United States Patent [19]

Ghisoni

[11] **Patent Number: 4,712,466**

[45] **Date of Patent: Dec. 15, 1987**

[54] **SEMIAUTOMATIC OPERATION REVOLVING CYLINDER PISTOL**

[76] Inventor: **Emilio Ghisoni,** Via Villa Serafina, 4, 27100 Pavia, Italy

[21] Appl. No.: **828,916**

[22] Filed: **Feb. 13, 1986**

[30] **Foreign Application Priority Data**

Feb. 13, 1985 [IT] Italy 19488 A/85

[51] **Int. Cl.**[4] **F41D 7/04**

[52] **U.S. Cl.** **89/157**

[58] **Field of Search** 89/155, 156, 157

[56] **References Cited**

U.S. PATENT DOCUMENTS

747,073	12/1903	Huntley	89/157
3,027,673	4/1962	Oliver	89/157
3,055,270	9/1962	Miller	89/157

FOREIGN PATENT DOCUMENTS

20275 of 1914 United Kingdom 89/155

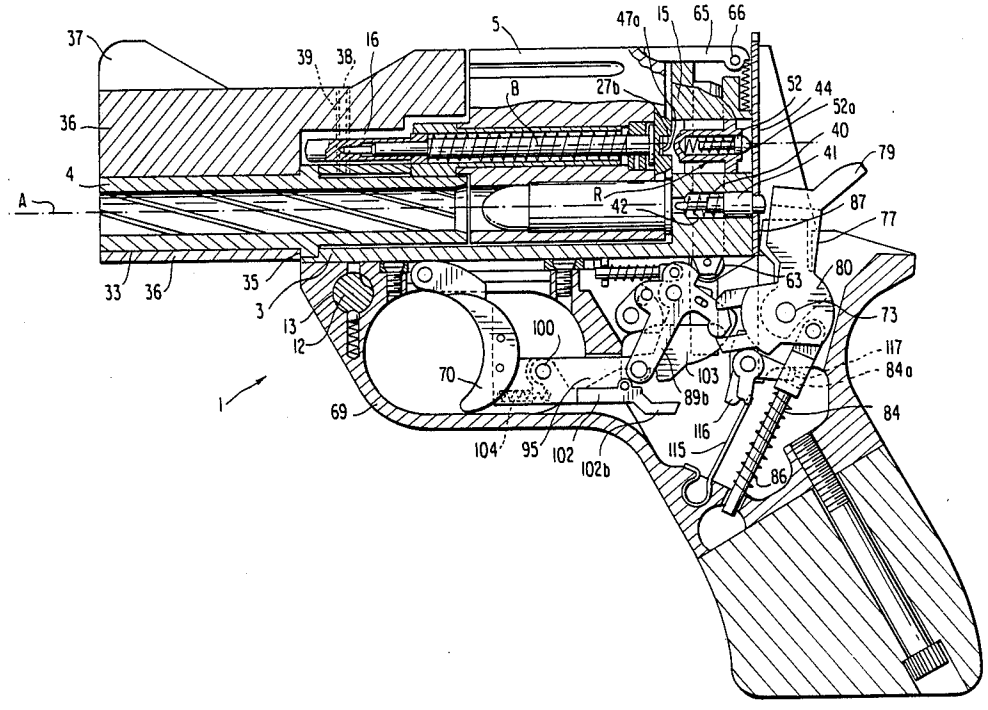
Primary Examiner—Stephen C. Bentley
Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak and Seas

[57] **ABSTRACT**

A revolving cylinder pistol comprising a mount containing the firing mechanism and a slide carrying the barrel and cylinder. The slide is guided movably on the frame between two mechanical stops.

Each recoil stroke of the slide automatically energizes a spring motor carried in the slide itself which is effective to cause the cylinder to revolve in timed relationship with the pistol cocking. The mount supports a pusher which can energize said spring motor on request and is operated by the reload mechanism.

9 Claims, 34 Drawing Figures



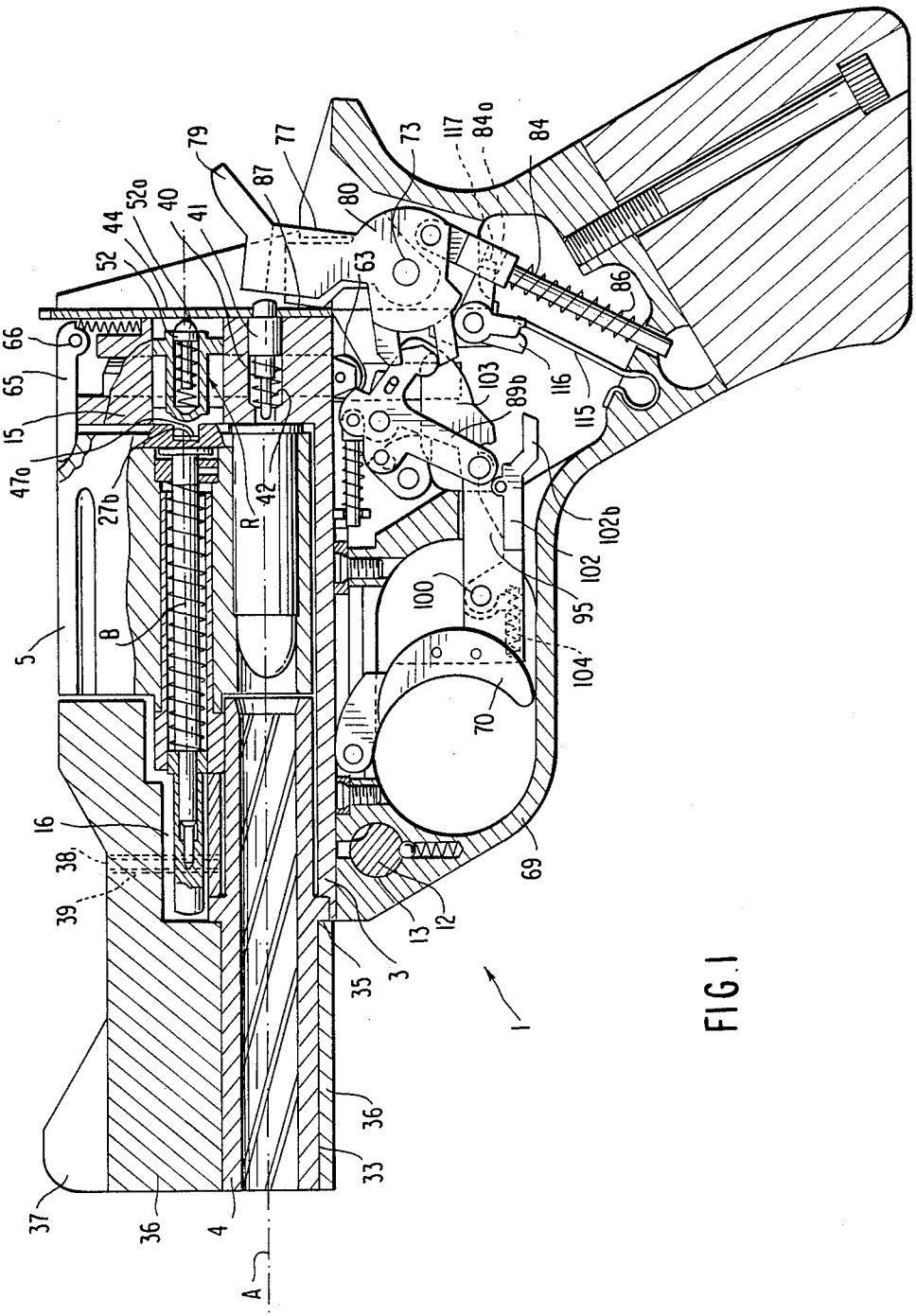

79
77
87
73
117
84o
84
80
52o
40
41
44
52
63
86
66
65
15
47o
27b
R
42
103
89b
116
115
102b
102
95
104
100
70
69
5
B
16
38
39
13
12
35
3
1
36
33
37
4
A

