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Butler et al.

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[54] **POWER ACTUATED TOOL**

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[73] Assignee: **Olin Mathieson Chemical Corporation,** New Haven, Conn.

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[22] Filed: **Aug. 10, 1979**

Related U.S. Patent Documents

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Appl. No.: **484,592**
Filed: **Sep. 2, 1965**

[51] **Int. Cl.**[3] **B25C 1/14**
[52] **U.S. Cl.** **227/8;** 227/10
[58] **Field of Search** 227/8–11; 60/632–638

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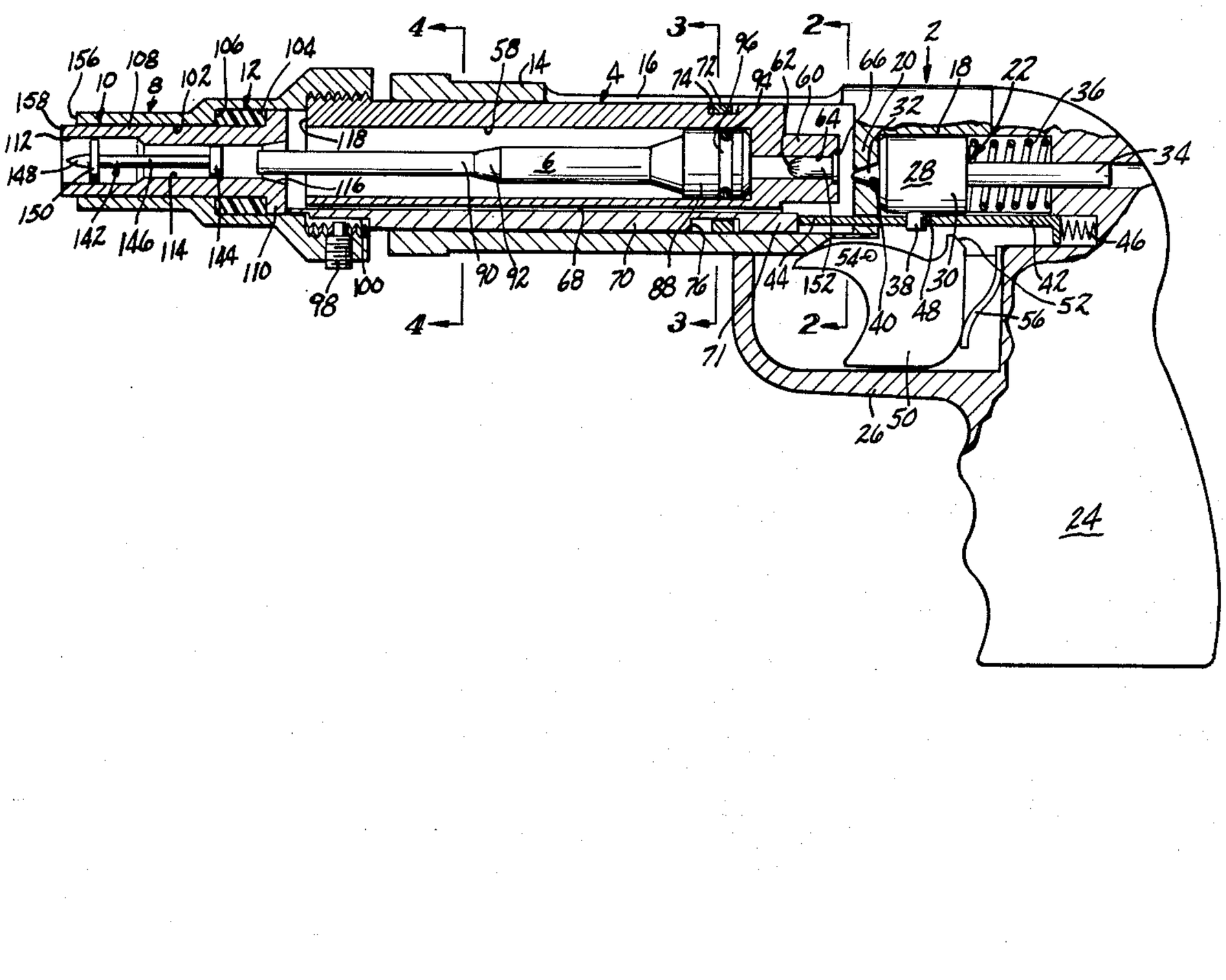
Primary Examiner—Paul A. Bell
Attorney, Agent, or Firm—William W. Jones; Paul J. Lerner

[57] **ABSTRACT**

An improved power-actuated tool having means for preventing firing if the tool is not properly aligned with the work surface. The tool housing member includes a slidably mounted firing mechanism having cocking means extending forwardly into engagement with a sensing means mounted in the barrel member for relative axial movement therewith. A first member is attached to the barrel member. A second member is mounted within the first member for relative axial movement therewith and with respect to the barrel member, and includes a portion adapted to engage the sensing means. The second member must be moved rearwardly with respect to the first member whereby the sensing means is moved rearwardly with respect to the barrel member and engages the cocking means to move the firing mechanism into the cocked position. The tool may also include an extractor mechanism mounted on the breech end of the barrel and provided with a lip portion adapted to engage the head of a cartridge positioned in the cartridge chamber. The extractor mechanism also includes an elongated portion slidably mounted in the barrel member and extending into a barrel guide slot. The end of the elongated portion is adapted to be engaged by a barrel guide screw secured to the housing upon movement of the barrel member from the breech closed to breech open position. The movement of the barrel member relative to the housing serves to move the extractor mechanism rearwardly with respect to the cartridge chamber thereby withdrawing the cartridge from the cartridge chamber.

