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PATENTED NOV. 1, 1904.

J. W. BARNA & V. HOFFMAN.

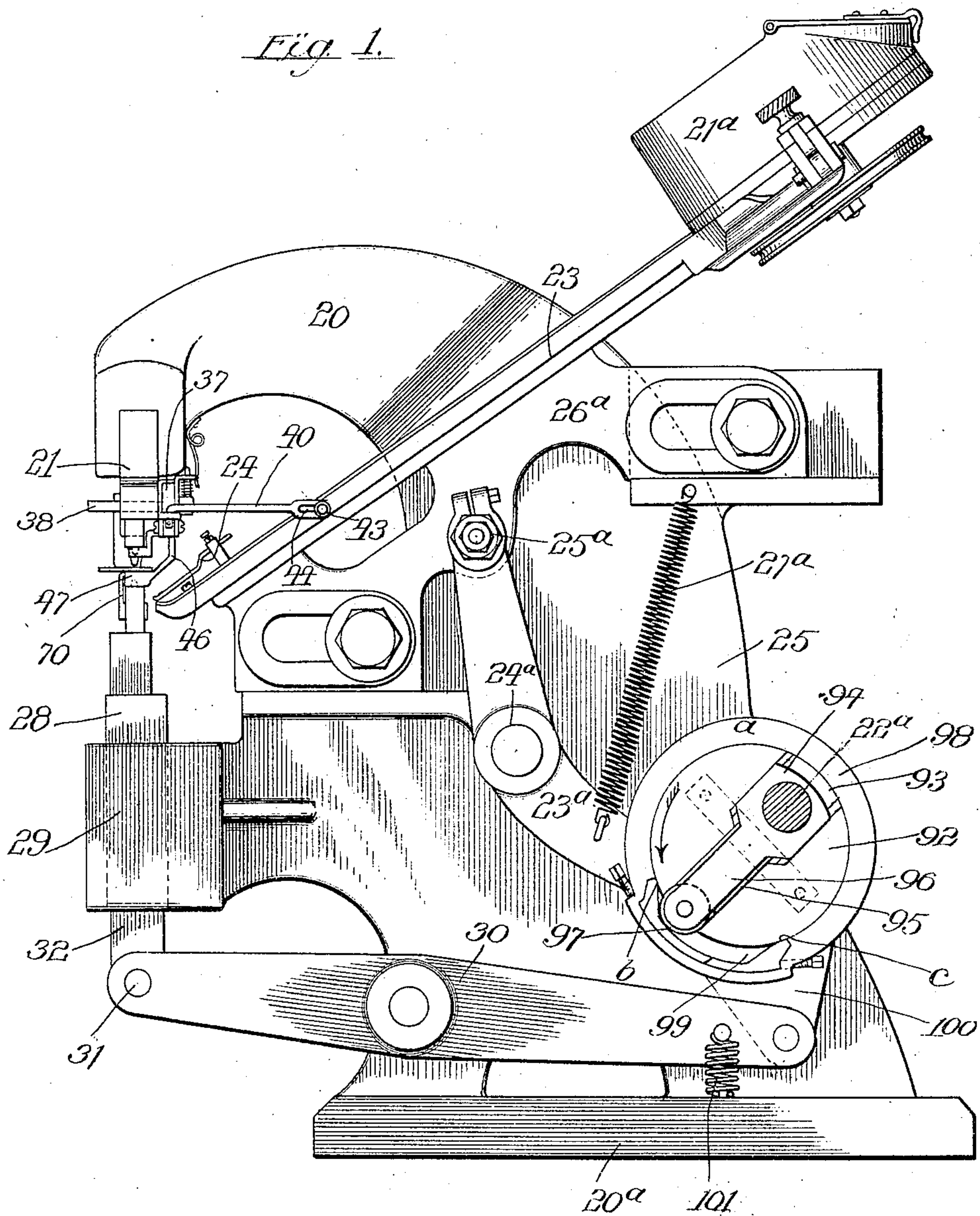
EYELETING MACHINE.

APPLICATION FILED JULY 20, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

*Fig. 1.*



*Witnesses:*

*Edu. Barrett*

*Lute S. Alter*

*Inventors.*

*Joseph W. Barna  
and Valentine Hoffman*

*By Coburn & McRoberts*

*Attorneys.*

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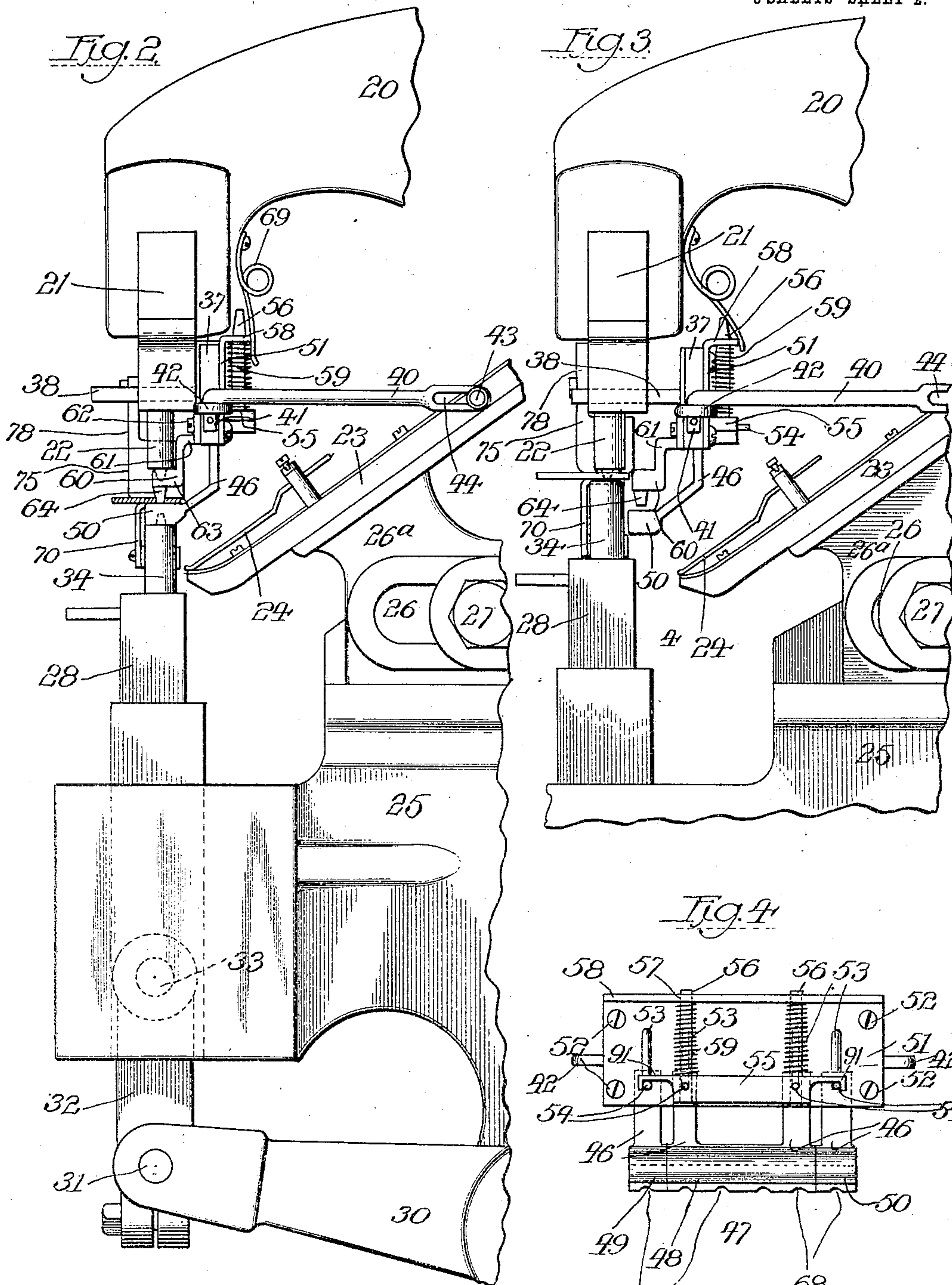
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3 SHEETS—SHEET 2.