FIG. 1

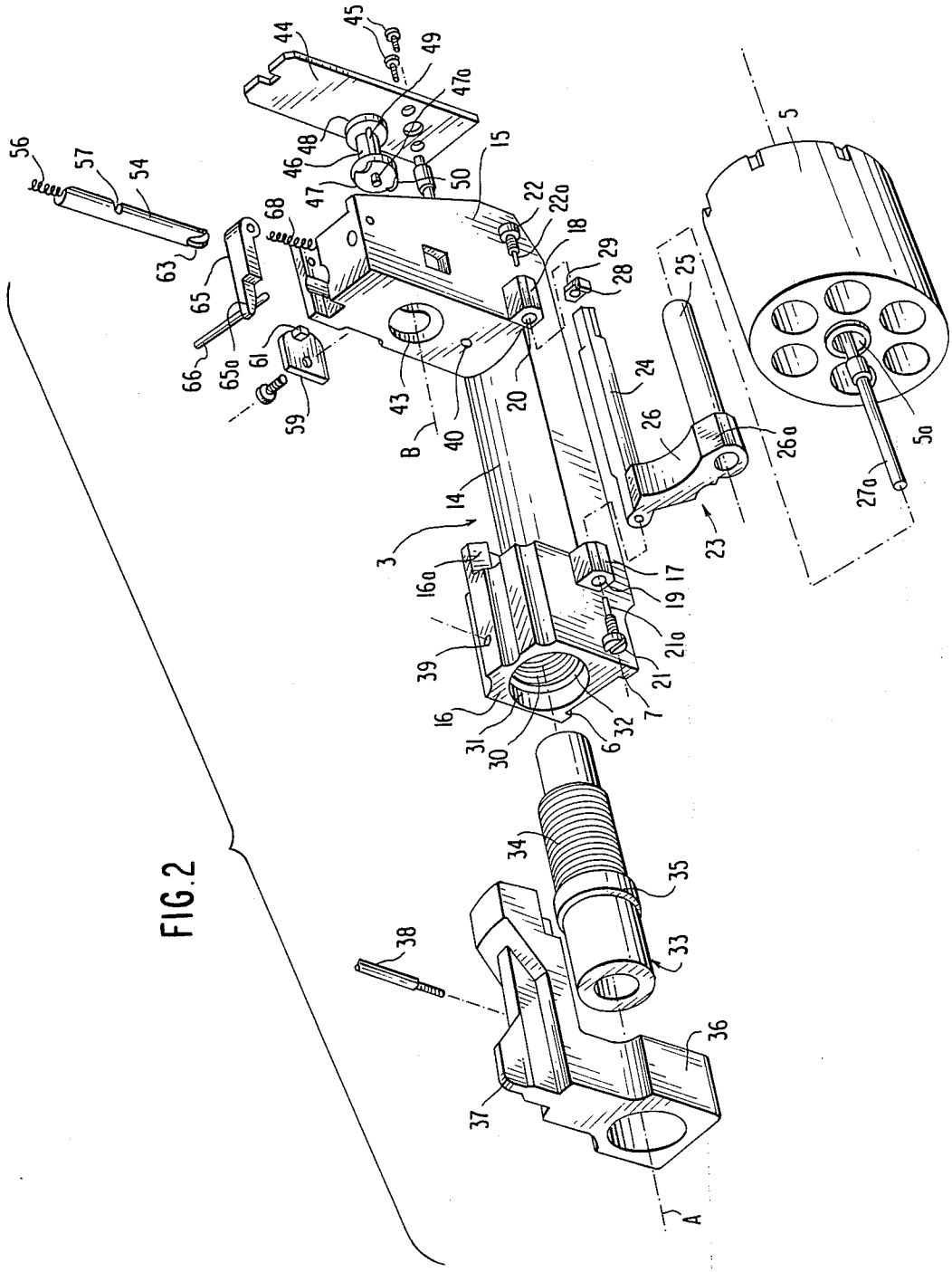
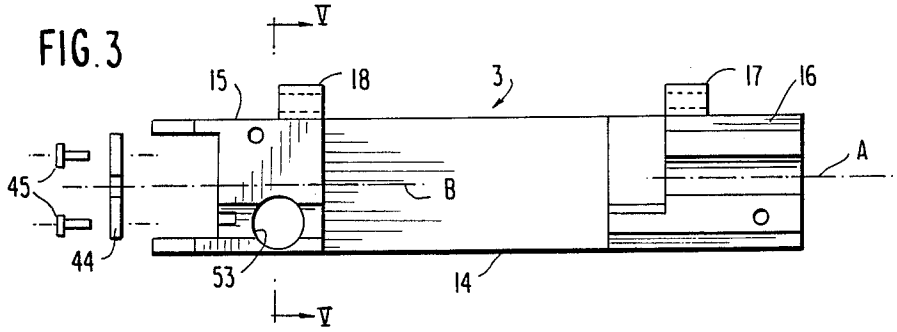

44
45
49
47a
48
46
47
50
15
22
22a
18
29
28
25
5
56
57
54
68
63
65
66
65a
61
59
43
B
40
20
24
26
26a
50
27a
14
3
16a
19
17
23
39
21
21a
16
31
30
7
32
6
34
35
33
38
36
37
A

FIG. 2

FIG. 3



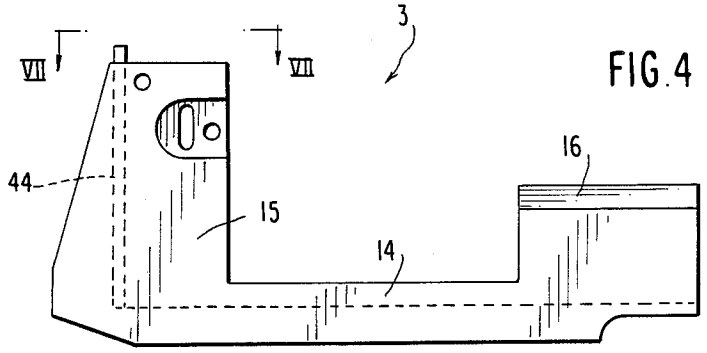


FIG. 4

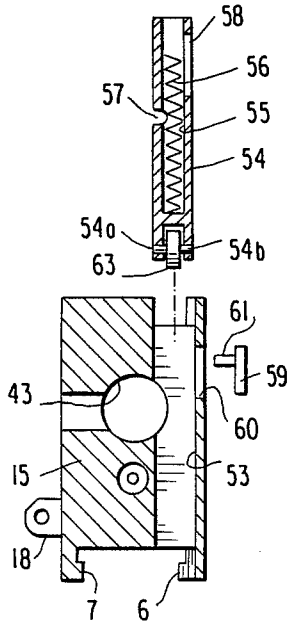


FIG. 5

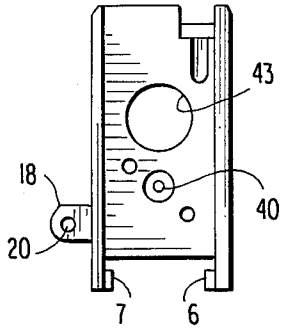


FIG. 6

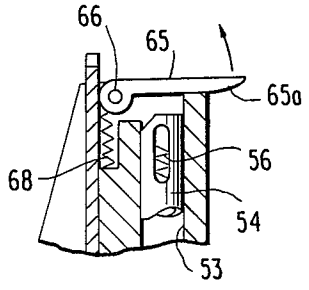


FIG. 7

FIG. 9

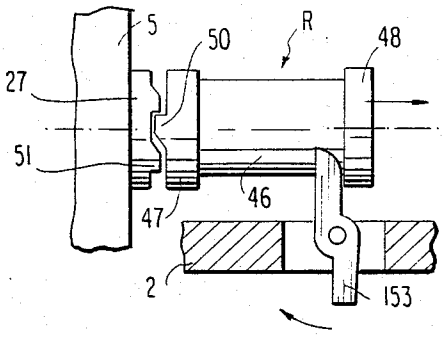


FIG. 10

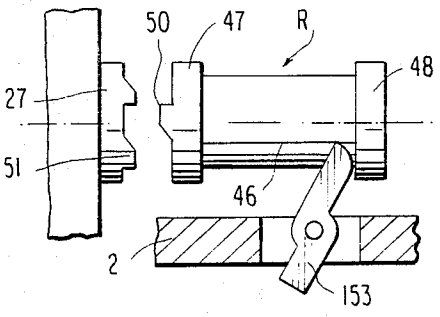


FIG. 11

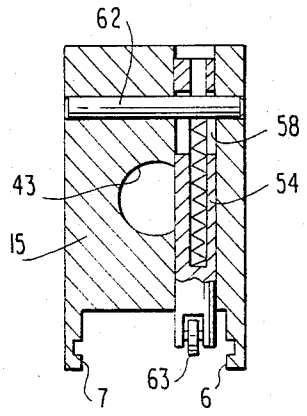


FIG. 8

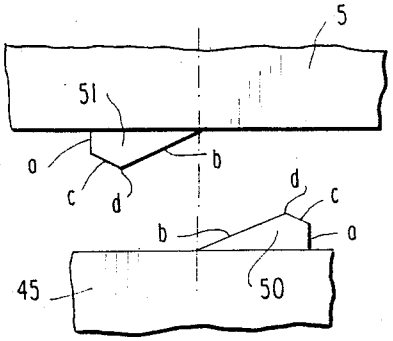
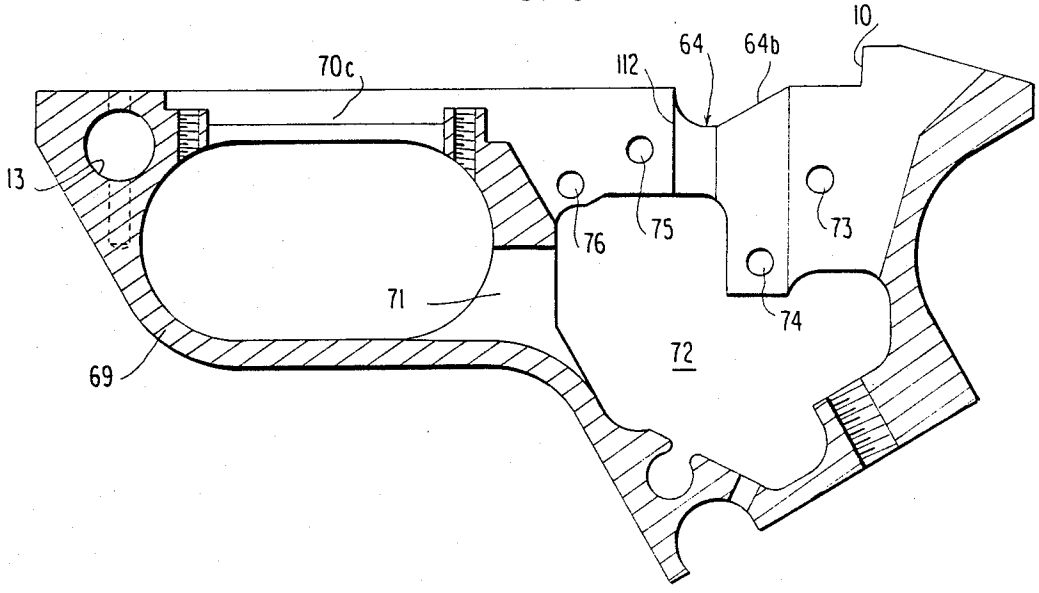


