

Oct. 1, 1963

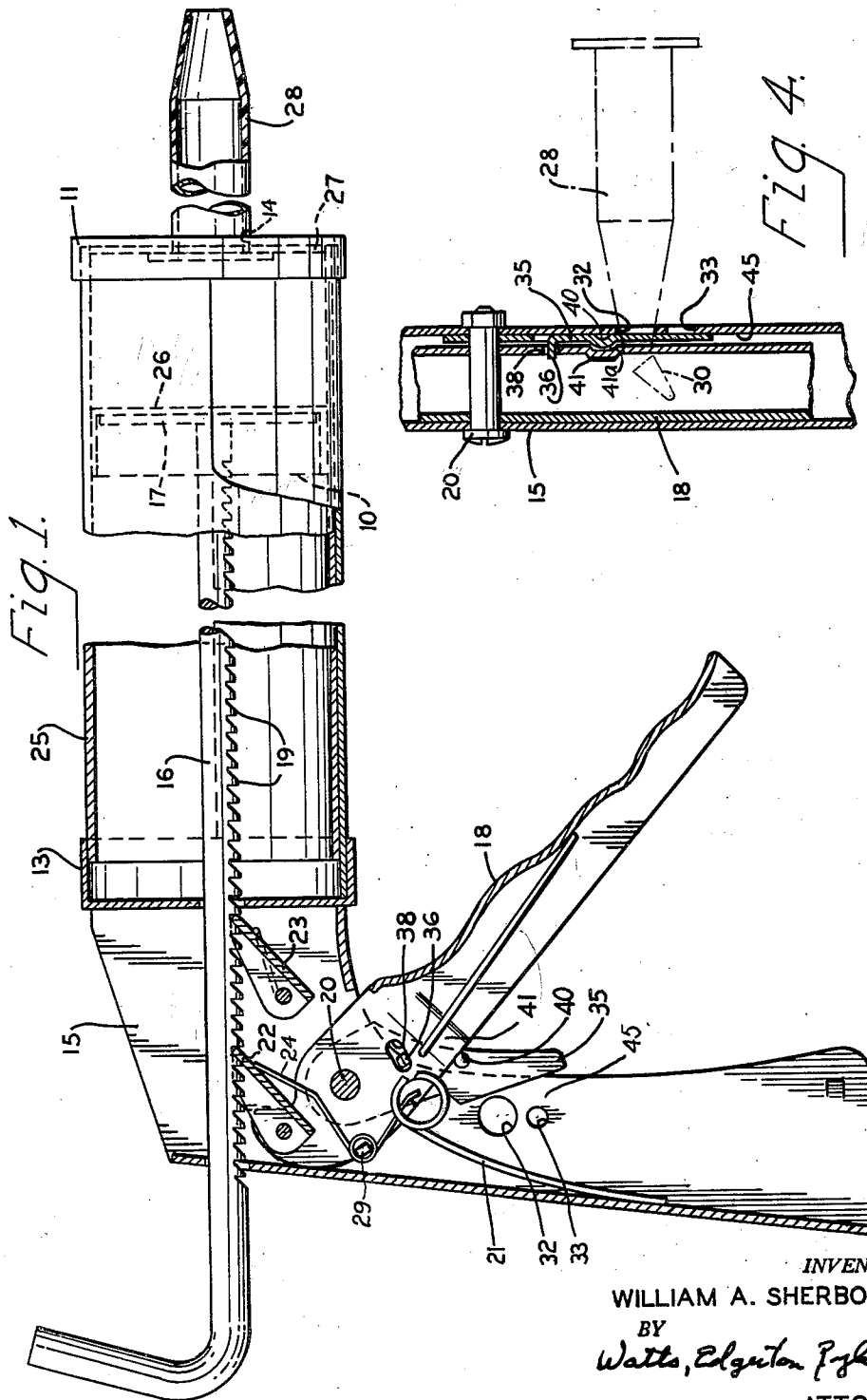
W. A. SHERBONDY

3,105,614

CALKING GUN WITH TRIMMING ATTACHMENT

Filed May 31, 1961

2 Sheets-Sheet 1



INVENTOR.
WILLIAM A. SHERBONDY
BY
Watts, Edgerton, Fyke & Foster
ATTORNEYS.