10 Claims, 9 Drawing Figures



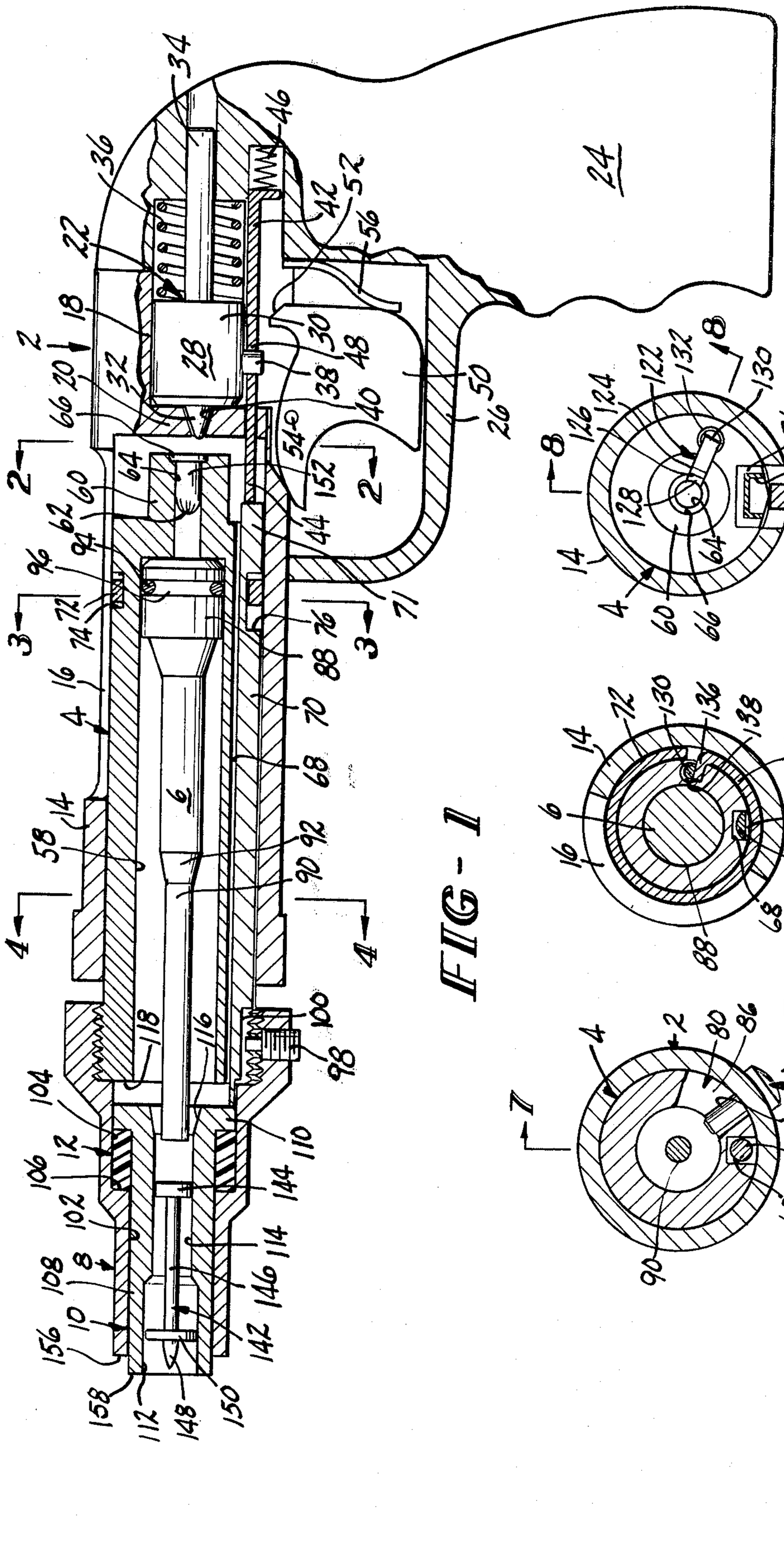


FIG - 1

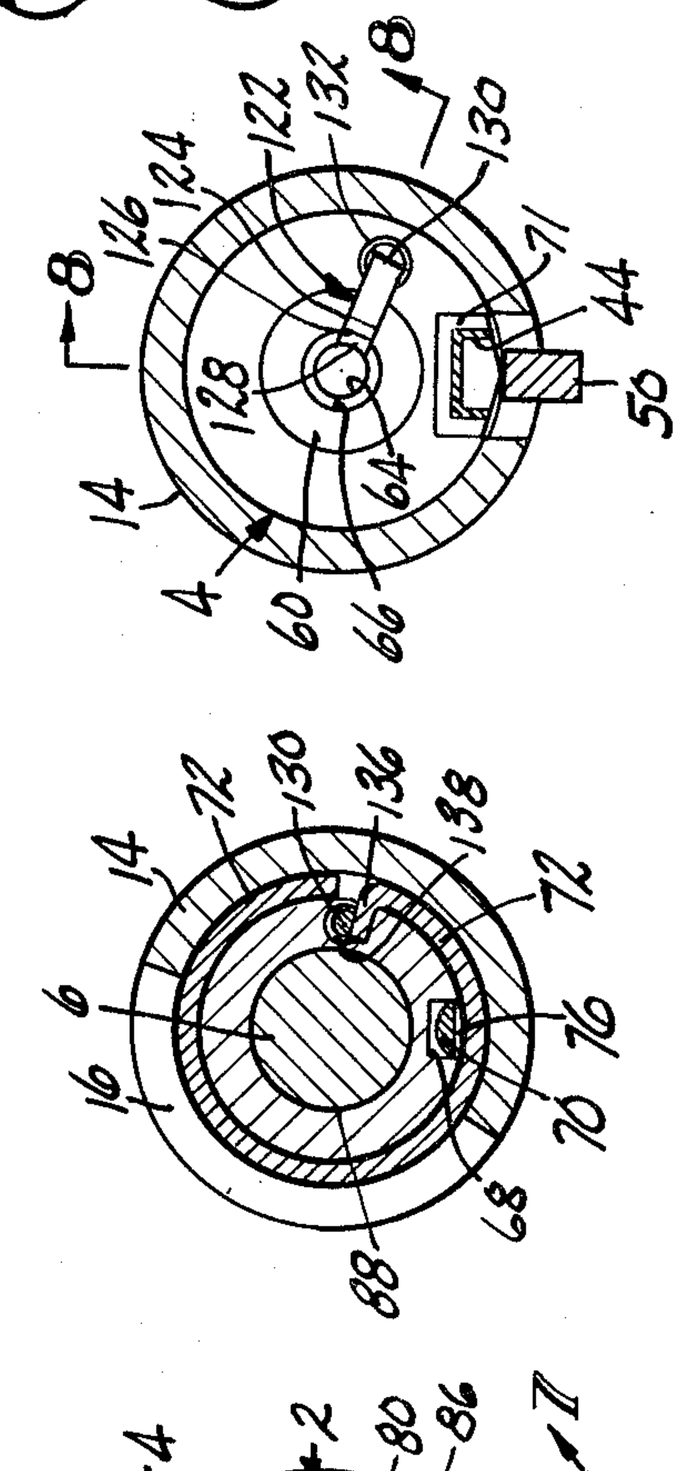


FIG - 2

FIG - 3

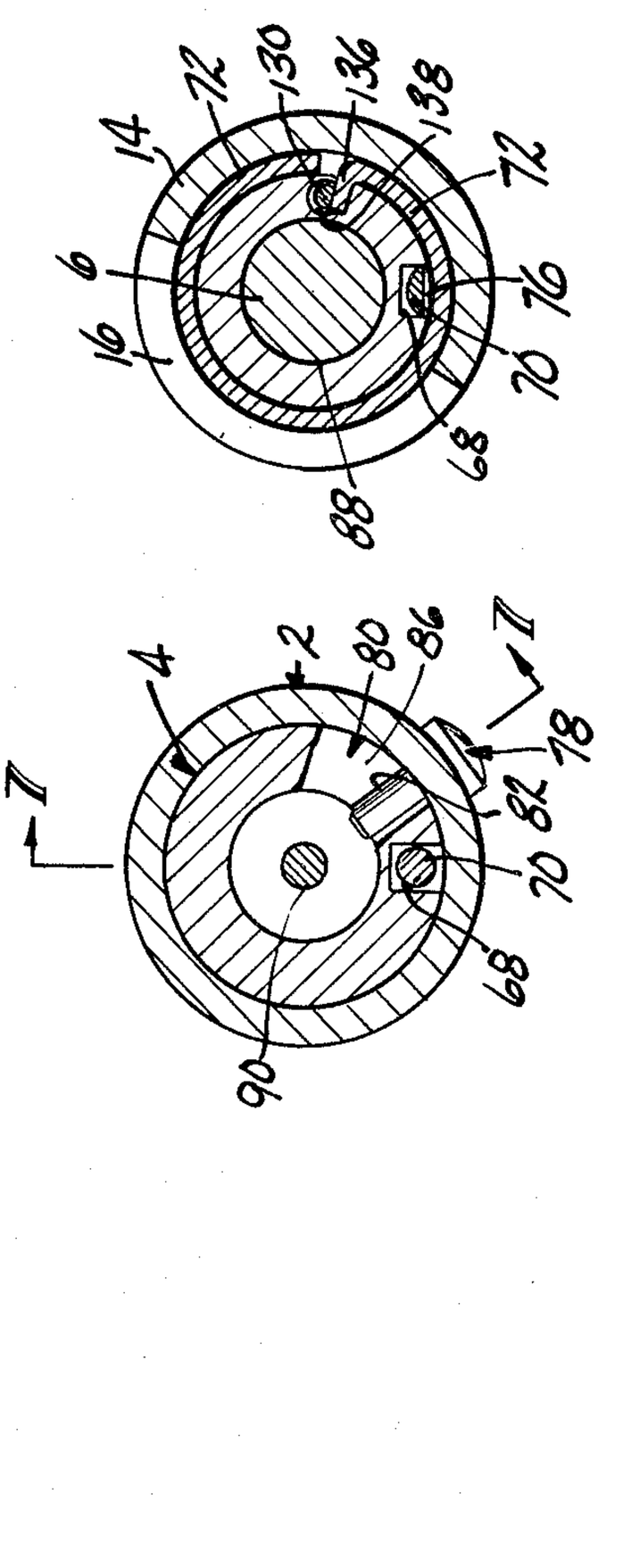
