

Guns

M A G A Z I N E

JANUARY
1955

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SHOOTIN' IRONS
OF THE OLD WEST

RESTORING A MUZZLE LOADER

MACHINE GUN MECHANICS



RISE OF THE
VARMINT RIFLE

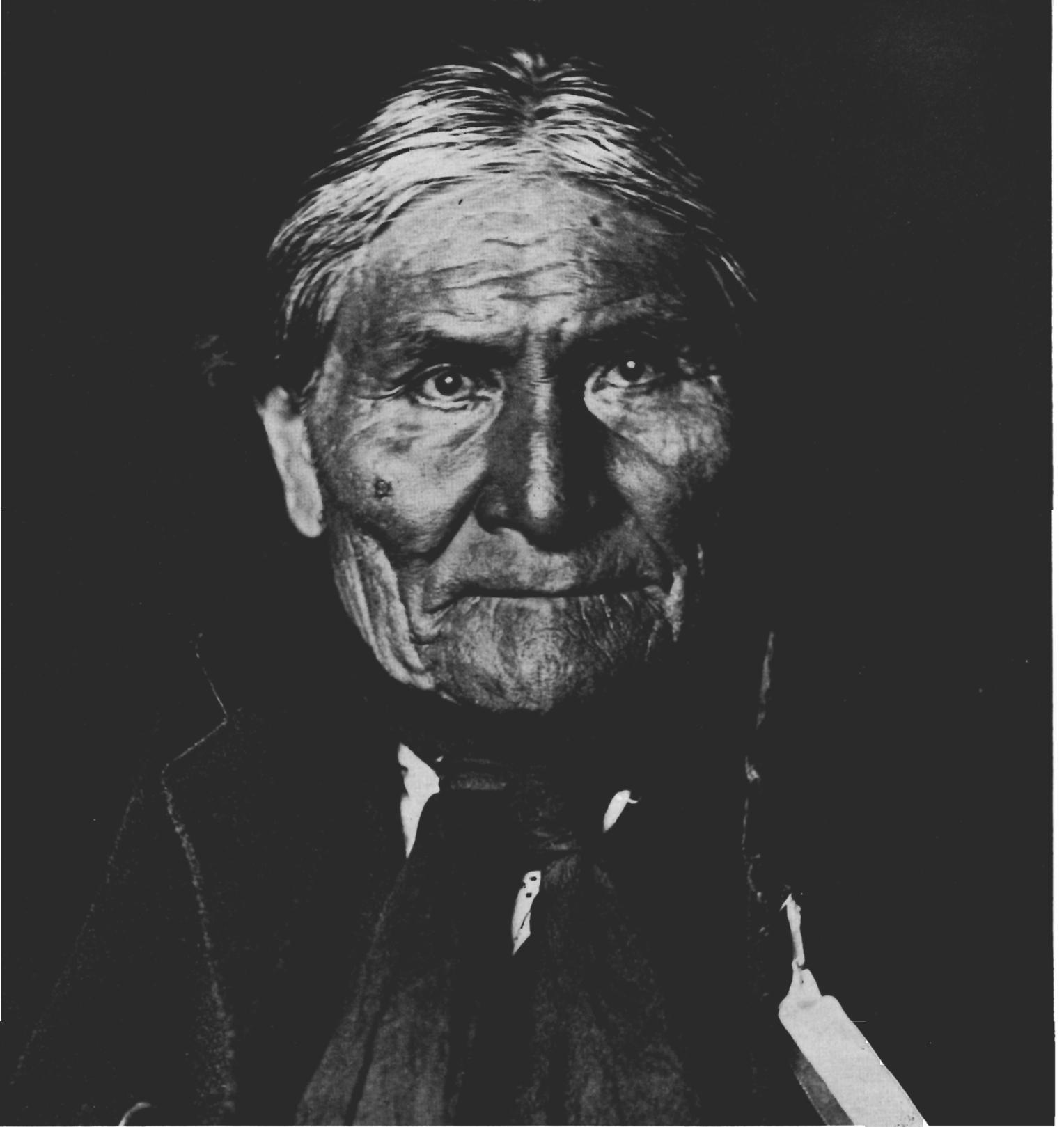


Photo from State Historical Soc., Lincoln, Nebr.

FIGHTING MEN OF THE WEST . . . GERONIMO

There is a quiet sadness in his eyes—a noble fierceness. Here is no beaten Indian of little pride, for this is Geronimo! War chief of the “Cheery Cows”—the Chiricahua band of Apaches—he led General Cook’s men a ten year chase. Slipping like a wolf of night through regiments flung out to trap him, Geronimo terrorized New Mexico and Arizona. Cornered in 1886 at Skeleton Canon, Arizona, the Apaches were transported to Fort Pickens, Florida, by the Army and later to Fort Sill, Oklahoma, where Geronimo died in 1909, aged 80. Gun collectors still wonder about the whereabouts of Geronimo’s rare Dance Bros. revolver.

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Volume One

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Guns

MAGAZINE

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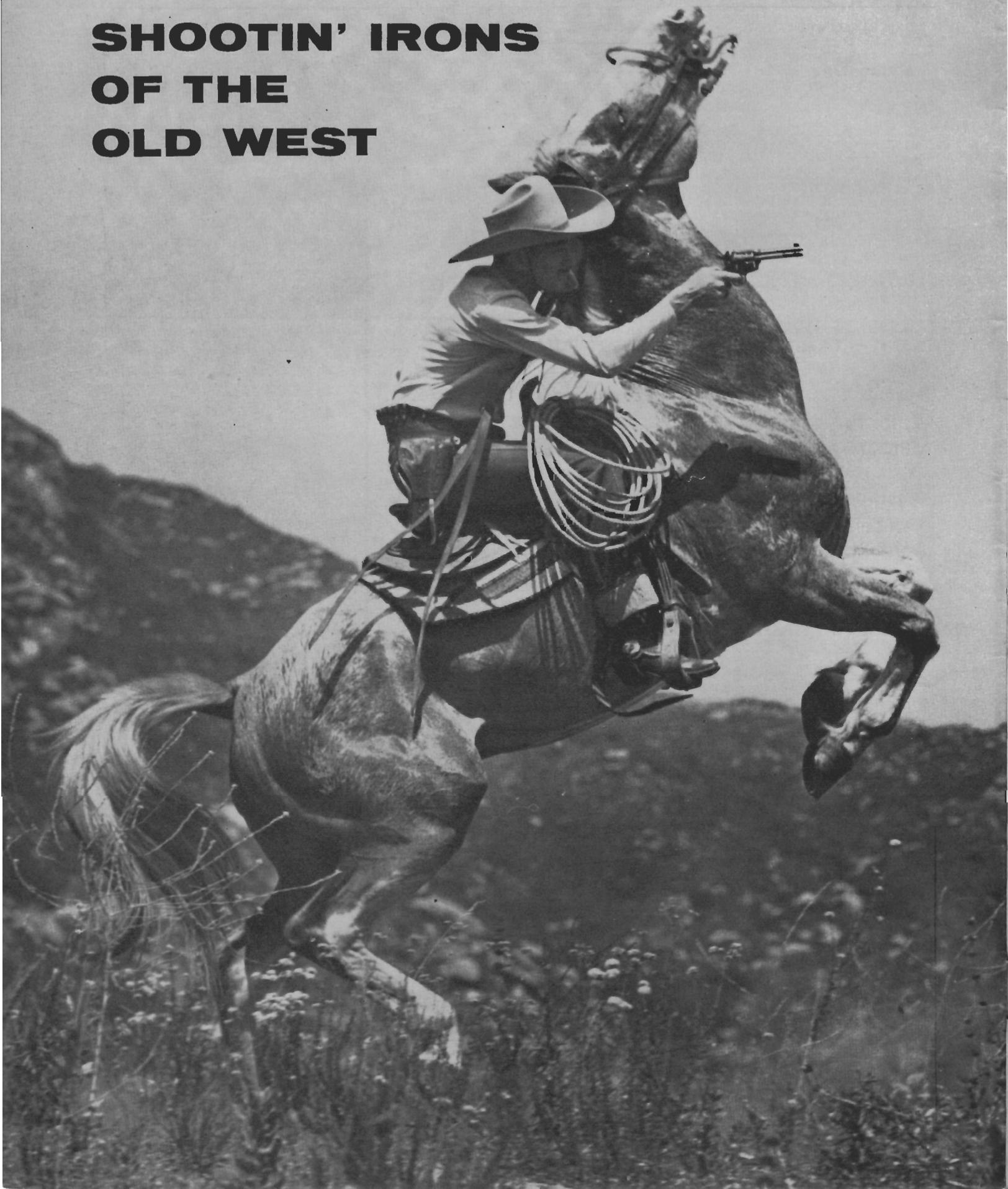
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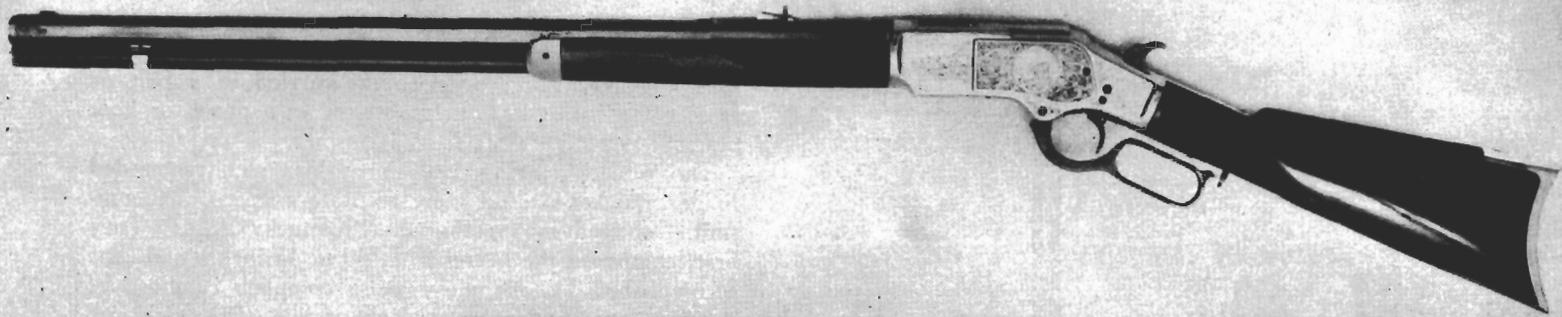
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**SHOOTIN' IRONS
OF THE
OLD WEST**





"1 of 1,000" Winchester M1873 is among rarest of historical western guns. Barrels were selected for unusual accuracy.

By M. R. FULLER

From beyond the wide Missouri to the modern mantelpiece, those western guns have romance; and a story to tell

EARLY WESTERN firearms did not just magically *appear*, oiled and loaded and ready to do the best possible job on Indians, bad men, wild animals as they came into gun shot! In fact, some of the guns which have become an important part of Western lore were not even well designed for the attack and defense missions they had to perform.

If you'd gone out into the old, old west—the west of the early mountain men—you would probably have seen a bewildering variety of single shot muzzle-loading flint-lock and caplock guns. A few double-barreled guns were also to be found.

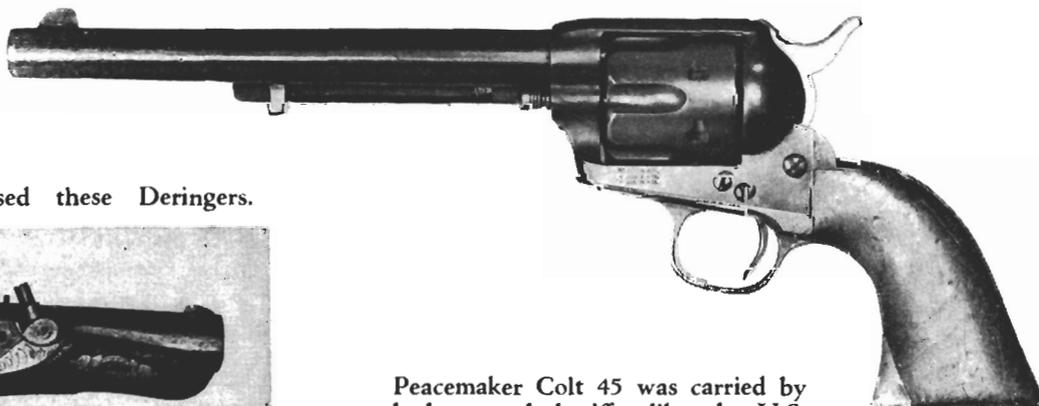
The muzzle-loaders, even when they were double-barreled, were not fast enough. The Indian who could keep a steady succession of arrows between himself and his

enemy was better armed. Wild animals too often were not killed by one shot, fired in frightened haste. And there was no time for a second shot as the animal attacked!

Again, the renegade who could fire first had the strong advantage—plenty of time to attack, plunder or kill and make his escape before the single-shot gun could be loaded, or reloaded.

They were good guns, though, these early single shots—the best the westerners had. Coupled with persistent, heroic owners and steadily improving designs of the gun manufacturers, they were the guns that conquered the west and all its hazards.

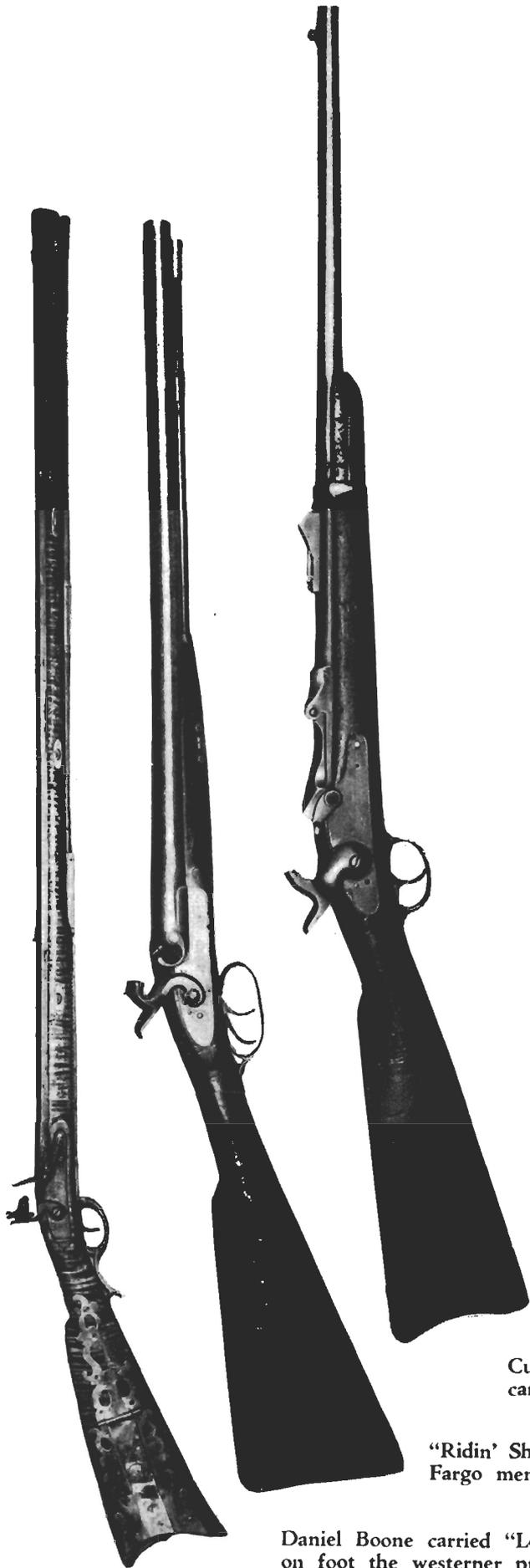
First rifles used by the settlers were short-barreled flintlocks of large bore. While these rifles were basic equipment of the early west, pistols were the real "life insur-



Peacemaker Colt 45 was carried by badmen and sheriffs alike: by U.S. Cavalry and Indians on the Frontier.

Mississippi gamblers used these Deringers.





ance.” The sidearm went wherever the settler did, moving, working, eating or sleeping—carried in a belt or sash, slung in saddle-holsters, stuffed in a pouch or boot top, but never very far from its owner.

The settlers moving into the wilder country needed lighter, quicker-loading, more accurate weapons. The gunsmiths obliged by creating the “Kentucky Rifle.” They first lengthened the barrel from 40 to 45 inches and thus accomplished by one move more complete combustion, better balance and a longer sight radius. The stock was extended the full length of the barrel and fitted with a ramrod.

Kentucky rifles averaged about .54 caliber and fired balls weighing about a half ounce. But in addition to rifling, the most important innovation of this weapon was the tallow-soaked patches of cloth or buckskin which speeded loading and served as a gas check. Hitherto a naked lead ball of approximately the same diameter as the groove diameter of the bore had been forced down the barrel. The Kentucky patch wrapped around a smaller ball cleaned the bore when forced down on top of the powder and it fit so snugly that it automatically imparted the necessary spin to the ball when it was discharged. The patch itself fell off soon after it left the muzzle, allowing the ball to fly on unimpeded.

The Kentucky rifle was so superior to any other shoulder firearm of its time that fantastic stories have arisen about its accuracy. It was extremely accurate for short ranges but not, by modern standards, for long range shooting. Dillin says that the favorite target at 20 yards was the head of a tack; at 60 to 100 yards the head of a turkey; at 200 yards the body of the turkey. This was about the limit of the Kentucky rifle’s accuracy, however. At 400 yards the best it could do was to hit an object the size of a cow.

When the repeating handgun came in—there were a few before 1830, but Colt’s original Paterson revolvers appeared in 1836 and the Allen and Thurber pepperboxes in 1837—things began to change. It didn’t pay to carry a revolver too haphazardly; the thing might go off while you were trying to disentangle it from wherever you had last put it, and, if you really wanted it in a hurry, the hammer was almost sure to get caught on some part of you.

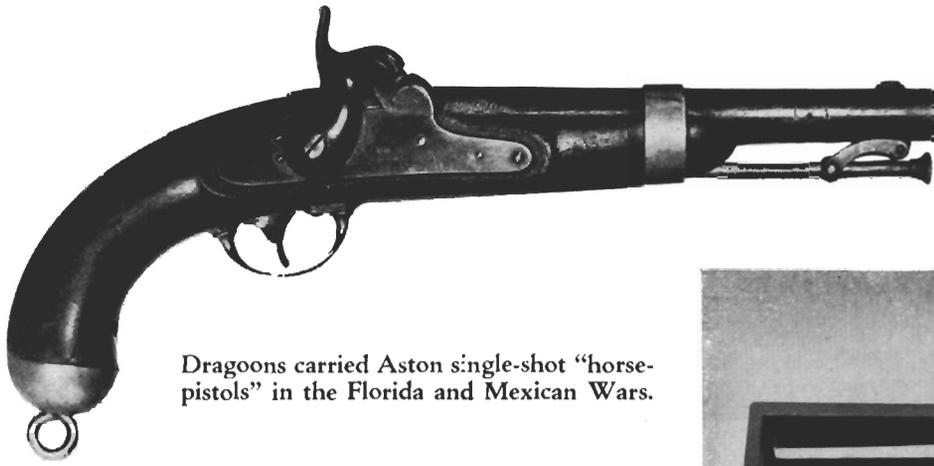
Of course, the Allen pepperboxes were quite streamlined and were double-action—fast on the draw and fast in shooting. But since they had no sights and a very hard pull, whenever anybody opened up with an Allen, friend and foe alike hunted a hole.

“The Patent Arms Manufacturing Company,” which produced Colt’s first commercial revolvers, now known as the Paterson Colts, had lasted only from 1836 to 1843.

Custer’s men lost some of these Springfield single-shot carbines to Sitting Bull’s braves on Rosebud in 1876.

“Ridin’ Shotgun” was important in frontier days. Wells Fargo men carried sawed-off double guns such as this.

Daniel Boone carried “Long Kaintuck’” but a-horse or on foot the westerner preferred a shorter, plainer rifle.



Dragoons carried Aston single-shot "horse-pistols" in the Florida and Mexican Wars.

Sam Houston liked these early Colt Paterson revolvers which were purchased by Texan Republic in the 1830's.

It made only around 2,700 revolvers in three styles (pocket, belt and holster) and in calibers .28, .31, .34 and .36, plus a few long guns. But these products were enough to make Colt famous on the frontier.

The Texas Navy had purchased some revolving pistols and carbines in 1839 and these were later turned over to the Texas Rangers. Colt had earlier sold about 75 revolvers to officers of the South Carolina militia and no doubt some of these, too, went West.