Oct. 1, 1963

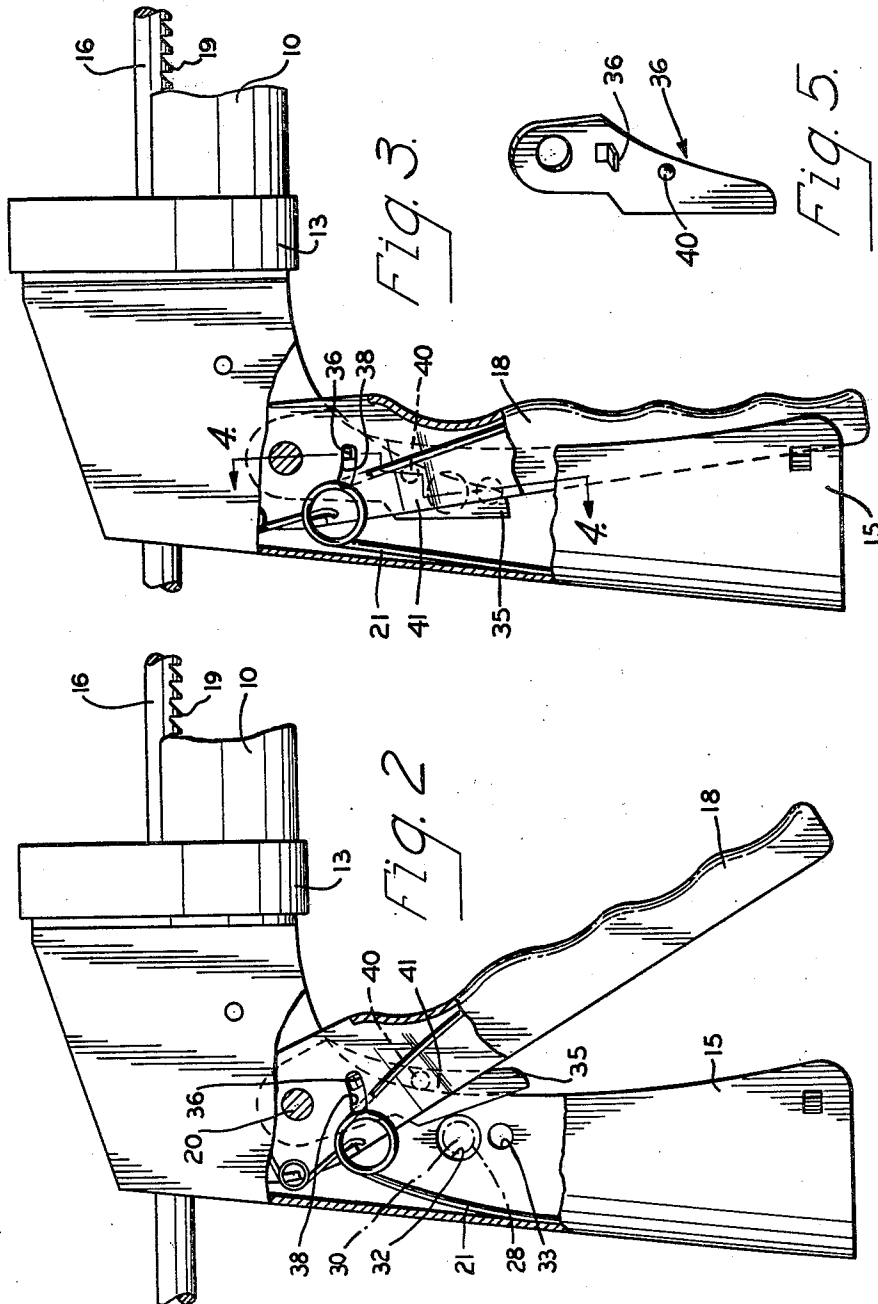
W. A. SHERBONDY

3,105,614

CALKING GUN WITH TRIMMING ATTACHMENT

Filed May 31, 1961

2 Sheets-Sheet 2



INVENTOR.

WILLIAM A. SHERBONDY

BY

Wells, Edgerton, Pyle, & Fisher

ATTORNEYS.

1

3,105,614

CALKING GUN WITH TRIMMING ATTACHMENT

William A. Sherbondy, 2517 Guilford Road,
Cleveland Heights, Ohio

Filed May 31, 1961, Ser. No. 113,786

14 Claims. (Cl. 222—82)

This invention pertains to calking guns of the type having a manually actuatable trigger.

