



# MAKE WINE MAUSER

“WITHOUT question the M98 Mauser is the best, strongest and most foolproof military turnbolt action ever made,” declares Frank de Haas in his definitive work, *Bolt Action Rifles*. I am not quite sure of the adjective “best” where military rifles are concerned; if I had to fight a war with a turnbolt rifle, I might prefer the Lee Enfield because of its 10-shot magazine and very fast reloading. But I do believe that in 1898 Paul Mauser perfected—well, almost—the bolt action for sporting rifle use, and further that most of the alleged improvements made to it by others since that time have in fact been retrograde steps.

Strong words and an extreme position, perhaps. But it seems that I am not entirely alone in holding this opinion.

Every *Gun Digest* devotes two or three pages to illustrations and short descriptions of some of the most desirable custom guns made in this country. Within reason price is not a major consideration in the building of these masterpieces; they employ whatever action, barrel, stock, etcetera, the owner and his gunmaker consider to be the best available for their purpose, regardless of cost.

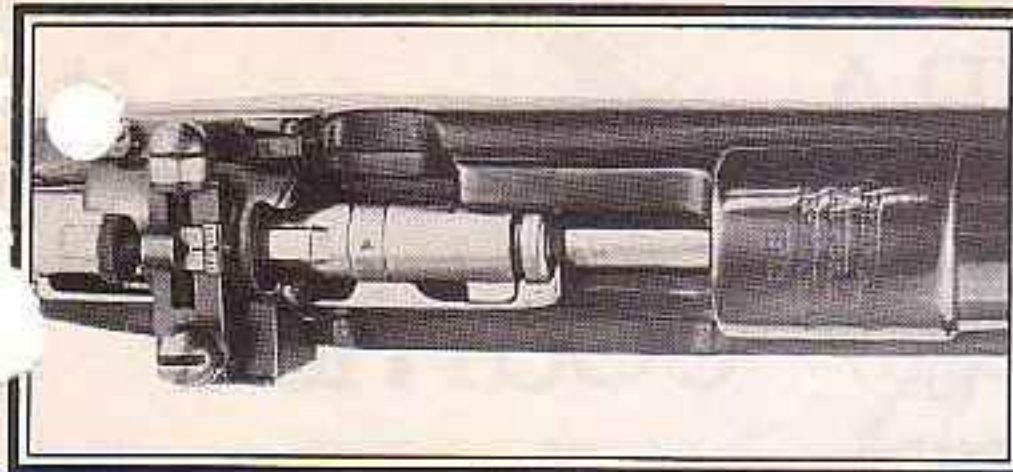
Checking quickly back through the last five editions of *Gun Digest*, I counted

113 center-fire custom rifles (or actions) illustrated. Of these, 38 were on a Mauser-system M98 action, and 22 on the Model 70 Winchester—the pre-64 Model 70, that is. Next came 12 Sakos, followed by nine Remington Model 700s (several of which were left-hand), nine Ruger No. 1s, three Ruger Model 77s, two No. 3 Rugers, two Model 1917 Enfields, and one Weatherby Mark V. There were 15 other miscellaneous or unidentifiable actions in the total.

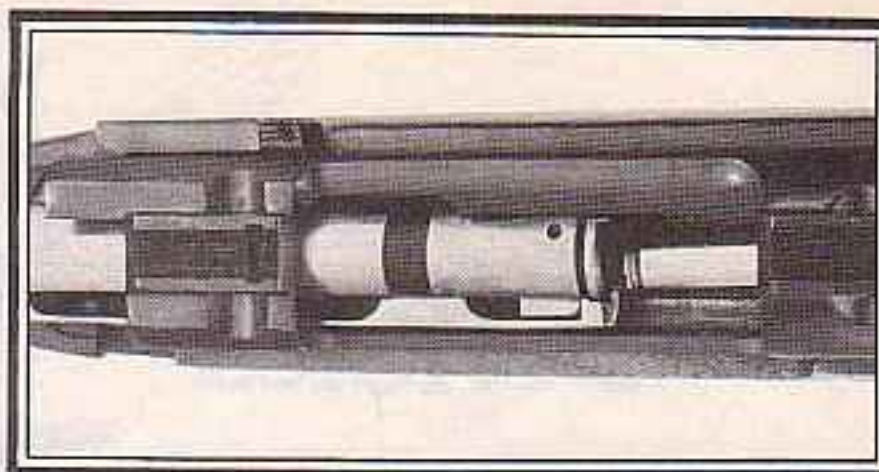
## BY FINN AAGAARD

Why was an action designed nearly nine decades ago chosen for the very heart of fully one-third of this sample of the highest-quality sporting rifles ever built anywhere on earth?

