United States Patent [19]

Hillberg et al.

[11] **3,810,326**

[45] **May 14, 1974**

[54] CONSTRUCTION FOR REVOLVERS

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[73] Assignee: **Browning Arms Company,** Morgan, Utah

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[52] **U.S. Cl.** **42/59,** 42/65

[51] **Int. Cl.** **F41c 1/00**

[58] **Field of Search** 42/59, 62, 65, 66

[56] **References Cited**

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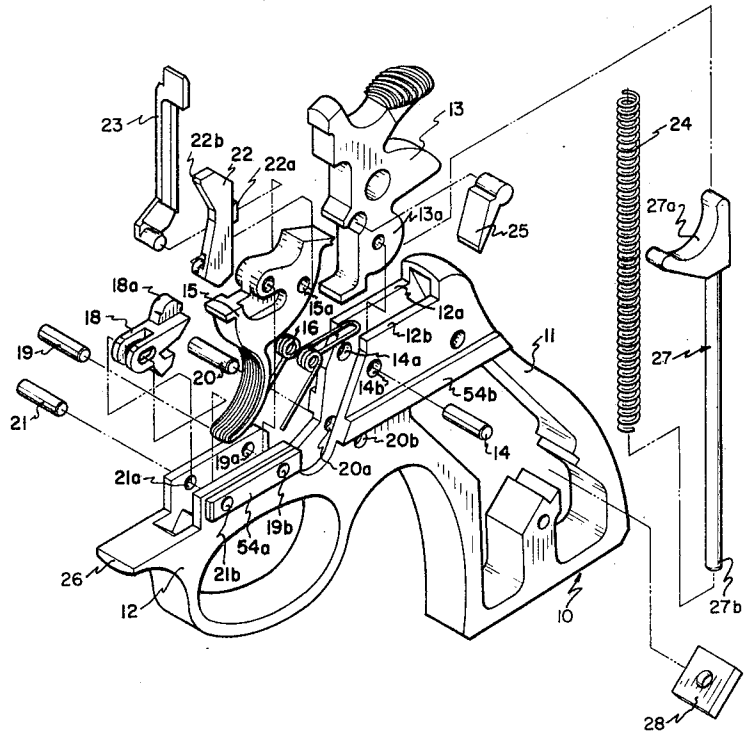
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Primary Examiner—Samuel Feinberg
Assistant Examiner—C. T. Jordan
Attorney, Agent, or Firm—Trask & Britt

[57] **ABSTRACT**

A revolver is constructed in two interlocking subassemblies, thereby avoiding the traditional side plate assembly techniques conventional in revolver construction. The first, or frame, subassembly is adapted to receive a cylinder and a crane so that the crane is checked by an internal (hidden) surface. The crane is secured by a pin inserted from inside, thereby avoiding dissimilar surface finishes at the front of the revolver. The second, or trigger guard, subassembly carries the entire firing and indexing mechanisms of the revolver in preassembled condition. The two subassemblies are joined and held in place by a single pin. Each subassembly carries structures which interlock when the revolver is assembled to prevent dry-firing when the cylinder is unlatched and to prevent opening of the cylinder when either the hammer is cocked or the trigger is pulled.