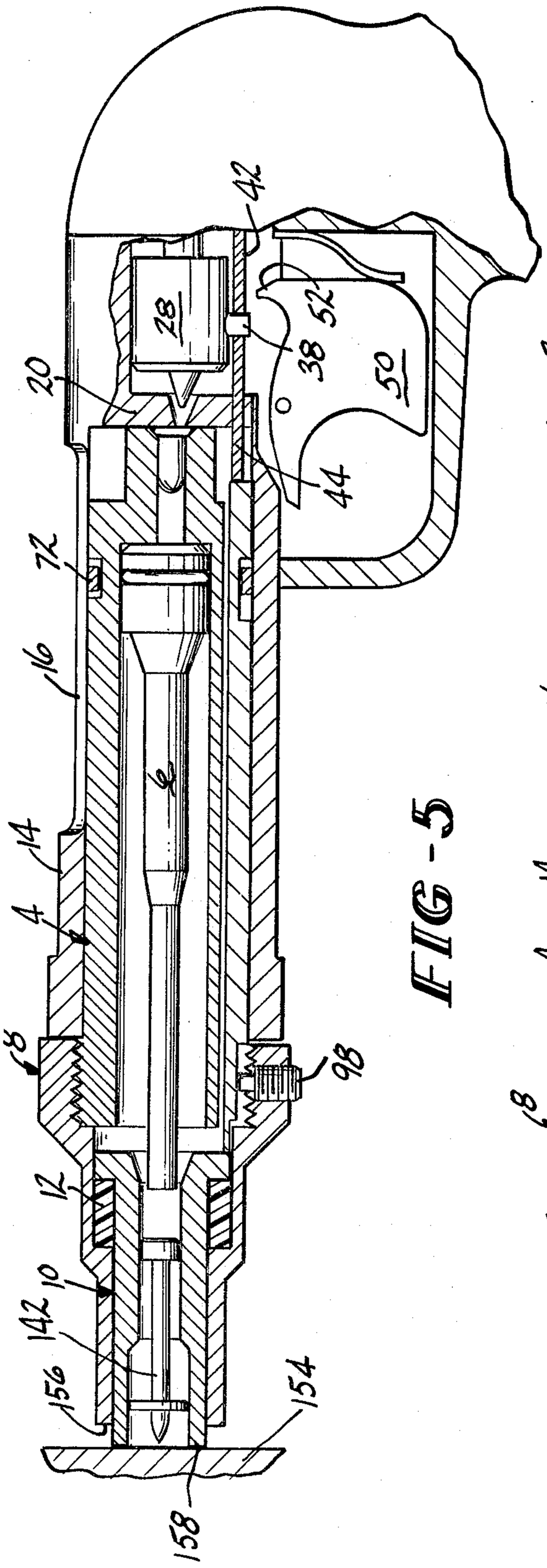


FIG - 4


42
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158

FIG - 5

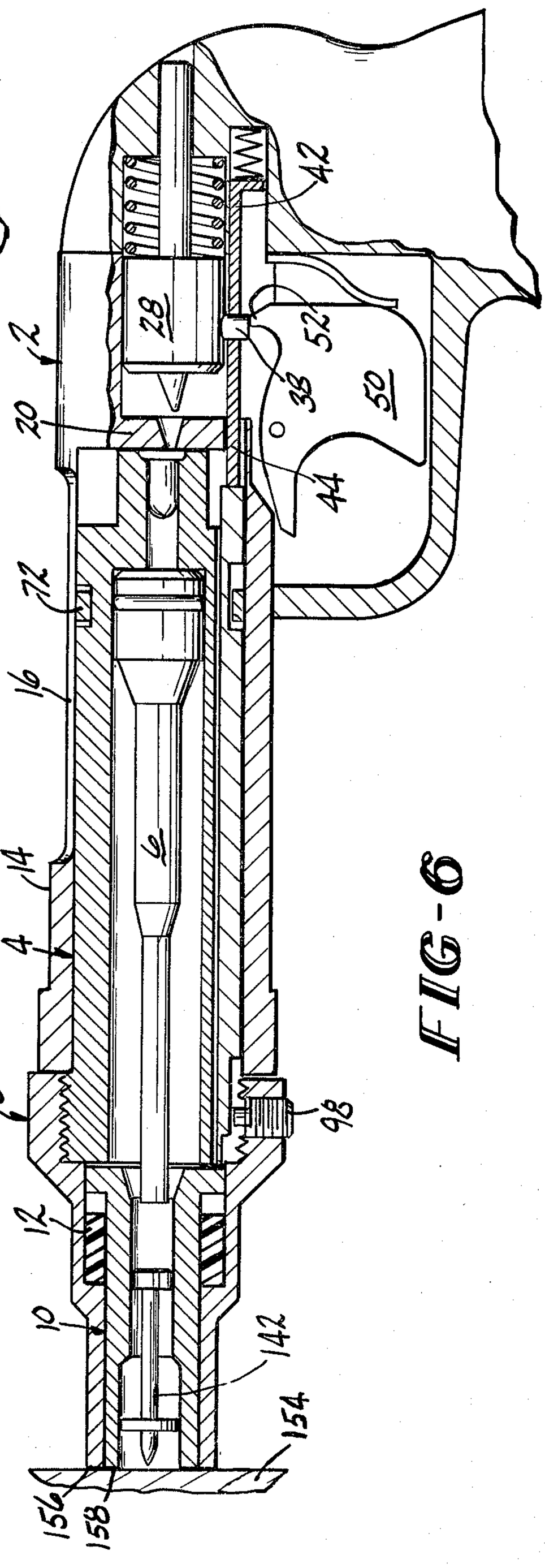
42
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FIG - 6

