CARTRIDGE CASING EXTRACTION MECHANISM FOR REVOLVERS


Assignee: Bangor Punta Operations, Inc., Greenwich, Conn.

Filed: Nov. 8, 1973

Appl. No.: 414,607

U.S. Cl. 42/68, 42/62
Int. Cl. F41c 1/00, F41c 15/00
Field of Search 42/68, 62, 59

References Cited
UNITED STATES PATENTS
689,260 12/1901 Wesson .............................................. 42/62
688,141 12/1901 Wesson .............................................. 42/62
818,177 4/1906 Kolb et al. ............................................ 42/62
3,221,433 12/1965 Lewis ............................................. 42/62
3,685,193 8/1972 Sefried ............................................. 42/62

Primary Examiner—Benjamin A. Borchelt
Assistant Examiner—C. T. Jordan
Attorney, Agent, or Firm—Patrick J. Walsh

ABSTRACT
Disclosed is a revolver including a frame having an opening and a barrel. A yoke pivotally carried by the frame, in turn, pivotally carries a cylinder for movement therewith between positions within the frame opening and to one side of the frame. The cylinder carries an extractor biased forwardly by a spring for retention adjacent the rear face of the cylinder. The cylinder also carries a centerpin biased rearwardly by a spring to provide a locking projection at its rear end for engagement in an aperture in the breech face of the revolver frame. The forward end of the centerpin carries a cylinder extractor thumbpiece and an extractor rod, connected to the extractor, encompasses the centerpin forwardly on the cylinder. When the cylinder lies within the frame opening, the extractor rod lies within a channel formed on the side of the barrel. The forward end face of the channel is undercut to provide a recess. The rear face of the extractor thumbpiece is counterbored and the thumbpiece is releasably locked within said recess. To release the cylinder and operate the extractor, the centerpin is axially displaced in a forward direction by a thumbpiece on the side of the frame to release the rear locking projection of the centerpin and the extractor thumbpiece from the barrel enabling the cylinder to swing out from the frame opening. Movement of the extractor thumbpiece rearwardly displaces the extractor from the cylinder and extracts cartridges from the chambers of the cylinder. When the cylinder is moved into the frame opening after loading and into its firing position, the centerpin is cammed forwardly to align the extractor thumbpiece with the end face of the channel and the rear locking projection with the locking aperture in the frame whereupon the centerpin is displaced rearwardly by its spring to lock the centerpin at both its front and rear ends.

10 Claims, 8 Drawing Figures
CARTRIDGE CASING EXTRACTION MECHANISM FOR REVOLVERS

The present invention relates to firearms in general and particularly relates to a revolver having a double locking extractor for removing cartridge casings from the chambers of its cylinder.

Most standard revolvers are provided with an extractor for removing cartridge casings from the cylinder chambers and from the rear end of the cylinder. On revolvers having a barrel length no greater than 2 ½ inches, design features of the extractor mechanism restrict extractor travel and prevent full extraction of the cartridge casings. More particularly, standard front locking systems for the extractor inhibit movement of the extractor distances sufficient to fully extract the cartridge casings from the cylinder chambers in short barrel revolvers of this type. Thus, there is a problem in providing an extractor for a short barrel revolver which has the capability of fully extracting the cartridge casings while also locking the cylinder centerpin both at its front and rear ends when the cylinder is closed into the frame for firing.