7 Claims, 10 Drawing Figures



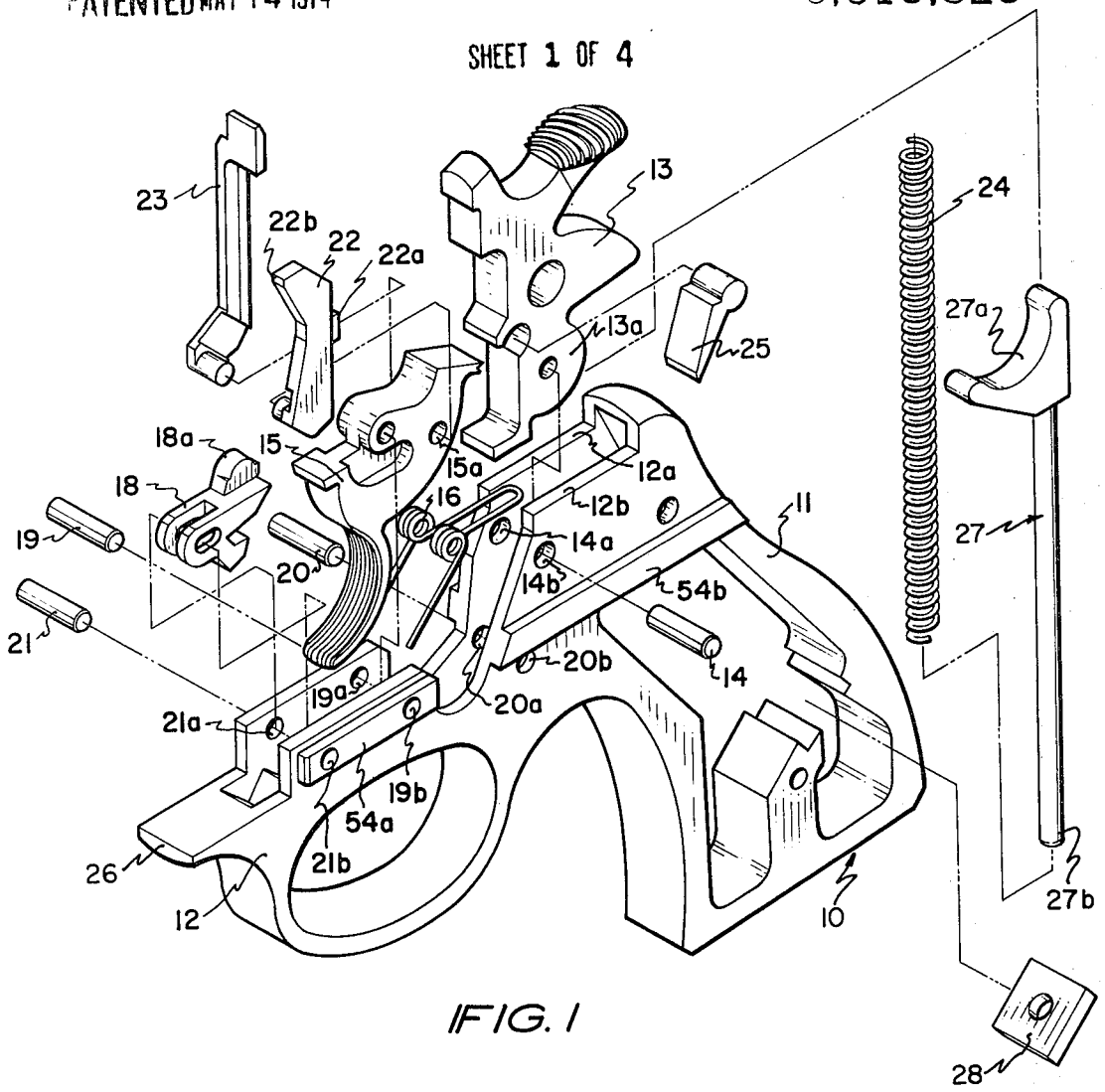


FIG. 1

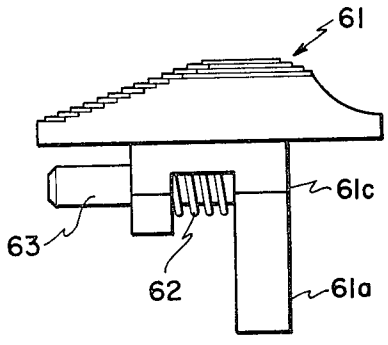


FIG. 3a

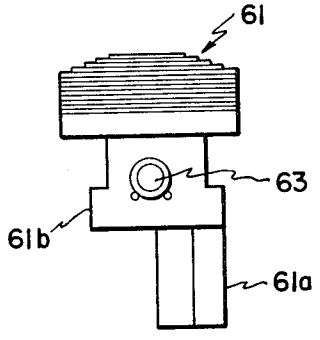


FIG. 3b

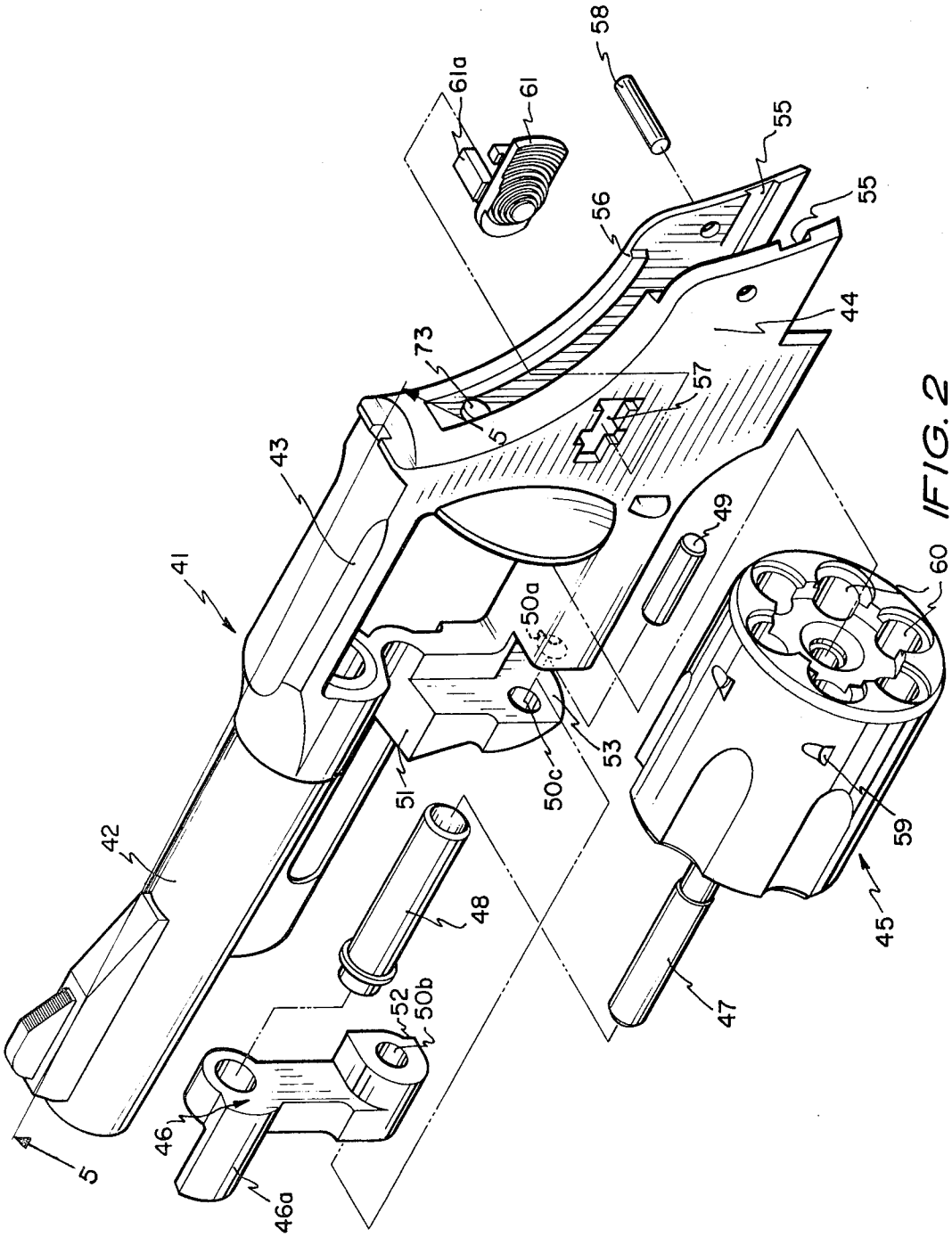

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61a
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44
73
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50a
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50c
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50b
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46a

