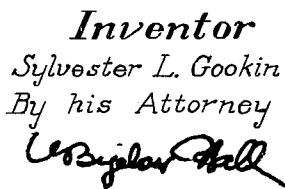


S. L. GOOKIN

ELEMENT APPLYING MACHINES

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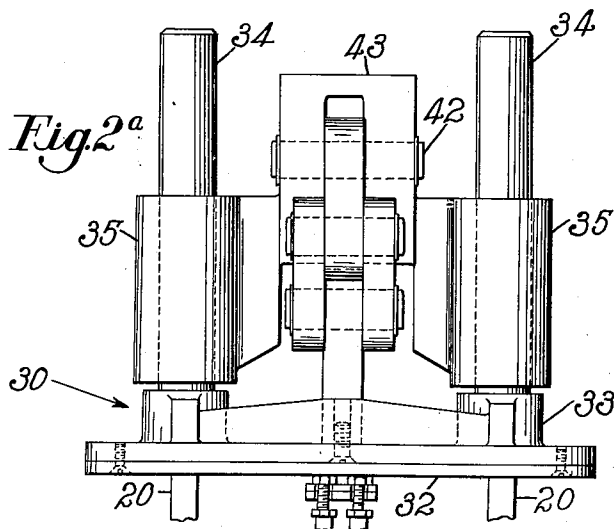
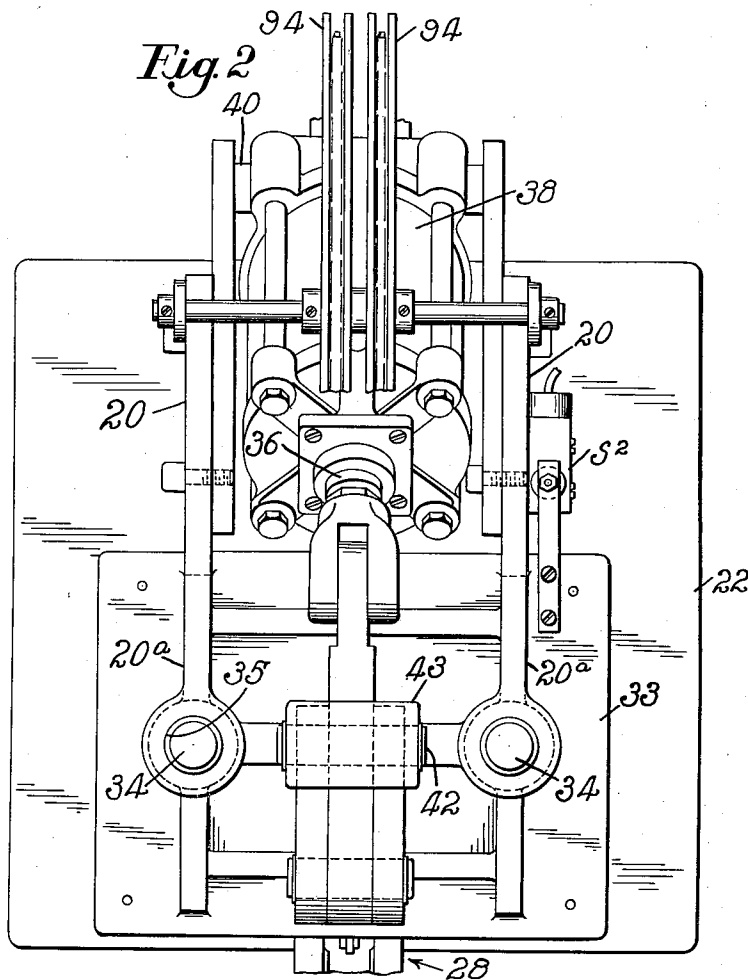
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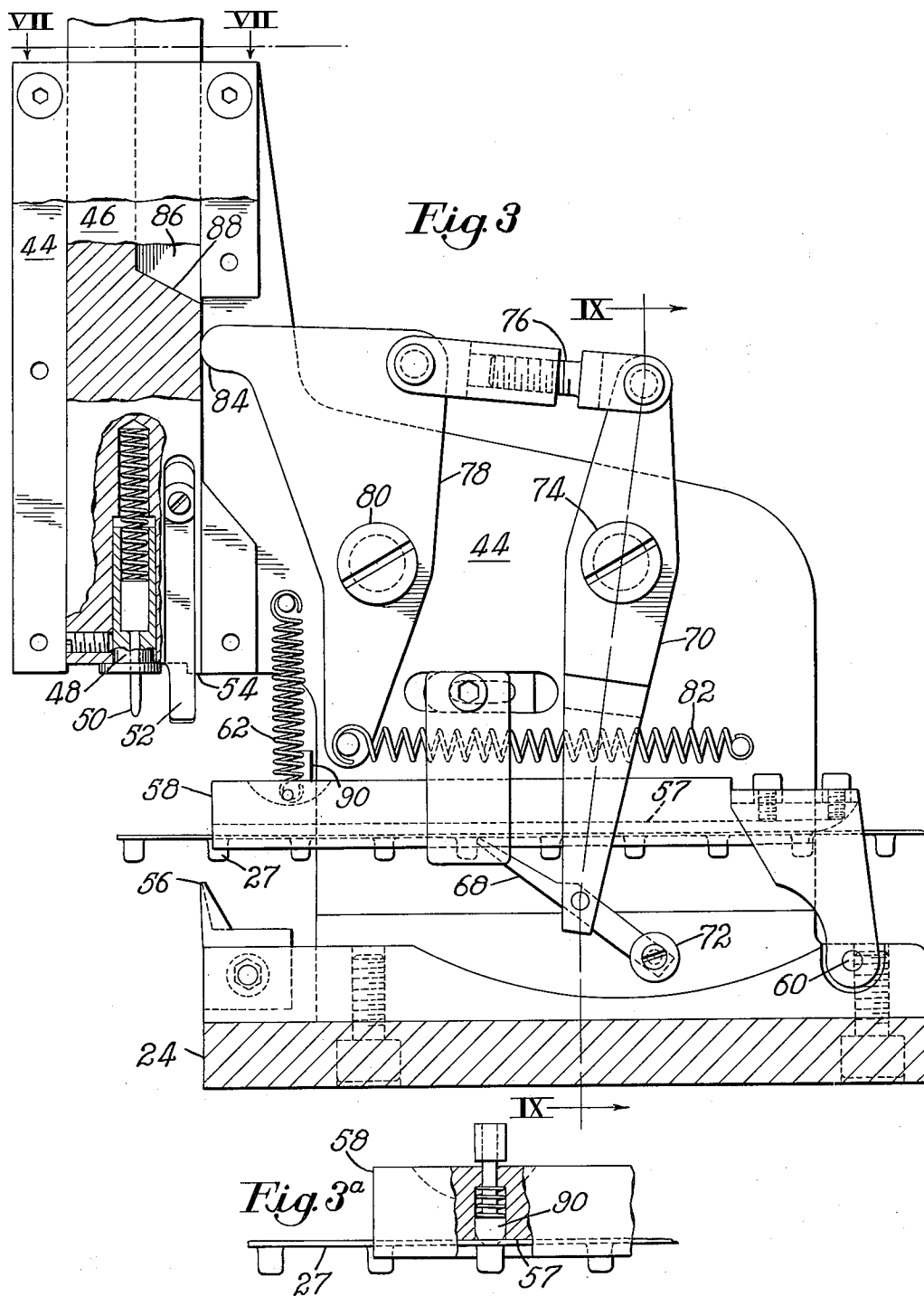
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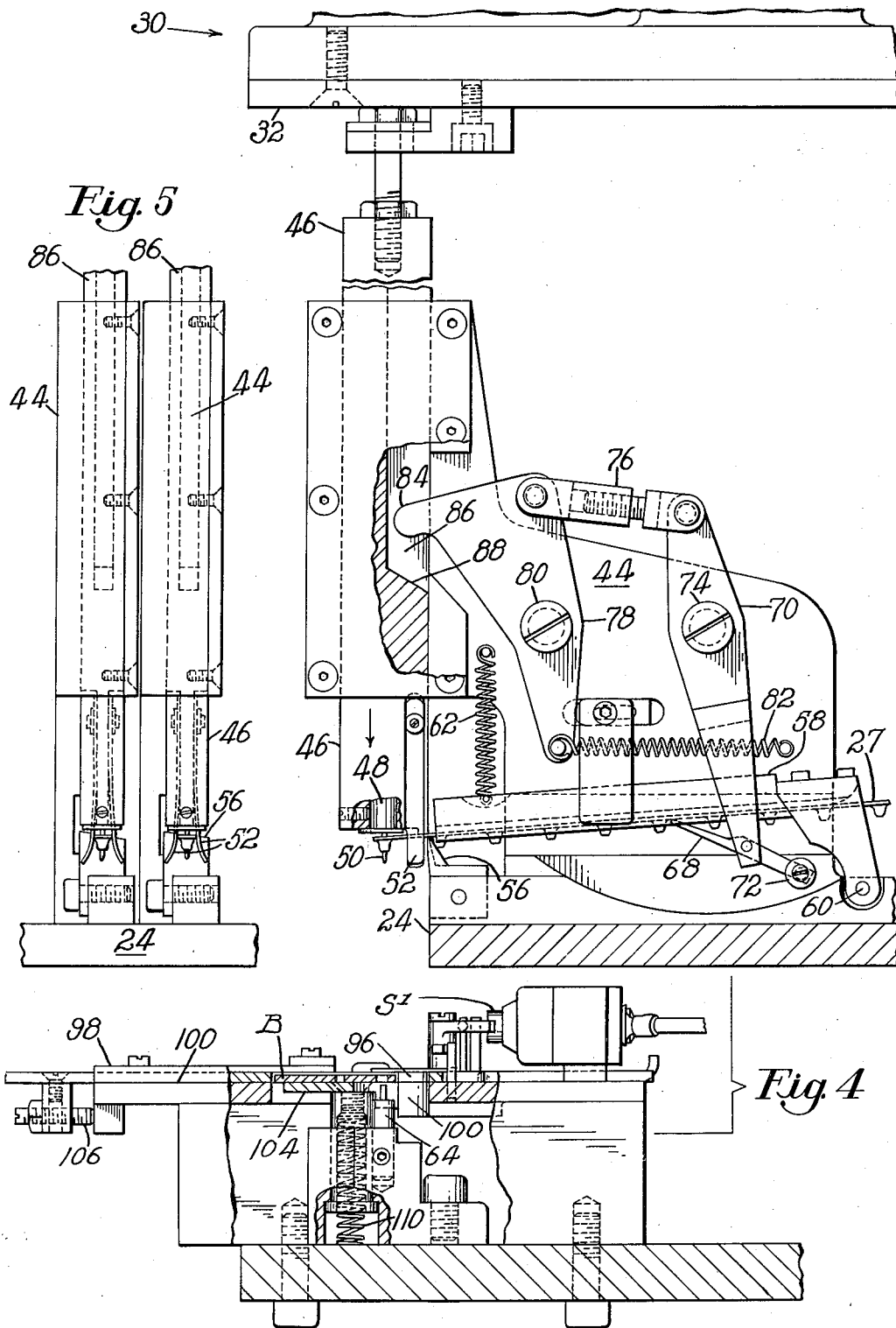
