United States Patent

[11] **3,570,738**

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[22] Filed **Apr. 24, 1969**
[45] Patented **Mar. 16, 1971**
Continuation-in-part of application Ser. No. 689,939, Nov. 24, 1967, now Patent No. 3,429,013, dated Feb. 25, 1969, and a continuation-in-part of 777,652, Nov. 21, 1968, and a continuation-in-part of 800,362, Feb. 12, 1969.

[54] **TOOL FOR APPLYING FASTENERS**
10 Claims, 21 Drawing Figs.

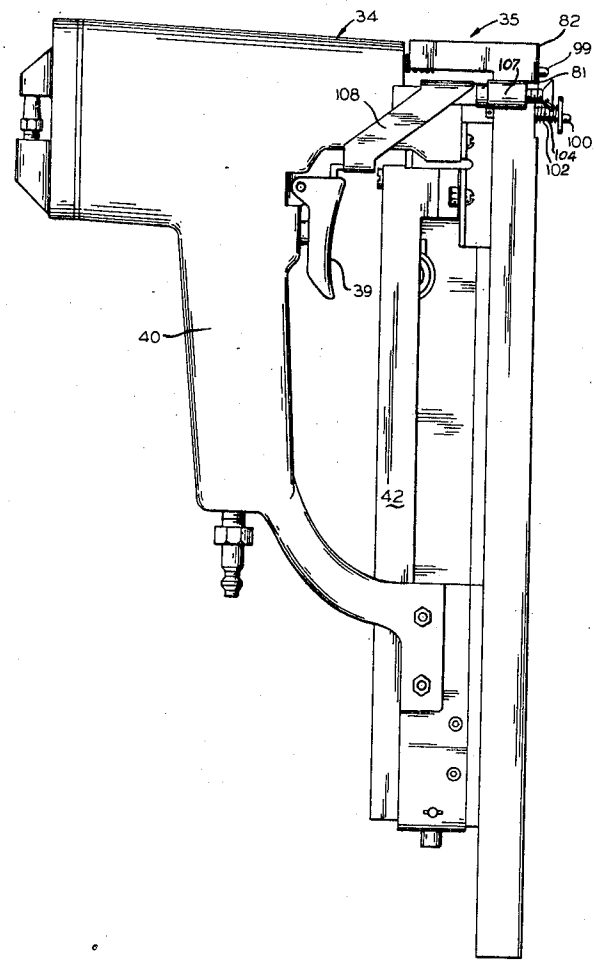
[52] **U.S. Cl.** **227/8, 227/120**
[51] **Int. Cl.** **B27f 7/06**
[50] **Field of Search** 227/1, 5, 6, 7, 8, 21, 48, 76, 120, 130, 153; 29/432, 434, 464

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Primary Examiner—Granville Y. Custer, Jr.
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ABSTRACT: Tool attachments associated with air tools that force nails or other fasteners into members. The tool attachments are adapted to store, feed and to pivotally mount uniquely formed wing headed fasteners with nails also stored by the tool for releasably holding a first member, such as a cabinet backing in a position relative to a second member such as a cabinet frame therebehind.