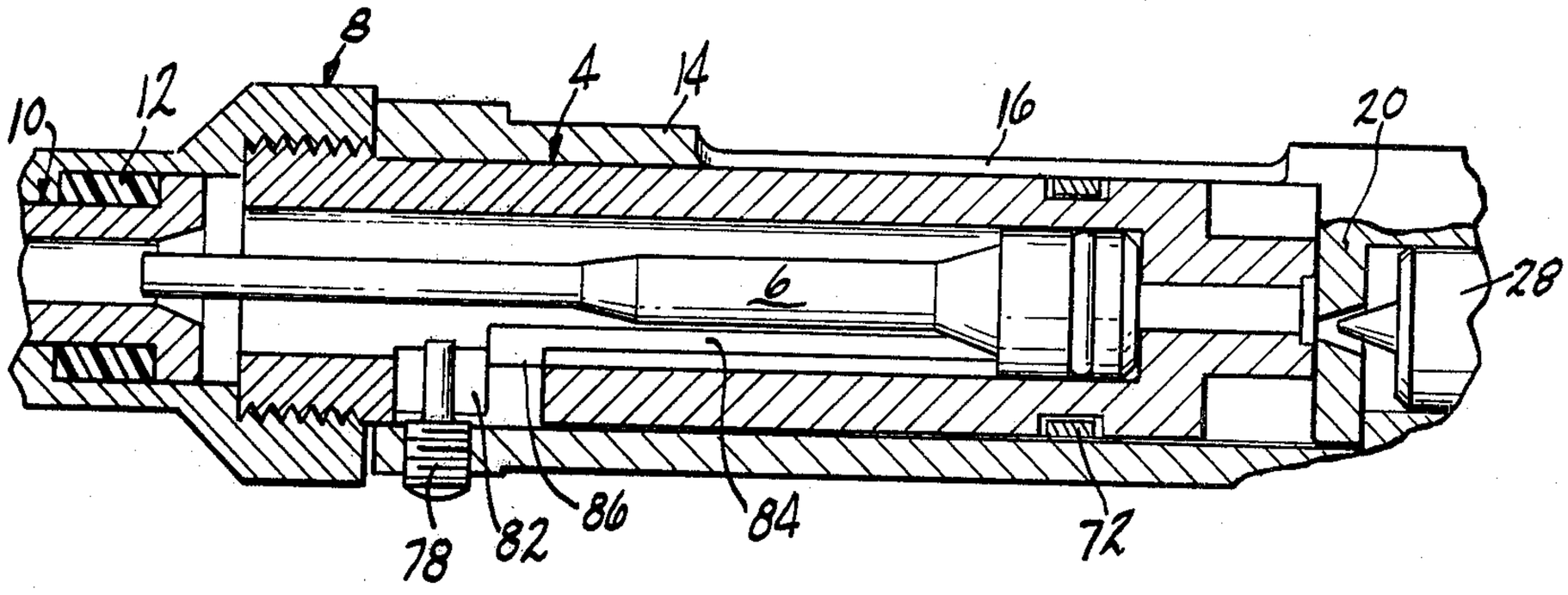

FIG - 7

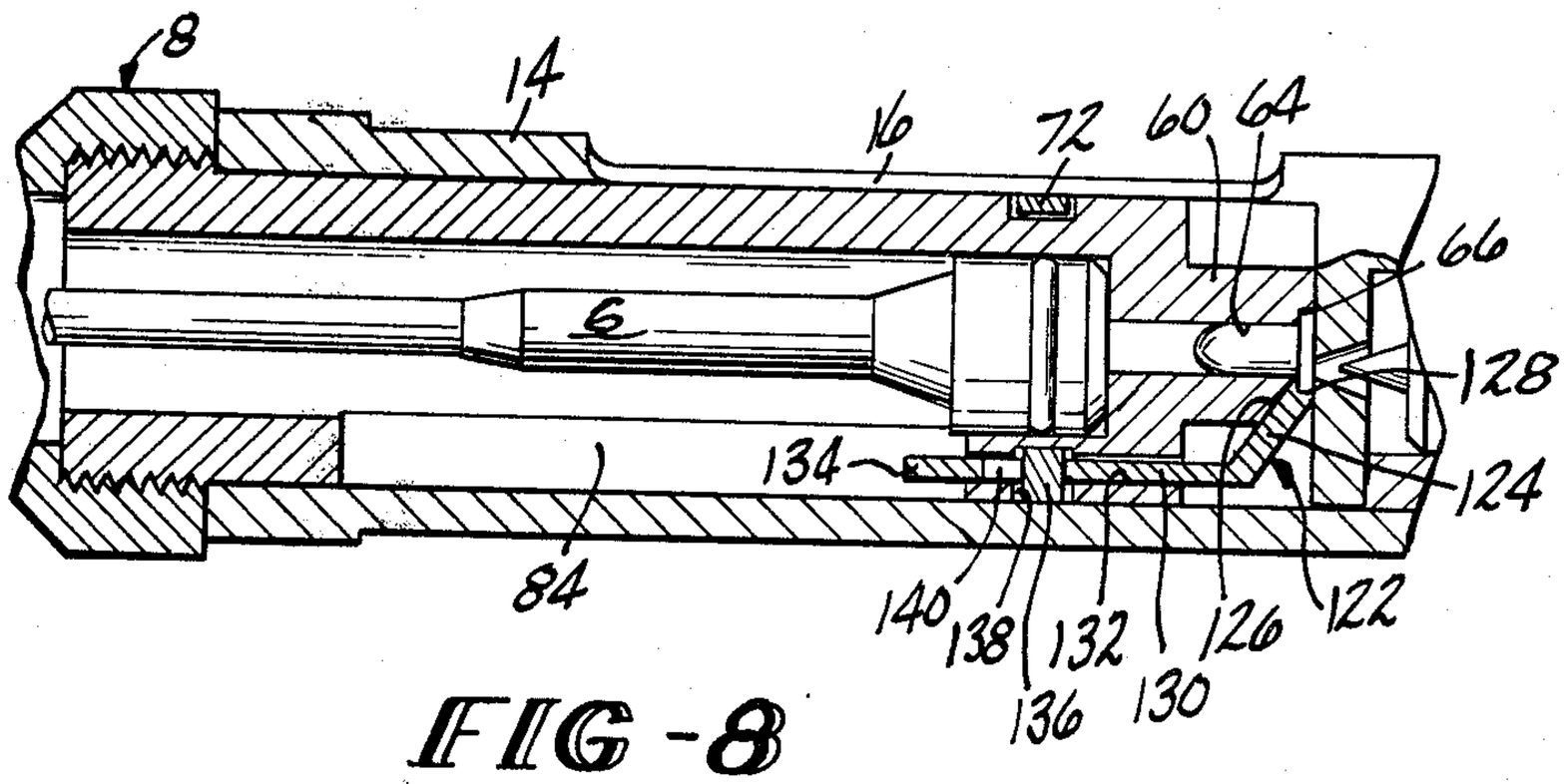

FIG - 8

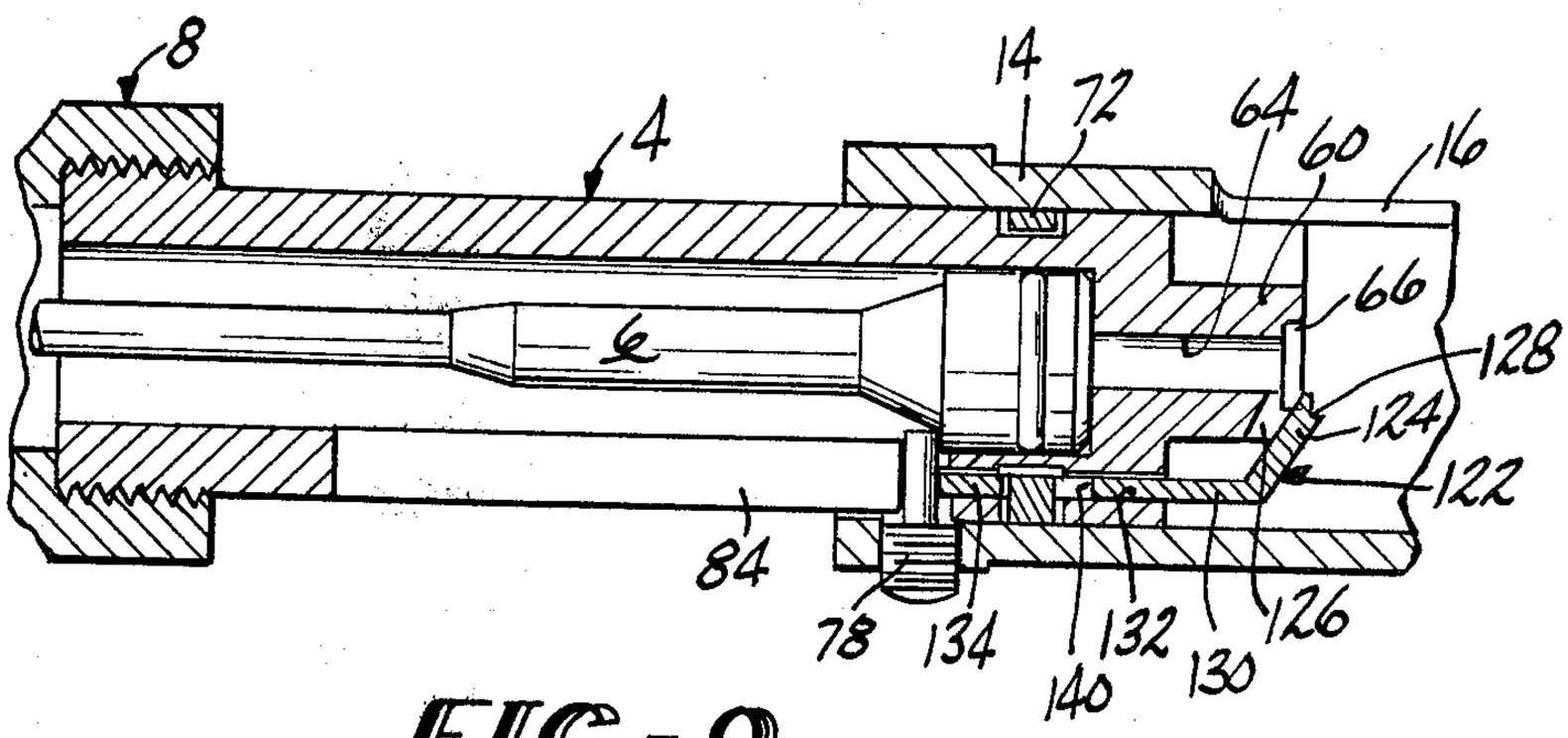

FIG - 9

POWER ACTUATED TOOL

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This invention relates to tools for driving various members such as hammers, punches, cutters, or fasteners such as studs, pins, and the like into wood, steel, masonry or concrete, and more particularly, relates to such tools actuated by power means such as an explosive cartridge.

One of the objects of this invention is to provide an improved tool for driving fasteners or other members into a suitable surface.

A more specific object of this invention is to provide an improved tool having means for preventing firing of the tool unless the tool is properly positioned against a suitable surface.

A further object of this invention is to provide an improved tool having means to prevent firing of the tool if the tool is not properly aligned with the work surface.

Yet another object of the invention is to provide a tool having an improved mechanism for ejecting a spent cartridge.

These and other objects of the invention may be achieved through the provision of a tool having a barrel member slidably disposed for axial movement within a housing member. The housing member may include a slidably mounted firing mechanism having cocking means extending forwardly into engagement with a sensing means mounted in the barrel member for relative axial movement therewith. A first member is attached to the barrel member. A second member is mounted within the first member for relative axial movement therewith and with respect to the barrel member, and includes a portion adapted to engage the sensing means.

The arrangement of the elements is such that for the tool to be fired, the second member must be moved rearwardly with respect to the first member whereby the sensing means is moved rearwardly with respect to the barrel member and engages the cocking means to move the firing mechanism into the cocked position.