The answer is partly out of tradition and for the image. The great magazine rifles built in England in its heyday by Holland & Holland, Rigby, Purdey, Westley Richards and the rest employed Mau-



The Mauser bolt's extractor picks up and retains the cartridge rim during chambering, an example of controlled feed. The author also feels the thumb slot or cut in the left receiver wall aids loading.



The Ruger Model 77 extractor, though similar to the Mauser's, doesn't grasp the cartridge rim until the round is chambered. Aagaard prefers the Mauser's controlled feed.

ser actions almost exclusively, as did Griffin & Howe and others in this country when they were not using those quite close Mauser derivatives, the '03 Springfield and the Model 70 Winchester.

But the main reason is dependability. Paul Mauser designed the M98 to function under the most adverse conditions of mud and snow and dust and neglect in battle, consequently it takes almost anything the game fields can subject it to without a hitch.

It is noticeable that both the Mauser 98 and the old Winchester Model 70, which together accounted for more than 50% of the *Gun Digest* custom guns, are what have been called "controlled feed" actions.

They both have the long non-rotating Mauser-type extractor attached to the bolt body by a collar. As the cartridge rises out of the magazine, its rim slides under the hook of the extractor, which holds it against the bolt face. This ensures that it will be extracted even if the bolt has not been fully closed.

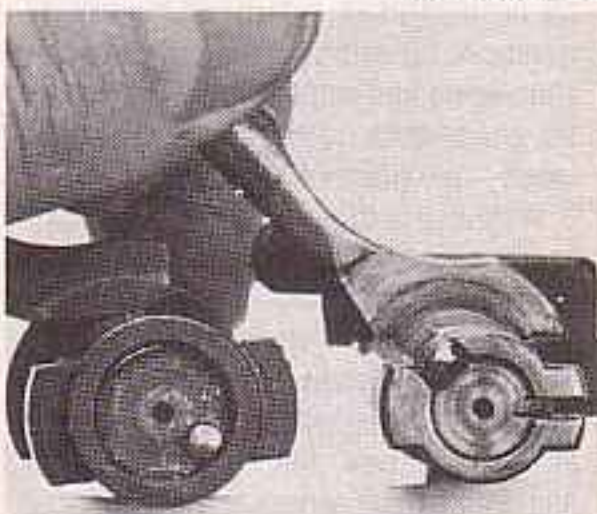
With most modern actions, the cartridge is pushed into the chamber ahead of the extractor, which does not snap over the case rim until the bolt handle is turned down. Consequently, if the bolt is withdrawn before it has been fully locked, a round may be left in the chamber. When it is then pushed forward again, the bolt will pick up another round from the magazine and ram it into the rear of the first one. Should a pointed bullet strike the chambered cartridge's primer with sufficient force, the results could be rather shocking! Though unlikely, this has happened at least once, I am told.

One can remove the cartridges from a Mauser's magazine in perfect safety by just pushing the bolt straight back and forth without turning the handle down, as the firing pin has two shoulders that prevent it from going all the way forward in the bolt has been rotated into the fully-locked position.

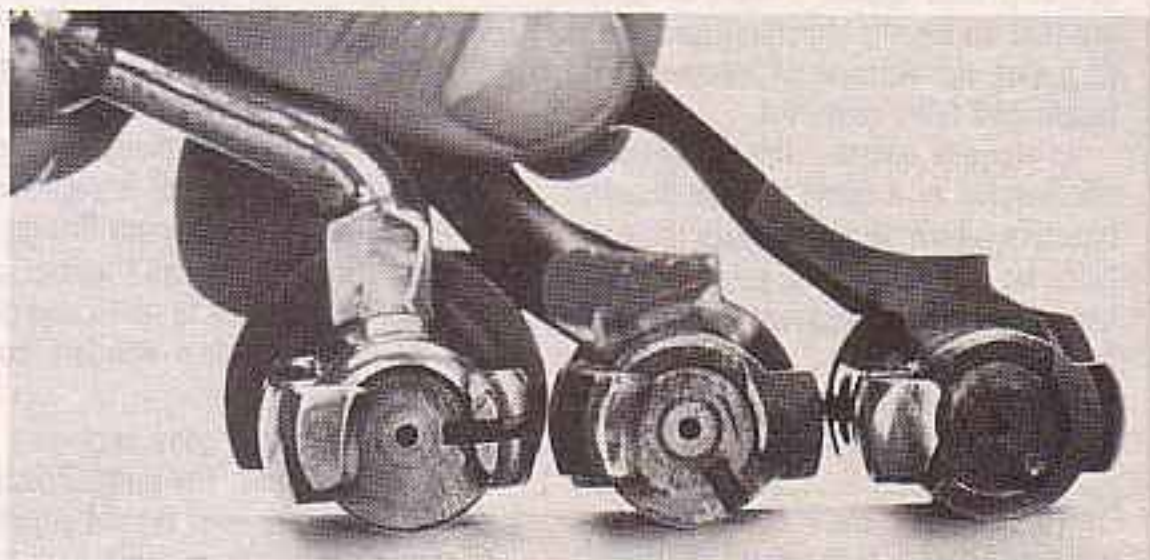
The Mauser extractor has a tongue that, fitting into a groove running part of the way around the bolt ahead of the