FIG. 16



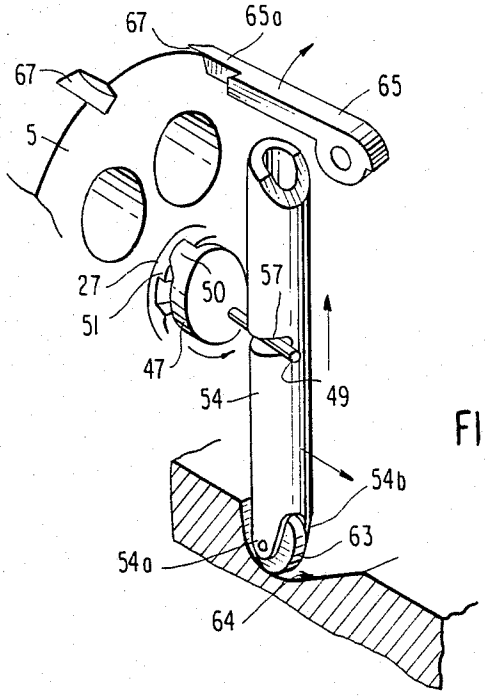


FIG.12

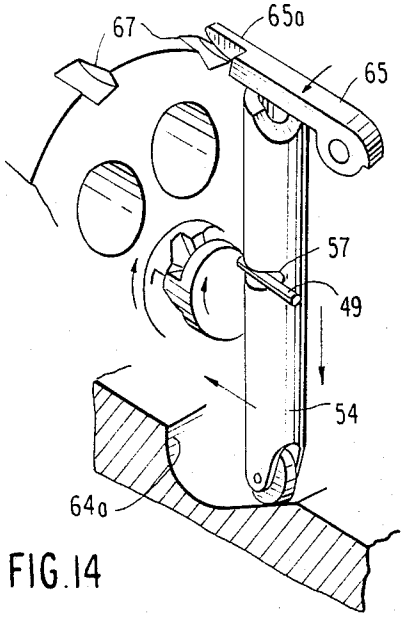


FIG.14

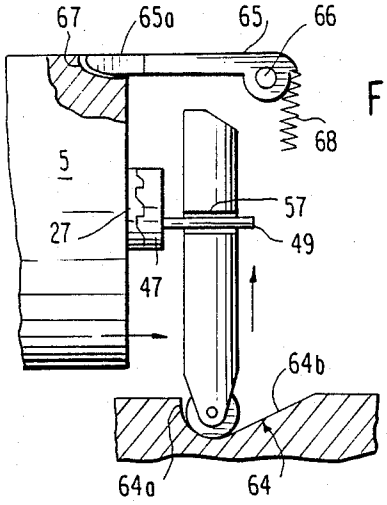


FIG.13

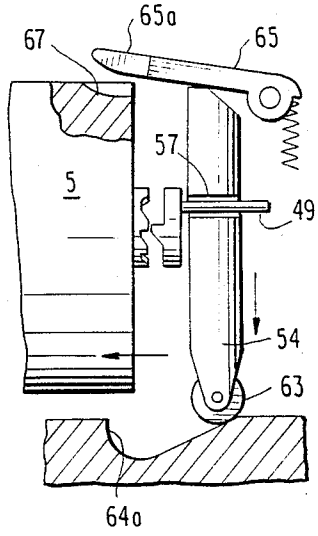


FIG.15

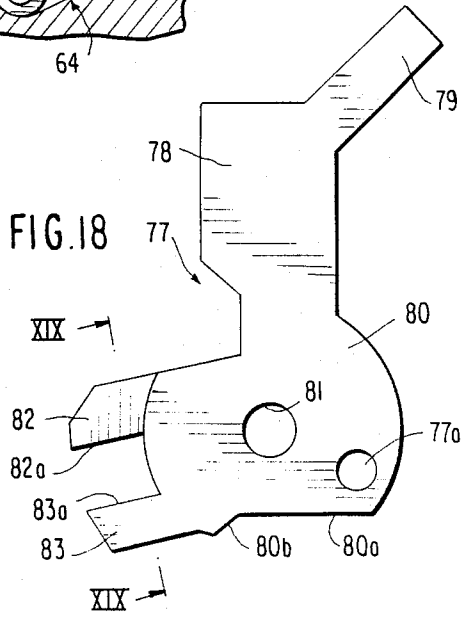


FIG.18

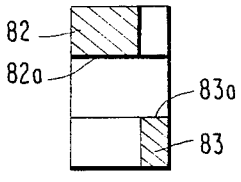


FIG.19

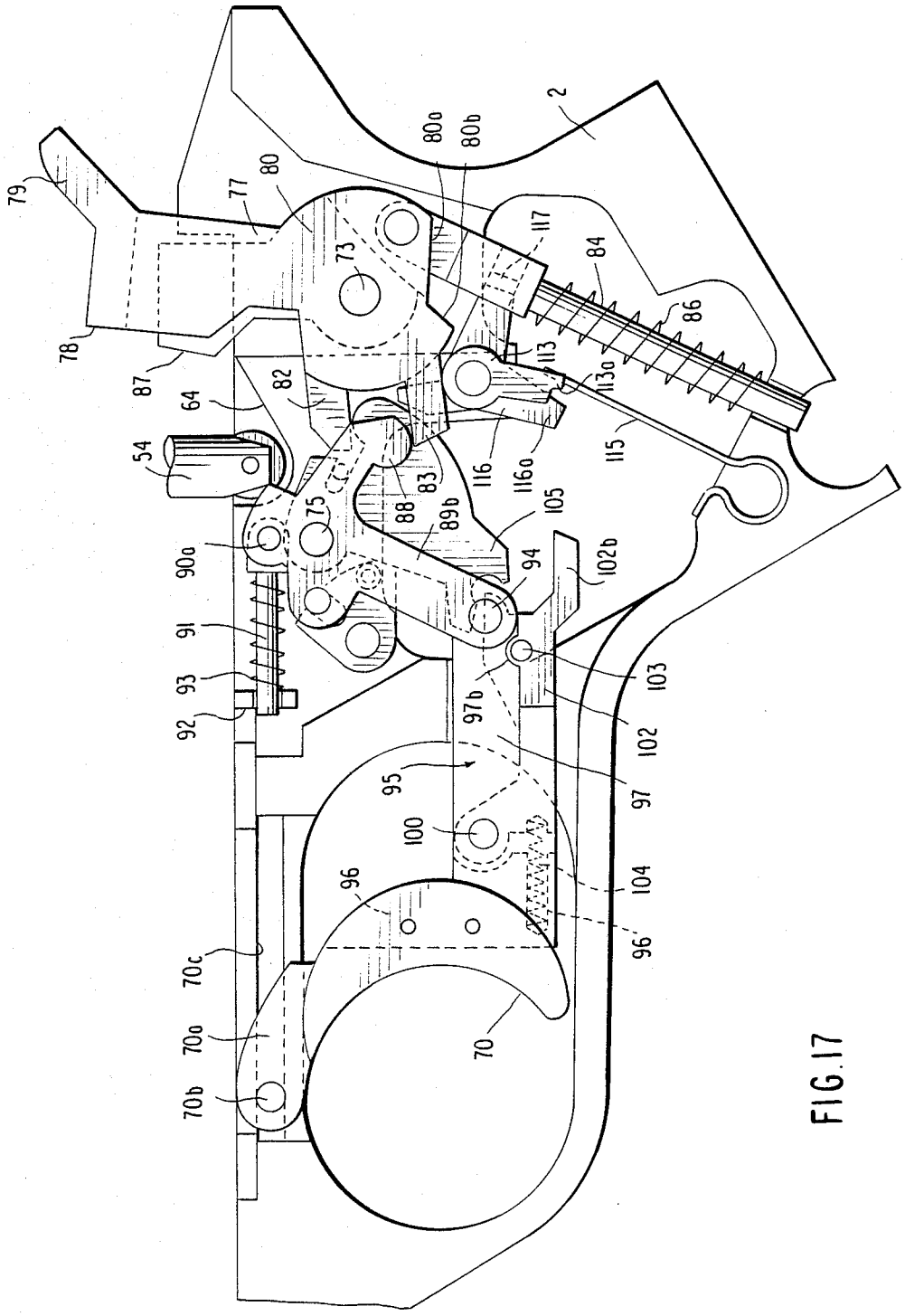

2
79
77
80
80a
80b
73
117
84
86
78
87
64
82
113
113a
54
116
116a
115
75
88
83
89b
105
90a
94
102b
91
93
92
103
97b
102
95
97
100
96
104
96'
70c
70a
70b
70

