

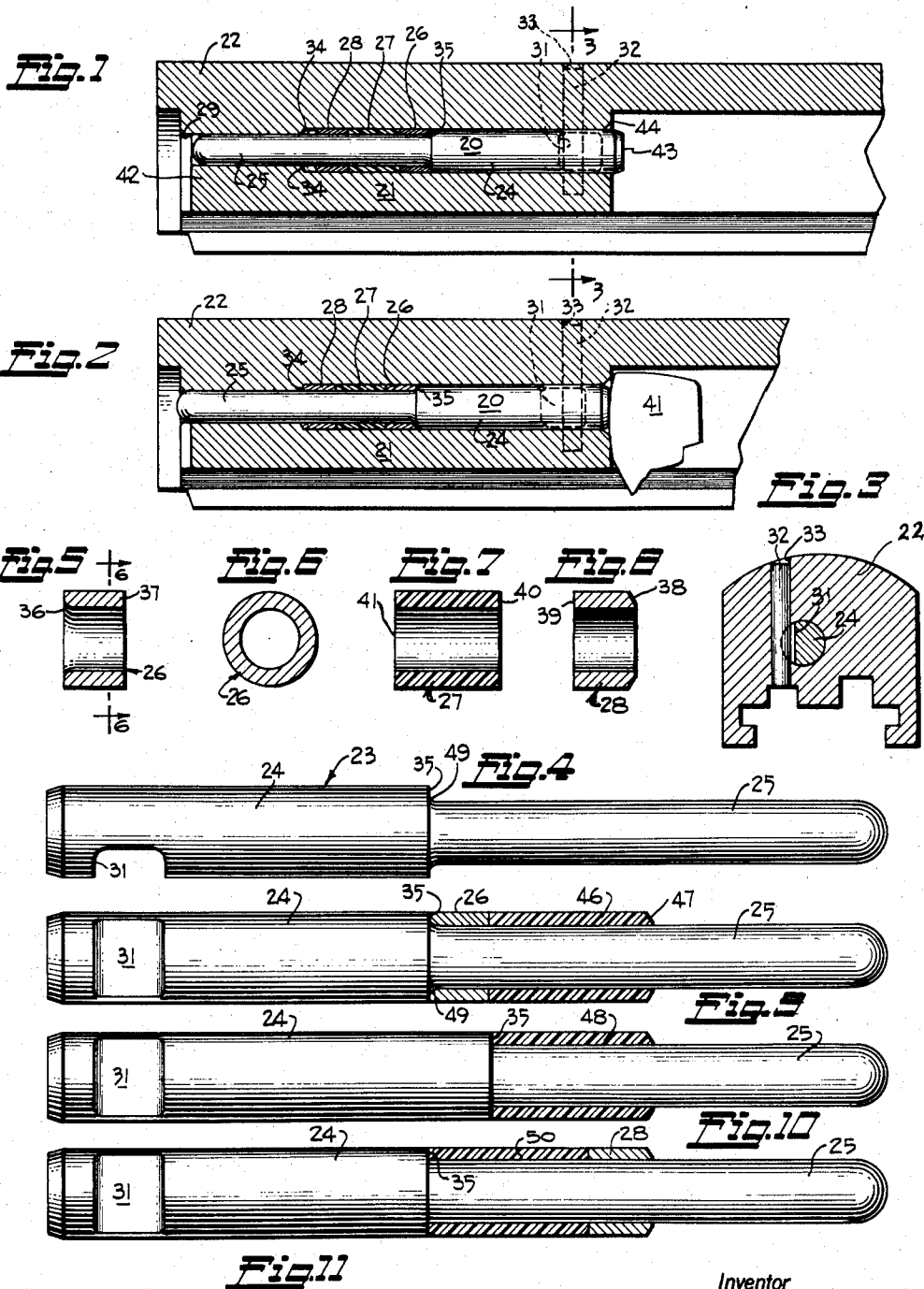
July 15, 1958

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2,842,885

FIRING PIN WITH PLASTIC SLEEVE FOR FIREARMS

Filed July 27, 1954



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FIRING PIN WITH PLASTIC SLEEVE FOR FIREARMS

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Application July 27, 1954, Serial No. 446,053

1 Claim. (Cl. 42—69)

This invention relates to firing pins for firearms, and more particularly to a firing pin assembly cushioned against shock, whereby to minimize breakage and lengthen the life of the pin.

It is common practice, particularly in the automatic pistol field, to mount the firing pin in a housing in which it is freely reciprocable longitudinally, within limits, such housing in the case of an automatic pistol being the slide, of course. In other types of firearms this housing will be a bolt or breech block, as the case may be, depending on the particular type of gun. The firing pin itself is generally of unitary construction and comprises a body portion and a reduced diameter portion, the forward end of which is adapted to strike the primer of a cartridge to fire the round. A stop is provided within the pin housing to contact the pin shoulder, formed at the junction of its body portion and reduced diameter portion, to prevent excessive forward motion of the pin during firing. The body portion of the pin is usually notched or partially cut away to accommodate a detent or retaining pin adapted to hold the firing pin within the housing and limit its maximum rearward longitudinal movement.

