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REVOLVER FIRING MECHANISM HAVING A DIE-CAST HAMMER AND TRIGGER WITH STEEL INSERTS EMBEDDED THEREIN

Filed June 4, 1968

FIG. 1

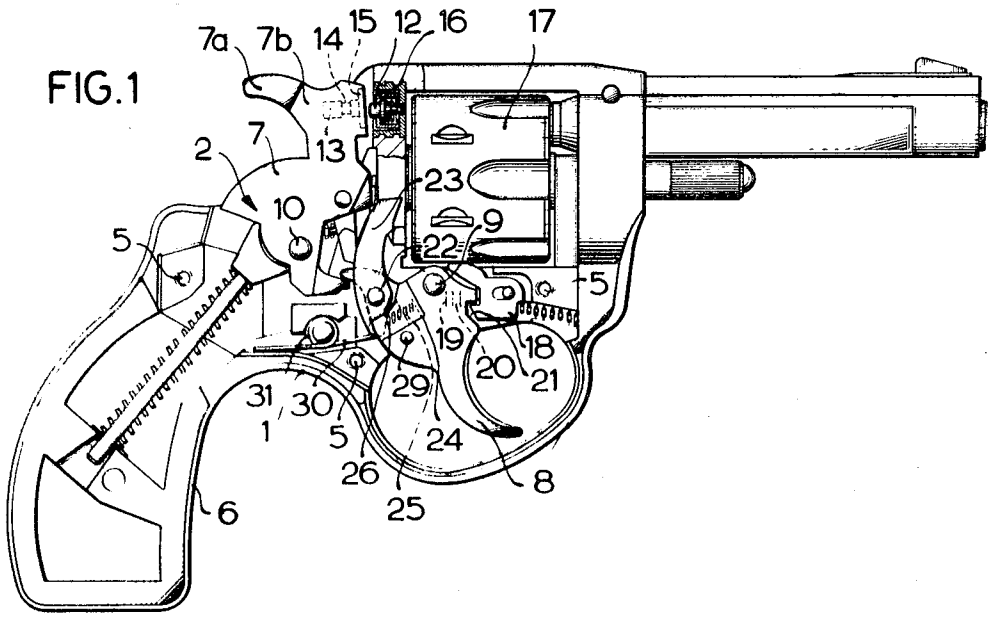


FIG. 2

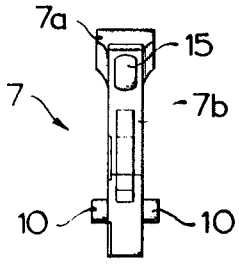


FIG. 3

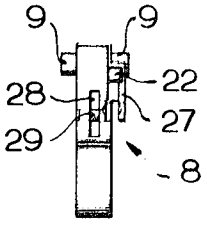
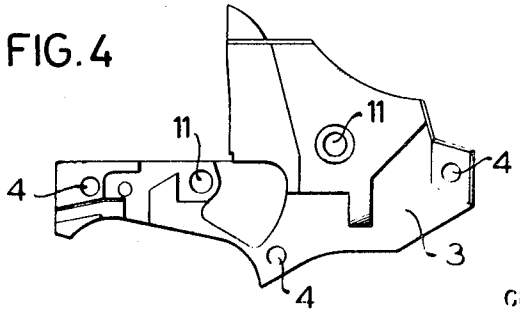


FIG. 4



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REVOLVER FIRING MECHANISM HAVING A DIE-CAST HAMMER AND TRIGGER WITH STEEL INSERTS EMBEDDED THEREIN

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U.S. Cl. 42—65 7 Claims

ABSTRACT OF THE DISCLOSURE

An inexpensive revolver in which the hammer and trigger are made of a die-cast metal and have coaxial pivot studs integrally on both sides for pivotably mounting them in socket holes in one side wall of a housing part of the frame and in a removable cover plate which closes the opposite open side of the housing part. Certain parts of the hammer and trigger are reinforced by steel inserts which are embedded therein by the casting process.

The present invention relates to improvements in a revolver which has a frame, a part of which forms a housing which encloses the lock mechanism and is open at one lateral side which is normally closed by a removable cover plate.

The revolvers of this known type of construction have the advantage that, when the cover plate is removed, the individual parts of the lock mechanism are easily accessible and may be easily removed or reassembled and also easily serviced from one side of the revolver. Such revolvers as were previously designed have, however, the disadvantage that, since the hammer and trigger are pivotable on stay bolts, that is, on pins which are secured to and project only from the inner side of the housing part which is integral with the frame, the hammer and trigger are supported only on one side and therefore exert excessive stresses upon these pivot pins. These stresses result in considerable wear upon these pins and the parts mounted thereon and also affect other parts of the lock mechanism.