FIG. 17

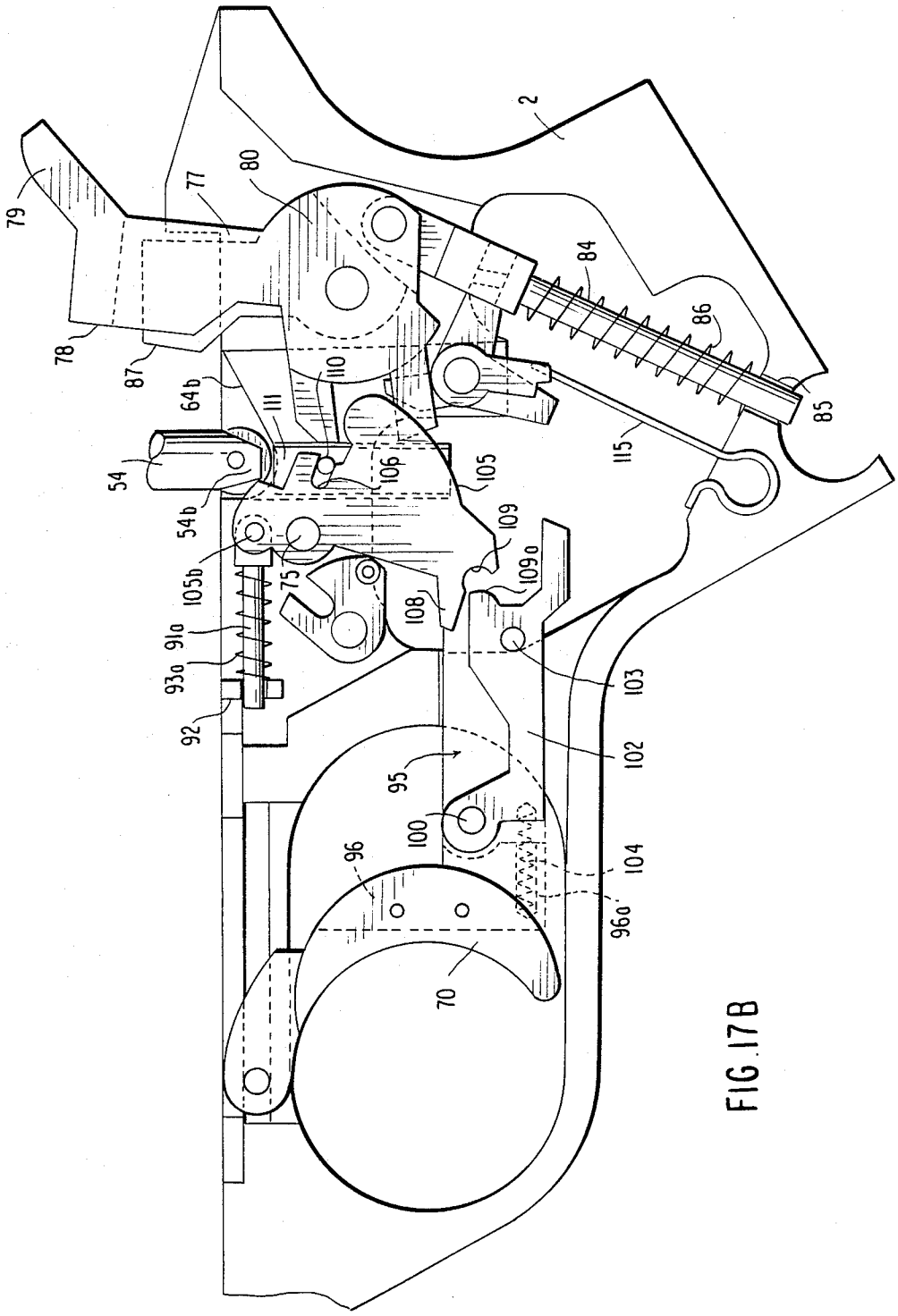

2
79
77
80
84
86
78
87
64b
111
110
85
115
54
106
105
54b
109
105b
75
109a
108
91a
93a
103
92
102
95
100
96
104
96a
70

FIG. 17B

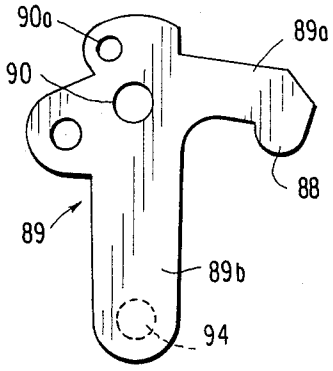


FIG.20

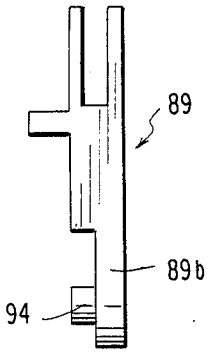
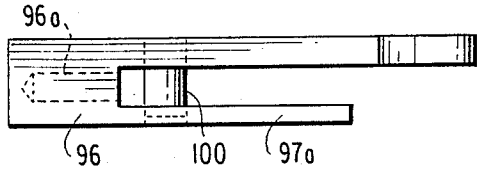


FIG.21

FIG.23



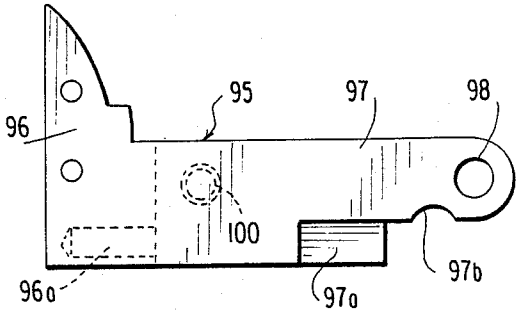
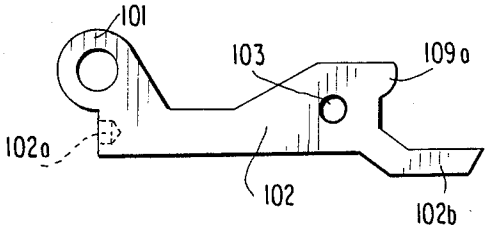