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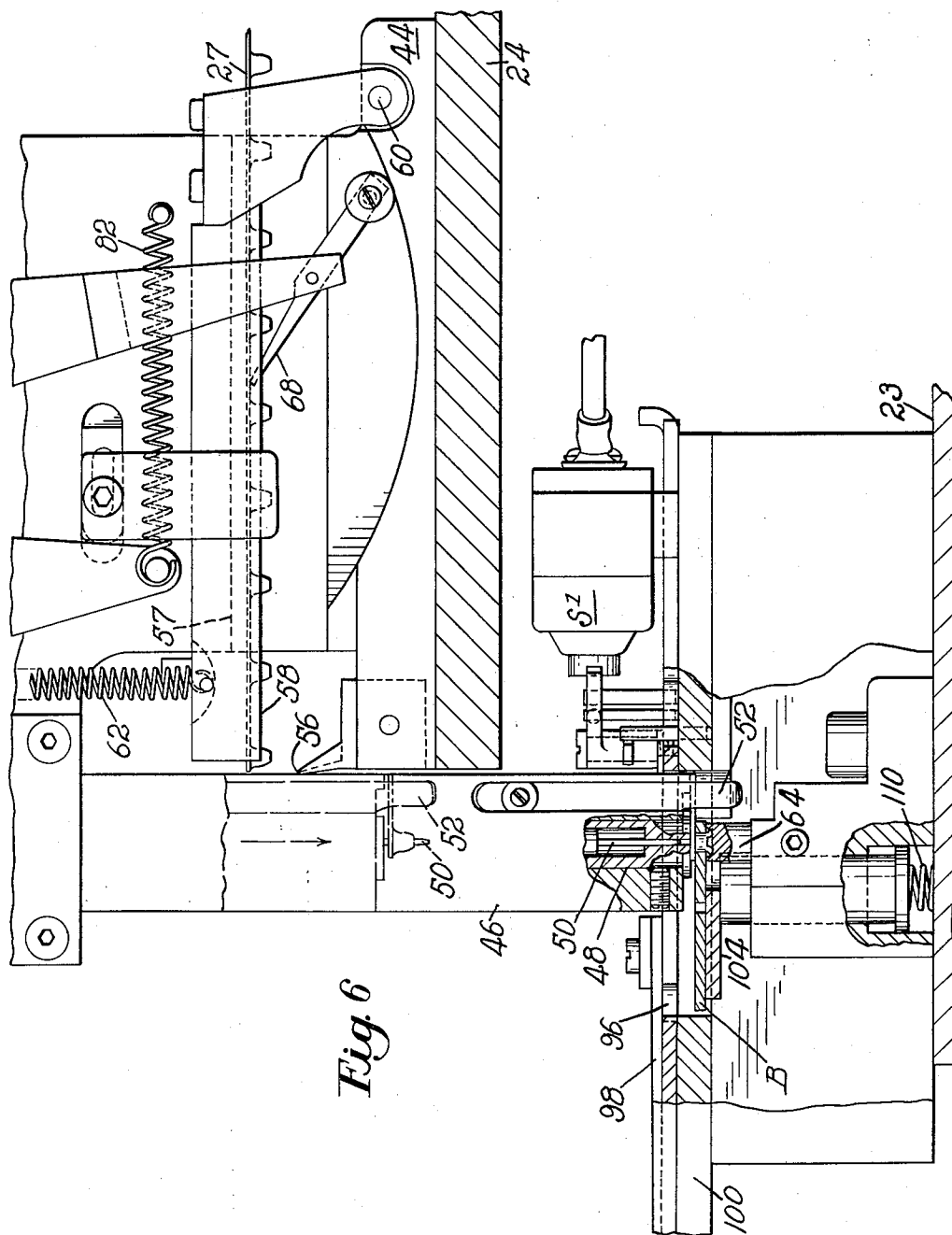
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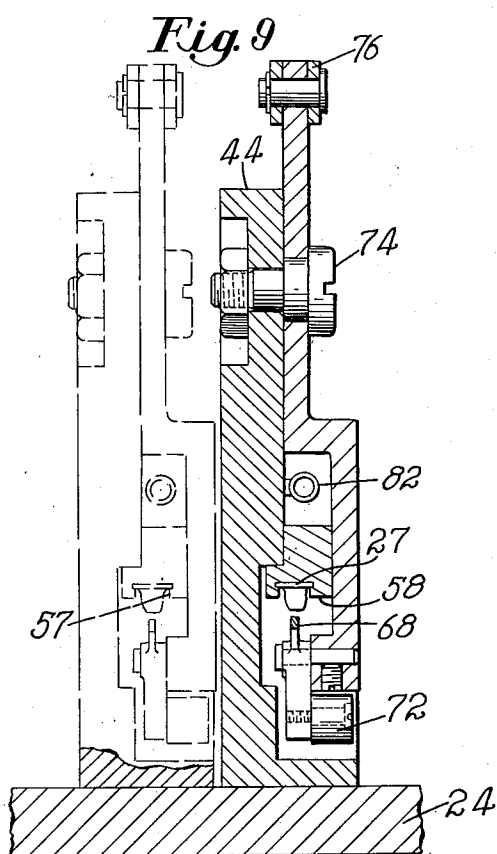
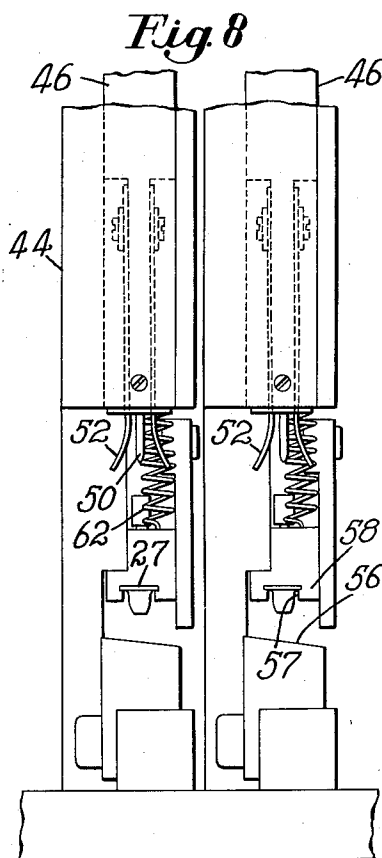
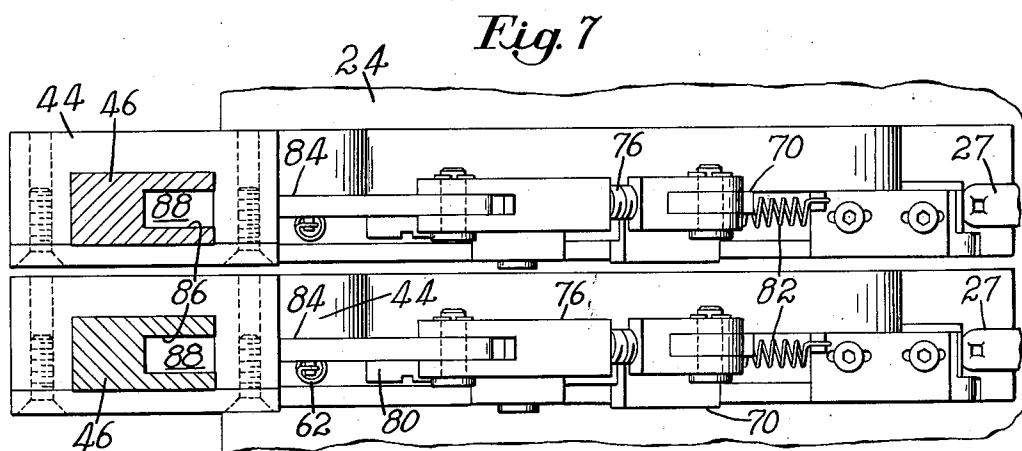
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Fig. 10

