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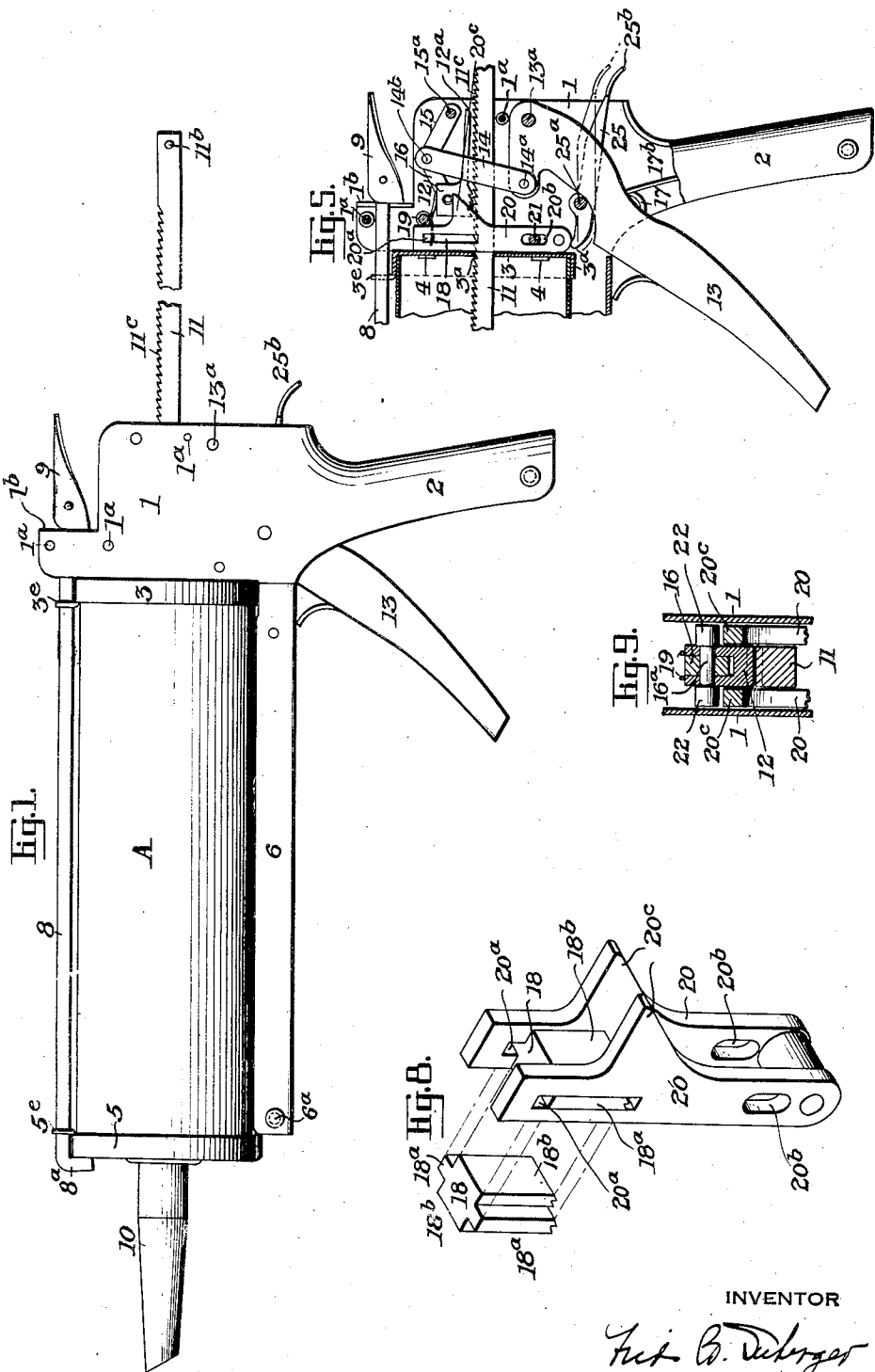
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RATCHET MECHANISM