Witnesses

Edu. Barrett

Levi S. Alter.

Inventor's

Joseph W. Barna,  
and Valentine Hoffman,

By Coward McRoberts  
Attys



No. 773,845.

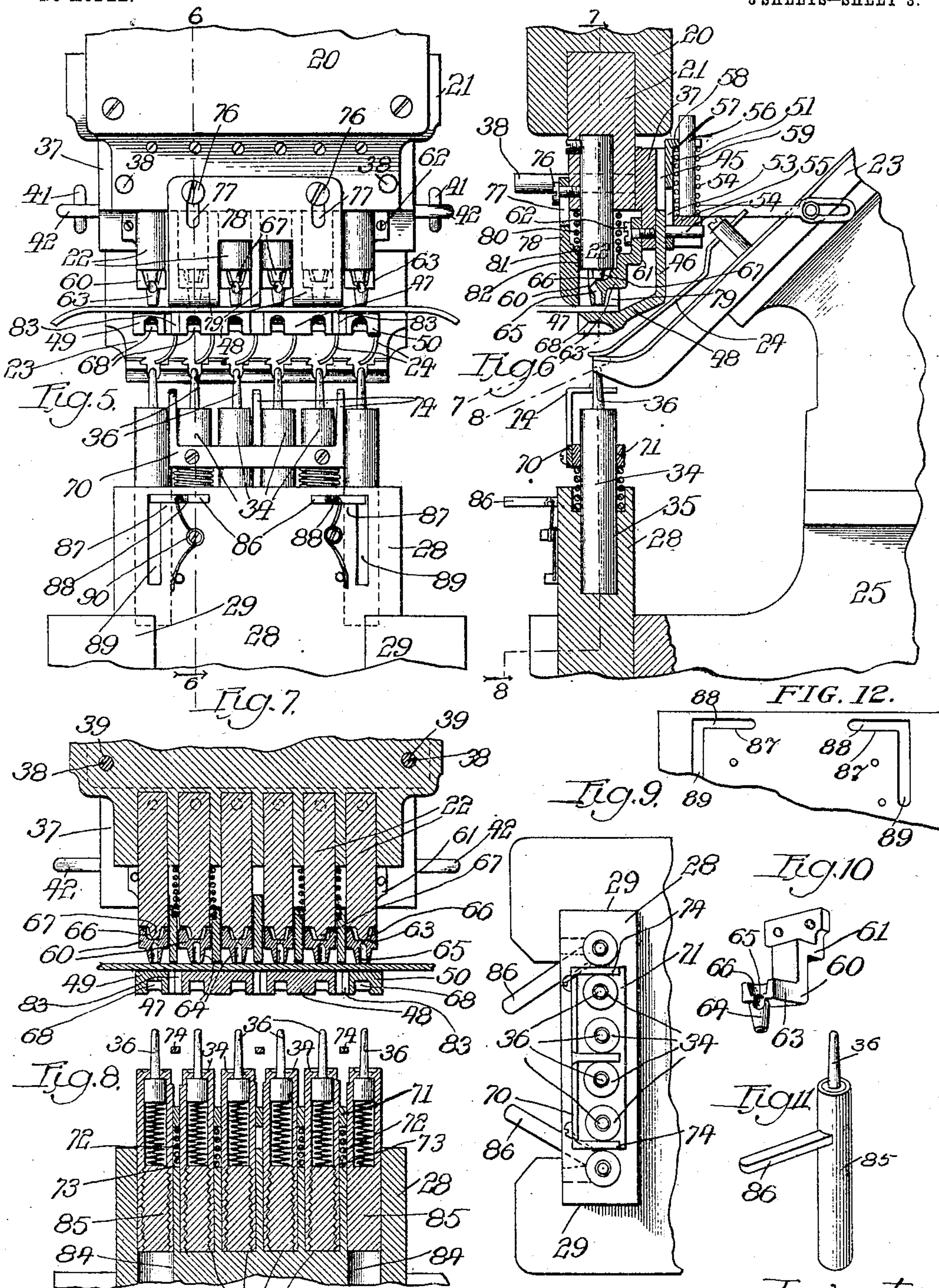
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses  
Edw. Barrett 35  
Lute S. Alter

Inventors:  
Joseph W. Barna  
Valentine Hoffman  
By Coburn McRoberts  
Attys



# UNITED STATES PATENT OFFICE.

JOSEPH W. BARNA AND VALENTINE HOFFMAN, OF CHICAGO, ILLINOIS,  
ASSIGNORS TO THE PEERLESS MACHINERY COMPANY, OF BOSTON, MAS-  
SACHUSETTS, A CORPORATION OF WEST VIRGINIA.

## EYELETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 773,845, dated November 1, 1904.

Application filed July 20, 1903. Serial No. 166,224. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH W. BARNA and VALENTINE HOFFMAN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Eyeletting-Machines, of which the following is a specification.

This invention relates to improvements in machines for setting eyelets, and particularly to the means for punching or forming the apertures in which the eyelets are to be secured.

The invention comprises generally, in combination with the usual stationary and movable sets of an eyeletting-machine, a punching mechanism cooperating therewith and designed to cut or punch out eyelet-apertures in the stock to which the eyelets are to be affixed and then through the medium of a suitable connection with a moving part of the machine to be withdrawn or retracted to permit the sets to affix the eyelets.

The invention further contemplates the provision of means for clamping or holding the stock in position for the setting operation to secure the same against movement upon the withdrawal of the punching mechanism and insure the alinement of the apertures in the stock with the spindles which pick up and deliver the eyelets to the sets.

Means are also preferably provided for throwing out of operation one or more of the sets and the punching mechanism associated therewith in order to vary at will the number of eyelets affixed at each operation.

The above and other features and improvements are hereinafter fully set forth, and particularly specified in the appended claims, and are illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an ordinary eyeletting-machine, showing my invention applied thereto. Fig. 2 is a side elevation of the front portion of the machine with the parts in the positions they occupy during the punching operation. Fig. 3 is a similar view, but with the punching mechanism retracted and the sets in operative position. Fig. 4 is

a rear elevation of the punch-block or anvil which coöperates with the punches, showing the springs for restoring the parts after each operation. Fig. 5 is a front elevation of the upper and lower sets, the punches, and punch-block, the parts being shown in their preliminary positions. Fig. 6 is a vertical section, partially in elevation, on the line 6 6 of Fig. 5. Fig. 7 is a section on the line 7 7 of Fig. 6. Fig. 8 is a vertical longitudinal section on the line 8 8 of Fig. 6, showing the lower or movable sets and their associated eyelet-spindles, together with the lower member of the stock-clamp. Fig. 9 is a plan of the lower sets and clamp members, the set of each end of the series shown as capable of being thrown out of action. Fig. 10 is a detail of one of the punch devices. Fig. 11 is a perspective of one of the end or independently-movable sets of the lower series also seen in active position in Figs. 5 and 9; and Fig. 12 is a fragmentary view of the upper portion of the carrier for the movable sets, illustrating the arrangement of the slots in which the finger-pieces attached to the end sets are adapted to move in throwing the end sets into and out of operation, the springs for holding the finger-pieces not being shown.

In the drawings the invention is shown as adapted to a setting-machine of ordinary construction and comprising the following mechanism: The base 20<sup>a</sup>, on which the machine is mounted, is provided with a head or standard 25, carrying the usual raceway 23, provided with ordinary eyelet-stops 24 for delivering eyelets to the setting mechanism and which is supplied with eyelets from a reservoir or other receptacle 21<sup>a</sup> in the ordinary manner. The raceway is retracted by a cam (not shown) keyed on the driving-shaft 22<sup>a</sup> through the medium of a lever 23<sup>a</sup>, pivoted to the head, as at 24<sup>a</sup>, and also, as at 25<sup>a</sup>, to a frame 26<sup>a</sup>, slidably mounted on the head. A spring 27<sup>a</sup>, anchored to the head 25 and the lever 23<sup>a</sup>, serves to advance the raceway after it has been retracted by its actuating-cam. The upper sets 22 are mounted in a block 21, secured to the under face of an arm 20 of the head 25.



The vertically-reciprocating carrier 28, upon which the lower sets are mounted, slides in ways 29, formed in extensions of the head 25, motion being imparted thereto by means of a lever 30, pivoted, as at 31, to a link 32, in turn pivoted to the carrier at 33, as shown in dotted lines in Fig. 2. The lever 30 is rocked by an eccentric mechanism hereinafter to be described. The sets 34 of the lower series are secured in the sockets 35 in the carrier 28 and are hollow, having seated therein the usual spring-supported spindles 36, designed to pick up the eyelets from the raceway and deliver them to the sets.

The parts hereinbefore described are of the usual construction, except as hereinafter pointed out, and further description thereof is not thought to be necessary.

In carrying out our invention we provide a novel device or mechanism for punching the eyelet-apertures in the stock and which is so mounted as to be automatically and periodically advanced and retracted for the performance of its functions. This punch mechanism comprises a series of punches and a punch-block or anvil coöperating therewith and one of which elements is designed to be forced upon or against the other to perform the punching operation. In the embodiment of the invention illustrated the said punches and anvil are mounted on a carrier and the punch-block is capable of movement relative to the punches and is moved against the same by the lower series of sets. Connection is made, preferably, with a movable part of the machine for retracting the carrier to withdraw the punches and block from the path of the movable sets when the latter close upon the stationary sets and also for advancing the punching mechanism upon the separation of the sets for the next punching operation.

In the construction illustrated there is provided a slide-block or carrier 37, located at the rear of the upper sets-block 21 and parallel therewith and having fixed thereto at each end a forwardly-projecting rod 38, which passes through and slides in an aperture 39 in the adjacent end of the block 21. Connection with a moving part of the machine is made for sliding the block 37 in any suitable manner, as by means of the links 40, having hooks 41 at their forward ends engaging eyes 42 on the ends of the block 37 and pivoted at their rear ends on studs 43 at the opposite sides of the raceway, passing through elongated apertures 44 in the said links 40.

