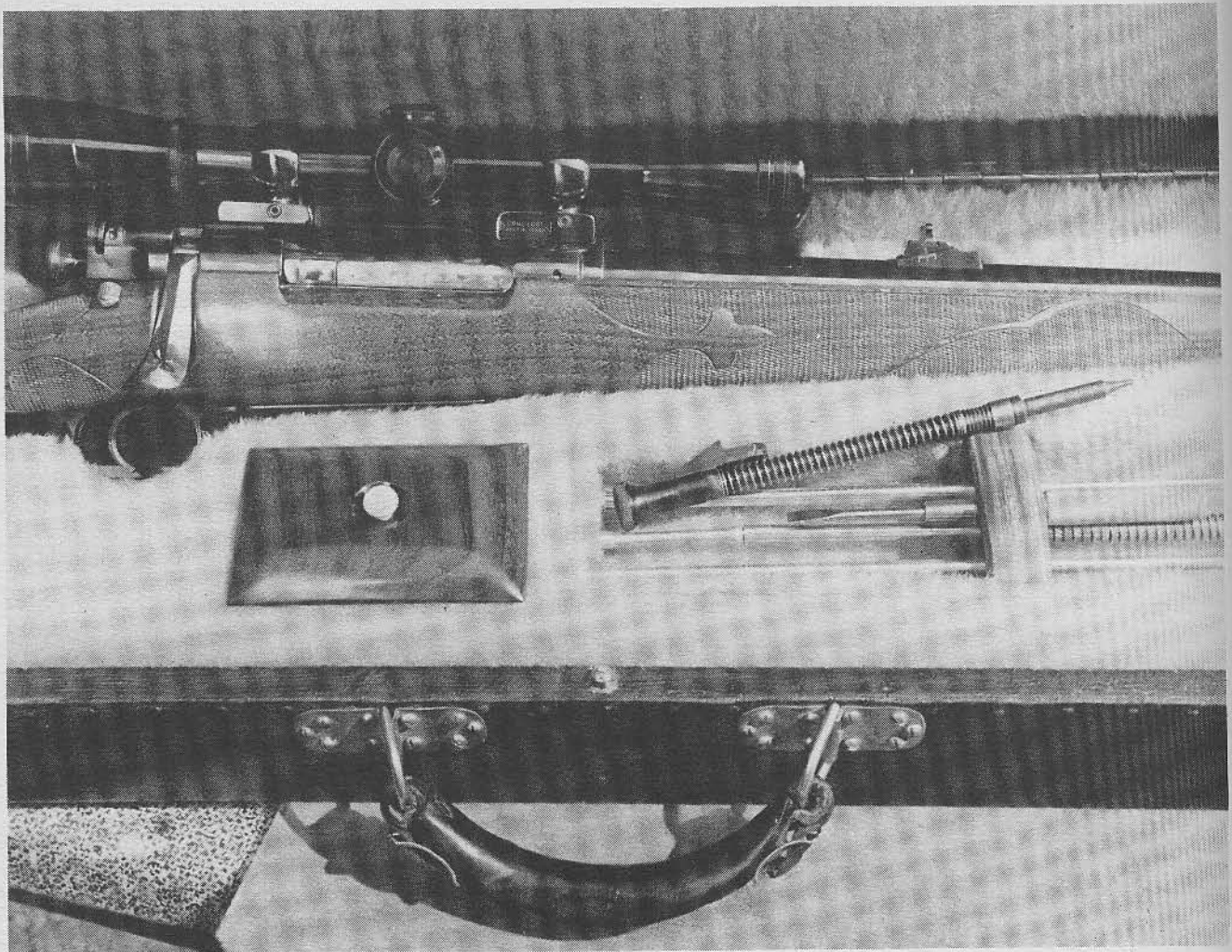


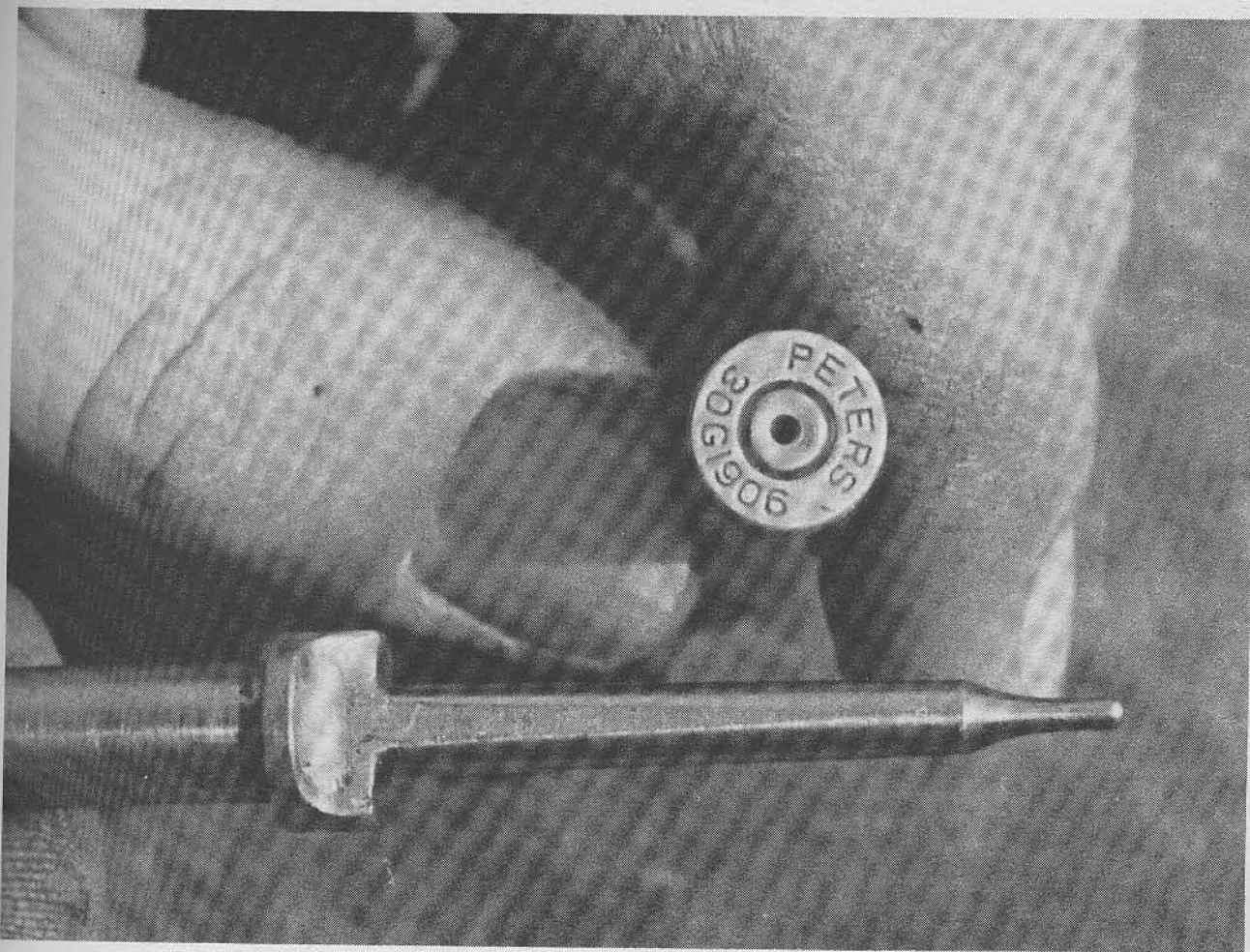
Chapter 20

ANATOMY OF A FIRING PIN

This Bit Of Metal Is The Heart Of Any Firearm

In spite of all the care that went into customizing this rifle, if the firing pin isn't adequately designed to do its job, the whole project can be considered a failure. The author expresses his thoughts, recommendations here.





This photo has been blown up to several times the actual size of the subjects so we can