

L. F. MUTHER & W. M. SPRYE.
EYELET SETTING MACHINE.
APPLICATION FILED JAN. 6, 1909.

Patented Nov. 12, 1912.

4 SHEETS—SHEET 1.

1,044,410.

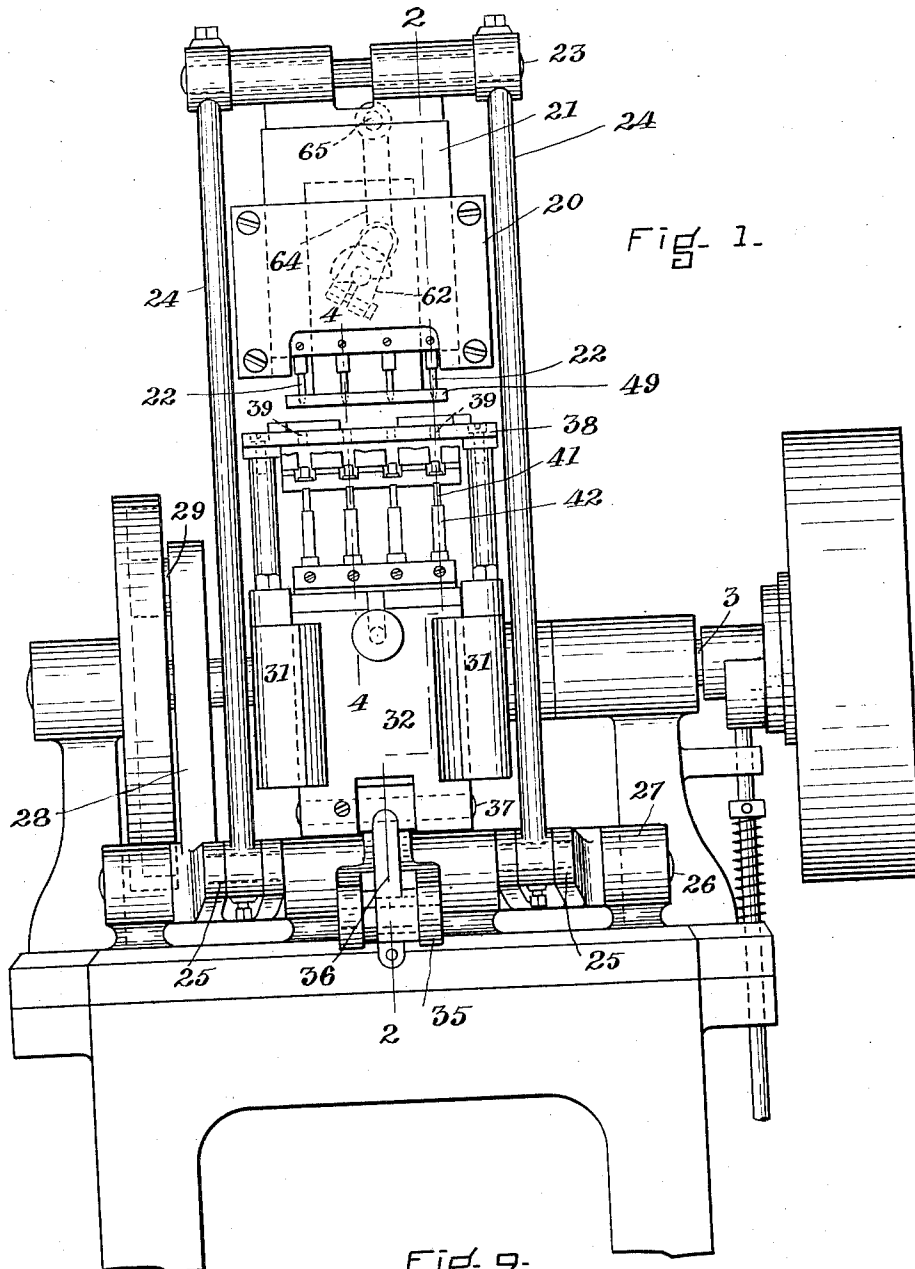


Fig. 1.

WITNESSES.

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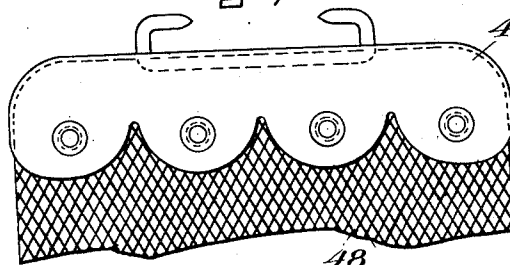


Fig. 7.