FIG.22

FIG.24



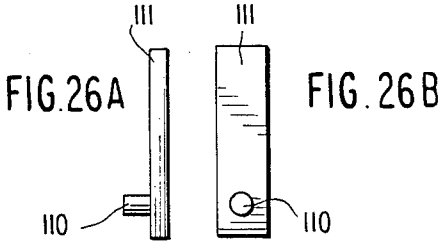


FIG.26A FIG.26B

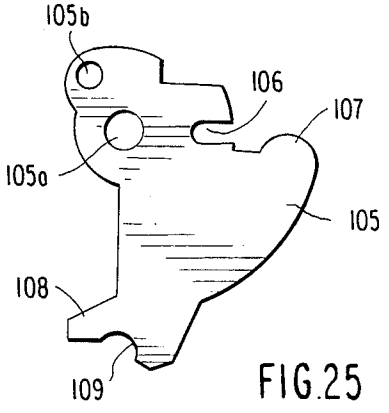


FIG.25

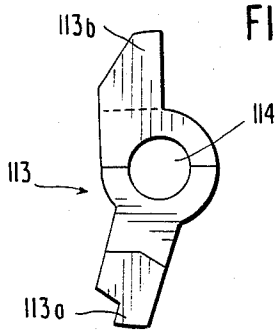


FIG. 27

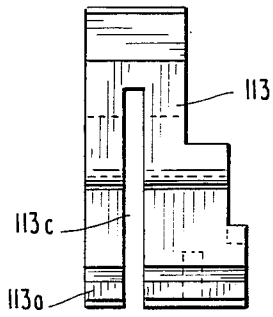


FIG. 28

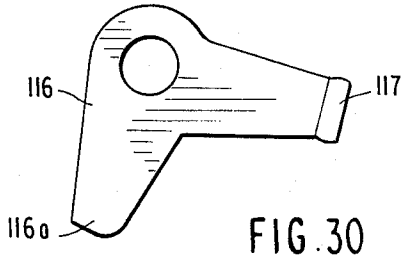


FIG. 30

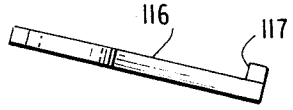


FIG. 31

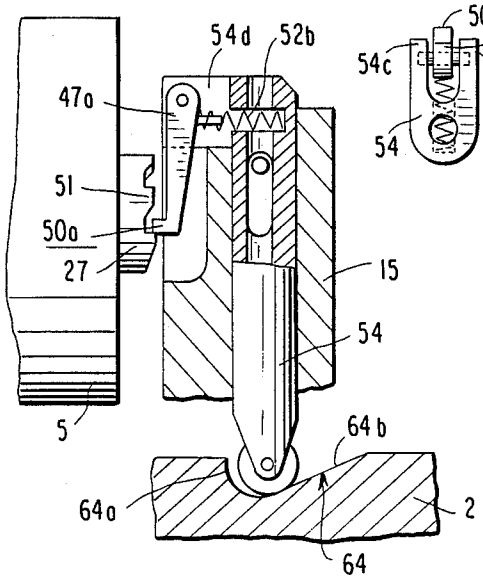


FIG. 32A

FIG. 32

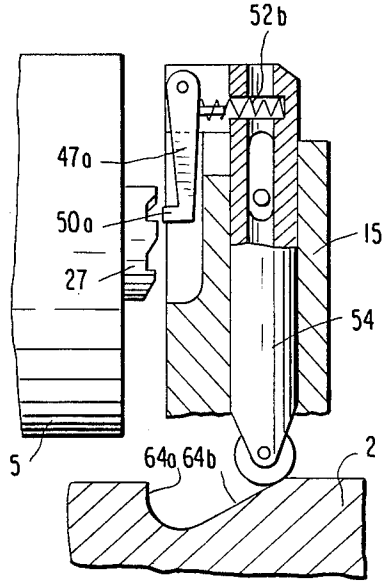


FIG. 33

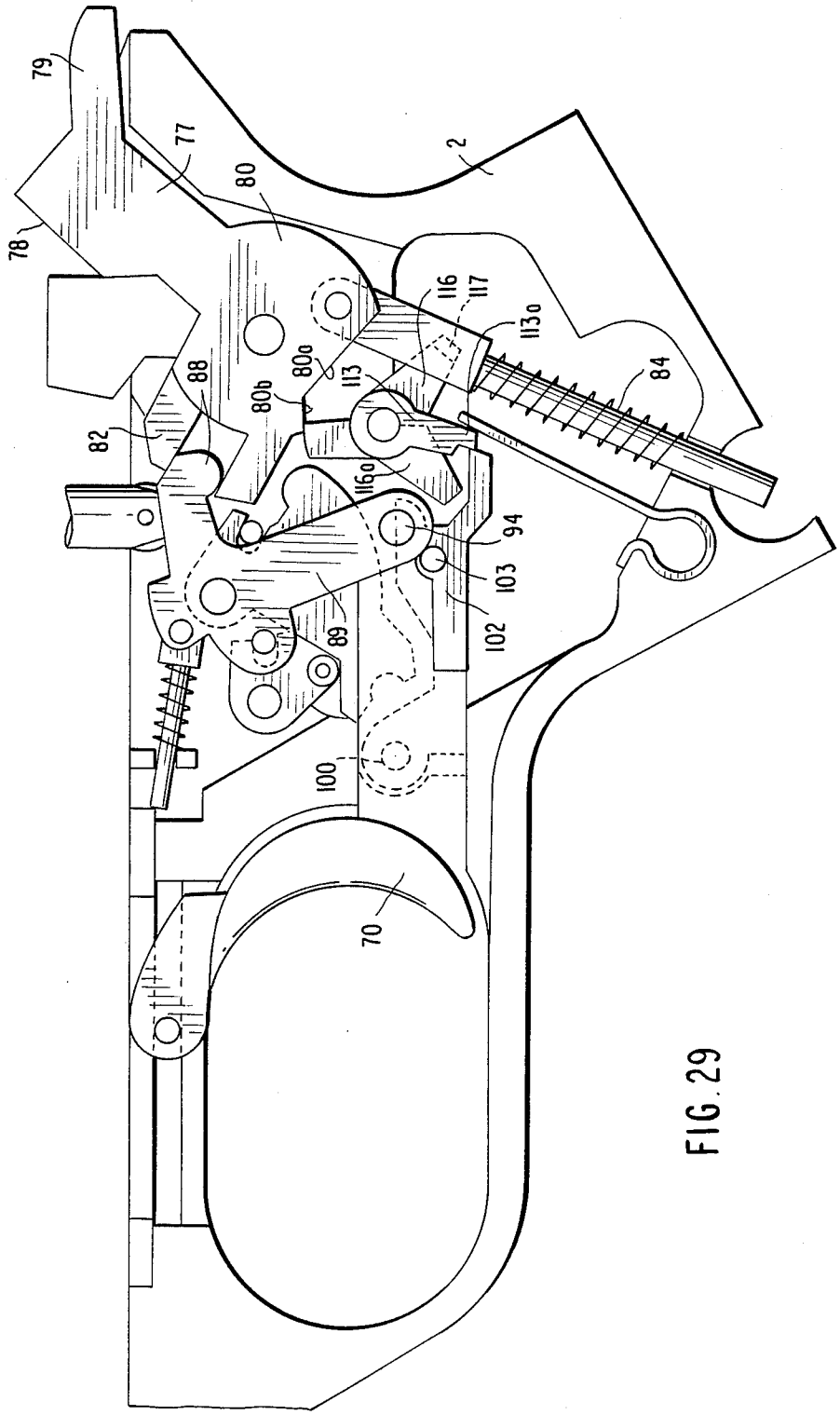

79
77
80
2
78
116
117
113o
80o
80b
113
84
88
82
116o
94
103
102
89
100
70

FIG. 29

SEMIAUTOMATIC OPERATION REVOLVING CYLINDER PISTOL

DESCRIPTION

This invention relates to a semiautomatic operation revolving cylinder pistol, hereinafter referred to more simply as "semiautomatic revolver".

It is a well known fact that the widespread, recognized, and still up-to-date acceptance enjoyed by revolvers is due no more to its reliable operation than to the possibility, in case of a misfire, of reloading for the next round by either pulling the gun trigger or cocking it by hand.

Also known is that some revolver types require that cocking be effected by acting on the hammerspur, and this results in the cylinder revolving to bring a cartridge chamber (or firing chamber) into alignment with the gun barrel. With other, and more widely used, types, by pulling the gun trigger, the cylinder rotation, snap cocking, striking, and firing of a round are all brought about in a continuous fashion. On releasing the trigger, the several revolver parts return to their original positions "automatically", ready for a successive operation cycle. With nearly all revolver types, however, one can reload by acting directly on the hammerspur, and in this case, the hammer is held in its ready-to-fire position by a special detent surface, on pulling the trigger, only the hammer is disengaged. This results in a higher firing accuracy because the trigger stroke length and the effort to be exerted on it are greatly reduced.

As for the revolver operation, the need has been occasionally felt for automating it; that is, the need has been felt for a semiautomatically operated revolver. To meet this demand, a revolver has been developed which utilizes the pressure from the firing gases to automatically revolve the cylinder and reload. Such a revolver, however, ran against the typical features of the gun (operation simplicity and reliability), and was soon abandoned.

Another attempt (by WEBLEY-FOSBERY) at automating revolvers centered on subdividing the revolver structure into two parts: an upper part comprising a framework supporting the barrel and cylinder, being connected slide-fashion to a lower part or frame, which contained the firing mechanism. The relative movement of the two parts, brought to be on firing, was utilized directly to re-cock and turn the cylinder. A first, basic drawback of such a semiautomatic revolver was that the cylinder rotation was only accomplished through the relative movement of the two revolver parts in the automatic mode, and could not be achieved by acting manually on the hammer or the trigger thereof. Thus, in the event of a misfire, it became necessary to manipulate the gun to pull its upper part backwards relatively to the frame by hand. Consequently, the above-mentioned primary advantage of conventional revolvers was lost.

Another drawback was that to provide for the cylinder rotation, a number of suitably profiled grooves, intersecting one another (railroad switch fashion), were provided wherein the top end of a peg attached to the gun frame was to engage slidingly. Thus, the cylinder had to be made suitably oversize in diameter, which resulted in gun carrying inconvenience. Also, since the barrel was aligned with the upper firing chamber of the cylinder, and hence, quite far from the resisting point of the gun holding hand, there occurred on firing, unless the hold on the gun was a firm one, a pivotal movement of the gun about said point instead of the desired linear movement of the upper part with respect to the lower one.

The problem that this invention is directed to solve is that of providing a revolver whose semiautomatic operation is based on utilizing the recoil brought about at the firing time, and which has such constructional features as to overcome the above-specified drawbacks of prior revolvers.

The solution idea of said technical problem is basically that of configuring the revolver upper part as a slide being guided movably on the frame and incorporating all those elements which are intended for revolving and locking the cylinder, and of linking the operation of such elements both to the gun recoil (short-distance shift of the slide along the mount) and to the firing mechanism housed within the frame, and specifically to the gun trigger and hammer.

Based on this idea, the aforesaid technical problem is solved according to the invention by a semiautomatic revolver comprising a frame containing the firing mechanism, and a slide supporting the revolver barrel and cylinder, said slide being guided movably on said frame between two mechanical stops and against the bias of spring means, characterized in that it comprises:

a rear housing formed on said slide and defining, rearwardly therein, a cylinder accommodating area;

a cylinder mounted in said area and having ratchet teeth on one end thereof

a pawl and ratchet device carried in said frame and being arranged to act,

a spring motor in said housing for actuating said pawl and ratchet device;

a means for energizing said spring motor, being actuated automatically by the recoil stroke of said slide on the frame each time that a round is fired; and

a pusher, guided movably in said frame and being linked mechanically to said firing mechanism and acting on said spring motor to energize it.

Advantageously, and in accordance with a preferred embodiment of this invention, said semiautomatic revolver is characterized in that it comprises:

a rear housing formed on said slide and defining rearwardly an area for accommodating said cylinder;

a cylinder mounted in said area and having ratchet teeth on one end thereof

a cylindrical seat formed in said housing coaxially with said cylinder, as mounted in said cylinder accommodating area, said cylindrical seat being open toward the cylinder;

a sprocket fitting rotatably and slidingly within said cylindrical seat;

at least one tooth formed on the wall of said sprocket confronting said cylinder, said at least one tooth being engaged operatively, with said teeth formed on said cylinder;

a slider-rack being guided movably in said housing and in constant engagement with said sprocket and subjected to the action of a spring;

a means for loading said spring automatically, being actuated by the slide recoil stroke; and

a pusher guided movably in said frame, and being linked mechanically to the firing mechanism and active on said slider and said spring.