see that the modern Mauser firing pin proved a fraction too long. It pierced primer completely, was shortened to right length to correct.

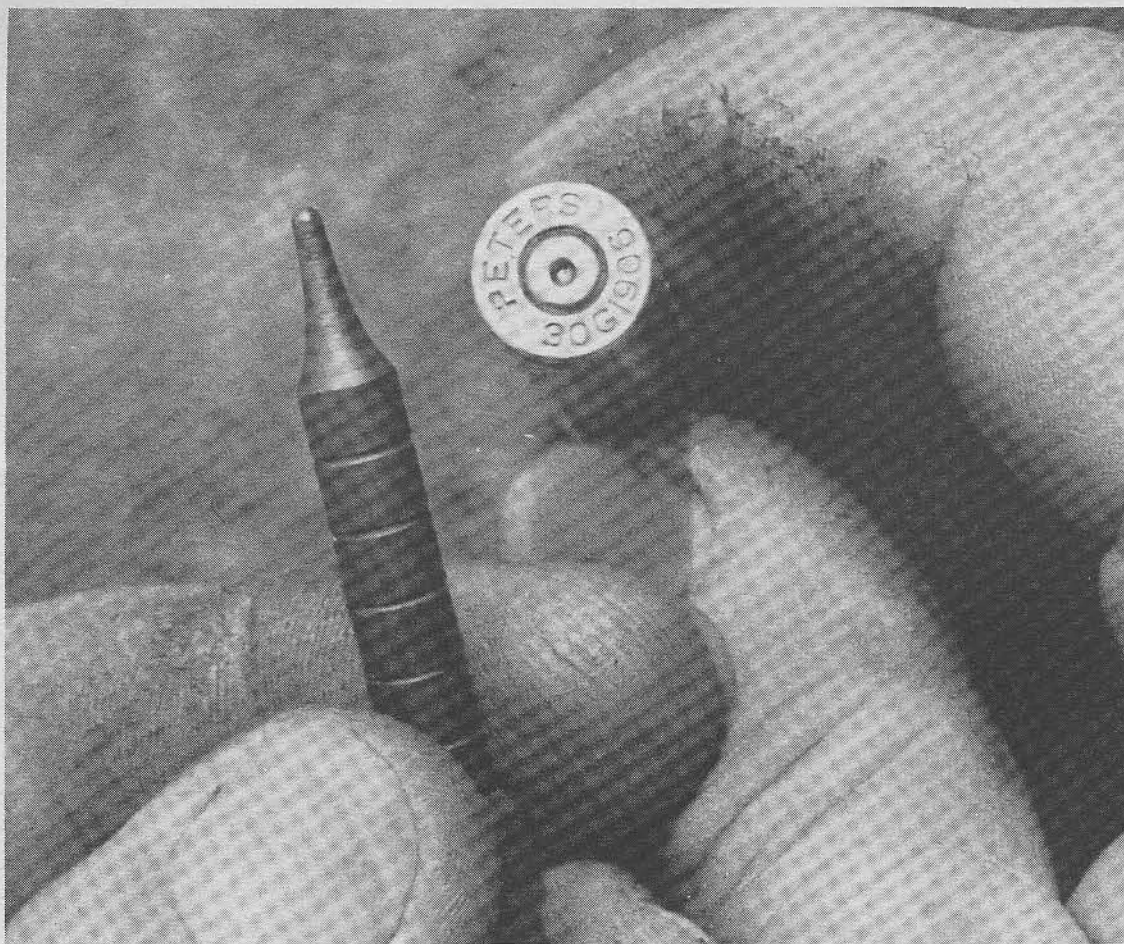
THERE ARE few knowledgeable men in the world of gunology who won't agree that the firing pin can be classed as the heart of any firearm, whether rifle, pistol or shotgun. The quality, the amount of engraving gracing the piece, or the quality of inlays, don't enhance the gun's use factor, if it won't fire!