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4 SHEETS—SHEET 2.

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4 SHEETS—SHEET 3.

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Fig. 4-

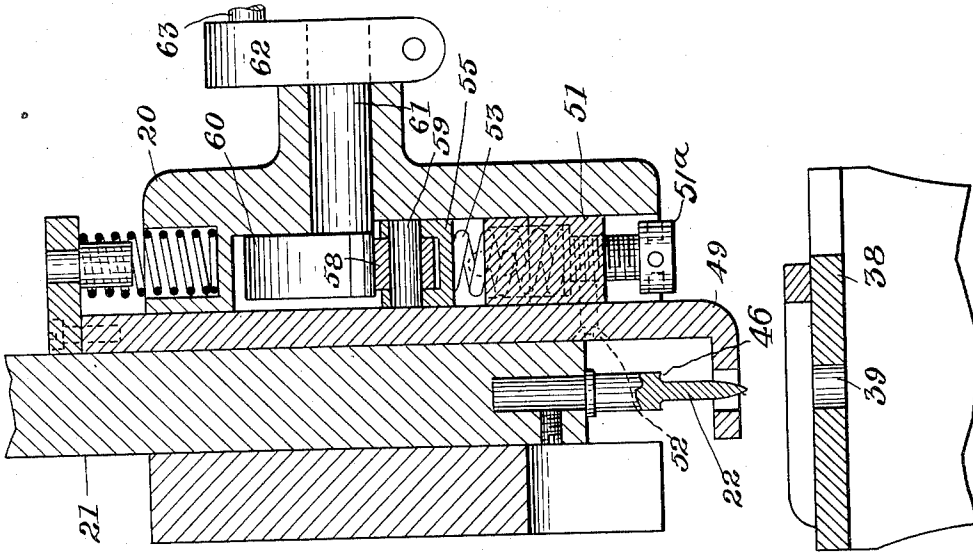
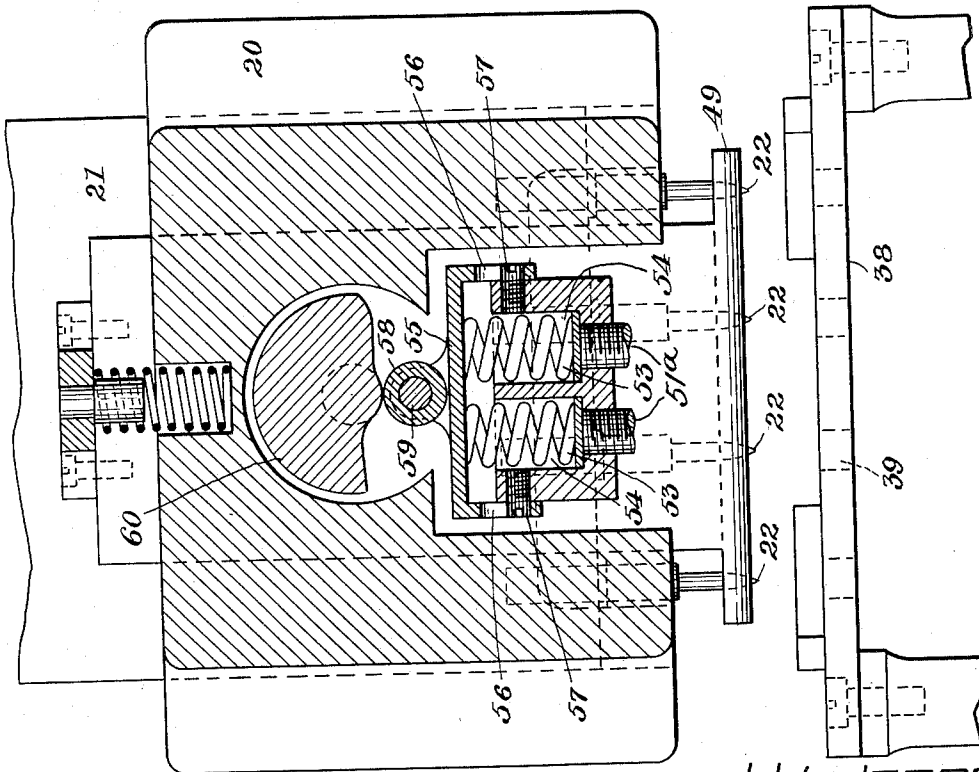


Fig. 3-



WITNESSES.