Formed in or on the rear face of the block 37 are vertical grooves 45, Fig. 6, and seated in such grooves are the slide-bars 46, by which the punch-block or anvil 47 is supported. In the present construction the anvil 47 is made in three sections 48, 49, and 50 for a reason hereinafter to be mentioned, and the central section, or 48, being considerably longer than the others, is provided with

a pair of the vertical bars 46, one at each end, in order to properly guide and avoid lateral movement of the same, while the narrow sections are provided with one slide-bar 46 each. A plate 51, secured by screws 52 to the block 37, retains the bars 46 in position and is provided with a number of vertical slots 53, one of which is located at the rear of each of the bars 46 and through which projects a pin or stud fixed to such bar, as shown in Fig. 4. A cross-head 55 is located on the rear face of the plate 51 and engages the pins 54 of the slide-bars 46 and is provided with vertical stems 56, which pass through guide-apertures 57 in a rearward flange 58 of the plate 51, and coiled about the stems 56 are expansion-springs 59, which react against the cross-head 55 and the flange 58, exerting a constant tendency to hold the anvil in its depressed position, such position being defined by the ends of the slots 53.

It will be obvious that the block 37 and plate 51 might be made integral and provided with the necessary grooves and slots; but the arrangement described is thought to be preferable as being easier to construct.

Secured to the front of the block 37 (clearly shown in Figs. 2, 3, and 6) are the punch devices 60, one for each pair of coöperating sets. Each of the punch devices 60, as shown in Fig. 10, comprises a bracket 61, secured by screws 62 to the said block, a forward extension or lug portion 63, and the punch 64, extending downwardly from the under face of the extension 63 and having an aperture 65, the upper end of which is inclined forwardly, as shown in Fig. 6, to permit of the escape of the punchings as they accumulate in and are forced upwardly through the said passage. The punches 64 are coaxial with the sets, as shown in Figs. 6 and 7, and to properly position the same a spring 69 may be provided and attached to the arm 20, so as to engage the carrier and press the slide 37 into snug engagement with the block 21. In order to better resist the thrust of the lower sets during the punching operation, as hereinafter described, the punches 64 are located close up against the upper sets, being provided with recesses 66 to receive the tips of the upper sets, the shoulders of the said sets resting against the shoulders, surrounding the said recesses. The construction not only prevents breakage of the punches, but in addition and by reason of the recesses 66 puts the wear on the shoulders of the sets 22, so as to prevent injury to their tips 67 and also permits the punches to be readily retracted, clearance being provided for the tips 64 by the said recesses.

The punch-block or anvil 47 extends forwardly from the slides 46 and has a flat upper face on which the stock is held and against which the punches act. The under face of the punch-block is provided with pockets 68,



designed to receive the eyelets on the spindles when the lower sets engage the punch-block to avoid crushing of the eyelets, and these pockets are preferably inclined upwardly toward the front upper edge of the block, as shown in Fig. 6, so that when the anvil is retracted it will slide off the ends of the spindles 36 gradually in order to prevent the latter being released suddenly so as to throw off the eyelets carried thereby. The shoulders at the sides of the grooves 68 are designed to be engaged by the shoulders or upper ends of the lower sets as the latter rise, whereby the anvils are moved upwardly against the punches to cut the apertures in the stock.

The eccentric mechanism previously referred to for operating the lower sets is designed to raise the latter into engagement with the punch-block 47 and after pressing the said punch-block against the punches provide a relief for the said punch-block and punches, so that they may be separated far enough to afford a clearance for the stock on the retraction of the punching mechanism. While we do not limit ourselves to the particular means shown, we have illustrated in the drawings (see Fig. 1) a novel form of eccentric accomplishing the several necessary steps or movements. This eccentric comprises a disk 92, provided with a radial slot 93, in which is slidably mounted a hub portion 94, fixed on the shaft 22<sup>a</sup>. The shaft 22<sup>a</sup> by reason of the radial slot 93 is eccentric to the disk 92. The latter is also provided with a groove 95, which is a continuation of the slot 93 and receives an arm 96 of the hub 94, the said arm at its end being preferably provided with an antifriction-roller 97. The length of the hub and arm, with its roller, is substantially equal to the diameter of the disk 92, and the eccentric-strap 98, inclosing the latter, is provided at a suitable point on its inner face with a recess 99, the purpose of which will be hereinafter explained. The eccentric-strap is provided with an arm 100, to which is pivoted the rear end of the lever 30.

In the operation of the machine the eyelets are delivered to the raceway 23 in the usual manner and held in such position as to be in the path of the spindles 36 as they rise with the lower sets. During such upward movement and while the hub-arm 96 of the eccentric is moving from *a* to *b* (indicated in Fig. 1) and after the eyelets have been picked up by the spindles 36 the raceway 23 begins its retractive movement, being actuated by the lever 23<sup>a</sup>. Before the studs 43 reach the rear ends of the elongated apertures 44 in the links 40 the punch-block 47 is engaged by the shoulders of the lower sets and pressed upwardly against the action of the springs 59, moving the stock, as shown in Fig. 2, against the punches 64, which, reacting against the punch-block, cut the apertures. At this point the end of the arm 96 of the eccentric enters the recess 99 in the

eccentric-strap and the latter and the disk 92 are forced upwardly by an expansion-spring 101 reacting between the base 20<sup>a</sup> and the rear end of the lever 30 and slide on the hub 94 and its arm 96. This movement rocks the lever 30, lowering its forward end and moving the lower sets with it. This movement is only sufficient to permit the punch-block 47, under the influence of its springs, to lower far enough to provide a clearance between the punch-block and ends of the punches to permit the stock being moved off the punches before the latter begin their retractive movement and as shown in Fig. 1. The punching operation having been performed, the movement of the raceway will have carried the studs 43 to the rear end of the apertures 44 and then retracted the block 37, carrying with it the punches and block 47, and during such retractive movement the arm 96 of the eccentric moves along the recess 99, or from *b* to *c*. Upon the retraction of the punches and punch-block the latter is pressed downwardly by its springs 59 in position to be advanced by the raceway at the proper time, the stock being held in such position that the apertures are in alinement with the spindles 36, which continue their upward movement with the lower sets. The eccentric continuing its rotation, the end of the arm 96 passes out of the recess 99 and the lower sets are then moved against the upper sets, and the eyelets having been passed through the apertures cut for their reception and moved onto the tips 67 of the upper sets the opposing sets are forced together and the eyelets upset in the usual manner. As the lower sets are receded the raceway advances again and when the studs 43 reach the forward ends of the apertures 44 advances the punch and anvil-carrier to its original position, as shown in Fig. 6.