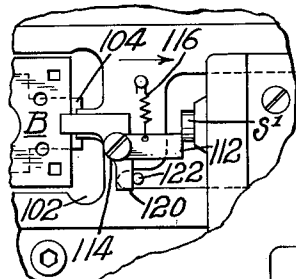
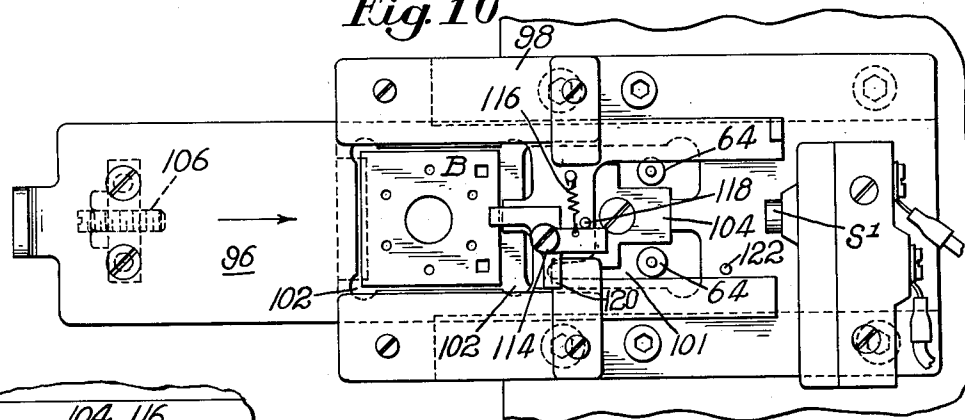