Filed July 6, 1936

2 Sheets-Sheet 1



INVENTOR

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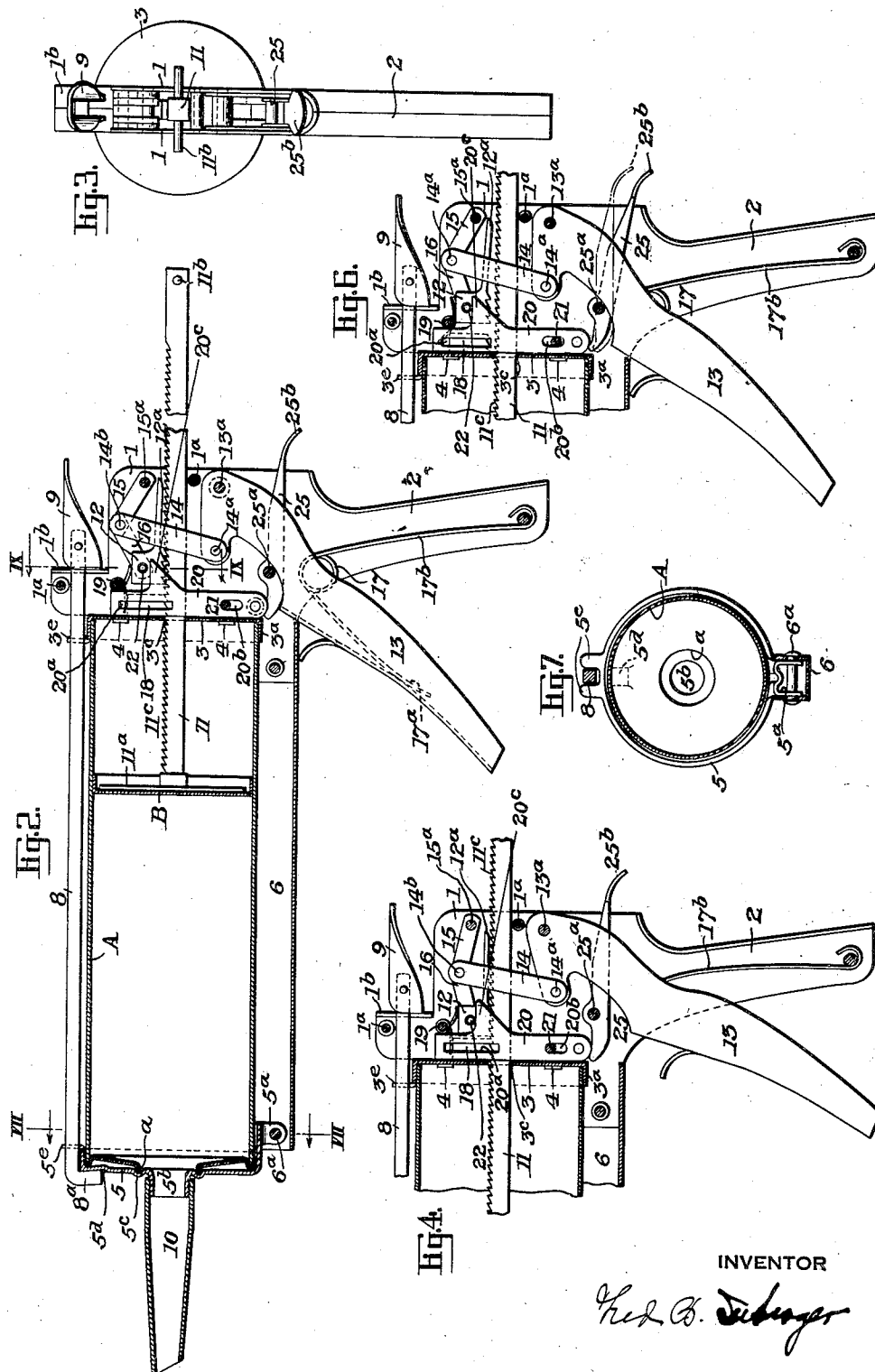
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## RATCHET MECHANISM

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8 Claims. (Cl. 74—148)

This invention relates to apparatus of the type generally known as calking or grease guns, and comprises a structure or frame of skeleton type having a pistol-grip stock, particularly designed for use with a cylindrical cartridge or container in which various types of putty and calking material, paints, etc., or grease or other oleaginous material may be packed for shipment; such container or cartridge being adapted to be mounted in the skeleton frame, and manually operated co-acting mechanism carried by the skeleton frame whereby the contents of such container or cartridge may be discharged through a suitable nozzle in a controlled manner.

