Jan. 10, 1967 F. F. STEVENS, JR 3,296,729

REVOLVER-TYPE FIREARM WITH A BARREL ASSEMBLY INCLUDING A MULTIPLE-BORE BARREL AND A BREECH PART RELEASABLY CONNECTED THERETO

Filed Aug. 30, 1965

FIG. 1

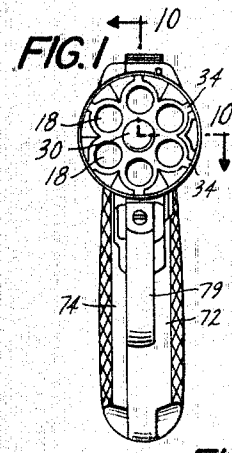


FIG. 2

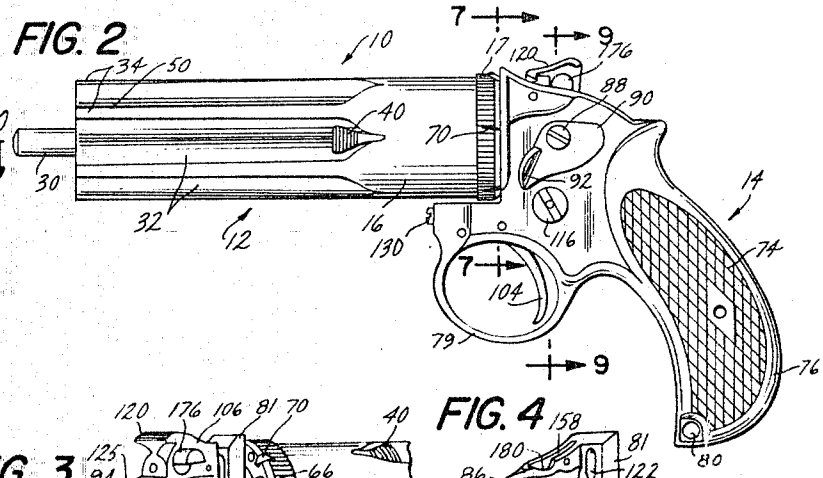


FIG. 3

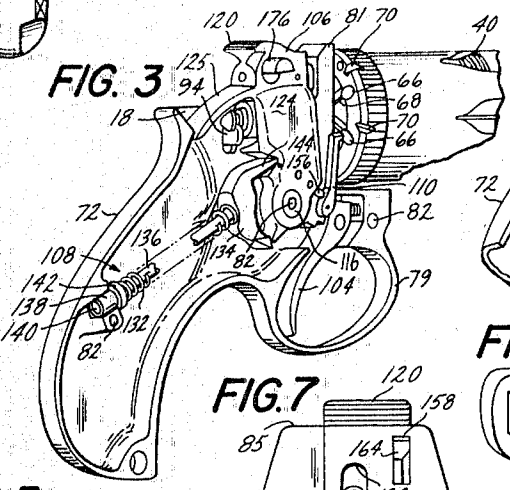


FIG. 4

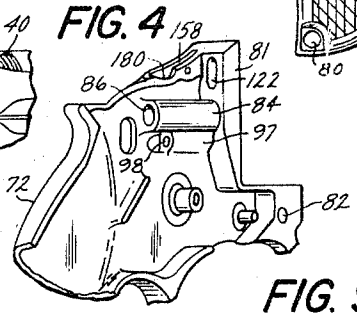


FIG. 5

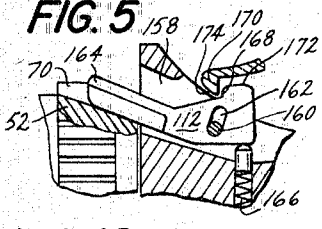


FIG. 7

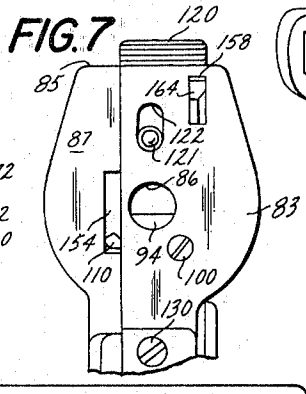


FIG. 8

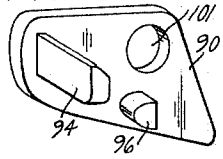


FIG. 9

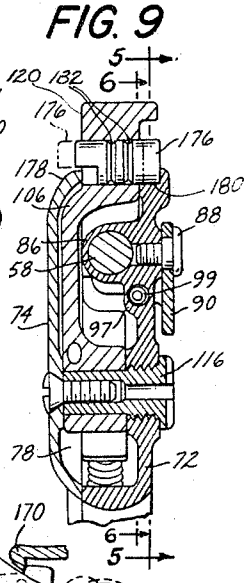


FIG. 10

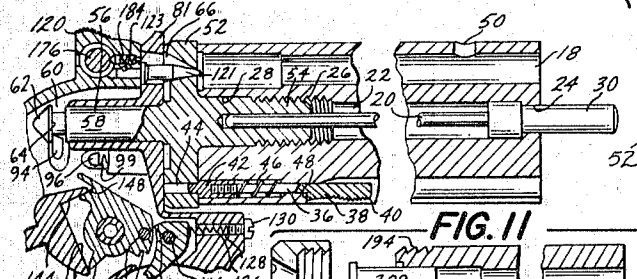


FIG. 11

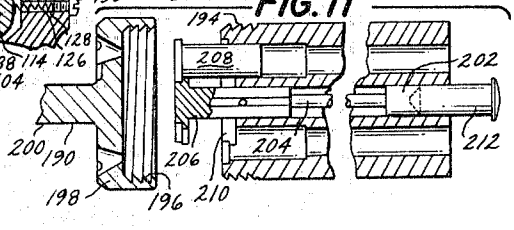
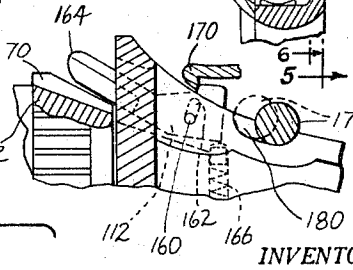


FIG. 6



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REVOLVER-TYPE FIREARM WITH A BARREL ASSEMBLY INCLUDING A MULTIPLE-BORE BARREL AND A BREECH PART RELEASABLY CONNECTED THERETO

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21 Claims. (Cl. 42—59)

This invention relates to firearms, and deals more particularly with improvements in revolver-type firearms.