In many applications such as around window and door frames in buildings, it is now accepted practice to fill cracks and seams with a pliable substance known as calk. This calk is usually applied by an apparatus known as a calking gun. In the usual gun, calk contained in a barrel is expelled through a nozzle outlet by a plunger. The gun has a pistol grip type handle secured to the barrel. A trigger is pivotally connected to the handle. A ratchet arrangement is interposed between the trigger and the plunger to selectively advance the plunger as the trigger is actuated.

In one class of this manually actuated type of calking gun, the calk material is contained in a disposable, usually paper, tube. An annular outlet end cap is secured to the outlet end of the tube. A nozzle is secured to the end cap. A piston is positioned within the tube to propel the calk toward the end cap and through the nozzle when pressure is applied to the piston. These tubes are selectively positionable in the barrel of the gun with the nozzle projecting past the outlet end of the barrel and the plunger positioned to propel the piston toward the outlet.

One popular type of cartridge has a funnel-like plastic nozzle, closed at its apex, which is the outlet end. These plastic nozzles, or spouts, are molded with closed outlets in order that an inexpensive and effective air seal is provided. The air seal so provided prolongs the shelf life of a tube of calking material by inhibiting its drying out.

When a tube of this type is put in use it is obviously necessary to remove the closed end of the nozzle in order to permit the calk to be expelled through the nozzle. This invention is directed to a specialized tool which is especially suited for trimming ends from such nozzles. It is a tool which is an integral part of the calking gun in order that it will always be present and available to perform its intended and specialized function.

According to this invention a cutter blade is carried on the trigger pivot. The blade and trigger are overlapped. A projection on the blade coacts with a wedge surface of the trigger to cause the blade to pivot in a shearing motion whenever the trigger is actuated. The handle has at least one, and preferably a plurality of shearing apertures. The blade is in shearing abutment with the handle and is moved across the shear apertures each time the trigger is moved through an actuation cycle. When there are a plurality of apertures they are each of a different size.

When one wishes to trim the end from a cartridge nozzle, the nozzle is positioned in a selected one of the apertures. The aperture is selected according to the diameter of the nozzle and the amount of the tip which is to be severed from the nozzle to provide an appropriately sized outlet aperture. The trigger is then compressed to bring the shear blade across the shear aperture in which the nozzle tip is positioned.

One of the features of this invention is that a wedge action is provided by the coaction of the blade projection and the trigger wedge surface. This wedge action forces the blade into tight shearing abutment with the handle even where the blade may be worn or bent. In

2

addition, if the nozzle resists shearing action for any reason, such as the wall of the nozzle being thick, the blade will slip relative to the trigger. As the blade slips relative to the trigger both the tightness of the shearing action and the mechanical advantage increase until the trigger is positioned for maximum leverage. At this point a positive drive projection on the blade abuts the trigger and the desired trimming action is effected. Thus, with the tool of this invention both a smooth even shear is obtained, and proper self-adjusting leverage is assured.

Accordingly, one of the principal objects of this invention is to provide a calking gun equipped with a novel and improved integrally formed shear especially suited for severing the tips from plastic calking cartridge nozzles.

Another object of the invention is to provide a novel and improved shear for calking nozzles which shear includes a plurality of curved shearing edges each of a different diameter whereby to accommodate nozzles of a variety of sizes.

An additional object of the invention is to provide a novel and improved calking gun shear which includes a blade which coacts with handle and trigger members and in which one of the members includes a shear edge and the other includes a means coacting with the blade to press the blade into tight shearing abutment with the other member.

A further object of the invention is to provide a calking gun equipped with handle and trigger members and a blade interposed between the members and in which the blade and one of the members have coacting slippable wedge means to permit a self-adjusting mechanical advantage to be obtained when the trigger member is pivoted relative to the handle member.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a foreshortened side elevational view with parts broken away and removed, of the calking gun of this invention;

FIGURE 2 is a fragmentary side elevational view with parts broken away and removed showing the gun handle and the shear assembly in a partially actuated condition;

FIGURE 3 is a view corresponding to FIGURE 2 with the shear assembly in the position it assumes at the conclusion of a shearing operation;

FIGURE 4 is an enlarged fragmentary sectional view of a portion of the device as seen from the plane indicated by the line 4—4 of FIGURE 3; and,

FIGURE 5 is an enlarged perspective view of the shear blade.