The general construction of the skeleton frame forming part of the structure of the present invention is substantially the same as that shown and described in my application, filed July 15, 1933, Serial No. 680,539, (now Patent No. 2,090,644, dated August 24, 1937).

One object of the present invention is to provide improved means, manually operated, for effecting discharge of the contents of a prefilled cartridge or container.

A further object of the invention is to provide simple and readily operable means for resetting the mechanism employed to effect discharge of such cartridge or container.

And a further object of the invention is to provide an improved form of container having an end wall with a central aperture; said aperture being closed by suitable means for transport and having a flange adapted to enter an annular recess in a nozzle-carrying member of the calking gun structure and form sealing engagement therewith.

These and other features of the invention are more fully described hereinafter; reference being had to the accompanying drawings, in which:

Figure 1 is a view representing a side elevation of calking apparatus within the scope of the present invention.

Fig. 2 is a longitudinal sectional view of the structure shown in Fig. 1.

Fig. 3 is an end view.

Fig. 4 is a fragmentary sectional view of a part of the structure illustrated in Fig. 2; showing parts of the mechanism in a different position.

Figs. 5 and 6 are similar views, illustrating parts of the mechanism in other positions.

Fig. 7 is a sectional view on the line VII—VII, Fig. 2.

Fig. 8 is a perspective view illustrating a detail of the invention, and

Fig. 9 is a fragmentary sectional view illustrating another detail of the invention, taken on the line IX—IX, Fig. 2.

The extruding apparatus forming the subject of this invention comprises a skeleton frame including a body portion having a pistol grip stock or handle and a forwardly projecting member constituting a support for a pivotally mounted seat for the discharge end of a cartridge containing the material to be discharged; such stock also carrying a cupped receptacle or seat receiving the rear end of said tubular cartridge or container. In order that such cartridge or container may be properly positioned and operatively held in the skeleton frame, one of the seats is fixed to the body of the same, while the opposite seat, which is centrally apertured, is pivotally mounted at the end of the forwardly projecting supporting member and is movable with respect thereto on such pivotal connection to permit insertion and removal of a cartridge or container. A locking bar carried by the body portion of the frame extends over the container or cartridge substantially parallel with respect to the forwardly projecting supporting member, and such locking bar has a hook at its end which engages and holds the pivotally mounted seat in position against one end of the cartridge or container; such action firmly clamping the opposite end of such container or cartridge in the fixed seat.

The tubular cartridge or container for use with my improved calking gun is indicated at A, and carries at one end a movable wall B, which may serve as a piston to force the contents of the same out through its opposite and apertured end and through the registering aperture in the movably mounted seat, under the action of a piston-impelling member carried by the skeleton frame. This piston-impelling member includes a plate carried at the end of a toothed rod which passes through the fixed seat, and the handle portion of the skeleton frame is provided with a trigger member operatively associated with means in engagement with said toothed rod whereby the latter may be moved to cause the piston-impelling member to act upon the piston within the container to discharge its contents.

The skeleton frame or support for the tubular container or cartridge includes a portion which may be termed the stock, constructed of two pieces of sections 1, 1, which may be of pressed metal of the same size and shape but of right and left contour, and these sections may be riveted, as indicated at 1<sup>a</sup>, or otherwise secured together. The stock has a pistol grip or handle 2, and at

its inner end and substantially directly above this pistol grip a flanged disk 3 is mounted; such disk constituting fixed seat for one end of the tubular cartridge A, such as that illustrated in Figs. 1 and 2; filled with fluent material to be discharged by pressure applied to the movable piston member B within such cartridge.

The disk 3 constituting the fixed seat or receptacle for the cartridge is circular in contour and may be of pressed metal. It may be secured to the sections 1, 1, of the frame by means of lugs 4 carried by the latter, which pass through openings in said seat or receptacle and are riveted or upset over the inner surface of the same. The flange 3<sup>a</sup> of the seat 3 may be tapered so that the end of the container or cartridge A may readily enter the same when the container is locked in position.