Means are preferably provided to hold the stock in proper position after the punching operation and prevent its dislodgment by the movement of the punching mechanism. To this end we employ a pair of cooperating clamp members, one associated with each series of sets. One member, as 70, comprises a block 71, provided with apertures to receive the lower sets 34, on which it is slidably mounted. Coiled about certain of the sets of the lower series, as shown in Fig. 8, are expansion-springs 72, seated in sockets 73 in the carrier 28 and reacting against the said carrier 28 and the block 71. Attached to or integral with the block 71 are fingers 74, which extend rearwardly between adjacent plungers, as shown, and in their normal position are disposed slightly below the upper ends of the spindles 36. The other member, 75, is carried by the block 21 of the upper sets and is held thereto by screws 76, which pass through vertical slots 77 in a plate 78, on the lower end of which is formed or attached the rearwardly-extending fingers 79, adapted to cooperate with



the lower clamp-fingers 74 and hold the stock. In the construction illustrated the outer fingers 79, which coact with the end or outer lower fingers 74, are provided with offsets 5 having vertical apertures 82, through which pass the second set from each end of the upper series 22, and coiled about such sets are springs 80, one of which is shown in Fig. 6, which react between the block 21 and shoulders 81, formed at the upper end of the apertures 82, and hold the fingers normally slightly below the ends of the punches 63, as clearly shown in Figs. 5 and 6, the position thereof being defined by the upper ends of the slots 15 77 in the plate 78. When the lower sets-carrier 28 rises, it carries with it the lower clamp member 70, the fingers of which move past the anvil 47 in recesses 83 in the front face of the same and provided for this purpose and 20 coacting with the upper clamping-fingers bear upon the stock with sufficient pressure to hold the latter securely, thereby insuring the alinement of the apertures with the spindles 36 after the punching mechanism is retracted. 25 As the lower sets advance on the upper sets the upper clamp member is elevated, such movement being permitted by the slots 77 in the plate 78, and in the first or punching operation the clamping members assume the positions shown in Fig. 2. Upon the separation of the punch-block from the punches due to the relieving-recess in the eccentric the upper clamp follows the downward movements of the lower clamp and pushes the stock off 35 the punches, so that the latter may be retracted, as heretofore described, without injuring the stock, and when the lower sets again rise to perform the setting operation the clamps assume the position shown in Fig. 3, holding 40 the stock in proper position for the affixing of the sets.

The invention also includes means for varying the number of eyelets affixed at each operation of the machine. Ordinarily different 45 machines are employed in eyeleting certain articles, such as shoe-uppers, when there is a variation in size or for other reasons it is desirable or necessary to vary the number of eyelets affixed. To avoid the use of a number of machines for accomplishing this result, we have provided means in one machine for throwing out of action one or more of the sets, so that the machine will set any desired number of eyelets at each operation. This 55 feature is claimed, broadly, in an application filed by us July 16, 1903, Serial No. 165,757, and in the present instance we claim the same only in combination with a movable punching mechanism, as herein set forth. One or 60 more of the sets may be made capable of being thrown out of operation. In the construction illustrated two of such knock-out sets are employed. The sockets 84, in which the two outer sets 85 are located, are made deeper

than the sockets of the inner sets, as shown in 65 Fig. 8, and the said sets are designed to be slid downwardly in such sockets, so as to be thrown out of action. Each of such sets 85 may be provided with a finger piece or trip 86, which when the set is in its active or elevated position rests on a shoulder 87, formed 70 by a horizontal slot 88 in the carrier 28, as shown in Figs. 5 and 12. By means of such finger-piece the set may be partially rotated to bring the finger-piece into a vertical slot 75 89 in the carrier, down which the finger-piece may be moved to depress the set attached thereto. Springs 90, mounted on the front face of the carrier 28 and engaging the finger-pieces 86, are designed to hold the finger- 80 piece against accidental dislodgement when the sets are in their active positions. The outer sets are, like the sets 34, provided with plungers 36 and operate under ordinary circumstances in the same manner. The sections 49 and 50 of the punch-block or anvil 85 47 coöperate with the outer independently-movable lower sets 85, and it is to avoid the elevating of these sections when the inner sets only are active and consequent puncturing of 90 the stock by the punches associated therewith that this sectional arrangement is provided. As shown in Fig. 4, the spring-controlled cross-head 55 is provided with apertures through which project the ends of the 95 pins 54 of the bars 46 of the section 48, thereby connecting such bars with the bar 55. The outer bars 46, however, and consequently their associated punch-block sections, while normally under the influence of 100 the spring-bar 55 are not affected when the inner sets alone are active. This result is attained by providing the ends of the bar 55 with shoulders 91, as shown in Fig. 4, with the under faces of which the pins 54 extending 105 from the outer bars 46 engage when the outer sections are elevated and against which the bar exerts its pressure to hold the said anvil-sections depressed. When, however, 110 the outer sets 85 are thrown out of action, the inner punch-block or anvil section 48 is raised and the shoulders 91 simply moved away from the pins 54 of the slide-bars of the outer sections, leaving such sections stationary.

In our application for patent herein referred to we have shown and described a 115 gage mechanism to be used in connection with an eyeleting-machine provided with a series of eyelet sets and means for shifting the position of the gage automatically to 120 center the same with reference to the sets when the number of active ones is varied. It will be readily understood that the same features may be adapted to the present machine without change and may be used with 125 equally advantageous results. It is also to be understood that one pair only of coöperating sets may be employed instead of the



series shown, in which case a single punch-block or anvil section and one punch would cooperate therewith.

Having described our invention, what we claim is—

1. In an eyeleting-machine, in combination, a pair of cooperating sets, one of which is movable, and a punching device movable into and out of the path of the movable set and actuated by the setting mechanism.

2. In an eyeleting-machine, in combination, a pair of cooperating sets, one of which is movable, and a punching device movable into and out of the path of the movable set and actuated by the latter.

3. In an eyeleting-machine, in combination, a pair of cooperating sets, one of which is movable, a punching device movable into and out of the path of the movable set and actuated by the setting mechanism while in the path of the movable set, and a connection with a moving part of the machine for moving the punching device.

4. In an eyeleting-machine, in combination, a pair of cooperating sets, one of which is movable, a punching device movable into and out of the path of the movable set and actuated by the latter, and a connection with a moving part of the machine for moving the punching device.

5. In an eyeleting-machine, in combination, a pair of cooperating sets, and a punching device operated by one of such sets.