Referring now to the drawings, a semi-cylindrical gun barrel 10 is provided. An outlet end cup 11 is secured to the outlet end of the barrel 10. The end cup 11 is equipped with the usual U-shaped nozzle access slot 14. This outlet end is the right hand end of the gun as seen in FIGURE 1. An inlet end cup 13 and connected handle 15 are secured to the left hand inlet end of the barrel 10.

A plunger composed of a plunger rod 16 and a head 17 is provided. The plunger rod 16 is journaled in the inlet end cup 13 and the handle 15 for relative reciprocation and rotation. The plunger has a plurality of ratchet teeth 19 for sequentially advancing the plunger when a trigger 18 is actuated.

A trigger pivot 20 is connected to the handle. The trigger 18 is pivotally mounted on the pivot and biased into a rest position, shown in FIGURE 1, by a trigger spring 21. A ratchet pawl 22 is pivotally mounted on the upper end of the trigger 18 for engaging the teeth 19 and sequentially advancing the plunger whenever the trigger

3

is actuated from the position shown in FIGURE 1 to the position shown in FIGURE 3. A spring 24 is carried on a peg 29 projecting from the trigger 18. The spring 24 holds the pawl 22 in operative engagement with the ratchet teeth 19. A holding pawl 23 is mounted on the handle. The holding pawl 23 acts against the ratchet teeth 19 to hold the plunger in an advanced position.

With the gun of the type described, a disposable cartridge of calking material is utilized. The cartridge includes a tube 25 which is usually paper and a piston 26 carried in the tube. The piston 26 is for urging the calk toward the cartridge outlet when the plunger is actuated against the piston. The cartridge has an annular outlet end cap 27 secured to it. The end cap 27 carries a plastic nozzle 28. As is suggested by the phantom showing of FIGURES 2 and 4, prior to use, tip 30 of the nozzle 28 is closed. An appropriate amount of this closed tip 30 must be trimmed off before the cartridge is put to its intended use.

The handle 15 includes at least one shear aperture. In the preferred and disclosed arrangement there are two such apertures 32, 33 of different diameter. As will become more apparent from the succeeding discussion, a portion of the walls defining each such aperture serves as a curved shear edge. A shear blade 35 is mounted on the pivot 20. The blade 35 has a shear edge which coacts with the shear edges of the apertures 32, 33 to sever tips from nozzles to selected and appropriate extents.

The blade 35 is positioned between the trigger 18 and the handle 15. The blade 35 includes a positive drive projection 36 which extends inwardly. The trigger 18 includes a curved drive slot 38 in which the drive projection is disposed. The blade also includes a dome-like, inwardly extending actuation projection 40. The actuation projection 40 coacts with and acts against a wedge portion 41 provided on the trigger 18. The wedge portion 41 is a depression formed in the metal surface of the trigger 18 and includes a sloping, or tapered, wedge surface 41a. The taper of the wedge surface 41a extends from the plane of the trigger surface to a maximum depth at the back edge of the trigger 18. The wedge surface 41a is best seen in FIGURE 4 as FIGURES 1 to 3 show only the back, or raised inside surface, of the depressed wedge portion 41.

When a tip 30 is to be trimmed from a nozzle 28, the nozzle tip is first positioned in a selected one of the shear apertures 32, 33. In the illustrations of FIGURE 2, the tip 30 is positioned in the larger of the shear apertures 32. Next the trigger 18 is actuated and caused to pivot inwardly from the position of FIGURE 1 toward the position of FIGURE 2. As the trigger moves inwardly, the actuation projection 40 will enter, and engage, the depressed wedge surface 41a.

The trigger will continue to move relative to the blade 35 until the friction of the actuation projection and the wedge surface are sufficient to cause the blade to commence to move inwardly about the pivot 20 with the trigger. The blade and trigger continue to move inwardly until the position of FIGURE 2 is reached and the blade abuts the nozzle tip 30.