locking lugs, controls its fore and aft movement, as do the extractors of the pre-'64 Model 70 and the Ruger Model 77. But the Mauser has a refinement the others lack. The groove is undercut at the front and the extractor has a matching lip that slips into this when it moves forward a little as it starts to pull the case from the chamber. Thus the extractor is locked and positively prevented from letting go of the case, and the greater the resistance the more firmly it is locked. No matter how badly the case is stuck

continued on p. 71



Mauser-type extractors are rare today. A Remington Model 700 (l.) and Sako L-46 typify the many alternative designs used.



The Mauser 98 bolt face (l.) shares obvious similarities to the pre-'64 Model 70 Winchester (c.) and the Ruger Model 77 (r.). Extractor design is similar, but Ruger chose a bolt face that encircles the case head and a button ejector.

**So says Field Editor Aagaard, who regards the venerable Model 98 as the most dependable rifle action devised.**

# Make Mine Mauser

continued from p. 41

in the chamber, the Mauser will always extract something, even if its only a segment of the case rim!

The Mauser and old Model 70 extractors in addition are wider and engage a bigger segment of the case rim than most modern ones, including the Ruger, which for some reason has its hook narrowed.

Mausers were designed to be loaded from the magazine, and the extractor will not normally snap over the rim of a cartridge dropped into the chamber ahead of it. Sometimes it can be made to do so by pressing in on it behind the collar while gently forcing the bolt handle down; or the hook's face can be bevelled and shortened slightly to snap over the rim just as does that of the old Model 70. It is, however, easy to ruin the extractor if one does not know exactly how to do it—I speak from personal experience!

The Mauser's extractor is unquestionably the most positive ever used on a bolt gun, but how much does that matter? Well, there is a record of the extractor on a .460 Weatherby Mark V failing in the middle of a buffalo affair (*Rifle*, No. 81, p. 52), and I have personally experienced extraction failures with three different post '64 Model 70 Winchesters, two of them being .458s.

The Model 70 extractors quit due to dust and crud accumulating unseen under them, but a Mauser extractor would have continued functioning despite that.

The modern plunger-type ejectors found on many rifles are quite reliable, but they cannot be used with a controlled feed action. They will throw the spent case out as soon as its mouth clears the receiver ring, whereas a Mauser will not eject unless the bolt is jerked all the way back. But short-stroking any bolt action results in a failure to feed a fresh cartridge into the chamber, regardless.

I find it quite interesting that while Paul Mauser did use the "modern" snap-on type of extractor and a plunger ejector on some of his earlier, more primitive designs, he had discarded both by 1892!

Much has been made of the modern recessed bolt heads, which supposedly are stronger because the head of the case is completely surrounded by a ring of steel. But less of the case is then inserted into the chamber; there has to be a tolerance between the bolt and the end of the barrel, and this gap comes a little way up from the head of the case, where the brass is thinner. Canadian gunsmith E. J. Epps had a photo on p. 32 of the *77 Gun Digest* showing a case that let go at exactly that point in a recessed bolt head action.

In contrast the M98 encloses the cartridge in the chamber all the way up to

its extractor groove, so that only solid brass is unsupported.

It seems that a recessed bolt head should in turn be surrounded by a barrel extension, as in the Remington Model 700 and Weatherby Mark V, otherwise the Mauser breeching is superior.

