United States Patent [19]

Hartog

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[54] **INDEXING SYSTEM FOR REVOLVERS**

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

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[52] **U.S. Cl.** **42/67;** 42/65

[51] **Int. Cl.²** **F41C 1/00**

[58] **Field of Search** 42/67, 65

[56] **References Cited**

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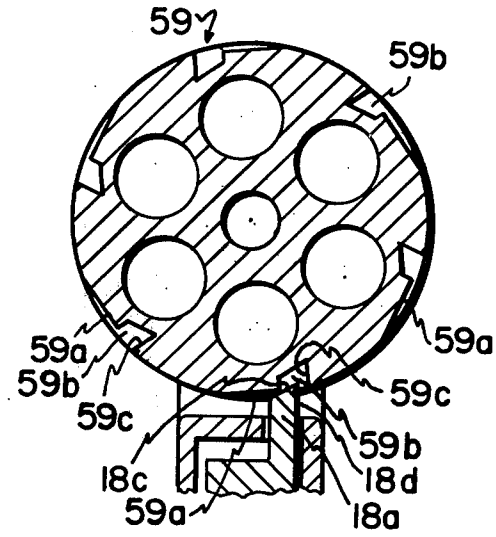
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Primary Examiner—Verlin R. Pendegrass
Assistant Examiner—C. T. Jordan
Attorney, Agent, or Firm—Trask & Britt

[57] **ABSTRACT**

A revolver is constructed in two interlocking subassemblies, thereby avoiding the traditional side plate assembly techniques conventional in revolver construction. A cylinder is mounted on the first, or frame, subassembly and is provided with a series of indexing grooves spaced in conventional fashion. The indexing grooves include an entry channel with a ramped bottom sloping to an indexing well. The indexing well is configurated with a check surface opposite the entry channel and substantially normal the outer surface of the cylinder. The second, or trigger guard, subassembly carries the entire firing and indexing mechanisms of the revolver including a cylinder stop member. The engaging end of the stop member has a sloped or ramp end, and is configurated in substantial conformance with the indexing well. With the two subassemblies joined, the stop member is positioned to register with the grooves in turn as the cylinder is rotated, thereby to precisely register the chambers of the cylinder with the barrel of the revolver.