It is an object of the present invention to provide a revolver of the type as first described above which may be manufactured more easily and at a considerably lower cost than similar revolvers of previous designs.

It is another object of the invention is to provide a new method of producing certain elements of such a revolver and particularly the hammer and trigger thereof at a low cost, even though these elements may be of an intricate shape.

A further object of the invention consists in designing the bearing means of the hammer and trigger of such a revolver so as to insure that these elements are equally and properly supported at both sides thereof.

For attaining these objects, the present invention provides that the hammer and trigger of the revolver are die-cast of a suitable metal and that each of them is provided at both sides thereof with coaxial pivot studs which are cast integrally with the hammer and trigger and are pivotable in socket holes which are provided in the inner sides of the housing part of the frame and of the cover plate which is removably secured to this housing part.

Because of the stresses which occur in the operation of a revolver and especially of the hammer and trigger thereof, it has in the past always been considered necessary to make these parts of steel, even though the manufacture of such steel parts is generally rather expensive.

Such steel parts must also be made of a relatively simple shape since their manufacture would otherwise be too uneconomical. A manufacture of steel hammers and triggers which is still reasonably economical is possible only if these parts are essentially plate-shaped and not provided with lateral projects. This also requires the hammer and trigger to be pivotably mounted in the manner as previously described, namely, on stay bolts which project from the fixed housing part of the frame, since the hammer and trigger then only need to be provided with simple bores to serve as bearing holes. This manner of mounting the hammer and trigger, of course, means that they are properly supported only on one side.

According to the invention, it has now been found that a hammer and trigger of a revolver are also capable of withstanding all stresses if they are made by injection die-casting, especially if certain parts thereof which are subjected to very severe stresses are reinforced by hard-metal inserts which are securely embedded therein when being cast. It is another advantageous feature of the invention that such die-cast hammers and triggers may easily be made of any desired shapes and that they may also be cast so as to have coaxial pivot studs integrally on both sides to permit them to be properly supported and pivotable in socket holes in the fixed housing part of the frame and in the removable cover plate.

By being die-cast, the hammer of the revolver may now also be provided without increase in cost with a thumb piece of any desired width greater than the thickness of the plate-shaped main body of the hammer. The hammer may therefore be cocked more easily than the steel hammers of previous revolvers.

For reinforcing the part of the hammer opposite to the firing pin, it is advisable to embed therein a steel pin which is adapted to take up the severe impacts to which the hammer is subjected when striking the firing pin. For anchoring this steel pin securely in the hammer, it is preferably provided with a recess into which the material of the hammer engages when the latter is being cast. For properly guiding the firing pin in the associated part of the revolver frame, it is further advisable to insert the firing pin into a steel bushing which is rigidly mounted in the frame and in which the firing pin is slidable. When employing such a steel bushing, it is a further feature of the invention to provide the reinforcing steel pin which is embedded in the hammer with a plate-shaped enlargement on its end facing the firing pin. This plate should have an outer diameter substantially as large as the rear end of the steel bushing so that, if the hammer strikes the firing pin when there is no cartridge in the respective cylinder chamber, this plate on the steel-pin insert of the hammer rather than the softer die-cast material of this hammer itself will hit first against the firing pin and then against the steel bushing and will thus prevent the hammer from being damaged. By hitting upon the steel bushing, it will also prevent the firing pin from being driven up to the cylinder itself and which might cause damage to the cylinder or interfere with the cylinder movement.

Another feature of the invention consists in also providing the trigger with one or more steel inserts at points which are subjected to very high stresses. Thus, for example, it may be advisable to reinforce the part of the trigger which is adapted to interengage with the cylinder-stop pawl by means of a steel pin which is embedded in the trigger when the latter is being die-cast. Like the steel pin in the hammer, it may also be provided with a recess for embedding it more securely in the hammer material. The part of this steel pin facing the stop pawl may then be milled off to provide a steel bearing surface for the stop pawl.

By making the trigger of a die-cast material, it is also

possible to provide a very suitable arrangement of the cylinder feed lever. Accordingly, it is another feature of the invention to mold the trigger in the form of a plate which has integrally on one lateral side thereof an additional pivot stud on which the feed lever is pivotably mounted. Underneath this additional pivot stud the trigger is provided with a projection which forms a pocket for holding a coil spring which acts upon the feed lever. The projection on the trigger preferably has integrally thereon a tab which projects over the pocket, serves as a lateral guide for the feed lever, and prevents the coil spring from sliding off the feed lever.