The present invention solves this and other problems associated with the extraction of cartridge casings from short barrel revolvers and provides a novel and improved short barrel revolver having a double locking extractor which obtains various advantages in construction, mode of operation and use in comparison with prior revolvers of this type. Particularly, the present invention provides a revolver having a frame carrying a barrel and an opening within said frame for receiving the cylinder. The cylinder is pivotally mounted on a yoke which in turn is pivotally carried by the frame whereby the cylinder is movable between a firing position within the frame opening and a loading and cartridge casing extraction position to one side of the revolver frame. The cylinder carries a centerpin which is spring biased rearwardly to provide a locking projection through the rear face of the cylinder. This projection cooperates with an aperture in the breech face of the frame when the cylinder lies in its firing position in the frame opening to releasably lock the rear end of the cylinder to the revolver frame. Concentric with the centerpin is an extractor which is spring biased in a forward direction to normally lie against the rear face of the cylinder and underlie the rims of the cartridge casings. The forward end of the cylinder centerpin extends through the yoke and carries an extractor thumbpiece adjacent the front end of the barrel. Also encompassing the cylinder centerpin forwardly of the cylinder is an extractor rod connected to the extractor. Along the side of the barrel there is provided an extractor rod channel which opens to one side of the barrel. The extractor rod and the centerpin encompassed thereby lie in the channel when the cylinder lies in its firing position. The forward end of the extractor rod channel is recessed axially from the forward end face of the revolver barrel. The extractor thumbpiece is counterbored along its rear face to define a circular flange receivable within the generally semicircular recess formed in the forward face of the barrel defining the extractor rod channel.

When the cylinder lies in the firing position and it is desired to extract cartridge casings from the cylinder chambers, a thumbpiece carried on one side of the frame is moved forwardly to displace the cylinder centerpin axially forwardly against the bias of its spring. Forward displacement of the centerpin removes the rear centerpin locking projection from the aperture in the revolver frame and also carries the extractor thumbpiece forwardly to displace the flange on the rear face of the extractor thumbpiece from the locking recess in the forward face of the extractor rod channel. The cylinder and yoke are thus free to swing from the frame opening to one side of the frame. When the centerpin has cleared the rear breech surface of the frame, the centerpin and extractor thumbpiece carried thereby are displaced axially and return to their normal rearward position under the action of the centerpin spring. The extractor thumbpiece is then moved rearwardly causing the extractor to be displaced axially rearwardly against its spring bias to remove the cartridge casings from the cylinder. Release of the extractor thumbpiece permits the centerpin and extractor rod carried thereby to return to their normal positions.

Upon closing the cylinder into the frame for return to the firing position, the centerpin is cammed forwardly by a lead surface in the breech of the frame and maintained in its forward position until the cylinder is centrally aligned within the frame opening and the rear locking end of the centerpin lies in alignment with the locking aperture. Upon camming the centerpin forwardly, the extractor thumbpiece is moved axially forwardly beyond the end face of the extractor rod channel such that the circular flange lies in axial alignment with the generally semicircular recess in the end face of the extractor rod channel. When the cylinder is centrally aligned, the centerpin is spring biased rearwardly to lock within the aperture in the frame. The centerpin also carries the extractor thumbpiece rearwardly whereby the circular flange locks within the recess in the extractor rod channel. In this manner, the centerpin is locked to the revolver frame at its opposite ends. By utilizing a forward locking mechanism of the foregoing described type, a range of extractor displacement is provided sufficient to fully extract the cartridge casings from the cylinder in a revolver of the type having less than a 2 ½ inch barrel. It will be appreciated that the extractor thumbpiece lies substantially flush with the end of the revolver barrel when the revolver is ready for firing.

Accordingly, it is a primary object of the present invention to provide a novel and improved extractor mechanism for a revolver.

It is another object of the present invention to provide a novel and improved extractor mechanism for a revolver of the type having a short barrel, for example, 2 ½ inches, wherein the extractor has the capacity to completely remove cartridge casings from the chambers of the revolver cylinder.

It is still another object of the present invention to provide a novel and improved extractor mechanism for a revolver having the foregoing characteristics and wherein the cylinder centerpin is locked both front and rear to the revolver frame when the cylinder is closed into firing position in the frame.

It is a further object of the present invention to provide a novel and improved extractor mechanism in a short barrel revolver for fully and completely removing the cartridge casings whereby the need to shake the revolver or turn it on end to remove the cartridge casings is completely eliminated.
It is a still further object of the present invention to provide a novel and improved extractor mechanism for short barrel revolvers providing a forward locking mechanism for the extractor rod and cylinder centerpin which is reliable in operation, simple in construction and can be inexpensively manufactured.