Fig. 13

Fig. 11

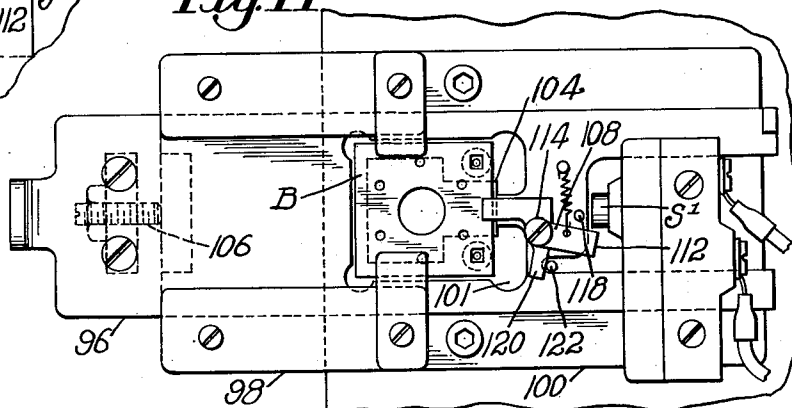
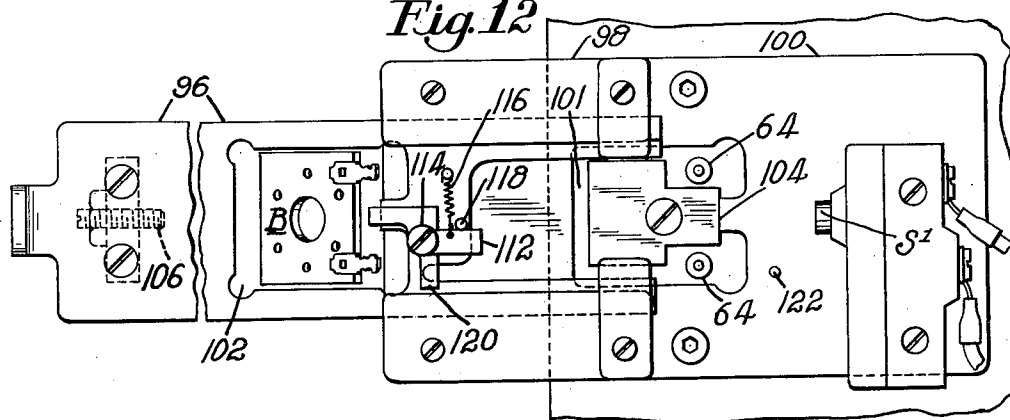


Fig. 12



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ELEMENT APPLYING MACHINES

Sylvester L. Gookin, Cohasset, Mass., assignor to United Shoe Machinery Corporation, Flemington, N.J., a corporation of New Jersey

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3 Claims. (Cl. 218—15)

This invention relates to machines for applying or securing elements to a work piece. More specifically it is concerned with the automatic application of said elements when each element, although fastened singly to the work piece, is fed to the machine in the form of a continuous strip in which the elements are integrally united, in either end to end or side by side relation.

Fields of industry where such machines are extensively employed include those of electrical wire terminal attaching and of eyelet fastener inserting because the terminal or eyelet blanks may be produced conveniently and cheaply in strip form.

An illustration of such an eyelet strip is disclosed in United States Patent No. 1,951,168, issued March 13, 1934 in the name of Benjamin H. Roth.