One object of this invention is to provide a firearm which is particularly adapted for both underwater and out of water use, which is reliable and easy to use both underwater and out of water, and which is also accurate and powerful both underwater and out of water.

A further object of this invention is to provide a firearm which by a simple manipulation may be furnished with a fresh supply of ammunition or converted from one type of ammunition to another.

A further object of the present invention is to provide a revolver-type firearm having a barrel assembly readily separable from a grip assembly, the barrel assembly being adapted to contain a plurality of armed cartridges and being readily assembled with said grip assembly for individual firing of any one of said armed cartridges, a single firing mechanism in said grip assembly being operable to fire each of said cartridges in succession.

A further object of the present invention is to provide an underwater firearm in which the barrel assembly is so constructed that the cartridges can be individually fired therefrom without having to displace a substantial amount of water.

A more specific object of the present invention is to provide an underwater firearm in which the firing mechanism includes a suitable safety mechanism for preventing inadvertent firing of a cartridge during assembly of the barrel assembly with the grip assembly or at any other time when the safety mechanism is not in the "firing" condition.

Another object of this invention is to provide a firearm of the foregoing character in which a barrel assembly capable of receiving a number of different ammunition cartridges may be safely indexed prior to any one shot to bring a desired ammunition cartridge into firing position for the shot.

Other objects and advantages of the invention will be apparent from the following description and from the drawing forming a part hereof.

The drawing shows preferred embodiments of the invention and such embodiments will be described, but it will be understood that various changes may be made from the constructions disclosed, and that the drawing and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

FIG. 1 is a front end view of an underwater firearm constructed in accordance with the present invention.

FIG. 2 is a side elevational view of the firearm shown in FIG. 1.

FIG. 3 is a fragmentary perspective view of the firearm of FIG. 1 and shows generally the firing mechanism of the grip assembly, the barrel assembly being omitted in part and the cover part of the grip assembly being shown removed.

FIG. 4 is a fragmentary perspective side view of the grip assembly frame as viewed in FIG. 3, the firing mechanism being shown removed for clarity.

FIG. 5 is an enlarged and fragmentary vertical cross-sectional view taken generally on the line 5—5 of FIG. 9 and showing the latch for releasably holding the barrel assembly in its various firing positions relative to the grip assembly, the latch in this view being shown in the position assumed when the hammer of the firearm is in its neutral position.

FIG. 6 is an enlarged and fragmentary vertical cross-sectional view taken generally on the line 6—6 of FIG. 9 and shows the latch in the position assumed when the hammer is pulled rearwardly as far as it will go with the firearm in its "on safe" condition.

FIG. 7 is a fragmentary front elevational view of the upper part of the grip assembly of the firearm of FIG. 1.

FIG. 8 is an enlarged perspective side view of the latch bolt used in the firearm of FIG. 1 for releasably holding the barrel assembly to the grip assembly, this view showing the opposite side of the latch bolt from that shown in FIG. 2.

FIG. 9 is an enlarged vertical transverse sectional view taken along the line 9—9 of FIG. 2.

FIG. 10 is a generally vertical cross-sectional view, taken along the line 10—10 of FIG. 1 in part, to show the barrel portion in assembled relation with the grip portion.

FIG. 11 is a longitudinal sectional view taken through a barrel assembly comprising a construction alternative to that of the preceding figures.

Turning now to the drawing in greater detail, and first considering FIGS. 1 and 2, these figures show at 10 a revolver-type firearm embodying the present invention. This firearm is in turn comprised of two basic assemblies or parts, namely a cylinder or a barrel assembly 12 and a grip assembly 14. The barrel assembly 12 serves to contain and house a number of armed cartridges, not shown, and includes a number of barrel bores which receive the cartridges and guide the projectile portions of the cartridges from the firearm during the firing process. The grip assembly 14 in turn serves basically to provide a grip for holding the firearm and a firing mechanism for controllably firing the cartridges carried by the barrel assembly. As hereinafter explained in more detail, the barrel assembly is readily separable from the grip assembly to permit loading of the barrel assembly or the interchange of different barrel assemblies with the grip assembly. In FIGS. 1 and 2, the barrel assembly 12 is shown in its normal assembled relationship with the grip assembly 14.

Considering now more particularly the construction of the barrel assembly 12, and referring to FIGS. 3 and 10, this assembly comprises basically a generally cylindrical barrel 16 and a breech part 17 releasably connected with the barrel. The barrel contains a plurality (in the illustrated case six) of bores 18, 18 arranged in an equally spaced annular series about its central axis and extending the entire length thereof. The inner or breech ends of the six bores are chambered and counterbored as required to accommodate the particular armed cartridges desired to be used with the barrel assembly. In the illustrated case, for example, each barrel bore 18 is both chambered to receive the case or shell of the cartridge and counterbored to receive the rim of such as case. The projectile portion of the cartridges may extend any distance beyond the chambered portion of its bore, but preferably the cartridges have projectile portions of such length as to extend substantially to or slightly beyond the front end of the barrel when the cartridges are in their loaded positions in the barrel assembly. The cartridges loaded in the barrel may all be similar to one another, or they may include two or more different varieties. When two or more different varieties of cartridges are loaded in one barrel, they usually will have differently shaped front ends so that by viewing or feeling the portions of the cartridges protruding from the barrel a user

may readily determine the type of cartridge which is in the firing position.

Another bore **20** extends longitudinally through the center of the barrel **16**. This center bore includes an intermediate portion **22**, a reduced diameter portion **24** adjacent the front end of the barrel, an internally threaded portion **26** located to the rear of the intermediate portion **22** and an unthreaded enlarged diameter portion adjacent the rear end of the barrel. Among other things, the bore **20** serves to receive an ejector rod **30** which is removable from the bore, when the breech part **17** is disconnected from the barrel, and usuable as a tool for displacing empty cartridge shells from the cartridge receiving bores **18, 18**.

