates.

11. A machine of the kind described comprising a material support having a face equipped with a punch-block and a clenching surface, a punch and set telescopically

combined having a common mounting to operate toward and from said support and entirely at one side thereof, and a unitary operating means for imparting punching and setting movements to the punch and set and also a bodily lateral movement thereto at intervals for feeding the stock to space the eyelets, there being means to hold the punch in relatively advanced position for punching and feeding, said means being arranged to release the punch for telescoping within the set as the set operates.

12. A machine of the kind described comprising a material support having a face equipped with a punch-block and a clenching surface, a punch and set telescopically combined with a unitary mounting for movement toward and from said support, at one side thereof, and also for movement laterally of the support, means for imparting punching and setting movements to the punch and set respectively and also bodily lateral movement thereto at intervals between the punching and setting operations for feeding the stock to space the eyelets, means for positively holding the punch in a relatively advanced position during the punching operation, means for rendering the named means inoperative as the set operates, and other means for yieldingly holding the punch advanced, said means permitting the punch to be pressed within the set during the setting operation.

13. A machine of the kind described comprising a material support having a punch-block and a clenching surface on the face thereof, a lever having an end positioned over said support mounted for movement toward and from the support and also for lateral movement, a punch and set telescopically combined carried by said lever end, means for moving said lever end toward said support for the punching, means for moving it laterally to feed and space the eyelets, means to move it farther toward said support for the setting operation, means for holding the punch relatively advanced for the punching, and means to render the last named means inoperative for permitting the punch to recede yieldingly within the set as the set operates.

14. A machine of the kind described comprising a material support having a punch-block and a clenching surface on the face thereof, a punch and set telescopically combined mounted for movement toward and from said support, and also for bodily lateral movement relative to said support, means for imparting punching and setting movements to the punch and set respectively, there being provision for the punch to telescope relative to the set as the set operates, means for periodically moving the punch and set laterally to feed the stock and space the eyelets, and an adjustable element co-

operative with said means to vary the position of the punch and set at one limit of movement thereof, whereby the extent of movement and hence of the feeding is varied.

15. A machine of the kind described comprising a material support having a punch-block and clenching surface on a face thereof, a punch and set telescopically combined mounted for movement toward and from said support and for bodily lateral movement, means for imparting punching and setting movements to the punch and set respectively, means for imparting periodic lateral movement between punching and setting operations to the punch for feeding, and an adjustable element cooperative with said means to vary the initial or punching position of the parts, whereby the extent of feeding or spacing movement is varied.

16. A machine of the kind described comprising a material support having a punch-block and clenching surface on a face thereof, a punch and set telescopically combined having a mounting in a lever over said material support, means for moving said lever toward said support to different extents for the punching and setting movements respectively and for moving the same laterally to feed the stock and space the eyelets, and means for adjusting said punch-block and clenching surface toward said punch and set at will.

17. A machine of the kind described comprising a material support having a punch-block and clenching surface on a face thereof, a punch and set telescopically combined having a mounting in a lever over said material support, means for moving said lever toward said support to different extents for the punching and setting movements respectively and for moving the same laterally to feed the stock and space the eyelets, means for adjusting said punch-block and clenching surface toward said punch and set at will, and means for adjusting said set separately from the punch toward and from the clenching surface, in its mounting on said lever.

18. A machine of the kind described, comprising a material support equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted at one side of said support, mechanism for imparting punching and setting movements to the punch and set respectively, and means for feeding the material after the punch is operated to punch a hole, said means having provision for maintaining the punch in alinement with the punched hole during such feed movement whereby it is adapted to serve as a positioning spindle for inserting the eyelet in such hole.

19. A machine of the kind described, comprising a material support equipped with a

punch block and a clenching surface, a punch and set telescopically combined and operatively mounted at one side of said support, mechanism for imparting punching and setting movements to the punch and set respectively, and means having said punch associated therewith for feeding the material intermittently.

20. A machine of the kind described, comprising a material support having a punch block and a clenching surface, punching and setting devices mounted for operative movements with reference to said punch block and clenching surface respectively, means having said punching devices associated therewith for feeding the material at intervals, and means for positioning the punch to serve as a spindle for alining the eyelet with reference to the set for the setting operation.

21. A machine of the kind described, comprising a material support equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted at one side of said support to coact with said punch block and said clenching surface respectively, means having said punch associated therewith for feeding the material, said means having provision for maintaining the alinement of the punch with the punched hole during such feed movement whereby it is adapted to serve as a positioning spindle for the eyelets in the setting operation, and means for relieving the punch during such feeding movement.

22. A machine of the kind described, comprising a material supporting table adapted to permit the material to be slid thereon, and equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted to co-act with said punch block and said

clenching surface respectively, mechanism for imparting operative movements to said punch and set, and means for adjusting said punch block with respect to said punch.

23. A machine of the kind described, comprising a material support equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted to coact with said punch block and said clenching surface respectively, mechanism for imparting operative movements to said punch and set, and means for effecting relative adjustment between said punch and said set when both are in normal operative position.

24. A machine of the kind described, comprising a material support equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted to coact with said punch block and said clenching surface respectively, mechanism for imparting operative movements to said punch and set, means for effecting a relative adjustment between said punch block and said punch, and means for effecting a separate relative adjustment between said set and said punch when both are in a normal operative position.

25. A machine of the kind described, comprising a material supporting table adapted to permit the material to be slid thereon and equipped with a punch block and a clenching surface, a punch and set telescopically combined and operatively mounted to coact with said punch block and said clenching surface respectively, mechanism for imparting operative movements to said punch and set, and means for adjusting said set with respect to said clenching surface.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."