There are many machines commercially available for use in the electronics industries, which machines are employed to attach either an electrical terminal element to the end of a conductor wire, or to secure an eyelet-like element to a flat work piece that has been pre-punched to provide holes therethrough for the reception of the barrel portion of the eyelet-like element. However, the employment of strip stock feed in conjunction with said machines has heretofore been limited to assembling operations wherein the bottom side of the continuous strip, as it is fed through the machine, is substantially flat and free from any depending portions that would preclude feeding the forward end of the strip across the top of the fixed shearing edge of the machine. That is to say; the wire gripping ferrule portion of the connector elements, and the barrel portions of the eyelet-like elements, project a substantial distance beyond the general plane of the strip. Since the strip must be fed along the guideway through the machine then between a pair of shear blocks adjacent the element attaching position, so that the endmost element in the strip may be sheared off just prior to or simultaneous with the element attaching operation, the smooth side of the strip must be disposed against the strip supporting or fixed shear block. Also, since visual observance by the machine operator requires that the space adjacently above the work piece and above the endmost element be unencumbered by machine elements in order that the positioning of the work may be corrected, if necessary, the fixed shear block has customarily been located beneath and to the rear of the endmost element of the strip, while the movable shearing edge is retracted well above said element during the strip feeding and the idle position of the machine cycle. It is to be noted that, due to the foregoing circumstances, all theretofore commercial machines and prior art disclosures have been restricted to a strip feed wherein the projecting barrel or tongue portions of the strip were upstanding and therefore able to be fed forward in the machine without interference with the lower or fixed shearing block.

While the above restriction poses no particular disadvantage in attaching terminals to the ends of conductor wires, it is a definite disadvantage where the eyelet-like elements must be inserted into work pieces because, with the barrel portions extending heightwise above the general plane of the strip, the barrel must enter the work piece from beneath, hence the operator is unable to observe even the element before, during or after the attaching operation.

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Accordingly, one of the objects of this invention is to provide a machine for attaching elements, from strips, wherein the protruding barrel portions of the strip can be fed to the operating station with the barrel end downmost, thus enabling the elements to be applied to the upper rather than to the lower surface of the work piece.

Another object of the invention is to provide a basic machine structure that may be quickly and cheaply adapted, by minor adjustments or additions, to feed a plurality of element strips so that a plurality of elements may be attached simultaneously in gang fashion at different locations on a work piece.

Still another object is to provide means for determining the different attachment locations in accordance with any given work pattern or spacing requirement.

A further object is to provide positioning means for presenting the work piece, to be operated upon, in accordance with the chosen pattern in which the elements are to be simultaneously attached.

Another object is to provide a basic machine that, with a minimum of alteration and expense, may be adapted to operate upon varying sizes and shapes of elements in strip form, while at the same time providing all of the above-mentioned advantages and objectives.

In accord with the foregoing objects a feature of this invention is that the element applying machine is so constructed that the element receiving work pieces are guided to an operating position whereat each element receiving location is accurately disposed immediately above a fixed lower anvil or set die assembly and in axial alinement with said die assembly as well as with the movable upper set die assembly which latter assembly, on its downward setting stroke, engages with the endmost element of the eyelet strip to guide the element downward toward the element receiving location on the work piece.

A further novel feature is that the forward end of the strip is fed to a position beneath the upper die assembly while said assembly is retracted upward and while a vertically pivotal strip feed guide or fairlead is elevated at its forward end to lift the strip material, prior to the feed stroke, to an elevation above the fixed shear block so that any depending portion of the strip elements will be clear of said block during the subsequent forward increment of feed.

A further feature is that the endmost element in the strip is engaged by the upper set die on its downward stroke and also by the upper shearing member both of which contacting engagement causes the forward end of the pivotal strip feed guide to be depressed until the endmost element contacts the lower or fixed shear member whereupon the element that has been engaged by the upper set die is severed from the strip and then carried downward and into the work piece.

These and other features of the invention will now be described in detail in connection with the drawings and will be pointed out in the appended claims.

In the drawings,

FIG. 1 is a right side elevation of a machine in which novel features of the invention are embodied; the full line showing of the reciprocable presser mechanism illustrating the idle position of the machine;

FIG. 2 is a top plan view of the machine;

FIG. 2a is a front elevation showing a detail of the reciprocable presser mechanism;

FIG. 3 is a right side elevation of the machine, in the at rest position and partially broken away, showing details of the strip feed mechanism and of the upper set tool;

FIG. 3a is a side elevation, partially broken away to show a detail of the strip feed mechanism;

FIG. 4 is a view similar to that of FIG. 3 but showing the machine parts at an intermediate phase just prior to

the severance of the endmost element from the remainder of the strip;

FIG. 5 is a front elevational showing of the parts in the same position as those of FIG. 4;

FIG. 6 is a right side elevation showing the machine parts at the conclusion of the element inserting and attaching stroke;

FIG. 7 is a top plan view, partly broken away, showing details as viewed along the line VII—VII of FIG. 3 looking in the direction of the arrows;

FIG. 8 is a front elevation showing a detail of certain parts in the positions illustrated in FIG. 3;

FIG. 9 is a sectional view of parts taken along the line IX—IX of FIG. 3 viewed in the direction of the arrows;

FIG. 10 is a top plan view of the work piece positioning and guiding slide, illustrating the position of the parts at the work loading station;

FIG. 11 is a view similar to that of FIG. 10 but illustrating the parts at the element attaching or operating station;

FIG. 12 illustrates the same parts as FIGS. 10 and 11 but at the finished work ejection position; and

FIG. 13 illustrates a detail of certain parts just prior to the position illustrated in FIG. 11.

Referring to FIGS. 1 and 2, the rigid frame members of the machine are comprised of a pair of parallel and spaced apart vertical side plates 20, 20, each plate being identical and provided with a forwardly extending upper portion 20A and a similarly extending lower portion 20B. These vertical side plates are secured in rigid relationship to a series of superimposed horizontal plates 22, 23 and 24. The plate 24 acts as a fixed support for one or more eyelet forming and inserting mechanisms, each designated generally as 26, for feeding a continuous strip, 27, of the eyelet-like formations and for inserting a severed end portion thereof into a mounting wafer or work piece that is operatively positioned beneath the respective mechanisms 26 by a work presenting transfer slide mechanism, designated generally as 28, supported upon the horizontal plate 23.