The outer surface of the barrel is machined or otherwise formed to provide a series of flutes or grooves **32, 32** located generally between the areas occupied by the bores **18, 18** and extending from the front edge of the barrel to a point spaced some distance from the rear end of the barrel. These flutes or grooves in addition to improving the appearance of the firearm and reducing its weight also define a series of ribs or longitudinal bars **34, 34** each of which is located over the center of an associated one of the bores **18, 18** so as to serve as an aid in sighting or aiming the firearm. As shown best in FIG. 10, the barrel also includes a small bore **36** which extends from the rear face of the barrel to the rear end of one of the flutes, the forward portion of this bore being of a smaller diameter than the rear portion. Fitted into this bore is a thumb operable latch **38** having at its forward end an exposed thumb engageable portion **32** and at its rear end a portion or part **42** having a point or finger arranged to enter an opening **44** in the breech part **17** to properly angularly locate the breech part relative to the barrel and to prevent undesired relative rotation of said two parts. A spring **46** in the enlarged diameter portion of the bore **36** biases the latch **38** to the illustrated position and a shoulder **48** limits movement of the latch beyond the position shown when the breech part is removed from the barrel. From FIG. 10 and FIG. 2, it will be obvious that by placing a thumb or finger on the exposed thumb engageable latch portion **40**, the latch may be drawn forwardly to unlatch the breech part for angular movement relative to the barrel.

With further reference to the barrel **16**, under some conditions of use and with some types of cartridges, the firearm may tend to rise at its front end as it is fired. This tendency may be readily and easily overcome by providing each of the barrel bores with a transverse vent, such as shown at **50** in FIG. 10, which faces upwardly when the associated bore is in the firing position. When such a vent is provided, gases generated by the explosion of the cartridge powder will escape through the vent shortly before the projectile leaves the final portion of its bore, and this will have the effect of producing a downward force on the front end of the barrel counteracting the rising tendency and thereby improving the accuracy of the firearm.

The breech part **17** normally closes the breech ends of the barrel bores **18, 18** and includes a radially extending disc portion **52**, a forwardly extending stem **54** and a rearwardly extending stem **56**. The disc portion **52** overlies the breech ends of the bores **18, 18** and has a flat forwardly facing surface which flatly engages a corresponding flat surface on the rear end of the barrel **16** when the breech part is in its fully assembled position with the barrel as shown in FIGS. 2 and 10. The forwardly extending stem **54** is externally threaded at its forward end portion for threaded engagement with the internally threaded portion **26** of the barrel center bore **20**, and rearwardly of the threads is an unthreaded portion which fits closely with the unthreaded bore portion **26** of the barrel. A forwardly opening longitudinal bore is also provided in this stem for receiving and supporting the rear end portion of the ejector rod **30**. The rearwardly extending stem **56** serves, as hereinafter described, as part of the means for rotatably and releasably supporting the barrel assembly relative to the grip assembly and includes a relatively long straight cylindrical section **58** adjacent the disc portion **52**. Adjacent its free end is a shouldered circular recess or groove **60** followed by a conical end portion **62**, the conical end portion being separated from the circular groove **60** by a radial shoulder **64**.

The disc portion of the breech part includes an annular series of generally conical openings **66, 66** for receiving the firing pin of the firing mechanism. The openings pass completely through the disc portion **52** and when the breech part is in its fully assembled position with respect to the barrel, each opening **66** is aligned with a respective one of the barrel bores **18, 18**. Also on the rear face of the disc portion, and inwardly of the series of openings **64, 64**, is an arrangement of surfaces defining a ratchet **68** which is cooperable with a hand in the firing mechanism for indexing the barrel assembly. For holding the barrel assembly in its various proper firing positions, the disc portion further includes a number of index notches **70, 70** in its rear edge, this edge being preferably beveled as shown.

Considering now the construction of the grip assembly **14**, and first referring to FIGS. 2, 3 and 4, this assembly includes a main frame **72** and a cover **74** which when assembled as shown in FIG. 2, provide a grip **76** for holding the firearm and also define an enclosed chamber **78** for receiving the firing mechanism. The main frame **72** includes a trigger guard **79** and an opening **81** suitable for receiving a lanyard, if desired, for tying the firearm to the wrist, belt or other parts of the body or clothing of a user to prevent loss. Above the trigger guard the main frame includes a vertically and transversely extending forward wall **81** having a flat forwardly facing surface **83**. The cover **74** has a corresponding wall **85** with a flat forwardly facing surface **87** which is located in the same plane as the surface **83** when the cover is in its normal assembled position with the main frame. The cover **74** is held in assembled relation with the main frame by three screws, not shown, which pass through openings in the cover and which are threaded into threaded openings, indicated at **82, 82** in FIG. 3, two of which are formed directly in the main frame and one of which is provided in the hammer pivot screw as hereinafter described.

As part of the means for releasably and rotatably supporting the barrel assembly relative to the grip assembly, the main frame **72**, as shown best in FIGS. 3, 4, 9 and 10, includes a socket defining portion **84** located generally in the mechanism chamber **78** and including a longitudinal bore or socket **86** for rotatably receiving the straight cylindrical portion **58** of the rear stem **56** of the breech part **17**. The length of the socket **86** is such that the breech part stem **56**, when the barrel assembly is fully assembled with the grip assembly, extends some distance beyond the rear end of the socket to expose the circular groove **60** and radial shoulder **64**. Pivotally supported on the main frame by a pivot screw **88** for rotation about a transverse axis is a thumb operable latch **90**. The major portion of this latch is located on the outer side of the main frame and includes a laterally outwardly extending projection **92** which is so located as to be engageable and capable of being pushed forwardly by the thumb of a user when the grip **76** of the firearm is gripped in the usual manner by the hand of the user. On the inner face of the latch **90**, as shown best in FIG. 8, are two laterally inwardly extending fingers **94** and **96** which pass through openings in the main frame and enter the firing mechanism chamber **78**. Below the socket defining portion **84** of the main frame is another smaller portion **97** including a longitudinally extendig bore **98** which receives a helical compression spring **99**. The bore **98** extends through the forward frame wall **81** and at its forward end is closed by a plug screw **100** threaded

therein. The spring **99** at its forward end bears against the screw **100** and at its rear end bears against the finger **96** to bias the latch **90** into latching relationship with the circular recess **60** of the breech part. This latching relationship is in turn accomplished by the finger **94** which enters the recess **60** and bears against the radial shoulder **64** to hold the breech part in the position shown in FIG. 10. At this point, it should be noted also, that the opening **101**, see FIG. 8, in the latch and which receives the pivot screw **88** is made of a slightly larger diameter than the corresponding portion of the pivot screw so that the latch in addition to being rotatable is capable of moving a limited amount longitudinally of the main frame. As a result, the compression spring **99** not only biases the latch angularly about the pivot screw **88** but also biases it rearwardly.