Further features and advantages of the invention will become more clearly apparent from the detailed description of an exemplary embodiment of a semiauto-

matic revolver according thereto, given herein below with reference to the accompanying illustrative and non-limitative drawings, where:

FIG. 1 shows in longitudinal axial section a semiautomatic revolver according to the invention;

FIG. 2 shows in perspective an exploded view of the slide for the semiautomatic revolver of FIG. 1;

FIG. 3 is a diagramatic, reduced scale, top view of the slide of the semiautomatic revolver of FIG. 1;

FIG. 4 is a reduced scale side view showing diagramatically the slide of FIG. 3;

FIG. 5 is a sectional view taken along the line V—V in FIG. 3, with some details shown exploded;

FIG. 6 is a rear view of the slide of FIG. 4;

FIG. 7 is a part-sectional view taken along the line VII—VII in FIG. 4;

FIGS. 8 to 10 show schematically, and to an enlarged scale, details of a sprocket device mounted on the slide of FIG. 1 to drive the cylinder of the semiautomatic revolver of this invention;

FIG. 11 is a sectional view of a modified embodiment of the slide shown in FIG. 5;

FIGS. 12 to 15 show, in perspective and diagramatically, some operation steps of the device of FIGS. 8 to 10;

FIG. 16 shows a longitudinal axial section through the frame of the inventive semiautomatic revolver;

FIGS. 17 and 17B show, in longitudinal axial section, the same frame as in FIG. 16, containing the firing mechanism of the semiautomatic revolver of this invention;

FIG. 18 is a side view of the hammer of the semiautomatic revolver of this invention;

FIG. 19 is a sectional view taken along the line XIX—XIX of FIG. 18;

FIGS. 20 to 28 and 30,31 show schematically a plurality of mechanical details of the release mechanisms contained within the frame of the inventive revolver;

FIG. 29 shows diagramatically the same mechanisms during an operational step of the revolver according to the invention; and

FIGS. 32 and 33 show diagramatically a modified embodiment of the sprocket device of FIGS. 8–10.

FIG. 32 is a top view of the slider 54 as shown in FIG. 32.

With reference to the aforesaid drawing figures, generally indicated at 1 is a semiautomatic revolver according to this invention. Said revolver comprises a frame 2, containing all the firing mechanisms to be described hereinafter, and a slide 3 carrying the gun barrel 4 and a revolving cylinder 5 of the revolver.

The slide 3 is mounted removably on the frame 2, whereon it is guided slidingly in the longitudinal direction. To that aim, the slide 3 is provided with a pair of undercut guides 6,7 movingly engaged with runways formed longitudinally in the sides of the frame 2. The linear movements of the slide 3 are of limited magnitude and restricted, at one end, by a pair of identical elevations 10,11, only one of which is indicated, formed on the frame 2, and at the other end, by a mechanical stop 12 engaged mechanically in a hole 13, also formed in the frame 2, wherein it is lockable in a position interfering with the travel path of the slide 3. This mechanical stop is essentially of a known type in the pertinent art (Walter P38).

For a clearer understanding of the structural features of the semiautomatic revolver according to this invention, the slide 3 and frame 2 thereof will be discussed hereinafter separately. Throughout the specification and the appended claims, the terms forward and rearward refer to the gun as held in the hand, and the terms right and left are related to the axis of the barrel 4 and/or the cylinder 5 and/or the longitudinal axis of the housing 2.

THE SLIDE

This comprises essentially a one-piece construction slide 14 (FIG. 2) formed with a rearward housing 15 and a forward housing 16 set apart by a distance equal to the length of the cylinder 5.

The cylinder 5 is mounted removably on the slide 14 by journalling lengthwise on two small blocks 17, 18 formed, or otherwise secured, on the left-hand flank of the slide 14. In particular, said small blocks 17, 18 are through-penetrated by respective threaded holes 19,20 having a common axis that lies lengthwise to said slide 14. Threaded into the holes 19 and 20 are two screws 21,22 which have end portions 21a and 22a left plain and projecting beyond the blocks 17 and 18 to form respective juxtaposed trunnions for a substantially fork-like tilting element 23. This tilting element 23 comprises a first arm 24 having oppositely located ends which are journalled on the above-mentioned portions 21*a* and 22*a*, and a second arm 25 attached cantilever-fashion to one end of a plate 26, the other end of which is attached to the arm 24. The arm 25 extends unrestrictedly toward the rear housing 15 and is sized to engage slidingly and pivotally in the bore 5*a* which extends axially through the cylinder 5. The arm 25 is also drilled axially to freely admit an ejector rod 27*a* the rear end of which has a substantially disk-like extractor 27.

Through the tilting element 23, the cylinder 6 can be shifted from a first position whereat it fits in between the rear housing 15 and the forward housing 16 of the slide 14, to a second position whereat it lies completely outside said slide.

The first position is defined by a positive stop formed between a flat shoulder 16*a*, formed in the forward housing 16 and jutting out of it toward the rear housing 15, and a flat wall 26*a* formed on the plate 26 of the tilting element 23.

The forward housing 16 is through-penetrated by a threaded hole 30, being preceded by a plain lead-in section 31 which has a larger inside diameter than said hole 30. Formed between this section 31 and the threaded hole 30 is an annular shoulder 32.

Indicated at 33 is a gun barrel having a threaded portion 34 intended to be threaded into the threaded hole 30, and an annular rim 35 intended to abut against the annular shoulder 32. A sleeve 36, carrying the sight 37, is fitted on the forward section of the barrel 33 to jut out of the housing 16, and is fastened to the housing 16 by means of a suitable screw 38, threaded into a threaded hole 39.

With reference to FIG. 1, it should be noted that the axis A of the barrel 33, as mounted on the slide 3, coincides with the axis of the lowermost cartridge chamber of the cylinder 5, as held in the first position specified above (firing position).

This same axis A coincides with the axis of a bore 40, formed in the rear housing 15 and being the seat for a firing pin 41 and its respective return spring 42.

Indicated at B is the axis of the cylinder 5 as held in its firing position. This same axis B coincides with the axis of a cylindrical bore 43 which extends through the rear housing 15 and is closed rearwardly by an abut-

ment plate **44** being fastened removably to the frame itself, by means of screws **45**, at a recessed location relatively to to the lateral sides thereof.

Mounted slidingly and rotatably in said cylindrical bore **43** is a sprocket R including a hub **46**, forward disk **47**, and a rear disk **48**. At a location between said disks **47,48**, eccentrically from the hub **46**, there is secured a parallel peg **49** to the sprocket axis.

The forward disk **47** is provided with a pair of face teeth **50** intended for engagement with the teeth **51** of an annular arrangement formed on the face of the disk-like extractor **27**.

The teeth **51**, provided in an equal number to the number of the cartridge chambers in the cylinder **5**, and the teeth **50** of the sprocket (**46–48**) have identical but opposed profiles. Specifically with reference to FIG. **8**, each of said teeth **50** and **51** has a face a perpendicular to the disk **47** and the disk-like extractor, extending radially thereto, a slanted back b, and in between, a bevel c which defines, with said back b, a ridge d.

The forward disk **47** of the sprocket R is also provided axially with a hub **47***a* (FIG. **1**) adapted to engage slidingly and rotatably in a cylindrical recess **27***b* formed axially in the spider extractor **27**.

A spring **52** on a spring guide **52***a* constantly biases the sprocket R (**46–48**) toward the spider extractor **27**.

A key **153** (FIGS. **9** and **10**), which is accessible and manually actuatable from the exterior of the rear housing **15**, is active on the disk **48** of the sprocket (**46–48**) to drive it back into the bore **43** against the bias of the spring **52** and release the cylinder **5** (FIGS. **9–10**).

In the rear housing **15**, at an eccentric position toward the right-hand lateral side thereof, there is formed a throughgoing cylindrical bore **53**, being perpendicular to and intersecting the bore **43** accommodating the sprocket **46–48**. Mounted slidingly within the through bore **53** is a cylindrical slider **54**, formed axially with a blind hole **55** wherein there fits a spring **56**.

In the wall of the slider **54**, on the side thereof facing the bore **43**, there is formed a notch **57** adapted to engage with the peg **49** on the sprocket **46–48**. At a diametrically opposed location, the slider **54** is formed with a slot **58** which extends along a generatrix line thereof and has a set length dimension.

A small plate **59**, attached removably to a lateral side of the rear housing **15**, preferably in a suitably sized seat **60**, is provided with a detent **61** extending through the slot **58** toward the interior of the slider **54** to form a fixed bearing for the top end of the spring **56**. It may be appreciated that the travel distance of the slider **54** in its respective bore **53** is determined by the length of the slot **58**.

Of course, said detent for the spring **56** may be comprised of an equivalent means, such as (FIG. **11**) a peg **62** carried on the rear housing **15** and extending bridge-like across the slider **54**, at a suitable distance from the bottom of the hole **55** thereof.

The slider **54** is provided at the bottom with a wheel **63** supported rotatably in between a pair of lugs **54***a*,**54***b* formed on the slider itself. The wheel **63** is in rolling engagement with a track **64** formed on the top profile of the right-hand lateral side of the frame **2**.