Once the blade 35 has come into abutment with the nozzle tip 30 the blade pivotal motion will stop while the trigger continues to move inwardly. As the trigger moves inwardly relative to the blade, the amount of overlap of the two increases and simultaneously the actuation projection 40 slides up the tapered wedge surface 41a. As the actuation projection slides up the wedge surface, the blade is caused to shift to the right, as seen in FIGURE 4, into tight shearing abutment with inner shear face 45 of the handle 15. Simultaneously, as the blade is being biased into tight abutment with the shear face 45, the mechanical advantage of the trigger relative to the shear edges is changing and the leverage is increasing.

If the walls of the tip 30 being cut are relatively thin, the coaction of the actuation projection and the wedge

4

surface may cause the tip to be trimmed off. Normally however, the tip will resist shearing by the drive provided by this projection-wedge coaction alone. The positive drive needed to effect most trimming operations is provided by the coaction of the positive drive projection 36 and the drive slot 38.

The drive slot 38 is sized such that its end will come into contact with the drive projection 36 when the relative movement of the shear blade 35 and trigger has provided the described tight shearing abutment and the trigger has assumed a position where maximum leverage may be obtained. This is essentially the position of FIGURE 2. The continued inward movement of the trigger will drive the blade 35 with it. At this point the shear edge of the blade and the shear edge of the aperture 32 will coact to trim the tip 30 from the nozzle 28, moving the blade to the position of FIGURE 3. FIGURE 4 shows a cross-sectional view of the position of the blade 35 immediately after trimming the tip 30 from the nozzle 28.

The described construction has the advantage of assuring good tight shearing abutment of the blade and the handle even though the blade or other parts may be worn and even though the blade may be bent or otherwise distorted. In addition the construction also has the advantage of assuring the obtainment of the shearing action with maximum trigger leverage. Another and less apparent advantage is present. This advantage is that the blade is maintained in a relatively safe and shielded position even though the trigger is pivoted a substantial distance inwardly to obtain high leverage before shearing is accomplished.

This shielding is obtained because the blade does not maintain its full overlapped position of FIGURE 3 when the trigger returns to its normal and rest position of FIGURE 1. Rather, because of the friction between the blade 35 with the shear surface 45, the blade slips relative to the trigger as the trigger returns from the position of FIGURE 3 to the position of FIGURE 1. The result is that the blade assumes the shielded rest position shown in FIGURE 1. In this position the blade is properly positioned for another shearing operation and at the same time substantially completely protected by the handle so that there is little danger of injury either to an operator or to the blade. Further, especially since few operators fully depress the trigger when applying calk, the blade and the remainder of the trimming assembly in no way interfere with the normal operation of the gun in applying calk.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed:

1. A calking gun including a barrel having a reciprocable plunger and a pistol group type handle secured to the barrel, a pivot carried by the handle, a trigger member pivotally mounted on the pivot, means interposed between the trigger member and the plunger to advance the plunger each time the trigger member is actuated, a blade member pivotally mounted on the pivot and including a shear edge, said handle including a shear edge, the blade member being interposed between the handle and the trigger member and positioned for shear edge coaction when the trigger is pivoted about the pivot, said members having adjacent surfaces overlapping in an overlap area, one of the members including an actuation projection projecting from one of its surfaces and abutable against the other of the members in said overlap area, said other member including a projection abutment wedge surface inclined relative to its surface and arranged to provide gradually increasing tighter abutment with said

5

actuation projection as the size of said overlap area is increased, and said trigger member being movable about the pivot toward and away from the handle to selectively advance the plunger and selectively bring the projection and wedge surface into coacting abutment and thereby cause simultaneous pivoting of the blade member.

2. The device of claim 1 wherein said projection is a part of the blade member and said trigger member includes said wedge surface.

3. In a calking gun having trigger and handle connected to a pivot for pivotal movement of the trigger relative to the handle and a calk expelling plunger assembly operatively associated with the trigger member, the improvement for trimming the tips from resilient cartridge nozzles, said improvement comprising; a blade pivotally mounted on said pivot and interposed between the trigger and handle, said blade and said handle having coacting shearing surfaces, said trigger being pivotal from a full open position away from said handle to a closed shear position adjacent said handle, said blade including an actuation projection and a positive drive projection, said trigger including a depressed wedge surface adapted for coaction with said actuation projection to move said blade toward said handle in tight shearing relation when the trigger is pivoted toward the handle, said depressed wedge surface being inclined from a maximum depth at an entrance end to a minimum depth in the plane of the trigger surface, said actuation projection being disposed at the entrance to the wedging surface when said trigger is in the full open position and said actuation projection being disposed on the upper portion of the incline when said trigger is in the closed shear position, said incline frictionally coacting with said actuation projection to pivot said blade toward said handle shearing surface as the trigger is pivoted toward the handle, said trigger including a positive drive slot, said positive drive projection being disposed in said slot, and said positive drive projection engaging the back of said slot when said blade is tightly against the handle shearing surface to positively drive said blade across said handle shearing surface as the trigger is pivoted toward the handle.