The relationship of the parts is further such that when the breech part is in its fully assembled and latched condition with the grip assembly, the radial shoulder **64** of the breech part holds the latch **90** slightly away from its rearward limited position. As a result, a large part of the force of the spring **99** is transferred to the breech part to hold the rear face of the breech part disc portion **52** in relatively tight engagement with the forward facing surfaces **83** and **87** of the main frame and cover. It will, of course, be understood that as the latch is moved from the latched position illustrated in FIG. 2, by pushing forwardly on the projection **92**, the finger **94** is swung from the recess **60** to release the barrel assembly for movement from the grip assembly, this being accomplished by grasping the barrel and pulling it forwardly relatively to the grip assembly. Also, when the barrel assembly is reassembled with the grip assembly, the conical end portion **62** of the breech part stem engages the latch finger **94** and rotates the latch slightly to allow the finger to pass over the end portion and into the groove **60** as the barrel assembly is pushed rearwardly relative to the grip assembly.

The firing mechanism is located primarily in the enclosed chamber **78** and constitutes basically a trigger **104**, a hammer **106**, a main spring assembly **108**, a barrel indexing hand **110** and a barrel latch **112**. The trigger **104** is pivotally secured to the main frame by a pivot pin **114**, and the hammer **106** is pivotally secured to the main frame by a pivot screw **116** which, as shown best in FIG. 9, is threaded into and passes through the main frame and additionally provides one of the threaded openings **82**, **82**, for receiving one of the screws which holds the cover **74** in place relative to the main frame. At its upper end, the hammer passes through an opening **118** in the main frame and includes a spur **120** which is intended to be engaged by the thumb of the user and pulled rearwardly to move the hammer from its forward to its rearward or cocked position. Extending from the forward face of the hammer is a hardened firing pin **121** which moves through an opening **122** in the forward frame wall **81** and has a rear portion locked in a bore in the hammer by a transverse lock pin **123**, as best shown in FIG. 10. Between the pivot screw **116** and its upper end portion, the hammer comprises an intermediate portion **124** which is in the shape of a relatively thin plate or web located adjacent the side wall of the cover **74** between the latter side wall and the socket defining portion **84** of the main frame. From FIG. 9, it will be noted that in vertical section, the hammer has a generally U-shaped appearance and surrounds the socket defining portion **84**. Also, at the upper end portion of the hammer is an arcuate generally rearwardly extending tail **125** which serves to close the opening **118** in the main frame when the hammer is in its forward position.

The lower or finger engageable portion of the trigger **104** is biased toward a forward position by a helical compression spring **126** which is located in a longitudinal bore **128** formed in the main frame and closed at its forward end by a plug screw **130**. The spring **126** at its forward end bears against the screw **130** and at its rear end bears against the upper portion of the trigger at a point located slightly above the trigger pivot screw **116**, as shown best in FIG. 10. The hammer is in turn biased toward its forward or firing position by the main spring assembly **108** which includes a helical compression spring **132**, a hammer engaging head **134** fixed to a shaft **136** which receives the spring **132**, and a bushing **138** which slidably receives the rear end of the shaft and provides a shoulder for engaging the rear end of the spring **132**. The bushing **138** is fitted into a slot **140** defined in the main frame and is restrained against rearward movement by a flange **142**. The head **134** is engaged and urged forwardly by the forward end of the spring **132**. At its forward end the head **134** includes a forwardly projecting finger **144** and a transversely extending surface **146**. Included in the hammer is a rearwardly facing notch **148** which receives the finger **144** and a finger **150** which bears against the transverse surface **146**. The neutral position of the hammer is shown in FIG. 3 and in this position the finger **144** engages the end of the hammer notch **148** at the same time as the hammer finger **150** engages the transverse surface **146**. In this position of the hammer, the firing pin terminates short of the forward face of the breech disc **52**. From the neutral position shown in FIG. 3, the hammer may be moved counterclockwise to a cocked position by a rearward force applied to the spur, and as the hammer moves to this cocked position the finger **144** of the main spring assembly remains in the hammer notch **148** to bias the hammer back toward its neutral position. When the hammer is fired or released from its cocked position, it may also move forwardly or clockwise, as a result of its inertia, from its neutral or FIG. 3 position to permit the firing pin to enter the chamber of the associated barrel bore to fire the cartridge therein. This firing position is shown in FIG. 10, and from this figure, it will be noted that as the firing pin reaches the firing position, the finger **144** moves slightly away from the end of the hammer notch **148**, but the hammer finger **150** remains engaged by the transverse surface **146** of the hammer to exert a biasing force on the hammer tending to return the same toward its neutral position.

The barrel indexing hand **110** is pivotally connected with the hammer by a transverse journal portion **152**, see FIG. 10, which is loosely received in a corresponding opening in the hammer. The hand extends upwardly from this journal portion and through a slot **154** formed in the forward wall **85** of the cover **74**. The upper end of the hand is biased forwardly into engagement with the ratchet **68** on the rear of the breech disc **52** by a helical compression spring **156** which is located in a blind bore in the hammer and which at its forward end bears against the rear surface of the hand, as shown in FIG. 3.

