Dec. 15, 1942. C. L. COATES 2,305,238

CAULKING GUN

Filed Dec. 5, 1938

Fig. 1

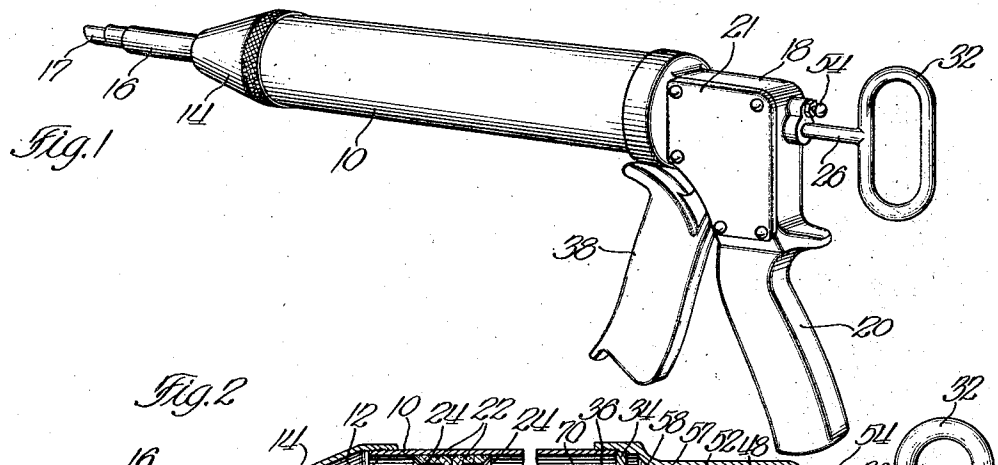


Fig. 2

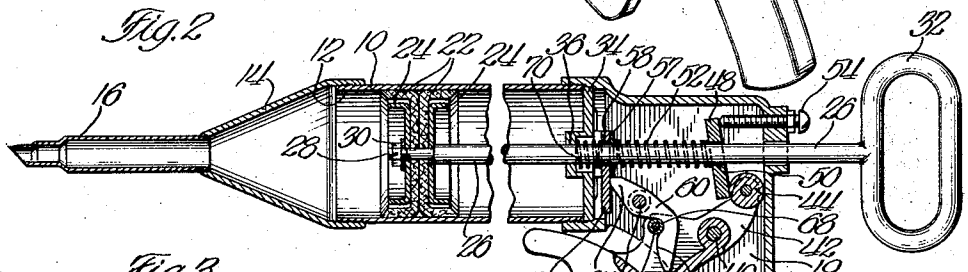


Fig. 3

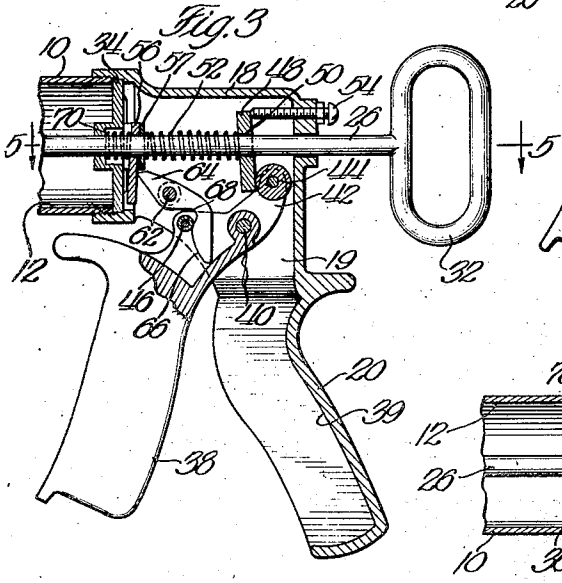


Fig. 4

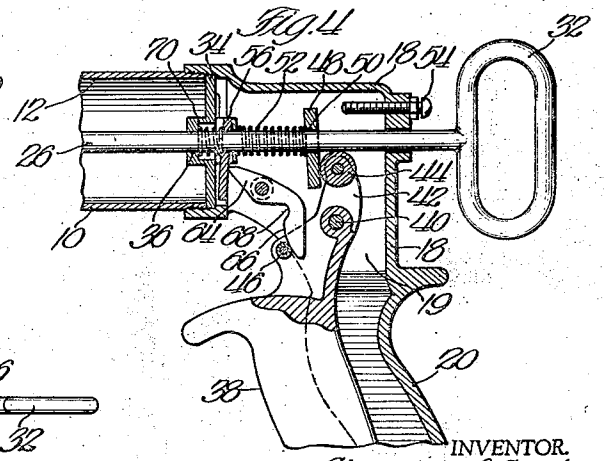
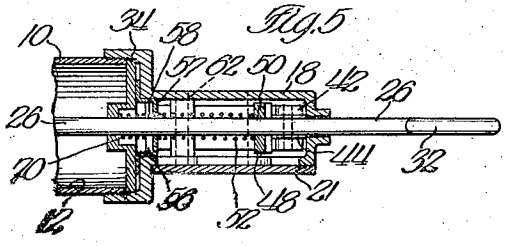


Fig. 5



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CALKING GUN

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8 Claims. (Cl. 74—169)

My invention relates to dispensing guns and particularly a type of gun known as a calking gun adapted to insert calking material into a joint.

Among the objects of my invention is the provision of a new and improved manually operated calking gun which is adapted to be conveniently handled and built for exerting considerable pressure upon a reservoir of the calking material to force it in limited governable quantities from the gun into a joint to be calked.

Another object is the provision of a new and improved calking device incorporating a cylinder and piston arrangement together with a mechanism adapted to apply force against the piston rod in order to force it through a calking stroke which includes a cam block means pierced by the rod adapted to be tilted so as to grip the rod and drive it through the calking stroke.

Still another object is the provision of a cam means for operating a piston rod which includes a set of cams pierced by the rod in such a manner that one cam may be tilted to grip the rod and drive it through a calking stroke while the other cam is tilted slightly forming a resistance to motion of the rod so that when a cam actuating mechanism is withdrawn preparatory to making a second stroke the other cam will maintain a sufficient grip upon the rod to prevent it from withdrawing from its advanced position.

A further object is to provide a new and improved cam block on the piston rod which is normally tilted at an angle so as to provide edges sharper than 90° for gripping the piston rod during an actuating motion in order that a non-slipping positive grip may be achieved, the gun being further provided with an adjustment for properly positioning the actuating cam block upon release from an actuating position in order that the axis of the aperture therethrough may be concentric and parallel with the axis of the piston rod to permit the latter to be freely withdrawn during a loading operation.