These and further objects and advantages of the present invention will become more apparent upon reference to the following specification, appended claims and drawings wherein:

FIG. 1 is a fragmentary cross-sectional view of a revolver particularly illustrating an extractor mechanism constructed according to the present invention;

FIG. 2 is a view similar to FIG. 1 illustrating the cylinder centerpin in position enabling the cylinder to swing to one side of the frame;

FIG. 3 is a fragmentary perspective view of the forward end of the revolver barrel illustrating a portion of the locking mechanism for the cylinder centerpin and extractor rod;

FIG. 4 is an enlarged fragmentary cross-sectional view of the extractor thumbpiece illustrated in a position locked to the revolver barrel;

FIG. 5 is a view similar to FIG. 4 and illustrates an alternate form thereof;

FIG. 6 is a perspective view of the revolver illustrating the cylinder in a cartridge casing extraction position swung to one side of the revolver frame;

FIG. 7 is an enlarged cross-sectional view of the cylinder and extractor mechanism illustrating the extractor as it fully removes the cartridge casings from the chambers of the cylinder; and

FIG. 8 is a view similar to FIG. 6 and illustrates the extractor mechanism fully extended with the cartridge casings removed and falling from the chambers of the cylinder.

Referring now to the drawings, particularly to FIG. 1, there is illustrated a revolver 10 constructed generally in accordance with the present invention and comprised of a revolver frame 12 having a barrel 14 and an opening 16 within the frame for receiving a cylinder 18. As is conventional, cylinder 18 carries a plurality of circumferentially spaced chambers 20 for receiving cartridges, the casings 22 of spent cartridges being illustrated in FIG. 1. It will also be appreciated that the revolver carries a standard firing mechanism whereby actuation of trigger 24 rotates cylinder 18 to sequentially align the cartridges with barrel 14 and a firing pin for firing the same. Since the firing mechanism per se forms no part of the present invention, further description thereof is believed unnecessary.

Cylinder 18 is carried by frame 12 on a yoke 26 for swinging movement between a firing position within frame opening 16 as illustrated in FIG. 1, and a cartridge casing extraction and cartridge loading position to one side of the frame for example as illustrated in FIGS. 6 and 8. More particularly, the lower end 28 of yoke 26 is pivotally carried by the frame and yoke 26 pivotally carries the cylinder 18 on bearing 30.

An extractor mechanism generally designated 32 is carried by the cylinder and includes an extractor head 34 comprised of an axially bored stem 36 terminating at its rear end in a generally six pointed star-shaped extractor head 38. Head 38 includes a plurality of circumferentially spaced arcuate surfaces 40 conforming to the arcuate shape of the cartridge casing with each surface 40 surrounding a portion of the cartridge casing when the latter is received in an associated chamber 20. The rear face of the cylinder is recessed along a circle which extends substantially through the center of the cylinder chambers 20 such that, when the extractor head 34 lies in the position illustrated in FIG. 1, the rims 42 of the cartridge casings overlie part of the rear face of the extractor head 34. A plurality of lugs 46 are circumferentially spaced about head 34 and project rearwardly for cooperation with a portion of the firing mechanism, not shown, for rotating the cylinder when the latter lies in the firing position.

The central portion of cylinder 18 is bored as at 48 to provide an axially extending opening which is reduced in diameter at 50. The stem 36 of extractor mechanism 32 lies within opening 48 and is splined to the cylinder along opening 50. The forward end of stem 36 is internally threaded for threaded engagement with the rear end of an extractor rod 52. Also carried adjacent the forward end of stem 36 is a collar 54 having a flange 56. A helical spring 58 is received within opening 48 about stem 36. Opposite ends of spring 58 respectively bear against flange 56 and a shoulder 60 forming a part of the rear end of cylinder 18. Spring 58 thus biases extractor mechanism 32 including the extractor rod 52 for axial forward movement for retention in the position illustrated in FIG. 1. Stem 36 is counterbored to receive the cylinder centerpin 62, the counterbore defining a shoulder 68. The cylinder centerpin 62 includes a radially outwardly projecting flange 64. A helical spring 66 having opposite ends engaging the rear end of extractor rod 52 and flange 64, respectively, biases centerpin 62 for axial rearward movement into the position illustrated in FIG. 1 with flange 64 butting shoulder 68. With flange 64 in abutment against shoulder 68, the rear end 70 of centerpin 62 projects within an aperture 72 formed through the breech surface of the revolver frame. Centerpin end 70 thus locks the rear end of the centerpin within frame opening 16 in the firing position of the revolver.