6. In an eyeleting-machine, in combination, a pair of cooperating sets, and an independent punching device operated by one of such sets.

7. In an eyeleting-machine, in combination, a pair of sets, one of which is movable, a punch and a punch-block normally in line with the sets and one of which is relatively movable and moved by the movable set, and means for moving the punch and block into and out of the path of the movable set.

8. In an eyeleting-machine, in combination, a pair of sets, one of which is movable, a carrier, a punch fixed to the carrier, a punch-block slidable on the carrier and actuated by the movable set, and means for moving the carrier.

9. In an eyeleting-machine, in combination, a pair of sets, one of which is movable, a carrier, a punch fixed to the carrier, a punch-block slidable on the carrier and actuated by the movable set, and a connection with a moving part of the machine for moving the carrier.

10. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating sets one of which is movable, a carrier, a punch fixed to the carrier, a cooperating punch-block slidable on the carrier and with the punch normally in the path of the movable set, and a link connection between the carrier and the raceway.

11. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating sets one of which is movable, a carrier, a punch fixed to the carrier, a spring-controlled punch-block slidable on the carrier and with the punch normally in the path of the movable set, and a link connection between the carrier and the raceway.

12. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating sets one of which is movable, a sliding carrier, connection between the carrier and the raceway, a punch and punch-block mounted on the carrier and one of which is spring-controlled and movable relatively to the other and both of which are normally in the path of the movable set, and means for retracting the carrier.

13. In an eyeleting-machine, in combination, cooperating series of sets one of which series is movable, and a punching device movable into and out of the path of the movable series and actuated by the setting mechanism.

14. In an eyeleting-machine, in combination, cooperating series of sets one of which series is movable, and a punching device movable into and out of the path of the movable series and actuated by the latter.

15. In an eyeleting-machine, in combination, cooperating series of sets one of which series is movable, a punching device movable into and out of the path of the movable series and actuated thereby to perform the punching operation, and a connection with a moving part of the machine for moving the punching device.

16. In an eyeleting-machine, in combination, cooperating series of sets one of which series is movable, a punching device movable into and out of the path of the movable series and actuated by the latter, and a connection with a moving part of the machine for moving the punching device.

17. In an eyeleting-machine, in combination, cooperating series of sets, and a punching device operated by one of such series.

18. In an eyeleting-machine, in combination, cooperating series of sets, and an independent punching device operated by one of such series.

19. In an eyeleting-machine, in combination, cooperating series of sets one of which series is movable, a series of punches normally in line with the sets and a relatively movable punch-block cooperating with the punches and actuated by the movable series of sets, and means for separating and then moving the punches and punch-block out of the path of the movable sets.

20. In an eyeleting-machine, in combination, a pair of cooperating series of sets one of which series is movable, a carrier, punches fixed to the carrier, a punch-block sliding on the carrier and cooperating with the punches



and actuated by the movable sets, and means for separating the punches and the punch-block and then retracting the carrier.

21. In an eyeleting-machine, in combination a pair of cooperating series of sets one of which series is movable, a carrier, punches fixed to the carrier, a punch-block sliding on the carrier and cooperating with the punches and actuated by the movable sets, means for separating the punches and punch-block, and a connection with a moving part of the machine for moving the carrier.

22. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating series of sets one of which is movable, a carrier, punches fixed to the carrier, a punch-block slidable on the carrier and with the punches normally in the path of the movable series of sets, and a link connection between the carrier and the raceway.

23. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating series of sets one of which is movable, a carrier, punches fixed to the carrier, a spring-controlled punch-block slidable on the carrier and with the punches normally in the path of the movable series of sets, and a link connection between the carrier and the raceway.

24. In combination with an eyeleting-machine having a movable raceway and a pair of cooperating series of sets one of which series is movable, a sliding carrier, connection between the carrier and the raceway, punches, and a spring-controlled punch-block mounted on the carrier and movable relatively to the punches and normally in the path of the movable series of sets, means for advancing the movable sets to perform the punching operation, and means for then partially retracting the movable sets to permit of the withdrawal of the punches and punch-block.

25. In combination with an eyeleting-machine having a stationary and a movable series of sets, a slidable carrier, punches fixed to the carrier, a vertically-movable punch-block cooperating with the punches and normally in the path of the movable series of sets, means for separating the punches and punch-block after actuation, and means for retracting the carrier after such separation.

26. In combination with an eyeleting-machine having a stationary and a movable series of sets, a slidable carrier, punches fixed to the carrier, a vertically-movable spring-controlled punch-block cooperating with the punches and normally in the path of the movable series of sets, means for separating the punches and punch-block, and means for retracting the carrier after such separation.

27. In combination with an eyeleting-machine having a stationary and a movable series of sets, a block in which the stationary sets are secured and having apertures therein, a carrier at the rear of the stationary sets and

having vertical grooves, rods fixed to the carrier and sliding in the apertures, punches fixed to the carrier and normally resting against the ends of the stationary sets, a punch-block having spring-controlled bars slidably mounted in the grooves and normally in the path of the movable sets, a cam for advancing the movable sets to actuate the punch-block, and connection with a movable part of the machine for retracting the carrier after such actuation.

28. In combination with an eyeleting-machine having a movable raceway and a stationary and a movable series of sets, a block in which the stationary sets are secured and having apertures therein, a carrier at the rear of the stationary sets and having vertical grooves, rods fixed to the carrier and sliding in the apertures, punches fixed to the carrier and normally resting against the ends of the stationary sets, a punch-block normally in the path of the movable sets and having spring-controlled bars slidably mounted in the grooves, a cam for advancing the movable sets to engage the punch-block, means for then partially retracting the said sets, and a connection between the raceway and the carrier for retracting the latter upon the partial retraction of the said sets, and means for again advancing the movable sets to perform the setting operation.

29. In combination with an eyeleting-machine having a stationary and a movable series of sets, a sliding carrier, punches fixed to the carrier and normally resting against the ends of the stationary sets, a punch-block normally in the path of the movable sets and provided with bars slidably mounted on the carrier, a retaining-plate fixed to the carrier and provided with vertical slots and a lateral flange having apertures, pins fixed to the bars and projecting through the slots, a cross-head engaging the pins, and rods fixed to the cross-head and extending into the apertures, expansion-springs surrounding the rods and reacting against the flange and the cross-head, a cam for advancing the movable sets to engage the punch-block, means for then partially retracting the sets after such advance, and a connection between the carrier and a movable part of the machine for retracting the carrier.

