THE WORLD'S GREATEST GUN BOOK

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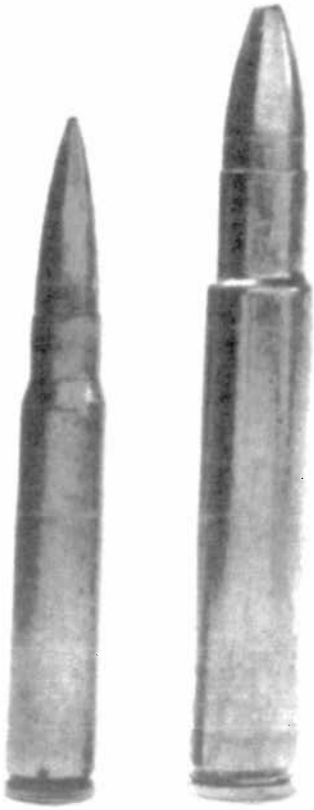
Edited by
Ken Warner

HK

The complete gun book,

A Mauser '98 will make a...

416 RIGBY



THE 416 RIGBY cartridges appear to be nearly as large as the action, yet two of them disappear down into the magazine under my insistent thumb. Holding the top cartridge down, I ease the bolt closed. Then I invert the rifle so the ejection port is facing the floor, and as fast as possible I bang the bolt open and shut twice, then open again. Each cartridge, in turn, is chambered and ejected.

Next, I repeat the entire loading and testing process, but this time I move the bolt on the inverted rifle as slowly as I can move it. The result is the same, the two enormous Rigby cartridges are fed, chambered and ejected perfectly. The rifle does this at any speed and in any position, demonstrating its reliability. Unlikely as it may seem, the action is basically an ordinary large-ring '98 Mauser.

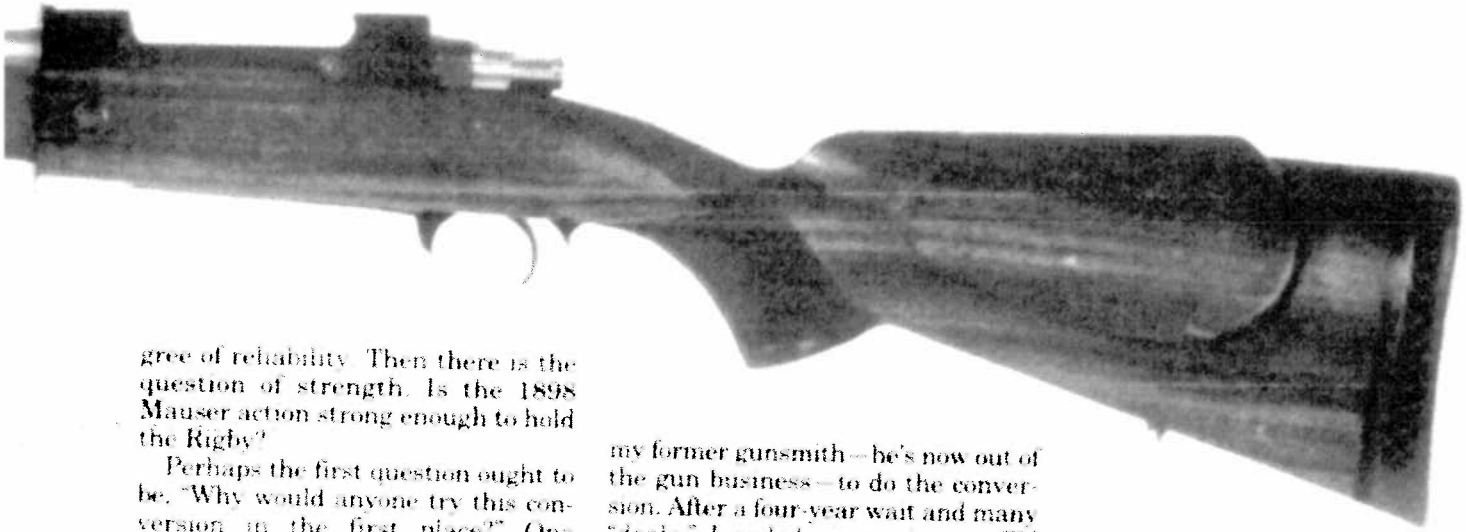
The problem in a nutshell is that the original Mauser 1898 action was designed around the 8x57 cartridge (left), and we had to make room for the 416 Rigby while retaining the integrity of the rifle.

This action was made by FN for Browning, but it is the same basic '98 Mauser that was designed around the 8x57 German military cartridge. This specific rifle began life as a .300 H&H Magnum, complete with an aluminum magazine box long enough for that cartridge or the .375 Holland & Holland Magnum. The Mauser '98 has long been used successfully for those two belted magnum cartridges, but the Rigby round is a bit longer and a whole lot fatter than either of them. At first glance, it seems impossible to get the big Rigbys into the rifle, much less feed them with any de-

by RAY ORDORICA

TWO-SHOOTER

Right and left-side overall views of Ordorica's completely successful and thoroughly reliable 416 Rigby two-shot on an FN Browning '98 action. The rifle features the author's action modification, stockwork, oil finish and checkering. The barrel is 24 inches long.



gree of reliability. Then there is the question of strength. Is the 1898 Mauser action strong enough to hold the Rigby?

Perhaps the first question ought to be, "Why would anyone try this conversion in the first place?" One answer is that you end up with a very light, very powerful rifle, albeit one with only two rounds in the magazine. Another answer, and my real reason, is that I had no choice other than to kiss lots of my money goodbye after having waited four years to get anything at all for it.

I had originally wanted a 416 Howell. I thought the Howell, which requires only a standard-length action, would make up into a light rifle that would be perfect for my many wanderings in the Alaskan Bush. I planned to load it with 300- to 350-grain bullets at 2600 fps or so.