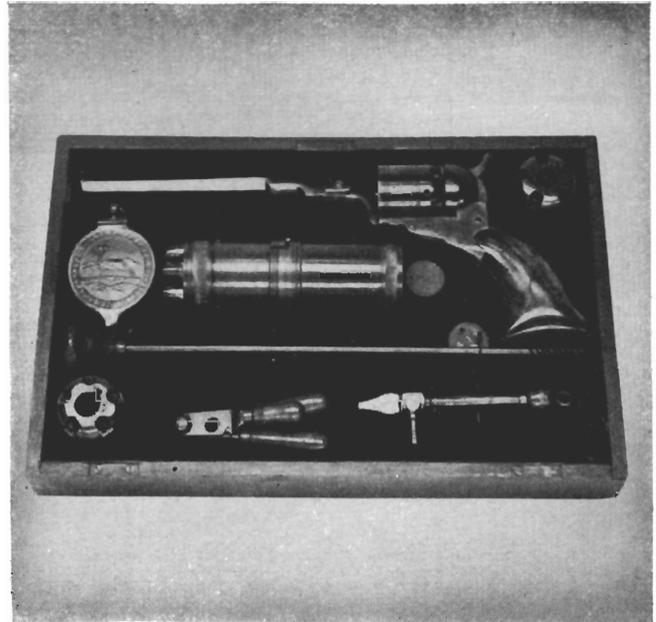
Indeed, though the early Allen pepperboxes outsold the revolver, the fact that you could hit something with the Colt weighed in its favor.

Texas' War for Independence, the Mexican War and the Gold Rush were a bonanza for handgun makers. Incidentally, the first big order (1846) caught Colt without a factory (the Paterson plant had been sold out), but he turned over most of the contract to Eli Whitney until he could establish his own plant at Hartford, Conn., in 1847. His "Walker" pistols, named for the famous Texan who had persuaded Colt to re-enter the field, and the later Dragoons won for Colt pistols a pre-eminence that they never entirely lost in later years.

Not that Colt had the field to himself very long! The Leavitt revolver, with hand-turned cylinder, appeared in 1837, and Wesson and Leavitt had prepared an improved arm which appeared in 1849 only to be knocked out in 1851 by Colt patents covering a mechanically-turned cylinder.

But everybody was "waiting at the door" when those patents ran out in 1856, and not all waited that long. In England, the Adams (or Deane-Adams) revolver, which was to become Colt's earliest and deadliest rival for world markets, was exhibited at the same Great Exhibition of 1851 at which Colt won a prize.

The Adams appeared in the United States—appropriately enough manufactured by the Massachusetts Arms Co., whose Wesson and Leavitt revolver had a few years earlier been clobbered by Colt. Revenge, perhaps? Remington entered the race in 1857 with the Beals pocket revolver, followed in 1860 by the heavy Beals military



revolvers and then by a whole series of belt, pocket, police and service revolvers.

A few of the other makers who got into the act were Savage, Starr, Walch, Warner (Springfield) and Whitney, and one, the Manhattan Fire Arms Company (of Newark, N. J.), produced a revolver which looked enough like a short-barreled Colt to satisfy anybody—except Colt.

The next outstanding American development in long guns came with the breechloading mechanism patented in 1848 by Christian Sharps. Paper cartridges were first used with the percussion cap, but the Sharps design was later adapted to the use of metallic cartridges when they were developed.

In the Sharps device, the breechlock was lowered by action of the triggerguard lever. The paper cartridge was inserted, and when the breech was closed again the paper at the end of the cartridge was cut automatically by an edge (like a knife blade) at the top of the block. This permitted the primer charge to flash directly into the powder charge. Early models could also be muzzle-loaded if the breech fouled shut. The Sharps rifle was used extensively in the Civil War, and in its metallic cartridge modification is generally considered most responsible for the virtual extinction of the bison.

Rifle design was determined by progress in cartridge design. Over a period of years the paper cartridge fired by a percussion cap which occurs as a primer gave way to metallic rim fire cartridges, the pin fire, and finally the center fire cartridge with a brass case which expanded momentarily under the expansion of gases inside it and effectively sealed off the explosion.

Meanwhile, in the field of side- (Continued on page 48)

HICKOK-



Hell's Own Marshal



James Butler Hickok

"I ADMIT I'VE KILLED MEN—BUT
NEVER UNLESS IN ABSOLUTE SELF-DEFENSE OR
IN PERFORMANCE OF DUTY."

By ROBERT ROZEBOOM

Illustration by Robert Fuqua



WILD Bill Hickok! They told stories about those silver-plated sixshooters on his hips. He could plug a dime, edgewise, at 20 paces—drawing and firing without even seeming to aim. Or he could chase a tin can through the air, alternating his shots with the rapid precision of a Gatling gun.

But when it was man-against-man they said a single bullet was generally enough.

It wasn't hard to see why they called him "Wild Bill." You could see it in the way he carried himself—200 pounds, six-foot-three in his boots, bent forward as if his high heels were tipping him. You could see it in the tapering lengths of his hands as he nursed a drink, in the bland gray eyes that stirred restlessly, in the thin tight line of his mouth, centered beneath a drooping mustache.

You were aware of it even in the calm, precise diction of his conversation:

"I suppose I'm called a red-handed murderer—which I deny. That I've killed men, I admit, but never unless in absolute self-defense or performance of an official duty."

James Butler Hickok was born May 27, 1837, on the Illinois prairie, and was soon the best rifle shot in La Salle County. He bought his first Colt sixshooter when he was 12. He left home at an early age—in the belief that he had killed another lad in a fight. He celebrated his 18th birthday aboard a steamboat for Kansas Territory.

Here he introduced himself as Bill, for reasons never quite understood. This was the period of the Free-Slave border turmoil in Kansas, in which young Bill

... Hickok fanned his .45 and Coe dropped after getting off only one shot.



Main street of Hays City, Kansas, scene of Hickok's fabulous exploits as town marshal, was wide-open here in 1879.

Hickok was to serve as personal bodyguard to the famous "General" Jim Lane.

In the fall of 1859 22-year-old "Wild Bill" threw in with a passing Santa Fe Trail freight caravan. He was accompanying a muletrain for Russell, Majors & Waddell high in New Mexico's Raton Pass when he started the long chain of gunfights which was to build his reputation, the controversy, and the legend.

The first battle was with a bear! He was riding ahead and alone, when a large cinnamon bear blocked his path. Bill put a bullet between her eyes, stirring the animal into wild anger—and his pony tossed him as the beast attacked. Bill lost one pistol in the scramble, emptied the other, and finally managed to disembowel the bear with his Bowie knife.

Half-scalped, with chest and thigh lacerations and a mangled arm, young Hickok was not predicted to survive.

That he did was a miracle. In March of 1861 the Company sent him to the Pony Express station at Rock Creek, Nebraska. With the job of stocktender he was expected to recuperate. It was one helluva recuperation.

Involved first was David Colbert McCanles, big, black-bearded and obnoxiously southern. He was busy trying to settle affairs in time to join the Confederacy.

Rock Creek Station, consisting of two ranchhouses, was McCanles' property. The east house had the Pony Express traffic.

The Pony Express station at Rock Creek was McCanles' property. Two months after Hickok arrived there, the Pony sold out to Wells Fargo and new stationmaster Horace Wellman arrived with his wife.

Dave McCanles had arranged to sell Rock Creek station to the new management on a monthly payment plan. When there was a delay in arrival of the June payment, McCanles became ugly and told station master Wellman to pay up or get out!

Battle lines were drawn—McCanles and his Rebel sympathizer friends against Wells Fargo, station master Wellman, and stock tender Wild Bill Hickok.

On the afternoon of July 12, 1861, Dave McCanles appeared at the Rock Creek ranch house, accompanied by Jim Woods, his cousin; Jim Gordon, a friend; and his 12-year-old son. Woods and Gordon waited in the barn, ready to come a-running if there was any trouble.

McCanles and his son spoke to Wellman at the ranchhouse door, giving him a final "pay or else" warning. Wellman went back inside. Moments later, Hickok was at the doorway.

McCanles frowned. "What the hell you got to do with this? If you want to take a hand in it, come out and we'll settle it like men." Bill just stared at him. "We're friends, ain't we?" Dave asked suddenly. "I want to know. We have been, ain't we, Hickok?"

"I guess so."

"Then send Wellman out here so I can settle with him, or I'll come in and drag him out."

Bill moved back into the house to confer with Wellman. McCanles walked around to the front door, looked in, asked for a drink of water. The bucket of water was on a table near him.

Hickok came over and spooned Dave a dipperful. Then Bill walked slowly back to a calico curtain, which partitioned off the sleeping room.



Hickok in formal garb of law-enforcement officer.

McCanles must have been nervous, or excited. He dropped the dipper, and ordered Bill to halt. Wild Bill stepped behind the curtain.

McCanles: "Come out of there and fight fair, or I'll come and drag you out."

Hickok: "There'll be one less sonofabitch when you try that."

Dave did a rash thing when he moved forward, outlined in the doorway like he was. Flame stabbed through the curtain and he sprawled dead on the doorstep.

Woods and Gordon heard the shot. Woods entered from the side. From behind the door Bill drilled him twice. He spun and threw a slug into Gordon, who was coming through the front door. He followed Gordon to the barn, plugged him again. Gordon took to the creek timber and Bill emptied his pistols at him.

Woods was in some weeds alongside the house, where a woman finished him with a grubbing-hoe. Bill reloaded. Then he and some others got on Gordon's trail with a bloodhound and found him under a tree, where one Doc Brink did the honors. . . .

After that they called him *Wild Bill Hickok*.

Wellman, Hickok, and Brink were arraigned, but public sentiment had already acquitted them. The national situation being what it was in 1862, Southerners were becoming unpopular.

Bill rode back to Ft. Leavenworth and was hired by a freighting agent. As wagonmaster of a train carrying Government supplies he was ambushed by Rebels east of Independence, Missouri. The indiscriminate gunplay irritated Bill. He joined the Union Army.

Throughout the conflict Wild Bill was attached to Southwest Army headquarters as a courier, scout and spy. Often in Confederate disguise he infiltrated Southern units in Arkansas and Missouri and saw front-line action at Pea Ridge. Straddling a beautiful captured mare named Black Nell, he helped stem the last advance of Old Pop Price in the fall of '64.

The end of hostilities in April, 1865 found him at Springfield, Missouri with an honorable discharge in his pocket and a reputation to uphold. But there was one man in town who was not impressed by Wild Bill, reputation or no reputation.

Big Dave Tutt was a Reb deserter who had turned Union spy and scout. Dave had a beautiful sister. Behind enemy lines in Arkansas, Bill Hickok had met her and liked her. But near Ozark, in the same state, he had garnered the more earthly affections of a high-spirited wench named Susanna Moore.

In the winter of 1864-65 Miss Moore was living with Bill in Springfield. Dave was also in town, and that spring the Tutt family—including lovely Miss Tutt—came to join him.

Susanna Moore had a temper. The potential renewal of Hickok's attentions to Miss Tutt annoyed her. She began being nice to Dave Tutt, of all people.

Bad blood quickly brewed between Bill and Dave. Dave became spokesman for the Hickok-hating element in Springfield. Finally Bill refused to play cards where Tutt was a party.

Dave took to kibitzing and would stake any anti-Hickok ingredient in a game. One July evening Bill cleaned a Tutt-backed player for around \$200. This annoyed Dave.

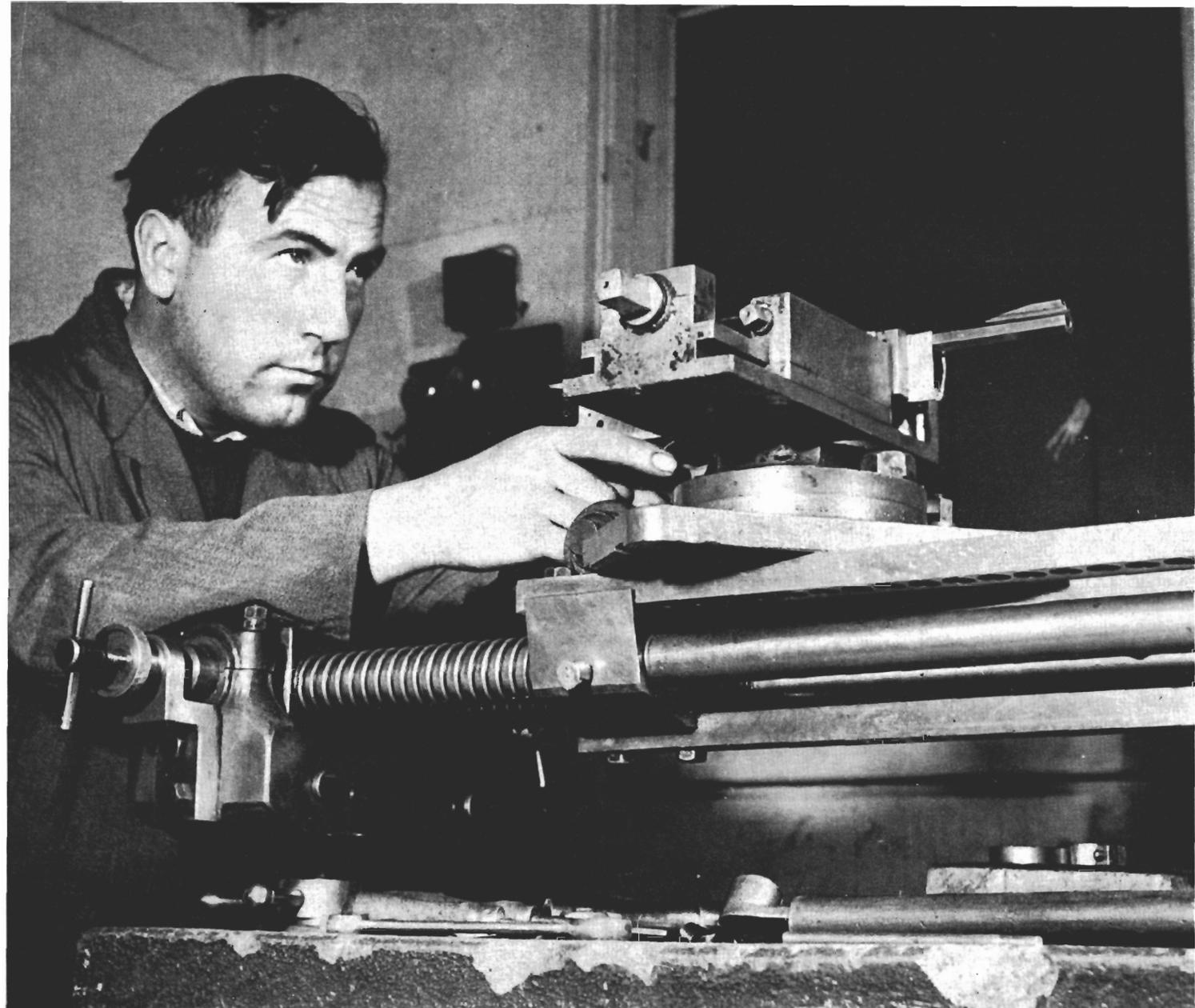
"Bill, you got plenty of money now. Pay me that \$40 you owe me on that horsetrade." Bill paid him, but Dave was not satisfied. "You owe me \$35 more; you lost it playing with me the other night."

"I think you're wrong, Dave. It's only \$25. I got a note on it downstairs. If it's \$35 I'll give it to you."

Hickok's gold watch was on the table. Dave pocketed it. I'll just keep this watch till you (*Continued on page 44*)

Young Hickok was imposing figure in his Indian-fighter buckskins with his belted six-guns and bowie knife.





No guesswork is used when targeting Hammerli. Machine rest holds barrel firmly—eliminates human errors.

BORN OF COMPETITION, HAMMERLI FREE PISTOL DOMINATED THE OLYMPICS—TO DATE, IT HAS TAKEN ALL THE MAJOR TROPHIES.

By William C. L. Thompson

Photographs by Sydney Latham, Globe

VISITORS to shooting matches tend to get blase—to think that “they’ve seen it before.” Americans at the Stockholm, Sweden World’s Championship pistol matches in 1947 were a little different: casual onlookers and ardent shooting fans went away convinced they had seen something remarkable. First, second and third places in the Free Pistol class had been taken by shooters using a pistol new to the shooting scene, but one destined to be renowned the world over—the Hammerli single shot free pistol. A hand-gun literally born for the *Tir!*

In the Olympic meet of 1948 in London and Bisley, a

gold and a bronze medal to Hammerli! In 1949 in Buenos Aires—first, second and third again of the World’s Championships to Hammerli! In 1950, the Guatemalan Sports Games of Central America—first place. In 1952, the Olympic matches at Helsinki—again a first for Hammerli! Was there a match which could be lost by a shooter using this new wonder pistol?

The Hammerli was something new, and then again, it was only a new cover to an old book. International and free pistol matches have been held for many years. Prior to the war, many master gunsmiths in Germany and

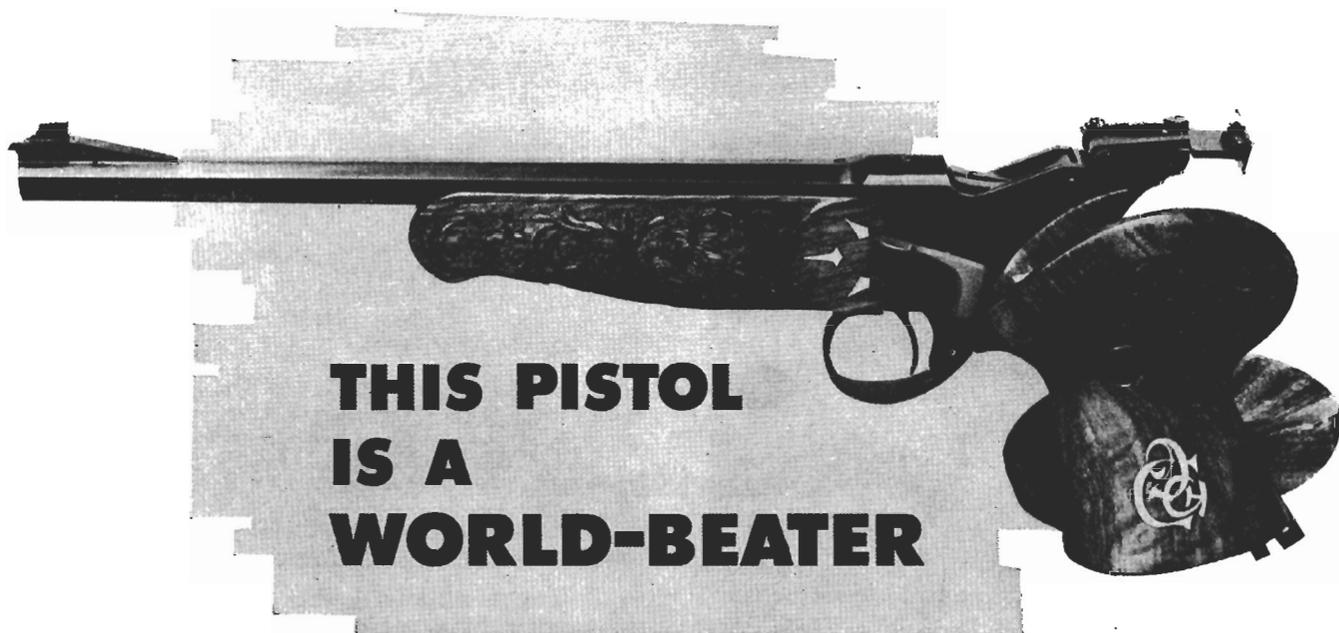
Austria made free pistols for master marksmen like Ullman of Sweden who rang up a record of 559 which still stands. These arms were designed for super-accurate shooting at 50 meters without restrictions on the limit of weight for the trigger pull, the style of grip, barrel length or sighting radius. Trigger pulls could be as light as mechanically possible, but woe to the shooter who carelessly touched one off before aiming properly—his was counted as a shot and no alibi!

Pistol stocks could not contact any portion of the wrist, which of course would have afforded a degree of support to the shooting arm which even the advocates of free shooting would have declined. Other than that one limitation, stocks could be as form-fitting with as much support

for guns intended to compete in the free pistol class, but in Europe the designs developed to that of which the modern Hammerli is the epitome.

The term "free pistol" designates an arm intended to compete in a match with far less restrictions than usual, somewhat like a "free style" swimming match. Yet the pistols which have been built for this shooting—fashioned as they were by different gunsmiths in many countries—have evolved into styles more alike one another than a modern revolver is like another model in its line! With the least restrictions in design, the free pistol has become one of the most formally stylized!

Years ago, the single shot Smith & Wesson 22 pistols—the "Perfected" and the "Olympic" model break-open



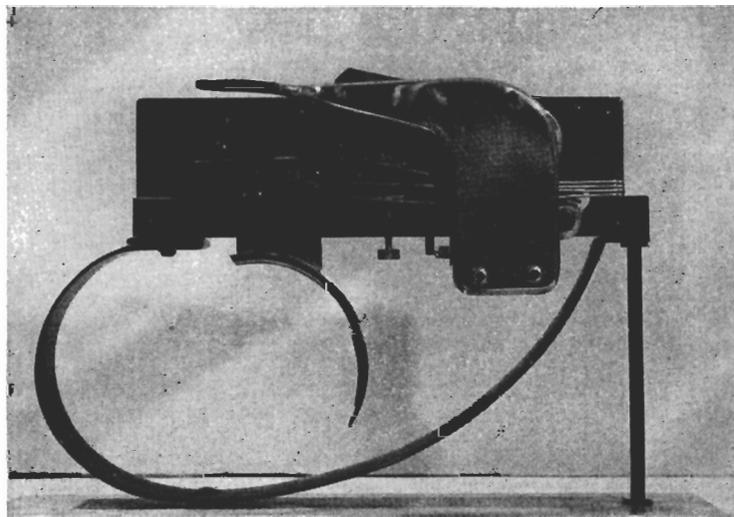
as the woodworker could shape and the shooter could get into!