Encased within the bolt, breech block or frame housing of every sporting firearm is that often tiny piece of metal. Should this component become broken, misshaped, shortened, dulled or malformed for any reason, the gun will fire spasmodically or not at all.

Over the years, I have repaired or replaced a multitude of firing pins that I would class as being of the Rube Goldberg

variety in all types of sporting handguns and shoulder weapons. In most cases, the owners of said guns had attempted either to shorten or sharpen a factory-fitted and installed firing pin simply because they thought "it wasn't right." The result was that the guns wouldn't fire at all or only on occasion. Some were of the opinion that they had purchased faulty ammunition, ignoring their own errant craftsmanship. The ammunition had to be the cause of the trouble!

Too, there have been many cases where the original firing pin had crystallized and broken, necessitating installation of a replacement. However, due to the lack of a ready source of supply or the fact that the gun owner felt that he could make a firing pin himself, he — as a rule — obtained



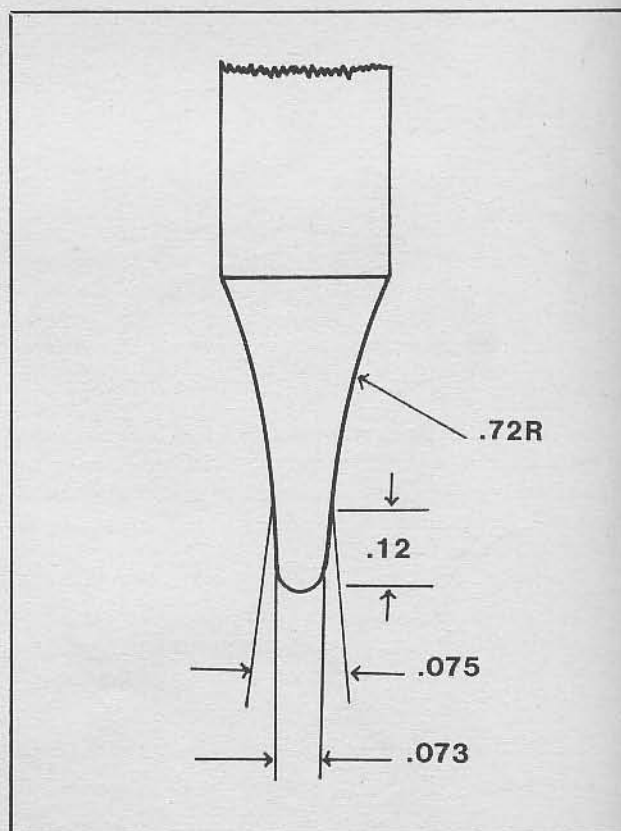
A firing pin — proper in contour, length and polished on the point correctly — should leave a perfect burnished indentation in the primer, as is illustrated in this case. (Right) This is Bish's concept of what he considers the most popularly accepted firing pin point radius for all center-fire cartridges. The drawing is not to exact scale.