The barrel latch **112** is best shown in FIGS. 5 and 6 and is located in a slot **158** which passes through the upper portion of the forward wall **81** of the main frame. The latch is in turn connected with the main frame by a pin **160** which passes transversely through the slot and through an elongated opening **162** in the latch. A forward portion or finger **164** of the latch extends beyond the forward frame surface **83** and, when the hammer is in the neutral position, engages one of the notches **70**, **70** of the breech disc **52**, as shown in FIG. 5, to hold the barrel assembly in one of its firing positions relative to the grip assembly. The latch is biased toward such latching relationship with the notches **70**, **70** by a spring **166** located in a vertical bore of the main frame and pushing upwardly against the bottom of the latch at a point spaced rearwardly of the pivot pin **160**. In addition to holding the finger **164** of the latch in engagement with the associated barrel notch **70**, this spring also tends to raise the latch so that the

lower end of the elongated opening **162** engages the pin. Above the pin **160** the latch further includes a generally vertical shoulder **168** which is engageable by a hook **170** formed on the spur portion of the hammer as the hammer is moved rearwardly from its neutral to its cocked position to rotate the latch and raise the forward portion **164** out of the associated notch **70**.

The relationship of the parts is such that as the hammer is moved rearwardly to its cocked position, the latch finger **164** at an intermediate position of the hammer spaced rearwardly from its neutral position, is engaged by the hook **170** and raised from the notch **70**. The latch finger is then held in this raised position throughout a given range of further rearward hammer travel during which the hook **170** of the spur passes over the upper latch surface **172** located rearwardly of the shoulder **168**. During the time that the latch is held in this raised position by the hook **170**, the barrel assembly is free to rotate relative to the grip assembly and the barrel indexing hand **110** engages one of the ratchet teeth on the breech disc and rotates the barrel a slight amount to move the immediate notch **70** out of alignment with the latch finger **164**. After the latch is released by the hook **170**, as a result of further rearward movement of the spur and hammer, the latch portion **164** drops back onto the beveled rear edge of the breech disc and remains on said beveled edge until a new notch **70** is moved into alignment therewith. Such movement of a new notch into alignment with the latch finger occurs as the hammer reaches its cocked position and, therefore, as the cocked position is reached, the barrel is automatically latched into the new firing position by the latch. As the hammer moves forwardly in firing, the forward inclined surface **174** of the hook **170** engages the rear portion of the barrel latch and pushes it downwardly, the elongated opening **162** thereupon sliding relatively to the pin **160** to permit the hook to return to its neutral position as shown in FIG. 5 without unlatching the barrel assembly.

A safety mechanism is also included in the firearm and is movable between a safe condition and a firing condition to selectively prevent or permit firing of the firearm. This safety mechanism is further such that when it is in its safe condition, the hammer is prevented from moving forwardly to its firing position but either is positioned or may be moved to such a position as to release the barrel assembly for rotation relative to the grip assembly. The details of the safety mechanism may vary widely without departing from the invention, and in the illustrated case, it is shown to include a generally cylindrical part **176**, referred to as a "safety bar," slidably received in a transverse bore in the upper or spur portion of the hammer. This safety bar is movable transversely relative to the hammer between two different detent positions at which it extends slightly from one or the other side of the hammer. Referring to FIG. 9, this figure in solid lines shows the part **176** in one of its detent positions, this being the safety position, and the broken lines show it in its other detent position, this being the firing position. From FIG. 9, it will further be noted that the left-hand side of the part **176** is cut away along its lower end so that the remaining portion which does project beyond the adjacent side of the hammer in the firing position passes over the upper edge **178** of the cover without interference during the movement of the hammer between its neutral and cocked positions. Also, when the part is in its firing position, the right-hand end of the part **176** is housed within or at least flush with the side of the hammer so that it will be incapable of interferring with any portion of the main frame. From FIG. 9, it will be noted, however, that when the part **176** is moved to its safety position, the right-hand portion of the part extends beyond the adjacent side of the hammer and enters a conforming recess **180**, shown best in FIGS. 4 and 6, formed in the main frame adjacent the slot **158** for the barrel latch. The recess **180** is of such arcuate extent as to prevent forward travel of the hammer beyond its neutral position and to permit a small limited rearward movement of the hammer from its neutral position when the associated end portion of the safety bar **176** is located therein. Therefore, the hammer by engagement between the part **176** and the wall of the recess **180** cannot be moved forwardly from its neutral position to fire a cartridge by forward forces applied to the hammer as might occur in dropping the firearm. As shown best in FIG. 6, the amount of rearward hammer travel permitted when the safety bar is in the recess **180** is just enough to permit the hook **170** of the hammer to engage and raise the barrel latch from latching engagement with the barrel assembly. The movement permitted, however, is not enough to permit the hook **170** to move rearwardly beyond the latch and therefore at the rearward limit of the movement, the latch is held by the hammer in its raised position. Therefore, when the firearm is in its safe condition, the user, by pulling back as far as possible on the hammer may free the barrel assembly for rotation relative to the grip assembly and may thereby select any one of the cartridges loaded in the barrel for firing. This is, of course, of particular advantage in cases where the barrel assembly is loaded with a number of different types of cartridges. The detent arrangement for holding the safety bar **176** in its two detent positions includes two circumferential grooves **182, 182** on its outer surface and a spring biased detent element **184**, the detent element and its associated spring being located in a small bore in the spur portion of the hammer forwardly of the part **176**. In FIG. 6, the broken lines show the safety bar **176** in the position occupied when the hammer is in its neutral position.

For controlling the cocking and firing of the hammer, the hammer includes a sear notch **186** which is engageable by a sear **188** formed on the upper end portion of the trigger **104**. As the hammer is moved to its cocked position, the trigger spring **126** moves the sear **188** into engagement with the sear notch **186** to hold the hammer in its cocked position. As the lower portion of the trigger is moved rearwardly, the sear is pulled from the sear notch to release the hammer for movement by the main spring to its firing position.

From the foregoing description of the construction of the firearm, it will be understood that it is particularly well adapted for use under water. More particularly, the barrel assembly and grip assembly may be readily attached and removed from one another. This permits a diver to carry a number of loaded barrel assemblies and to readily interchange such assemblies with the grip assembly to reload the firearm after the cartridges of one barrel assembly have been fired or to arm the firearm with a different type of cartridge, it being possible to load one barrel assembly with one type of a cartridge and another barrel assembly with another type of cartridge. Furthermore, the firearm is so constructed that substantially all of the parts thereof may be made from stainless steel so as to resist corrosion and rusting as a result of immersion in water. Still further, the parts of the firing mechanism and particularly the intermediate portion **124** of the hammer are so constructed as to displace very little water during the firing of the firing mechanism so that the water in the firing mechanism cavity will not impede the movement of the hammer sufficiently to prevent the firing of a cartridge as it is struck by the firing pin. In this regard, it should be particularly noted that the intermediate hammer portion is curved along its forward and rear edges so as to give it a stream-line effect as it moves through the water in the firing mechanism.