At the opposite end of the skeleton frame, a combined nozzle and flanged seat receiving the apertured end of the container or cartridge is mounted; such seat being indicated at 5 and having a depending lug or hinged member 5<sup>a</sup> which is pivotally connected to the forwardly projecting portion 6 of the frame by means of a pin or rivet 6<sup>a</sup>. This seat 5 is centrally apertured, as indicated at 5<sup>b</sup>, and it has an annular recess 5<sup>c</sup> for engagement by a flange *a* at the end A' of the container A, to insure a tight joint and avoid leakage of the contents during extrusion.

A locking bar to hold the movable seat 5 against the apertured end A' of the cartridge or container is indicated at 8, and this bar passes through a wall 1<sup>b</sup> of the head of the structure and is provided with a hooked end 8<sup>a</sup> which engages the seat 5; the latter having a slight depression 5<sup>d</sup> receiving said hooked end. The bar is guided by ears 3<sup>e</sup> and 5<sup>e</sup> carried by the seats 3 and 5, respectively, and is connected at its end adjacent to the wall 1<sup>b</sup> to a pivotally mounted cam 9 which, when turned into engagement with the wall 1<sup>b</sup>, as indicated in Fig. 2, effects a pull on said bar 8 whereby its hooked end 8<sup>a</sup> firmly holds the pivotal seat 5 in engagement with the cartridge or container.

The cartridge or container for the calking material may be in the form of a tube of cellulosic material; cardboard and the like, or I may employ a metal tube, the discharge end thereof having an outwardly extending flanged aperture capable of engaging an annular seat in the cartridge receptacle at the nozzle end of the same. In either instance, the calking material may be placed in the container or in a separate shell or envelope of paper, "Cellophane", or the like, placed in the container and which may be collapsed by the piston means as the calking material is extruded through the end of the cartridge or container and the nozzle 10 carried by the seat 5. Any suitable form of nozzle may be used.

A toothed rod 11, which may be square, passes through an opening 3<sup>c</sup> in the fixed seat 3, and carries a piston-impelling member or plate 11<sup>a</sup> adapted to engage the piston B in the container or cartridge; the opposite and free end of the toothed rod being provided with a cross-piece 11<sup>b</sup> which serves as a stop when the piston means reaches the limit of its outward movement within the cartridge or container, and also for retracting the toothed rod to starting position when a cartridge or container has been emptied and it is desired to insert a fresh one. In order that the piston means, including the impelling member 11<sup>a</sup>, carried by the toothed rod 11 and arranged to act upon the piston member B within the cartridge

or container, may be operated, and the following mechanism may be employed:

The square toothed rod 11, extends through the head of the calking gun structure and is impelled forward by the movement of a toothed power-applying member or power shoe 12, engaging teeth 11<sup>c</sup> on said rod 11. This power-applying member 12 is operatively connected to a trigger lever 13, pivoted at 13<sup>a</sup> in the head of the structure, by toggle mechanism including the several links 14, 15 and 16; the link 14 being pivotally connected at one end, at 14<sup>a</sup>, to the trigger lever 13; the opposite end being connected at 14<sup>b</sup> to the links 15 and 16. The opposite end of the link 15 is pivotally mounted, as at 15<sup>a</sup>, in the head, while the opposite end of the link 16 is pivotally connected at 16<sup>a</sup> to the power-applying member 12.

The trigger lever 13 is held outwardly in the position shown by means of a spring 17, suitably supported and having legs 17<sup>a</sup> and 17<sup>b</sup>, which engage the trigger lever 13 and the handle 2, respectively.

The toothed power-applying member or power shoe lies normally a slight distance above the toothed rod 11, as indicated in Fig. 2, but not out of actual engagement therewith. When the trigger lever 13 is compressed against the handle 2, in the manner indicated in Fig. 4, the power-applying member 12 is pressed into full engagement with the teeth of the rod 11 and moved forward by the toggle mechanism one or more teeth at a time. When the trigger lever is released and the toggle links return to their inactive position, the power-applying member may rise sufficiently to clear the teeth and retract for fresh engagement therewith.