As illustrated in FIG. 3, the forward end of the revolver barrel 14 is provided with a channel 74 opening to the same side of frame 12 as the cylinder when located in its loading or extraction position. Channel 74 receives the forward portions of extractor rod 52 and centerpin 62 when cylinder 16 lies in the firing position illustrated in FIG. 1. To lock the forward portions of the centerpin 62 and extractor rod 52 to barrel 14, the end of channel 74 below the barrel is counterbored to form a recess 76 also opening to the one side of the barrel. The forward or end face of the barrel defining the extractor rod channel 74 is thus inset from the end of barrel 14 and is also counterbored to form a generally semicircular or semi-annular recess 78. As best illustrated in FIGS. 1 and 4, generally cylindrical extractor thumbpiece 80 is screw-threaded on the forward end of centerpin 62. The rear face of thumbpiece 80 is counterbored to provide a rearwardly opening annular recess defining an outer annular flange 82 for reception in generally semi-circular recess 78 at the forward end face of the extractor channel.

Referring now to FIG. 1, it will be appreciated that the cylinder is maintained within the frame opening 16 and the centerpin 62 is locked to the revolver frame and barrel at both its forward and rear ends. That is, the rear end 70 of pin 62 extends within aperture 72 while the annular flange 82 of extractor thumbpiece 80 is received within recess 78 to lock the forward end of cen-
terpin 62 and extractor rod 52 to the revolver barrel and against swinging movement therefrom. To unlock the cylinder from the revolver frame and permit swinging movement thereof on yoke 26 to one side of the frame, for example to the position illustrated in FIG. 6, a thumbpiece 87 carried by the revolver frame 12 rearwardly of cylinder 18 is coupled to a stub pin 86 also received in aperture 72. Thumbpiece 87 and pin 86 are springbiased, by means not shown, forwardly by a spring of insufficient force to overcome the bias of spring 66 urging centerpin 62 rearwardly into aperture 72. Thus, upon forward movement of thumbpiece 87, centerpin 62 is displaced axially forwardly such that its rear end 70 is displaced from aperture 72. Axial displacement of centerpin 62 also displaces the annular flange 82 of extractor thumbpiece 80 forwardly beyond the end face of the extractor channel. Forward movement of the centerpin 62 in this manner thus releases the cylinder and yoke for swinging movement to one side of the frame.

When the cylinder and yoke have swung to the extent that the centerpin is clear of the rear breech surface of the frame, the centerpin and extractor thumbpiece 80 are returned by spring 66 to their normal rearward position with flange 64 butting shoulder 68 of the extractor stem 36. When the cylinder has swung completely to one side of the frame, the extractor thumbpiece 80 is grasped and the centerpin 62 and extractor rod 52 moved rearwardly toward cylinder 18. This rearward movement extends extractor head 34 axially rearwardly from cylinder 18 as illustrated in FIG. 7 thereby to remove the cartridge casings from the chambers of the cylinder. Upon complete removal of the cartridge casings and release of extractor thumbpiece 80, spring 58 returns the extractor mechanism including head 34, stem 36, extractor rod 52 and centerpin 62 to their normal position.