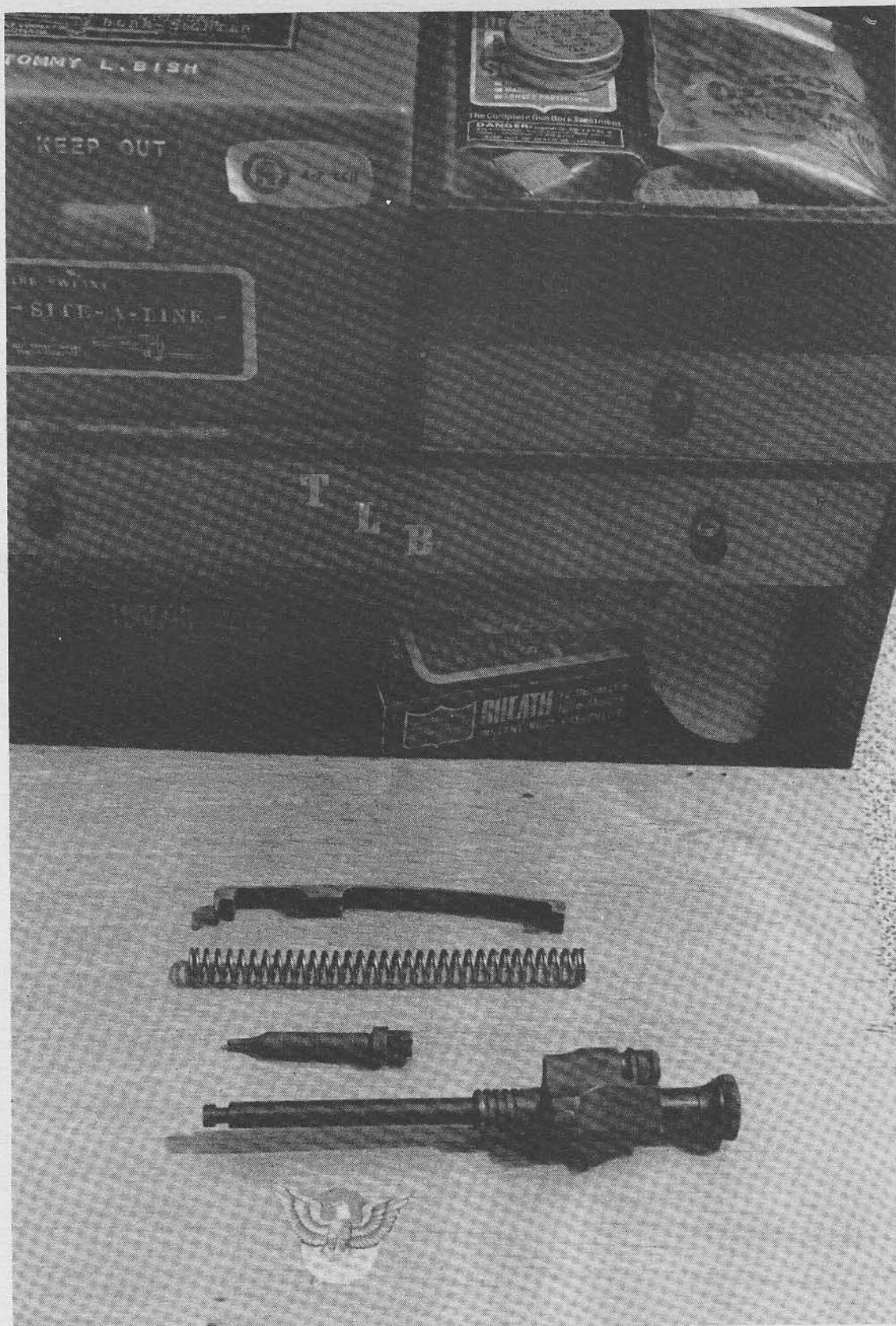
a common nail or piece of cold-rolled steel and whittled out the needed part. The end result was that on rare occasions the cobbled-out pin might have lasted for years, but more often the newly made component wasn't capable of firing more than one round before it was pounded out of shape.

Contrary to what some may think, the firing pin of any well-built gun is a highly engineered part. Its overall length, the degree of angle and shape of its nose are all important to the proper and instant detonation of the cartridge primer. The steel from which the firing pin is made and its degree of temper will determine its efficiency. Should it be too short, too long, too dull or too pointed, then troubles are certain to be experienced sooner or later.