To prevent retractive movement of the toothed rod 11 at this time, a detent 18 is provided, mounted in advance of the power-applying member 12; such detent being held in engagement with the toothed rod 11 by a spring 19, one end of which also overlies the power-applying member 12, and this detent is mounted in a pair of vertically movable cam members 20, more clearly shown in Fig. 8, which members are arranged in the head of the structure just behind the flanged disk 3 which forms a seat for end of the movable cartridge A containing the calking material. These cam members 20 have their sides slotted at 20<sup>a</sup> for the reception of side wings 18<sup>a</sup> of the detent 18 and, in addition, they have guide slots 20<sup>b</sup> near their lower ends permitting vertical movement with respect to one of the rivets, indicated at 21, which holds the walls 1, 1, of the head together. These members 20 also have rearwardly projecting portions 20<sup>c</sup> which underlie projections 22—one on each side—carried by the power-applying member 12, in axial alignment with the pivotal connection with the toggle link 16. The detent 18 has forwardly and rearwardly arranged portions 18<sup>b</sup> which lie between the spaced cam members 20, and its bottom portion is provided with teeth which engage the teeth 11<sup>b</sup> of the rod 11. The power-applying member or shoe 12 has a rearwardly disposed tongue or extension 12<sup>a</sup> overlying the toothed rod 11 which helps to keep it in proper position during its operation by the toggle mechanism, as well as when it is released from the toothed rod.

A lever 25, which is employed to release the detent and power-applying member from the toothed rod 11 by raising the cam members 20; one end underlying said members, is pivotally mounted at 25<sup>a</sup> and has a thumb-engaging piece 25<sup>b</sup> in a convenient position with respect to the

handle 2. When this thumb piece is depressed, the lever 25 first raises the cam members 20 and through them the power-applying member 12, and subsequently the detent 18, in the manner indicated in Figs. 5 and 6; permitting retraction of the toothed rod 11, after which the empty cartridge may be removed and a fresh cartridge inserted in the gun.

The power shoe mechanism and detent are so designed that, when actuated by the release lever, the power shoe is first disengaged; the slots 20<sup>a</sup> in the sides of the cam members 20 being long enough to permit the rearwardly extending portions 20<sup>c</sup> to lift the power shoe before the bottom of the slots 20<sup>a</sup> engage the detent. It is essentially a delayed action or dwell. Should the detent release first, the back pressure on the rod would cause the toggle to raise and jam so that it would be impossible to release the power shoe.

The cartridge may be provided with a suitable slip cover over the end in which the piston member B is placed, and the opening surrounded by the flange a at the opposite end may be closed by a suitable cap or cover. Both cap and cover are removed before the cartridge is placed in the gun. To load the structure after the piston impeller has been retracted to a point adjacent to the seat 3, the cartridge with both ends open is placed in the frame with the end containing the piston member B fitting within the fixed seat 3. Then the seat 5 is closed upon the opposite end of the cartridge or container, and the locking bar 8 brought into position whereby its hooked end 8<sup>a</sup> may engage such seat 5, after which action such bar is locked in position by turning the cam 9 to the position shown in Fig. 2. The position of the flange a at the end of the cartridge or container in its engagement with the annular recess 5<sup>c</sup> of the seat 5 protects the latter from receiving any of the contents; thereby insuring proper delivery to the nozzle 10. The nozzle may have various forms of outlets, one of which is shown in Figs. 1 and 2.

In view of the fact that many compounds available for extrusion by the use of a structure of this type have a great amount of elasticity, it is desirable, when a determined part of a calking or other operation has been completed, that the back pressure upon the contained material be relieved, and this may be effected by actuating the detent releasing lever 25 for partial or full relief of the back pressure regardless of the position of the trigger at the time such detent release is actuated.

From the foregoing description, it will be apparent that simple and efficient means are provided for accomplishing the objects of the invention, and while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise constructions set forth, but includes within its scope such changes and modifications as may be made within the terms of the appended claims.