The tool may also include an extractor mechanism mounted on the breech end of the barrel and provided with a lip portion adapted to engage the head of a cartridge positioned in the cartridge chamber. The extractor mechanism also includes an elongated portion slidably mounted in the barrel member and extending into a barrel guide slot. The end of the elongated portion is adapted to be engaged by a barrel guide screw secured to the housing upon movement of the barrel member from the breech closed to breech open position. The movement of the barrel member relative to the housing serves to move the extractor mechanism rearwardly with respect to the cartridge chamber thereby withdrawing the cartridge from the cartridge chamber.

This invention may be more readily understood by reference to the following description of a preferred embodiment of the tool and the accompanying drawings in which:

FIG. **1** is a longitudinal sectional view of a tool constructed in accordance with the present invention;

FIG. **2** is a transverse sectional view taken along the line **2—2** of FIG. **1**;

FIG. **3** is a transverse sectional view taken along the line **3—3** of FIG. **1**;

FIG. **4** is a transverse sectional view taken along the line **4—4** of FIG. **1**;

FIG. **5** is a longitudinal sectional view of the tool in one stage of its operation wherein the buffer housing has been moved rearwardly to the point where the barrel member abuts the receiver;

FIG. **6** is a longitudinal sectional view of a tool in another stage of the operation wherein the tool is properly positioned against a suitable surface and ready for firing;

FIG. **7** is a longitudinal sectional view of a tool taken along the line **7—7** of FIG. **4** showing the relationship of the barrel guide screw and the barrel guide slots in the barrel member;

FIG. **8** is a longitudinal sectional view of a portion of the tool taken along the line **8—8** of FIG. **2** showing the extractor mechanism in its seated position; and

FIG. **9** is a partial longitudinal sectional view showing a portion of the tool in the breech open position and showing the extractor mechanism in a position after it has ejected a spent cartridge.

Referring specifically to the drawings, the tool comprises generally a housing **2** having a barrel member **4** disposed therein. A piston member **6** is mounted within the barrel member **4** for relative axial movement therewith. A buffer housing member **8** is attached to the forward end of the barrel member **4** and extends forwardly therefrom. A fastener guide **10** is mounted for sliding movement within the buffer housing member **8**. Disposed between the buffer housing member **8** and the fastener guide **10** is a buffer member **12**.