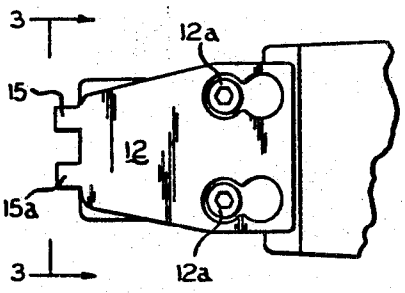


FIG.2

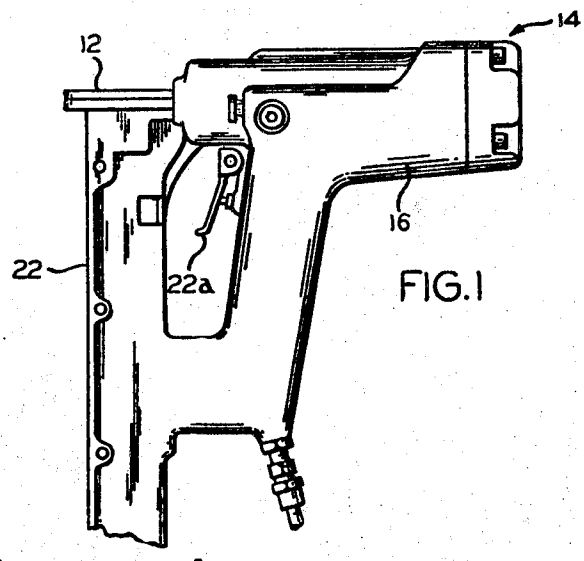


FIG.1

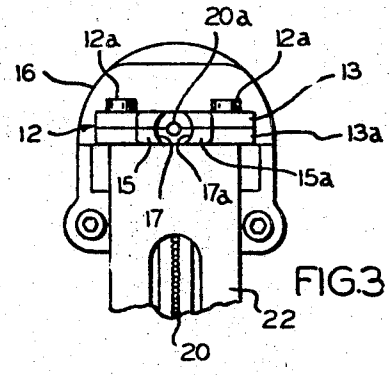


FIG.3

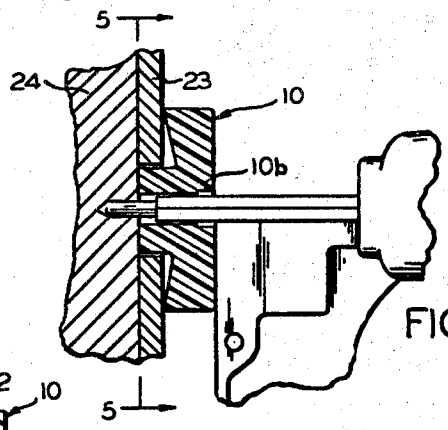


FIG.4

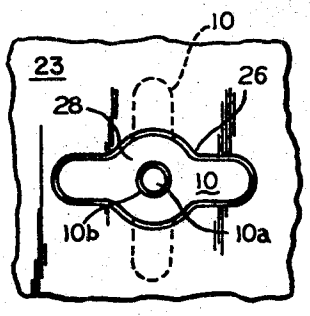


FIG.7

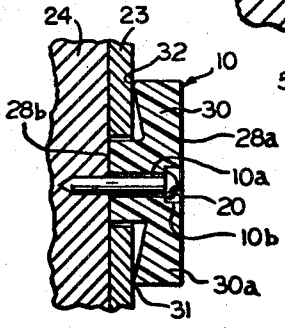


FIG.6

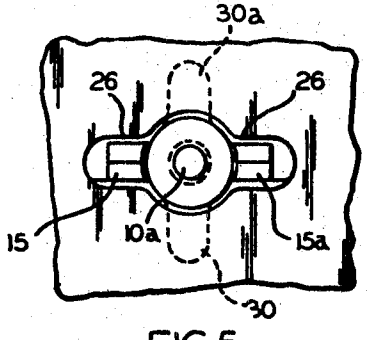


FIG.5

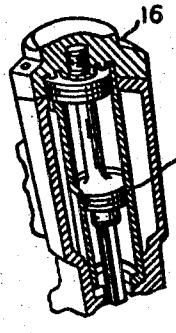


FIG.8

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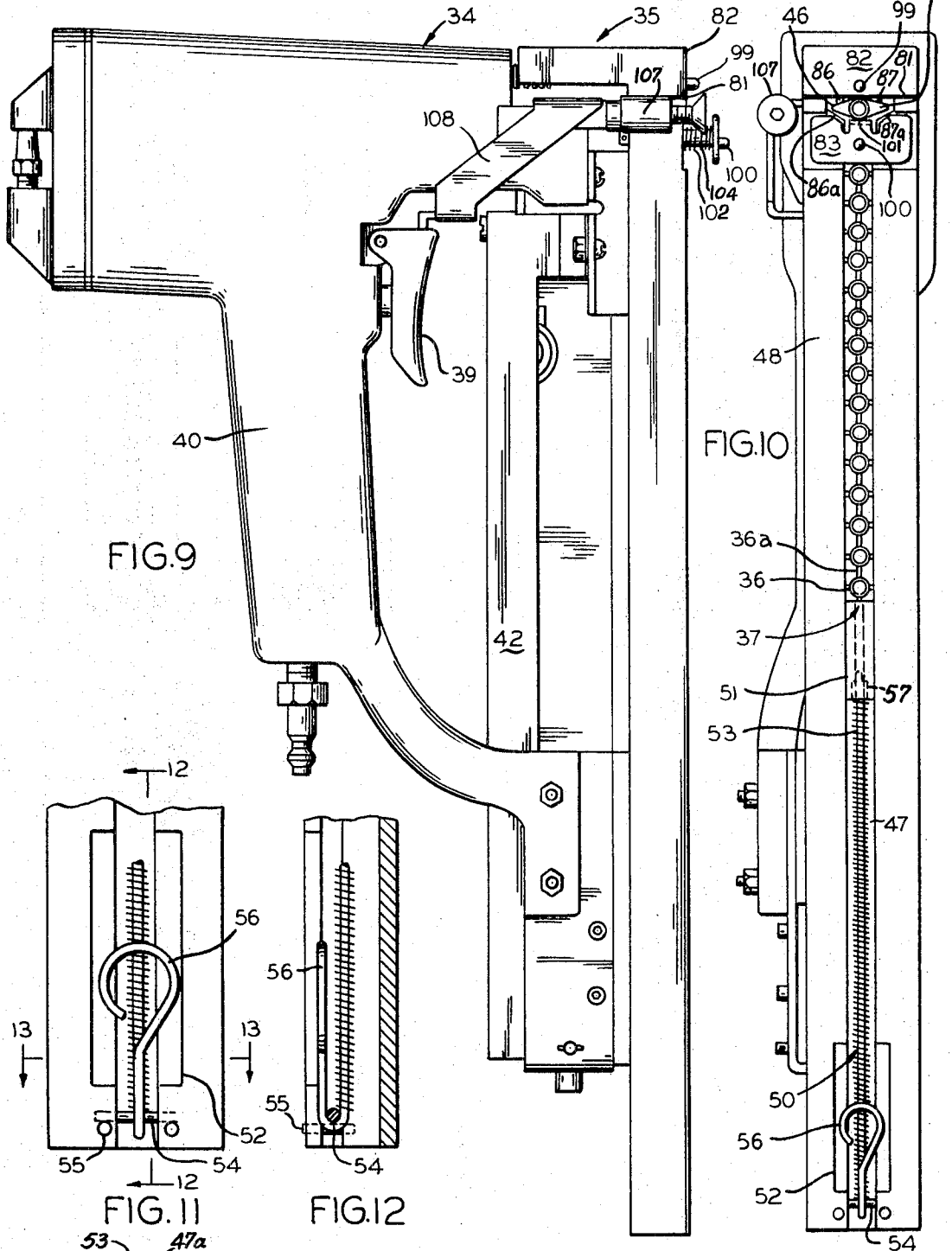