The presser mechanism, by which the forming and inserting mechanism 26 is directly actuated, is designated generally as 30. This mechanism is comprised of a horizontal pressure plate 32 affixed beneath the enlarged foot of a reciprocable ram 33 carrying a pair of guide rods 34 each suitably journaled for vertical sliding movement, in guideways 35 formed on the forwardly extending upper frame portions 20A. The presser mechanism 30 is power operated through a pivotal toggle linkage coupling the ram 33 with a reciprocable piston rod 36 of a double acting pneumatically operated cylinder 38 which in turn is pivotally attached, at its lower end, to the machine frame by a pin 40. The central, or fixed pivot pin 42 of the toggle linkage is journaled at both ends in a portion 43 of the fixed frame (FIG. 2a), so that, as the piston rod 36 is extended from the cylinder 38 by pneumatic pressure, the toggle linkage forceably depresses the ram and pressure plate 32 toward their lowermost position, illustrated by the broken line showing in FIG. 1. The extent of downward movement of the presser mechanism 30 is adjustably limited by a microswitch S² that in part electrically controls a shiftable air valve for reversing the direction of movement of the piston rod 36, as will be described more fully hereinafter.

The eyelet forming and inserting mechanisms 26 are each constructed as individual units that may be oriented in various spaced apart relation with each other to provide a plurality of simultaneous eyelet forming and setting operations in conformity with the eyelet inserting pattern that is required for any given work piece. In the illustrated embodiment of this invention the machine is provided with only a pair of forming and inserting mechanisms arranged in adjacent parallelism with one another for the simultaneous setting of a pair of eyelet-like elements; however, the machine is basically designed

to accommodate a much larger number of such mechanisms that may be located in any suitable pattern upon the horizontal supporting plate 24 to which each mechanism, when positioned in accordance with the work piece requirements, is secured as by screws. The construction and operation of each of the eyelet forming and inserting mechanisms may best be described with reference to FIGS. 3 and 4 wherein the fixed portion of each mechanism is an upright member 44 providing a frame for the attachment of the various operating units that are about to be described. An actuating plunger 46 is supported for reciprocative heightwise movement within a guideway provided with vertical walls formed in the member 44. The plunger 46 is operatively affixed at its upper end to the pressure plate 32 by an adjustable bolt connection so as to be concomitantly movable with the hereinbefore described presser mechanism 30. The lower end of the plunger 46 has recessed therein an upper set cap tool assembly 48 having a protruding but inwardly yieldable concentric spindle pin 50 for entering the barrel bore of an eyelet unit disposed beneath and in axial alignment with the pin 50, whereby the eyelet unit becomes impaled and supported by the pin during the downward operating stroke of the plunger 46. Also protruding beneath the lower end of the plunger 46 are a pair of spring gripping fingers 52 each adapted, when lowered upon an eyelet strip 27, to engage resiliently both side edges at a region rearwardly of the spindle 50 but just forwardly of the rear wall of the plunger 46. This rear wall at its lower edge 54 constitutes a shearing member that operates, in conjunction with a stationary lower shear block 56, upon the downward stroke of the plunger 46 to sever an eyelet-like unit from the end of the strip material 27. The strip material is progressively fed in step-by-step manner through a T-slot passageway 57 in a fairlead block 58 mounted pivotally by a pin 60 set in the frame member 44. The strip is inserted in the block 58 with the barrel portions of the strip downwardly depending and protruding a substantial amount beyond the bottom of the block 58. The lead block 58 is normally biased upwardly at its forward end by a spring 62 tending to maintain the strip material horizontal as it is fed toward the path of the plunger 46, thereby to present the endmost eyelet bore in alignment with the spindle pin 50 when the plunger is in its elevated position, FIG. 3. However, upon the descent of the plunger (FIG. 4) and after the spindle 50 has penetrated the eyelet barrel and the fingers 52 have engaged with the opposite margins of the strip material, the top of the flat strip portion extending between the endmost eyelet and the forward end of the block 58 is forceably depressed by abutment with the plunger shearing edge 54, causing the block 58 and the strip to move downward against the force of spring 62 until the bottom of the strip strikes the lower shear block 56; whereupon an eyelet-like unit is severed from the end of the strip (FIG. 6). It is obvious that the path of feed for the strip 27 must be disposed at an elevation substantially above the height of the fixed shear block 56, for otherwise the shear block would obstruct the advance of the strip by contacting the eyelet barrel portions that are downwardly depending beneath the flat portion of the strip material. Upon the completion of the severance of the strip, the block 58 under the urgency of spring 62 is again elevated to horizontal position. The severed unit, now securely supported by the spindle 50 and by the resilient fingers 52, is then carried downwardly by the continued descent of the plunger to insert the eyelet barrel through an opening in a work blank B which has been properly oriented to receive the eyelet by the work presenting slide mechanism 28 that will later be described in detail. Upon the completion of the downward stroke of the plunger 46 the eyelet barrel is set into and clenched to the work piece in the well-known manner by the co-operative action of the upper set cap tool assembly 48 and a lower set die

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assembly 64 secured in axial alinement with the assembly 48.