A further object still is the provision of an actuating mechanism for the piston rod of a calking gun which incorporates a pair of actuating devices, one adapted to force an actuating cam block into engagement with a piston rod and drive it through a dispensing stroke and another cooperable with the first adapted to maintain its position relative to a retaining cam block while maintaining a fixed adjustment relative to the first device so that only a limited resistant binding will be applied against the rod for braking purposes and which is further constructed in a manner such that the braking action may be removed by automatic return of the mechanical portions of the device to an initial position to permit withdrawal of the piston and piston rod during a loading stroke.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view of my device.

Figure 2 is a longitudinal sectional view of my device showing the actuating parts in retracted position.

Figure 3 is a fragmentary longitudinal view in section showing the actuating parts in the beginning of a dispensing stroke.

Figure 4 is a fragmentary longitudinal view in section showing the actuating parts in the completion of a dispensing stroke.

Figure 5 is a top view in section taken on the line 5—5 of Figure 3.

In the manufacture of calking guns it is convenient to have a gun of substantial capacity which at the same time can be easily carried about and manually operated. Such a gun moreover must since manually actuated be provided with a means of multiplying the manual force sufficient so that a considerable pressure can be put upon a reservoir of calking material, which is frequently of a rather viscous and nonflowing character, in order that the calking material may be injected into a joint with sufficient force so as to properly fill it.

In the embodiment of my device shown herein there is provided a barrel or cylinder 10 forming a reservoir 12 for the calking material, said barrel or cylinder being provided with a filler cap 14 terminating in a dispensing projection 16 and an applicator nozzle 17 from which the calking material is ejected into a joint.