The modern free pistol is a direct outgrowth of the old single shot duelling and indoor-target pistols so popular in Europe during the late 1800's. Capable of extreme accuracy when properly loaded, the old guns grew into masterpieces of precision. Long barrels had a heritage in the code duello, which decreed barrels of 10" in length to be "legal" and frowned on those which were shorter or longer. In those gay days the barrels were also of a half-inch bore, firing a round ball with percussion cap and black powder. The Gastinne Rennett and other single shot target pistols gradually decreased the bore to about 30 caliber. With the designing of the gallery or saloon Flobert pistol, a 22 cal. "little brother," the Free Pistol was on the way. The Flobert and the later pistols of the Gastinne-Rennett style copied the formal duelling pattern. With these smaller caliber bores, shooters soon discovered that their accuracy obsoleted the duelling practice targets offered. The distance was lengthened to 50 meters and with the precise accuracy of the 22 Long Rifle cartridge, a whole new code of shooting developed.

In America, altered revolver frames afforded the basis

Contoured grip is distinctive feature of the Hammerli match pistol. Adjustable rear sight hangs over hand. Note the trigger set lever.

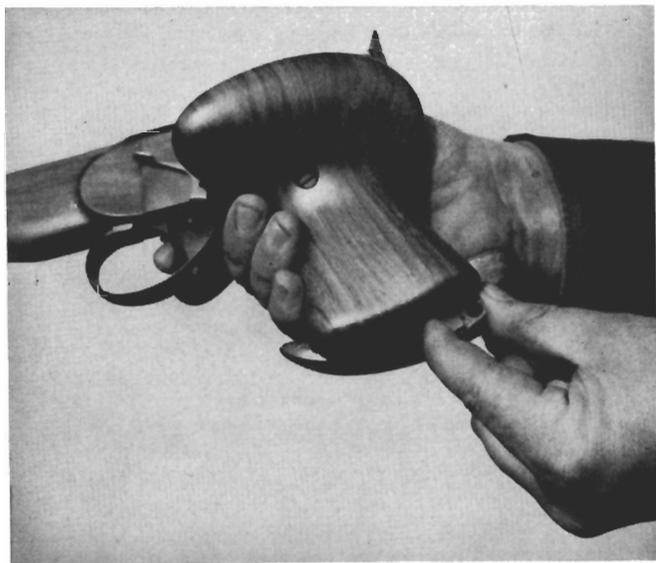
Trigger is secret to Hammerli success. The five-lever design is sensitive, yet rugged. Can be adjusted for heavy or feather touch.





MARKSMEN USE SPECIAL TECHNIQUE IN SHOOTING HAMMERLI FREE PISTOL

Form-fitting Hammerli stock has movable bottom piece which can be adjusted to width of individual shooter's hand. Custom-shaped grips are also made.



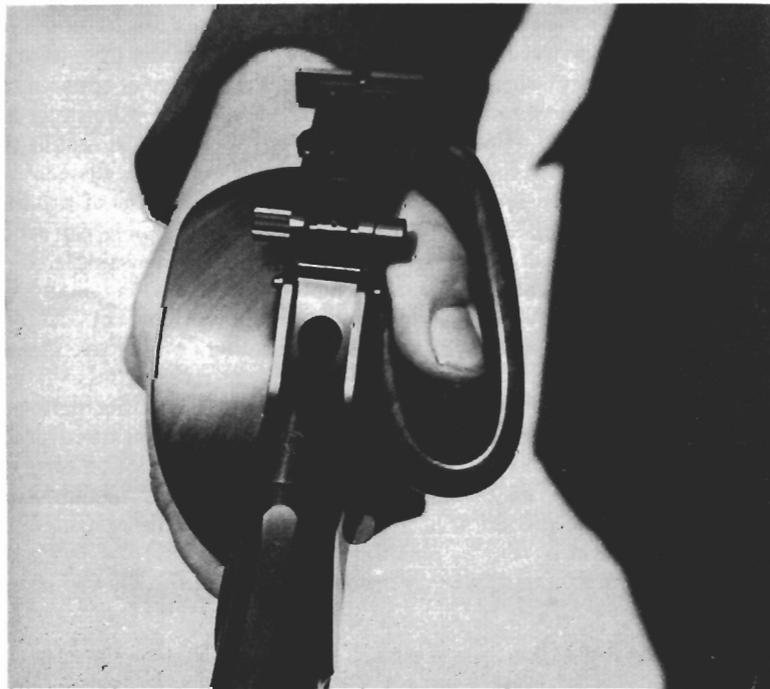
Lever at bottom of grip opens and closes breech block. Here in rear locked position, chamber is loaded, firing pin spring compressed, ready to go.

Ready to fire! With trigger set, gun loaded and cocked, the shooter has but to hold the gun in line with the target and he's a winner! If



Trigger set lever is then pressed down by shooter's other hand, which moves delicate internal levers into position. Trigger can then fire at a touch.

. . . he holds correctly and sights properly! Top view shows the deeply contoured Hammerli grip which gives shooter every help, aids in long matches.



styles—were popular among American shooters. At the International Shooting Union free pistol match held in Rheims, France, in 1924, the American team used single-shot Smith & Wesson pistols. They scored an aggregate of 2503 out of 3000—the winning team from Switzerland scored but 69 points higher. At the pre-match trials the U.S. team indicated they could shoot better than 2600! Among the high scores of the Americans for Olympic free shooting, was the record of Karl T. Frederick of New York in 1920: 496 out of 600. Another American was not to win the Olympic free matches until Sgt. Hue Benner knocked down the crown with 553 for the record in the 1952 Helsinki matches. And Benner used a Hammerli!

The Hammerli is similar to several German arms imported before the war. Old timers in the shooting game will remember the Büchel "Tell" and "Luna" pistols—the Luna differing from the Tell mainly in the position of the rear sight on an extension curving back over the wrist. The Hammerli is a much improved version of this gun.

Basically, the Hammerli is a midget Martini action. A Martini is capable of having the firing pin fall adjusted to a crisp, snappy minimum. Short firing pin fall means short lock time, and greater inherent accuracy. This the Hammerli has!

Operation of the Hammerli is somewhat complicated to the novice, but it is hardly the gun for a beginner. A lever, the end of which protrudes below the grip, can be moved by the left hand. First, the gun is held by the barrel and the right hand gently intertwined with the form-fitting grooves and channels shaped in the precisely fitted grip. In adjusting the factory Hammerli to the individual, the bottom plate of the grip can be moved snugly upward, allowing the shooter to recover the identical grasp each time the gun is picked up. Having once got a hold on the pistol, the action is opened by moving the lever forward. After placing the cartridge in the breech, it is sometimes necessary to shove the shell solidly into the chamber, to permit the rifling to engrave the bullet.

After moving the lever to the rear and closing the breech, which cocks the firing pin, the trigger must be set. The five-lever trigger mechanism is capable of being adjusted from a heavy pull to the thin edge of nothing, setting being done by the side-exposed lever. With the trigger set and the gun loaded, the shooter merely has to extend his arm and touch it off . . . and if he is a good shot it's a center bull!

Harry Reeves, Detroit police instructor, found the Hammerli set trigger a change from double-action revolvers. Said he: "It takes months of careful practice to master the light hold and the delicate control necessary for the set trigger. Once mastered, it is a far better way of releasing an accurate shot. As long as I kept in practice I could call my shots in that 2-inch ten ring and shoot scores considerably better in average than I could with my regular .22 pistol. I found that free pistol shooting and training improves my scores with all the other handguns."

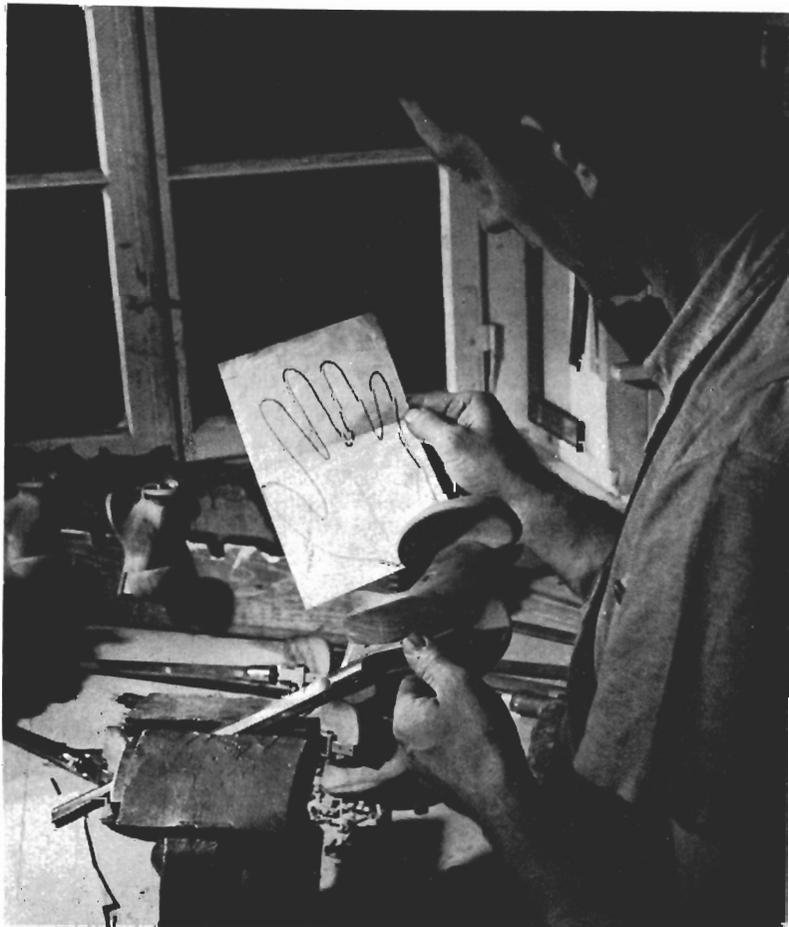
Reeves voices what many early scoffers at the free pistol came to discover—not only does the discipline of the free pistol force a good shooter to excel himself, but ammunition defects are also shown up—something not ordinarily discovered through shooting a regular pistol.

In the post-war world the records set with the Hammerli pistol prove unmistakably that it has a place. Priced at about \$275 in America, it is not a toy for amateurs, but

there is a reason for the price. Hammerli produces about 500 such pistols yearly. Yet the Hammerli Sportwaffenfabrik at Lenzburg, Switzerland, is one of the world's largest arms factories and supplies hundreds of thousands of rifles, shotguns and machine guns to the world markets. Though the demand is great, Hammerli simply cannot hire enough workmen of the skill necessary to produce the handcrafted free pistol. Even after a Hammerli free pistol has been completely finished, it is stripped down to every bolt and pin, and inspected in the most minute detail. Only when it can pass inspection to perfection—and in the machine rest make groups of ten test shots virtually touching each other at 50 yards—does a Hammerli "pass" and go to the stock room.

The interest shown by American marksmen in free pistols has prompted Hammerli to establish an agent in the U.S. He is H. F. "Hank" Grieder, and at the Camp Perry 1954 National Matches he was a busy man! From dawn 'til late at night his display shack was crowded. He had on hand a large selection of guns and found his skill frequently in demand for delicate adjustment of the sensitive trigger mechanisms. Often he would disappear and questioners could not find him—then an hour or two later he would show up from a session observing the firing line, with a pleased smile on his face. Obviously, Hammerli had scored again! ©

To achieve perfect molding of the handle to the grip of the pistol shooter, workers follow a profile of the customer's hand. Comfortable fit of the handle to the shooter's palm and fingers is one of the most important factors in good shooting.





Nickel-plated copy of Smith & Wesson was made by Orbea Bros., Eibar. These glutted country.



Hammer spur of revolver, above, was either broken or filed off. Otherwise it is exact duplicate.

THOSE TWO-BIT SPANISH PISTOLS

IT WAS NO COINCIDENCE THAT THEY LOOKED EXACTLY LIKE GENUINE SMITH & WESSONS. A TERRIFIC BUY—UNTIL YOU FIRED!

By EDWARD BENNETT

WALKING down the noisy, crowded downtown sidewalk, Hank felt lost and lonely until he passed the pawn shop window with a shiny display of guns. Here was something about the big city that made him feel at home.

Pressing his nose against the window, he eyed the collection and their amazingly-low price tags. One pistol particularly caught his eye—a Smith & Wesson 38-caliber revolver at the bargain price of \$9.45.

Inside the shop he quickly shelled out a \$10 bill and fondly fingered the gun in his pocket as he walked out. Here indeed was a terrific buy he could boast about to the boys in Mason's Corner.

Back home from his weekend trip into the big city, Hank ventured down to the town drug store after his day's chores on the farm. His pistol was tucked into his blue jeans when he strolled up to the soda fountain to tell his chum, Bob, about his bargain buy.

Bob was not satisfied just to see the pistol; he wanted to try it too. Off the two went back of the Farmer's Exchange, where there was a target for the local lads to try out their aim.

Hank carefully sighted the bull's eye and pressed the trigger. In the next instant the pistol's cylinder exploded in his hand! His hand became a painful bleeding mess. Hank was another victim of the biggest racket in the gun business—cheap two-bit Spanish pistols.

TESTED AND ENDORSED BY THE SPANISH GOVERNMENT

ONLY \$13.00

Side Swing Cylinder Revolver made of Bilbao blue steel. Send for this accurate, dependable and powerful gun with automatic hammer safety. Send No Money. Pay postman on arrival \$13.45 plus postage. Satisfaction guaranteed or money back.

NEW YORK IMPORTERS CO. Free catalog. Dept. 81-M 200 Broadway New York City

Pistols may or may not have been tested by Spanish government, as ad claims. Sometimes the testing mark was overlooked or forged.

The Spanish pistol came into its heyday in this country shortly after the First World War when the demand for cheap pistols was greater than the supply.

Domestic production was not enough and a big mail order business developed.

Firms in New York and Chicago, operating out of small offices and having no legitimate stores or repair shops, engaged in the importation and sale of foreign-made pistols and revolvers. Many of these were of good quality—the Webley arms sold by Stoeger's and the Mauser arms distributed by Von

Lengerke and Detmold stood at the top of the world's quality production. But among those at the bottom were the Spanish revolvers, which were cheap imitations of name guns.

Spanish laws regulating the proving of guns were in a state of flux because of the 1916 Brussels convention and the interruption of the war. Some makers designed false marks, punching names on the soft metal of cheap, unsafe export guns. Low price, not quality, was the object.

Prospective importers in New York would approach a Spanish commercial house asking them about pistols. The Spanish firm, often a reliable company but knowing little about guns, would obtain bids. These came from "setters up"—men who supervised in their own shop the assembly of parts produced by cut-rate workmen in ill-equipped home workshops, filed out laboriously by hand from soft

metal, and not correctly hardened.

The guns turned out by this sweat-shop system were destined for export to the United States. Smith & Wesson revolvers (retailing then at from \$25 to \$30), were the ones most generally imitated. Some did not bear Spanish proof marks nor the words "SPAIN" or "MADE IN SPAIN." Frequently the only marks were the legend on the barrel: "made for Smith & Wesson ctgs.", and a circular monogram on the frame or grips resembling the interlaced "S&W" of the genuine article.

Advertisements with such expressions as "With removable inspection plate strictly guaranteed," or "Quick as a flash, safe, great penetrating power and true marksmanship," seemed to assert something but were mere gibberish. "Buffalo," "the Famous Wild Cat," "Tank Model," and similar trade names were couched to relieve the buyer of his \$6.45 ("Sells elsewhere at \$12.00"), or only "cut to

\$9.59—Final Sale, King of Revolvers."

The usual imitation Smith & Wesson appeared in two frame sizes, copying the popular Military & Police, and the smaller-frame Regulation Police revolvers. Chambered for the .38 S&W Special cartridge, or the 32-20 Winchester Center Fire load, these guns would also accept and fire the powerful 38/44 high speed loads, designed to be fired only in a much heavier frame gun, or the 32-20 WCF rifle cartridge, definitely not recommended even for well-made revolvers. So, from time to time, one of these pot-metal guns, cylinders machined (?) from brittle grey iron, would come apart.

When this happened, what more natural thing to do than return it to the maker for repairs—look, see, on the barrel here, it says "SMITH & WESSON"—so off to the Post Office with the junk.

The first few times this happened the repair manager



Genuine Smith & Wesson of 1920-25 period, military and police model. Note typical style points.

New Only \$6.45

Greatest Bargain Ever Offered
6-Shot Finest Perfected Revolver
 Sells elsewhere at \$12.00. Quick as a flash, safe, great penetrating power and true marksmanship. Blue steel or nicked, 38, 32 or 22 caliber all same price. Satisfaction or money back. **SEND NO MONEY.** Pay postman on arrival \$6.45 plus postage. If you send money with order **WE PAY ALL POSTAGE.** **FEDERAL MAIL ORDER CORP., 414 BROADWAY, Dept. 542, New York**

"Quick as a flash, safe, great penetrating power and true marksmanship"—and all for only \$6.45.

Identical except for grips. Compare left side of this real S&W with photograph of Orbea gun.

Wordings of ads were meaningless. For instance: "With removable inspection plate strictly guaranteed."

THE TEXAN

\$14.75

32.20 or 38 Cal.
 A POWERFUL, ACCURATE AND SAFE Swing Out TESTED and APPROVED by official EXPERTS. With REMOVABLE INSPECTION PLATE STRICTLY GUARANTEED.
SEND NO MONEY—Pay on delivery. MONEY BACK IF NOT SATISFIED.
NEW YORK IMPORTERS CO.
 Dept. 81-T 200 Broadway, New York



simply wrapped the gun up for return to the sender, but there came a day when this "mistake" happened too often. Top management began to investigate and all hell broke loose.

The lawyers consulted with the designers, who consulted with the sales department, who consulted with the lawyers, who were in constant touch with the Wesson family. The

imitation Smith & Wessons were coming in by the ton. They constituted not only a nuisance but a threat to the reputation of Smith & Wesson. Investigation revealed that the American vendors were telling the public that these guns were genuine Smith & Wesson arms, made abroad at a factory established in Spain by Smith & Wesson during the war and kept operating because of cheap labor.

Compare lockwork of genuine S&W (right) with that of the Orbea gun (below). The Orbea uses a rebound lever similar to that of Colt design to actuate the trigger return and cam the pawl or cylinder lifter forward, but otherwise the design is identical. The Orbea is somewhat cheaper to make or fit but not as reliable.



Other importers said that the guns were marked in Spanish for a foreign order which had been refused and now Smith & Wesson was stuck with the guns and had to sell them for what they would bring. The line symmetry of these Spanish guns with the original Smith & Wesson revolvers offered a legal and practical way to stop their importation.

The tariff Act of 1922, Section 316, paragraph (a), states that: "unfair methods of competition and unfair acts in the importation of articles into the United States, or in their sale by the owner, importer, consignee, or agent of either, the effect or tendency of which is to destroy or substantially injure an industry, efficiently and economically operated, in the United States, are hereby declared unlawful."

Under this act, Smith & Wesson filed a complaint against importers of Spanish guns. A preliminary hearing was held shortly after the filing of the complaint on May 28, 1923, and a tariff commission of four men was formed to investigate.

Civil suits to obtain injunctions



Among the many style points that helped to maintain Smith & Wesson's suit against Spanish pistol makers was the bottom flat of the barrel which they copied.

against the further sale of the imitation S&W's had been brought against Galef, and also Gluck (as "Import Trading Co."), for importing Orbea Hermanos (Eibar) revolvers. Newmark, et al, as the "Paramount Trading Co.", and the Rosen-Margolies Co., were likewise enjoined. Two other firms were cited in New York, the Unwin Trading Co., and "Lago", for importing another make gun, produced by the Beistegui brothers in Spain. This model of gun differs from the usual Smith & Wesson only in having a trigger-guard which removes, to permit a sort of "bottom assembly" of the lockwork through this hole, rather than placing the lockwork in the frame in the usual manner. Trocaola Aranzabel arms, imported by Galef, and Garate Anitua y Cia, guns, imported by the American Novelty Company of Chicago were also cited, as well as the guns of Guisasola Hermanos of Spain.

Because certain of these arms, such as the Beistegui guns, differed somewhat from Smith & Wesson's internal design, no claim of "patent infringement" or copying of mechanisms was claimed. What Smith & Wesson did say was that certain "details" of these guns had been copied.

"Collocation" of details listed were:

1. *Shape of stock.* Claimed to be an exclusive feature of Smith & Wesson revolvers, "not any more functional than any other handle of any other shape put on the end of a revolver," an arbitrary design adopted when S&W began manufacture of their present pattern of gun, in 1896.