At this phase of the machine operation downward movement of the plunger 46 is automatically terminated (FIG. 1) by the abutting engagement of an adjustable stop screw 66 with the microswitch S^2 which in turn electrically activates mechanism not shown for shifting an air valve thereby to energize the pneumatic cylinder 38 in the reverse direction thus causing the presser member 30 and actuating plunger 46 to commence their upward returning movement. As soon as the spindle 50 and the fingers 52 have reached an elevation above the now horizontal plane of the strip 27 within the fairlead block 58, the strip material is automatically fed forward by an indexing movement that will now be described with particular reference to FIGS. 3 and 4. The periodic advance of the strip material 27, in time relation to the operative cycle of the machine, is directly effected through an intermittently actuated feed finger 68 having its tip adapted to abutting engagement successively behind each of the eyelet barrel formations during the feeding movement. The finger 68 is pivotally carried at the lower end of a two-arm feed lever 70, and the finger 68 is suitably counterweighted at 72 to urge the finger into operative engagement with the strip while yet permitting retrograde movement of the finger independently of the strip movement. The feed lever 70 is medially mounted upon the frame member 44 by a pivot screw 74, and the upper arm of the lever is linked, by an adjustable connecting rod 76, to an upper arm portion of a power driven actuating lever 78 similarly mounted on the frame member 44 by a pivot screw 80. The lower arm of the actuating lever 78 is biased in a counterclockwise direction by a spring 82, so that the forward upper portion 84 of lever 78 is normally spring urged forwardly in a vertical plane coincident with the plane of a vertical slot 86 formed in the rear of the plunger 46. The lower extremity of the slot 86 terminates in a shelving cam surface 88 adapted, upon the upward return movement of the plunger 46, to engage with the lever portion 84 and to cam the actuating lever 78, positively in a clockwise direction and against the force of the spring 82. This camming action, which occurs soon after the plunger is elevated above the level of the forward end of the strip 27, causes the feed lever 70 similarly to shift clockwise thus forcing the feed finger 68 forwardly a sufficient amount to feed the strip and project another eyelet-like unit beyond the forward end of the block 58, as illustrated in FIG. 3. In order to maintain the strip, after the feeding operation, against accidental displacement or retrograde movement, a spring biased detent 90 (FIG. 3a) may be suitably positioned in the block 58 so as resiliently to press its domed lower extremity into any one of the eyelet barrel spaces when located beneath it by the feed mechanism. The forward extent of the feed stroke may be regulated conveniently by lengthening or shortening the adjustable connecting rod 76 so as precisely to terminate the feed stroke when the endmost eyelet barrel is in axial alinement with the spindle pin 50 of the upper tool assembly 48.

Having fed the strip, the upward movement of the plunger 46 is terminated in its at rest position.

While the foregoing machine construction has been described chiefly in regard to the operation of but a single eyelet forming and inserting mechanism, it is to be understood, as above mentioned, that the basic machine structure may be provided with a plurality of such mechanisms, each of which is identical in construction and operation to that just described and, therefore, should need no further disclosure other than to state that, for each additional eyelet forming and inserting mechanism, the machine is equipped with an additional separate reel 94 of strip material, and an additional lower set die assembly 64.

The work pieces or wafers into which the eyelets are to be inserted and set in gang fashion may, if desired, be

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located manually in proper position upon the respective lower set die assemblies 64. However, in the illustrated embodiment of the machine, a work transfer slide mechanism (FIGS. 10 through 12) is adapted to receive a work piece B at an intermediate loading station and to convey the piece to its properly oriented position whereat the openings into which the eyelet barrels are to be clenched are each positioned between and in axial alinement with their respective set tool assemblies 48 and 64. This work presenting mechanism comprises a movable member in the form of a horizontal frame plate 96 slidably mounted, between a pair of parallel guideways 98, upon a supporting base 100. The base 100, over which the frame plate 96 is adapted to slide, has a cut away portion 101 providing an open area in the vicinity above the lower set die assemblies 64 to accommodate the eyelet setting anvil portions of the die assemblies and to permit, as will be hereinafter explained, the work piece B to be lowered through the cut away portion and operatively disposed upon the set die assembly 64 preparatory to the eyelet inserting and clenching operations. The plate 96 likewise has a cut away portion 102 in the form of a frame dimensioned to receive in complementary fashion the slides of a work piece B when deposited therein, as illustrated in FIG. 10. Extending upward from the horizontal plate 23 is a work piece supporting table 104 having its upper surface normally disposed flush with the top of the supporting base 100 (FIG. 4) so that a work piece wafer, when held in the frame plate 96, may be slid from the loading position of FIG. 10 onto the top of the table 104 (FIG. 11) by manual movement of the plate 96 rearwardly in the machine. The degree of rearward movement, for operatively locating the work piece in the machine is limited by an adjustable stop screw 106, and when said movement has been accomplished a pivotal switch tripping lever 108 trips a microswitch S^1 to initiate the operative cycle of the machine. The table 104, as best shown in FIG. 4, is slidably supported in elevated position by a compression spring 110; however, upon the descent of the actuating plunger 46 with its upper set cap 48, contact against the work piece B forces the work piece and table 104 downward so that the work piece and the eyelets that are now inserted therein are pressed down upon the lower set die assemblies 64 (FIG. 6) to effect a clench of the eyelets. Upon the upward return movement of the plunger 46 the piece B with the eyelets set therein is again elevated by the spring 110 to the level of the frame plate 96. The finished piece B (FIG. 12) is then ejected from the machine by sliding it forwardly with the frame plate 96 to a position beyond the extension of the supporting base 100 whereupon the finished piece drops, by force of gravity, from the slide mechanism 28. The frame plate 96 is then returned by the operator rearwardly to the intermediate or work piece loading position of FIG. 10 whereat another work piece is to be deposited in the opening of the frame plate 96.

The microswitch S^1 for activating the operation of the machine by the downward actuation of the presser mechanism 30 is tripped by the abutment therewith of a rearwardly directed arm 112 which comprises one of two arms of the pivotal lever 108. This lever is journaled, by a pivot pin 114, to the frame plate 96 so as to move concomitantly therewith as the plate is manually slid forward operatively to locate the work piece. The lever arm 112 is normally held, biased counterclockwise by a spring 116, in contact with a stop pin 118 (FIG. 10), so that the arm 112, as it is moved rearwardly will strike and trip the switch contact S^1 (FIG. 13). However, further rearward movement of the plate 96 brings another arm 120 of the lever into contact with a fixed stop pin 122 that causes the lever 108 to pivot clockwise (FIG. 11) until contact with the switch is lost. The switch S^1 need be only momentarily activated in order to commence the automatic cycle of the machine, because this switch energizes a solenoid to shift an air valve in the

pneumatic cylinder 38. This having been done the frame plate 96 and work piece B may remain at the operating position (FIG. 11) without further effect upon the switch S¹ which is now open.