The housing **2** includes a tubular forward portion **14** having a breech opening **16** therein and a rear portion **18** separated from the forward portion **14** by a breech closure portion **20**. The rear portion **18** houses the firing mechanism **22**, and includes a pistol grip **24**, and a trigger guard **26**.

The firing mechanism **22** includes a firing pin **28** slidably mounted within the rear portion **18** of the housing **2**. As can be seen in FIG. **1**, the firing pin **28** includes a cylindrical body portion **30**, a conical nose portion **32** extending forwardly from the cylindrical body portion **30**, and an elongated cylindrical rearwardly extending projection **34**. The firing pin **28** is urged forwardly by a suitable spring member **36**. A detent member **38** extends radially downwardly from the body portion **30** of the firing pin **28**. This detent member **38** may be spring biased outwardly by a suitable spring means (not shown). The conical nose portion **32** of the firing pin **28** is adapted to extend through a frusto-conical opening **40** in the breech closure portion **20**.

A cocking member **42** is mounted for axial movement in the rear portion **18** of the housing **2** and includes a forward portion **44** which extends through a slot in the breech closure portion **20** and into the tubular forward portion **14** of the housing **2**. The cocking member **42** may be spring biased forwardly by a suitable spring member **46**. The cocking member **42** also includes a slot **48** through which the detent **38** on the firing pin **28** may extend. A trigger member **50** having a sear portion **52** may be pivotally mounted on the housing **2** by a pivoted pin **54**. The trigger member **50** is resiliently urged out of engagement with the firing pin **28** by a spring member **56**.

The barrel member **4**, which includes a bore **58**, is mounted for movement within the tubular forward portion **14** of the housing **2**. The breech end of the barrel member **4** includes a cylindrical projection **60** into which the cartridge receiving chamber **62** extends. The cartridge receiving chamber **62** includes an elongated bore **64** and an enlarged counterbore **66** adapted to receive the rim portion of a cartridge.

A groove **68** extends along the entire length of the outer surface of the barrel member **4**. Mounted within the groove **68** is a rod-like sensing member **70** which is of a length such that it can extend from both ends of the barrel member **4**. The sensing member **70** includes an enlarged head portion **71** at its breech end for engagement with the cocking member **42**.

The sensing member **70** is held in proper relationship with the barrel member **4** by a circumferentially extending band spring **72** disposed in a recess **74** in the external surface of the barrel member **4**. The sensing member **70** includes a reduced portion **76** which has a greater axial length than the width of the spring **72** whereby the sensing member **70** may have limited axial movement with respect to the barrel member **4**.

The barrel member **4** is guided during its movement with respect to the housing **2** by a barrel guide screw **78** which is secured to the housing **2** and extends into a Z-slot **80** in the barrel member **4**. As seen particularly in FIGS. **4** and **7**, the Z-slot **80** includes a first, relatively short, axially extending portion **82** adjacent the muzzle end of the barrel member **4**, a circumferentially spaced, relatively long, axially extending portion **84** which extends to a point adjacent the breech end of the barrel member **4**, and a circumferentially extending portion **86** interconnecting portions **82** and **84**.

The piston member **6** is slidably mounted within the bore **58** of the barrel member **4**. The piston member may include a cylindrical head portion **88** and a reduced elongated shank portion **90**. The shank portion **90** has a tapered portion **92**. A piston ring **94** may be mounted within a suitable groove **96** in the head portion **88**.

The buffer housing member **8** is threadedly secured to the muzzle end of the barrel member **4**. Relative rotation between the barrel member **4** and buffer housing member **8** may be prevented by a suitable screw member **98** which is attached to the buffer housing member **8** and extends into the barrel member **4**. The sensing member **70** includes a reduced portion **100** in its forward end to provide clearance with the screw member **98**.

The buffer housing member **8** includes a first cylindrical internal surface portion **102** and a second enlarged internal surface portion **104**. The intersection of portions **102** and **104** provides a shoulder **106** in the internal surface.

The fastener guide **10** is slidably disposed within the buffer housing **8** and includes an external surface **108** having a sliding fit with the first internal surface **102** of the buffer housing member **8**. An enlarged flange portion **110** having a diameter slightly less than the diameter of the enlarged internal surface portion **104** of the buffer housing **8** is provided adjacent the rearward end of the fastener guide **10**. The internal surface of the fastener guide **10** includes a counterbore **112** adjacent the muzzle end thereof, a reduced cylindrical portion **114**, and an inwardly tapering portion **116** adjacent the rearward end.

The buffer member **12** is disposed between the shoulder **106** and enlarged internal surface portion **104** of the

buffer housing member **8** and the flange portion **110** and external surface **108** of the fastener guide **10**. The buffer member may be a hollow cylinder of a suitable resilient material such as neoprene or urethane.

It will be noted that the axial length of the buffer member **12** is less than the length of the enlarged internal surface portion **104** of the buffer housing member **8** such that space is provided between the forward face **118** of the barrel member **4** and the buffer member **12** to permit limited axial movement of the fastener guide **10** relative to the buffer housing member **8**. The forward end of the sensing member **70** may extend from the forward face **118** of the barrel member **4** into the area defined by the enlarged internal surface portion **104** of the buffer housing **8** in a position such that it may be engaged by the flange portion **110** of the fastener guide **10**.

The extractor mechanism, indicated generally by **122** is shown in detail in FIGS. **2**, **8**, and **9**. As can be seen, the extractor mechanism **122** includes a head portion **124** disposed in a slot **126** in the cylindrical projection **60**. The slot **126** communicates with the cartridge receiving chamber **62** in the area of the counterbore **66**. The head portion **124** of the extractor mechanism **122** includes a lip portion **128** having a shape corresponding to the counterbore **66** and adapted to engage the rim of a cartridge. An elongated rod portion **130** is attached to the head portion **124** and extends axially forwardly of the tool. The rod portion **130** is slidably mounted in a bore **132** which is coextensive with the relatively long portion **84** of the Z-slot **80** in the barrel member **4**. When the head portion **124** of the extractor mechanism **122** is seated in the slot **126**, the forward end **134** of the rod portion **130** extends into the relatively long portion **84** of the Z-slot **80** as best shown in FIG. **8**.

The extractor mechanism **122** is limited in its axial movement by virtue of engagement with the spring member **72**. As can be seen particularly in FIG. **3**, the end portion **136** of spring member **72** extends radially inwardly into a suitable slot **138** in the barrel member **4**. The rod portion **130** of the extractor mechanism **122** includes a recessed portion **140** for reception of the end portion **136** of the spring member **72**. The axial length of the recessed portion **140** is larger than the width of the spring member **72** to permit relative axial movement of the extractor mechanism **122** with respect to the barrel member **4**.

In operation, a fastener member **142** is positioned in the muzzle end of the fastener guide **10**. The fastener member **142** may include an enlarged head portion **144** and a reduced shank portion **146**. A plastic tip or washer or other member **148** may be attached to the forward end of the shank portion **146** and may include a circular flange **150** adapted to engage the walls of the counterbore **112** and center the fastener member **142** in the fastener guide **10**.