In order to prevent the trigger from being worn by the trigger spring which conventionally consists of a torsion coil spring, the invention further provides the trigger with a slot which is open in the direction toward the revolver grip, and with a steel pin which extends transversely through the slot and forms a bearing surface for one arm of the trigger spring.

The features and advantages of the present invention will become further apparent from the following detailed description thereof which is to be read with reference to the accompanying drawings, in which—

FIG. 1 shows, partly in section, a side view of a revolver according to the invention from which the lock and grip cover plates are removed;

FIG. 2 shows a front end view of the hammer, as seen from the right side of FIG. 1;

FIG. 3 shows a rear end view of the trigger, as seen from the left side of FIG. 1; and

FIG. 4 shows an elevation of the lock cover plate of the revolver frame, as seen from the inner side thereof.

Referring to the drawing, there is shown, in brief, an inexpensive revolver having a hammer and trigger that are made of a die-cast metal. The hammer and trigger are pivotally mounted on coaxial pivot studs in socket holes that are provided on one side wall of the frame and on the removable cover plate. Parts of the hammer and trigger are reinforced by steel inserts which are embedded therein by a casting process.

In FIG. 1, the revolver according to the invention comprises a frame which has a housing part **1** which encloses the lock mechanism **2** and forms the grip **6**. One lateral side of the housing part **1** shown in FIG. 1 is closed and preferably made integral with the frame. The opposite lateral side is open and is adapted to be closed by a removable cover plate **3**, the inner side of which is shown in FIG. 4, and by a removable grip cover plate, not shown. With the cover plates removed, the individual parts of the lock mechanism **2** are easily accessible for service and maintenance thereof. The lock cover plate **3** is secured to the housing part **1** by screws, not shown, which are inserted into bores **4** in cover plate **3** and are screwed into tapped bores **5** in the housing part **1**.

In the operation of a revolver, high stresses are developed on various parts thereof and especially on the hammer **7** and trigger **8**. The hammer **7** and the trigger **8**, as illustrated in FIGS. 2 and 3, respectively, are made by injection die-casting of a suitable metal. According to the invention, the hammer **7** and trigger **8** constructed in accordance with a die-casting process is capable of withstanding all of the normal operating stresses. For pivotably mounting the trigger **8** and hammer **7** on the housing part **1** and the cover plate **3**, each of them is provided with a pair of coaxial pivot studs **9** and **10**, respectively, which project from the opposite sides of the hammer **7** and trigger **8** and are cast integrally with them. These pivot studs **9** and **10** engage into opposite socket holes **11** which serve as bearings in the inner sides of frame **1** and cover plate **3**. If necessary, these socket holes **11**, of which only those in the cover plate **3** are shown in FIG. 4, may be provided with bushings.

By virtue of utilizing the die-cast process for the revolver parts, the thumb piece **7***a* may be easily made of any desired width greater than the thickness of the plate-shaped main body **7***b* of the hammer **7**. Thus, the hammer **7** may be cocked more easily than steel-type hammers of previous manufactured revolvers.

This increase in width facilitates the cocking of the hammer **7**. This is important as the firing rate of the revolver may be increased by decreasing the time consumed in moving the hammer to the set cock position by the thumb of the user.

The hammer **7** and trigger **8** of a revolver, according to the invention, are reinforced by hard-metal inserts which are securely embedded therein during the die-casting process.

A hard-metal insert such as steel pin **13** is provided at the side of the hammer **7** opposite to the firing pin **12**. This steel pin **13**, which is indicated in FIG. 1 in dotted lines and includes a recess **14**, is firmly embedded in the die-cast material of the hammer **7** which engages into and fills out the recess **14**. On its front end, the steel pin **13** has a plate-shaped enlargement **15** which overlaps the outer edge of a steel bushing **16** which is inserted into the frame and in which the firing pin **12** is guided. If the trigger **8** is pulled and the hammer **7** is released and propelled forwardly when no cartridge is contained in the respective chamber of cylinder **17**, the steel plate **15** after striking the firing pin **12** will hit against the steel bushing **16** and thereby prevent the firing pin **12** from being driven up to the cylinder **17**. A cylinder stop pawl **18** is another operative element of the revolver which moves in response to the movements of the hammer **7** and the trigger **8**. The stop pawl **18** normally holds the cylinder **17** in properly aligned position between the hammer **7** and the barrel of the revolver. The particular function and operation of a cylinder stop member such as the cylinder stop pawl **18** is well known in the art. For example, attention is directed to the description of the cylinder stop **72** in columns 6 and 7 of the U.S. Pat. 3,245,167 to G. H. Freed.