FIG. 2

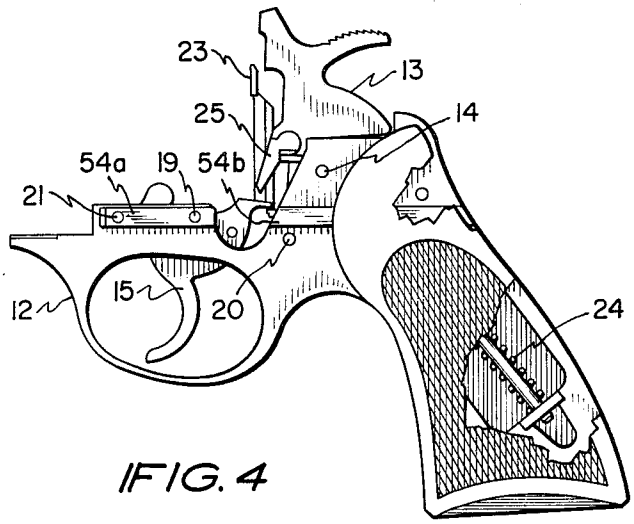


FIG. 4

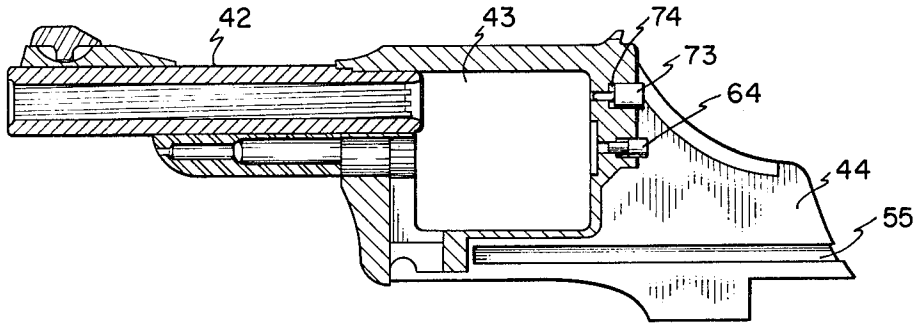


FIG. 5

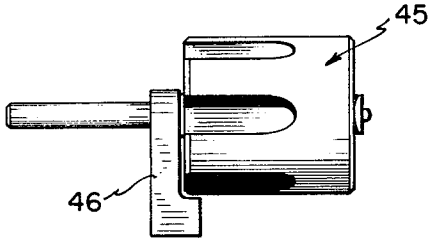


FIG. 6

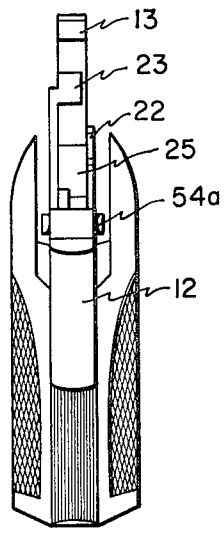


FIG. 7

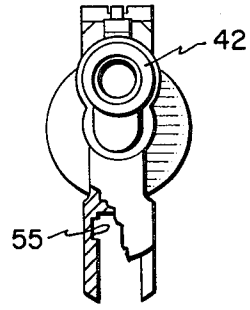


FIG. 8

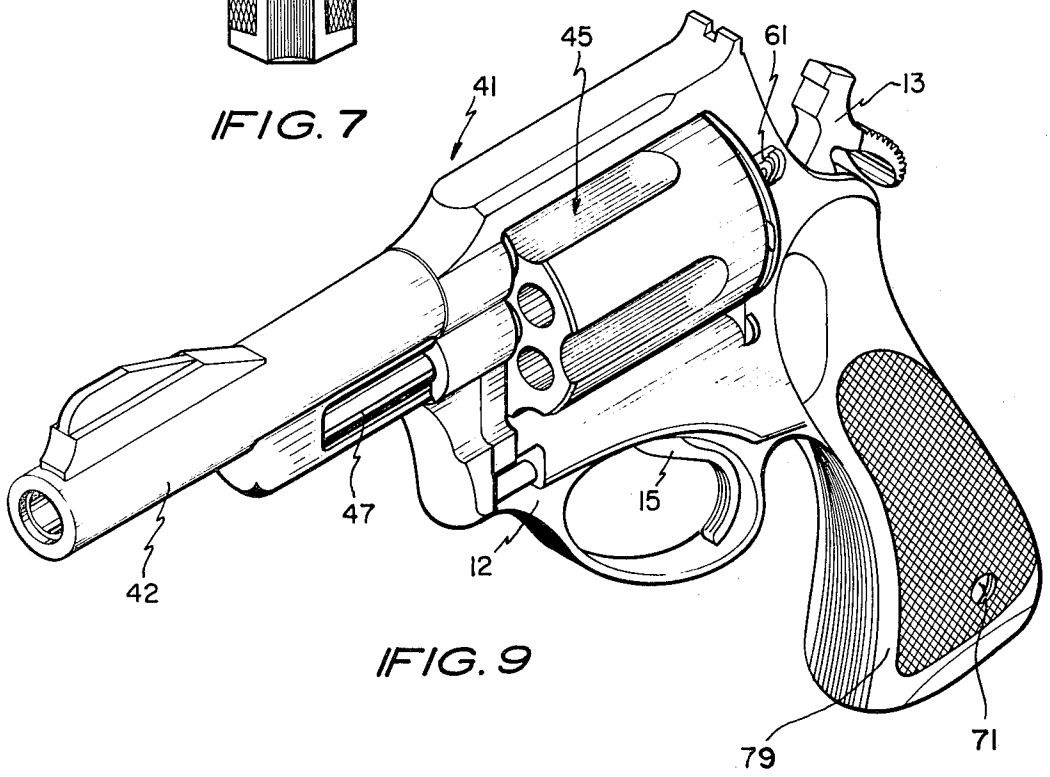


FIG. 9

CONSTRUCTION FOR REVOLVERS

BACKGROUND OF THE INVENTION

1. Field

This invention relates to revolvers. Specifically, this invention provides a novel revolver structure and a superior assembly technique.

2. State of the Art

Revolvers are conventionally assembled through a removable side plate. The cylinder, cylinder crane and associated components, as well as the individual components of the firing and indexing mechanisms, are mounted within the frame through various side plates and are held in place with a large number of assorted pins and screws. It is thus necessary to align the fasteners carefully, most of which are exposed to view in the assembled revolver.

Although construction of rifles relying upon single assemblies carrying the hammer, trigger guard, hammer spring, sear, trigger and trigger spring have been disclosed, for example, by U.S. Pat. No. 904,646 and 976,122, such assemblies have apparently never been suggested for revolver structures. In fact, the specific assemblies suggested for rifles would be structurally inappropriate for use in revolvers. U.S. Pat. No. 3,654,720 discloses a removable trigger guard assembly which provides a partial solution to the problems associated with side plate construction techniques, but at the expense of certain structural disadvantages.