When the pistol is fired, the hammer will strike the rear end of the body portion of the pin, and will drive the pin forward until its shoulder strikes the pin stop. The shock of this contact, which is especially acute if the trigger is pulled when there is no cartridge in the gun chamber, will in many cases cause the pin to break after repeated use. This may occur either at the cut-away portion of the pin or along its reduced section. It has been proposed in the past to cushion this shock by interposing a spring between the pin shoulder and the stop, but due to space limitations within the slide or other pin housing as the case may be, it has been found impracticable in most cases to place therein a spring of sufficient strength to be effective or which is itself sufficiently free from liability to breakage.

It is accordingly an object of this invention to provide a firing pin embodying cushioning means for effectively reducing the shock when the pin shoulder is driven against the pin stop, thereby to increase the life of the pin. It is a further object to provide such cushioning means which is also effective for supporting the reduced diameter portion of the firing pin, while permitting free, sliding movement of the pin in its housing.

It has been found that the foregoing objects may be attained by lengthening the reduced diameter portion of the pin, and fitting a sleeve of nylon, Saran, or other tough plastic over the reduced diameter portion. Such a sleeve may be used alone or in conjunction with a cooperating metal sleeve or sleeves designed to take the wear off the plastic sleeve directly. Now, when the pistol is fired, the plastic sleeve will be effectively interposed between the pin shoulder and the stop, and will take up sufficient of the shock to greatly reduce breakage. In fact, it has been found in a series of tests, that by use of the plastic sleeve, breakage of the pin

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is materially reduced and it is believed in fact that the life of the pin is thus substantially doubled.

In order that those skilled in the art may be more fully advised of the nature of the invention and of a means for carrying it out, it will be more fully described in connection with the accompanying drawings in which:

Fig. 1 is a cross-sectional view in elevation of a portion of an automatic pistol slide incorporating the new firing pin assembly, the pin being shown in withdrawn position, said assembly being the presently preferred embodiment of the invention in which a plastic sleeve is interposed between two metal sleeves on the reduced portion of the firing pin;

Fig. 2 is a cross-sectional view similar to that of Fig. 1 showing the firing pin in firing position to which it has been advanced by the hammer;

Fig. 3 is a cross-sectional view of the pistol slide and firing pin as it would appear when viewed along line 3—3 of Fig. 1;

Fig. 4 is a plan view on a greatly enlarged scale of the firing pin member alone;

Fig. 5 is a cross-sectional view of the inner or rear metal sleeve of the assembly shown in Figs. 1 and 2;

Fig. 6 is a cross-sectional view taken along line 6—6 of Fig. 5;

Fig. 7 is a cross-sectional view of the intermediate or plastic sleeve shown in Figs. 1 and 2;

Fig. 8 is a cross-sectional view of the outer or front metal sleeve in the aforesaid assembly; and

Figs. 9, 10, and 11 are cross-sectional views of alternative forms of the new firing pin assembly, the pins in these views being rotated 90° about their longitudinal axis from the position shown in Fig. 4.

Referring to the embodiment of the invention shown in Figs. 1 through 8, the firing pin assembly, indicated generally at 20, is carried in the breech block portion 21 formed integrally in the slide 22 of an automatic pistol. Assembly 20 comprises a shouldered pin 23 having a main body portion 24 and a projecting portion of reduced diameter forming a nose 25 upon which cylindrical sleeves 26, 27 and 28 are carried. The firing pin assembly 20 is disposed in a bore 29, within which the forward end of nose 25 of pin 23 makes a sliding fit, and a counterbore 30 within which the body 24 of the pin likewise makes a sliding fit. In order to retain the firing pin assembly within the breech block 21, the pin is partially cut away in its main body 24 to provide an elongated channel or notch 31, and a detent or retaining pin 32 carried in a vertical hole 33 of slide 22 intersects counterbore 30 adjacent notch 31 so that longitudinal movement of the pin is limited by engagement of the shoulders of the notch against the retaining pin. This retaining pin serves only to prevent the firing pin assembly from falling out of the rear of the breech block 21 and is not the means by which the forward movement of the pin is normally intended to be limited in firing the gun.

As shown in Figs. 1 and 2, a rearwardly facing beveled stop 34 is formed in breech block 21 at the junction of bore 29 and counterbore 30. The firing pin 23, in turn, has a shoulder 35 which provides a forwardly facing stop at the junction of its nose portion 25 and main body portion 24. The aforesaid sleeves 26, 27 and 28 are disposed on the nose portion 25 of pin 23 intermediate the stops. These sleeves engage the nose portion 25 with a light frictional contact, each sleeve having an outside diameter substantially equal to that of the body 24 of pin 23. The rear sleeve 26, illustrated more particularly in Figs. 5 and 6, is made of steel, its rear face 36 being rounded to conform to the contour of the forward face of shoulder 35 while its forward face 37 is squared.