3 Claims, 7 Drawing Figures



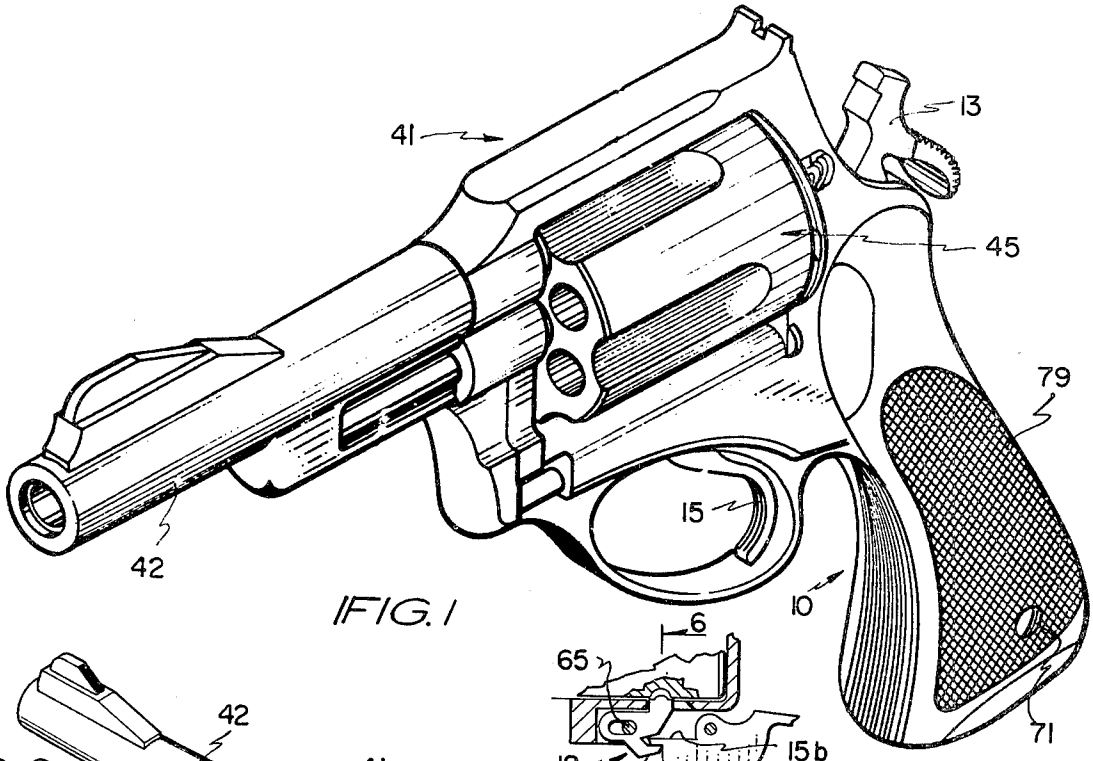


FIG. 1

FIG. 4

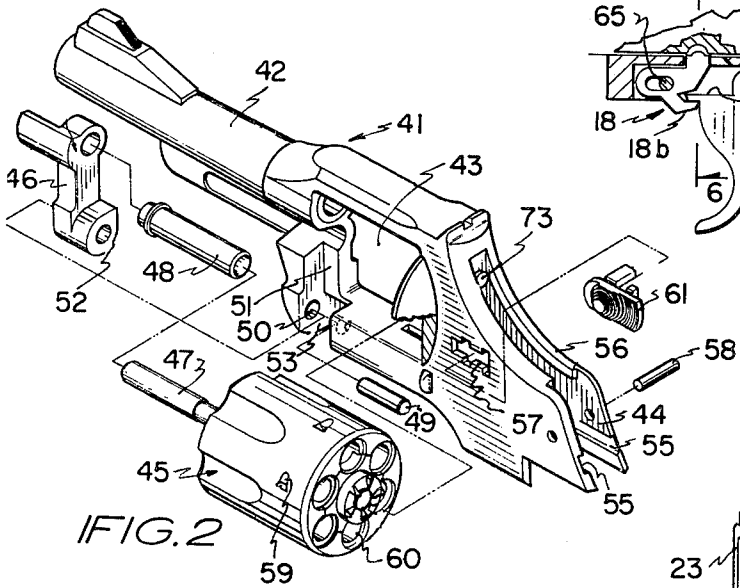


FIG. 2

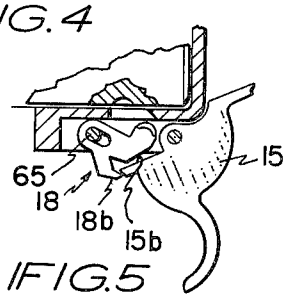


FIG. 5

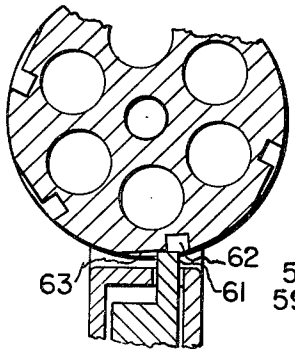


FIG. 7
(PRIOR ART)