4. In combination, a calking gun having a handle, a trigger pivotally mounted on the handle, a calk expelling plunger mechanism operatively connected to the trigger, a blade movably mounted between the trigger and the handle, said blade and said handle having coacting shearing surfaces, said trigger being pivotal from a full open position away from the said handle to a closed shear position adjacent said handle, said blade including an actuation projection and a positive drive projection, said trigger including a depressed wedge surface adapted for coaction with said actuation projection to move said blade toward said handle in tight shearing relation when the trigger is pivoted toward the handle, said depressed wedge surface being inclined from a maximum depth at an entrance end to a minimum depth in the plane of the trigger surface, said actuation projection being disposed at the entrance to the wedging surface when said trigger is in the full open position and said actuation projection being disposed on the upper portion of the incline when said trigger is in said closed shear position, said incline frictionally coacting with said actuation projection to move a blade shearing surface toward said handle shearing surface as the trigger is pivoted toward the handle, said trigger including a positive drive slot, said positive drive projection being disposed in said slot, and said positive drive projection engaging the back of said slot when said blade is tightly against the handle shearing surface to positively drive said blade across said handle shearing surface as the trigger is pivoted toward the handle.

5. The device of claim 4 wherein said handle shearing surface includes a plurality of arcuate shear edges each of a different radius of curvature and said plurality of arcuate shear edges being arranged in ascending order of

6

size with the largest at the point of maximum shearing force relative to the smallest.

6. The device of claim 4 wherein said blade is pivotally mounted to said handle.

7. The device of claim 6 wherein said handle shearing surface includes a plurality of arcuate shear edges each of a different radius of curvature and said plurality of arcuate shear edges being arranged in ascending order of size away from the blade pivot with the largest at a point of maximum shearing force relative to the smallest.

8. In combination a calking gun having a handle member, a trigger member pivotally mounted on the handle member, a calk expelling plunger mechanism operatively connected to the trigger member, a blade pivotally mounted between the trigger and handle members, said blade and one of the members including shear edges coactable to provide a shearing action, said members being pivotal in closing movement from a full open position to a closed shear position, and said blade and other of said members including time delay means permitting relative movement of the blade and the other member during the initial portion of the closing movement of the members before commencement of the shearing action and causing said blade to move with said other member relative to the one member during the remaining portion of such closing movement to effect said shearing action.

9. The device of claim 8 wherein said blade and said other member include coacting wedge means urging said blade into increasingly tighter shearing engagement with the one member as said closing movement progresses during its initial portion so that said shear edges are in tight shearing relation during the remaining portion of the closing movement.

10. In combination a calking gun having a handle member, a trigger member pivotally mounted on the handle member, a calk expelling plunger mechanism operatively connected to the trigger member, a blade movably mounted between the members, said blade and one of the members including coacting shear edges, said members being pivotal in closing movement from a full open position to a closed shear position, said blade and the other of said members including coacting means to cause shearing movement of the blade relative to the one member when the members are pivoted in such closing movement, said blade including an actuation projection, said trigger including an inclined wedge surface adapted for coaction with said actuation projection to move said blade toward said handle in gradually increasing tight shearing relation when the trigger is pivoted toward the handle, said actuation projection being disposed in the lowermost portion of said inclined wedge surface when said trigger is in full open position and said actuation projection being disposed on the upper portion of the incline when said trigger is in the closed shear position whereby said actuation projection coacts with said inclined surface to urge the blade into increasingly tighter shearing engagement with said one member and to move said blade relative to said handle as the closing movement progresses.