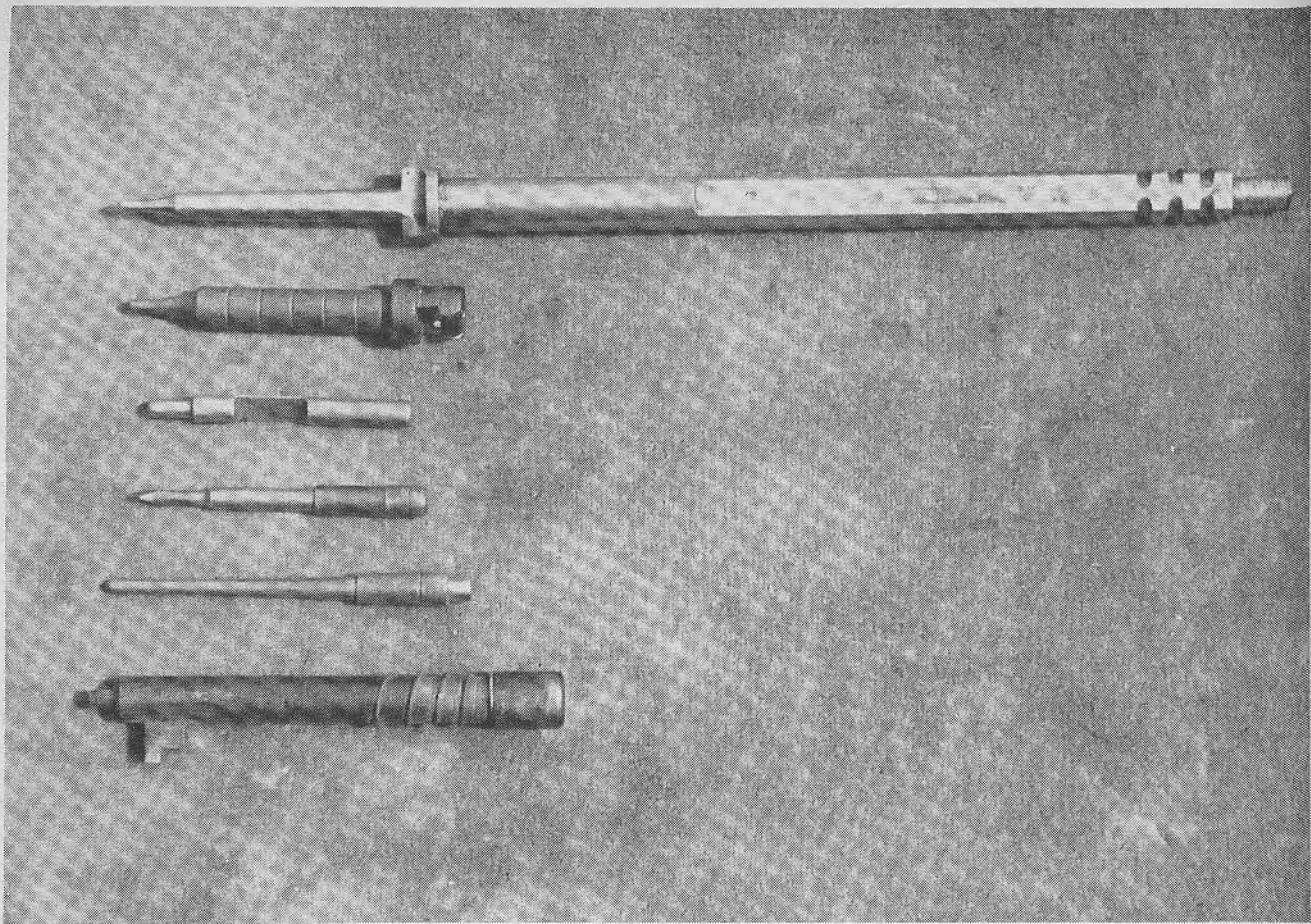
Quite naturally, the radius and profile of a firing pin for a rimfire cartridge differs greatly from that for a center-fire round.

In the center-fire version, there is what is known in the trade as radius-to-caliber, when it comes to forming the nose or point of a firing pin to ensure the proper detonation of the primer. Should this radius be too blunt, misfires will





When he goes into the field for game, Bish has a kit close at hand that will allow him to replace or to make instant repairs to firing pins or other broken gun parts. This practice can save many hunts.



This collection comprises a variety of round and flat firing pins for the .22 rimfire cartridge, as well as those for the big bore center-fire rifles that include the Mauser and the 1903 Springfield. Note design differences.

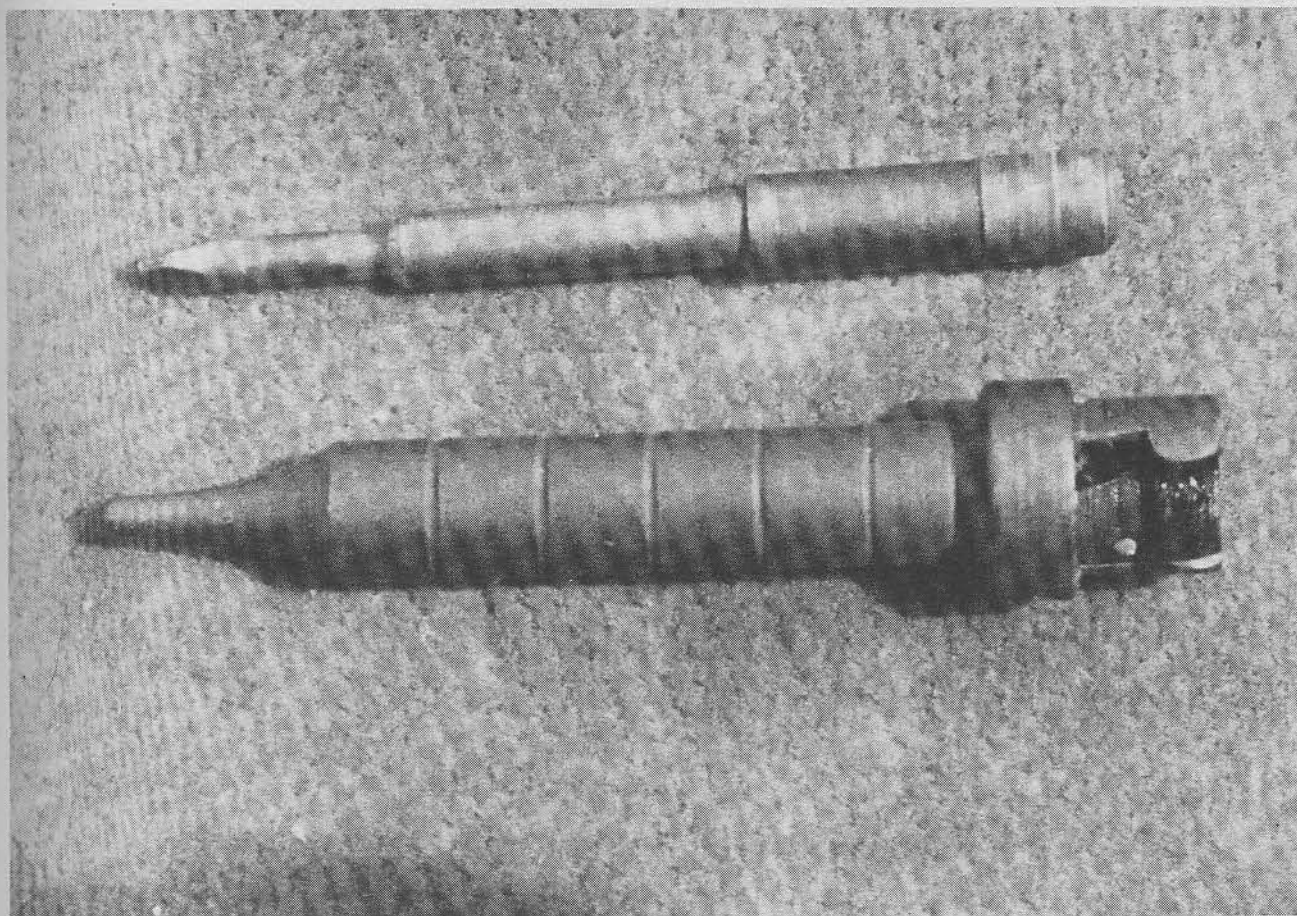
occur. Should it be too sharp, pierced primers and blow-backs often result.