After reloading, the cylinder is swung toward the frame opening 16. The rear end 70 of centerpin 62, upon such swinging movement, is cammed forwardly by the lead surface 90 in the breech of the frame. This camming action maintains the rear end 70 of centerpin 62 engaged along the rear breech surface and also maintains extractor thumbpiece 80 axially forwardly of the front end surface of the extractor channel. When the cylinder is swung completely into the firing position, spring 66 displaces centerpin 62 rearwardly such that its rear end 70 engages within aperture 72, which in turn, displaces stub pin 86 rearwardly against the bias of the spring, not shown, acting on thumbpiece 87. Simultaneously with the movement of centerpin 62 rearwardly, the flange 82 of extractor thumbpiece 80 engages within recess 78 to lock the forward end portions of centerpin 62 and extractor rod 52 within channel 74.

Referring to FIG. 5, there is illustrated an alternate form of forward locking mechanism for the extractor rod and centerpin. In this form, the interior edge 94 of channel 78a formed on the forward end face of the extractor rod channel is tapered to receive a similarly tapered flange 82a counterbored on the rear face of the extractor thumbpiece 80. These tapered surfaces align the extractor thumbpiece 80 and consequently the centerpin 62 and extractor rod 52 in exact axial alignment with the locking aperture through the rear breech surface.

It will thus be appreciated from the foregoing description that the extractor rod can be displaced substantially the full length of the revolver barrel when the cylinder is swung to one side of the frame thereby providing for full and complete extraction of the cartridge casings from the chambers of the cylinder and eliminating the need to shake the revolver or turn it on end to completely extract the casings. Simultaneously, it will be appreciated that, with this full extraction, the cylinder centerpin is effectively locked at both its front and rear ends when the cylinder is closed into the frame for firing.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore to be embraced therein. embraced.

What is claimed and desired to be secured by United States Letters Patent is:

1. A revolver comprising: a frame having an opening and a barrel, a yoke pivotally carried by said frame, a cylinder pivotally carried by said yoke and pivotal with said yoke between a firing position locating said cylinder within said frame opening and a cartridge casing extraction and loading position to one side of said frame, a centerpin carried by said cylinder and mounted for axial sliding movement between first and second positions, means biasing said centerpin for axial movement into said first position, means carried by said frame for locking a rear end portion of said centerpin to said frame when said cylinder lies in said firing position and said centerpin lies in said first position and for releasing the rear end portion of said centerpin from said frame when said cylinder is axially displaced from said first position into said second position, a cartridge casing extractor carried by said cylinder for axial movement in a direction generally parallel to the rotational axis of said cylinder, an extractor thumbpiece carried by a forward end portion of said centerpin, said thumbpiece being recessed along its rear face to define an arcuate rearwardly projecting flange, a channel mounted below said barrel, said channel having an arcuate recess substantially surrounding a forward end portion of said channel for receiving the thumbpiece flange and for locking said thumbpiece to said barrel and for releasing the forward end portion from said barrel when said centerpin is axially displaced from said first position into said second position, centerpin in said second position thereof unlocking said cylinder from said frame and enabling said cylinder to swing from said frame opening to said one frame side, and means coupling said extractor thumbpiece and said extractor to enable displacement of said extractor axially away from said cylinder when said cylinder is located on said one frame side for complete extraction of cartridge casings from said cylinder.

2. A revolver according to claim 1 wherein said revolver has a barrel length of about two and one-half inches, said coupling means enabling displacement of said extractor a distance from said cylinder sufficient to fully extract the cartridge casings from said cylinder.

3. A revolver according to claim 1 wherein the latter locking means includes means responsive to axial
movement of said centerpin from said second position to said first position for locking said thumbpiece to said barrel.

4. A revolver according to claim 3 wherein said centerpin normally lies in said first position when said cylinder lies to said one frame side, means carried by said revolver for axially displacing said centerpin from said first position to said second position in response to swinging movement of said cylinder from said one frame side toward said firing position.

5. A revolver according to claim 1 wherein the latter locking means includes an axially forwardly opening recess and an abutment formed on said barrel, and means responsive to axial movement of said centerpin from said second position to said first position for locating at least a portion of said thumbpiece in said recess and in lateral alignment with said abutment to preclude swinging movement of said centerpin and said cylinder from the cylinder firing position toward said one frame side.