I acquired a pre-'64 Featherweight Model 70 action and negotiated with my former gunsmith—he's now out of the gun business—to do the conversion. After a four-year wait and many "deals," I ended up owning an FN Browning that had been rechambered to accept the 378 Weatherby necked to 30-caliber. The 416 Rigby base diameter is the same as the 378 Weatherby's, so it came down to a choice between the Rigby and nothing, because I had grown tired of waiting. I had no need for a 30-caliber rifle.

So now, the gunsmith installed and chambered a barrel in 416 Rigby and got the rifle to shoot. Not feed, *shoot*. He then did exactly nothing to my rifle for more than a year, though he told me he was continually working on it.

I paid for a Shilen match-grade barrel with 1:14-inch twist, and the gunsmith assured me that's what he used. Much later, I discovered I actually have a 1:12-inch twist barrel and a call to Shilen verified that they have never made a 416 barrel with that twist rate.

I assume it is a Douglas barrel, and Douglas makes very good barrels. I had wanted a twist rate that wouldn't over-stabilize shorter 416 bullets. Original Rigbys had 1:16-inch twist, and they work well enough with light, short bullets. My limited accuracy testing to date indicates that with modern homogeneous bullets such as the Barnes X, which are rather long for their

weight, the twist of my rifle is not too fast at 1:12 inches.

Getting my rifle out of the gunsmith's shop at the end of this additional year was a good move. One day, a little later, he simply disappeared. And it took me nearly another year of part-time work, doing it myself, to turn the gun into a fully functional, reliable entity.

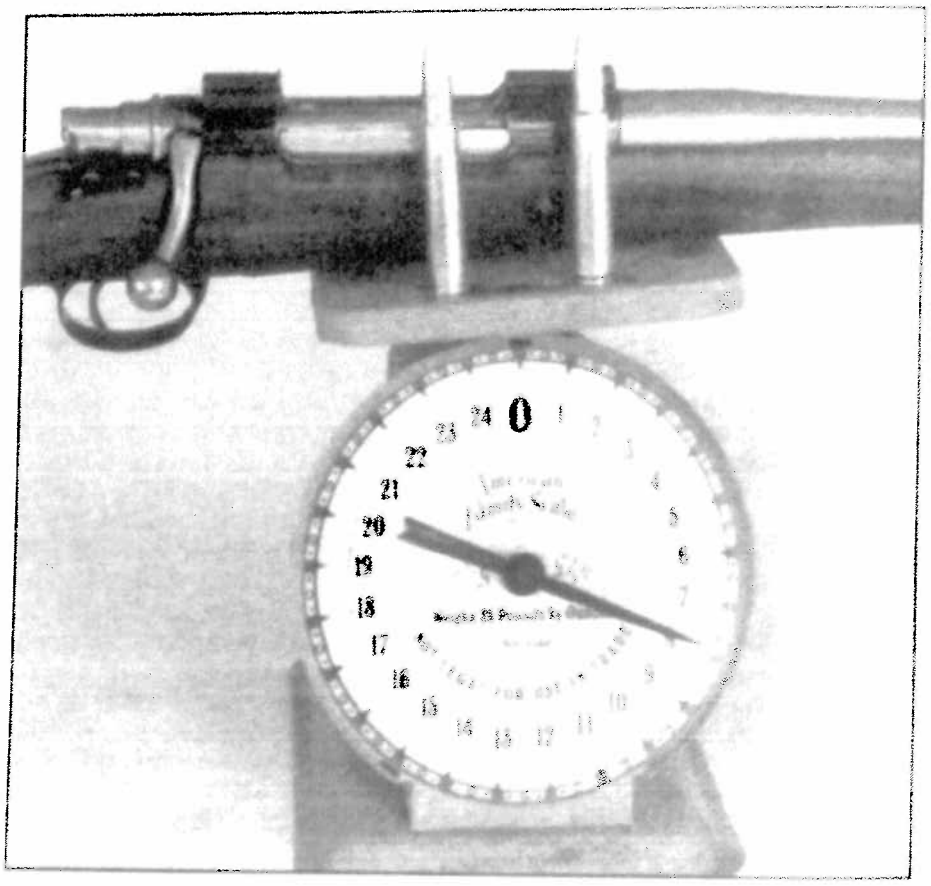
When I first approached the concept of stuffing the Rigby cartridge into this particular action, I was apprehensive about its strength. I checked my references and found that the bolt diameters of normal-length (1898) and true "magnum" Mausers, around which the [illegible] 416 Rigbys were built, are identical (.70-inch). Therefore, there were no problems with the bolt.

The magnum Mauser action is longer than ordinary '98s, and they have more metal behind the lower locking lug. My main concern with this conversion project lay right there. I wondered if there would be sufficient strength in the lower lug of the FN action to support the thrust developed. I knew that the '98 action, when lengthened to accept 375s and 300s, had proven itself more than adequately strong for the job. Therefore, I reasoned, if I kept the thrust than, that provided by those two belted magnum cartridges, the rifle would be more than strong enough for the Rigby.

Federal told me they loaded the 416 Rigby to 41,500 CUP nominally, with a maximum of 42,000 CUP acceptable. All those long belted magnums work perfectly in ordinary Mauser actions. These modern magnum cartridges, often handloaded to well over 50,000 CUP, generate acceptable forces on the '98 action, and the Rigby generates less force. And so it proved.

The rifle handles Federal factory

The action loaded with its maximum capacity of two 416 Rigby cartridges. The magazine box is cut away to permit the lower cartridge more side room. The scope bases are by Warne.



Ordonica's Rigby weighs less than 8 pounds complete with its two cartridges and is built for Alaskan use with 300- and 350-grain bullets at medium velocities, and for lots of carrying. The author feels any outstanding '98 action can be used to get an extremely light 416 Rigby, if one is needed.