FIG.9

FIG.10

FIG.11

FIG.12

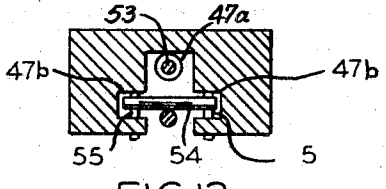


FIG.13

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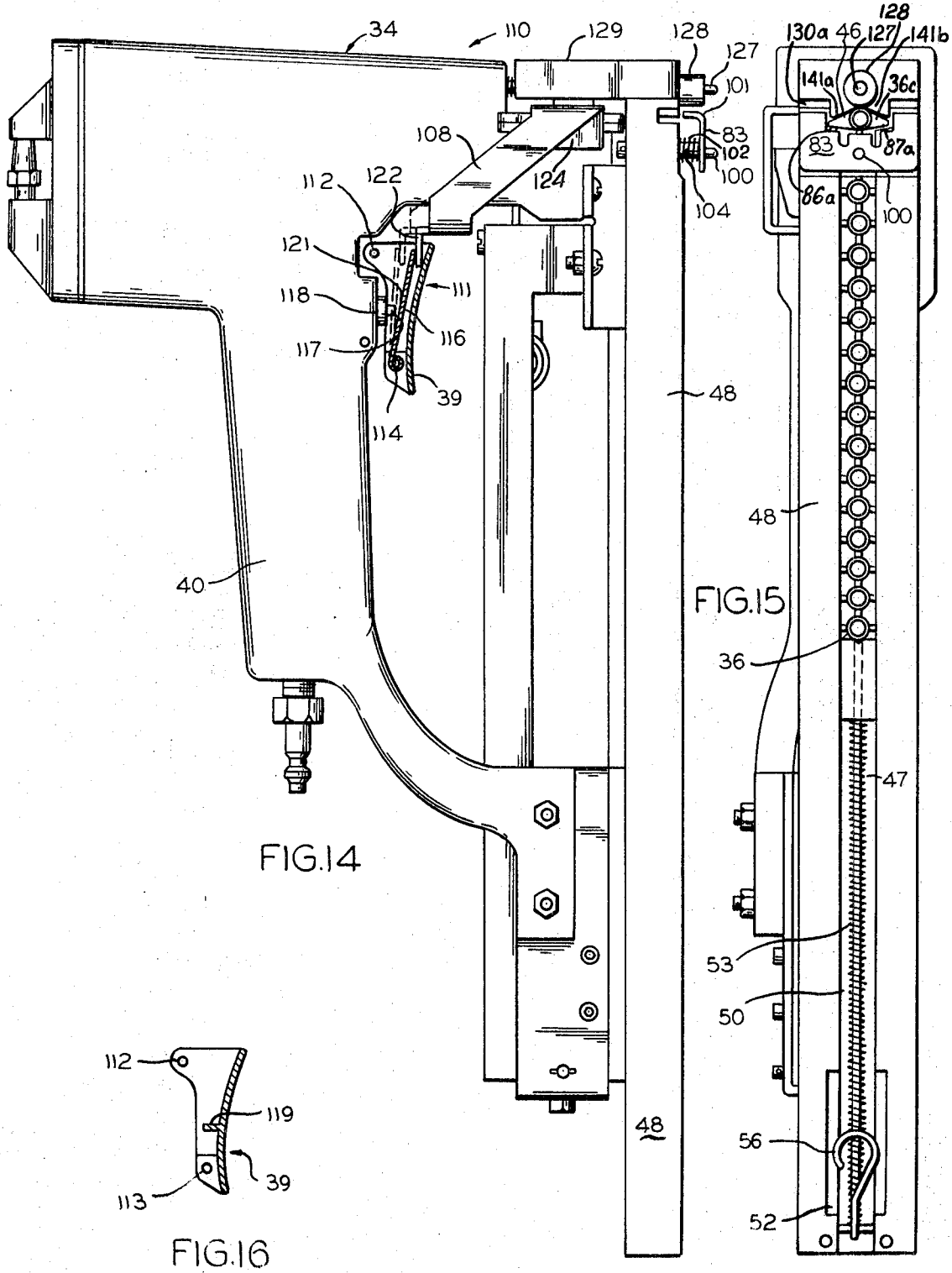


FIG.14

FIG.15

FIG.16

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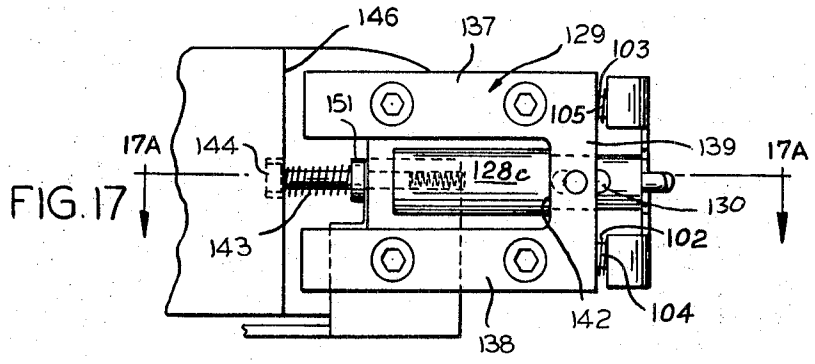