The track **64** (FIGS. **12** to **15**) comprises a forward section **64***a*, extending substantially in an arc of a circle and being adapted to receive the wheel **63** of the slider **54**, and an inclined rear section **64***b* which climbs up toward the rear of the frame **2**. In practice, the track **64** forms a feeler for said profile. It should be noted that, with the wheel **63** on the forward section **64***a* of the track **64**, the lug **54***a* of the slider will protrude inwardly of the frame **2**.

Indicated at **65** is a rod-like index having one end mounted on a pin **66**, carried on the rear housing **15**, and the other end **65***a*, protruding forwardly from said frame, engaged removably in a notch **67** of plural notches formed peripherally in the cylinder **5**. A bias spring **68** urges the index **65** constantly into a position of engagement in one notch **67**. It should be noted that said index **65** extneds across the bore **53** so as to interfere with the travel path of the slider **54**.

THE FRAME

The frame **2** comprises a flattened box-type body whose undercut runways for the sliding movement of the slide **3** have already been described, the stops **10,11** and **12** which delimit the movements of said slide on the frame **2**, and the cam-like profiled track **64**.

On the frame **2**, a guard **69** defines a forward area accommodating a trigger **70**, which area is in communication, through a passageway **71**, with a box **72** housing the first mechanism. Within this box **72**, on one side of the frame **2**, there are secured the pins **73**, **74,75** and **76**. Journalled on the pin **73** is the hammer **77**, of which there are clearly shown in FIGS. **17** to **19** the part **78** acting on the firing pin **41**, the hammer spur **79**, and a base part **80** of substantially disk-like shape and being through-penetrated by a hole **81** for mounting said hammer to the pin **73**.

The hammer **17** is provided forwardly with two parallel lugs **82,83** set apart along the circular profile of the base part **80** of said hammer in mutually offset relationship.

To the hammer **77**, rearwardly of the pin **73**, there is journalled at **77***a* the top end of a rod-like spring guide **84**, the other end of which is guided, slidingly in a bore **85** formed at the bottom of the firing mechanism box **72**. A spring **86**, fitted over said spring guide **84**, is arranged to act on the hammer **77** to oppose its angular movement into the cocked position.

Engaged with the active part **83***a* of the arm **83** of said hammer **77** is a half-round lug **88**, formed on the end of an arm **89***a* of a plate-like lever **89**, of substantially cranked shape (FIG. **20**). This lever **89** is through-penetrated centrally by a hole **90**, by means of which it is journalled on the fixed pin **75**. Journalled to the plate-like level **89**, near the hole **90***a*, is the head of a spring guide **91** engaged slidingly through a passageway formed in a supporting detent **92**. A spring **93** on said spring guide **91** resists the angular movements of the lever **89** in a counterclockwise direction with reference to the cited Figures.

Attached to the otherarm **89***b* of said level **89** is a pin **94**.

Indicated at **95** in FIGS. **22,23** is a two-rod link comprising a base portion **96**, a first arm **97** and a second arm **97***a*, parallel to and shorter than the first. Via split pins or the like conventional locking means not shown, the base portion **96** is secured to the trigger **70**, whence the link **95** extends fully out, through the passageway **71** toward the box **72** for the firing mechanism.

In the end of said link **95** arm **97**, there is formed a hole **98**, wherein the pin **94** of the lever **89** is journalled.

In between the arms **97** and **98** of the link **95**, close to the base portion **96**, there is affixed a pin **100**, which has the open eye end **101** of a flat lever **102** extending between said arms mounted rotatably thereon. Secured to

this lever **102** is a cylindrical peg **103** adapted to engage, in the manner explained hereinafter, in a semicircular notch **97***b* formed in the bottom side of the arm **97** of the link **95**. A spring **104**, fitted partway into a seat **96***a* in the base portion **96** of the link **95**, and partway into a seat **102***a* in the lever **102**, urges the latter to move angularly in a countercockwise direction, with reference to the cited Figures, about the axis of the pin **100**.

The plate-like lever **89**, link **95**, and lever **102** form a drive interconnecting the hammer **77** and trigger **70**.

Indicated at **105** is a further plate-like lever (FIGS. **25**,**17***b*) provided with a through hole **105***a* whereby it is mounted pivotally on the fixed pin **75**. This lever **105** is also subjected to the bias of a spring **93***a* (FIG. **17**), the spring guide **91***a* wherefor is journalled in the hole **105***b*, said spring urging the lever **105** to move angularly about the axis of said pin **75** in a clockwise direction.

Close to the pivotal connection hole **105***a*, the lever **105** has a slot **106** of elongate shape which opens rearwards of the frame **2** toward a semicircular lug **107** formed on the lever itself. On the remote end portion to that having the hole **105**, there formed a foot **108** extending forwardly and a semicircular notch **109**, intended for engagement with a semicircular lug **109***a* formed on the free end of the previously mentioned flat lever **102**. The function served by that engagement will be more clearly apparent hereinafter.

The open slot **106** has a peg **110** engaged slidingly and pivotally therein which is secured to and contilevers from a indexing slide **111** guided movingly on the lateral side of the frame **2** provided with the camming track **64**. More specifically, in said lateral side there is milled a rectangular groove **112** which is open to the semicircular start portion **64***a* of said track **64**.

It should be also noted that on the pin **73** there is journalled a dummy hammer **87** which, being subjected to the bias of a spring similarly to that described in connection with the hammer **77**, pushes constantly on the slide **3**, resisting its movements toward the rear of the frame **2**. Of course, said dummy hammer **87** would never interfere with the firing pin **41**.

The trigger **70** (FIG. **17**) is provided above with a ridge-like projection **70***a* and adjacent the free end of this ridge, a pin **70***b* is secured transversely with the opposed ends of the pin engaged slidingly in a T-shaped guide **70***c* formed at the top of the frame **2**. It should be observed that this feature of the trigger **70** being mounted for translatory pivotal movement affords a markedly reduced construction of the top portion of the frame **2** over conventional designs. This, in combination with the slide **3** being greatly extended longitudinally (it is nearly as long as the frame **2** whereon it slides), and with the barrel being aligned to the bottom cartridge chamber of the cylinder **5**, obviates the disadvantage of the gun pivoting about the resisting point on the hand gripping it upon firing a round.

OPERATION

On firing a round, the slide **3** is set into motion by the recoiling effect along the frame **2** toward the rear of the latter, which movement is opposed by the springs which act on the hammer **77** and dummy hammer **87**. The wheel **63** of the slider **54** is forced along the uphill section **64***b* of the track **64**. Consequently, said slider **54** will be raised against the spring **56** in its respective bore **53**, producing a counterclockwise rotation of the sprocket R (**46**–**48**). On the occurrence of this rotation, the backs b of the teeth **50** and **51**, respectively of the sprocket **45** and the spider extractor **27**, will slide over each other causing said sprocket to move rearwardly in its axial seat **43**. On moving over and past the ridges d,the teeth **50** and **51**, after sliding with their respective bevels c, become aligned so as to have their faces a in a "flush" configuration (FIG. **9**). Owing to the bias force of the spring **52**, the sprocket R (**46**–**48**) will be returned to its forward position, thus reengaging its teeth **50** with the teeth **51** of the spider extractor **27**. On raising the slider **54**, the index **65** has been moved up out of engagement with the cylinder **5**. Accordingly, the cylinder **5** will be let free to rotate. As the recoil effect ceases on the slide **3**, predominant on it becomes the action of the spring biasing the dummy hammer **87**, with the hammer **77** being held back in position. The slide is moved forward and the wheel **63** of the slider **54** caused to travel back down the sloping section **64**b of the track **64** to its original position at the semicircular section **64**a. As a result, the slider **54**, under the urge from the spring **56**, is lowered back into its respective bore **53**, to produce a clockwise rotation of the sprocket (**46**–**48**). The sprocket R entrains the cylinder **5** rotatively, which results in a fresh cartridge chamber becoming aligned to to the gun barrel.

The semiautomatic revolver of this invention is thus ready for another round of fire. It should be noted that the rotation of the cylinder **5** is effected, in essence, by a spring "motor" (the slider **54** plus the sprocket R), wherein the spring is loaded by the recoil energy. Said motor, being mounted on the slide **3**, comprises essentially a rack (slider **54**) and pinion (sprocket R) mechanism of a basic type, wherein the face engagement between the sprocket R and cylinder **5** is of the ratchet variety.

It shall now be shown how, in the event of a misfire, the revolver of this invention still affords switching to the next round, by re-cocking with a direct action on the hammer itself or on the trigger, and simultaneous rotation of the cylinder to bring another cartridge chamber into alignment with the revolver barrel.

By acting on the hammerspur **79** of the hammer **77**, an angular movement thereof is produced, about its respective pivot **73** in the clockwise direction as viewed in the drawings, simultaneously with an angular movement of the crank level **89** in the counterclockwisse direction, owing to the lug **88** thereof engaging with the arm **83** of said hammer **77**. The platelike lever **89**, in its angular movement about the axis of the fixed pin **75**, drives the double rod link **95** rearwards owing to the pin **94** of said lever **89** becoming engaged in the hole **98**, in the arm **97** of said link (FIGS. **1** and **17**).

The link **95** movement is followed, of course, by a corresponding movement of the trigger **70**, wherewith said link is made fast. The lever **102** also follows this rearward movement, retaining its original position by virtue of the action of the spring **104** and of the cylindrical peg **103** being engaged in the semicircular notch **97***b* of the arm **97** of the link **95**.