After a new cartridge **152** is inserted in the cartridge receiving chamber **62**, the operator may grasp the buffer housing member **8** to move the buffer housing member **8**, barrel member **4**, and buffer member **12** toward the breech closure portion **20** of the housing **2** into the breech closed position of the tool as shown in FIG. **5**. The operator may then place the muzzle end of the tool against a suitable surface **154** and push forwardly on the housing **2**. In so doing, the fastener guide **10** is moved rearwardly with respect to the buffer housing member **8** to the point where the forward end faces **156** and **158** of the buffer housing member **8** and fastener

guide **10** are flush with each other and in engagement with the surface **154**. As the fastener guide **10** moves rearwardly, the flange portion **110** contacts the forward end portion of the sensing member **70** and moves that member rearwardly relative to the barrel member **4**. Rearward movement of the sensing member **70** moves the firing mechanism **22** rearward in the rear portion **18** of the housing **2** due to the engagement of the sensing member **70** with the cocking member **42**. When the end faces **156** and **158** are flush with each other, the firing mechanism **22** is moved into the position shown in FIG. **6** wherein the detent **38** on the firing pin **28** is aligned with sear portion **52** of the trigger member **50**. At this point the tool is in proper position for firing by pressing the trigger member **50** which will release the detent **38** from the cocking member **42**. The firing pin will then be projected forwardly by virtue of its associated spring member **46** whereupon the conical nose portion **32** will be extended through the frusto-conical opening **40** in the breech closure portion **20** of the housing **2** striking the cartridge **152**. The release of the gases by the actuation of the cartridge **152** will project the piston member **6** forwardly within the barrel member **4** a sufficient distance to drive the fastener member **142** into the surface **154**.

After the firing operation is completed, the operator may again grasp the buffer housing member **8** and pull the buffer housing member **8** forward relative to the housing **2** to move the components of the tool into their breech open position. In so doing, the barrel member **4** will move forward relative to the housing guided by the barrel guide screw **78** in the relatively short axially extending portion **82** of the Z-slot **80**. The relative movement may continue until the barrel guide screw **78** is aligned with the circumferentially extending portion **86** of the Z-slot **80** whereupon the buffer housing **8** may be rotated by the operation to align the barrel member **4** with the relatively long axially extending portion **84** of the Z-slot **80**.

Since the barrel guide screw **78** extends into the bore **58** of the barrel member **4**, the forward end of the head portion **88** of the piston member **6** will abut the barrel guide screw **78** during the forward movement of the barrel member **4** with respect to the housing **2**, whereby the piston member **6** will be held stationary with respect to the housing **2** while the barrel member **4** is drawn forward relative thereto. The forward movement of the barrel member **4** relative to the housing **2** is arrested by the abutment of the piston member **6** against the end of the bore **58** in the barrel member **4**.

As the barrel member **4** is drawn forward relative to the housing **2**, the extractor mechanism **122** is actuated by abutment against the barrel guide screw **78**. Referring particularly to FIGS. **8** and **9**, as the barrel member **4** is moved toward the breech open position, the end of the rod portion **130** of the extractor mechanism **122** abuts the barrel guide screw **78** whereupon the cartridge receiving chamber **62** continues in its forward movement. The lip portion **128** of the extractor mechanism **122** engages the head of the cartridge and, along with the air pressure built up in the barrel member **4** behind the head portion **88** of the piston member **6**, serves to extract the spent cartridge from the cartridge receiving chamber **62**. At this point, the breech portion of the barrel member **4** is exposed through the opening **16** in the housing member **2** and a new cartridge may be inserted in the cartridge receiving chamber **62**. A new fastener member may be inserted in the fastener guide **10** and the firing operation repeated.

By virtue of the above-described structural arrangements of the various components of the tool, air firing of the tool is rendered substantially impossible. For example, if the operator grasps the buffer housing member **8** without positioning the tool against a suitable surface and moves it rearwardly toward the housing **2** into the position shown in FIG. **5**, the tool could not be fired since the detent member **38** in the firing pin **28** has not been moved rearwardly into a position to be engaged by the sear portion **52** of the trigger member **50**.

As yet another feature of this invention, if after the tool is properly positioned against a suitable surface such as shown in FIG. **6**, the tool is tilted a sufficient distance from the position wherein its axis is perpendicular to the work surface, the tool cannot be fired. As the tool is tilted from its position as shown in FIG. **6**, the fastener guide **10** moves forward relative to the buffer housing member **8** until it also contacts the work surface. This forward movement is accomplished by virtue of the sensing member **70**, which has its forward end in contact with the fastener guide **10**, being biased forwardly by the cocking member **42** which is under the action of the spring members **36** and **46**. At this point the firing mechanism **22** will have moved forwardly in the housing **2** to a position wherein the detent **38** is out of alignment with the sear portion **52** of the trigger member **50**.

In the event that the piston member **6** is overdriven due to the fact that the fastener member **142** penetrated the work surface too deeply, or went through the work surface, the tapered portion **92** on the shank portion **90** of the piston member **6** will engage the correspondingly tapered portion **116** of the fastener guide **10**. The energy of the piston member **6** will then be transmitted through the fastener guide **10** and be absorbed by the buffer member **12**.

While reference has been made above to a preferred embodiment of the invention it will be appreciated that various modifications and alterations will readily suggest themselves to those skilled in the art. Accordingly, the scope of this invention should be ascertained by reference to the following claims:

What is claimed is:

1. A power-actuated tool including a receiver having a front and rear portion, barrel means slidably mounted within said front portion for movement between a breech open position and a breech closed position, said barrel means including a breech end and a muzzle end, firing pin means mounted in said rear portion for movement between a cocked position and a fired position, cocking means operably connected to said firing pin means to move said firing pin means from its fired position to its cocked position, sleeve means attached to the muzzle end of said barrel means, guide means mounted within said sleeve means for relative axial movement therewith, and sensing means mounted in said barrel means for relative movement therewith, said sensing means being in engagement with said cocking means and with said guide means when said barrel means is in its breech closed position with said guide means extending from the muzzle end of said sleeve means, whereby said guide means must be moved toward said rear portion of said [housing] *receiver* with respect to said sleeve means to move said firing pin means to its cocked position.

2. The power-actuated tool of claim 1 wherein said front and rear portions of said receiver are separated by breech closure member, said cocking means extends into said forward portion *of said receiver*, said sensing means comprises an elongated rod member mounted within an axially extending groove in the outer surface of said barrel [member] *means*, and said barrel [member] *means* includes a circumferentially extending groove on its outer surface, and further including a band spring mounted within said groove, said sensing means having a cutout portion for reception of said band spring, the length of said cutout portion being greater than the width of said spring to permit movement of said sensing means with respect to said barrel means.

3. The power-actuated tool of claim 1 wherein said sleeve [member] *means* comprises a buffer housing member having a counterbore therein, said counterbore having a larger diameter than the bore of said barrel means and wherein said guide means has an upstanding flange adjacent its rearward end having a diameter substantially equal to the diameter of said counterbore, and further comprising a buffer member disposed between said counterbore and said flange [member], said buffer member having an axial length less than the depth of the counterbore minus the thickness of said flange whereby axial movement of said [fastener] guide *means* relative to said buffer [housing] *member* is permitted.