2. *General contour of frame and trigger guard.* The trigger guard is cut in one piece with the frame.

3. *Shape of front end of frame.* The front portion is so moulded as to conform to the lines of the barrel and ejector rod.

4. *Squaring off of barrel on under side.* Uniquely Smith & Wesson, until imitated.

5. *Front cylinder lock.* Testimony was to the effect that this feature, aligning the cylinder or ejector rod securely, was found only in S&W arms.

6. *Thumb piece.* This moves forward to open the cylinder. The characteristic thing (Continued on page 45)



Shape of trigger-guard, barrel, ejector rod, cylinder latch thumb piece, etc., have changed but new Centennial is still recognizably S&W.



Combat Masterpiece is S&W .38 target revolver built on same basic frame of which Orbea is a copy. It still retains S&W style points.



Even more pronounced is similarity of S&W Regulation Police revolver, .38 caliber. Only a few changes have been made in this gun.



"FIRE ON FULL AUTOMATIC"

German Machine Pistol 44 is used by a G.I. outside former Wehrmacht unit headquarters. Weapon is the original Nazi "burp gun." It had cyclic rate of 1,200 rounds per minute; used short 7.92 round; gas operated with tip bolt.

GUNS THAT COULD FIRE WITHOUT STOPPING—MACHINE GUNS. IT WAS AN IDEA THAT REVOLUTIONIZED WAR!

By HARVEY BRANT

Photos from Department of Defense

EVER since the invention of gunpowder and the firing of the first bullet from a gun, men of arms have constantly searched for ways to make a weapon fire more than just one time, rapidly and automatically. Ordnance experts have come a long way from the earliest repeating pistols of Renaissance times to the burp guns of today. But the search goes on.

Admittedly, today's automatic weapons are a far cry from the metal cartridge breechloader carried by King Henry VIII, or the repeating "Cookson-type" pistol held by Admiral Nelson when he fell dead in battle on the deck of his H.M.S. Victory. They have come a long way from such ridiculous notions as machine guns which shot round bullets at Christians and square bullets at Turks.

The first truly successful machine gun appeared after

the development of the drawn-brass cartridge case. It was the Gatling Gun.

As first proposed, the Gatling Gun used steel chargers. It was not until 1866 when Dr. Gatling's civilizer appeared in caliber .50 rim fire metallic cartridge that it was widely adopted.

It became the standard U.S. service machine gun and negotiations were begun with other countries for its manufacture abroad. The cartridge case was formed from brass and was basically similar to cartridges in use today.

The brass case performed several functions. It carried the powder, bullet, and primer all in a neat and durable package, strong enough to be handled by mechanical fingers and guides in machine firing weapons. Of even greater importance was the flexibility of the brass, expand-

ing under pressure, as an obturator to seal the breech from loss of gas.

Greater velocities were obtained, while the smoke remained in the barrel or exited from the muzzle. This permitted small moving parts to be used, for the expanded cartridge case kept them free from powder fouling which would otherwise render the gun inoperative.

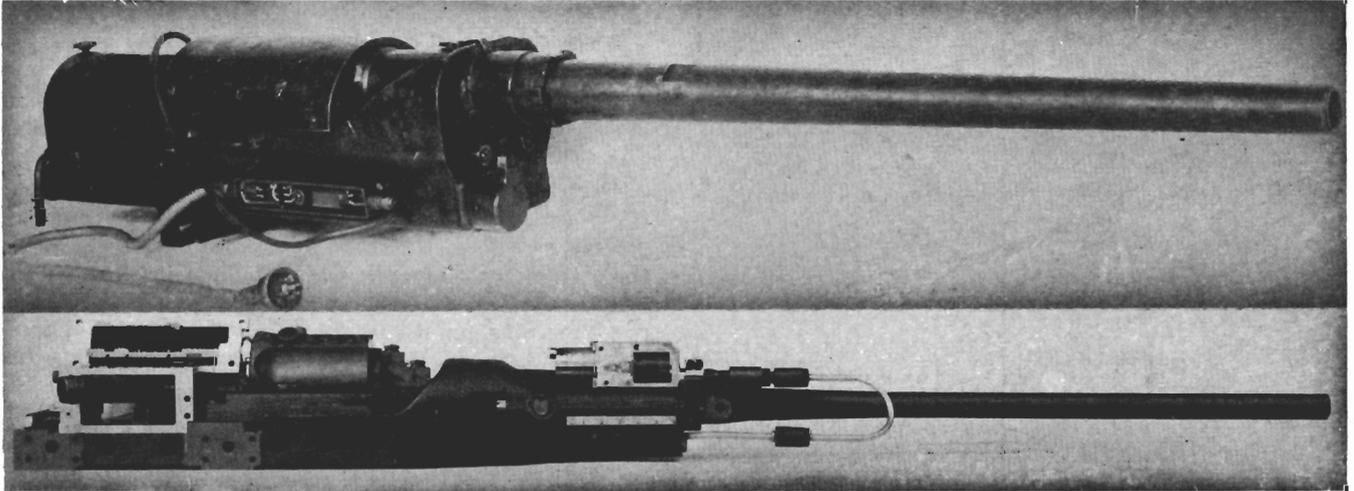
The technical know-how and design inspiration were all there, but the drawn brass cartridge case made repeating guns truly practicable.

By the turn of the century, in pistol, rifle, machine gun

and light cannon categories, three basic patterns of automatic-breech gun functioning had been established.

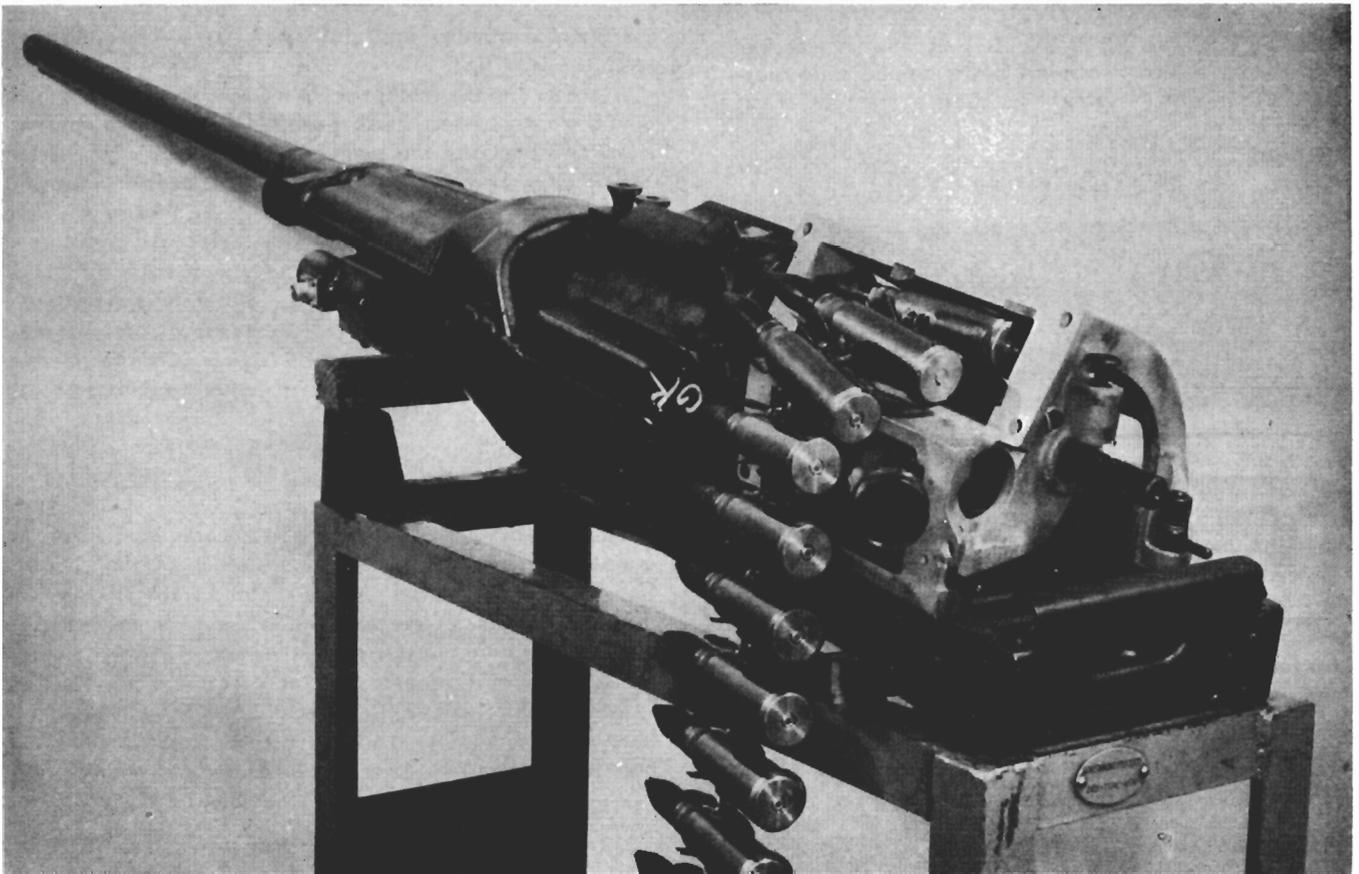
Simplest is the "straight blowback" breech with a modification, the "delayed blowback." Next class is "recoil, locked breech design" with two developments—short and long recoils. Third pattern is "gas operation, locked breech design." Variations of it are the impinging gas, expanding gas and short-stroke piston designs.

Most familiar of the straight blowback type are the pocket pistols firing .22RF, .25 automatic, .32 automatic, and .380 automatic cartridge.

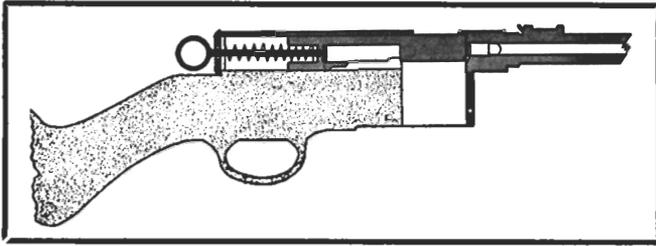


Captured revolver-cannon (top) is Mauser prototype. Studied by U.S. Ordnance engineers, this gun led to design by Armour Research Foundation of advanced 20mm cannon, below, used in Korea.

Belt of 20mm armor piercing shells in feed position. Exact rate of fire is classified, but exceeds 1,200 rounds per minute making the M39 the fastest production gun ever made. (G.M. Corp. photo.)

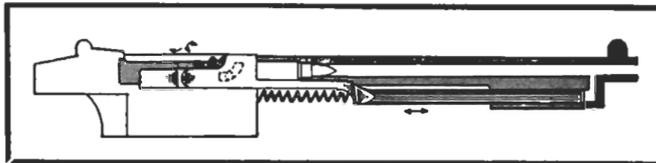
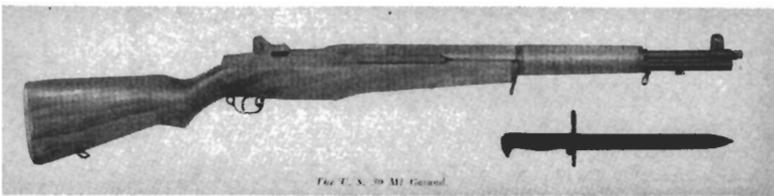


BLOWBACK PRINCIPLE



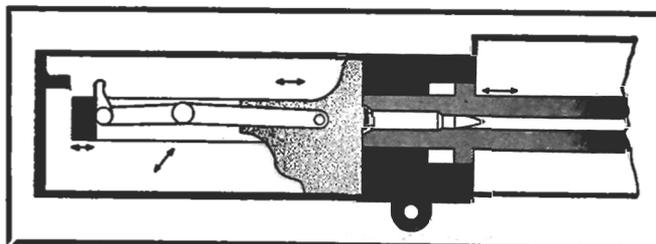
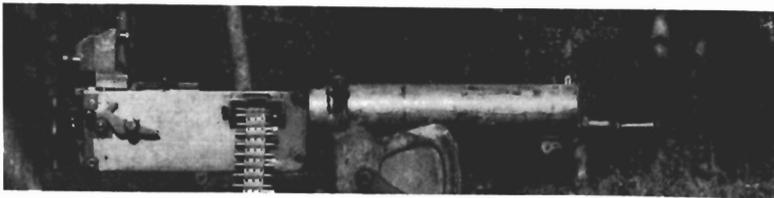
Italian-made Beretta sub-machine gun has 25 shot magazine of 9mm ammunition. Ring is pulled back to cock hammer. Spring bayonet folds under muzzle.

GAS OPERATED



Garand .30 cal. U.S. rifle is best known example of gas operating principle. Gas is tapped from muzzle vent, and pushes back piston, opens bolt.

RECOIL OPERATED



First standard automatic machine gun, Maxim is still used in virtually unchanged form on worlds' battle fronts. Toggle lock is American idea.

It relies on the weight of the breech-block or slide, and the recoil or recuperator spring, to keep the breech closed under maximum pressure. The inertia of these parts is such that during the flight of the bullet down the barrel their acceleration is negligible.

Only after the bullet has left the barrel and the internal pressure dropped to safe limits does this "residual pressure" move the breech open, extracting the spent cartridge and compressing the action springs to function the gun in automatically loading another cartridge.

Designs affording little support to the case during maximum pressure are suitable only for short stubby pistol-type cartridges of low power. Recovered shells are usually considerably stretched, indicating high pressures while extracting.

A modification of this slam-bang functioning appears in somewhat heavier arms, notably the sub-machine gun class. While straight blowback is now generally used, designs incorporating some sort of delay have achieved limited success in the past.

The Thompson sub-machine gun developed at the end of World War I utilized a friction delay principle of operation.

The first locked-breech design to achieve success was the world's first truly automatic gun: the Maxim *short-recoil* machine gun designed in 1884-86. The breech-block is locked by a toggle joint which has its rearmost link pivoted to the long arms of the barrel extension.

The middle pivot of the toggle is slightly above the center line of the other pivots, and functions much as a leg, the knee bent slightly to the rear and the weight of the body "locking" the calf and thigh.

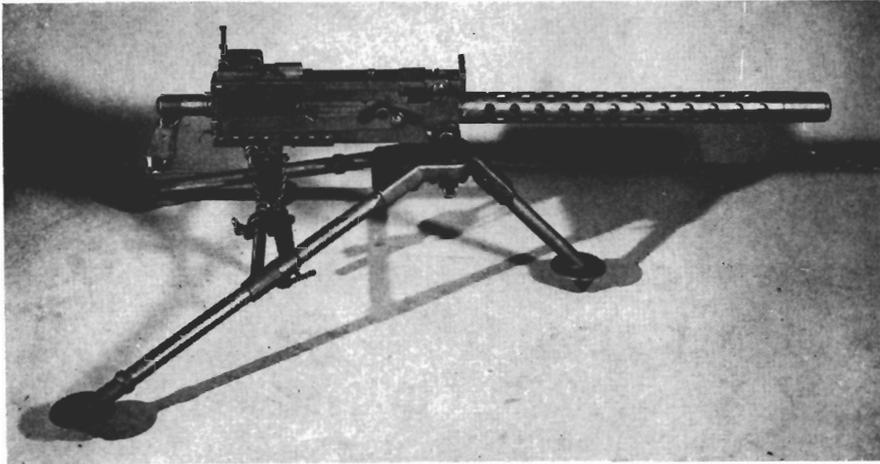
As the bullet leaves the muzzle, the whole assembly recoils a fraction of an inch until the middle pivot is crammed downwards and crosses the centers of the other two pivots. The barrel and extension then are stopped, but residual pressure together with momentum collapse the toggle and force the breech-block rearward, extracting the spent cartridge and pulling a fresh one into line from the feed belt.

A spring is also compressed by this movement, which now begins to assert itself, pushing the breech-block forward and bringing the toggle into line again. The fresh cartridge is chambered, the barrel and extension move up into "battery" or firing position. If the trigger is held, the striker will be tripped and automatic firing will result until the ammunition is exhausted or the trigger released.

The *long recoil* principle was one which offered one fancied advantage over other designs: absorption of recoil by large masses. In short-recoil guns, the barrel was permitted to move only enough to allow pressures to fall and unlocking to take place. Then the relatively light weight breech-block would move to the rear, at high speed, and become arrested rather abruptly by the buffers or fixed parts of the breech mechanism.

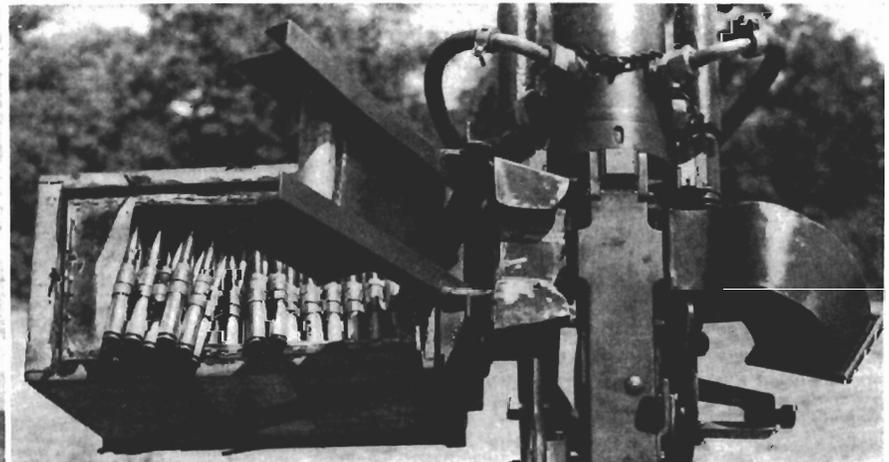
This was a severe shock to these parts, and often an even more severe shock to the shoulder of the shooter. Causing the large mass of the barrel to absorb some of this "kick" was a clever notion, while to some extent it made functioning more secure from jams.

All long recoil weapons had the barrel and breech-block locked together, while the assembly recoiled the whole length of the cartridge, and more, in the receiver. Then the breech-block became disengaged (*Continued on page 46*)



Browning .30 cal. light machine gun operates on short recoil principle. Similar gun was designed for aircraft use in World War I. Water-cooled predecessor of this same weapon was patented by John Browning in 1901.

Air-cooled, gas-operated Hotchkiss 7.7 is basic Japanese infantry support weapon. Cartridges are stripped from feed clip which slides through gun breech. Gun is more complicated and heavier than recent models but is thoroughly reliable for use in combat.



Browning water-cooled .50 cal. machine gun on anti-aircraft mount as modified by Army Ordnance personnel in Australia during World War II to increase firepower and maneuverability. Inset shows feeder chute, roller which sends even flow of ammo into movable feed tray. Note that ammo shipping box is used instead of rack.



Crack Soviet assault troops carry cheap but efficient Sudaev PPS-1943 machine pistols in parade. Sovfoto.

By **ROGER MARSH**

Gun editor, Cleveland Plain Dealer

LIKE EVERYTHING else Russian, Soviet small arms have been described by experts in contradictory terms which range from "dependable" and "excellent" to "inefficient" and "terrible." The facts are that in many respects the estimates of both extremes are correct.

Even the Russians themselves admit as much. They have openly conceded that they have produced some weapons that do not measure up. But when they have found arms that do not perform dependably, they do not hesitate to dump them quickly and turn to other models.

The truth about the status of Russian small arms and how they compare to American guns is often obscured in verbose Communist propaganda, but stripped of red verbiage, one undeniable fact does



**HOW GOOD ARE
RUSSIAN
SMALL ARMS?**

PERFORMANCE, NOT LOOKS, IS WHAT COUNTS IN RUSSIAN THINKING. THOUGH THEIR WEAPONS APPEAR CRUDE, IN MANY RESPECTS THEY ARE THE WORLD'S FINEST IN DESIGN AND EFFICIENCY.

Soviet "old faithful" is 7.62-mm. Nagant revolver, 1895 pattern. It was issued to troops and partisans during World War II. This one was made at Tula in 1923.



TT33 pistol is the Tokarev-designed 7.62-mm. Browning type official sidearm. It may have been supplanted or supplemented by a rumored autopistol designated "Pattern 48."

emerge: crude-appearing as many Soviet guns appear, they are rugged and some are among the best in the world in terms of actual use.

Much of the depreciation of Soviet guns is probably due to their tendency to emphasize function rather than looks. While Russian weapons are rough appearing, in many respects they are the world's finest in design and efficiency. Beauty and lines do not figure in Russian thinking. All they are interested in is performance.

Typical is the Russian approach to the machine pistol, which has become a standard hand and shoulder weapon for Soviet soldiers.

The original Soviet machine pistol was a Degtyarov design of 1934/38 pattern. It was an entirely conventional blowback submachine gun weighing $7\frac{1}{2}$ pounds, $30\frac{1}{2}$ inches in overall length. Its cyclic rate of around 900 rounds per minute was somewhat high for its magazine capacity of 25 rounds. This box magazine was later supplemented by a drum holding 70 rounds. The design was a makeshift, however, and not widely issued.