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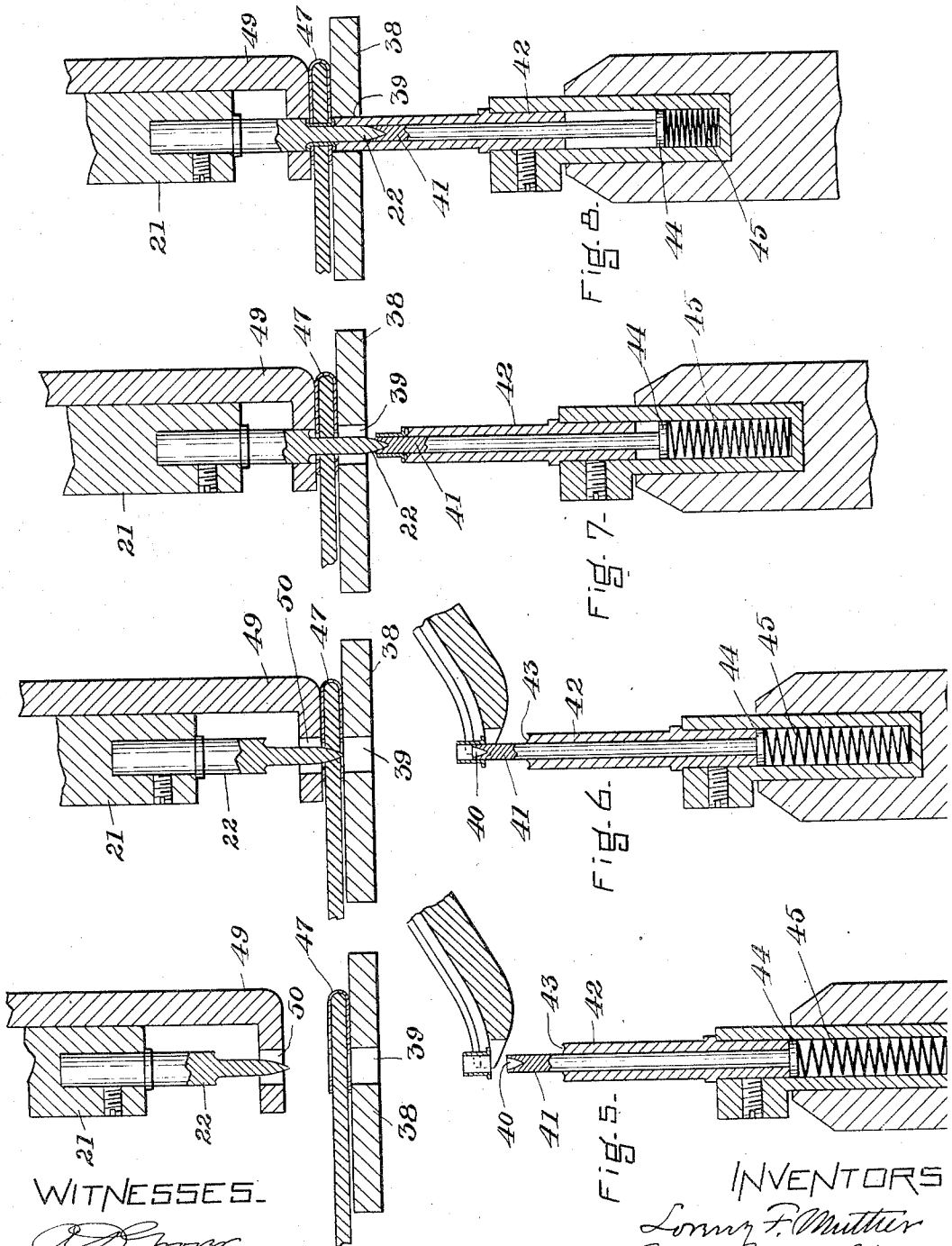
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Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE.

LORENZ F. MUTHER, OF NEWTON, AND WILLIAM M. SPRYE, OF LYNN, MASSACHUSETTS, ASSIGNORS TO LORENZ MUTHER, OF BOSTON, MASSACHUSETTS.

EYELET-SETTING MACHINE.

1,044,410.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed January 6, 1909. Serial No. 470,924.

To all whom it may concern:

Be it known that we, LORENZ F. MUTHER, of Newton, county of Middlesex, and State of Massachusetts, and WILLIAM M. SPRYE, of Lynn, county of Essex, State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Eyelet-Setting Machines, of which the following is a specification, reference being had to the drawings accompanying the same and forming a part thereof.