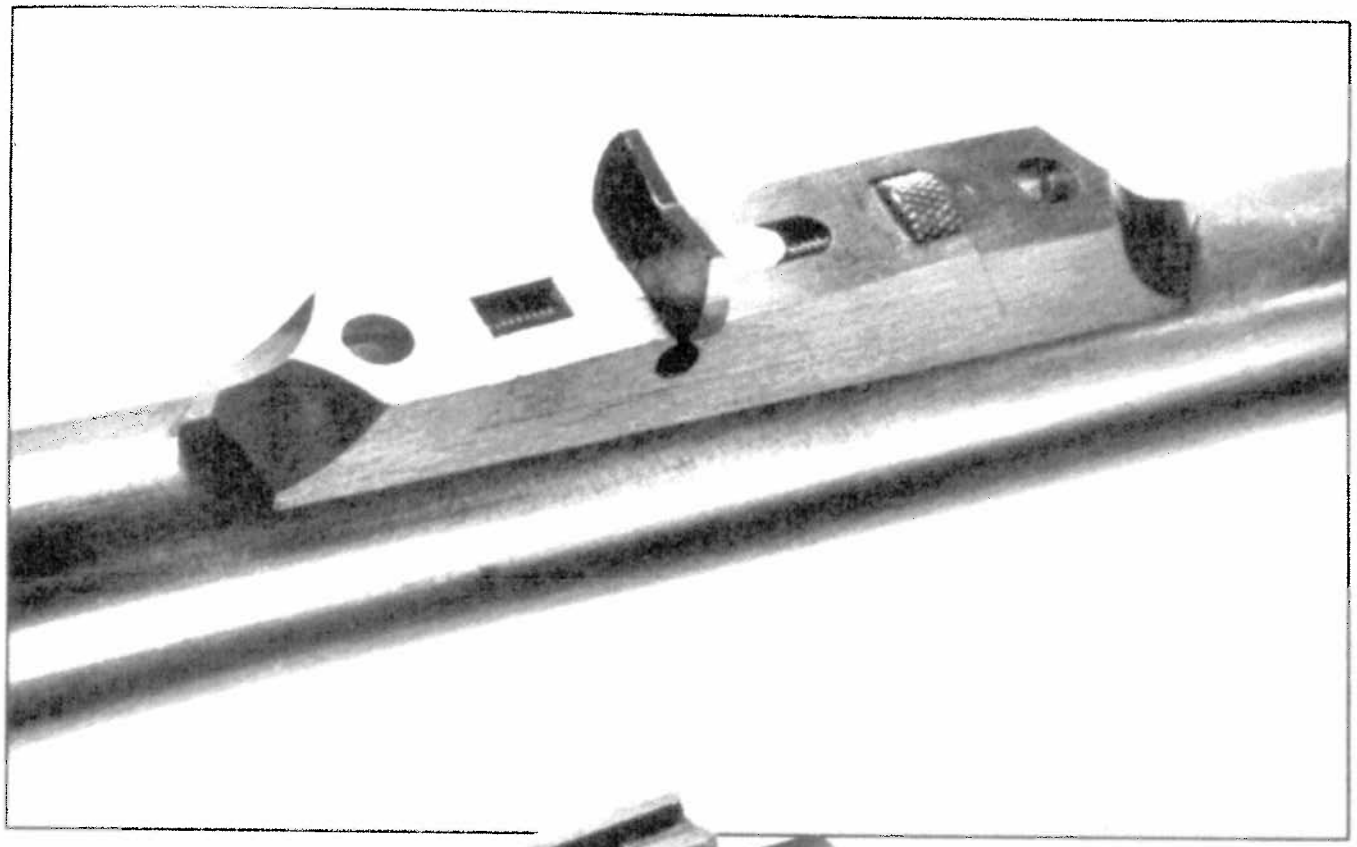
loaded cartridges far better than my shoulder does with an 8-pound rifle. There is no need to hot-rod this cartridge in this rifle. My loads with light bullets are very conservative (300-grain Barnes X at 2625 fps; 335-grain Jensen J26 at 2575; and 350-grain Barnes X at 2450 fps) and designed for Alaskan use. In short, the rifle is perfectly safe for my uses, and entirely safe with any current factory loads as well.

First, however, I had to make the cartridges fit the magazine. Right off the bat, I'll say that I didn't alter the width of the action rail lips. They remain at their .60-inch spacing that worked just fine with the 300 H&H cartridge. The main problem was to get the big rounds to stay under those lips, not pop out more easily.

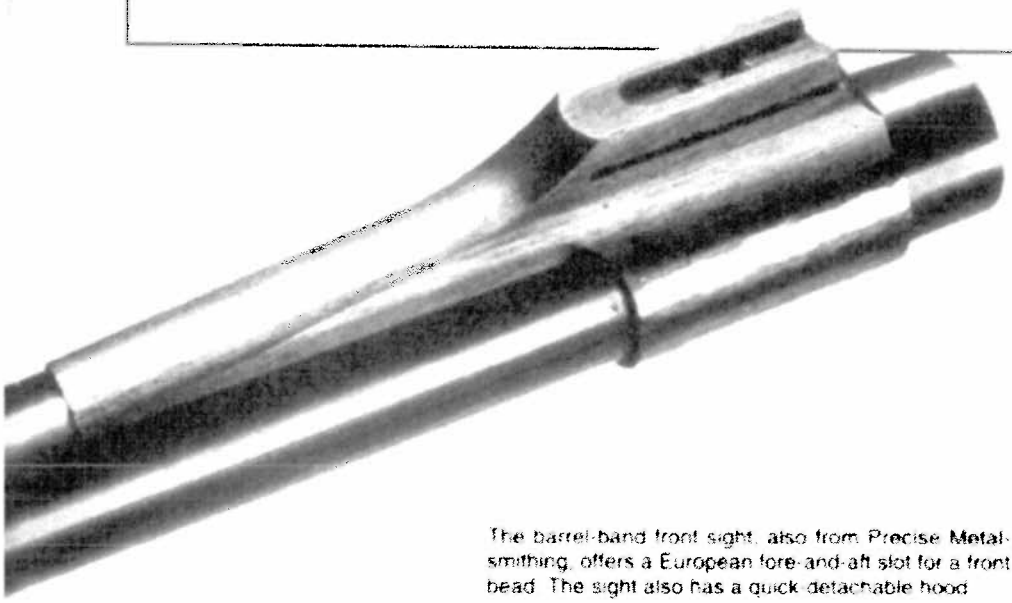
Federal Cartridge Company told me their factory-loaded 416 Rigbys measure 3.75 inches maximum length, 3.63 inches minimum. The standard length of 300 H&H cartridges is given as 3.60 inches, and the unaltered aluminum magazine box of the FN measured 3.68 inches. This meant it would have to be lengthened by approximately .07-inch. I did this by filing the magazine box as thin as I could get it. I achieved an overall inside length of 3.70 inches, which has accepted all the Federal factory loads I've tried in it. I intend to use my own handloads almost exclusively, so I find the magazine length to be fully acceptable.