In order to illustrate more clearly the hows of making a new firing pin, assuming that none are immediately available of factory origin and also assuming that you are in possession of the original firing pin parts, broken though they may be, it is best to use these parts as a template for the new pin.

A piece of drill rod (tool steel) of the correct size is lathed or filed to the exact dimensions of the original firing pin, being particularly careful in this phase to assure that both the overall length and taper of point is identical to that of the broken pin. Following the initial shaping, the entire

firing pin then is polished, completely removing any file or tool marks from the surface. This is particularly important in the point or nose section of the new pin.

The new firing pin should leave a burnished appearance in the indentation when it strikes the primer. Lastly, the new pin is heated to a cherry red and quenched in water, repolished and drawn in temper to a dark blue color. Correctly done, this will leave the new firing pin extremely tough in texture, but not to the point of being brittle. A good rule of thumb to follow in tempering a gun component such as this is: If a file will barely scratch its surface, it's tough enough. However, if you find that a file cuts the new pin easily, retemper; the pin is too soft.



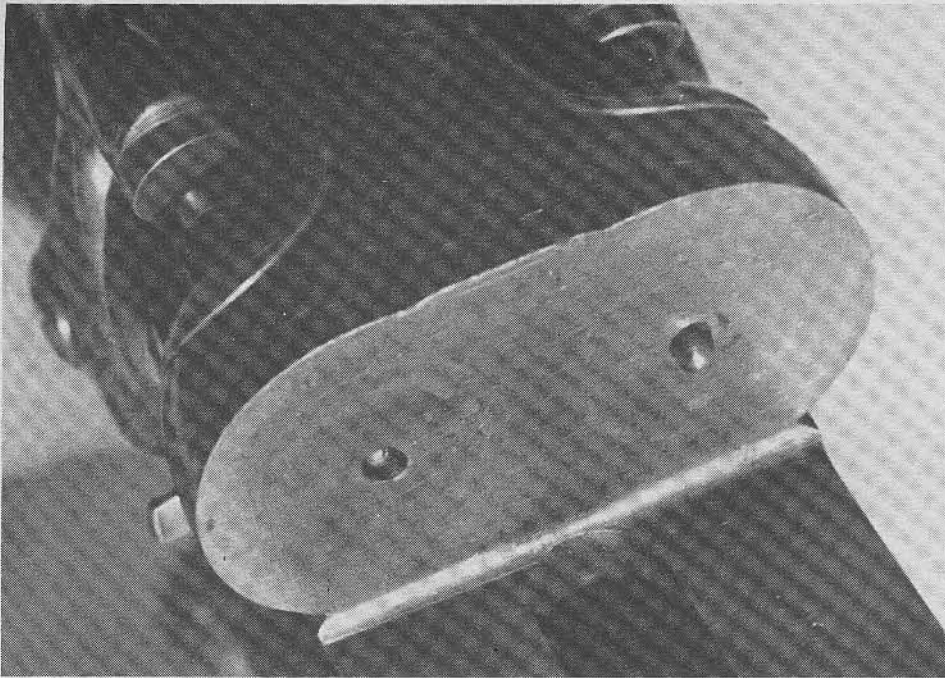
Firing pins tend to be distinctive in shape and design, depending upon their use. The pin at top has a wedge, flattened shape for ignition of a .22 rimfire case. The lower firing pin was designed for center-fire Springfield.

In some cases, where firing pin troubles are experienced, even though the firing pin appears to be in perfect condition, there is the possibility that the recoil shield or the hole in the frame of the gun has enlarged itself to the point it no longer supports the radius of the firing pin's nose as it should. Should this be the case, it is necessary for a competent gunsmith either to replace the original worn bushing or drill out and install a complete new bushing in a frame where such a bushing was not original equipment.