4. The power-actuated tool of claim 3 further including piston means mounted within said barrel means for movement from a firing position to a driven position, said guide means including a tapered portion, and said piston means including a correspondingly tapered portion adapted to engage said tapered portion on said guide means when said piston *means* is in its driven position whereby the energy of said piston is transferred to said buffer member if said piston is driven beyond said driven position.

5. A power-actuated tool including a receiver having a front and rear portion separated by a breech closure portion, a barrel member slidably mounted within said front portion for movement between a breech open and breech closed position, said barrel member having a breech end and muzzle end, firing pin means mounted within said rear portion for movement between a fired [positions] *position* and a cocked position, cocking means operably connected to said firing pin means to move said firing means from its fired position to its cocked position, said cocking means extending into said [forward] *front* portion of said receiver, buffer housing means secured to the muzzle end of said barrel [means] *member*, said buffer housing *means* having an enlarged counterbore opening into said barrel means, said counterbore having a greater diameter than the bore of said barrel [means] *member*, guide means mounted within said buffer housing *means* for relative axial movement therewith, said guide means having an outwardly extending flange portion adjacent its rearward end, said flange portion having a diameter substantially equal to the diameter of said counterbore, buffer means mounted within said counterbore and positioned between said buffer housing *means* and said flange [position] *portion* of said guide means, said buffer [member] *means* having an axial length less than the difference between the length of the counterbore and width of said flange portion whereby axial movement of said guide means relative to said buffer

housing *means* is permitted, sensing rod means mounted in a groove in the outer surface of said barrel [means] *member* and extending the entire length thereof, a band spring surrounding said barrel member and mounted in a groove therein, said sensing rod means having a cutout portion for reception of said band spring, said cutout portion having a greater axial length than the width of said band spring whereby limited relative axial movement of said sensing rod means with said barrel member is permitted, said sensing means engaging said cocking means and in contact with said guide means when said barrel [means] *member* is in its breech closed position with said guide means extending from the muzzle end of said buffer housing *means* whereby said guide means must be moved rearwardly with respect to said buffer housing *means* until their end faces are substantially flush with each other to move said sensing means and cocking means rearwardly with respect to said barrel member and said receiver to thereby move said firing pin means from its fired position to its cocked position.

[6. A power-actuated tool including a receiver having a tubular forward portion, a barrel member mounted within said forward portion for relative movement therewith, said barrel member having cartridge chamber in one end thereof, a barrel guide slot extending axially in said barrel member, means secured to the forward portion of said receiver and extending into said barrel guide slot, and extractor means mounted on said barrel member and having a lip portion communicating with said cartridge chamber and adapted to engage a cartridge positioned in said cartridge chamber, said extractor means being mounted for relative axial movement with respect to said barrel member and having a portion extending into said barrel guide slot whereby during movement of said barrel member with respect to said receiver member said means extending into said barrel guide slot will engage said portion of said extractor to actuate said extractor.]

[7. The power-actuated tool of claim 6 further including a bore in said barrel member, a piston member having a head portion and a shank portion mounted within said bore, and wherein said barrel guide slot communicates with said bore and said means secured to said receiver extends into said bore in a position to engage the head portion of said piston member.]

8. The power-actuated tool of claim [6] *11* wherein said extractor means includes a rod portion extending through an opening in said barrel member and into said barrel guide slot and said barrel member includes a cutout portion communicating with said cartridge chamber for reception of said extractor *means.*

9. The power-actuated tool of claim 8 further including a groove in the outer surface of said barrel member having a portion communicating with said opening, and a band spring positioned in said groove and extending about said barrel member with an end portion extending into said portion communicating with said opening, said rod portion of said extractor *means* having a cutout portion for reception of said band spring, said cutout portion having a length greater than the width of said band spring whereby limited relative movement of said extractor *means* with said barrel member is permitted.

10. A power-actuated tool including a receiver having a tubular forward portion, a barrel member mounted within said forward portion for relative movement therewith, said barrel member having a bore in one end thereof and a cartridge chamber in the opposite

end thereof communicating with said bore, a barrel guide slot extending axially in said barrel member and communicating with said bore, screw means secured to the forward portion of said receiver and extending through said barrel guide slot into said bore, piston means mounted within said bore, said piston means having a head portion and a reduced shank portion, an extractor mounted on said opposite end of said barrel member, said extractor including a head portion received within a slot in said barrel member, said head portion including a lip communicating with said cartridge chamber and adapted to engage a cartridge positioned in said cartridge chamber, a rod portion on said extractor extending through an opening in said barrel [means] *member* and into said barrel guide slot, a circumferential groove in the outer surface of said barrel member having a portion communicating with said opening, and a band spring positioned in said groove and extending about said barrel member with an end portion extending into said portion of said groove communicating with said opening, said rod portion of said extractor having a cutout portion for reception of said band spring, said cutout portion having a length greater than the width of said band spring whereby limited relative movement of said extractor with said barrel member is permitted, said means on said receiver extending into said bore being positioned to engage the head portion of said piston member and said rod portion of said extractor upon movement of said barrel member relative to said receiver.

11. A power-actuated tool including a receiver having a tubular forward portion, a barrel member mounted within said forward portion for relative movement therewith, said barrel member having a cartridge chamber in one end thereof and a bore, a piston member having a head portion and a shank portion mounted within said bore, a barrel guide slot extending axially in said barrel member and communicating with said bore, means secured to the forward portion of said receiver and extending into said barrel member through said barrel guide slot and into said bore in a position to engage the head portion of said piston member, and extractor means mounted on said barrel member and having a lip portion communicating with said cartridge chamber and adapted to engage a cartridge positioned in said cartridge chamber, said extractor means being mounted for relative axial movement with respect to said barrel member and having a portion extending into said barrel guide slot whereby, during movement of said barrel member with respect to said receiver, said means extending into said barrel guide slot will engage said portion of said extractor means to actuate said extractor means.

12. A power-actuated tool comprising:

(a) a receiver;

(b) a barrel member mounted in said receiver for relative axial movement therewith;

(c) a piston member mounted in a bore within said barrel member for movement therein between a driving position and a driven position;

(d) means forming a cartridge chamber in a breech end of said barrel member;

(e) means forming an axially extending guide slot in said barrel member, said guide slot opening into said barrel bore;

(f) guide means secured to said receiver and extending through said guide slot and into said barrel bore, said guide means being operable to engage said piston member to move the latter from said driven position to said driving position responsive to axial movement between said barrel member and said receiver;

(g) said barrel member having a slot communicating with said cartridge chamber;

(h) means forming an opening extending through said barrel member between said last named slot and said barrel guide slot;

(i) extractor means moveably mounted in said barrel member slot, said extractor means including a lip portion adapted to engage the head of a cartridge chambered in said cartridge chamber, and said extractor means including a portion thereof extending through said opening into said barrel guide slot;

(j) means forming a recess extending circumferentially about said barrel member;

(k) a spring means mounted in said recess and operable to limit the extent of movement of said extractor means; and

(l) said guide means being operable to engage said portion of said extractor means extending into said barrel guide slot, when returning said piston member to said driving position, to actuate said extractor means.

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