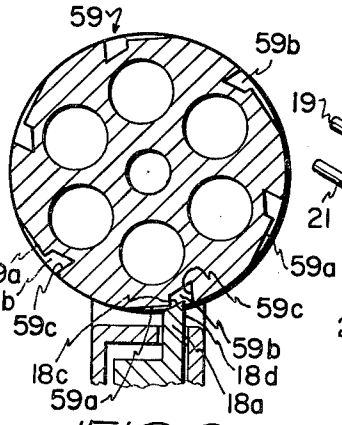


FIG. 6

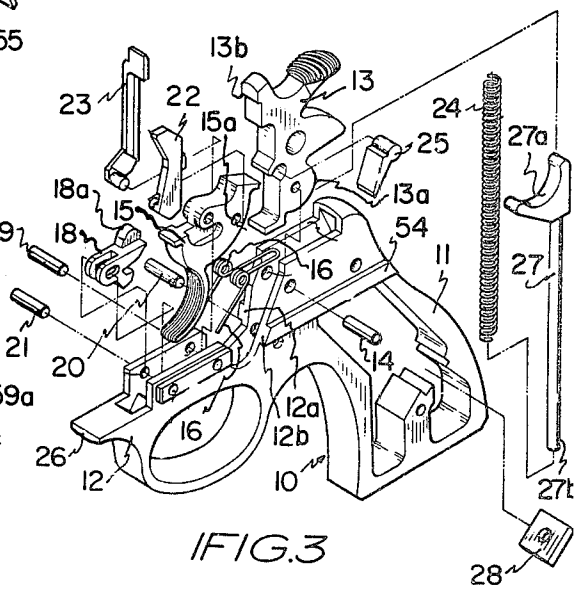


FIG. 3

INDEXING SYSTEM FOR REVOLVERS

RELATED APPLICATIONS

U.S. Patent application Ser. No. **337,004,** filed Mar. **1, 1973,** now U.S. Pat. No. **3,810,326,** discloses and claims a novel revolver constructed with two interlocking subassemblies. This application discloses an indexing system especially useful in connection with that type of revolver construction.

BACKGROUND OF THE INVENTION

Field: This invention relates to revolvers. Specifically, this invention provides a novel indexing system for precisely registering the chambers of a rotating cylinder with the barrel of a revolver.

State of the Art: Indexing systems of typical revolvers include indexing grooves corresponding to each chamber of the cylinder and a cylinder stop which sequentially engages these slots to register the individual chambers of the cylinder with the barrel. These grooves may terminate in a recess or "well" for ultimate engagement of the stop, thereby to check both clockwise and counterclockwise rotation of the cylinder. Prior art systems require precise timing for proper entry of the stop into the appropriate indexing slot. Otherwise, the momentum of the rotating cylinder can carry a chamber beyond the registration point. This misalignment is potentially hazardous. The construction procedures and parts inherent in prior art revolver manufacture have not lent themselves to adequate correction of this problem, especially in the case of less expensive handguns.

SUMMARY OF THE INVENTION

As disclosed by the aforementioned Ser. No. 337,004 (U.S. Pat. No. 3,810,326), the various structural members of a revolver may be 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 shapes and configurations of the individual members of the indexing system is different from corresponding members of other firearms, however. These differences simplify the assembly procedures involved and provide stronger and more reliable parts.

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 preferred 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. The present invention may be applied to revolvers constructed by other techniques, however.

A first subassembly of the preferred form 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 preferred 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.

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 a view in perspective of the assembled revolver of this invention;

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

FIG. **3** is an exploded perspective view of a trigger guard subassembly of this invention, without hand grips;

FIGS. **4** and **5** are fragmentary side views in elevation, partially broken away, of a portion of the trigger guard subassembly of FIG. **3**;

FIG. **6** is a sectional view of a cylinder and cylinder stop of this invention; and

FIG. **7** is a view similar to FIG. **6** of a prior art construction.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

As illustrated in FIGS. **1** through **3,** 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 in the sidewalls **12***a*, 12*b*. In like fashion, a trigger **15,** trigger spring **16** and cylinder stop **18** are pivotally attached by pins **19, 20** and **21,** respectively. 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 withiin 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 ham-

mer forward, 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.**

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. **3.** 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.** 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. **3**) when the trigger guard subassembly of FIG. **3** 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 except for the improvements referred to hereinafter. 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,** a firing pin **73** and cylinder-release plunger (hidden below pin **73**) are slipped into place, and the subassemblies are joined by sliding rails **54** into corresponding grooves **55.** 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 mechanism 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** 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 this invention, positive engagement of the cylinder **45** 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 grooves **59** of the cylinder **45** before the cylinder has completed its 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.**