Side plate assembly techniques, although highly developed, impose severe restrictions upon the uniformity of finish which can be achieved on the assembled revolver. For example, the cylinder crane is conventionally mounted from the front, thereby exposing the surfaces of two separate members at the front of the revolver. These surfaces must be polished and finished to match. Moreover, the stop surface of the crane is external and inevitably becomes marred through use. Side plate assembly techniques are time-consuming and costly in terms of the multiplicity of parts and operations required to assemble a complete revolver.

SUMMARY OF THE INVENTION

Accoridng to this invention, the various structural members of a revolver are mounted in subassemblies. The members are all more or less conventional in function, and their general interrelationship in the completely assembled revolver is also generally conventional. The specific shape and configuration of the individual members may be somewhat different than corresponding members of other firearms, however, to simplify the assembly procedures involved, and the total number of parts required for a completed revolver is reduced.

Each subassembly includes a plurality of members which are easily mounted within the subassembly, being held in place with pins and/or internal surfaces. The corresponding members of revolvers constructed by side plate assembly techniques are relatively difficult to position properly and often include a plurality of parts; many of these parts must be fastened in place with screws from the outside surfaces of the gun. The members of the subassemblies of this invention are cooperatively adapted so that the subassemblies may be interlocked and fastened in place with a single assembly pin or screw.