FIG. 17

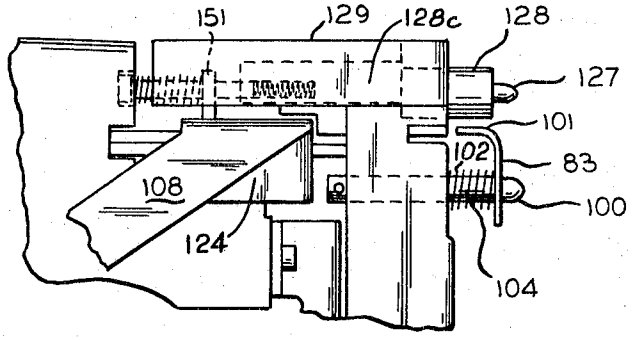


FIG. 18

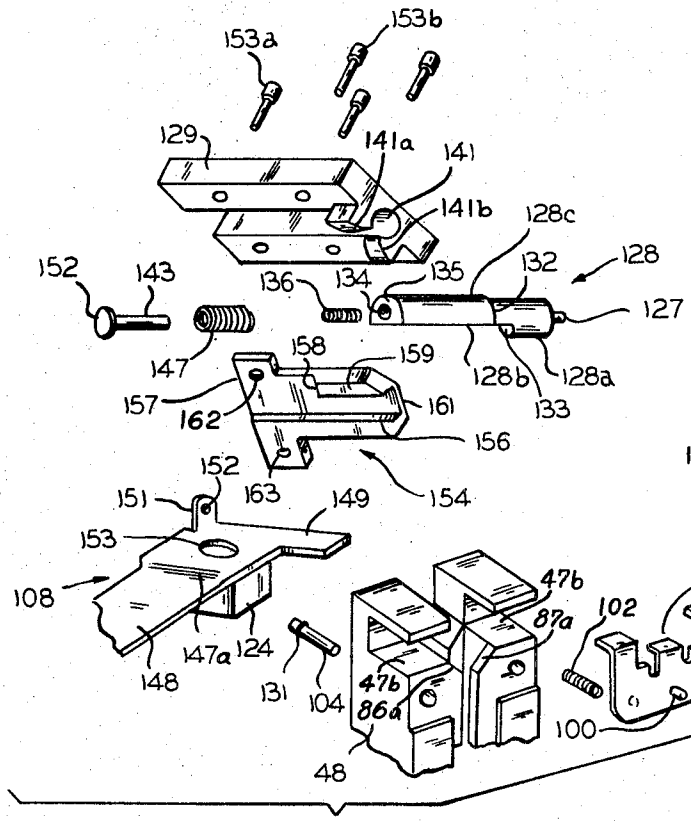


FIG. 19

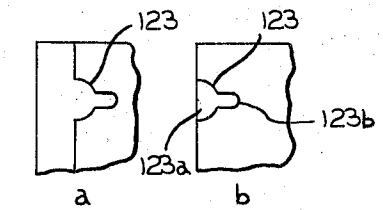


FIG. 20

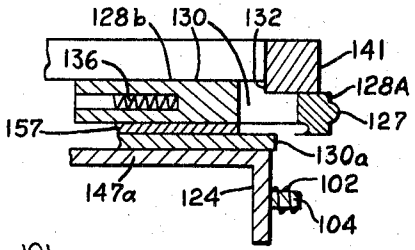


FIG. 17A

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TOOL FOR APPLYING FASTENERS

This invention relates to improved tool attachments for mounting wing headed fasteners with a minimum of cost and time. This invention is related to the previously filed and since abandoned patent application entitled "IMPROVED WING HEADED FASTENER AND TOOL ATTACHMENT FOR APPLYING FASTENER," Ser. No. 615,830, filing date Feb. 13, 1967, as well as previously filed continuation-in-part application entitled"IMPROVED WING HEADED FASTENER WITH TOOL ATTACHMENTS AND METHOD FOR APPLYING FASTENER," Ser. No. 689,939, filed Nov. 24, 1967 which issued as U.S. Pat. No. 3,429,013 on Feb. 25, 1969, and is a continuation-in-part of the previously filed patent application entitled "TOOL ATTACHMENTS FOR IMPROVED WING HEADED FASTENER AND METHODS FOR APPLYING FASTENER," Ser. No. 777,652, filed Nov. 21, 1968, and "IMPROVED WING HEADED FASTENERS AND TOOL ATTACHMENTS FOR APPLYING FASTENERS," Ser. No. 800,362, filed Feb. 12, 1969.

For many years the electronics industry, among others, has been faced with the problem of reassembling imperfect units such as television sets after the same have been assembled. Of principal concern is the necessity of removing and thereafter replacing threaded fasteners which are normally used in fastening the backing members of television cabinets, or the like. The cost involved in the operation adds considerably to the unit cost of the product being manufactured and thus there is a definite need for obviating the removal and replacement of the threaded fasteners.

Several attempts have been made in the past to remedy this problem by using fasteners which do not have to be removed from the cabinet in order to enable removal of the cabinet backings which they secure: such fasteners do exist and although they obviate problems of removal, it is more difficult to install these new fasteners than it is to install the old and well-known threaded fasteners.

As explained in the previous applications, my coinventor and I have obviated the disadvantages attendant with utilizing common threaded fasteners for securing first members, such as cabinet backing members, to second members, such as cabinets, by providing fasteners which enable the backing of a cabinet to be removed expeditiously without removal of the fasteners. In addition, the fasteners can be positioned and applied automatically with out new tools and processes thereby obviating the difficulties involved with initially applying or installing the fasteners. It was thus a primary object of our invention covered under U.S. Pat. No. 3,429,013 to provide new and improved fasteners which can removably associate a cabinet backing or the like, with a cabinet so that the backing can be assembled and disassembled with a minimum amount of time and effort. It was a further object of the previous inventions to provide new and improved tool attachments to facilitate using the improved fasteners that removably associate a cabinet backing, or the like, with a second member such as a cabinet in order that the backing can be removed from the cabinet without removal of said fastener.

It is an object of this invention to provide new attachments for an air tool to thereby adapt the tool especially for the new and improved fasteners. The attachments enable the new and improved fasteners to be associated with members at a predetermined location with respect to key slots in those members, with even greater facility than was possible heretofore.

It is even still further an object of this invention to provide new and improved systems for positioning fasteners such as described herein with respect to nail driving tools in order to associate the fasteners with members by driving nails therethrough.

It is a further object of this invention to provide tool attachments having improved trigger enabling means for the air tools with which the attachments are made. While we previously disclosed interconnected fasteners of the type described, as well as attachments with automatic nailing tools that provided automatic means for successively severing each of the fasteners after they are positioned for fastening by the nails as explained in the previous patent applications, an improved tool attachment for enabling the operation of the tool for mounting the fasteners is described herein.

Thus, we have provided improved tool enabling equipment for the tool used in mounting the wing headed fasteners.

Other and further objects of this invention will become more readily apparent from reading the description in light of the accompanying drawings wherein:

FIG. 1 is a side elevational view illustrating the invention of the previously filed applications used with an automatic nailing tool that is powered by compressed air;

FIG. 2 is a front view of a portion of the tool attachments of the invention of the previously filed applications illustrating its mode of association with the automatic nailing tool of FIG. 1;

FIG. 3 is a bottom view looking in the direction of the arrows 3–3 in FIG. 2 at the portion of that tool attachment of our invention;

FIG. 4 is a sectional view illustrating how a nail fastener is forced through one of the new and improved wing headed fasteners to secure the same fastener and therefore a first member such as a cabinet backing to a second member, such as a cabinet frame;

FIG. 5 is a view taken along a plane passing through the lines 5–5 in FIG. 4 and looking in the direction of the arrows to illustrate how the tool attachment of the first mentioned application cooperates with a key slot to locate the wing headed fastener and nail in a certain position relative to said key slot;

FIG. 6 is a sectional view similar to FIG. 4 illustrating how our new and improved wing headed fastener is held in position with the wing head substantially transverse to the key slot with its wing portions forced against the backing surface by a nail;

FIG. 7 is a view illustrating our new and improved wing headed fastener in relation to the key slot in the cabinet backing where the wing headed fastener has an open position (shown by the solid lines) and a closed position (shown in phantom);

FIG. 8 is a cut away view of the actuating piston member of the air tool illustrated in FIG. 1;

FIG. 9 is a side elevational view illustrating an embodiment of the inventive attachment for use with an automatic nailing tool where the improved fastener is illustrated in a spaced apart interconnected relationship;

FIG. 10 is a bottom view of the automatic nailing tool with the tool attachment of FIG. 9;

FIG. 11 is an enlarged fragmentary view of the bottom of the tool attachment of FIG. 10;

FIG. 12 is a sectional view of FIG. 11 taken along a plane passing through the lines 12–12 and looking in the direction of the arrows;

FIG. 13 is a sectional view of FIG. 11 taken on a plane passing through the line 13–13 and looking in the direction of the arrows in FIG. 11;

FIG. 14 is a side elevational view illustrating an embodiment of the invention of this application showing the improved trigger enabling arrangement;

FIG. 15 is a bottom view of the automatic nailing tool with tool attachment of FIG. 14;

FIG. 16 is a partial sectional view of the trigger shown in FIG. 14;

FIG. 17 is a fragmentary front view of FIG. 14 showing a portion of the tool attachment;

FIG. 17A is a cross-sectional view taken along line 17A–17A of FIG. 17;

FIG. 18 is a fragmentary side view of FIG. 14 showing a portion of the tool attachment;

FIG. 19 is an exploded perspective view of pertinent portions of the trigger enabling arrangement; and

FIG. 20 shows variations in slots in and positions of the first members wherein the inventive tool attachment is especially useful.