I had to take a very small amount of metal off the face of the feed ramp, more of a polishing than a grinding action. I don't believe that I removed more than .020-inch from the surface of the ramp, which is not enough to sacrifice the integrity of the bottom lug area. I polished the ramp on both sides under the rails to ensure smooth feeding.

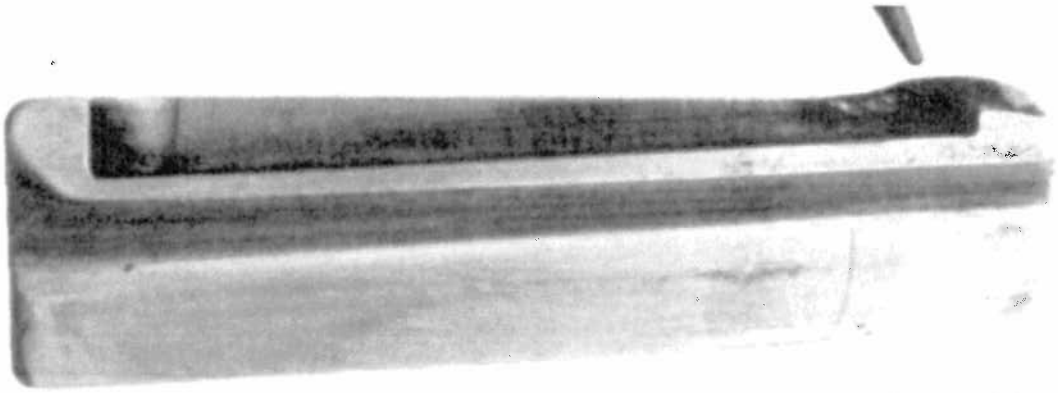
The large diameter of the Rigby



The rear sight by Precise Metalsmithing Enterprises, Inc., is the author's choice for fastest work with iron sights on a dangerous game rifle. The sight is sweated and screwed to the barrel to keep it in place against severe recoil.



The barrel-band front sight, also from Precise Metalsmithing, offers a European fore-and-aft slot for a front bead. The sight also has a quick-detachable hood.



It was necessary to weld a small bead of metal to the nose of the magazine follower (at pencil point) to ensure sufficient pressure from the follower against the cartridge that rides on it. This bead prevents the follower from sagging toward the left.

case requires a wider space within the magazine, and also dictates the action to be wider under the lips of the rails. I went to work, one cartridge at a time. The first cartridge placed into the magazine is held there by the force of the follower, pressing the case against the right action rail. In an unaltered rifle, this spring force tends to push a fat cartridge vertically up and out of the magazine box. The cartridge wants to pop out as soon as it is bumped or jarred, or moved slightly forward by the bolt.

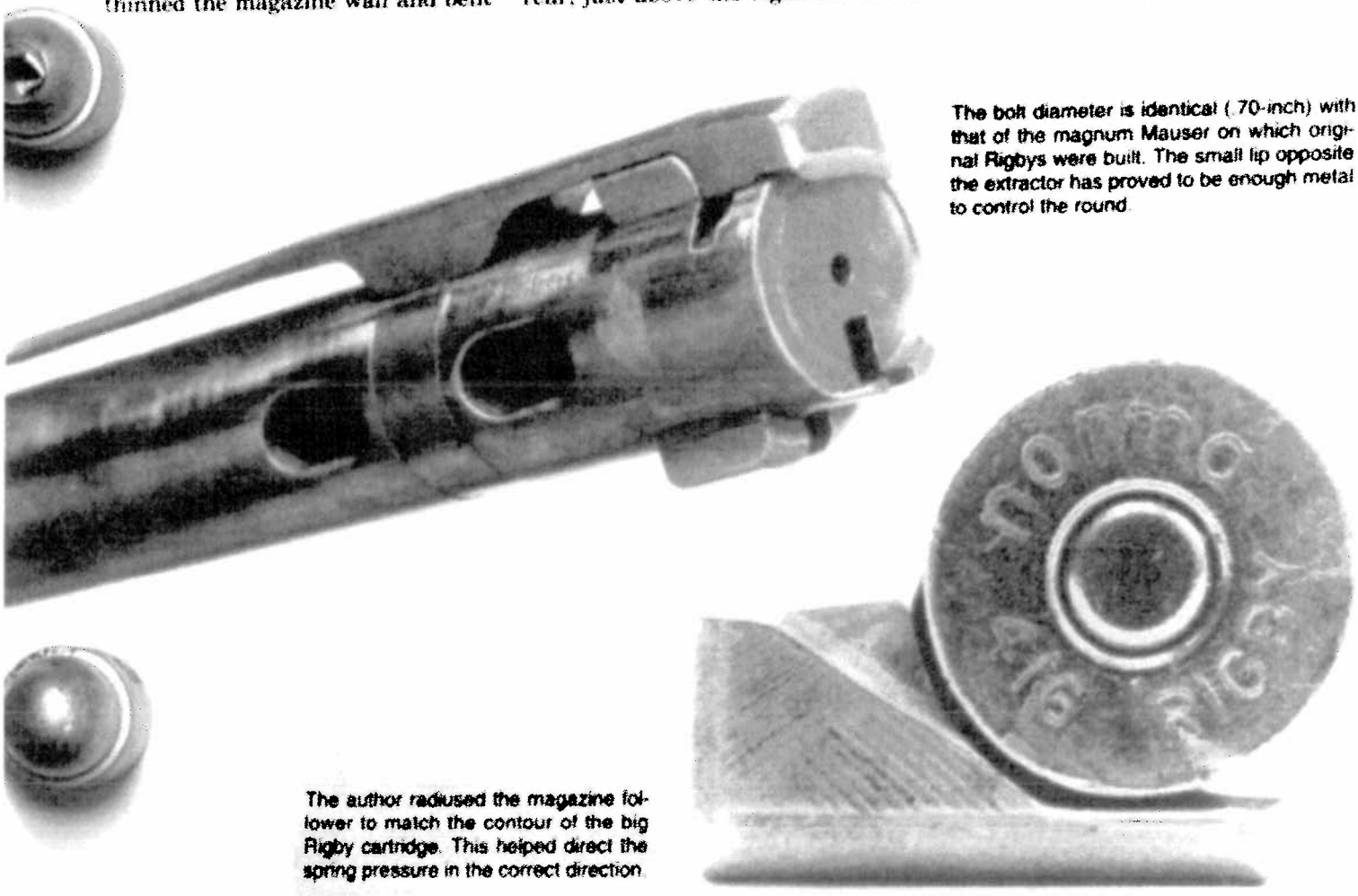
The solution was to find more room under the rail to the right. I went to work with a hand-held grinder and widened the action in that area as much as the magazine would allow, thinned the magazine wall and bent it slightly outward to meet the edge of the widened action.