The Russo-Finnish War of 1939 exposed the weaknesses of the 34/38. Besides the high cyclic rate, they were too hard to make. Degtyarov attempted to remedy this with his PPD1940, a simplified type resembling the 34/38 in function but intended to use only a 71-round

drum. But even the PPD1940 could not be supplied in sufficient quantities though it was better than the 34/38.

In 1941 Shpaghin, the rising star of Soviet ordnance, brought out the PPSH1941, unattractive in appearance but of excellent design. It could be mass-produced in far greater quantities than any previous Russian design. The weapon is ideally suited for warfare under almost any conditions. Although the 71-round drum was standard, a 35-round box magazine was brought out late in the war. The PPSH became the standard "burp gun" of the North Koreans. It is still standard with the Red Army and has appeared in every satellite nation from Korea to Eastern Germany.

In 1942 the Soviets brought out the PPS (Sudaev). The PPS is like the PPSH 1941 in basic design and assembly but used only a 35-round box. It had a folding metal buttstock and virtually all wood was eliminated. But the 1942 version had one major defect—the stock folded forward over the top of the action and was so long that it interfered with ejection. This defect was corrected in a 1943 version and weight cut to six pounds.

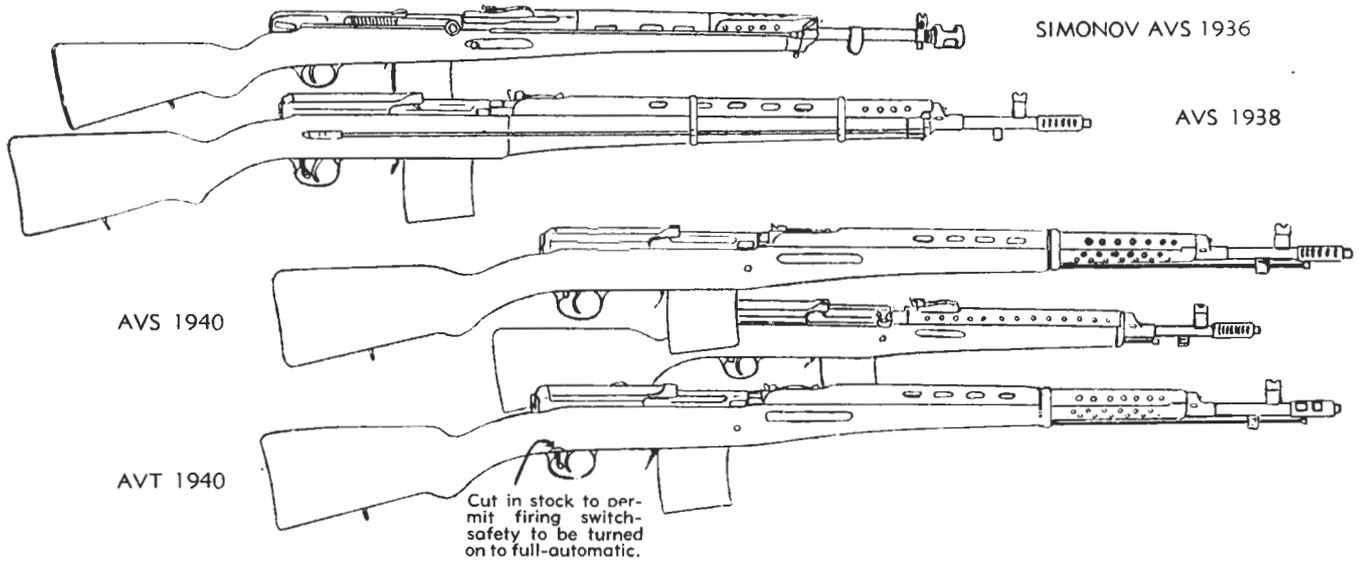
The standard Soviet pistol, in service without major change since the early 1930's is the Tokarev TT-33. It is chambered for the 7.62-mm. Russian autopistol cartridge and is a short-recoil-operated arm of basic Brown-

SMALL ARMS OF THE SOVIET UNION

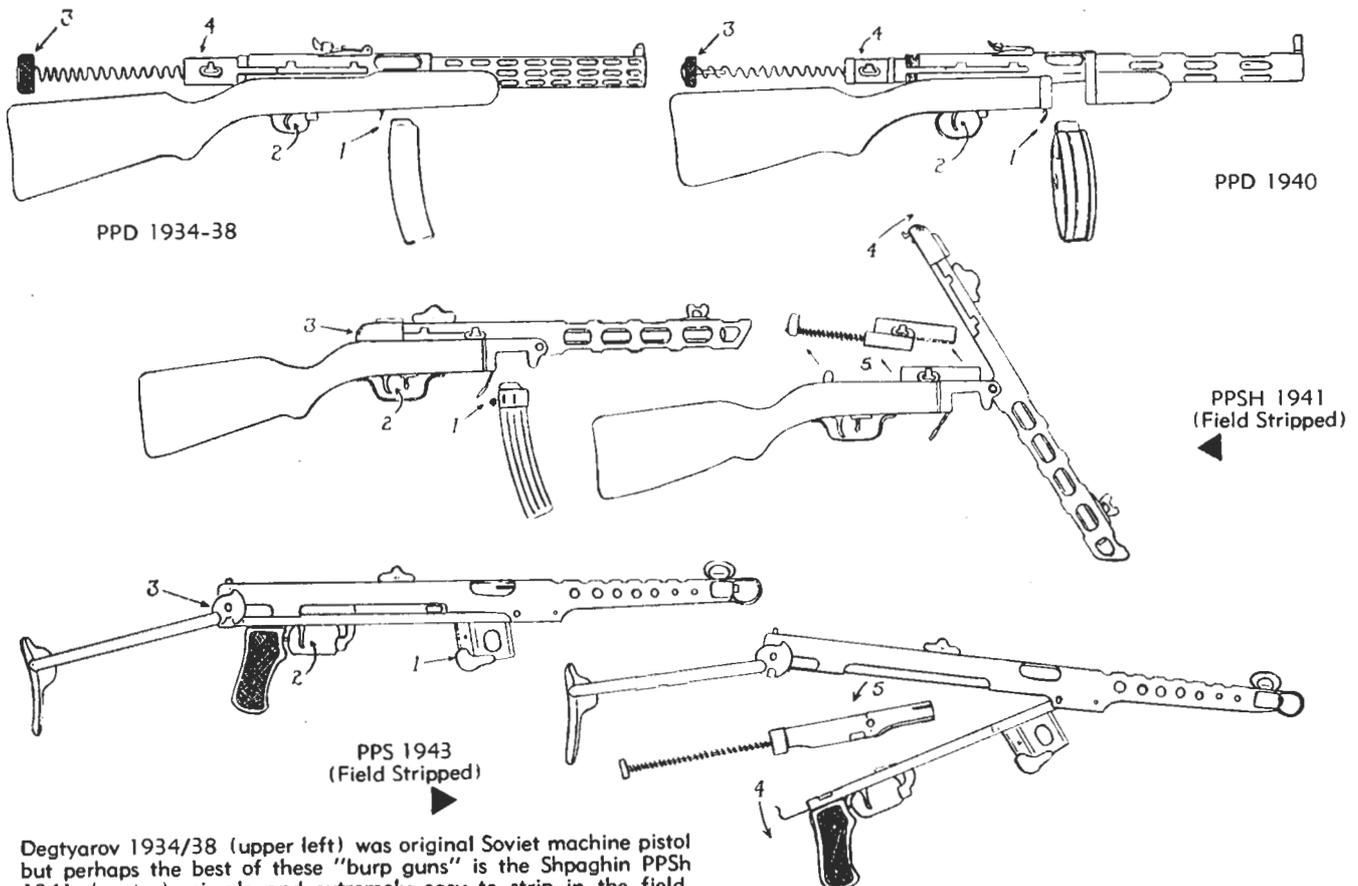
A PORTFOLIO OF DRAWINGS BY THE AUTHOR



SEMI-AUTOMATIC RIFLES



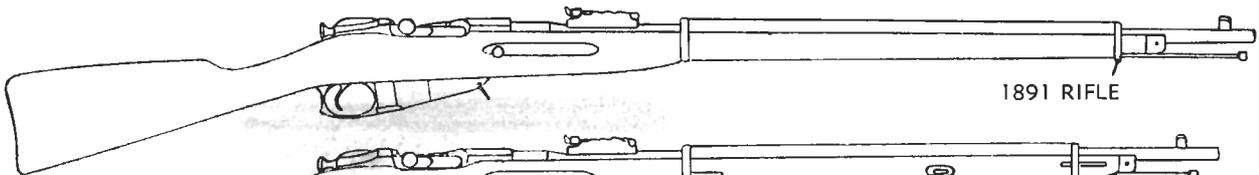
SUBMACHINE GUNS



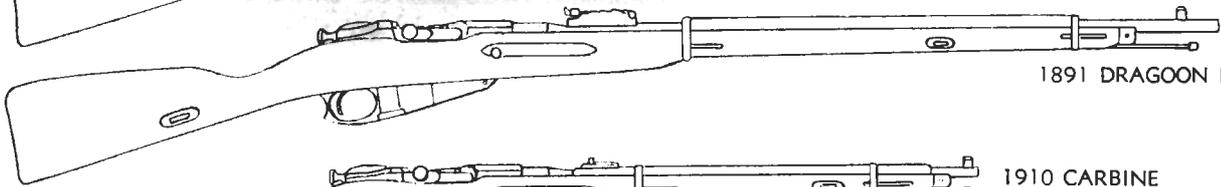
Degtyarov 1934/38 (upper left) was original Soviet machine pistol but perhaps the best of these "burp guns" is the Shpaghin PPSH 1941 (center), simple and extremely easy to strip in the field.



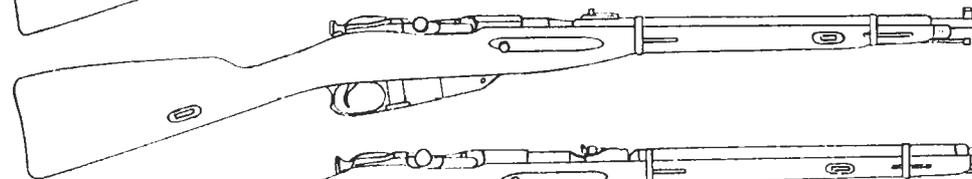
SERVICE RIFLES AND PISTOLS



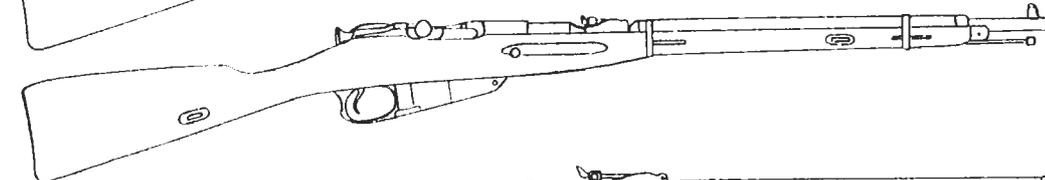
1891 RIFLE



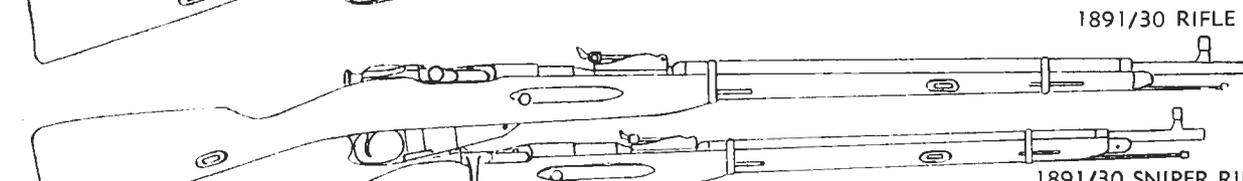
1891 DRAGOON RIFLE



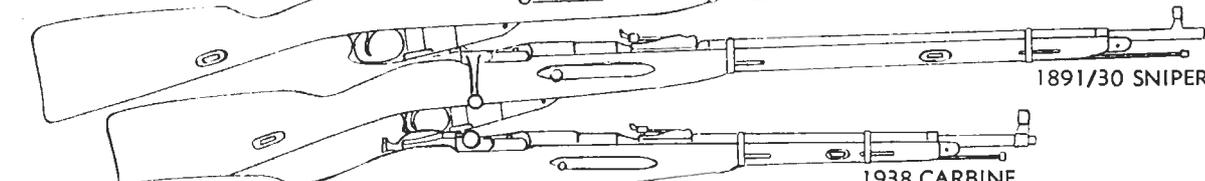
1910 CARBINE



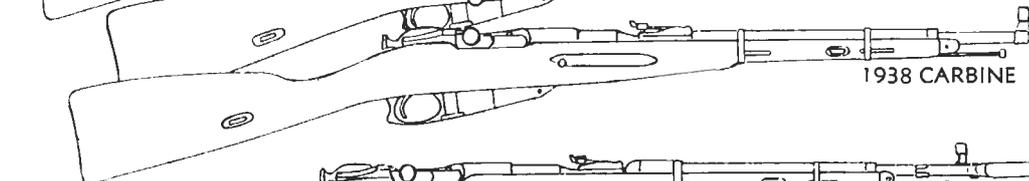
1924/27 CARBINE



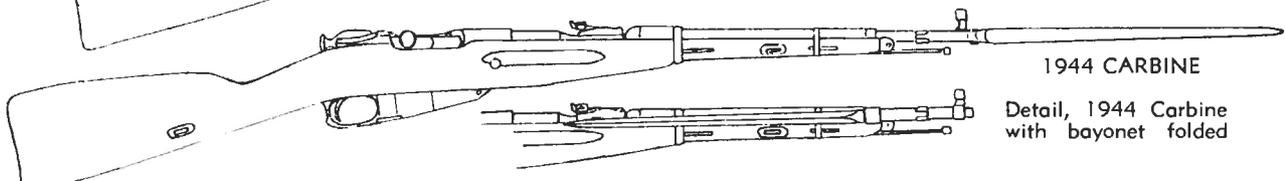
1891/30 RIFLE



1891/30 SNIPER RIFLE

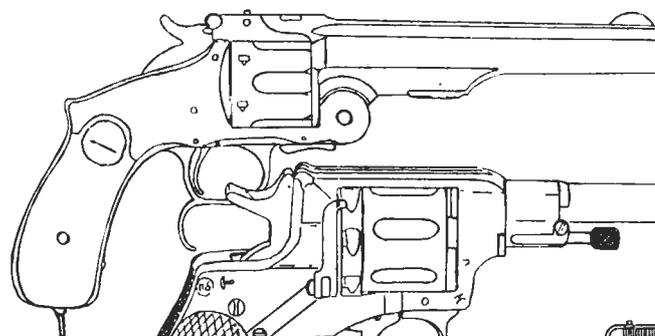


1938 CARBINE



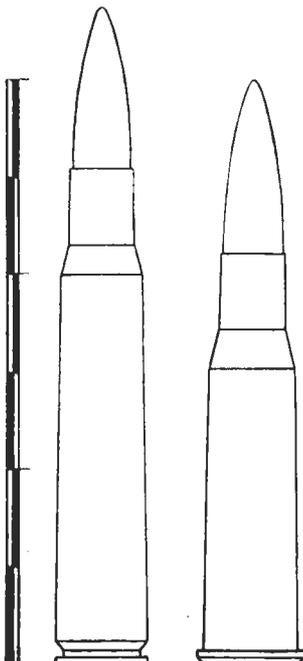
1944 CARBINE

Detail, 1944 Carbine with bayonet folded

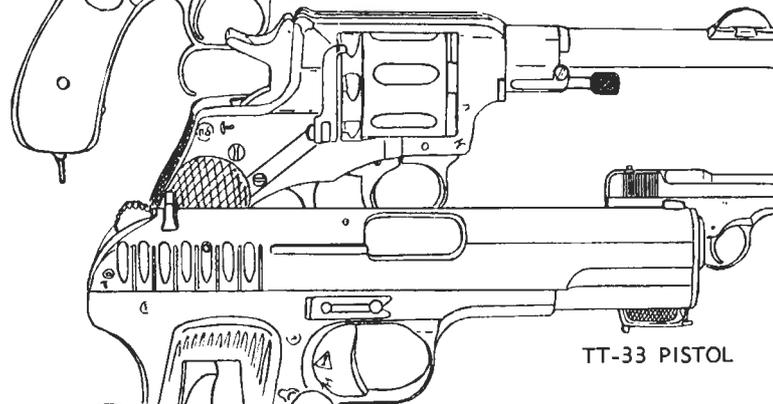


S&W .44 RUSSIAN REVOLVER

7.62-MM. NAGANT



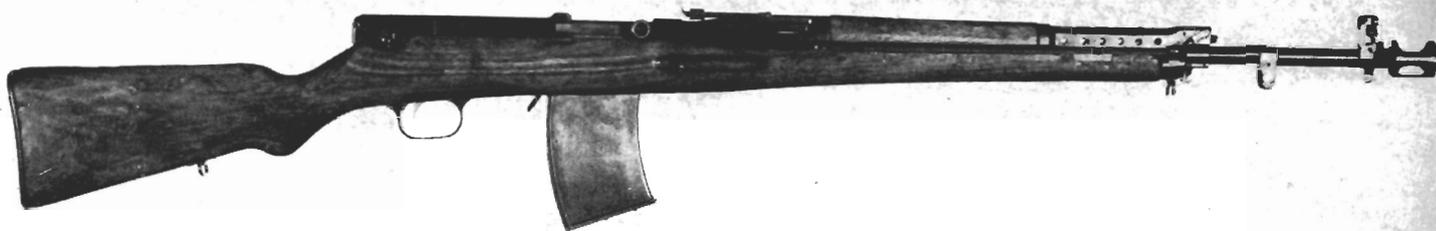
U.S. Cal .30 Russ 7.62-mm. U.S. Cal .45 7.62-mm Russ 7.62-mm Nagant automatic



KOROVIN .25 PISTOL

TT-33 PISTOL

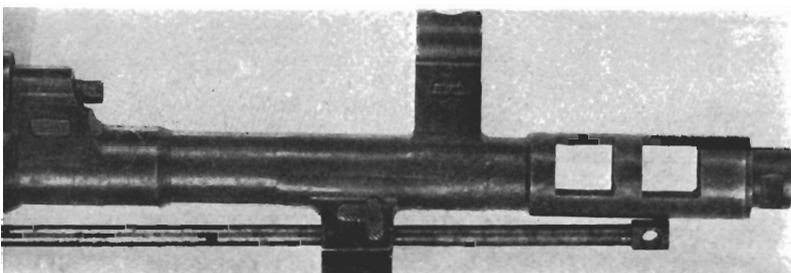
Standard Soviet service pistol is Tokarev TT-33 (above) but others are in use, including the Korovin .25 which is pictured here for the first time in a general circulation magazine. At left is comparison of U.S. and Soviet cartridges. Note especially the unusual 7.62-mm. Nagant cartridge with projectile enclosed in the case.



National Rifle Association

First service autoloading rifle was Simonov 1936 7.62-mm. design. It proved vulnerable to dirt and difficult service conditions and was replaced in 1938 by first of the Tokarev series.

New style muzzle brake having two ports on each of its sides has replaced the multiple-slot muzzle brakes of the Tokarev 1938 and 1940 rifles.



Roger Marsh

ing design weighing only 1 $\frac{3}{4}$ pounds and measuring only 7 $\frac{3}{4}$ inches overall. The TT-33 is extremely simple both in design and manufacture and is easy to field-strip and clean even under adverse conditions.

A new Soviet autopistol of larger caliber and somewhat different design known as Pattern 48 has been rumored but from the sketchy descriptions available it is possible that the arm is a 9-mm. pistol similar to the Czech Pattern 47, to the FN Browning GP, or to the Swiss "Petter."

Various imported autopistols have been used by the Soviets—mostly Mauser 1920 (Bolo Mauser) automatics.

These virtually replaced the old Nagant revolver as a service pistol before the TT-33 and TT-30 appeared.

The oldest Soviet handgun is the ancient Nagant revolver of 1895 pattern. It was still being made up in small lots even after the advent of the Tokarev. It is chambered for a unique 7.62-mm. cartridge whose bullet is fully seated within the case. At the moment of firing, the Nagant wedges its cylinder forward to envelop part of the rear end of the barrel as the mouth of the case enters the barrel to seal the gap between barrel and cylinder. One batch of Nagants similar in general design characteristics to the service model but chambered for the .22 RF cartridge was made up around 1935.

The cartridge used in the Russian autopistols is identical for all practical purposes with the 7.63-mm. Mauser pistol cartridge, .30 caliber. This made life much simpler for Russian ordnancemen who were already accustomed to boring rifle and machine gun barrels in .30 caliber. After the sudden surge to popularity of the machine pistol in Soviet service, the cartridge was subsequently issued in tracer (green nose) and in AP/I (red



Cadets of Dzerzhinsky Naval Engineering Institute present arms with Tokarev M1940 rifles. Gun replaced similar M1936 Simonov.

and black nose) loads as well as the standard bullet.