Another factor in firing pin malfunction often is experienced where retracting springs are utilized, such as those in many shotguns and automatic pistols. Should these springs be too stiff or possibly break under normal use, firing pin

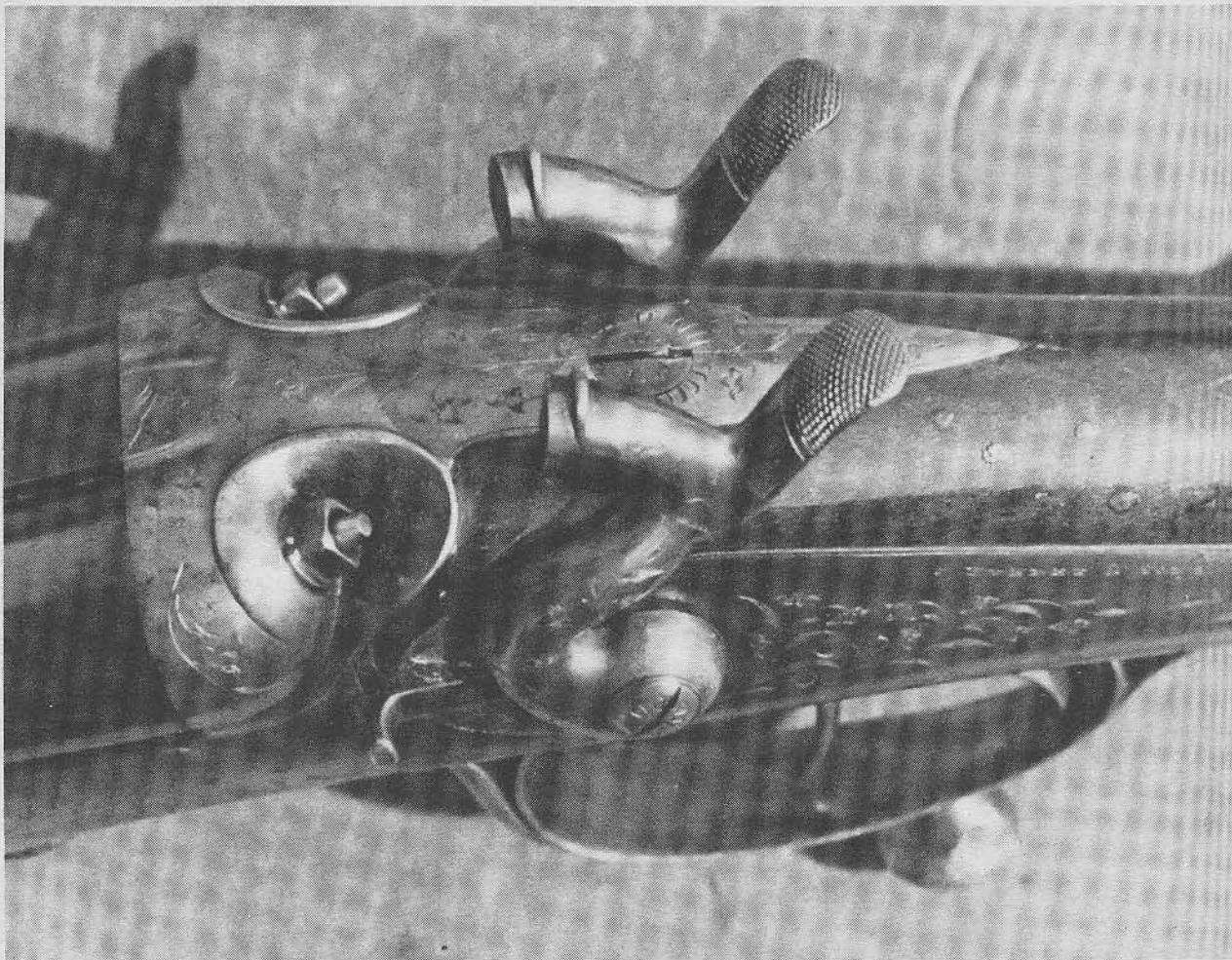
troubles could result. A broken retraction spring can jam a firing pin, often locking it in place in the firing pin bushing, as in a double-barrel shotgun.

In such an event, no attempt should be made to break or open the gun. The locked firing pin protruding from the recoil shield could mar or seriously damage the breech facing of a barrel or set of barrels. Should this occur, it is necessary to dismantle the action, remove the firing pin and broken spring, then replace the spring and reassemble. With those shotguns having exposed hammers, the repair or replacement of firing pins is a simple matter, necessitating only that the firing pin retaining nut be unscrewed to expose the entire spring and pin.