A first subassembly of this invention includes a barrel member and a frame member which includes the major portion of the frame of the revolver. This subassembly is for convenience referred to herein as the "frame subassembly." It includes a receiving space for mounting of a cylinder subassembly, which includes a cylinder mounted on a cylinder crane. It also includes a receiving space for insertion of a firing pin, and in most instances accommodates a cylinder release plunger. The cylinder subassembly is for convenience regarded herein as a removable portion of the "frame subassembly," whereas the firing pin, cylinder release plunger, or any other components loosely mountable within the frame are regarded as ancillary for purposes of this disclosure.

A second subassembly, which is for convenience referred to herein as a "trigger guard subassembly," carries all of the indexing and firing mechanisms of the revolver. (The firing pin, which is best loosely mounted within the frame subassembly, is not regarded as a portion of the firing mechanism for purposes of this disclosure.) The methods and apparatus of this invention not only reduce the number of members required for indexing and firing, they also permit the use of larger (hence stronger) parts. Moreover, the moving parts are provided with more uniform support than has been available through side plate assembly techniques.

The various members carried by the subassemblies are cooperatively arranged to ensure their working alignment when the subassemblies are interlocked. Moreover, support surfaces are provided in association with the subassemblies to assist in proper alignment of the various members and to ensure structural rigidity of the assembled revolver.

The assembly method of this invention permits the crane stop to be hidden, thereby eliminating a surface which customarily shows wear after a short period of time. Moreover, the crane may be mounted from the interior of the frame, thereby hiding its mounting pin from view.

The preferred embodiments of the invention include a safety mechanism to prevent dry-firing with the cylinder opened and to prevent opening the cylinder with the hammer cocked or trigger pulled. Such mechanisms may be incorporated in the claimed revolver with little additional expense because of the subassembly manufacturing techniques disclosed herein.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, which illustrate what is presently regarded as the best mode for carrying out the invention,

FIG. 1 is an exploded perspective view of a trigger guard subassembly of this invention, without hand grips;

FIG. 2 is an exploded perspective view of a frame subassembly of this invention, including a cylinder and cylinder crane subassembly;

FIG. 3*a* is a view in elevation of a preferred cylinder latch safety mechanism of this invention;

FIG. 3*b* is a view in elevation of the same mechanism rotated to the left 90° about a vertical axis;

FIG. 4 is a side view in elevation, partially broken away, of the trigger guard assembly of FIG. 1 in assembled condition, including hand grips;

FIG. 5 is a section view of the frame subassembly of FIG. 2, taken along the line 5—5 looking in the direction of the arrows;

FIG. 6 is a side view in elevation of a cylinder and cylinder crane subassembly in assembled condition;

FIG. 7 is a front view, in elevation, of the trigger guard assembly of FIGS. 1 and 4;

FIG. 8 is a front view, in elevation, of the frame subassembly of FIGS. 2 and 5; and

FIG. 9 is a view in perspective of the assembled revolver of this invention.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

As best illustrated by FIG. 1, a trigger guard subassembly of this invention includes a structural support member 10 with a conventional rear handle portion 11 and a channeled frontal portion 12 projecting forward therefrom. The sidewalls 12*a*, 12*b* of the frontal portion of the support member 10 form a channeled interior. A hammer 13 is mounted to pivot on a hammer pin 14 inserted through bores 14*a*, 14*b* in the sidewalls 12*a*, 12*b*, as best shown by FIG. 4. In like fashion, a trigger 15, trigger spring 16, and cylinder stop 18 are pivotally attached by pins 19, 20, and 21, respectively, inserted through corresponding bores 19*a*, 20*a*, 21*a*, 19*b*, 20*b*, and 21*b*. The pins bear uniformly on the respective sidewalls 12*a*, 12*b*, thereby insuring uniform support of the pivoting mechanisms. An index lever 22 (cylinder pawl) and striker plate lever 23 are carried by the trigger 15, being pivotally journaled within opposite ends of a bore 15*a*. A mainspring 24 and strut 25 are attached to the hammer 13 as shown. The mainspring 24 operates on spring guide 27 to bias the hammer forward (see FIG. 4) and the strut 25 is biased forward by an internal spring (not shown). One end 27*a* of the guide is configurated to constantly engage a portion 13*a* of the hammer, while the shaft 27*b* of the guide slides through the bearing plate 28. As best seen from FIG. 7, all of the aforementioned mechanisms are configurated so that when they are mounted in the subassembly, they are confined completely between the sidewalls 12*a* and 12*b* of the trigger guard 10. Only the levers 22 and 23 extend to the outersurfaces of the sidewalls. The remaining mechanisms, except portions of the hammer 13 and trigger 15, are mounted entirely within the channeled interior of the frame 10.