Modern Soviet rifles have a history that dates back to 1891 with the adoption of the Moisin-Nagant rifle, a combination of the breech action of the Russian Moisin with the magazine of the Belgian Nagant. The rifle is chambered for a rimmed, bottle-necked cartridge. It is a crude-looking piece of machinery—but it works in all weathers and with the modernized loadings of the 7.62-mm. Russian cartridge which were initiated in 1908, it is still a most effective weapon.

The original Model 1891 has a 31.2-inch barrel which was reduced in the 1891 Dragoon rifle to 28.5 inches. From this Dragoon rifle came the modern line rifle—the Soviet 1891/30. The main improvement that the Soviets made in the 1930 rifle was to change the shape of the receiver ring from the original octagon section to a more easily made round section. The alteration was tried out in the 1924/27 carbine. It was unique in one respect; it did not have a front sight hood and so the bayonet had the front sight hood built into it.

In some services and situations a shoulder weapon more than four feet long is not satisfactory. The Model 24/27 carbine apparently did not satisfy the Soviets for in 1938 they brought out a new 40-inch carbine.

Despite the development of autoloading rifles, the Soviets never stopped developing the Moisin-Nagant action and in 1944 they brought out a special carbine with a permanently attached folding bayonet. This carbine seems destined to be the standard Soviet rifle-caliber shoulder weapon—thus the wheel has come full circle: the newest arm is built on the oldest action.

Meanwhile the Russians were working on autoloading rifles. In 1936 (same year the U. S. adopted the Garand) they adopted the Simonov.

The Simonov has one of the most interesting locking systems on record—a hollow block (sliding vertically in the barrel extension) through which the bolt head passes. When the bolt is fully locked the face of the bolt supports the cartridge in the chamber and is in turn supported by the lower arm of the locking block, which is wedged upward by the upper section of the bolt. When the Simonov is fired, gases are tapped off to drive back a piston and the operating slide which is mounted around the rear sight. This slide first shoves back the upper section of the bolt, thus depriving the locking block of support, and then cams the block down, permitting the bolt to move to the rear.

The action is simple and compact but the Simonov proved virtually impossible the field-strip and was quite vulnerable to dirt. Its muzzle brake was well designed but was too weak to be used as a bayonet support, so a special bayonet was introduced. Its 15-round box magazine probably made firing from a rifle pit quite uncomfortable. Thus, its manufacture was discontinued within a year or two of its adoption.

In its place the Soviets turned to the Tokarev 1938 and then to the 1940. Both of these arms were gas-operated and both, like the Simonov, used the nozzle-and-cup gas take-off system but here the resemblance ended.

The Tokarev magazine capacity was limited to 10 rounds, the magazine being replaceable as a whole or chargeable from standard rifle chargers while on the gun.

The action consists of a tilting bore whose rear end is



Roger Marsh

Typical Soviet cartridges (left) are 7.62-mm. rifle; single 7.62 rifle, and 7.62 autopistol. Compare with U.S. (right) .45 autopistol, standard .30 rifle, and eight-round Garand clip.

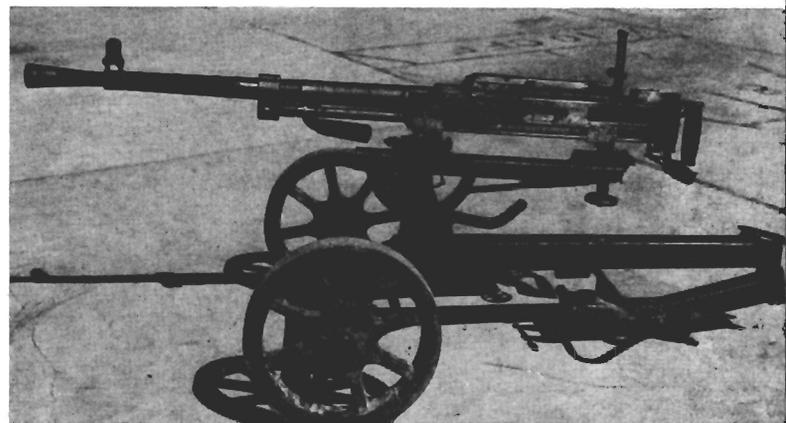
cammed down into a locking recess by continued forward movement of the bolt cover after the bolt is fully forward and the cartridge is chambered. Gas pressure drives back the piston rod on firing, the rod driving back the bolt cover to unlock and retract the bolt which remains open after the last round is fired.

A fully-automatic Tokarev was also developed. Externally it seems a standard Tokarev but the stock has two relief cuts for the safety where the standard has only one: the safety turned to the left is "off," turned straight down is "safe," and when the safety lever is turned all the way to the right the arm is set for full-auto fire.

The Soviets apparently unloaded a great many of their obsolete and obsolescent weapons in China before World War II and in North Korea after the war. For example, the Maxim-Tokarev, a light machine gun which the Russians did not adopt after building a test batch, was handed to the Chinese. Similarly, quantities of old Winchester 1895's in 7.62-mm. and of Model 1916's (made in U.S.A.) were sent to the North Koreans, as were such varied items as Pattern 14's and Mausers.

Now the Tokarev rifles are reported to have been withdrawn from Soviet service because of their unsatisfactory performance under winter conditions. They were replaced by manually-operated arms of 1891/30, 1938 and 1944 patterns. It is odd that the Soviets, having set a precedent for unloading second-line equipment, did not release their Tokarevs and retain the bolt-actions. Perhaps the Tokarev is not as dead as intelligence reports would have us believe, or perhaps the Russians have much better weapons in service that we know nothing of.

A Russian-made heavy machine gun, M-1943, uses 7.62 mm ammo; used as AA piece with trail at vertical.





Ewing Galloway

HOW TO BUY YOUR **Guns for HUNTING!**

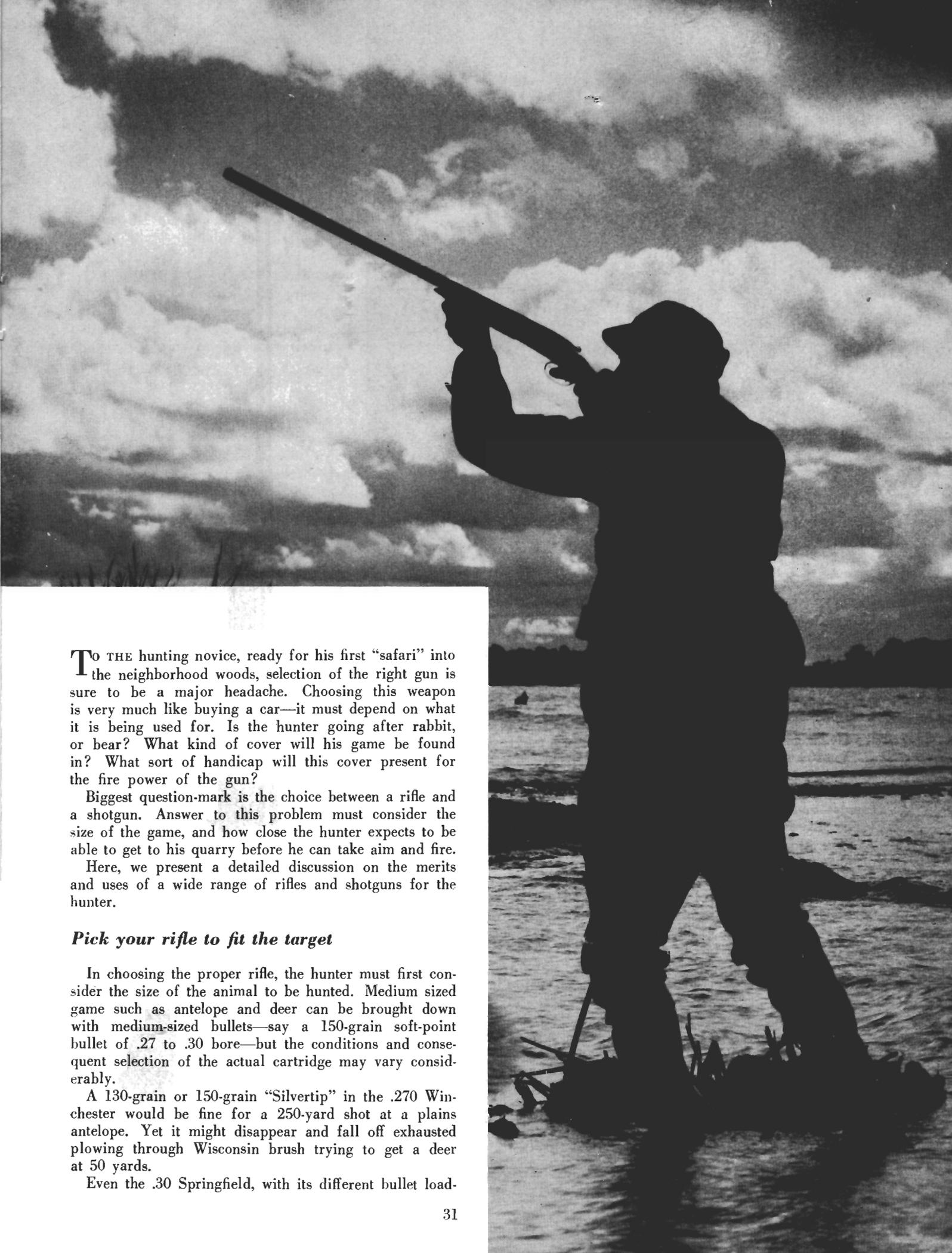
By Leonard R. Grover

**There's a question mark in front
of every gun shop counter—the guy who
says: "What gun should I buy?"**

The answer may lie herein—



**Savage Model 99 lever action rifle, left, is good
workmanlike killer—much cheaper than such fine
guns as scope-equipped Weatherby magnum, right.**



TO THE hunting novice, ready for his first "safari" into the neighborhood woods, selection of the right gun is sure to be a major headache. Choosing this weapon is very much like buying a car—it must depend on what it is being used for. Is the hunter going after rabbit, or bear? What kind of cover will his game be found in? What sort of handicap will this cover present for the fire power of the gun?

Biggest question-mark is the choice between a rifle and a shotgun. Answer to this problem must consider the size of the game, and how close the hunter expects to be able to get to his quarry before he can take aim and fire.

Here, we present a detailed discussion on the merits and uses of a wide range of rifles and shotguns for the hunter.

Pick your rifle to fit the target

In choosing the proper rifle, the hunter must first consider the size of the animal to be hunted. Medium sized game such as antelope and deer can be brought down with medium-sized bullets—say a 150-grain soft-point bullet of .27 to .30 bore—but the conditions and consequent selection of the actual cartridge may vary considerably.

A 130-grain or 150-grain "Silvertip" in the .270 Winchester would be fine for a 250-yard shot at a plains antelope. Yet it might disappear and fall off exhausted plowing through Wisconsin brush trying to get a deer at 50 yards.

Even the .30 Springfield, with its different bullet load-



Proper stance with shotgun is here shown by Milt Hicks, noted sportsman.

ings considered as the "all-around cartridge," failed to get its deer one day. My buddy returned to camp tired and disgusted, berating *me* for having sold my 50/110/350 Winchester Express Model 1886 lever gun. With the heavy slug of that rifle chawing its way through the woods he felt sure he would have had a hit instead of the miss he did get by the twigs and saplings in the way diverting his 30-06 bullet.

Two cartridges practically guaranteed to bring down the largest North American game—and elephants as well, if any are found in the States—are the Holland & Holland calibers, British imports.

The .300 H&H Magnum is just what its name says—a "magnum" cartridge is one of greater than ordinary power and energy; thus the .300 bullet is similar to the .30-06 bullet but far more powerful in terminal energy—and it is delivered energy that counts.

The .375 H&H Magnum is likewise a "large edition." Possessing, in the American loadings, about two tons of force concentrated in a projectile of less than half-an-inch diameter, the .375 has the habit of kicking at both ends.

With a properly stocked rifle the .375 H&H is not impossible to handle, but it is not recommended for beginners. Kodiak or Alaskan brown bear, the largest land mammals on this side of the water, do not kill easily, but the .375 is a great comfort in a tight corner and will do the job. For anything smaller, though, it is a sure case of being "over gunned"—and it seldom takes the blue-shouldered hunter long to realize it.

Various types of large-caliber rifles are available. By far the most popular is a bolt-action variation of the Mauser.

Modified under a dozen names—Springfield, Enfield 1917, Arisaka, Winchester M70, Remington 721—all these owe considerable to the basic Mauser breech.

Only three makes of lever action rifles have survived: Winchester, Savage and Marlin. All are now made only in medium or "light heavy" powers. The .300 Savage, originally designed as a ballistic substitute for the .30 Springfield which was too long to work through the Savage action, is not loaded to the same power today.

The .35 Remington and the .348 Winchester, which appear in the Mar-



Bolt action repeaters are inexpensive but few hunters can get in more than one shot on fast game.

lin 336 and Winchester M71 rifles, respectively, are good brush cutters. Their bullets are heavy, and have enough inertia to keep on through underbrush at normal woods ranges till they hit. The .35 and .348 are considered good deer, bear, elk and moose calibers. The .35 Remington is often preferred by women and smaller men because of the somewhat lighter apparent recoil.

A newcomer is the improved Remington slide-gun. Replacing the obsolete Model 141 Gamemaster, this new Model 760 is available in .35 Remington, 30-06, .300 Savage, and .270 Winchester, and in the hands of a careful shooter is adequate for any game on this continent.

Aside from automatic-firing rifles, which have never been too successful for hunting and sporting purposes, the slide- or trombone-action gun is considered fastest to operate. Next comes the lever-action, then the bolt-action, and last, of course, the guns of single-shot design, which are mainly older rifles of obsolete pattern.

The sample of the 760 examined, though not as finely finished as a pre-war gun (what product is, these days?), was ample in all details. Of a front-lug rotating bolt design, the M760 owes a slight debt to the Mauser design. The .30-06 has for some time enjoyed the reputation of being our most highly developed commercial cartridge and in this new Remington it makes a fine combination.

Most rifles can be fitted with a telescope sight—some more readily than others—but there are mounts and scopes to fit everyone's needs and pocketbook.

For around \$35 to \$60 the hunter can have his choice of scopes suitable for moderate range big-game hunting. Varmint shooting at ranges up to 400 or more yards is a highly specialized sport, but the largest scope used in most normal hunting is a six-power.

Many of these exist as attachments to raise the magnification of 4-X or 2½-X scopes. The advantage of the lower magnification is its larger field of view at any given range; in hunting, the idea is to be able to see and hit the target, not punch holes in stationary paper. A large field of view will permit the eye to more readily see and center the animal, even though it is running.

Glass sights of only 1:1 magnification have been popular for many years in Europe, even on shotguns, and are coming into some use here. Perhaps by restricting the attention of the eye through a tube, and "concentrating" the vision as it were, these enhanced qualities of sight may occur. The simple tube sight has also been used to correct this failing of the eye to be distracted by extraneous things.

Books have been filled with discussions on cartridges and calibers, and the only sure conclusion to be drawn from such work is this: there just ain't no ideal caliber! Learn the vital areas of the game you're going to shoot. Not every hit is fatal and a gun shot or flesh wound will doom the animal to a lingering and cruel death from starvation, loss of blood, or exhaustion.

Practice the elements of shooting—dry fire and a thorough understanding of the ballistics of the cartridge you use will pay off when the time comes—that half-second in which you will use your skill. Then the caliber is almost secondary. It will boil down to "can you shoot?" If you can't, no amount of artillery will help you. If you can, then pick out the rifle to fit your country, your game, and your pocket-book.

Choose your shotgun with care

You should consider the amount of shooting you are likely to do—not just in season but also on the skeet and trap range, when you are ready to choose your shotgun. If you do a lot of shooting, the cheaper guns may prove expensive in the long run. Choice of stock dimensions is fixed on these cheap guns and a shotgun which does not fit makes shooting difficult.

There are two classes of shotguns—double- and single-barreled. The double is the more difficult to manufacture, for although using fewer parts than an automatic, for example, there is considerable hand work necessary to fit the breech.

Inexpensive doubles are made, selling for under \$100, by Savage, Stevens, and Winchester. These are entirely serviceable and will kill game as dead as a high-priced "best gun". But, they may be indifferently finished and may not last as long under hard shooting.

Single barrel guns comprise four general types—single shot, automatic, pump repeating, and bolt action. The first class of gun is usually found as a cheap, strong but heavy "farm" gun. It is the cheapest sort of shot-shooting gun obtainable and is used for pests as much as for sport.

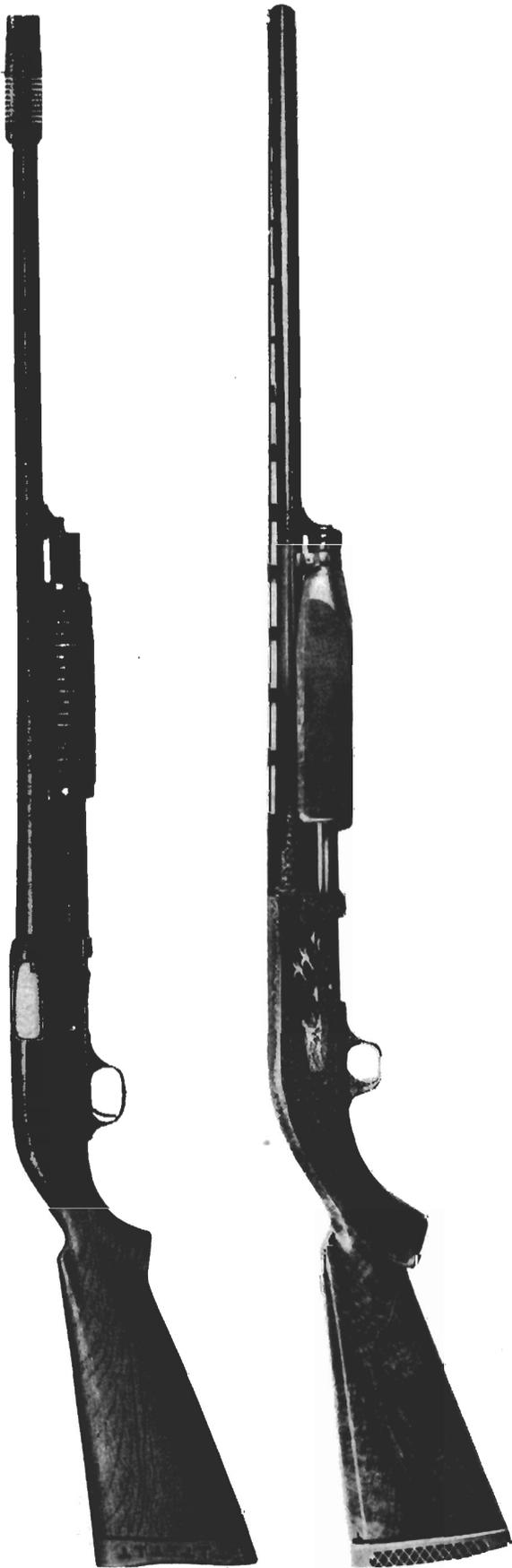
The automatics and the pump guns are styled very similarly in appearance, and have some internal comparisons. With one-barrel and a tubular magazine beneath the barrel inside the forearm, they offer more than the two shots of the double, though nothing beats the double in speed.

Automatics are fast and sure in action, and generally sell for about \$100 up for the best grades and finishes, though some makes can be had for less. All are machine-made, with hand finishing at a strict minimum, but Winchester, Remington and Browning also offer better qualities of their automatics costing hundreds of dollars, which are better finished.

Pump guns are often called "trombone action," for moving the forearm back and forth functions the mechanism and loads the fresh cartridges from the magazine. These likewise start at about \$100 for the better makes.

Bad medicine for moose is the 35 Remington cartridge in older Remington 181 or new Model 760





Pump guns, or slide-action repeaters vary tremendously in price and quality. Stevens at left has "Super Choke." Gold-inlaid Ithaca at right sells for \$2,000.

Both pumps and automatics have advantages on the skeet range. With only a single sighting plane instead of the possibly confusing parallel of two barrels, they give the shooter two to six rapid shots.

The bolt-action shotgun originated as a "cheap repeater" and it has always remained so. In the early 20's German gunsmiths were forbidden to make rifle-bore guns by the Versailles Treaty. With piles of German Army scrap on hand, they designed the bolt action shotgun, fitted a special bolt head to a Mauser bolt, and altered the action. With a new barrel, these old Mauser rifle actions became the "Geha" shotgun, imported by Stoeger Arms Co. and others. They sold some, because they were multi-shot, and cheap.

The perfection of the American and Belgian automatics really obsoleted this type of gun, but the idea still persists. Tolerances are not critical, and they can be hammered together in great quantity. They do offer economy, and more than one shot, though they are not very fast. Prices are about \$25-\$30 on all models while the cheapest pumps and automatics will be more than twice as much.