Our invention relates to eyeletting machines having a plurality of punching and eyelet setting dies for setting a plurality of eyelets at each operation of the machine.

The objects of our invention are to provide an eyelet setting machine for setting eyelets in fabrics, such as woven or fibrous fabric, without cutting the fibers or threads thereof.

A further object of our invention is to provide an eyelet setting machine capable of uniting fabrics of soft texture, such as woven or fibrous fabrics, to others of a hard substance, such as metal plates or pieces of different shapes and thicknesses by one or more eyelets inserted therein and used as rivets.

In the drawings accompanying this specification,—Figure 1 is a front elevation of our eyelet setting machine; Fig. 2 is a sectional side elevation of the same taken through line 2—2, Fig. 1; Fig. 3 is a front elevation through line 3—3 Fig. 2; Fig. 4 is a sectional side elevation of Fig. 3; Figs. 5, 6, 7 and 8 are sectional side elevations of the punch and dies taken through line 4—4 Fig. 1, and show four positions of the punch and dies from the position where the eyelet is inserted and riveted to complete the operation of uniting two or more pieces of fabric; and Fig. 9 shows one type of fabric with a metal end which our eyelet setting machine is designed to secure together by eyelets.

The machine is provided with the base 1 and the frame 2. The frame 2 has a main bearing for the driving shaft 3, upon which are mounted the operating cams 4 and 5 and the eccentric 6. The purpose of these parts will be described more fully hereafter. The machine is also provided with the usual type of hopper for containing the eyelets and feeding them to the raceways. The

hopper (which is not shown) is mounted 55 on the frame 7, which frame is provided with the slots 8 and 9 designed to reciprocate longitudinally upon the bearings 10 and 11, and is held in position by the bolts 12 and 13. The frame 7 is oscillated back 60 and forth by means of the cam 5 which contacts with the roll 14 mounted on the lever 15, which lever is pivoted upon the pivot 16 and connected to the raceway frame 7 by the stud 18, which passes through the slot 17; the stud 18 being secured in the frame 7. This form of connection causes the frame 7 to oscillate transversely with every revolution of the driving shaft 3 so that the raceway 19 will present an eyelet to the setting 70 device at each cycle of operation of the machine, the eyelet being presented so that the setting device will pass through it in its outward movement, as is shown in Figs. 5 and 6. After the eyelet has been taken 75 upon the end of the setting device, as shown in Fig. 6, the raceway reciprocates longitudinally backward out of the path of the movement of said setting device so that the eyelet can be carried up and inserted in the 80 work to be riveted together.

The top of the frame 2 is provided with a bearing 20 arranged to receive a reciprocating head 21, which reciprocating head has mounted therein the perforators 22, 22, 85 etc. The reciprocating head is provided with a pivot-pin 23 extending transversely through it to which the connecting rods 24, 24, are pivotally attached at their upper ends, the lower ends of said connecting rods 90 being attached to oscillating levers 25, 25. These oscillating levers are in turn secured to the shaft 26 which is revolubly mounted in a bearing 27 formed on the frame 2. The shaft 26 has secured thereto the lever 95 28 which has a roll 29 mounted on its outer end. The roll 29 is formed and arranged to slide freely in the cam-track 30 formed in the side of the cam 4, the cam being arranged so that every revolution of the shaft 100 3 causes a vertical movement of the reciprocating-head 21. The frame 2 is also provided with guide-ways 31, 31 to receive a vertically reciprocating-head 32. The vertically reciprocating-head 32 is moved up 105 and down by means of the eccentric 6 which is mounted on the shaft 3. This eccentric is provided with the eccentric-strap 33 sur-

rounding the same having attached to it a lever 34 which is pivoted upon the shaft 26 near its center, its outer end 35 being provided with links 36 which are attached to the reciprocating-head 32 by means of the pivots 37; so that with every revolution of the eccentric 6 the vertically reciprocating plunger 32 is moved up and down. The vertically moving head 21 has secured in its lower side a plurality of punches 22 as is shown in Fig. 1 so that a vertical movement of said plunger 21 causes the punches 22 to move downwardly toward a work-bed 38 so that they will pass through the holes 39 in same and perforate any fabric that may be placed upon said work-bed 38.