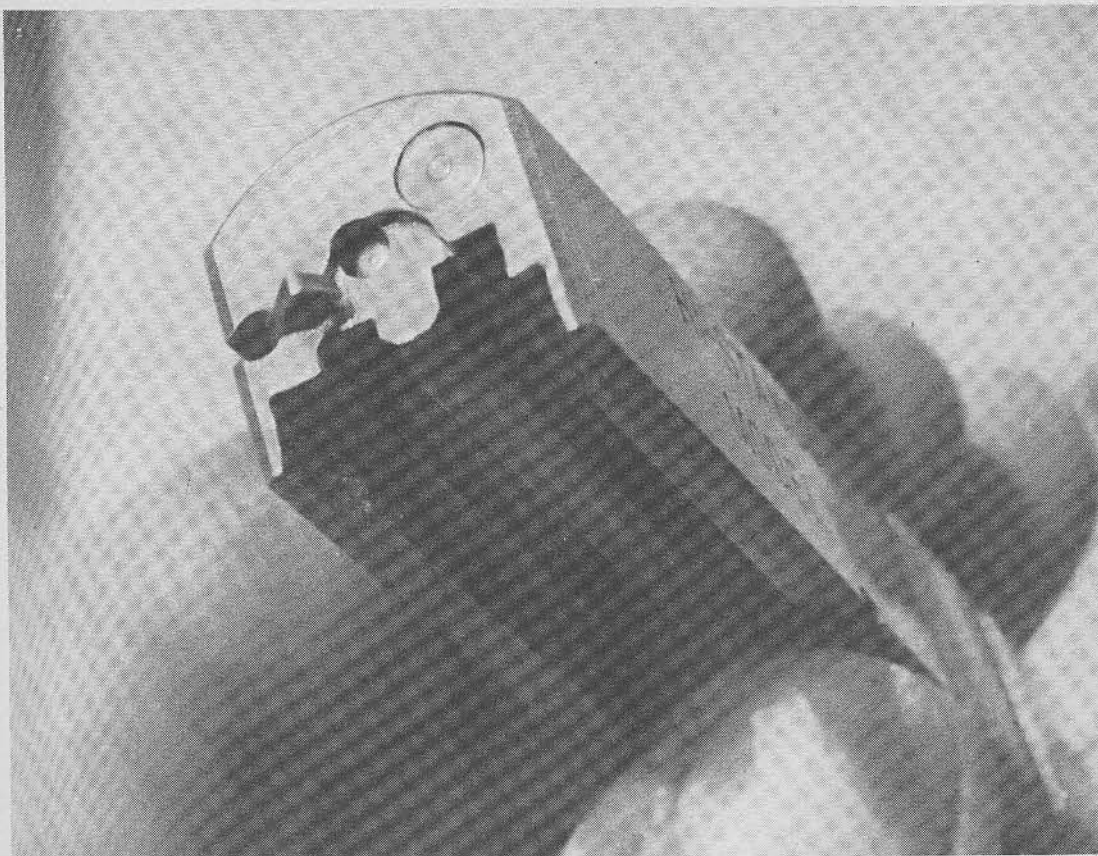


Should a firing pin retraction spring break or become badly malformed, firing pins tend to stay in forward firing position. This could result in the gun being impossible to open in the case of break-action type.

The firing pins of this Purdey double rifle had tendency to stick in the forward position. After investigation, this problem was remedied by the author, who removed the firing pins to successfully replace retracting springs.



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Contrary to what seems popular belief, not all firing pins for rimfire cartridge ignition are flat or wedge-shaped. For example, in the old High Standard pistol, pins are round.

In the case of some automatic pistols there is what is known as a free-floating pin that is actuated by a sharp blow from the hammer; this gives it sufficient momentum to travel forward in its slot with sufficient force to detonate the primer. Firing pins of this type are shorter than the channel in which they ride. The firing pin, after striking the primer, is drawn to the rear by the retraction spring until the nose or point of the firing pin is flush with the face of the breech block or slide. Should this retraction or firing pin spring be broken or be too stiff, then firing pin troubles are certain to happen.

Replacement firing pins for rimfire cartridges are made in basically the same manner as that outlined for center-fire cartridges. They must be made from good tool steel and properly tempered. However, the major difference in the two types of firing pins will be found in the shaping of the point or nose of the pin.

As outlined, the nose of a firing pin for center-fire cartridges must be rounded to the proper radius. The point or nose of a rimfire firing pin must be either wedge-shaped or, in the case of some pistols, revolvers and rifles, the pin is round in shape, but has an almost flat nose to assure proper detonation of the fulminate within the rim of the cartridge.

The wedge-shaped version is not sharpened but is left with a slightly rounded, flat surface to assure that the firing pin does not pierce the brass rimfire cartridge case. This

flattened surface should measure approximately one-sixteenth-inch in thickness or slightly less. Too, the exact proper length is all important for reliable primer detonation, whether rimfire or center-fire.

Though the lowly firing pin is seldom mentioned in writings concerning new or even obsolete weapons, it still is one component that has sent many a hunter and shooter home without the satisfaction of a trophy bag or a decent score on the target range.

In many cases the malfunctioning of a firing pin can be remedied easily in the field had the sportsman thought to include an extra in his kit. This is especially true of customized sporting rifles based on the '98 Mauser, Springfield, Enfield or any of the other so-called war-weary and obsolete military arms that have been converted to sporting use. The replacement of a firing pin or extractor is a simple matter, if the sportsman will use forethought in planning his hunt and include these vital parts in his field repair kit.

However, it has been my experience that too few hunters take into consideration those factors that could happen to even their most cherished hunting arms. A rifle, pistol or shotgun is only a mechanical device. It is subject to wear and tear and failure of parts just as the automobile. Therefore, especially on an extended hunt into a wilderness area, some thought should be given to those parts most liable to breakage — especially firing pins and extractors.