Muzzle devices such as the Cutts Compensator and the Poly Choke are of great use in the single barreled group. These gadgets have interchangeable or variable choke tubes which constrict the shot mass as it leaves the barrel, affording the shooter his choice of any desired degree of tightness or choke instead of the single degree of choke possible without the attachment.

Thus, a gun can be regulated for those extra long shots down on the bay and still be opened up to give wide patterns at closer ranges.

The cartridge must be right!

"What to shoot in a shotgun" poses a problem. More than 2,000 different combinations of shot, length, bore, and powder once were available but committees and conferences have reduced these to somewhat over 100.

Common sense should be employed in selecting cartridges—if you want to use the magnum or extra length shells make sure your gun is chambered for them and will handle them safely. Shot sizes range from the single ball to dust shot, sizes 11 or 12. Between these extremes will be found a shot for every reasonable purpose.

Rifled slugs or "punkin balls" are suitable for close work at large animals—a hit with a 12-gauge slug on a rabbit would not leave much meat. Buckshot are good for nothing except close work on deer.

BB shot can be used for flock shooting at geese. No. 2 shot works a little better and is a fox load, too. No. 3 can be used for ducks with a magnum 10-gauge and two ounces will reach out 80 yards to bring them down.

No. 4 can be useful for ducks. More appropriate is No. 5 shot, which is correct for most all duck shooting with full choke guns where the shooting is to be more than 50 yards. But the standard is No. 6 shot, loaded in all gauges from .410 to 12. It can be used for medium-sized birds like grouse, pheasant, squirrels or rabbits.

Numbers 7 and 7½ have an advantage in patterning and will do for ducks up to 40 yards, pheasant, prairie chickens, ruffed grouse, and teal. It is considered very good also for quail, doves, snipe and general "upland shoot-

ing." No. 8 has an advantage of more shot per load, but is really the smallest of any practical use nowadays.

In choosing the gauge, consider the spread of the shot, all other things being equal. Obviously, a 12-bore will make a larger spread of shot than will a .410 of the same shot size. This means a denser shot pattern at longer ranges, and more kills.

Recoil in the larger bores is not really a conversation topic—differences in "kick" are a combination of many elements, half of them psychological. The "sweetest sixteen" can bruise a shoulder, while ordinary-sized people can keep a 10-gauge going for a good while without too much damage at the butt end.

The .410 is useful for small game and woods shooting but does not carry a large enough charge of shot to be

serious for longer work at the ducks. The 28-gauge has almost disappeared, along with the 30 and 32's, while the 20-gauge is now the standard light gauge.

The three popular gauges, 20, 16, and 12, are the usual "complete" battery found in the gun racks today, and all are really suitable, with the proper shot and choke.

A properly fitted shotgun should come naturally to the shoulder as slowly or as rapidly as you wish to bring it up, with the line of sight over the barrel coinciding precisely and without effort with the natural position of the head. To get a cheap gun to fit you may lead to considerable cutting or "butt stretching," and ordering a better gun at first may be the answer.

Automatics and pumps will last a lifetime but a good double gun will be handed down from father to son. ©

Dressed moose may weigh six, seven hundred pounds. But with a trophy head like this, who cares? You shot him? You'll get him out even if you have to drag him through the brush with your teeth.



THE RISE OF THE

Today's small caliber rifles can hit a woodchuck right between the eyes at distance of 200 yards.



Gary Cooper is a varmint gun fan. Here he is with wildcat he shot with high-speed .22 rifle in Idaho.

JUST about the time when most of the nation's hunters are putting up their rifles for the year, and with tears in their beers bemoaning the end of the "season," another breed of rifleman is probably enjoying his best shooting.

He is the varmint hunter. Out in the field, searching the elusive woodchuck or crow, the coyote or the hawk, the varmint hunter enjoys "open season" all year around. He's a far cry from the run-of-the-mill hunter, who may fire his rifle less than 20 times during the local game season and then retires his rifle to the attic until next year's season. The varmint hunter keeps his rifle "hot" all year.

Basically, there are two types of these gents, training their sights on the small game: the bench rest shooter and the in-the-field hunter.

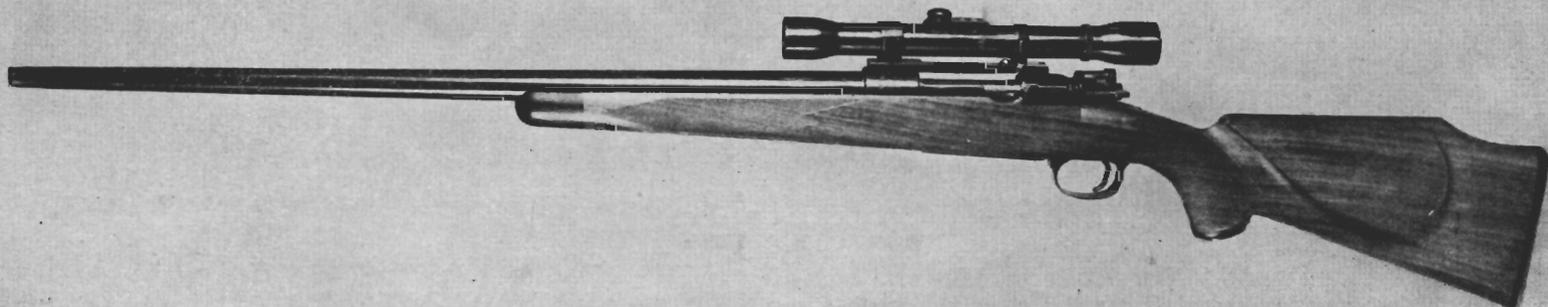
The bench rest shooter is a highly specialized species, interested only in extreme accuracy. To a bench rest shooter, weight means absolutely nothing. His rifle may weigh 15 pounds or more, with a clumsy appearing stock and a barrel that may be up to an inch and a quarter in diameter. Not all varmint hunters go to these extremes, however.

In certain fields of varmint shooting one does not tote a gun all over the country. He does most of his walking through a pair of binoculars. Still, some walking must be done.

So, the run-of-the-mill varmint hunter compromises between a standard weight gun and the extreme bench rest piece. This assures him sufficient accuracy to hit a woodchuck's head at 200 yards, and he still is able to carry the piece without a hand truck.

The dictionary defines "varmint" as a colloquialism for "vermin," and the definition for "vermin" includes small, troublesome, or destructive animals or birds." Under this blanket definition there are woodchuck and fox as well as coyotes, prairie dogs, hawks, bobcats and crows. Originally these were hunted and killed with whatever weapon the individual used in local hunting.

But today, varmint hunting has become big business. It isn't that special caliber guns and equipment are essential in the killing of varmint, but rather that the growing wariness and craftiness of the hunted has forced the



High-speed 22/250 on Mauser action was made up in the author's Chicago gun shop. It is equipped with a Weaver KV scope on a Redfield Mount. It has a Buhmiller barrel. Such beauties are coming into increasing demand.

VARMINT RIFLE

By George Pearsall



Winchester Lo Wall is made up for .22 Hornet cartridge—one of the smallest of the high speed .22's. It is equipped with a Unertl varmint scope but otherwise it is pretty much an orthodox stock varmint weapon.

hunter to use cartridges of increased power and range.

Yes, varmint hunting has moved far from the time of the "privy-bounty."

When I was a boy we used to hunt crows with our trusty .22 shorts. We'd shoot a lot and occasionally make a kill. Crows weren't nearly as wise then to the ways of modern man.

There was a bounty on each crow killed which would more than pay the cost of our cheap ammunition. We took the heads of our crows into the sheriff's office. He would gingerly separate and count the heads, and pay us about a nickel apiece. Following this he would throw the whole

mess into the outhouse behind his office.

It was surprising how many of us kids suddenly would have an urge to visit the privy. Of course, we always went equipped with string and fish-hook. The bounty on some of those crow's heads was paid many times over!

It is said today, with some accuracy, that we have more varmint calibers than we have varmint.

The .22 Hornet and the .218 Bee are generally adequate and least offensive in built-up areas. The .22 Hornet (one of the most popular) has been in use for a great many years and improved to the point where it is still very suitable up to 150 or 175 yards under low wind conditions.

But as a wind-bucker this little favorite can no longer keep up with our more potent calibers. Real power is needed to maintain accuracy in a 15 m.p.h. cross wind.

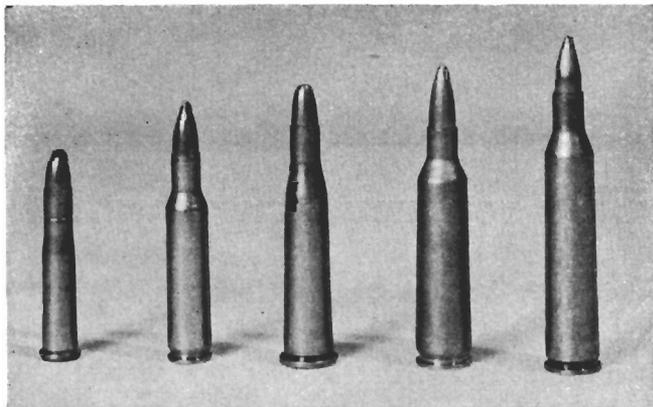
The .218 Bee, one of the later developments, is in about the same class as the .22 Hornet.

When the need came for greater distances, the development of such cartridges as the commercial .219 Zipper and the .220 Swift made it possible to secure reasonably certain hits at 200 and even 300 yards. But the varmint hunter is not interested in fair accuracy. He demands much more.

"Improved" forms of these cartridges not only increased the accuracy of light bullets at long ranges, but also insured more barrel life.

Improved cartridges in the Swift are the .220 Rocket and the .220 Arrow.

The Rocket is just a variation, in the shoulder and sides, of the .220 Swift case to permit greater powder capacity and better combustion. Commercial ammunition can be fired in its chamber with- (Continued on page 48)



Popular varmint cartridges (l. to r.) are .22 Hornet, .222 Remington, .219 Zipper, 22/250, .220 Swift.



Holley's restored gun is compared with author's. Both were made under same contract, sold for \$7.



First step involves disassembling muzzle loader. Here, Holley uses screwdriver to remove the lock.

PHOTOGRAPHS BY VORIES FISHER

IT WAS a muzzle loader. There was a letter too, in the battered old shoebox—the paper yellowed with age, with the letterhead “Territory of Oklahoma, House of Representatives,” and the dateline, “Guthrie, 189—”. The letter, unsigned, said:

“This gun belonged to the Carroll Co. Ark. emigrants that was massacred at the mountain meadows Utah in 1857 by the Mormons and Kanosh Indians.

“Old Wasatch the Kanosh chief got this gun who died in 1875 and the gun was layed with him and was found by A. B. Evans up in the Beaver range in August 1894. His horse and dog was killed and layed with him.”

Grampaw had owned the gun. We kids had been pretty impressed by the wild tales he used to tell about it, and how he had personally taken it away from the Indian chief. When the old story teller moved on to the Happy Hunting Grounds, the gun had been stored up in the attic, and it wasn't too long before we learned that the only Indians he'd ever seen were performing ones, in the famous wild west show of the old days, the 101 Ranch.

It was sometime after I had become interested in guns, and had scouted half of the world in search of the good ones and the great and historic ones,



By Norb Hildebrand

**THE FIRST THING YOU SHOULD CHECK WHEN
FOOLING AROUND WITH OLD GUNS IS THIS:**

“MAKE SURE THE WEAPON AIN'T LOADED!”



Lock comes out easily and seems to be in good condition. Cleaning and oil will make it work.



Barrel is taken from stock and placed in vise. The percussion cone lug is gently screwed out.

that I remembered my Grandfather's old muzzle loader.

I looked for it in the attic, planning on using it as a nice colorful mount over the fireplace. Then, when I discovered the letter with it, I decided on taking the gun over to a friend, Jim Holley.

Jim makes a hobby of collecting old muzzleloaders, and putting them back in condition.

As I walked into Jim's apartment he was squinting lovingly down the barrel of an old flintlock he'd been working on. "Got yourself an Injun gun, eh?" he greeted me.

"Shades of old grampaw," I said, "how do you figure that?"

"That's easy," says Jim, "all those brass tacks on the stock spell Indian. Where the white man went in for

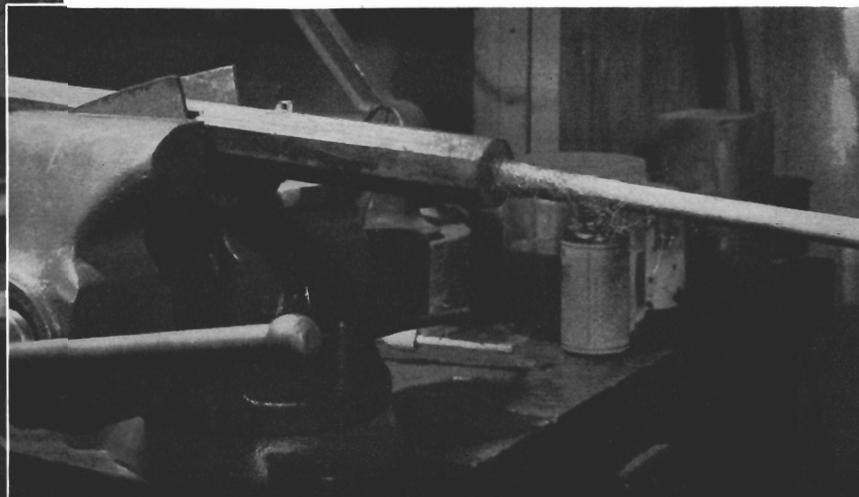
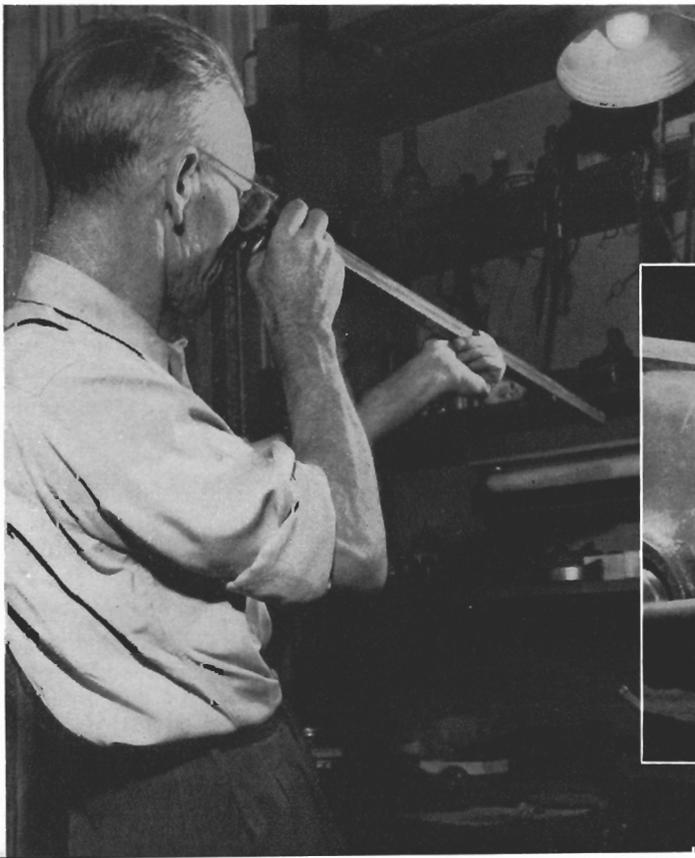


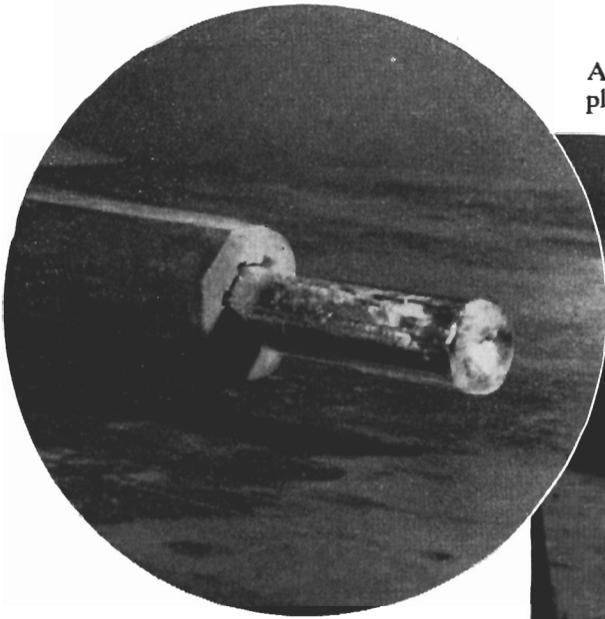
Breech tang is removed. There is no danger of spank since barrel is soft iron—but it gets hot.



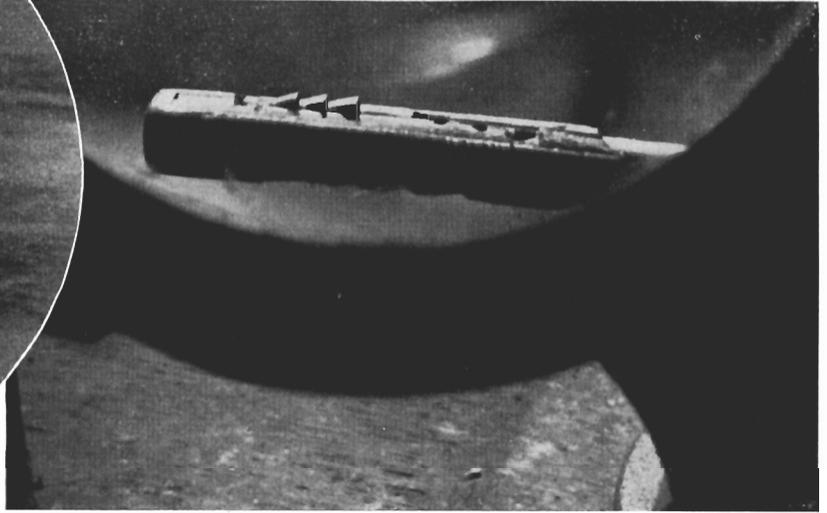
Barrel was dirty—but still good. Rather than re-rifle, and increase bore, it was "freshened".

Wad of fine steel wool is first wrapped around ramrod and used to clean out corroded barrel.





At left, ramrod has been gently tapped, ejecting plug. It is exact duplicate of inside of barrel.



Plug is fitted with home-made saw blade corresponding with the grooves in rifling. Saw is made from a tempered flat file.

fancy engraving and inlaid silver, the Indian went for brass tacks.”

Jim took a look at the dirty, rust-speckled lock plate, rubbed it with an oily rag and an inscription showed up: “Leman, Lanctr. Pa.” it read. A similar one was brought up on the barrel.

“That gun was originally made for the Indian trade,” said Jim. “Made by Henry E. Leman who established his own rifle-making plant in Lancaster, Pa., in 1834. Originally this gun, part of a Government contract for 500 guns to be supplied to the Indians, cost seven bucks.

“I’ve got one in my collection just like it—along with a very fine Leman gun. You want to put it in shape?”

I mumbled something about the fireplace—just maybe put a new stock on, take off the rust, shine it up.

“Humph,” says Jim. “Fine relic like that deserves better’n a dust-collecting gun over a fireplace.”

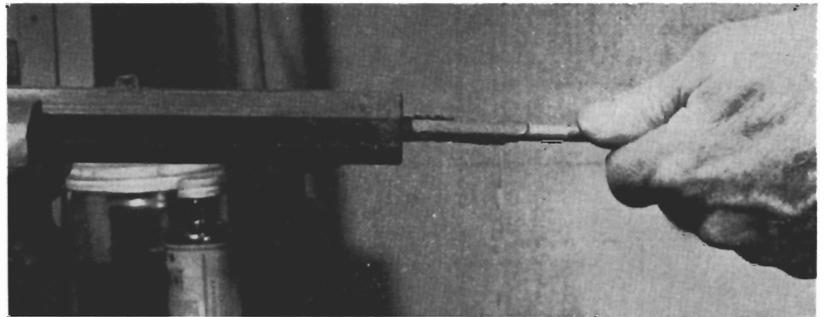
“Why that’d make you a good workin’ gun—nothing fancy and no fine target work—but that gun was made to shoot and shoot hard—she’s a .50 caliber. It’d be a crime to replace that stock. Sure it’s bad and the wood ain’t curly maple but you’ve got yourself a real relic and you oughtn’t to go doctorin’ it up—just put it back in shoot-in shape and see what your grampaw was up against.”

Well, you don’t argue with Jim. All his guns shoot—and well. Jim hunts with them and shoots competitively too and though he’s a flintlock enthusiast his collection includes the best of the cap-locks as well.

So Jim gave me a briefing on restoration work.

“First thing,” says Jim, “is to make sure the gun ain’t loaded.”

After all the years that gun has been kicking around in the attic, his remark sounded a bit humorous. So Jim took



Re-sawing of barrel is started as plug is guided by saw blade along grooves of rifling. Same method will also be used on lands.

the ramrod out from its position under the barrel and gently slid it down into the barrel as far as it would go.