Adjacent to the point of engagement **21** with the cylinder stop pawl **18**, trigger **8** is likewise reinforced against the high stresses developed therein by another hard-metal insert such as steel pin **19** which also has a recess **20** and is firmly embedded in the material of the trigger **8** when the latter is die cast. One side of the steel pin **19** is milled off to form a bearing surface for the tooth of pawl **18**.

A cylindrical feed pawl **23** is another operative element of the revolver which moves in response to the movements of the hammer **7** and the trigger **8**. The feed pawl **23** is pivotally pinned, at pivot stud **22**, to trigger **8** and operates in response to trigger movements to rotate the cylinder **17** whereby a new cartridge comes into alignment with the hammer **7** and the barrel of the revolver each time the weapon is fired. The particular function and operation of a feed lever such as feed pawl **23** is well known in the art. For example, attention is directed to the description of the hand member **68** in column 6 of the above mentioned Pat. 3,245,167.

By making the trigger **8** of a die-cast material, it is also possible to provide a suitable arrangement of the cylinder feed pawl **23**. Accordingly, when die-casting the trigger **8**, it is also provided at its front side, as seen in FIG. 1, with the pivot stud **22** on which the cylinder feed pawl **23** is mounted, and underneath this stud with a projection **24** which forms a pocket **25** containing the spring **26** which acts upon the cylinder feed pawl **23**. As shown in FIG. 3, the projection **24** carries a tab **27** which projects over the pocket **25** and serves as a lateral guide of pawl **23** and prevents the spring **26** from sliding off the pawl **23**.

The trigger **8** is further provided with a slot **28** which is open at the side facing the grip **6**, and with a steel pin **29** which extends transversely through the slot **28** and forms the support of one arm **30** of a torsion coil spring **31** which forms the trigger spring. This construction prevents the trigger **8** from being worn by the trigger spring which conventionally consists merely of a torsion coil spring.

Having thus fully disclosed my invention, what I claim is:

1. In a revolver having a frame, a cylinder having chambers rotatably mounted on said frame, a firing pin slidably guided in said frame, said frame having a housing part with an opening at one lateral side thereof, a cover plate removably secured to said housing part to close said opening, and a lock mechanism comprising a hammer and a trigger pivotably mounted in said housing part, a feed lever pivotably mounted on said trigger in said housing part for turning said cylinder from one firing position to another, a stop pawl adapted to engage with said cylinder for locking the same in each of said firing positions, and interengageable catch parts on said trigger and said stop pawl for pivoting said stop pawl so as to disengage the same from said cylinder during the first part of the pivoting movement of said trigger when pulled, the improvement according to which said hammer and said trigger consist of metal die-castings each having coaxial pivot studs integral with both sides thereof, at least one of said die-castings when being cast having at least one steel insert embedded therein, and the inner sides of said housing part and said cover plate having coaxial socket holes for receiving said pivot studs so that said hammer and trigger are pivotably mounted at both sides thereof.

2. A revolver as defined in claim 1, in which said steel insert is embedded in said trigger in a position so as to reinforce said catch part of said trigger, said steel insert having an end portion milled off so as to form a steel bearing surface for said catch part of said stop pawl.

3. A revolver as defined in claim 1, in which said trigger has a slot-shaped recess, and further comprising a steel pin mounted in said trigger and extending transversely through said recess, and a trigger spring in the form of a torsion coil spring in said housing part and having one arm connected to said housing part and another arm extending into said recess and bearing on said steel pin.

4. A revolver as defined in claim 1, in which said trigger has a further pivot stud integral therewith and projecting from one side thereof and parallel with said coaxial pivot studs of said trigger, said feed lever being pivotably mounted on said further pivot stud, said trigger having a projection forming a pocket underneath said further pivot stud, a coil spring in said pocket and acting upon said feed lever and a tab integral with said trigger and projecting from said projection over said pocket for guiding said feed lever.

5. A revolver as defined in claim 1, in which said steel insert consists of a steel pin embedded in said hammer in a position opposite to said firing pin.

6. A revolver as defined in claim 5, in which said steel pin has a recess filled out by the die-cast material of said hammer.

7. A revolver as defined in claim 5, further comprising a steel bushing embedded in said frame, said firing pin being slidably guided in said bushing, said steel pin having a plate-shaped enlargement on its front end having a size substantially equal to the outer diameter of said bushing and adapted first to hit against said firing pin and then against said bushing.

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