I also filed the top of the magazine follower to make it conform to the radius of the Rigby cartridge. With the follower pressing hard against the cartridge, and with more room under the right rail, I was able to keep the first (right) cartridge well-restrained and under complete control. I could bang the bolt open hard with a round in the magazine and that first round would stay firmly in place. With the feed ramp smoothed, it would also feed reliably. I was halfway there.

It seemed desirable to open the action's ejection port by grinding the action ring slightly toward the front, as well as the rear bridge toward the rear, just above the right rail. This permits easier loading and also allows ejection of loaded rounds. As the cartridge base strikes the ejector, the bullet swings to the right, clears the ring, and the cartridge is ejected out of the action.

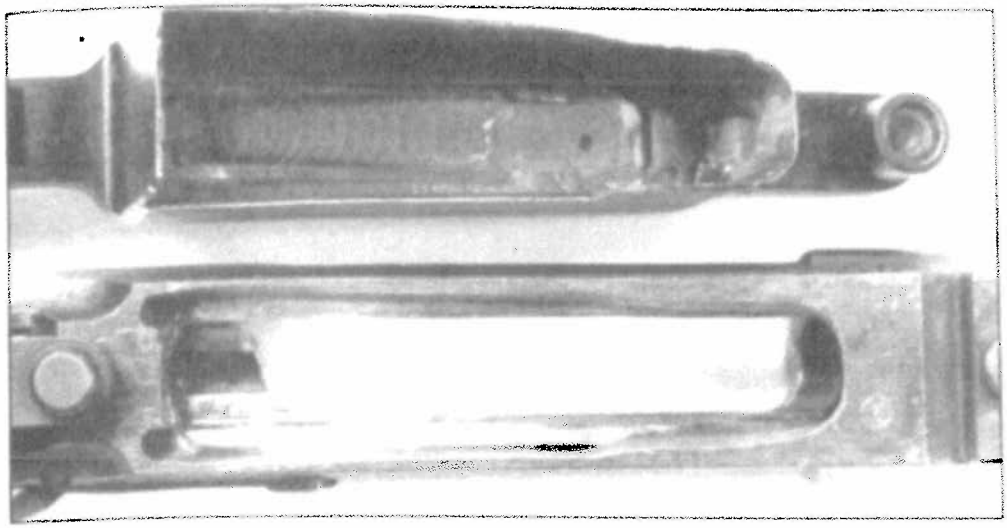
Original Rigbys have a vertical groove ground into the rear center of the front ring to permit easier passage of the bullet nose when loading. Although I did grind a small groove here, it isn't necessary or desirable. On this rifle it accomplishes nothing. One doesn't load this gun by pressing the cartridges straight down...which you can't do anyway with a scope in place, even on original Rigbys. The cartridge must be inserted from the right side.

Now that I had the first cartridge well-controlled, I pressed the second



The bolt diameter is identical (.70-inch) with that of the magnum Mauser on which original Rigbys were built. The small lip opposite the extractor has proved to be enough metal to control the round.

The author radiused the magazine follower to match the contour of the big Rigby cartridge. This helped direct the spring pressure in the correct direction.



The magazine box has been filed very thin, and its left wall bent outward. The action, seen from the bottom, has had metal removed below the rails, particularly toward the rear of the action. However, the rails themselves are unaltered.

one down into the magazine on top of the first. Then I went to work under the left rail, widening the action and thinning the left wall of the magazine, then bent it very slightly outward.