Sleeve 28 is also made of steel and has a beveled forward face 38 adapted to engage stop 34 of the breech block 21 when the firing pin is driven forwardly by hammer 41 of the pistol, as well as a squared rear face 39. Sandwiched between these steel sleeves is a sleeve 27 of nylon, Saran or other similar tough resilient plastic or plastic-like material. Both the fore and aft faces 40, 41, respectively, of this sleeve are squared so as to abut firmly against their respectively mating surfaces 39, 37 of sleeves 28 and 26. The firing pin 23 is freely slidable between a retracted or retired position in the breech block 21 as shown in Fig. 1, and a firing position, as seen in Fig. 2. In the retired position of the pin, the tip of the nose portion 25 is behind the forward face 42 of the breech block 21 while the rear end 43 of the pin projects outwardly beyond the rear face 44 of the breech block. In the firing position, the hammer 41 drives the pin forward to cause its nose to project beyond the face 42 and strike the primer (not shown) of a shell chambered in the gun.

When the pistol is fired, the hammer strikes the rear end 43 of the firing pin 23 and forces it forward until the forward face 41 of sleeve 28 contacts the stop 34 in breech block 21. Since a very substantial force must be applied to the firing pin in order to insure against misfires, there is considerable shock incurred when the forward motion is suddenly terminated. This shock often causes breakage in the conventional firing pins after the gun has been used for some time. When the composite firing pin of the type just described is used, however, the plastic sleeve takes up a substantial portion of this shock and dampens vibration, thus greatly minimizing the occurrence of breakage.

Other modifications of the novel firing pin assembly are illustrated in Figs. 9 through 11. These modifications omit one or more of the metal sleeves used in the preferred embodiment of the invention described hereinabove. In the construction shown in Fig. 9, for example, the forward sleeve 28 has been dispensed with and the short plastic sleeve 27 replaced by a longer sleeve 46 having a beveled front face 47 adapted to engage stop 34. While this form of assembly is less expensive than the 3-sleeve assembly previously disclosed, continuous pounding of the front face 47 against the beveled stop 34 may tend to deform the plastic material slightly and cause sticking of the firing pin in the breech block. If this occurs, however, sleeve 46 is easily and economically replaceable.

In the embodiment illustrated in Fig. 10, the inner and outer metal sleeves 26 and 28 have been eliminated and have been replaced by a single plastic sleeve 48. In order to eliminate the inner metal sleeve 26, however, it is necessary to machine the firing pin 23 to eliminate the small fillet 49 by which the nose 25 is faired into body 24 in the construction shown in Fig. 4. Such a fillet has a tendency to ride under and expand the material of the sleeve, rapidly disrupting the sleeve causing the firing pin to stick in the breech block. It has been found that the cost of machining an accurately squared face on this shoulder may approximate the cost of a separate metal

sleeve such as the sleeve 26 whose squared face 37 is easily formed by a cut-off operation so that this particular embodiment of the invention is somewhat less preferable than that previously described.

There is also shown in Fig. 11 a further combination in which a plastic sleeve 50 and a single metal sleeve 28 are employed. While this form of the invention eliminates the deformation of the outer end of the plastic sleeve arising from impact against stop 34, it is subject to the same difficulty as that shown in the pin of Fig. 10 with regard to the necessity for providing for a squared shoulder 35 on the firing pin. Because of the comparative smallness of a firing pin of this type, especially in .22 calibre guns where the pin may conventionally be only from an inch and one-quarter to an inch and three-quarters long and have a maximum body diameter of less than one-eighth of an inch in its reduced nose portion, it becomes somewhat difficult to machine the shoulder without leaving the small radius or fillet 49 at the junction of the nose and body portions. However, it may be that an improved method of fabrication will be discovered whereby such fillet can easily be eliminated, in which case the constructions shown in Figs. 10 and 11 may then be preferred since they will then be less expensive to manufacture than the type shown in Figs. 1 and 2.

What is claimed is:

In a firearm, the combination comprising a breech block having a passage therein, a firing pin slidably mounted in said passage for limited longitudinal movement therein, said firing pin having a body portion fitting a first section of said passage and a reduced diameter nose portion extending from said body portion and fitting within a second section of said passage of correspondingly reduced diameter, a stop shoulder being formed between said sections of said passage and an oppositely facing shoulder being formed on said firing pin by the juncture of said body and nose portions, said shoulders being positioned relative to each other to limit the forward travel of said firing pin; and a sleeve of tough, resilient, plastic material having properties similar to nylon, said sleeve fitting closely on said nose portion along a part of its extent adjacent the firing pin shoulder to provide a cushion between said shoulders, the outside diameter of said sleeve being essentially the same as that of said body portion so that said sleeve swells into integral engagement with the wall of the first section of said passage when it is compressed between said shoulders upon actuation of the firing mechanism of said firearm.

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