In addition to the barrel assembly construction described above, another construction such as that shown in FIG. 11 may be employed in the firearm. Refering to this figure, the barrel assembly there shown is generally similar to that described above except for including a breech part **190** which is connected to the barrel **192** by external

threads 194 on the rear end portion of the barrel and internal threads 196 formed on the breech part. This eliminates the need for a forwardly extending stem on the breech part as in the previous construction, but except for this change, the breech part 190 is or may be similar to the breech part 17 and includes a disc portion 198 and a rearwardly extending stem 200. The elimination of the forwardly extending stem of the breech part permits the barrel 192 to be conveniently equipped with an extractor 202 slidably received in a central barrel bore 204 and having a head 206 on its rear end which is engageable with the rims of cartridges, such as shown at 208, located in the bores of the barrel for moving the cartridges from the barrel bores after being fired. FIG. 11 shows the extractor in a position at which the head 206 has moved the cartridge 208 partially from its associated barrel bore. When the breech part 190 is fully assembled with the barrel 192, it holds the extractor head 206 within a recess 210 formed in the breech end of the barrel. The extractor includes another portion 212 which extends forwardly beyond the forward end of the barrel and which, after the breech part is removed from the barrel, is movable rearwardly to move the extractor head from its recess to expel the cartridges.

The invention claimed is:

1. A firearm comprising a grip assembly and a barrel assembly, said barrel assembly including a barrel having a plurality of bores spaced circumaxially about a central axis and extending through the length thereof and a breech part releasably connected with said barrel, said breech part having a portion which closes the breech ends of said bores when said breech part is connected with said barrel, said breech ends of said bores being open for the insertation and removal of cartridges when said breech part is disconnected from said barrel, and said grip assembly including means for releasably mounting said barrel assembly to said grip assembly for rotation of said barrel assembly relative to said grip assembly about said central axis and also including a firing mechanism for firing cartridges positioned in said bores.

2. A firearm as defined in claim 1 further characterized by said portion of said breech part which closes said bores being annular in shape and having ratchet teeth on the rear face thereof and a plurality of indexing notches in the rear radially outer edge thereof, and said firing mechanism of said grip assembly including a hand engageable with said ratchet teeth for rotating said barrel assembly relative to said grip assembly during a portion of the firing procedure and a latch engageable with any given one of said indexing notches to hold said barrel assembly against rotation relative to said grip assembly during another portion of the firing procedure.

3. A firearm comprising a grip assembly and a barrel assembly, said barrel asembly including a barrel having a plurality of circumaxially spaced bores extending through the length thereof and a breech part releasably connected with said barrel, said breech part having an annular portion which closes the breech ends of said bores when said breech part is connected with said barrel and a rearwardly extending stem, and said grip assembly including means for releasably mounting said barrel assembly to said grip assembly for rotation of said barrel assembly relative to said grip assembly about the axis of said rearwardly extending stem and also including a firing mechanism for firing cartridges positioned in said barrel bores.

4. A firearm as defined in claim 3 further characterized by said annular portion of said breech part including a plurality of openings passing therethrough and each communicating with a respective one of said bores when said breech part is connected with said barrel, and said firing mechanism including a firing pin movable through a given one of said openings in said breech part to fire a cartridge positioned in the associated barrel bore.

5. A firearm as defined in claim 3 further characterized by said means for releasably mounting said barrel assembly to said grip assembly including means defining a socket in said grip assembly for rotatably and longitudinally slidably receiving said rearwardly extending stem of said breech part, means defining a circumferential groove in said stem, and a latch on said grip assembly having a finger movable into and out of said groove when said barrel assembly is fully assembled with said grip assembly and when in said groove serving to hold said grip and barrel assemblies in said fully assembled condition.

6. A firearm as defined in claim 5 further characterized by said grip assembly having means defining a forwardly facing surface surrounding the forward end of said socket, said barrel assembly having means defining a rearwardly facing surface surrounding said rearwardly extending stem, a pivot pin for said latch, said latch having an opening for receiving said pivot pin which opening is of such a shape as to permit said latch to move both angularly and a limited extent forwardly and rearwardly, and biasing means for said latch for biasing the latter both angularly into latching engagement with said stem and rearwardly so as to urge said stem rearwardly and draw said rearwardly facing surface of said barrel assembly into engagement with said forwardly facing surface of said grip assembly.

7. A firearm as defineed in claim 6 further characterized by said grip assembly including a frame having a portion defining said socket and said biasing means comprising another portion of said frame having a rearwardly opening bore arranged generally parallel to said socket, said biasing means including a compression spring in said latter bore, and means defining a forwardly facing surface on said latch engageable with the rear end of said spring, said spring being of such length as to be compressed between said forwardly facing latch surface and the forward end of the bore in which it is received.

8. A firearm as defined in claim 3 further characterized by said breech part and said barrel including coengageable threaded portions for threadably connecting said breech part to said barrel, and means for releasably holding said breech part and said barrel part against further relative motion when in their fully assembled condition.

9. A firearm as defined in claim 8 further characterized by said coengageable threaded portions including a forwardly extending externally threaded stem on said breech part and an internally threaded central bore in said barrel.

10. A firearm as defined in claim 9 further characterized by said forwardly extending stem having a forwardly opening bore and said central bore extending the full length of said barrel and having a reduced diameter portion at its forward end defining a radially inwardly extending shoulder, and an ejector rod positioned in said central bore, said ejector rod having a portion extending through said reduced diameter portion of said central barrel bore and beyond the forward end of said barrel and having a radially outwardly extending shoulder engageable with said radially inwardly extending shoulder of said barrel to limit forward displacement of said rod, said ejector rod further having a rear end portion receivable in said bore of said forwardly extending stem of said breech part when said breech part is connected with said barrel, said ejector rod when said breech part is disconnected from said barrel being removable from said central barrel bore and usable as a tool for pushing cartridges from said circumaxially spaced bores.