Referring to the drawings, wherein like characters of reference indicate corresponding parts throughout our new

and improved wing headed fastener 10 and tool attachment 12 are shown in FIGS. 1—8 in connection with an air tool which is commonly used for driving nails. Exemplary embodiments thereof have heretofore been illustrated and described in U.S. Pat. Nos. 2,872,901, 3,081,740, 3,081,741, 3,081,742, 3,056,964, 3,056,965 and in the previously mentioned patent and applications for Letters Patent.

As illustrated in FIGS. 1, 3 and 8, the air tool 14 has a cylinder head 16 that is supplied with compressed air to drive a reciprocating piston 18 in order that nails 20 which are held in the magazine 22 thereof are forced through an aperture 20*a* in the tool attachment 12. It will be noted that the tool attachment 12 is associated with the lower portion of the air tool 14 by fastening members 12*a*. The tool attachment 12 comprises a pair of apertured plates 13,13*a*. The plates are contiguously positioned and form the aperture 20*a* therebetween for purposes of enabling the nails 20 in the magazine 22 to be forced therethrough by the piston 18 upon actuation of the trigger 22*a* of the air tool 14. The attachment 12 of the embodiment of FIG. 1 has a pair of spaced apart noses 15, 15*a*, which have inner sides with opposing arcuate edges 17, 17*a* to receive and hold the wing headed fasteners 10 in position in connection with the air tool 14.

The wing headed fasteners 10, as illustrated in FIGS. 4—7, are intended for use in cooperation with a first member, such as a cabinet backing 23 to removably associate the backing with a second member such as a cabinet 24 in order that when it is desired to remove the cabinet backing, the same can be removed without removing the fasteners. The first member or cabinet backing 23 has a key slot 26 which substantially conforms to a cross section of our new and improved wing headed fastener 10 as illustrated in FIG. 7.

As illustrated in FIGS. 6 and 7, the wing headed fastener 10 has a central body portion 28 with top and bottom ends 28*a*, 28*b*, respectively. A pair of wing portions 30, 30*a*, project from the central body portion in opposite directions. The wing portions preferably have flat upper ends and inclined lower ends 31, 32 having the lowest points thereof at the outside and rising upwardly at points closer to the central axis thereof. The wing portions 30, 30*a* are preferably composed of resilient material such as plastic and the lowest points thereof are accordingly deflected upward toward the top end of said wing headed fastener when forced against the cabinet backing 23. Such deflection causes pressure to be exerted on the surface underneath the fastener to secure the fastener and fastened member.

It will be noted from FIGS. 4 and 6 that the lower ends of the wing portions 30, 30*a* are rounded so that when it is desired to rotate the fastener, friction is minimized. Also, the central body portion 28 has an opening 10*a* with a recess 10*b* formed therein through the central axis thereof from the top to the bottom for receiving a nail 20 used to attach the wing headed fastener 10 to the said second member.

In operation, the air tool 14 of the above first filed application, with its magazine filled with nails 20 has an improved wing headed fastener 10 releasably held by the attachment 12 as illustrated in FIG. 5. The central body portion 28 of the fastener 10 is held by the arcuate edges 17, 17*a* so that the aperture 10*a* in the wing headed fastener 10 is aligned with the intended path of the nails 20. Thereafter the noses 15, 15*a* of the tool attachment 12 of the embodiment of FIG. 1 are positioned in the key slot 26, as illustrated in FIG. 5 in order that the wing headed fasteners has its wing portions 30, 30*a* positioned substantially transverse to the key slot 26 and therefore in contact with the backing member 23 of the cabinet 24. Thus, when the air tool 14 is actuated a nail 20 is forced through the aperture 20*a*, the aperture 10*a* of the wing headed fastener 10 and finally into engagement with the cabinet 24 as illustrated in FIGS. 4 and 6. When a nail 20 is actuated through a wing headed fastener 10 which is releasably held by the attachment 12, it also causes the wing headed fastener to be released from the arcuate edges 17, 17*a*.

The wing headed fastener's open and closed positions are illustrated in FIGS. 5 and 7. In FIG. 7, the wing headed fastener is in its open position and is in alignment with the key slot 26 in order that the backing 23 can be removed from the cabinet without removing the fastener 10. The wing headed fastener's closed position is illustrated in phantom in FIG. 5 and 7 where the wing portions thereof are in contact with the backing of the cabinet in a substantially transverse position with respect to the key slot in order to secure the backing 23 to the cabinet 24. It will be further noted that in order to enable easy rotation of the wing headed fasteners, the nails 20 are driven into the cabinet a predetermined distance which gives optimum pressure on the wing headed fastener in addition to allowing selected rotation thereof, when this is desired.

In FIGS. 9—13 improved embodiments of the wing headed fasteners and the tool attachments are shown. Therein, an automatic nailing tool 34 is illustrated in combination with a series of fasteners 36 which form a strip 37 and are interconnected by means of interconnecting portions or gates 36*a*. By being interconnected, the wing headed fasteners 36 can be automatically moved to a position where they can be simultaneously separated from each other and applied rapidly and efficiently in holding the members together, as will be explained hereafter.

The nailing tool 34 is patterned after the conventional nailers illustrated in the aforementioned patents and patent applications and described in connection with FIGS. 1—8. The air tool is provided with an actuation trigger 39 and a handle 40. A tool attachment 35 is added to tool 34 and includes a nail magazine 42 with nails (not shown) positioned therein in order that they can be driven through the mouth of the tool.

At the bottom of the tool is a characterized aperture 46 which is shaped to allow the sides of the wing headed fasteners to move from the tool after the fasteners have been severed and fastened to a member. In FIG. 10, the characterized aperture is established, in the front by the pins 86, 87 and in the back by shoulders 86*a*, and 87*a* in the magazine 48. A fastener 36*b* is here drawn in the aperture, as the fastener appears before it is nailed in place. The aperture 46 feeds into a channel 47 which is formed in the wing headed fastener magazine 48. The channel 47 includes undercut slots 47*b* for receiving the wings 30, 30*a* of the fasteners to thus slidably receive and capture the strip 37 in the channel 47. The strip 37 of the fasteners 36 are spring biased on one end by the spring means 50 and are stopped at the front end by a first cutoff means 81. The first cutoff means is sandwiched between a fastener plate 82 and magazine 48. A second cutoff means 83 is located proximate to the fasteners at the front end of the set of fasteners and enables each of the individual fasteners 36 to be severed after they are positioned for fastening by the nails as will be explained hereafter.