6. A revolver according to claim 1 wherein said centerpin is carried by said cylinder for axial sliding movement relative to said extractor for movements thereof between said first and second positions and for joint axial movement with said extractor relative to said cylinder.

7. A revolver according to claim 6 wherein said extractor includes a stem having a central passage for receiving said centerpin and an internal shoulder within said passage, a flange carried by said centerpin for engagement with said shoulder when said centerpin lies in said first position, said cylinder having a central bore receiving said stem and said centerpin, a spring engageable between said cylinder and said stem for biasing said extractor for movement in a forward direction, said stem and said centerpin being jointly movable rearwardly relative to said cylinder against the bias of said spring.

8. A revolver according to claim 7 including an extractor rod having an axial passage therethrough for receiving said centerpin, said centerpin being axially movable relative to said extractor rod during movement of said centerpin between said first and second position, said extractor rod being secured to said stem for joint movement with said extractor.

9. A revolver comprising: a frame having an opening and a barrel, a yoke pivotally carried by said frame, a cylinder pivotally carried by said yoke and pivotal with said yoke between a firing position locating said cylinder within said frame opening and a cartridge casing extraction and loading position to one side of said frame, a centerpin carried by said cylinder and mounted for axial sliding movement between first and second positions, means biasing said centerpin for axial movement in a direction generally parallel to the rotational axis of said cylinder, said barrel having a channel laterally to said one frame side, the forward end face of the portion of said channel having an arcuate recess substantially surrounding a forward portion of said channel, an extractor thumbpiece carried by a forward end portion of said centerpin, said thumbpiece being recessed along its rear face to define an arcuate axially rearwardly projecting flange for reception in said recess for locking said thumbpiece to said channel and for releasing the forward end portion from said barrel when said cylinder is axially displaced from said first position into said second position, said centerpin in said second position thereof unlocking said cylinder from said frame and enabling said cylinder to swing from said frame opening to said one frame side, the first mentioned locking means including means for displacing said centerpin from said first position to said second position when said cylinder lies in said firing position to locate said flange forwardly of said end face thereby enabling lateral swinging movement of said thumbpiece from said barrel and means coupling said extractor thumbpiece and said extractor to enable displacement of said extractor axially away from said cylinder when said cylinder is located on said one frame side for complete extraction of cartridge casings from said cylinder.

10. A revolver comprising: a frame having an opening and a barrel, a yoke pivotally carried by said frame, a cylinder pivotally carried by said yoke and pivotal with said yoke between a firing position locating said cylinder within said frame opening and a cartridge casing extraction and loading position to one side of said frame, a centerpin carried by said cylinder and mounted for axial sliding movement between first and second positions, means biasing said centerpin for axial movement into said first position, means carried by said frame for locking a rear end portion of said centerpin to said frame when said cylinder lies in said firing position and said centerpin lies in said first position and for releasing the rear end portion of said centerpin from said frame when said centerpin is axially displaced from said first position into said second position, a cartridge casing extractor carried by said cylinder for axial movement in a direction generally parallel to the rotational axis of said cylinder, said barrel having a channel laterally to said one frame side, the forward end face of the portion of said channel having an arcuate recess substantially surrounding a forward end portion of said channel, an extractor thumbpiece carried by a forward end portion of said centerpin, said thumbpiece being recessed along its rear face to define an arcuate axially rearwardly projecting flange for reception in said recess for locking said thumbpiece to said barrel and for releasing the forward end portion from said barrel when said centerpin is axially displaced from said first position into said second position, said centerpin in said second position thereof unlocking said cylinder from said frame and enabling said cylinder to swing from said frame opening to said one frame side, the first mentioned locking means including means for displacing said centerpin from said first position to said second position when said cylinder lies in said firing position to locate said flange forwardly of said end face thereby enabling lateral swinging movement of said thumbpiece from said barrel and means coupling said extractor thumbpiece and said extractor to enable displacement of said extractor axially away from said cylinder when said cylinder is located on said one frame side for complete extraction of cartridge casings from said cylinder.