In the nowadays quite rare event of a case failure, the Mauser handles the escaping gas rather well. Two generous ports in the bolt body vent into the left lug raceway, whence, on the military rifles and most Oberndorf Mauser sporters, an easy escape route is provided by the thumb slot. Any gas that did get back through the receiver bridge would be deflected from the shooter's face by the flange on the bolt sleeve, a feature that is missing from both the Winchester Model 70 and Remington Model 700. Both of these also vent into the left lug raceway, but of course lack the thumb slot, so some of the escaping gas could be directed back into the shooter's face if a pierced primer allowed it to get inside the bolt.

The Ruger bolt does have a flange covering the left lug raceway, and also has two long slots and a hole that would port gas down into the magazine well, which would seem to be a better idea. The Weatherby Mark V has the three gas escape holes in its bolt in line with the ejection port, which is better yet.

The thumb slot in the left receiver wall of the Mauser was a necessity for the quick and certain recharging of the magazine from stripper-clips. It is disparaged for "weakening" the action. This is not so from the point of view of safety, as the action is locked in the receiver ring, and one could chop off everything behind that without affecting its ability to withstand the firing of the cartridge.

The thumb slot does adversely affect potential accuracy by making the action less rigid and more likely to flex irregularly during recoil. This need not concern a big game hunter, though, as the accuracy loss is a matter merely of fractions of an inch, and a thumb-slot receiver can form the basis of a 1½ minute of angle sporting rifle as well as any other action.

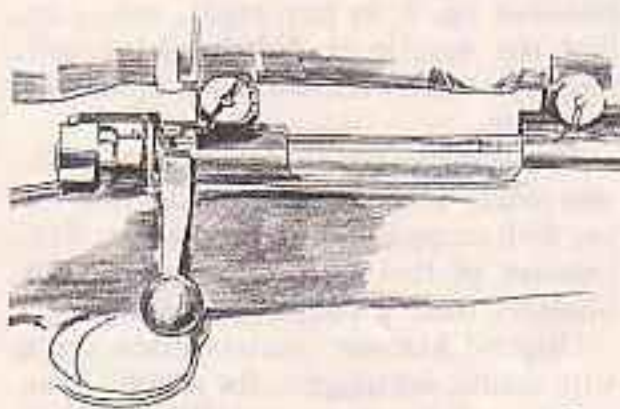
Rather than being a liability, the thumb slot is actually an advantage in the field, because it does make charging the magazine a little easier even when one is not using stripper-clips. This is particularly so in an "eyes off" situation such as when one is desperately thumbing fresh cartridges into the magazine while watching some beast he has annoyed and may have to ward off at any moment.

African professional hunter Nicky Blunt once took a file and cut a thumb slot in a Winchester Model 70 for this exact reason. I am not sure that is a good idea, though, as the Model 70 has nothing to prevent the left locking lug from hanging up in such a slot, whereas the Mauser takes care of it with a guide rib that

during the critical period is engaged in the groove found at 12 o'clock in the receiver bridge.

The Mauser is sometimes criticized for having a sloppy bolt that rattles around loosely except when locked. The smooth, tightly fitted actions such as the old Mannlicher-Schoenauer are indeed delightful in the sporting goods store or the gun room, but Paul Mauser meant his rifles to work in the field, where it matters, and I for one am darned glad of it.

Years ago a friend and I finished a stalk on a herd of impala by crawling on hands and knees across sandy ground. When my companion tried to chamber a round in his Mannlicher-Schoenauer, it jammed. Finally, we got the bolt out and found that two little grains of sand that my Mauser would never even have noticed had tied that slick action up solidly.



A basic M98 Mauser with turned-down bolt arm and low safety is Aagaard's working gun. He stocked this '06 with fiberglass.

The slow ignition and consequent inaccuracy due to its firing pin gathering momentum over a full 1/2" of travel as compared to about 1/4" for most modern actions is also held against the Mauser. While true in theory and possibly of consequence in bench-rest matches and the like, it is nothing for a hunter to fret about. If he misses an antelope or gets into trouble with a bear, it will be because he misjudged the range or jerked the trigger, not because the firing pin took a few extra milliseconds to fall. Besides, that long travel seems to ensure that it will give the primer a solid clout. I can remember no ignition problems with a Mauser that could be blamed on the action, but I have experienced a couple with modern speed-lock actions.

The original M98 bolt-sleeve three-position safety that swings through 180 degrees is probably the best ever fitted to a turnbolt rifle. It cams the cocking piece back out of contact with the sear, when fully engaged it locks the bolt, and it can hardly be knocked off accidentally. When fast shooting may be required, it is turned to the upright, 90° position. Then the thumb easily sweeps off the safety as the rifle is coming to the shoulder and continues to come to rest in its proper place on the left side of the grip. In this half-way position, it does not lock

the bolt, which can then be operated with the safety applied.