The channel 47 which with undercut slots 47*b* is shaped in conformity to the cross section of the fasteners as illustrated in FIG. 13 has opening 52 proximate to the rear end thereof which accepts the set of fasteners 36 upon their insertion therein.

The spring means 50 has a pusher member 51 attached to a retainer shaft member 53 having a rear peg member 54 extending therefrom. The rear peg member is sized so that it can be moved through the opening 52, as well as be slidably received in the slots 47*b* so that the spring means 50 can be held in place at the rear of the machine by the force of the spring pushing member 51 against strip 37 and peg 54, against retaining means such as posts 55.

Handle means such as handle 56 is shown as integral to spring retainer shaft 53. It facilitates properly positioning the spring means 50 into an out of the opening 52. The spring retaining shaft is journaled through journal 57 so that member 51 rides on the shaft to press against strip 37 responsive to the exertion of the spring force caused by the compression of the spring means 50 between peg 54 and member 51. The journal 57 is slidably contained in groove 47*a* of channel 47. The shaft is shown broken away for convenience; actually it extends al-

most the entire length of the magazine 48, that is the length of shaft 53 plus the length of member 51 reaches from posts 55 to the characterized aperture 46.

The first cut off means 81 is held to fastening plate 82 by pins 86, 87 and cooperates with the characterized aperture 46 to locate the fasteners 36 for activation. It will be noted that the second cutoff means 83 has a bottom plate 98 which has a protrusion 100 extending downward therefrom, as well as a cutter 101 extending upward toward the interconnecting gate means 36*a* of each of the fasteners 36 positioned in the characterized aperture 46. The cutoff means 83 is spring biased away from the tool by the spring means 102 which is interposed between the machine and the cutoff means 83 at a location where a pair of reciprocally actuatable piston members (one of which is numbered 104) extend from the nailing tool. Only the spring 102 and piston 104 are visible in FIG. 9. A second and similar spring and piston is immediately behind 102 and 104 and are concealed from view in FIG. 9.

It will be noted that the safety catch 108 of the nailing tool must be completely depressed for the trigger 39 to be actuated. The safety catch 108 is associated with the release lever or piston 107 to enable the trigger 39 when the piston 107 is depressed.

Means are provided for depressing the safety catch when the tool is properly position against cabinet back 23 and relative to the slot in the first member. A protrusion 99 extends from the fastener plate 82 so that it can cooperate with a protrusion 100 extending from cutting means 83 to be constrainingly received in a key slot to locate the improved fasteners 36 in a predetermined location relative to the key slot and to locate the fastener in order that it can be forced against a cabinet backing, or the like, upon the driving of a nail. Thus, when the protrusions 99, 100 are fitted into a slot in a first member and when the protrusions 99, 100 are fitted into a slot in a first member and when the wing headed fastener is positioned so that the main body portion thereof is clear of the cutter 101, then the second cutter means 83 and the piston 107 are depressed to enable the trigger 39.

If the main body position does interfere with the cutter 101, the safety catch 108 is not released. Thus, if a fastener is present, it must be properly positioned with respect to the aperture 46. Moreover, the invention also contemplates an operation of the arm 108 by a fastener so that the tool will not operate when a fastener is not present within the characterized aperture.

Briefly in resume, if the tool is not pressed against the cabinet, or alternatively if a wing fastener is not in proper position, the parts 107, 108 (FIG. 9), 116 (FIG. 14) are in the positions shown by solid lines. When the trigger is pulled, the left-hand end of arm 116 is raised (as viewed in FIG. 14). The arm 116 pivots about the point where it is resting on the arm 122. However, arm 116 does not raise far enough to move pin 117. If the tool is in position and a fastener is in proper position, parts 107, 108 (FIG. 9) and 122 (FIG. 14) raise, (as indicated in dashed lines for parts 116, 122 in FIG. 14). When the trigger 39 is pulled, the left-hand end raises. The lever 116 pivots about the point where it is resting on the arm 122. This time the pin 117 is pushed, and the tool is actuated.

To review the operation of the tool 34 and attachments thereof, the set of interconnected fasteners 37 are placed in the slotted magazine compartment 48 and the spring means 50 is urged against the interconnected fasteners 37 to position them successively for activation and fastening. The cutoff means 81 and 83 have guillotine-type knife edges which operate to sever each of the fasteners 36 prior to their being nailed. As each fastener 36 is nailed, another fastener is actuated by the spring means 50 to a position where it is in the characterized aperture 46 and ready for nailing. The fasteners are located by means of the protrusions 99, 100 as before described.

Turning now to FIGS. 14—20, it is noted that the same type air gun 34 is shown therein. The attachments 110 include the magazine 48 wherein the chain of wing headed fasteners 36 is stored. The magazine includes a channel 47 and spring means 50 having handle 56. An aperture 52 is located at the bottom rear of the magazine 48 for receiving the chain of wing headed fasteners. A characterized aperture 46 serves to enable the wing headed fasteners to be forcibly removed from the tool. A fastener 36*c* is shown in the characterized aperture 46, as the fastener appears before it is nailed in place. The front of the aperture 46 is defined by the shoulders 141*a* and 141*b* (which also appear in FIG. 19), and the back of the aperture is defined by shoulders 86*a*, 87*a* on magazine 49.

The gun 34 is equipped with a handle 40, a trigger 39, and a safety catch 108. The attachments further include the bottom plate 83 having a protrusion 100, and a cutting means 101 extending upward therefrom. The bottom plate 83 is joined to the magazine by a pair of reciprocally actuable piston means 104, 105.

In FIG. 14 trigger 39 is shown in a partial sectional view to more clearly show an embodiment of the trigger enabling means 111. As shown in FIGS. 14 and 16, the trigger 39 is substantially tongue-shaped having an aperture 112 at the front top corner thereof. Aperture 112 is used for pivotally mounting the trigger 39 to handle 40 with any well-known means such as through the use of a pin so that the trigger 39 pivots around aperture 112. A second aperture 113 is shown at the other end of the trigger. The aperture 113 is also used to contain a pivot pin 114. The pivot pin is used to pivotally hold a lever 116 thereto. The lever 116 pivots around pin 114. This lever is what actually presses against the actuating protrusion 117 of the air valve 118 so that when the trigger is pressed air valve 118 causes the air pressure to force the nails from the gun through the fastener thus fastening the fastener to the second member.