The gun as a unit includes a frame or casing 18 at the opposite end of the cylinder provided with a hollow central portion 19 closed by a cover 21. A stationary handle or grip 20 is secured to the casing adapted to be grasped by the user. In the cylinder there is provided a piston formed with two oppositely positioned cups 22 of some pliable semiresilient material held in place by a pair of correspondingly positioned metal cups 24. These are held together by means of a piston rod 26 having a reduced end portion 28 piercing the cups which are held thereon by a lock nut 30,

The piston rod **26** terminates in a handle **32** by means of which the rod and piston may be withdrawn during a loading operation which is ordinarily accomplished by removing the cap **14** and filling the cylinder with a calking material. During a dispensing stroke the piston is moved in an opposite direction or in a direction from right to left as viewed in the drawing.

The cylinder head is closed by a cap **34** which need not be tightly sealed, the cap being provided with an aperture **36** to admit the piston rod **26**.

For forcing the piston rod through a forward or ejecting stroke there is provided a movable handle **38** pivoted to the casing **18** within the open central portion **19** by a pin **40**. As it pivots the movable handle is designed to be received into an opening **39** within the grip **18**. This handle is provided with a projection **42** on which is positioned a roller **44**, and a pin **46**, the purpose of which will be subsequently described. The actuating handle member is adapted to pivot freely about the pivot pin **40**.

To supply a driving engagement with the piston rod **26** there is provided a cam block **48** which has a central hole **50** pierced at an angle relative to the face of the block in order to provide sharp edges for gripping the piston rod. The cam block is urged to a released position such as that shown in Figure 2 by means of a coiled spring **52**. An adjusted screw **54** is provided for setting the angular position of the cam block **48** when the mechanism is released, so that the axis of the aperture **50** may lie coincident with the axis of the piston rod **26** in order to permit the piston rod to be freely withdrawn. During the actuating stroke when the actuating handle **38** is pivoted the roller **44** is pivoted against the lower inclined side of the cam block **48** tending to tilt the block slightly toward a vertical position thereby causing the edges to bite into the piston rod and drive it through a dispensing stroke until limited by completion of forward motion of the actuating handle. During this actuating operation the roller **44** rolls over the contacted surface of the cam block **48** so that there will be no additional binding difficulty.

During the dispensing stroke the motion of the piston rod is resisted slightly by means of a locking cam block **56** which is provided with an aperture **58** at substantially right angles to its faces pierced by the piston rod **26**. When tilted slightly, the locking cam block is adapted to occupy a releasable locking position. A bracket **57** holds the cam block in place against which it is urged to a normally disengaged position by means of a coiled spring **70**.

There is provided in addition a pawl **60** pivoted upon a pin **62** in the casing **18** having an extension **64** adapted to contact with the lower side of the locking cam block **56** in order to tilt it slightly. The locking cam block, however, is not designed to be tilted sufficiently to prevent sliding of the piston rod through its aperture. In order that the pressure thereon may be kept constant throughout a feeding stroke the pawl **60** is provided with a cam track **66** which has a curved surface such that it forms an arc of a curved track drawn about the pin **40** as a center. The cam track is provided at one end with a recess **68**. For actuating the pawl there is provided the pin **46** which is movable by the actuating portion of the handle. The locking cam block is designed to be continually urged to a released position by means of the spring **70**.

Operation

In operation the actuating handle grip **38** first occupies the position shown in Figure 2 to which it is forced by means of the coiled spring **52** pressing against the actuating cam block **48**. In this position the actuating cam block is tilted as shown, the adjusting screw **54** being adjusted in such a manner that the central biased aperture in the cam block **48** is concentric with the axis of the piston rod. In the same position the pin **46** is received in the recess **68** provided for it at the end of the cam track. This also provides a release for the pawl **60** in such a manner that the locking cam block may be free to permit the piston rod to be withdrawn. The coiled spring **52** when urging the actuating cam block toward an inoperative position likewise urges the actuator handle **38** to a position for beginning a dispensing stroke.