11. In combination, a calking gun having a handle, a pivot on said handle, a trigger pivotally mounted on said pivot for pivotal movement relative to the handle, a calk expelling plunger mechanism operatively connected to the trigger, a blade pivotally mounted on the pivot and interposed between the trigger and the handle, said blade and said handle including coacting shear edges, said trigger including an inclined wedge surface and said blade including an actuation projection coacting with said wedge surface and moving up said incline to move said blade into gradually increasing tight shearing relation with said handle shear edge as the trigger is pivoted toward the handle, said trigger including a positive drive slot, said blade including a positive drive projection coacting with said slot to provide a time-delayed positive drive connection between the trigger and said blade, and said positive

drive projection and said slot being dimensioned to cause said trigger to positively drive said blade as said trigger is pivoted towards said handle after said wedge surface has moved said blade in a tight shearing relation with said handle shear edge.

12. In combination, a calking gun having a handle, a pivot on said handle, a trigger pivotally connected to said pivot and pivotal in closing movement from a full open position away from said handle to a closed shear position adjacent said handle, a calk expelling plunger mechanism operatively connected to said trigger, a blade movably mounted between said trigger and said handle, said blade and said handle including coacting shear edges, said blade and said trigger including wedge portions coacting to move said blade in gradually increasing tight shearing relation with said handle shear edge as the trigger is pivoted toward the handle during the initial portion of the closing movement, said blade and said trigger including other coacting portions to form a drive connection, said coacting portions having a lost-motion relation during the initial portions of the closing movement of said trigger towards said handle and a positive drive relation during the remaining portions of the closing movement of said trigger towards said handle, whereby said blade is moved into increasingly tight shearing relation with said handle during the initial portions of said closing movement and is driven across said handle shear edge during the remaining portion of said closing movement.

13. In combination, a calking gun having a handle, a trigger pivotally mounted on the handle, a calk expelling plunger mechanism operatively connected to the trigger, a blade pivotally mounted on said pivot and interposed between said trigger and said handle, said blade and said handle having coacting shearing surfaces, said trigger being pivotal for closing movement from a full open position away from said handle to a closed shear position adjacent said handle, said blade and said trigger including coacting wedging means to move said blade toward said handle during the initial portions of said closing movement so that the shearing surfaces are in tight shearing relation during the remaining portions of said closing movement, said blade and said trigger including coacting portions forming a lost-motion connection permitting relative movement of the blade, trigger and handle during the initial portions of said closing movement, and said coacting portions locking to form a positive drive connection causing the blade to move with said trigger member during said remaining portions of said closing movement.

14. A cutter comprising a handle, a trigger, a pivot connecting the trigger to the handle for pivotal movement of the trigger relative to the handle, a blade pivotally mounted on said pivot and interposed between the trigger and the handle, said blade and said handle having coacting shearing surfaces, said trigger being pivotal from a full open position away from said handle to a closed shear position adjacent said handle, said blade including an actuation projection and a positive drive projection, said trigger including a depressed wedge surface adapted for coaction with said actuation projection to move said blade toward said handle in tight shearing relation when the trigger is pivoted toward the handle, said depressed wedge surface being inclined from a maximum depth at an entrance end to a minimum depth in the plane of the trigger surface, said actuation projection being disposed at the entrance to the wedging surface when said trigger is in the full open position and said actuation projection being disposed on the upper portion of the incline when said trigger is in the closed shear position, said incline frictionally coacting with said actuation projection to pivot said blade toward said handle shearing surface as the trigger is pivoted toward the handle, said trigger including a positive drive slot, said positive drive projection being disposed in said slot, and said positive drive projection engaging the back of said slot when said blade is tightly against the handle shearing surface to positively drive said blade across said handle shearing surface as the trigger is pivoted toward the handle.

References Cited in the file of this patent

UNITED STATES PATENTS

190,784	Schultze	May 15, 1877
222,672	Conover	Dec. 16, 1879
323,028	Ducker	July 28, 1885
512,451	Shultz	June 9, 1894
1,085,793	Boettger	Feb. 3, 1914
1,159,246	Monard	Nov. 2, 1915
2,102,939	Bishop	Dec. 21, 1937
2,112,790	Scharnewski	Mar. 29, 1938
2,120,531	Sichere	June 14, 1938
2,659,517	Reinhardt	Nov. 17, 1953
2,768,768	Cornell et al.	Oct. 30, 1956
2,786,604	Collins	Mar. 26, 1957

FOREIGN PATENTS

537,964	Germany	Nov. 2, 1930
---------	---------	--------------