When safety catch 108 is in its normally lower position and trigger 39 is operated upward, the protrusion 117 of the air valve 118 is not forced upwardly to operate the valve. Instead, ridges 119 integral to trigger 39 abut against the shoulders 121 of valve 118 before any pressure can be applied to protrusion 117. Thus, the valve does not operate unless lever 116 is first pivoted upwardly around pin 114 so that when the trigger 39 is pressed upward, the lever is in a position to be forced against protrusion 117 before ridges 119 touch shoulder 121.

Means are provided for enabling the trigger 39. More particularly, safety catch means 108 includes finger 122 which is long enough to reach into trigger 39 to a position juxtaposed to lever 116; so that if safety catch 108 is forced upward, finger 122 forces lever 116 to pivot around pin 114 into its valve protrusion operating position.

Means are provided for forcing safety catch 108 upward when fastener 36 is in position in the slot 123 shown in FIGS. 20*a* and 20*b*. More particularly, safety catch 108 can be operated, and forced upward when bottom plate 83 is pushed upward. Thus, the reciprocally actuable piston means 104 extends upwards sufficiently to reach a table portion 124 of safety catch 108 when plate 83 is forced upwards against spring means 102 holding it in its normally lowered position. Spring 102 and pin 104 conceal spring 103 and pin 105, as viewed in FIG. 14 (see FIG. 17). Pins 104, 105 in abutting table 124 force safety catch 108 upwards which in turn causes finger 122 to force lever 116 into its valve operating upward position. Thus, when the trigger 39 is then actuated, lever 116 causes protrusion 117 to be pushed upward and operate valve 118. The nail is then forced through characterized aperture 46 pushing against fastener 36 causing knife cutting edge 101 to sever the connection of the fastener from the strip of fasteners.

Difficulties are encountered in enabling trigger means 39 in the previously described embodiments. If the gun has to be positioned with only one protrusion within slot portion 123*b*, such as where the rear of the picture tube prevents proper positioning of the gun, then it was difficult to enable the trigger. Also where the slot comprises only half of a slot such as shown in FIG. 20 these difficulties were especially amplified.

For example, with the slot as shown in FIG. 20*a* wherein the first member had a slot right at its edge and when the edge of the second member and the edge of the first member were not aligned but were set parallel to each other, then often piston 107 would not be pushed down far enough since it would abut the second member, and the thickness of the first member is sufficient to preclude compression of member 107 unless the tool was held in a particular position.

Similar difficulties were encountered when the first member and second member were aligned with common edges, such as shown in FIG. 20*b*. Therein again, the only time when the previously described embodiments would work, is if they were held with the magazine against the first member such that the protrusion 100 was in the portion of the slot 123*b*.

The present embodiment of the invention overcomes the difficulties. More particularly, means are provided for enabling the trigger when only protrusion 100 is within slot portion 123*b* or when only the new protrusion 127 on reciprocally actuable piston 128 located or held within fastening plate 129 is in slot portion 123*b*. Thus, the trigger 39 is enabled when either protrusion 100 or protrusion 127 is within slot portion 123*b* or when both are in slot portions 123*b* simultaneously.

Means are provided for enabling the trigger when protrusion 100 is within slot portion 123*b* abutting the second member. More particularly, pistons 104 are provided which are sufficiently long to reach the table portion 124 of safety catch 108. Thus, when plate 83 is forced upward responsive to protrusion 100 abutting the second member, piston 104 abuts table 124 forcing the safety catch 108 up so that finger 122 moves lever 116 into its operating position.

Means are provided in this embodiment for causing safety catch 108 to operate reciprocally. These means are shown as spring means 147.

Spring means 126, 102 surround pistons 104, and are held between pistons 104 and magazine 48 by pins, such as pin 131 at the top of piston pin 104, 105.

Means are provided for operating the safety lever 108 responsive to protrusion 127 abutting the second member in extending through slot portion 123*b*. More particularly, protrusion 127 is mounted on piston 128. Piston 128 is a reciprocally actuable piston. As best seen in FIG. 19, piston 128 is a cylindrically shaped piston that is longitudinally truncated. Thus, the bottom of piston 128 comprises portion 128*a* which is completely cylindrical. Above the complete cylindrical portion 128*a* is a longitudinally truncated portion 128*b*. The portions 128*a*, 128*b* come together at a shoulder 132 which limits downward travel of cylinder 128. The shoulder 132 defines the bottom of section 128*c* of cylinder 128. Similarly, there is a shoulder 133 defining the top of the completely cylindrical portion 128*a*. Trimming cutoff means are provided for trimming off the uncut gate portion left by cutoff means 101. More particularly, cylinder 128 has a slot 130 with a sharp arcuate edge for receiving the untrimmed gate portion and slicing it off when the fastener is forced through the characterized aperture.

The trimming means should be clear from a study of FIGS. 17 and 17A. When a fastener 36 is severed from the strip, a guillotine knife edge 101 severs the gate 36*a*. This leaves a short gate stub 36*b* on the edge of the fastener body. The stub 36*b* is pushed into the hole 130 by the magazine spring 53. When the tool is pressed into its fastening position, the cylinder part 128 moves into the part 129. Thus, the edge of slot 130 trims the stub 36*b* from the fastener.

A spring receiving hole 134 is located at the top of the cylindrical piston 128. It receives spring 136 therein, which assures that the piston has a normally lowered position, as shown in FIG. 18, for example. When the cylindrical piston 128 is in its normal position, protrusions 127 and 100 are in approximately the same plane.

The attachments 110 include a fastening plate 129. The fastening plate 129 is substantially U-shaped having legs 137 and 138 joined by a transverse section 139. The transverse section 139 has a characterized cylindrical receiving aperture 141 protruding rearwardly therefrom. The rearmost portion of the cylindrical receiving aperture 141 forms the front wall of the characterized aperture 46.

Shoulder 132 of cylinder 128 abuts the upper inner wall 142 of the transverse section 139. Thus, spring 136 holds cylinder 128 normally so that its shoulder 132 abuts surface 142 of transverse section 139.

A pin 143 reaches from an undercut surface 144 (FIG. 17) in surface 146. Spring means 147 fits over pin 143, and acts to hold safety catch 108 in a normally lowered position.

Safety catch 108 is a plate having a main body section 147*a*. Extending upward therefrom is arm 148 which leads to the previously described finger 122. Attached to the upwardly extending arm 148 and the main body portion 147*a* is the table portion 124. A peninsular section 149 reaches downward from the main body portion 147*a*. Extending frontwards and at right angles to the main body plate 147*a* is tab 151. Tab 151 has an aperture therein, 152, designed to receive pin 143 therethrough so that pin 143 can extend into the spring receiving hole 134 in cylinder 128. Spring 147 is held between tab 151 and the head 152 of pin 143; thus, spring 147 acts to force safety catch 108 into its normally downward position.