30. In combination with an eyeleting-machine having a stationary and a movable set, a punch normally resting against the end of the stationary set and provided with a recess on its upper face to receive the tip of said set, a coacting punch-block normally in the path of the movable set, and means for separating and then retracting the punch and block.

31. In combination with an eyeleting-machine having a stationary and a movable set provided with a spindle, a punch normally resting against the end of the stationary set, a coacting punch-block normally in the path of the movable set and having the face there-



of which is engaged by the spindle inclined to the upper front edge of the same, means for separating the punch-block and punches, and connection for retracting the punch and anvil after such separation.

32. In combination with an eyeleting-machine having a stationary and a movable series of sets provided with eyelet-spindles, punches, one of which normally rests against the end of each of the stationary sets and is provided with a recess on its upper face to receive the tip of such set, a punch-block normally in the path of the movable sets and having the face thereof which is engaged by the spindles inclined to the upper front edge of the same, a cam for advancing the movable sets to engage the punch-block, means for then partially retracting the movable sets, and a connection with a moving part of the machine for retracting the punches and punch-block after the retraction of the movable sets, the said eccentric then moving the movable sets into engagement with the stationary sets to perform the setting operation.

33. In combination with an eyeleting-machine having a stationary and a movable series of sets provided with eyelet-spindles, a sliding carrier, punches mounted on the carrier and one of which normally rests against the end of each stationary set and is provided with a recess to receive the tip of such set, a relatively movable punch-block normally in the path of the movable set and actuated by the latter and having the portion of the face thereof which is engaged by the spindle inclined to the upper front edge of the same, means for separating the punch and block after actuation, and a connection with a movable part of the machine for retracting the carrier after such separation.

34. In combination with an eyeleting-machine having a stationary and a movable series of sets, punching mechanism movable into and out of the path of the movable sets, and a clamp associated with the sets for holding the work upon and during retraction of the punching mechanism.

35. In combination with an eyeleting-machine having a stationary and a movable series of sets, a punching device movable into and out of the path of the movable sets, cooperating clamp members to hold the work upon and during the retraction of the punching device, one of which is associated with each of said series.

36. In combination with an eyeleting-machine having a stationary and a movable series of sets, a punching device movable into and out of the path of the movable sets, of a pair of spring-pressed coacting clamp members associated with the sets.

37. In an eyeleting-machine, in combination, a movable and a stationary series of sets, a punching device movable into and out of the path of the movable sets, a block in which

each series is secured, a spring-pressed clamp member carried by the block of the stationary sets, and a spring-pressed coacting clamp member carried by the block of the movable series.

38. In an eyeleting-machine, in combination, a movable and a stationary series of sets, a block in which each series is secured, a member having clamping-fingers and carried by the block of the stationary sets and provided with vertical slots, screws passing through said slots and into the said block, a clamp member comprising a plate having apertures through which the lower sets pass and fingers coacting with the fingers of the upper member, and springs surrounding the movable sets and reacting against the said plate and the carrier of the latter sets.

39. In an eyeleting-machine having a series of stationary and movable sets, a series of punches normally located under the stationary sets and a movable punch-block coacting therewith, an eccentric for elevating the movable sets to actuate the punch-block, means to then partially retract the movable sets, a connection with a movable part of the machine for retracting the punches and block after the retraction of the sets, and a clamp for holding the work against movement upon the retraction of the punches and block.

40. In an eyeleting-machine, in combination, a movable and a stationary set, punching mechanism normally in the path of and actuated by the movable set, connection with a movable part of the machine for retracting the punching mechanism, and a clamp for holding the work against movement upon the retraction of the said mechanism.

41. In an eyeleting-machine, in combination, a movable and a stationary series of sets, punching mechanism normally in the path of and actuated by the movable sets, connection with a movable part of the machine for retracting the punching mechanism, and a spring-pressed clamp member associated with each series of sets for holding the work against movement upon the retraction of said mechanism.

42. In combination with an eyeleting-machine having a movable and a stationary series of sets, a block in which each series of sets is mounted, a carrier slidably mounted on the block of the stationary series of sets, punches fixed to the carrier, a vertically-slidable punch-block mounted on the carrier and normally in the path of and actuated by the lower sets, a member provided with fingers extending between the stationary sets and having a plate having vertical slots, screws passing through the slots into the block of the stationary sets, springs interposed between the fingers and the said block, a second member carried by the movable sets and having fingers coacting with the fingers of the other member, springs interposed between the



second member and the block of the movable sets, and means for retracting the punches and block.

43. In an eyeleting-machine in combination, a series of stationary sets, cooperating movable sets, means for throwing one of the sets out of action, a series of punches normally in line with the sets, a movable punch-block normally in the path of and actuated by the movable sets and having a section inoperative when its cooperating set is thrown out of action, and means for retracting the punches and anvil.

44. In an eyeleting-machine, in combination, a series of stationary sets, cooperating movable sets, means for throwing one of the sets out of action, a series of punches normally in line with the sets, a punch-block normally in the path of the movable sets and having independently-movable sections actuated by the active sets, and connection with a moving part of the machine for retracting the punches and block.

45. In an eyeleting-machine, in combination, a series of stationary sets, cooperating movable sets, means for throwing certain of the sets out of action, a series of punches normally in line with the sets, a punch-block in the path of the movable sets and having independently-movable sections engaged and moved by the active sets, and a connection with a movable part of the machine for retracting the punches and punch-block.

46. In an eyeleting-machine, in combination, a series of stationary sets, cooperating movable sets the end ones of which are capable of being thrown out of action, a sliding carrier, punches fixed to the carrier and normally in line with the sets, a vertically-movable punch-block mounted on the carrier and having independently-movable sections actuated by the active sets, and connection with a moving part of the machine for retracting the punches and punch-block.