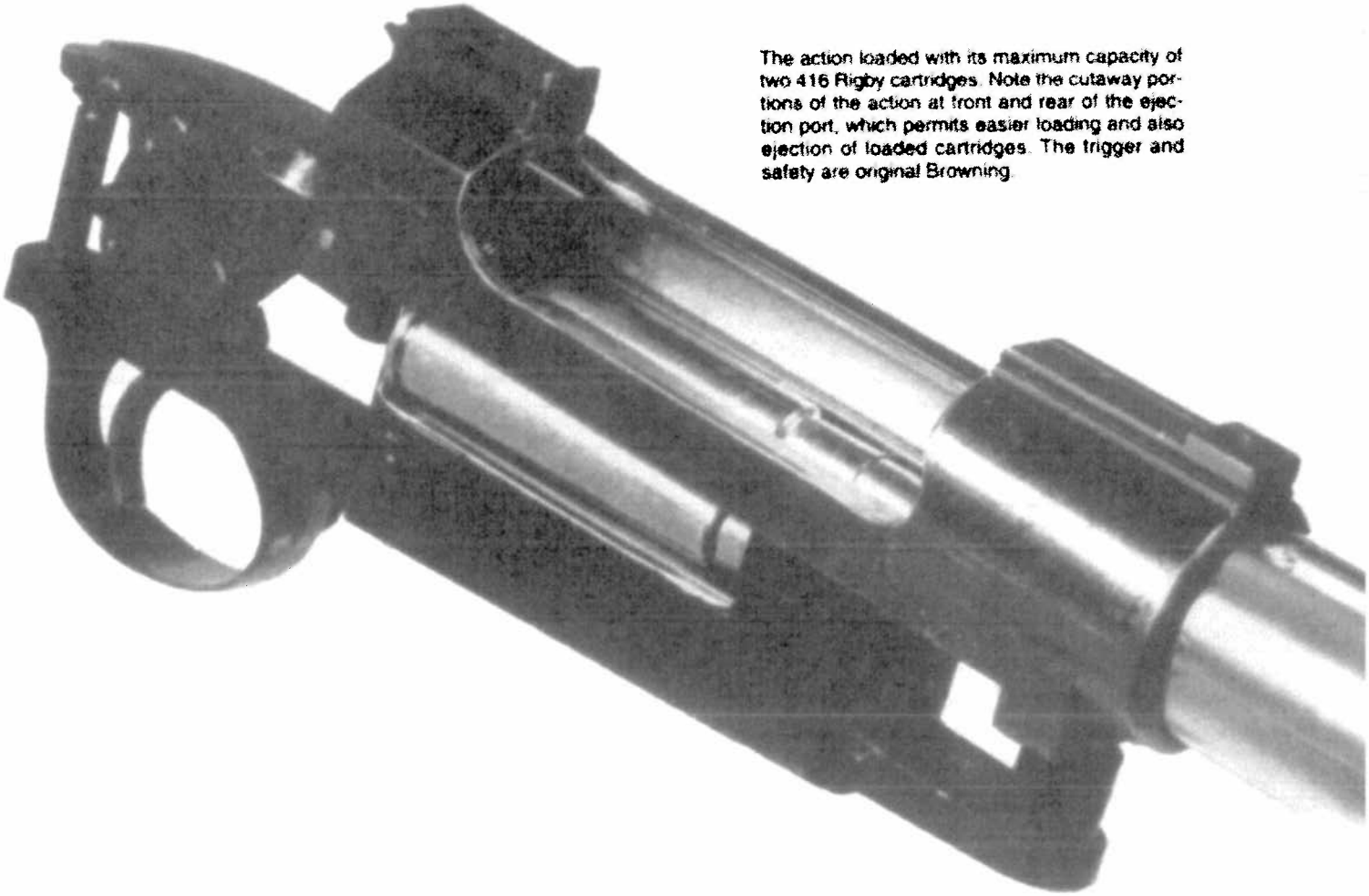
After this work, I discovered the magazine follower no longer restrained the first cartridge as it once did. If I had only one round loaded into the magazine it would now pop out. The left front side of the follower now had nothing to press against and sagged to the left.

I cured this by welding a bit of metal onto the left side of the follower, near its front, to keep it pressing against the right cartridge. Now the first (lower) cartridge stayed firmly in place under the right rail.

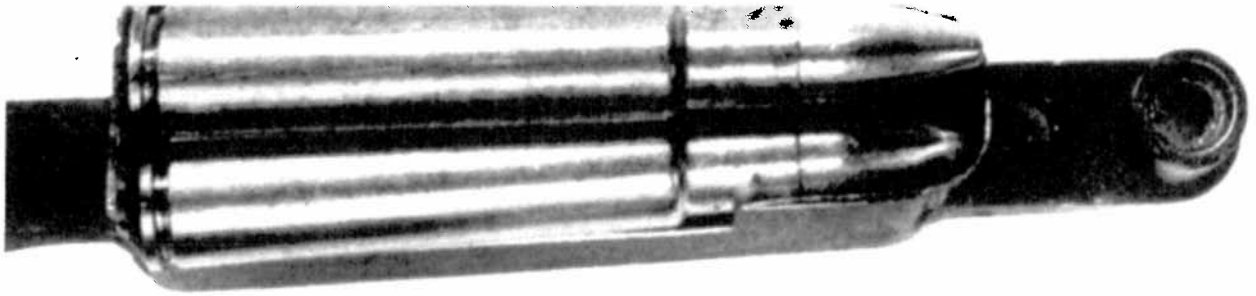
Once I had room for two rounds, I discovered I couldn't reliably keep both of them in the magazine as I worked the bolt. Any vibration or even just opening the bolt over them could cause one or both to pop out, though the rifle worked perfectly with only one round loaded.

I watched carefully as I pressed the second cartridge down on top of the first and discovered the lower cartridge was being forced to the left, toward the center of the rifle, by the right wall of the magazine box. Thus, the lower round pressed not against the side of the upper one, but against the bottom of it as shown in my diagrams.

I had made as much room as I could under the left rail, and it looked OK. However, that lower cartridge needed to get over to the right more and press the top one tight against the left action rail, thereby restraining it. I could not get the



The action loaded with its maximum capacity of two 416 Rigby cartridges. Note the cutaway portions of the action at front and rear of the ejection port, which permits easier loading and also ejection of loaded cartridges. The trigger and safety are original Browning.



just fit into the original aluminum FN Browning magazine box with no room to spare. The lower cartridge overhangs the box slightly and is retained by the stock wood. Works perfectly.