In the main body section of safety catch 108 there is found a slot 153. Slot 153 is necessary to enable safety catch 108 to move up and down and around one of the fasteners holding fastener plate 129 to the gun. Thus, for example, the drawings show fastener plate 129 held in place to the gun and to the attachments 110 using fasteners such as Allen head screws 153*a*, 153*b*. Thus, the Allen head screws reach through four apertures in fastening plate 129.

Means are provided for guiding safety catch means in its travel from the lowered position to the raised position and back, in response to either protrusion 100 or 127 being in contiguous relationship with a second member. More particularly, a guide plate 154 is provided. Guide plate 154 has a channel therein 156 characterized to fit around peninsular portion 149 of safety catch 108. The top of guide plate 154 normally abuts against tab 151 while the bottom of main body section 147*a* abuts against a shoulder 158 on ridge 159 of guide plate 154. In the normal position, the shoulder 133 of cylinder 128 is spaced away from the bottom section 161 of guide plate 154. The guide plate is held in a stationary position by the fasteners 153*a* and 153*b*, which pass through apertures 162, 163 in the guide plates.

Thus, in operation when protrusion 127 is abutted against a second member, cylinder 128 is forced upward against its spring 136. The top surface of the cylinder 128 presses against tab 151 to force safety catch 108 upward against spring 147 mounted on pin 143. This of course, causes finger 122 to pivot lever 116 to its operating position. The cylinder 128 is stopped in its upward travel by shoulder 133 abutting against the bottom 161 of plate 154.

Thus, it is shown that the trigger is enabled by the actuation to the upward position of either cylinder 128 or bottom plate 83. Accordingly, the tool is operable when protrusion 100 or 127 jointly or severally abut the second member.

From the description above, it will become manifest to anyone familiar with the art that the device is simple in construction, and positive in its function and performance, and although I have shown a specific construction and arrangement of the details, I am fully cognizant of the fact that many changes may be made in the material and the construction without effecting the operativeness of the device, and I reserve the right to make such changes as I may deem convenient or necessary without departing from the spirit of my invention or the scope of the appended claims.

We claim:

1. A tool that holds clips of nails and operates to individually eject the nails for driving the nails into base members:

said tool comprising magazine means adapted to receive an integrally connected strip of apertured wing headed

fasteners for use in removably attaching first members such as cabinet backings to said base members;

said magazine having a characterized aperture means shaped to enable passage therethrough of individual ones of said wing headed fasteners;

said characterized aperture means located in the path of said driven nails;

feeding means for automatically placing successive ones of the wing headed fasteners of the strip into position in said characterized aperture with the aperture of the wing headed fastener in the path of the driven nails;

means for separating the positioned wing head fastener from said strip to enable the separated wing headed fastener to pass through said characterized aperture and be fastened to said base member by said driven nails;

a first protrusion resiliently mounted on said tool means and located to the rear of said characterized aperture;

a second protrusion means resiliently mounted on said tool means and located to the front of said characterized aperture;

said first and second protrusion means each having a normal downwardly extended position for aligning said characterized aperture with slots in said first members and an upward retracted position;

normally disabled trigger means for selectively operating the tool to drive individual ones of said nails; and

enabling means operated responsive to the said first or second protrusion means being in the upward retracted position for enabling said trigger means.

2. The tool of claim **1** wherein said enabling means comprises safety catch means slidably attached to the handle of said tool:

said safety catch means having a normal lower position and an upward position;

pivot means at one end of said trigger means for pivotally attaching said trigger to said tool;

tool actuation means encompassed by said trigger means;

lever means for abutting said actuation means pivotally attached to said trigger means;

stop means on said trigger means to prevent said lever means from abutting said actuation means unless said lever means is pivoted upward; and

finger means on said safety catch means juxtaposed to the unpivoted end of said lever to pivot said lever upward when said safety catch is in the forced upward position.

3. The tool of claim **2** wherein resilient means are provided to maintain said safety catch in the normal lower position.

4. The tool of claim **3** and a bottom plate means positioned on the bottom of said tool adjacent said characterized aperture, said first protrusion means extending downwardly from said bottom plate means:

reciprocating bottom plate piston means extending through said magazine means and fixedly attached to said bottom plate means;

bottom plate spring means surrounding said bottom plate piston means between said magazine means and said bottom plate means for maintaining said bottom plate in a normally downwardly extending position; and

said bottom plate piston means being of sufficient length to abut said enabling means to force said enabling means to the upward position when said bottom plate is pushed upward to juxtapose said magazine means.

5. The tool of claim **4** wherein fastening plate means are provided at the front of said tool means for use in attaching said magazine means to said tool:

said fastening plate means having a characterized cylinder receiving aperture at the bottom thereof;

cylinder means reciprocatingly mounted in said cylinder receiving aperture;

said second protrusion fixedly attached to and extending downward from the bottom of said cylinder;

said cylinder having a normal downward position and an upward position; and

tab means on said enabling means maintained juxtaposed to the top of said cylinder whereby when said cylinder is forced upward so is said enabling means forced upward.

6. The tool of claim **5** wherein said separating means comprises first cutting means extending upward from said bottom plate whereby when said bottom plate is forced upward said first cutting means is positioned to cut the gate between consecutive wing headed fasteners from the body of the fastener positioned in the characterized aperture; and wherein trimming means are provided at the other side of said characterized aperture to trim the remains of the gate from the fastener in the characterized aperture.

7. The tool of claim **6** wherein said trimming means comprises slot means in said cylinder:

said slot means having a sharp lower edge; and

wherein said cylinder receiving aperture positions said cylinder to receive the remains of said gate in said slot means when a wing headed fastener is in said characterized aperture.

8. The tool of claim **7** wherein said safety catch comprises a main body section; table top means extending normally to said main body section and positioned to be abutted by said reciprocating bottom plate pistons.

9. The tool of claim **8** wherein said means for holding said safety catch in a normally downward position comprises pin means extending downward from said handle through said tab means; pin spring means surrounding said post means and held compressed between said handle and said tab means.

10. The tool of claim **8** wherein said means for holding said cylinder means in a normally downward position comprises:

an axial hole extending downward from the top of said cylinder;

spring means in said hole; and

wherein said pin means extends into said hole to compress said spring means.