47. In an eyeleting-machine, in combination, a series of stationary sets, cooperating movable sets the end ones of which are capable of being thrown out of action, a sliding carrier, punches fixed to the carrier and normally in line with the sets, a punch-block comprising three sections normally in the path of the movable sets and the end sections of which are engaged by the end pair of movable sets, slides fixed to the punch-block sections and provided with studs, and sliding on the carrier, a retaining-plate fixed to the carrier and provided with vertical slots through which the studs project, a cross-head having apertures receiving the ends of the studs of the inner punch-block slides and provided with shoulders at its ends the under faces of which are engaged by the studs of the end punch-block sections, a spring holding the bar normally depressed, and a connection with a

moving part of the machine for retracting the carrier.

48. In an eyeleting-machine, in combination, a stationary and a cooperating movable set, a punch normally in the line of the sets, a movable punch-block associated with the punch, an eccentric for moving the movable set to force the same against the punch, means to then retract the movable set, and a connection with a movable part of the machine for withdrawing the punch and block out of the path of the movable set upon the retraction of the said set.

49. In an eyeleting-machine, in combination, a stationary series of sets, a sliding block, a cooperating series of sets mounted on the block, an eccentric comprising a disk provided with a diametrical way, a hub-section having an arm located in the way, an eccentric-strap provided with a recess on its inner face, a lever pivoted to the block and the eccentric-strap, a carrier, punches fixed to the carrier and normally in the line of the sets, a spring-pressed punch-block associated with the punches and normally in the path of the lower sets, and a connection with a movable part of the machine for retracting the carrier.

50. In an eyeleting-machine, in combination, a stationary series of sets, a sliding block, a cooperating series of sets mounted on the block, an eccentric comprising a disk provided with a diametrical way, a hub-section having an arm located in the way, an eccentric-strap provided with a recess on its inner face, a lever pivoted to the block and the eccentric-strap, a carrier, punches fixed to the carrier and normally in the line of the sets, a spring-pressed punch-block associated with the punches and normally in the path of the lower sets, a connection with a movable part of the machine for retracting the carrier, and cooperating clamp members one of which is associated with each series of sets for holding the work upon the retraction of the carrier.

51. In combination with an eyeleting-machine provided with a stationary set and a cooperating movable set, of a punching device movable into and out of the path of the movable set and comprising punch-block and punch members, one of which members is movable against the other upon the advance of the movable set.

52. In combination with an eyeleting-machine provided with a pair of cooperating sets, one of which sets is movable, of a punching device movable into and out of the path of the movable set and comprising punch-block and punch members, one of which members is moved against the other upon the advance of the movable set.

53. In an eyeleting-machine, in combination, a pair of cooperating sets, one of which is movable, a carrier, a punching device com-



prising a punch and punch-block movable into and out of the path of the movable set and mounted on the carrier, and means for advancing and retracting the carrier.

5 54. In combination with an eyeleting-machine provided with a stationary set, a carrier provided with a cooperating set, a punching device movable into and out of the path of the latter set, means to advance the carrier to  
10 actuate the punching device, and means to partially retract the carrier to permit of the withdrawal of the punching device and to enable the carrier to move the set carried thereby into engagement with the stationary set.

15 55. In combination with an eyeleting-machine provided with series of cooperating sets, one of which series is movable, of a punching device movable into and out of the path of the movable series and actuated upon the advance  
20 of the movable series.

56. In combination with an eyeleting-machine provided with series of cooperating sets, one of which series is movable, of a punching device movable into and out of the path of the  
25 movable series of sets and actuated by and while in the path of the said movable series of sets.

57. In combination with an eyeleting-machine provided with series of cooperating sets,  
30 one of which series is movable, of a punching device movable into and out of the path of the movable series of sets, means for advancing the movable series of sets while the punching device is in the path of the latter to perform  
35 the punching operation, and means to partially retract the said series to permit of the withdrawal of the punching device.

58. In combination with an eyeleting-machine provided with a series of stationary sets,  
40 a carrier provided with cooperating sets, a punching device movable into and out of the path of the latter sets, means for advancing the carrier to actuate the punching device, and means to partially retract the carrier to permit of the withdrawal of the punching device.  
45

59. In combination with an eyeleting-machine provided with a series of stationary sets, a carrier provided with cooperating sets, a punching device movable into and out of the  
50 path of the movable sets, means to advance the carrier for actuating the punching device, means to retract the carrier to permit of the withdrawal of the punching device to enable the advancing means to finally move the movable sets upon the stationary sets.  
55

60. In combination with an eyeleting-machine provided with a pair of cooperating sets, one of which sets is movable, a punching device movable into and out of the path of the  
60 movable set, and means to hold the work upon and during the withdrawal of the punching device.

61. In combination with an eyeleting-machine provided with a pair of cooperating sets, one of which sets is movable, a punching device movable into and out of the path of the  
65 movable set, and a clamp to hold the work upon and during the withdrawal of the punching device.

62. In combination with an eyeleting-machine provided with a pair of cooperating sets, one of which sets is movable, of a punching device movable into and out of the path of the  
70 movable set and comprising a punch-block and punch members and one of which members is moved against the other by the advance of the movable set, and a clamp for holding the work upon the withdrawal of the punching device.  
75

63. In combination with an eyeleting-machine provided with series of cooperating sets, one of which series is movable, of a punching device movable into and out of the path of the  
80 movable series of sets, means for advancing the movable series of sets to actuate the punching device, means to partially retract the said series to permit of the withdrawal of the punching device, and a pair of spring-pressed clamp members to hold the work upon the  
85 partial separation of the sets and the withdrawal of the punching device.  
90

64. In combination with an eyeleting-machine provided with a stationary set and a cooperating movable set, a punching device movable into and out of the path of the  
95 movable set, means to advance the set for actuating the punching device, means to retract the movable set to permit of the withdrawal of the punching device, and means for withdrawing the punching device to enable the movable set to be moved into engagement with the stationary set.  
100

65. In combination with an eyeleting-machine provided with a series of stationary sets and a cooperating series of movable sets, a  
105 punching device movable into and out of the path of the movable sets, mechanism to advance the movable sets for actuating the punching device, means to retract the movable sets to permit of the withdrawal of the punching device, and a connection with a movable  
110 part of the machine to withdraw the punching device to enable the movable sets to be moved into engagement with the stationary sets.  
115

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH W. BARNA.  
VALENTINE HOFFMAN.

Witnesses:

ARTHUR B. SEIBOLD,  
ROBERT K. GUSTAFSON.