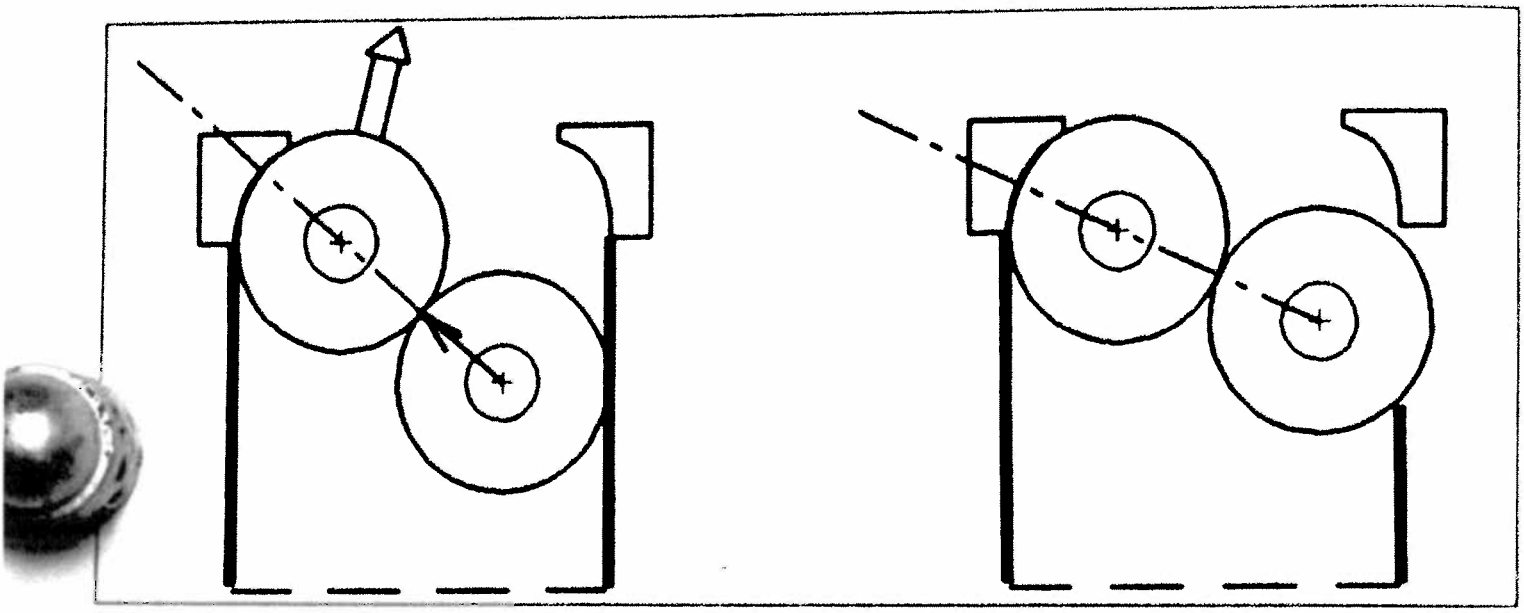


Diagram A (left) illustrates the problem with fitting two 416 Rigby cartridges into a magazine that isn't wide enough for them. The force from the lower cartridge pressing too far down toward the bottom of the upper cartridge causes the upper one to be ejected from the magazine as a result of the slightest vibration. When the bolt is opened to chamber a round, the jar of the bolt hitting the bolt-stop is enough to cause one or both cartridges to pop out of the box, causing a jam. The spring force retaining the cartridge is represented by the line bisecting the primers. Diagram B shows the author's solution to this problem. By cutting away the right side of the magazine, he created more room for the lower cartridge. Now the line of spring force (between the two primers) becomes more horizontal, keeping both cartridges down under the rails and under complete control.

right side of the magazine box any thinner.

After a very long period of meditation, the solution came: Simply get the magazine box out of the way and let the cartridge rest against the wood of the stock, outside the box. That would effectively give me a wider magazine box. I could chamfer the lower edge of the action rail on the right so the lower cartridge would climb that edge after the first cartridge was fed into the chamber. I cut away the box from where the lower cartridge pressed against it, smoothed the edges, and then tried it. It worked perfectly, much to my satisfaction.

After I did a bit more work, smoothing and fairing the edges of everything, I discovered I had a totally reliable two-shooter in 416 Rigby. It holds the ammunition securely in the magazine and feeds them extremely well from any rifle position and at any speed. I couldn't ask for more, except perhaps for more magazine capacity.

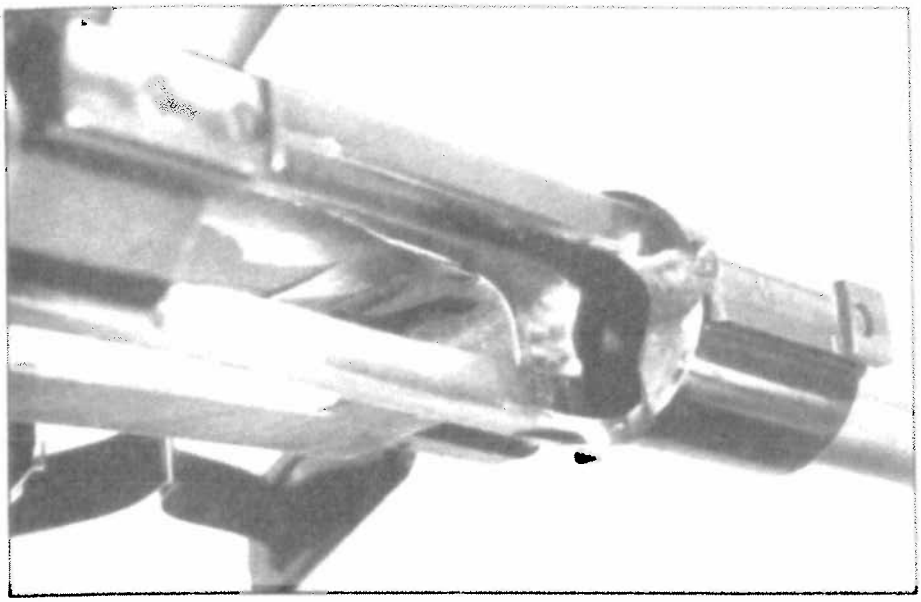
I discovered it is not possible to make the rifle accept a third round without making a new magazine. If I wanted to do that—I don't—I'd try to utilize the stock wood for the walls of the new box.