The only thing wrong with the safety is that it does not work under a low-mounted telescopic sight, and one can't blame Paul Mauser for that, as scopes were not much in vogue when he designed the action.

For use with scopes, modern Mausers such as the last FNs, the Santa Barbaras and the Mark Xs adopted a slide-operated safety on the right side of the tang that blocks only the trigger and/or sear, not the firing pin itself. I suppose that they are alright, but personally I prefer a low-swing leaf safety such as the Buehler, it mounted on an original-type bolt sleeve, which visibly cams the firing pin back when applied. I also want it to lock the bolt, as I have been badly frightened by a rifle refusing to fire when it should have, because the bolt handle had been knocked up. I, in any event, take care that the muzzle is pointing in a safe direction when I am loading or unloading the piece.

The Winchester Model 70 three-position safety is the best so far devised for use with scope sights on bolt action rifles. Safeties of this type are available for Mausers from a couple of makers.

Original Mauser sporters often came with double set triggers, for which I have no use at all, but some, and all the military rifles, used the standard two-stage trigger. Though seldom employed nowadays, it was really a good and inexpensive design that permitted deep sear engagement for safety when the bolt was slammed back and forth violently. The long and light first pull of the trigger removed most of this engagement, and then came the easily felt heavier resistance of the second stage, when a slight additional movement would fire the piece. The second stage could be adjusted by careful honing to safely give a very clean, crisp pull.

In use one took up the slack automatically, without conscious thought, as the rifle came onto the target, and then he squeezed off the second stage when the sight picture was right, in the normal fashion. The only disadvantage is that if one is going to use it, he must have it on all his rifles, else he could be frightfully embarrassed by taking up the slack on a trigger that didn't have any! Consequently all my Mausers are now fitted with the excellent Timney adjustable triggers, which I set to give a crisp pull of about 3 lbs.

Several successful bolt actions that derive little from the Mauser have been developed. They often have multiple lugs and short, 60° bolt lifts (compared to the 90° rotation in the Mauser). Some lock-up towards the rear of the bolt—which necessitates a heavier receiver—while the Colt-Sauer even employs cam-operated pop-out locking lugs. All of which is very well, but it seems to me that they

tend to be needlessly complicated while offering no real advantages that would be readily apparent in the field. I suspect that few of them could match the reliability of the Mauser when the going gets rough.

We speak here of the reliability of a *good* Mauser, that is. Because while the design is unsurpassed, it has been executed by all sorts of makers all over the world. The Pathans even made M98s by hand in Pakistan. There are shoddily made Mausers, and others are worn-out through hard use and neglect.

It is wise to have any surplus military Mauser rifle or action checked by a gunsmith before using it. But generally the genuine German-made articles are sound, as are the ones made at Brno in Czechoslovakia, and of course those manufactured by the famous FN concern in Belgium. The modern Spanish-made Santa Barbara and the Yugoslavian Mark X—which is used in the Whitworth rifles—may lack a little finish, but they are strong and safe actions that will give a lifetime of good service.

I am, quite obviously, no engineer, only a simple hunter. But I have used a rifle as a tool of my trade for a number of years, and have had the opportunity to see how many different ones performed in the hands of my clients.

Given the choice, for any serious big game hunting where reliability is imperative, I will unhesitatingly pick a rifle with a Mauser system M98 action. I am not, however, fanatical about it. Included in my battery of "using" guns is a Weatherby Mark V, two Ruger 77s, and two Winchester 70s. One of the last is my .458 stopping rifle, and it is a late model 70 at that. It is only coincidence that I have no Remington in the collection, a deficiency I intend to correct if I can get my hands on a limited edition Classic in .350 Rem. Mag.

Nor do I think that the Mauser M98 is quite perfect. My ideal bolt action for a sporting rifle would have some features from several different designs. The extractor would be able to snap over the rim of a chambered cartridge like the one on the old Model 70. It would also have the Model 70's safety catch, its bolt handle, and quite likely its excellent and simple trigger. The gas venting system would be copied from the Ruger Model 77, as would be the integral scope sight bases, which both Brno and Sako have also used for years. As a fancy touch it might have the neat little pop-up aperture sight that Brno hides in the receiver bridge of its ZKK models.

But the essence of it, everything else including the bolt and receiver, the one-piece trigger guard and magazine box, the controlled feed, the bolt-stop and ejector, the breeching, and the utter dependability would be pure M98, just as Paul Mauser designed it 87 years ago. ■