The firing and indexing mechanisms shown function in the fashions known as "single-action" or "double-action"; i.e., the revolver may be fired by first pulling back on the hammer 13, then releasing the hammer at will (by pulling back the trigger 15), or by merely pulling back the trigger 15 alone.

Referring to FIG. 2, a frame subassembly of this invention includes a frame 41 which consists of a barrel portion 42, a cylinder housing 43, and a bifurcated rear portion 44 configurated interiorly to receive the trigger guard subassembly of FIG. 1. The cylinder 45 and crane 46 shown comprise a removable cylinder subassembly (a portion of the frame subassembly). As shown, the cylinder 45 includes an axial pin 47 which is rotatably mounted within a crane sleeve 48, and the entire crane member 46 is pivotally secured within the cylinder housing 43 by means of a pin 49 inserted through the bore 50 (50*a*, *b* and *c*). The pin 49 is inserted through the bifurcated rear portion 44 of the frame, and is secured in place by the abutment of surface 26 of the trigger guard frame 12 (FIG. 1) when the trigger guard subassembly of FIG. 1 is joined to the frame subassembly of FIG. 2.

A portion of the front cylinder housing portion 43 of the frame is formed as a recess 51 to receive the cylinder crane 46, thereby registering the cylinder 45 in its proper position for firing. The crane 46 is configurated to fill the opening 51. The cylinder 45 itself functions and is indexed in conventional manner. Outward pivoting of the cylinder for loading is checked by contact of an extension 52 of the crane 46 with a hidden crane stop surface 53 within the frame 41.

After mounting all of the components of the trigger guard and frame subassemblies except the latch 61 of FIG. 3, a cylinder release plunger 64 and firing pin 73 are slipped into place, as shown in FIG. 5, and the subassemblies are joined by sliding rails 54 (54*a*, 54*b*) FIG. 1, into corresponding grooves 55, FIG. 2. The firing pin 73 in inserted into a firing pin housing 74 which communicates with the interiors of both the cylinder housing 43 and the bifurcated rear portion 44 of the frame subassembly 41. Initially, the strike plate lever 23 and index lever 22 are pivoted forward to enable these two components to enter beneath the slotted top edge 56 of the frame 41. The trigger guard subassembly 10 is then partially inserted within the frame subassembly until the index lever 22 passes the opening 57. The latch 61 is then inserted in the opening 57, and insertion of the trigger guard subassembly is completed. With the subassemblies properly joined, the indexing and firing mechanisms operably register with the cylinder and firing pin. The assemblies 10, 41 are secured by a single assembly pin 58 as shown. Hand grips 79 (FIG. 9) are attached to the rear 11 of the trigger guard subassembly to cover the assembly pin 58, being held in place by a single visible screw 71.

According to a preferred embodiment, as illustrated by FIG. 1, positive engagement of the cylinder by the cylinder stop 18 is ensured by shaping the leading edge of the projection 18*a* so as to permit it to begin engaging the indexing slots 59 of the cylinder 45 before the cylinder has completed it incremental revolution into its selected firing position. This modification improves the reliability of the firearm with respect to registering the cylinder chambers 60 with the barrel 42 (FIG. 2).

FIGS. 1, 2 and 3 illustrate a highly desirably safety feature which is economically feasible because of the assembly technique disclosed herein. The cylinder latch 61 illustrated by FIGS. 2 and 3 includes a horizontal inward projection 61*a*. This projection 61*a* depresses a cylinder release plunger 64 (FIG. 5) to release the cylinder when the latch 61 is pushed forward.