On the flat lever **102** being so moved, the semicircular lug **109***a* (FIG. **17**B) formed thereon will engage with the semicircular notch **109** in the platelike lever **105**, shifting it angularly in the counter-clockwise direction as viewed in the drawings, about the axis of the fixed pin **75**. As a result of this angular movement and of the slot **106** being coupled to the peg **110** of the indexing slide **111**, the latter will be raised in its respective guide **112**. In its upward movement, the indexing slide **111** first meets the lug **54***b* on the slider **54** from beneath, to then

cause it to be raised and the sprocket R (46–48) turned counterclockwise.

As the angular movement of the plate-like lever **105** continues in the counterclockwise direction, the foot **108** thereof contacts the top side of the flat lever **102**, pushing it down against the bias of the spring **104**. Thus, the lever **102** is disconnected from the plate-like lever **103**, i.e. the lug **109***a* is disengaged from the notch **109**.

Dominant on this lever **105** becomes then the action of the spring **56** of the slider **54**, which brings about an angular movement in the clockwise direction, again as viewed in the drawings. As a result, the indexing slide **111** is returned to its original position, and the slider **54**, being so urged by its respective spring **56** expanding back to yield the energy stored up during the recoil step, will also be restored to its home position, with the wheel **63** engaging with the start section **64***a* of the track **64**.

During this movement of the slider **54**, the sprocket (46–48) is rotated in the clockwise direction and will entrain the cylinder **5** therealong, as discussed in connection with the semiautomatic operation of the revolver.

Disconnection of the lever **102** from the lever **105** occurs on the hammer **77** reaching, in its angular movement, the "cocked" position.

Prior to the occurrence of that disconnection, a keeper **113** (FIGS. 27,28) is brought into operation. This keeper is formed with a central hole **114** whereby it is journalled to the fixed pin **74** (FIGS. 1,16, 17). On a dog-like end **113***a* of said keeper **113** there acts a hairpin spring **115** which tends to urge it to turn in the clockwise direction as viewed in the drawings. The other end **113***b* is normally held against the forward circular profile of the base portion **80** of the hammer **77** (FIG. 1), between the arms **82** and **83** thereof.

In approaching the end of the cocking travel range of the hammer **77**, due to support from the circular profile of the base portion **80** thereof being removed, the aforesaid end **113***b* of the keeper **113** will be urged by the hairpin spring **115** against the side **80***a* of the hammer **77**. The rear lug **102***b* of the lever **102** is held in the down position relatively to the dog **113***a* by the action exereted thereon by the foot **108** of the lever **105**.

On disconnection, the lever **105** is turned clockwise, and the foot **108** thereof is moved forward out of contact with the lever **102**. This lever is then let free to resume its raised position (starting position) under the action of the spring **104**. With that upward movement, the lug **102***b* of the lever **102** is brought to bear on the dog **113***b* of the keeper **113** from below.

On releasing the hammer **77**, it will move forward again by a few degrees until the side **80***b* of its base portion **80** comes to rest on the end **113***b* of the keeper **113**. However, the aforesaid forward angular movement of the hammer **77** will bring about a corresponding short forward movement of the entire drive interconnecting said hammer **77** and trigger **70**. As a consequence, the lug **102***b* of the lever **102** moves in front of the dog **113***a* of the keeper **113** (FIG. 27).

On pulling the trigger **70**, the keeper **113** will rotate counterclockwise under the urge from the lever **102**, against the bias of the hairpin spring **115**, thus moving out of the way of the hammer **77**. Accordingly, the hammer **77** will be free to fall onto the firing pin **40**.

A crank lever **116** (FIGS. 30 and 31) is journalled to the fixed pin **74**, whereon the keeper **113** is mounted pivotally, and turns in a slot **113***c* formed centrally in the keeper itself (FIG. 28). This lever **116** is provided with a right-angle projecting lug **117** which engages in a cutout **84***a* formed in the head of the spring guide **84** of the hammer **77**.

On the hammer **77** falling onto the firing pin **40**, the lever **116** will rotate in the counterclockwise direction under the urge from the spring guide **84**. The end **116***a* of the lever **116** is brought to contact and pushes on the lug **102***b* of the lever **102**, and by overcoming the bias force of the spring **104**, will disengage this lever **102** from its rest on the dog **113***a*.

After firing of a round, the hammer **77** moves rearwards under the thrust from the slide **3**, and the spring guide **84** will resume the position it occupied prior to firing. Consequently, the lever **116** will be driven rotatively by said spring guide in the clockwise direction and its end **116***a* removed from the working area of the lever **102**. As a result, the lug **102***b* of said lever **102** can arrange itself to push on the dog **113***a* for firing the next round.

In the modified embodiment of FIGS. 32,33, the rotary drive for the cylinder **5** is implemented by a pawl lever **47***b* being journalled between two parallel ears **54***c*,**54***d* formed at the top of the slider **54**. A spring **52***b* biases said lever **47***a* toward the cylinder **5**, thereby its foot **50***a* will engage ratchet-fashion with the teeth **51** on said cylinder.

I claim:

1. A semiautomatic operation revolving cylinder pistol, comprising a frame containing a firing mechanism and a slide supporting the revolver barrel and cylinder, said slide being guided moveably on said frame between two mechanical stops and against the bias of spring means, characterized in that it comprises:

a housing formed on said slide and defining, rearwardly therein, a cylinder accommodating area;

a cylinder rotatably mounted in said area having a plurality of teeth disposed in an annular configuration on an end face of said cylinder;

pawl and ratchet means moveably mounted in said housing and being arranged to act on said teeth to rotate said cylinder;

a spring motor in said housing for actuating said pawl and ratchet means;

means for energizing said spring motor automatically by the recoil stroke of said slide on the frame each time a round is fired; and

pusher means moveable guided in said frame and being linked mechanically to said firing mechanism for acting on said spring motor to energize it.

2. A revolver pistol according to claim **1** characterized inthat said cylinder is mounted removably and idly on an arm carried cantilever-fashion on a pin supported pivotally at a lateral location externally of said slide, said cylinder being moveable angularly about the axis of said pin from an operative position in said cylinder accommodating area to a position tilted sideways out of said cylinder accommodating area.

3. A revolver pistol according to claim **1** characterized in that it comprises a dummy hammer journalled rearwardly on said frame and being subjected to the action of a spring means, said dummy hammer having an active part held constantly pressed against said slide to resist its movement toward the rear of said frame.

4. A semiautomatic operation revolving cylinder pistol comprising a frame containing a firing mechanism and a slide supporting the barrel and cylinder of said pistol, said slide being guided moveably on said frame

between two mechanical stops and against the bias of spring means, characterized in that it comprises:

a rear housing formed on said slide and defining, rearwardly therein, a cylinder accommodating area;

a cylinder mounted for rotation in said area and having a plurality of ratchet teeth on the end;

a cylindrical seat formed in said housing coaxially with said cylinder when fitted in said cylinder accommodating area, said cylindrical seat being open toward said one end of said cylinder;

a disk rotatably and slidingly positioned in said cylindrical seat and having a surface forming said cylinder;

at least one tooth formed on said surface of said disk confronting said cylinder, said at least one tooth being disposed in ratcheting engagement with said ratchet teeth formed on said cylinder;

a rack slider guided moveably in said housing in constant engagement with said disk and a spring for biasing said slider in one direction;

means for loading said spring automatically being actuated by the recoil stroke of said slide each time that a round is fired; and

a pusher guided moveably on said frame, linked mechanically to the firing mechanism, and acting on said slider and said spring to load said spring.

5. A revolver pistol according to claim **4** characterized in that said slider is engaged slidingly in a through bore formed in said frame in a direction perpendicular to and intersecting the cylindrical seat housing said disk, said slider being provided, on the end thereof facing said frame, with a wheel held by said spring in rolling engagement with a track formed on top of said frame and having a section climbing up toward the rear thereof.

6. A revolver pistol according to claim **5** characterized in that said slider is formed axially with a blind hole wherein said spring is positioned, means for resisting the bias of said spring carried on said housing and extending across said blind hole through a slot of set length formed longitudinally in said slider.

7. A revolver pistol according to claim **5** characterized in that said pusher includes a slide mounted for a sliding movement on guides carried on said frame, being moveable to and from said track to engage with and urge said slider against the bias of said spring, said slide being connected mechanically to a lever of said firing mechanism actuated on cocking or pulling the trigger.

8. A revolver pistol according to claim **4** characterized in that it comprises a trigger mounted slidingly in guide means formed longitudinally on said frame.

9. A semiautomatic operation revolving cylinder pistol, comprising a frame containing a firing mechanism and a slide supporting the barrel and cylinder of said pistol, said slide being guided moveably on said frame between two mechanical stops and against the bias of spring means, characterized in that it comprises:

a rear housing formed on said slide and defining, rearwardly therein, an area for accommodating said cylinder;

a cylinder rotatably mounted in said area and having ratchet teeth on one end thereof;

a slider guided moveably in said housing inside a through bore formed therein in a perpendicular direction to said frame and said barrel, a spring biasing said slider in one direction;

a wheel mounted rotatably on the end of said slider confronting said frame, said wheel being held by said spring in rolling engagement with a track formed on top of said frame and having a section climbing up toward the rear thereof;

a pawl lever journalled on the other end of said slider and having a foot jutting out toward said cylinder to engage, ratchet-fashion, with said ratchet teeth formed on said cylinder, and a spring for biasing said pawl lever toward said cylinder.

* * * * *