11. A firearm as defined in claim 8 further characterized by said coengageable threaded portions including an externally threaded portion adjacent the rear end of said barrel and an internally threaded portion extending forwardly from the radially outer margin of said annular portion of said breech part.

12. A firearm as defined in claim 11 further characterized by said barrel including a central bore extending

through the length thereof and a recess in the rear end of said barrel between said central bore and said circumaxially spaced bores, and an extractor slidably received in said central bore, said extractor having a head on its rear end receivable in said recess and engageable with the rims of cartridges positions in said circumaxially spaced bores to move said cartridges from said bores as said head is moved rearwardly from said recess, said head being held in said recess by said breech part when said breech part is fully connected with said barrel and said extractor extending forwardly beyond said barrel so that the forward end thereof may be pushed rearwardly to move said head rearwardly when said breech part is disconnected from said barrel.

13. A firearm as defined in claim 3 further characterized by said barrel including a plurality of vents each communicating with a respective one of said barrel bores and each arranged so as to be directed generally upwardly when the associated barrel bore is in a firing position.

14. A firearm as defined in claim 3 further characterized by said grip assembly including means defining a substantially enclosed chamber for housing parts of said firing mechanism and having an opening in the upper portion thereof, said firing mechanism including a hammer pivotally connected with said chamber defining means for movement between neutral, cocked and firing positions relative thereto and having an upper portion extending from said chamber through and beyond said opening, said upper hammer portion having an opening passing transversely therethrough, and a safety part received in said transverse opening and slidable relative thereto to cause one or the other end thereof to extend beyond the associated side of said upper hammer portion, said chamber defining means on one side of said upper hammer portion being so shaped as not to interfere with said safety part during pivotal movement of said hammer when the adjacent end of said safety part is extended from the associated side of said upper hammer portion and said chamber defining means on the other side of said upper hammer portion being so shaped as to define a recess for receiving the adjacent end of said safety part when it is extended from the associated side of said hammer, said recess being of such shape as to be engageable with said safety part when the adjacent end thereof is received therein to prevent movement of said hammer from its neutral position to its firing position.

15. A firearm as defined in claim 14 further characterized by means defining a plurality of angularly spaced index notches in said barrel assembly, said firing mechanism including a barrel latch movable into and out of an adjacent one of said index notches to releasably hold said barrel assembly in any one of a corresponding plurality of index positions relative to said grip assembly, and means for moving said barrel latch out of the immediately associated index notch in response to movement of said hammer from its neutral position toward its cocked position and for thereafter moving said latch into another notch before said hammer reaches its cocked position, said recess which conditionally receives the adjacent end of said safety part having such a length as to permit said hammer to be moved a limited extent from its neutral position toward its cocked position when the adjacent end of said safety part is received therein, the amount of such permitted movement being such that at the limit thereof said means for moving said barrel latch holds said barrel latch out of said index notches to permit said barrel assembly to be manually rotated to any desired index position.

16. In a firearm the combination comprising separate grip and barrel assemblies, said barrel assembly including an elongated barrel having a plurality of longitudinally extending bores angularly spaced in a series about its central axis and also including a breech part with a disc portion for closing the breech ends of said bores, said breech part disc portion having a plurality of openings therethrough each communicating with a respective one of said bores, said breech part further including a rearwardly extending cylindrical stem having an annular groove adjacent its rear end, said grip assembly including a frame with a cylindrical socket for rotatably receiving said stem and of such a size and shape that at least a portion of said annular groove of said stem is exposed when said stem is positioned as far as possible in said socket, a latch having a finger, means supporting said latch for movement of said finger relative to said frame into and out of said annular stem groove and in a direction longitudinally of said socket, means biasing said latch to urge said finger into said annular stem groove and rearwardly of said socket so as to draw said breech part axially into tight engagement with said grip assembly, a tab on said latch engageable by the thumb or finger of the user to move said latch against the force of said biasing means to remove said latch finger from said stem groove and thereby to release said stem for removal of said barrel assembly from said grip assembly, and a firing mechanism included in said grip assembly and including a firing pin adapted to move forwardly from a cocked position through one of said openings in said breech part into a firing positino whereat it is adapted to fire a cartridge positioned in one of said barrel bores.

17. In a firearm the combination comprising a grip frame and cover defining a grip and a substantially enclosed chamber having an opening in the upper portion thereof, said grip frame and cover each including a forward wall defining forwardly facing coplanar surfaces, said grip frame including a socket opening extending through the forward wall thereof and through a portion of said grip frame located behind said forward wall, a firing mechanism housed at least in part within said substantially enclosed chamber and including a hammer pivotally connected with said grip frame for movement about a transverse axis located below said socket opening for movement between neutral, cocked and firing positions relative to said grip frame and having an upper portion located above said socket opening and extending from said chamber through and beyond said opening therein, said upper hammer portion having an opening passing transversely therethrough, a barrel having a plurality of circumaxially spaced bores extending through the length thereof, a breech part, threaded portions on said breech part and said barrel for threadably connecting said breech part of said barrel, means for releasably holding said breech part and said barrel against threading relative motion when in a fully connected condition, said breech part having an annular portion which closes the breech ends of said barrel bores when said breech part is connected with said barrel and a rearwardly extending stem receivable in said socket opening of said grip frame to rotatably support said breech part and barrel relative to said grip frame, said annular portion of said breech part having a plurality of openings passing therethrough each communicating with a respective one of said barrel bores when said breech part is connected with the barrel and having a rear face including a set of ratchet teeth, said annular breech part further including a series of angularly spaced notches in the rear radially outer edge thereof, said forward wall of said grip frame including an opening passing therethrough and located above said socket opening and said hammer including a forwardly extending firing pin movable through said latter opening and through a given one of said openings in said annular portion of said breech part to fire a cartridge positioned in the associated barrel bore, said rearwardly extending stem on said breech part including an annular groove adjacent its rear end, said stem being of such a size and shape that at least a portion of said annular groove is exposed when said stem is positioned as far as possible in said socket, a latch having a finger, means supporting said latch for movement of said finger relative to said grip frame into and out of said annular stem groove and in a direction longitudinally of said socket opening, means biasing said latch to urge said finger into said annular stem groove