In operation, when the trigger **15** is pulled, the pawl **22** is lifted to engage and spin the cylinder **45** clockwise as viewed in FIGS. **6** and **7.** FIG. **4** illustrates the cylinder stop **18** in its "stop" position; that is, the projection **18***a* is registered within an indexing groove **59.** FIG. **5** shows the manner in which the projection **18***a* is pulled from the groove **59** by the trigger **15** to permit the cylinder **45** to spin. The mechanism is timed so that the projection **15***b* of the trigger releases the projection **18***b* of the cylinder stop prior to firing. The projection **18***b* is biased towards the grooves **59** by a hidden spring. The projection **18***a* thus returns to contact the rotating cylinder in time to engage the next groove **59,** thereby to lock the cylinder **45** in precisely the correct position (with a chamber **60** exactly registered with the bore of the barrel **42**) prior to firing.

The stop **18** is slotted to ride on a pin **65.** The stop **18** can thus move sufficiently for the trigger projection **15***b* to reengage the stop projection **18***b* upon release of the trigger **15** prior to a subsequent firing of the revolver. The leading edge of the projection **18***b* is beveled to form an entry ramp for the leading edge of the projection **15***b.* (Compare FIGS. **4** and **5.**)

An important aspect of the indexing system of this invention is the cooperative configurations of the projection **18***a* and the grooves **59.** Each slot includes a shallow leading ramp portion **59***a* and a well portion **59***b.* The terminal portion of the projection **18***a* is configurated to register with the well portion **59***b* substantially completely; that is, in contact with substantially the entire surface of the well. The ramp **59***a* portions of the grooves assist entry of the projection **18***a* into the well portions and decrease the time interval required for entry once the cylinder has rotated to proper position for registration. Of primary importance is the ramped distal surface **18***c* of the projection **18***a.* As shown by FIGS. **6** and **7,** this ramped surface permits partial entry of the stop **18** into the well **59***b* beyond the level of the bottom of the shallow ramp **59***a.* Accordingly, contact of the check surface **59***c* of the groove by the stop surface **18***d* is positive over a substantial area at the instant the cylinder chamber is registered with the barrel. Complete entry of the projection **18** into the well **59***b* is thus assured. By contrast, the prior art stop **64** (FIG. **7**) is held out of the well **62** by the shallow ramp surface **63** until the cylinder is substantially in its registered position. Positive engagement by the prior art structure requires much more precision of timing.

It should be noted that the structure illustrated also incorporates a safety feature whereby the striker plate lever **23** is linked to the hammer **13** and trigger **15** so that it registers with the firing pin **73** only the when the trigger is pulled. Thus, the gun cannot be discharged accidentally by merely releasing the hammer. When the trigger is not pulled, the striker lever **23** reposes entirely below the firing pin, and a projection **13***b* on the hammer **13** holds the remainder of the hammer out of contact with the pin.

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.

I claim:

1. In a revolver including means for spinning a cylinder mounted within a frame in response to pulling a trigger to bring individual chambers of the cylinder sequentially into registration with a bore of a barrel at-

tached to said frame, the improvement which comprises:

a series of indexing grooves arranged in a ring around the outer surface of the cylinder, one such groove corresponding to each chamber of the cylinder and each of said grooves comprising a shallow ramp portion at the leading end of the groove and a well portion at the trailing end of the groove terminating in a check surface;

stop means normally biased to register with the well portion of the groove corresponding with a chamber in registration with the bore of the barrel including a projection with a ramped distal surface to permit partial entry of said projection into said well as the cylinder is advanced towards its registered position; and

linkage means cooperative with said stop means and said trigger to retract said stop means from said well portion in response to pulling of said trigger to permit said cylinder to rotate and thereafter to release said stop means to engage the ramp portion of the next succeeding groove before the corresponding chamber is urged into registration with said bore.

2. The improvement of claim **1** wherein the registering portion of said projection is configurated to conform substantially with the well portion of said grooves.

3. The improvement of claim **1** wherein said stop means is mounted to the frame of said revolver by means which permit engagement by said trigger to pull said stop means from engagement with a said groove and release by said trigger while said trigger is still pulled to permit engagement by said stop means of said next succeeding groove.

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