I don't like to carry a bolt-action rifle with a load in the chamber. I prefer to carry the rifle with its chamber empty and load every round from the magazine at all times. All my bolt-action big game rifles are controlled-feed designs, and I have the habit of loading all of them from the magazine, not dropping one "up the spout." I don't want to change my gun-handling habits just to get a third shot out of the Rigby...though I *can* load three.

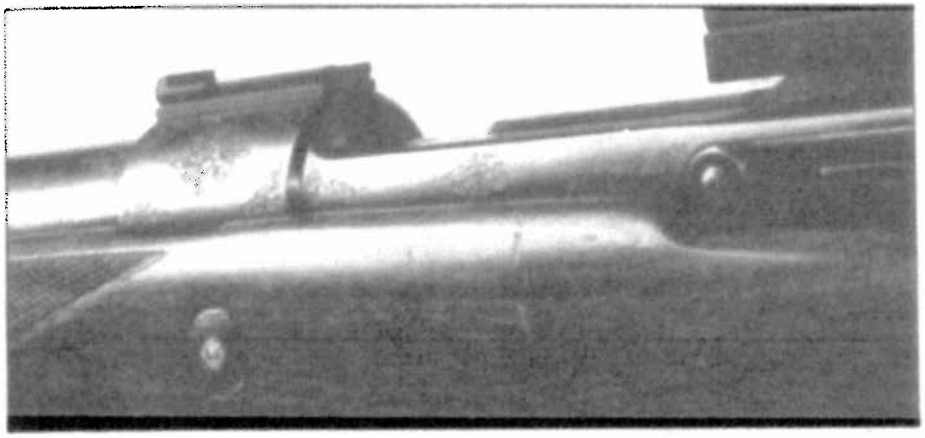
Perhaps the biggest advantage of putting together this project is that I ended up with a very light, very powerful rifle. I never feel the recoil when shooting any rifle at game, and I prefer powerful rifles for all my hunting. If I have a choice of two rifles of equal weight for any shooting job, but one is more powerful, I'll usually choose the more powerful rifle (within reason, of course). My FN Rigby 416 weighs just under 8 pounds with iron sights and two rounds, all ready to go. I haven't put a scope on it, but if I do, the total weight will be about 8½ pounds.

A friend has a 425 Express with ballistics similar to the original 416 Rigby that weighs even less than mine, and he had it Mag-na-ported. He says the kick with even very heavy loads is tolerable. I haven't found muzzlebraking to be necessary with this rifle because most of my shooting is with light bullets at moderate velocities, and they don't kick as much as full-power factory 410-grainers at 2400 fps.

When I finally had a fully function-



The feed ramp required only minimal metal removal. The author widened it slightly below the rails and polished the ramp surface. The Rigby cartridges quickly climb the ramp. The author radiused a notch into the right side of the action ring in order to ease loading and permit ejection of loaded rounds. The small vertical notch in the action ring at the rear of scope base is unnecessary.



Author Ray Ordorica put the finishing touches on his 416 Rigby by engraving it in an English-style rose-and-scroll pattern, then rust-bluing it. The scope bases, by Warne, accept a 2.5x Weaver in the latest Warne OD rings.

Africa is the intended hunting ground of most 416 Rigbys. The author (left) took this impala under the guidance of PH Tony Calavrias, Kiboko Safaris, in the Selous Game Reserve in Tanzania. The 416 Rigby is ideal for one-rifle African hunts, well suited for taking plains game at long range or Cape buff up close.

al rifle in my hands, I became considerably more enthusiastic about the project. I shortened the forend 2 inches, reshaped the entire stock, gave it a best-quality oil finish, and checkered it in a 20-line-per-inch pattern. Although the stockwork is done, the metalwork you see in the photos here is quite rough. All of it has now been cleaned up and polished to give smoother feeding and better looks. The trigger needed a bit of work, but now it's perfect. I have engraved the action in a rose-and-scroll pattern, and I'm now rust-bluing the rifle.

I experimented with the new Warne combination aperture sight/scope base, and though it is an excellent sight, and even though I really like aperture rear sights on all-purpose rifles, I decided I didn't want it on this rifle. I installed an adjustable wide-angle express rear sight and a barrel-band, large-bead front sight, both made by Precise Metalsmithing Enterprises.

This project proved that it is possible to stuff the 416 Rigby into an original '98 Mauser action and make it function perfectly with that big cartridge. It ends up lighter than can be built on a magnum-length action. I think the project is viable for any outstanding '98-sized large-ring action, but not for just an ordinary '98 that is of questionable ancestry. No matter how good the action, one must never use heavy handloads in a Rigby built on a '98 action.

I think there are better ways to get a 416 Rigby. Today, you can buy a Ruger 416 Rigby bolt action, and they are great bargains, in my opinion. Ruger also offers their Number One single shot in 416. Dakota offers their Model 76 African rifle in 416 Rigby in either right- or left-hand versions. Original Rigbys also pop up from time to time, though they will never be inexpensive. The 1917 Enfield action is even more suitable to the 416 Rigby than the '98, as is the Korean-made BBK magnum Mauser action, and the Brno ZKK 602.

Paul Roberts, director of John Rigby & Co., told me recently that Rigby did in fact use FN actions to make their 416s shortly after WWII. He said they didn't like doing it, for many of the reasons I've listed. Be that as it may, Mr. Roberts did formally establish the fact that John Rigby & Co. had made this conversion before I did it. Even though my FN doesn't have the original "Rigby's Special 416 Bore for Big Game" engraved on it, I'm happy to be in good company. ●

FROM RAY ORDORICA

CUSTOM 416 RIGBY/FN MAUSER,
s/n 20723
with 2.5x WEAVER SCOPE (WITH POST) IN QD MOUNTS.

NOTE!! RAY ORDORICA'S
ARTICLE FROM
1997 GUN DIGEST
INCLUDED IN BOX.

Note: Stock modification, checkering, action-modification concept, gunsmithing, engraving, and rust bluing done by Ray Ordorica. (Signed on action and with his monogram under the front-sight band.)
[Barrel installation and chambering done by Kerry Olson (sp?) in 1991 in Alaska.]