The latch 61 is constantly biased forward toward the indexing lever 22 by a latch spring 62 supported by a spring guide 63, as best shown by FIG. 3. With the cylinder even partially open, the latch 61 moves forward so that a first stop surface 61*b* rests above a stop element 22*a* projecting rearward from the index lever 22. The index lever 22 is thus blocked from rising, thereby preventing the trigger 15 from being pulled back. As a result, the revolver cannot be fired unless the cylinder latch 61 is held back in its "latched" position; i.e., with the cylinder 45 properly secured within the cylinder housing 43.

With the cylinder 45 closed and latched, the surface 61*b* is forced back so that it is physically located behind the vertical path of motion of the stop element 22*a*. Thus, the index lever 22 is free to rise in response to pulling the trigger 15 so that its distal end 22*b* can engage and revolve the cylinder in normal fashion. With the trigger pulled back, the index lever 22 is lifted, bringing the stop element 22*a* into blocking relationship with a second stop surface 61*c* of the latch 61. The latch 61 is thereby prevented from moving forward to unlatch the cylinder.

Reference herein to details of the illustrated embodiments are not intended to limit the scope of the claims which themselves recite those features regarded as essential to the invention.

We claim:

1. In a revolver, the combination comprising:

a frame subassembly with a barrel and a bifurcated rear frame portion including a cylinder-receiving space;

a cylinder subassembly, including a crane pivotably mounted to said frame subassembly ahead of said cylinder-receiving space and a cylinder rotatably mounted to the distal end of said crane for swinging into and out of said cylinder-receiving space; and

a trigger guard subassembly with a rear handle portion and a channeled frontal portion configurated for matched entry into said bifurcated rear frame portion, said trigger guard subassembly including:

firing means, including a trigger, operably mounted within said channeled frontal portion; and

indexing means, operably mounted within said channeled frontal portion for rotating said cylinder in response to pulling of said trigger.

2. A combination according to claim 1 including cylinder latch means slidably mounted in said frame subassembly and carrying stop means cooperatively adapted with said indexing means to prevent firing of the revolver when the cylinder is not in its latched condition, said latch means being normally stored, when the cylinder is latched, in a position which permits firing of the revolver but being biased to move into position to prevent firing when the cylinder is unlatched.

3. A combination according to claim 2 wherein said indexing means includes an indexing lever linked to said trigger so that its distal end moves up to engage and rotate said cylinder when the trigger is pulled and includes a stop element projecting therefrom; the latch means is biased towards said indexing lever and includes a first stop surface which is normally stored behind the vertical path of travel of said stop element but moves to above said stop element when the cylinder is unlatched.

4. A combination according to claim 3 wherein said latch means includes a second stop surface positioned behind the stop element when the distal end of th index lever moves up, thereby to prevent unlatching of the cylinder.

5. The combination of claim 1 wherein the cylinder crane is pivotably mounted by means of a pin inserted from the bifurcated rear portion through said crane, said pin being anchored by said subassembly on opposite sides of said crane and being held in place by said trigger guard subassembly.

6. A method for constructing a revolver, which comprises:

providing a one-piece frame subassembly with a barrel, a cylinder housing behind the barrel, a bifurcated rear portion extending back from said cylinder housing, and a firing pin housing communicating with both the cylinder housing and the bifurcated rear portion;

providing a cylinder subassembly including a cylinder rotatably mounted at one end of a cylinder crane;

providing a trigger guard subassembly with a rear handle portion, a channeled frontal portion projecting forward from said rear handle portion, and indexing and firing means operably mounted within said channeled frontal portion;

pivotably mounting the end of said cylinder crane opposite said cylinder to said frame subassembly so that said cylinder can be swung into and out of said cylinder housing;

slidably mounting a firing pin within said firing pin housing; and

joining said trigger guard subassembly to said frame subassembly by sliding said channeled frontal portion into said bifurcated rear portion until said indexing and firing means operably register with said cylinder and said firing pin.

7. A method according to claim 6 wherein the frame subassembly includes a receiving space for said cylinder crane, and the cylinder crane is pivotably mounted to said subassembly by means of a pin inserted from said channeled rear portion to extend through the walls of said receiving space and the cylinder crane.

* * * * *