and rearwardly of said socket opening so as to draw said breech part axially to cause said rear face of said breech part to tightly engage said forwardly facing surfaces of said grip frame and cover, a tab on said latch engageable by the thumb or finger of the user to move said latch against the force of said biasing means to remove said latch finger from said stem groove and thereby to release said stem for removal of said barrel and breech part from said grip frame, a safety part received in said transverse opening of said hammer and slidable relative thereto to cause one or the other end thereof to extend beyond the associated side of said upper hammer portion, said grip frame and cover on one side of said upper hammer portion being so shaped as not to interfere with said safety part during pivotal movement of said hammer when the adjacent end of said safety part is extended from the associated side of said upper hammer portion and said grip frame and cover being so shaped as to define a recess for receiving the adjacent end of said safety part when it is extended from the associated side of said hammer and when the hammer is in a given neutral position relative to said grip frame and cover, said recess being of such shape as to be engageable with said safety part when the adjacent end thereof is received therein to prevent movement of said hammer from its neutral position to its firing position, a hand pivotally connected with said hammer and biased toward engagement with said ratchet teeth on said breech part for indexing said breech part and barrel in response to movement of said hammer, a barrel latch pivotally and slidably connected with said grip frame and including a finger releasably engageable with a given one of said notches in said breech part to hold said breech part and barrel in a given angular position relative to said grip frame, said upper portion of said hammer including a hook portion engageable with said barrel latch for operating the same in response to movement of said hammer relative to said grip frame.

18. A firearm as defined in claim **17** further characterized by said recess which conditionally receives the adjacent end of said safety part having such a length as to permit said hammer to move a limited extent from its neutral position toward its cocked position when the adjacent end of said safety part is received therein, the amount of such permitted movement being such that at the limit thereof said hook portion of said hammer holds said barrel latch out of engagement with said notches of said breech part to permit said breech part and barrel to be freely rotated relative to said grip frame.

19. In a firearm the combination comprising a frame, a cartridge receiving part having a number of cartridge receiving bores therein and rotatably mounted to said frame for movement between a number of index positions at each of which a respective one of said cartridge receiving bores is located in a firing position relative to said frame, a hammer carried by said frame and movable relative thereto between a forward firing position and a rearward cocked position, a latch mechanism for releasably holding said cartridge receiving part in a selected one of said index positions, said latch mechanism being movable between a released condition at which said cartridge receiving part is free to rotate relative to said frame and a latched condition at which said cartridge receiving part is prevented from rotating relative to said frame, means for operating said latch mechanism in accordance with the position of said hammer relative to said frame and in such a manner that said latch mechanism is in its latched condition when said hammer is in its firing position and that as said hammer is moved from its firing to its cocked position said latch mechanism is moved from its latched condition to its released condition as the hammer reaches an intermediate position and is held in said released condition over a given range of travel of said hammer rearwardly beyond said intermediate position, and a safety mechanism movable between a safe condition and a firing condition for selectively preventing and permitting firing of said firearm, said safety mechanism including parts which when said safety mechanism is in its safe condition are coengageable to prevent movement of said hammer to its firing position and which parts are so constructed and arranged as to permit placement of said hammer at a position within said given range of travel at which said latch mechanism is in its released condition to free said cartridge receiving part for rotation relative to said frame.

20. In a firearm the combination comprising a frame, a cartridge receiving part having a number of cartridge receiving bores therein and rotatably mounted to said frame for movement between a number of index positions at each of which a respective one of said cartridge receiving bores is located in a firing position relative to said frame, a hammer carried by said frame and movable relative thereto between a forward firing position and a rearward cocked position, a latch mechanism for releasably holding said cartridge receiving part in a selected one of said index positions, said latch mechanism being movable between a released condition at which said cartridge receiving part is free to rotate relative to said frame and at latched condition at which said cartridge receiving part is prevented from rotating relative to said frame, means for operating said latch mechanism in accordance with the position of said hammer relative to said frame and in such a manner that said latch mechanism is in its latched condition when said hammer is in its firing position and that as said hammer is moved from its firing to its cocked position, said latch mechanism is moved from its latched condition to its released condition as the hammer reaches an intermediate position and is held in said released condition over a given range of travel of said hammer rearwardly beyond said intermediate position, and a safety mechanism movable between a safe condition and a firing condition for selectively preventing and permitting firing of said firearm, said safety mechannism including parts which when said safety mechanism is in its safe condition are coengageable to restrict forward movement of said hammer to a forward limit position located between said firring position and said intermediate position and which parts are so constructed and arranged as to permit said hammer to be moved rearwardly from said forward limit position to a position located within said given range of travel throughout which said latch mechanism is in a released condition so that when said safety mechanism is in its safe condition said cartridge receiving part may be released for rotation relative to said frame by moving said hammer rearwardly from said forward limit position.

21. In a firearm the combination comprising a frame, a cartridge receiving part having a number of cartridge receiving bores therein and rotatably mounted to said frame for movement between a number of index positions at each of which a respective one of said cartridge receiving bores is located in a firing position relative to said frame, a hammer carried by said frame and movable relative thereto between a forward firing position and a rearward cocked position, a latch mechanism for releasably holding said cartridge receiving part in a selected one of said index positions, said latch mechanism being movable between a released condition at which said cartridge receiving part is free to rotate relative to said frame and at latched condition at which said cartridge receiving part is prevented from rotating relative to said frame, means for operating said latch mechanism in accordance with the position of said hammer relative to said frame and in such a manner that said latch mechanism is in its latched condition when said hammer is in its firing position and that as said hammer is moved from its firing to its cocked position said latch mechanism is moved from its latched condition to its released condition as the hammer reaches an intermediate position and is held in said released condition over a given range of travel of said hammer rearwardly beyond said intermediate posi-

tion, and a safety mechanism movable between a safe condition and a firing condition for selectively preventing and permitting firing of said firearm, said safety mechanism including parts which when said safety mechanism is in its safe condition are coengageable to restrict the movement of said hammer to a range extending between a forward limit at which said hammer is positioned between said firing position and said intermediate position and a rearward limit located within said given range of travel

throughout which said latch mechanism is in a released condition so that when said safety mechanism is in its safe condition said cartridge receiving part may be released for rotation relative to said frame by moving said hammer to the rearward limit of its restricted movement.

No references cited.

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