When the actuating handle grip is manually actuated by pulling it backwards against the stationary hand grip the extension bearing the roller **44** presses against the lower tilted side of the actuating cam block tending to tilt it slightly and in so doing force the piston rod **26** through its dispensing stroke. At the same time, the pin **46** is drawn out of the recess **68** and made to travel along the cam track **66**, the location of which is positioned such that the extension **64** of the pawl is then pressed just slightly into contact with the locking cam block. Due to the mechanical advantage of the pivoted part **5** a considerable force is exerted upon the piston rod in order to force the piston through a dispensing stroke.

As the actuating stroke is continuing the pin **46** rides over the cam track **66** maintaining the pawl **60** in the position first assumed without pressing it any tighter against the locking cam block. In the meantime the extension **42** and roller **44** together with the actuating cam block **48** move the rod and piston through a full dispensing stroke, the completed position of which is shown in Figure 4. When the actuating handle is then released all of the pivoting parts are returned to their initial position and the coiled springs **52** and **70** push the cam blocks into their proper released position. After the piston rod and piston have been driven completely through a succession of dispensing strokes sufficient to empty the cylinder it then becomes necessary to refill the cylinder. Therefore, with the actuating parts in a released position such as shown in Figure 2 both of the cam blocks are spring pressed into such a position that the axes of their perforations are parallel to the axis of the piston rod **26**. Then by means of gripping the handle **32** of the piston rod the rod can be slid through the perforations in order to withdraw the piston while the nozzle **17** and cap **14** are removed for filling the cylinder with a calking preparation preparatory to another succession of dispensing strokes.

There has therefore been provided a convenient manually actuated high pressure calking gun incorporating a simplified mechanism adapted to drive it through a succession of dispensing strokes which includes a locking means for preventing the retraction of the piston during any of the succession of dispensing strokes, there being also provided a convenient means for releasing the mechanism in order that the gun may be refilled.

Some changes may be made in the construc-

tion and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure, or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a reciprocating piston device comprising a barrel and a piston having an extension mounted reciprocably therein, a mechanism cooperable with the piston providing for retracting the piston and for forcing the piston in an opposite direction comprising a stationary grip and an actuator member movably mounted thereon, an actuator cam block positioned in gripping relation with the piston extension and an extension on the actuator member adapted to shift the relative position of said actuator cam block into gripping position on the piston extension and to move it through a dispensing stroke, a locking cam block positioned in gripping relation with said piston extension adapted to be shifted to a sliding grip position therewith for checking retraction of the piston after a dispensing operation, a lock shifting member movably mounted upon the stationary grip adapted to shift the position of said locking cam and a shifting element on the actuator member cooperable with said lock shifting member to hold said locking cam block in locking position during retraction of the actuator cam block.

2. A reciprocating piston device comprising a barrel and a piston therein, a reciprocating rod for manually retracting the piston and a manually operated mechanism cooperable with the rod for forcing the piston in an opposite direction, said mechanism comprising a stationary grip and an actuator member movably mounted thereon, an actuator cam block having a portion positioned around the rod and an extension on the actuator member to tilt said actuator cam block into gripping relation with the rod and to force it through a dispensing stroke, a locking cam block having a portion positioned around the rod adapted to be tilted into a sliding grip relation with the rod for checking retraction of the rod after operation in said opposite direction, a pawl movably mounted upon the stationary grip provided with a portion for tilting said locking cam block and with a cam track, a cam on the actuator handle slidable on said track to hold said locking cam block in locking position during reciprocation of the actuator cam block.

3. A reciprocating piston device comprising a barrel and a piston therein, a rod for manually retracting the piston and a manually operated mechanism cooperable with the rod for forcing the piston in an opposite direction, said mechanism comprising a stationary grip and a movable actuator handle pivotally attached thereto, a reciprocating actuator cam block having an aperture positioned around the rod and an extension on the handle adapted to be moved against said actuator cam block to tilt it from an initial position into gripping relation with the rod and to force it through a stroke in said opposite direction, and means for returning it to the initial position, a locking cam block having an aperture positioned around the rod adapted to be tilted to a sliding grip relation with the rod for checking retraction of the rod after an operation in said opposite direction, a pawl pivoted to the stationary grip provided with an extension for tilting said locking cam block and with a cam track, a cam on the actuator handle slidable on said track to hold said locking cam block in a sliding grip position during reciprocation of the actuator cam block.