The operation of the illustrated form of the invention is as follows: With the presser mechanism 30 and associated machine parts in the at rest position of FIGS. 1 and 3, and with the frame plate 96 of the transfer slide mechanism 28 located at the loading position of FIG. 10, the operator inserts a wafer blank B within the opening 102 wherein the wafer rests upon the base member 100. The plate 96 is then manually pushed rearwardly until the arm 112 of the lever 108 trips the microswitch S¹ and passes therebeyond until adjustment screw 106 contacts its stop block. The microswitch upon being actuated in turn energizes a solenoid (not shown) to shift the pneumatic piston valve to admit air pressure into the lower end of the pneumatic cylinder 38. The resultant downward movement of the ram 33 lowers the actuating plunger 46 until its rearwardly open slot 86 is at a level to admit the entrance therinto of the upper lever portion 84 (FIG. 4), whereupon under the urgency of the spring 82, both levers 78 and 70 move counterclockwise to shift the feed finger rearwardly of the strip so as to position the tip of the finger 68 at the rear of an eyelet barrel element, as shown in FIG. 6, preparatory to the next strip feeding operation. The lowering movement of the actuating plunger 46 causes the gripping fingers 52 to engage the adjacent sides of the strip and the pin 50 to enter the bore of the forwardmost eyelet formation (FIGS. 4 and 5). The downward movement of the plunger 46 also depresses the forward end of both the strip 27 and the fair-lead block 58 until the projecting end portion of the strip, contiguous with the shearing edge 54 at the lower rear of the plunger 46, is forced against the fixed shear block 56, whereupon an endmost element of the strip is severed. At the time of the severance said element is impaled through its barrel opening by the spindle pin 50, and, additionally, is frictionally clamped between the opposed pair of gripping fingers 52. At this stage of the machine cycle the element to be inserted in the work piece is firmly supported beneath the actuating plunger 46, as illustrated in the broken line showing of FIG. 6. Further downward movement of the plunger 46 inserts the barrel portion of the element through the preformed opening in the wafer-like work piece B, and the lower end of the barrel of the element B is clenched against the lower set die assembly 64. At this phase of the machine operation the lower limiting stop screw 66 contacts the microswitch S² which in turn energizes a solenoid (not shown) for shifting the pneumatic valve in the cylinder 38 so as to redirect the flow of pneumatic pressure to the top of the piston, thereby causing the retraction of the piston rod 36 to elevate the presser mechanism 30, and return the machine to its at rest position wherein it will remain until the microswitch S¹ has again been activated by the manual positioning of the next work piece to be operated upon. During the upward retraction of the actuating plunger 46, and when said plunger has arrived at a position substantially above the horizontal plane of the strip 27 which at the time is in elevated position, the portion 84, of the actuating lever 78, that is extending into the slot 86 is cammed upward and out of said slot by the abutment of the cam surface 88 against the forward end of the lever portion 84. Said camming action moves the actuating lever 78, against the force of the spring 82 in a clockwise direction, thereby concomitantly shifting the feed lever 70 to force the feed finger 68 forwardly in the machine a sufficient distance to feed another element blank across and beyond the lower shear block 56 in the manner illustrated in FIG. 3.

As soon as the element, or elements, have been set in the work piece, the operator may free the frame plate 96 of the finished work piece by sliding the frame plate to

its forwardmost position, as illustrated in FIG. 12; whereupon the opening 102 has passed beyond the forward extent of the supporting base 100 so that the work piece B, being no longer supported, will fall from the work transfer mechanism.

In the event that the size or shape characteristic of the element receiving work pieces were to be altered, the work presenting slide mechanism may readily be modified to accommodate different work pieces without affecting the basic structure of the machine. The only change required to be made would be the replacement of the frame plate 96.

If the pattern or location in which the elements are to be inserted were to be altered, a substitute lower set die assembly 64 may be quickly installed upon the horizontal plate 23. In the latter event the requisite number of co-operating eyelet forming and inserting heads 26 could be reoriented upon the plate 24 and readily secured in alinement with their respective anvils of the new lower set die assembly 64.

In the event that it were desired to employ strip elements of a different shape or size, the machine could be cheaply modified to feed and set the new elements. It is to be noted (FIGS. 3 and 8) that the fairlead block 58 is so mounted that it may readily be removed from the machine and replaced by a new block having a strip feed slot 57 of suitable proportions for the new strip material. The increment of strip feed may be adjusted, if required, by means of the adjustable connecting rod 76. Also, the upper set cap tool assembly 48 may be quickly removed and replaced by a tool assembly having different size characteristics. In addition, in order to vary the extent of downward movement of the presser mechanism 30, in accordance with changes in the work piece thickness, all that need be done is change the setting of the adjustable stop screw 66.

From the foregoing description it is apparent that the machine construction of this invention presents a basic machine that is very versatile in that it may, with a minimum of expense and time, be adapted for use with varying types of industrial element attaching requirements.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a machine for attaching elements that are fed to the machine in the form of a continuous strip of element blanks, a fixed shear member for cooperating in severing the endmost element blank from the strip; an actuating plunger mounted for reciprocation toward and away from the said member; and element attaching tool, including gripping fingers, carried by the plunger and adapted to engage with the endmost element blank prior to the severing operation; a second shear member carried by and actuatable by the plunger into co-operative shearing relation with the fixed shear member; and means for intermittently feeding the strip to advance the endmost element thereof beyond the fixed shear member and into the operative path of the tool, said means comprising a yieldably mounted fairlead block for guiding the strip, biasing means normally maintaining the block and a strip thereon in a plane substantially transverse to the path of the tool and spaced apart heightwise from the fixed shear member, a feed finger engageable with the strip, and means for advancing the finger in time relation to the operation of the plunger; whereby after the feeding operation said tool gripping fingers and second shear member engage with the endmost element blank causing the block and a strip thereon to yield toward and into cooperative shearing relation to the fixed shear member.

2. A machine, in accordance with claim 1, wherein the means for advancing the finger is positively actuated by engagement with the plunger as the plunger is moved in the direction away from the fixed shear member.

3. A machine, in accordance with claim 1, wherein the movement of the plunger toward the fixed shear member

carries the tool and second shear member into forceful abutting engagement with the endmost element blank thereby causing the element and fairlead block to yield, against the force of said biasing means, until the strip contacts with the fixed shear member and is severed by the then existing co-operative relation of both shear members. 5

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