I claim:

1. The combination with a frame support and a toothed rod mounted for longitudinal movement with respect to said frame support, of a toothed power-applying member in operative engagement with said toothed rod and longitudinally movable with respect to the same, a plurality of toggle links pivotally connected at a common point; one of said links being connected to

the power-applying member, a second having connection with actuating means therefor and a third pivotally anchored in said frame support, and a trigger pivotally mounted in said frame support for operating said toggle links.

2. The combination with a skeleton frame support of a toothed rod supported by said frame and longitudinally movable therein, a toothed power-applying member in operative engagement with said toothed rod and longitudinally movable with respect to the same, a plurality of toggle links pivotally connected at a common point; one of said links being connected to the power-applying member, a second having connection with actuating means therefor and a third pivotally anchored in said frame support, a trigger pivotally mounted in the frame support for operating said links, and means for disengaging the power member from the toothed rod.

3. The combination with a skeleton frame support of a toothed rod supported by said frame and longitudinally movable therein, a toothed power-applying member in operative engagement with said toothed rod and longitudinally movable with respect to the same, a plurality of toggle links connected at a common point and operatively connected to said power member; one of said links being connected to the power-applying member, a second having connection with actuating means therefor and a third pivotally anchored to the skeleton frame support, a trigger pivotally mounted in said frame support for operating said toggle links, and a spring-actuated detent engaging said toothed rod and disposed in advance of the power-applying member.

4. The combination with a skeleton frame support, of a toothed rod supported by said frame and longitudinally movable therein, a toothed power-applying member in operative engagement with said toothed rod and longitudinally movable with respect to the same, a series of toggle links connected at a common point; one of said links being connected to the power-applying member, a second having connection with actuating means therefor and a third pivotally anchored to the skeleton frame support, a pistol grip carried by said frame, a trigger for operating said toggle links pivotally mounted in the frame support and disposed adjacent said pistol grip, a spring-actuated detent engaging said toothed rod and disposed in advance of the power-applying member, and means for imparting vertical movement to said detent to release it from engagement with the toothed rod.

5. The combination with a supporting frame, a toothed rod longitudinally movable in said frame and means longitudinally movable into engagement with said rod and in substantial parallelism therewith to actuate the same, of a toothed detent engaging said toothed rod ahead of its moving means, a spring for holding said detent in engagement with said rod, a vertically movable support for said detent disposed within the frame, and a lever for lifting said detent support to free the detent from the toothed rod and simultaneously raise the rod moving means.

6. The combination with a skeleton frame support, a toothed rod longitudinally movable in said skeleton frame support and means longitudinally movable into engagement with said rod and in substantial parallelism therewith to actuate the same, of a toothed detent engaging said toothed rod, spring means for holding said detent and rod-moving means in operative engagement with the toothed rod, a vertically movable support for

said detent disposed within the frame, and a lever for lifting said detent support to free the rod-moving means and subsequently raise the detent from the toothed rod.

- 5 7. The combination with a skeleton frame support including a pistol grip, of a toothed rod mounted for longitudinal movement in said skeleton frame support, a toothed power-applying member in engagement with said toothed rod, 5  
 10 a series of toggle links; one of said links being pivotally connected to said power-applying member and another of said links being pivotally connected to the frame, a trigger pivotally mounted in the frame and pivotally connected to a third 10  
 15 a third toggle link; said trigger being movable with respect to the pistol grip to effect movement of the power-applying member through the medium of the toggle links which have a common 15  
 20 power-applying member from engagement with the toothed rod.

8. The combination with a skeleton frame sup-

port including a pistol grip, of a toothed rod mounted for longitudinal movement in said skeleton frame support, a toothed power-applying member in engagement with said toothed rod, a series of toggle links; one of said links being 5  
 pivotally connected to said power-applying member and another of said links being pivotally connected to the frame, a trigger pivotally mounted in the frame and pivotally connected to a third 10  
 toggle link; said trigger being movable with respect to the pistol grip handle to effect movement of the power-applying member through the medium of the toggle links which have a common 10  
 pivotal connection, a toothed detent disposed in advance of the power member, spring means for 15  
 holding said detent in engagement with the toothed rod, and means for consecutively disengaging the power-applying member and the detent from the toothed rod including a lever pivotally mounted in the frame support. 20

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