4. In a reciprocating device mounted on a frame having a reciprocating rod therein, a rod locking mechanism comprising a locking device for releasably holding the piston during reciprocation thereof comprising an actuator handle movably connected to the frame, a cam thereon, a pawl movably mounted relative to the frame provided with a projection and with a cam track, and a locking cam block having an aperture therein pierced by the piston rod adapted to be tilted to a slidable rod gripping position by action of the projection thereagainst while the cam passes over said track, said pawl having a recess adjacent the cam track adapted to receive the cam to release the pawl from the cam block so that the rod is free to shift endwise through said aperture.

5. In a reciprocating device mounted on a frame having a reciprocating rod therein, a releasable rod locking mechanism comprising a locking device for releasably holding the rod during reciprocation thereof comprising an actuator handle pivotally connected to the frame, a cam thereon, a pawl movably mounted on the frame provided with a projection at one side and with a cam track at another side, a locking cam block having an aperture therein pierced by the rod adapted to be tilted to maintain a constant slidable rod gripping position by action of the projection thereagainst while the cam passes over said track, said pawl having a recess adjacent the cam track adapted to receive the cam to release the pawl from the cam block and a spring for pressing said cam block to a normal nongripping position so that the rod is free to shift endwise through said aperture.

6. In a reciprocating device including a barrel, a piston in the barrel having a rod attached thereto for manipulating it, an actuating mechanism for forcing the piston through a motion in one direction and a stationary grip, the combination of a locking device for maintaining the advance of said piston comprising a movable actuator handle having a pivot pin connecting it to the stationary grip, a cam roller on the handle, a pawl pivoted to the stationary grip provided with a projection at one side and a cam track at the opposite side curved about the pivot pin as a center point, a locking cam block having an aperture therein pierced by the piston rod adapted to be tilted to a slidable rod gripping position by action of the pawl projection thereagainst while the cam roller is rolled along, said cam track having a recess adapted to receive the roller in a normal nongripping position wherein the pawl is withdrawn from the cam block, and a spring for pressing said cam block to the normal nongripping position so that the rod and piston may be freely withdrawn in the opposite direction.

7. In a plastic material dispenser having a piston rod adapted to be impelled forwardly to expel the material and to be retracted when the dispenser is to be refilled; a gripping member for actuating said piston rod, automatic means for returning said gripping member to an inoperative position, a hand lever having a portion engaging said rod gripping member to actuate the same; and means for preventing improper return movement of the piston rod comprising a plate member adapted to hold said piston rod against improper rearward movement, an abut-

ment against which said plate member rests in its inoperative position, automatic means for returning said plate member to its inoperative position, and means operated by the hand lever for impelling said plate member to its operative position.

8. In a plastic material dispenser having a piston rod adapted to be impelled forwardly to expel the material and to be retracted when the dispenser is to be refilled; the means for actuating said piston rod comprising a gripping member having an aperture through which said piston rod extends, said aperture being slightly larger than the diameter of the piston rod whereby when said member is tilted the piston rod will be gripped thereby, a spring bearing against said gripping member and adapted to return the same automatically to an inoperative position, a hand lever having a portion engaging said rod gripping member and adapted to first tilt the same to rod gripping position and thereafter to impel the same forwardly; and means for preventing improper return movement of the piston rod comprising a plate member having an aperture through which said piston rod extends, said aperture being slightly larger than the diameter of the piston rod whereby when said plate member is tilted said piston rod will be held against improper rearward movement, an abutment against which said plate member rests in its inoperative position, a spring bearing against said plate member and adapted to return the same automatically to its inoperative position, a lever having a portion engaging said plate member and adapted to first tilt the same and then impel it forwardly to its operative position, said lever being actuated by a member carried by the hand lever and being shaped to maintain said plate member in its operative position during subsequent rod operating movements of the hand lever.

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