In the process of setting eyelets, the punches 22 which are tapering to a point are caused to pass down through the fabric, making a hole in the fabric by pressing the fiber of the fabric outwardly from the axis of the punch without cutting any of the fibers. Further downward movement of the punch causes it to pass down through the fabric, as shown in Fig. 6, until its end enters a depression 40 in the top of the eyelet feeding plunger 41. The eyelet feeding plunger 41 is then moved upwardly with the punch 22, carrying therewith the eyelet which fits closely upon the end of the plunger 22. The shoulder 43 of the plunger 42 contacts with the head of the eyelet and presses the eyelet up through the fabric, as shown in Fig. 8, until the head of the eyelet is in contact with the under face of the fabric; thereupon the cams operating the reciprocating block 32 cause the plungers 42 and 22 to approach each other and rivet the eyelet securely at both ends upon the upper and lower surfaces of the fabric, as is hereinafter described in greater detail. After the eyelet is pressed upwardly through the work the plunger 42 remains stationary and the plunger 22 moves downwardly to rivet the upper end of the eyelet over the fabric, as is shown in Fig. 8. The eyelet feeding plunger 41 slides freely in a hole in the die 42 and is provided with the head 44 which rests upon the upper end of a compressible spring 45 so that said feeding plunger 41 may be moved downwardly in the die 42, compressing the spring 45 in its downward movement, as is shown in Fig. 8.

The punches 22 constitute both the punch and the riveting-die, the annular plunger 46 forming the riveting portion of the punch.

In setting eyelets in fabric such as is shown in Fig. 9, the holes in the metal 47 are punched before it is inserted on the fabric 48, the holes being spaced the same distance apart as the punches 22. In order to hold the metal and the fabric firmly, it is necessary to have a presser-foot that will come down upon the fabric and firmly hold it upon the bed-plate 38.

49 represents a presser-foot which is wide enough to embrace all the punches 22, the punches passing through holes 50 in the presser-foot. This presser-foot 49 is slidably mounted on the plunger 21 and has secured to it a block 51 by means of the screw 52. This block is arranged to receive spiral springs 53, 53, the lower ends of the springs being incased in recesses 54 formed in the block and their tension adjusted by means of the adjusting screws 51^a, 51^a. The upper ends of the springs press upwardly against a yoke 55, the yoke 55 having down-turned ends provided with slots 56, 56, arranged to receive screws 57, 57, to hold the yoke in place on the block 54. This yoke is provided with a roll 58 pivoted by a pivot 59 to the yoke 55. The roll is adapted to bear against a cam 60 which is mounted on a shaft 61, the shaft 61 being oscillated by means of a crank member 62 provided with a wrist-pin 63 which engages in a hole in a pitman 64, which pitman is secured by the stud 65 to the plunger 21 in such manner that when the plunger 21 reciprocates up and down vertically, it partially rotates the cam 61 through said crank 62 and the connection 64, the cam being set to advance the presser-foot downwardly ahead of the punches 22 so that the foot will press firmly against the fabric 47 before the punches 22 enter the same to punch a hole. It also holds the fabric while the eyelet is pressed into the hole. When the hole has been punched, the eyelet inserted and riveted, and the plungers 21 and 32 moved apart, the presser-foot 49 is moved upwardly to the position shown in Fig. 5 to complete the cycle of operation so that the work may be removed and another piece inserted in the machine.

What we claim is:—

1. In an eyelet setting machine, a frame; a work table supported by the frame; an upper reciprocating head slidably mounted in said frame; a plurality of pointed perforators mounted in said reciprocating head; a presser foot slidably mounted in the reciprocating head; means formed on said reciprocating head for reciprocating said presser foot in advance of the movement of the reciprocating head, and for yieldingly pressing it upon the work to be operated upon; means for perforating the fabric, setting and riveting an eyelet in the fabric while it is held by said presser-foot; and means for disengaging the presser foot from the work when the eyelet has been set and riveted.

2. In an eyelet setting machine having a plurality of perforating and eyelet setting devices; a work supporting table; a vertically reciprocating plunger carrying perforators for perforating the fabric; a presser foot mounted upon and carried by said ver-

5 tically reciprocating plunger; a cam and
cam shafts for causing a vertical movement
of said presser foot; means for partially
rotating said cam shaft and cam mounted
10 upon the vertically reciprocating plunger; a
vertically reciprocating member having a
roll revolubly mounted therein to contact
with the cam, said member being movably
secured to a portion of the presser foot;
springs interposed between said member and
a portion of the presser foot; and adjusting

screws for adjusting the tension on said
springs.

In witness whereof, we have hereunto set
our hands, in the presence of two subscri- 15
ing witnesses, this the 4th day of December,
A. D. 1908.

LORENZ F. MUTHER.
WILLIAM M. SPRYE.

Witnesses:

A. H. SPENCER,
H. M. KELSO.