Putting his fingers around the end of the rod, at the point where the barrel ended, he withdrew the rod and laid it along the outside of the barrel, his fingers still marking the depth it had reached. The rod came within a little less than an inch and a half of the base end of the barrel where it rested in the stock.

“May not be loaded,” said Jim, “but there’s something in there. We’d better have a look and watch what you do with your pipe ashes.”

The first step in disassembling was to remove the lock. A small wood screw on the left of the stock was all that held it in place. Aside from a little corrosion and dried grease, the lock looked to be in fair shape.

“The Indians weren’t noted for the care they gave their guns,” said Jim, “but on the other hand they didn’t take them apart all the time to see what made them work, or try to improve the mechanism.

The next step was to remove the barrel, held in the stock

by several pins, which were pushed out with a punch, and a wood screw through the tang at the base of the barrel where it fitted into the stock.

A gentle tug brought the barrel out of the wooden forearm.

Protecting the rifle barrel with a heavy strip of rubber, it was now placed in a vise. "Can't stand to see vise marks on a gun," said Jim.

At the butt end was a drum, one end of which screwed into the barrel while the other end, at right angles, held the percussion cone. A square head on the drum offered a hold to unscrew it with a wrench.

"We're going to do this as slowly as we possibly can," Jim explained as he fitted the wrench to the drum.

The drum turned out quite easily after a few drops of penetrating oil were applied.

With the lug out, Jim took the barrel out of the vise

plug—one end of which screws into the end of the barrel, the other end being fastened to the stock to hold the barrel securely in place. The breech plug was also treated with penetrating oil and slowly screwed out with a wrench.

This plug is often the amateur gunsmith's downfall. Of ordinary iron, it may easily bend and shear off if too much force is applied to the wrench and the plug is really rusted tight. If it is too tight, don't be in a rush. It's been screwed into the end of the barrel for a hundred years or more—let it soak a few days longer in penetrating oil.

This time a good deal more powder came out when the barrel was held up and tapped. Finally, after probing with the soft wire, Jim was satisfied he had all the powder out—it made a good tablespoonful on the paper.

Getting the ball out was next. The ramrod was again inserted in the barrel from the front and gently tapped to the rear. A few more drops of oil, a few taps, and both patch and ball—the latter about the size of a marble—came out. The patch was cotton, discolored, stiff and crumbly.

Now we could look down the barrel and see how badly corroded it might be—how much work was needed to put it in shooting condition.

It looked like the inside of an old chimney stack to me, compared with my modern guns at home. But Jim didn't think it (*Continued on page 49*)



Restoration of stock is begun by removing the copper plates which helped hold it together.

and turned it over a sheet of paper. A little dribble of black dust spilled out. "Just like I thought," said Jim, "it *was* loaded."

I thought of the number of times I'd clicked that hammer!

"Who do you suppose would do a stupid thing like that?" I asked, "having a loaded gun around for years."

"Well, it wasn't so stupid for the man who used to use this gun," Jim pointed out. "After all, it took some little time to pour in a charge of powder, and tamp in the patch and ball.

"Generally he'd want to use his gun pretty fast—so he loaded it this far and then all he'd have to do to shoot is put the cap in place. It's not at all unusual to find old muzzle loaders like this, that have been in the family for years, loaded for bear."

After loosening as much of the powder with a piece of soft wire as could be done through the drum hole, Jim clamped the barrel back in the vise.

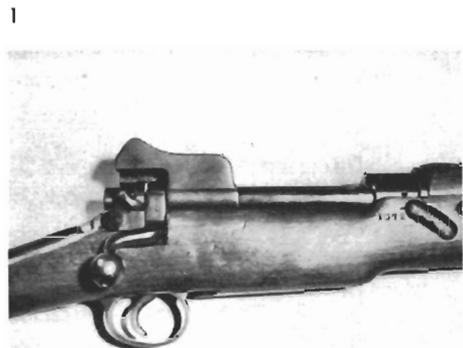
The next operation was the removal of the breech



Cracks and seams in wood stock are mended by applying good grade of resin plastic glue. Clamp of wood splinter and innertube windings exert pressure while the glue sets.

BASIC GUN CARE

ROUTINE FOR RIFLES



Large caliber rifles of the bolt action principle are modified Mauser patterns. Enfield shown here can be dressed-up to become basis for a fine sporting rifle.

**RUST AT WORK, HIDDEN, CAN RUIN
YOUR BEST GUN. SEASON TO SEASON CARE
REQUIRES DISASSEMBLY "KNOW-HOW"**

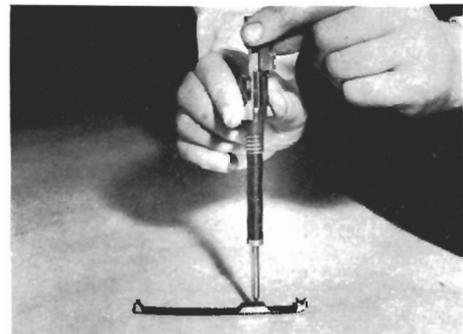
HAMMERLESS PISTOL TAKEDOWN

1



Remove clip or magazine. Savage has a release on front of frame. Other pistols have magazine latches on side at rear of trigger or hooking onto clip bottom.

5



Place firing pin tip on hard surface, so it will not slip out under pressure. Push down bolt sleeve until cocking piece can be rotated 90°, freeing it from rod.

Gun care means more than just cleaning the barrel, though this is important. Temperature changes from the cold out-of-doors to a warm room will cause moisture to condense inside parts, often leading to rusting of delicate springs and failure to fire or jamming in an automatic. Sweat and body acids from perspiring hands will etch fine steel finishes,

2



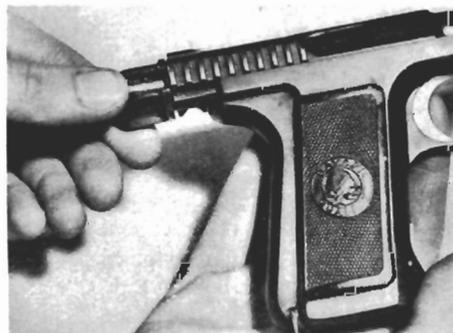
Clear the gun. Pull slide carefully to rear and look into breech end of barrel to make sure chamber is empty. Extractor may not work properly in hand operation.

3



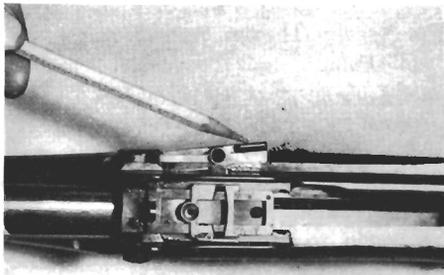
Thumb safety on Savage also serves as the slidelock. Colt and other large automatics have lock placed in similar position to aid disassembly. Slide is locked at rear.

4



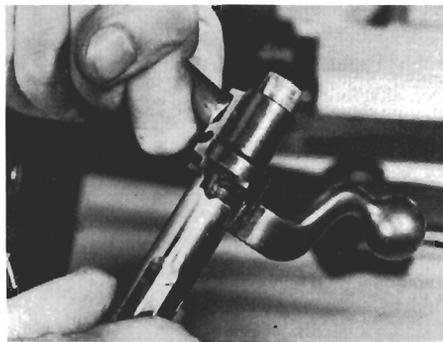
Cocking lever is pressed slightly which permits lugs which hold bolt to slide to be rotated out of engagement. Then bolt may be pulled out to rear, striker cocked.

2



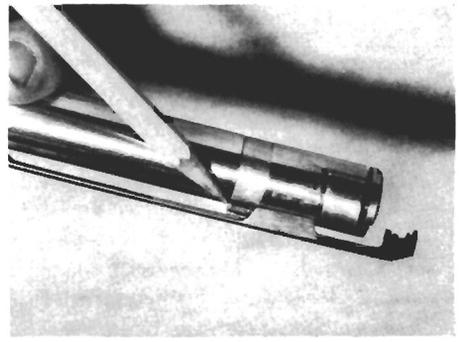
Bolt is held in by bolt stop attached to ejector box (pulled out here) on Mausers and Enfields. Springfield stop turns out; Mannlicher has rocking thumbpiece stop.

3



Cartridge rim is hooked under cocking piece which is pulled up to clear bolt body. Bolt sleeve which holds firing pin and cocking piece is now unscrewed.

4



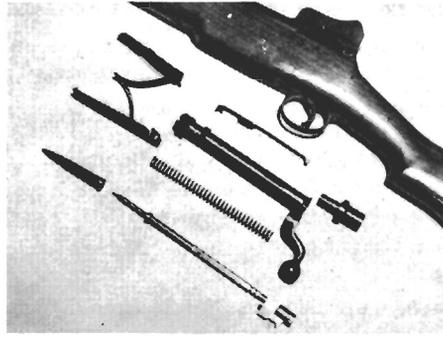
Spring collar holds extractor. Rotating extractor onto bolt body frees it from cut near face of bolt. Extractor may be pushed forward to disengage from collar.

6



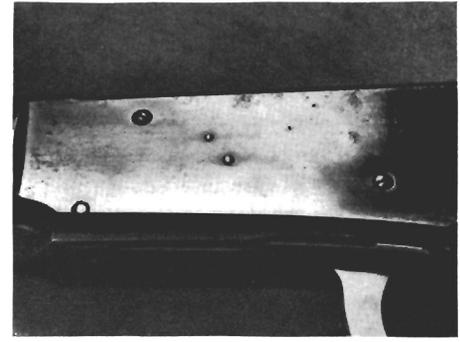
Bullet point is always available tool for dismounting. Push in magazine floorplate catch—this releases floorplate, spring, and follower, for easy removal.

7



Related parts which are placed near each other simplifies the matter of assembly. Have ample working space and keep parts in view since lost parts are a nuisance.

8



Rust was allowed to accumulate on frame of this M94 deer rifle. Butcher used coarse emery instead of fine steel wool—made refinishing necessary to hide scratches.

too often an otherwise nearly new gun will be marked by deeply lined fingerprints left by some careless person who was in too much of a hurry to wipe the gun down with an oily rag, or attend to the basic elements of gun care. Periodic "field stripping" should be standard procedure in the care of even inexpensive guns. Firearms are designed with sim-

ple disassembly in mind. Parts may be removed by use of a cartridge—case rim, bullet point—but if care is not taken in safe and correct reassembling of breech mechanism, the cartridge may do some unintentional disassembling on its own—right back in the shooter's face! Be careful, don't try to force things, and read the maker's directions.

5



Breech bolt is removed from slide. This is as far as disassembling of bolt is recommended in this gun. Further stripping might be required for repairs.

6



Release slide by flipping the slide latch forward to "off". Hold slide so it will not fly off of frame: recoil spring is inside, still under dangerous tension.

7



Gun breaks down into few main components for cleaning after shooting. Wipe parts dry and oil lightly with a good commercial gun or a light neutral machine oil.

Hell's Marshal . . .

pay me that \$35."

Bill frowned. "I don't want to make a row in this house, but you better put that watch back on the table."

Dave laughed and walked out.

Soon everyone in town knew that Tutt had Hickok's watch. Bill finally asked Dave not to wear the watch or advertise its change of ownership.

Tutt said, "I intend wearing it in the morning."

"If you do I'll shoot you," said Hickok.

The population of Springfield and vicinity assembled bright and early. Around nine o'clock Tutt walked up the west side of the city square and took a seat in the doorway of a livery stable. Hickok entered the square from the south and inquired about Dave along the east side. People told him Dave was across the square. Bill spied Dave's kid-brother and told him to go warn Dave not to wear the watch.

At that moment Dave came out of the stable. Bystanders scattered.

Dave turned east to cross the square; Bill stepped off the sidewalk to meet him. Both had their artillery unlimbered. Dave brandished a brand-new Colt's Navy model. Bill displayed a .44 Colt's Dragoon.

"Dave, don't you come across here with that watch!"

Tutt started forward at a run. Hickok laid his weapon over his left forearm for support. Halfway across Dave jerked up his six-shooter. The shots were simultaneous.

Tutt stopped, swayed for a second or two, raised his arm as if to fire again, then turned and staggered back and flattened on the sidewalk.

He was dead when they reached him. The jury called it self-defense.

In 1869, Hays City, Kansas was in the market for a police officer with lots of guts. Wild Bill Hickok took the job . . . and the Hays City Vigilance Committee held its breath.

Hays City was the western end of the railroad tracks, the jump-off for all things west. Main Street was a double row of saloons, dancehalls and brothels. As many as 500 teamsters sometimes hit town at one time.

Troublemaker No. 1 for Hickok was Sam Strawhorn. A few days after taking the oath, Bill helped the marshal of nearby Ellsworth confine Sam on a drunk charge.

A day or so later Sam appeared at Hays. Hickok was playing cards in a local tavern. Strawhorn entered, strolled past the card game toward the bar; then swung round with a leveled sixshooter. Hickok's bullet caught him square in the eye. A brass band serenaded the initiation of the new marshal that evening.

No. 2 was Bill Mulvey, big bad Missouri man. He was riding his horse into saloons, shooting the pretty rows of bottles, when someone told him Wild Bill was marshal. Mulvey explained that he had come to Hays for the express purpose of killing Wild Bill.

These remarks were made known to Hickok just as Mulvey came galloping down the street, rifle cocked. Bill stepped out to meet him. Mulvey pointed the rifle, but Hickok waved to someone apparently behind Mulvey.

"Don't shoot him in the back! He's drunk!"

Mulvey wheeled his horse around and never knew what hit him. The slug went in one ear and out the other.

No. 3 was a personal affair, a cattleman by the name of Bill Thompson. The two Bills were both seeking the favor of an Ellsworth beauty named Emma Williams.

Hickok was eating stew in a restaurant one noon when Thompson entered, pistol in hand. Bill looked up, then slid to the floor. Thompson's bullet scattered Hickok's stew; Hickok's bullet scattered Thompson's brains.

In 1871 Abilene, Kansas was living its high-water year, a mushrooming cattletrade mecca at the junction of the Kansas-Pacific and the Chisholm Trail. Zigzagging Texas Street was the sinful section of town. Respectable citizens ignored it seeing it a companion to their prosperity. But Bill Hickok was hired to govern it.

Chief among saloons was the Alamo, a favorite of wealthy cattlemen. Its walls were decorated with reclining nudes; its green gaming tables and brass-bound bar were busy around the clock.

Marshal Tom Smith had succeeded the previous season in enforcing an ordinance against sidearms, only to get shot that winter.

Abilene had liked clean-cut Tom Smith and had misgivings about Hickok's reputation. The town was

still in doubt on April 15 when they swore him in for \$150 a month plus fines. The Novelty Theater even hired its own policeman.

Bill made his headquarters at the palatial Alamo Saloon. If the citizenry didn't trust him, still less could be said for the attitude of Texas ranchers patronizing the Alamo. Threats on his life soon began to alter Bill's usual good nature.

It was not uncommon to see him in the barber's chair with a sawed-off shotgun across his knees. His white linen shirts, showing afar on a summer's afternoon, ballooned out over the gleaming butts of his sixshooters. In the evenings he wore a low-cut vest under his black suit-coat, with twin derringers tucked inside. He carried the shotgun when worried.

His irritation early centered on the Bull's Head Saloon—unofficial headquarters for the cowboys—and its owners, Texans Ben Thompson and Phil Coe.

October 5 was closing day for the cattle season. The Lone Star mob whooped it up that evening in a last-roundup blowout. Hickok was agreeable, but warned the crowd to keep their celebration within bounds. Around nine o'clock someone fired a pistol in front of the Alamo.

Hickok entered from the rear of the Alamo and ordered a drink, studying the crowd outside. He was angry. He finished the drink and stalked out. Coe was there, too. Bill asked him who fired the shot.

The crowd quieted. "I fired the shot; I shot at a dog," Coe answered.

They were several feet apart. Coe stood at the sidewalk well. He must have made a move toward his pistol because Bill went into action.

His derringers were suddenly out. He fired once and pocketed the empty piece pulling a sixshooter as he discharged the other. Coe fell and Hickok backed to the doorway exclaiming, "I shot too low!"

On December 12 the city council discharged Wild Bill.

It was a Hickok bordering on vagrancy that spent 1872 in Kansas City with the Market Square bunch. Afternoons on the bench in front of the police station; evenings at the dancehalls and theaters; with monte, faro, and poker from midnight till dawn. Since gambling for a living had its ups and downs, people who knew Hickok doubted if he even owned a horse.

In the spring of 1873 Buffalo Bill offered him a job as actor in his new road show.

It wasn't long, though, before the whole thing got on Wild Bill's nerves, much to Cody's growing displeasure. Finally a footlight lamp exploded in his face and put him in a hospital. He returned to the West in August—broke again.

Then, in 1875, the public pulse quickened at the news of gold in the Black Hills of Dakota Territory. In February of that next year Bill was at Cheyenne, Wyoming figuring how to raise sufficient capital to outfit himself.

On March 5, Wild Bill Hickok married Agnes Lake. Bill was 38; Agnes was 49 but well-endowed culturally—and financially.

A two-week honeymoon in Cincinnati and then Bill headed back alone to Cheyenne. The old excitement was in him again. With his friend Colorado Charley Utter and 200 others, he trekked north for the Hills.

Deadwood Gulch in the spring of '76 was big pickings, the richest goldfield in the world. The town itself bordered a creek, circled by pine-clad hillside diggings. It was a veritable armed camp, overflowing with prospectors, prostitutes, bandits, bullwhackers, gamblers, and gunslingers—a seething Sioux-surrounded outpost amid the wilderness.

Hickok arrived at this den of cheap life and expensive whiskey in May. As his party mounted Break Neck Hill and looked into the valley he is supposed to have turned to the others.

"Boys, I got a hunch that I'm in my last camp and that I'll never leave this gulch alive."

Utter laughed and told Bill to quit dreaming.

A lot of people would have liked Hickok out of the way, but God knows there were men in the Gulch more qualified to do the job than Jack McCall. Jack had been just a kid running away from home a few years before—a 25-year-old ex-buffalo hunter and an inferiority complex big as a barn.

When the gambler John Varnes slipped him \$25 he probably didn't think Jack would go through with it.

Around 3 o'clock a well-oiled McCall entered Nuttall & Mann's, where the now-famous poker session was in progress. Hickok had taken a seat with his back to the room not because of carelessness but because the

gunman, Charley Rich, would not give up the stool against the wall.

Wild Bill never knew what hit him. There was McCall's hysterical shout—"Damn you, take that!"—and the explosion behind his ear was his death.

The .45 slug from close range completely pierced his skull, coming out under his right eye, striking another player in the forearm and lodging there.

The startled old fellow screamed, jumped up, and stumbled to the door and into the street shrieking, "Wild Bill shot me!"

McCall followed him, backing out behind gunpoint.

Only afterwards did the stunned witnesses stoop to examine the figure curled beneath the thinning gunsmoke, knees drawn up, fingers still cramped for the cards. Tradition says that Bill's bloodspattered two-pair lay face-up on the floor. Black eights and aces; the original Dead Man's Hand.

The cry went out: "Wild Bill's shot!" Miners knocked off work and came back to town at the news. McCall was placed in custody, requesting a quick trial.

A litter was fashioned and the corpse was carried across the creek to Colorado Charley's camp, followed by a procession that talked of tethering McCall to the nearest limb. Leaving Charley to make funeral plans, the crowd surged back to the bars and to more incoherent talk of justice.

"Well men," Jack told the jury the following day, "I've but a few words to say. Wild Bill killed my brother in Hays City in 1869, and I killed him. Wild Bill threatened to kill me if I ever crossed his path. I'm not sorry for what I done. If I had to, I'd do the same thing over again."

The jury was philosophical about it, frontier style. To avenge a brother was justifiable; you couldn't swing a man for that. An hour after his acquittal Jack McCall was out of town.

That same afternoon they laid Bill away in his good black broadcloth suit and a new linen shirt.

Beside him in the coffin they placed his Sharps carbine, according to a wish he had often expressed. If you drive to Black Hills Park today you can see his grave there, an unimpressive enclosure made less beautiful by visitors of a prior year who chipped away his headstone.

In Deadwood itself, the Adams Museum displays a few belongings, and a new Korczak Ziolkowski monument

proclaims him the marshal not only of Abilene, but of Dodge City and "Hay City"—more original history plus some original spelling.

They got Jack McCall later, by the way. He was bending his elbow in a Custer City tavern one evening when a Federal marshal heard him admit the murder, laughing at the story he had told about avenging an imaginary brother's death. The marshal arrested Jack and took him to Yankton for retrial where, to McCall's credit, he made a clean breast of it and went to the noose without a whimper.

Lovers of Western lore, however, like to recall the moment when Jack faced the U. S. attorney on the stand and was asked, "Why didn't you go around in front of Wild Bill and shoot him in the face like a man?"

McCall, they say, fixed his questioner with a surprised glance. "I didn't want to commit suicide!" ©

BENNETT

(from page 19)

Two-bit pistols . . .

about the thumb piece is its shape and position: any other shape could be used.

7. *Hollow rivet in hammer nose.*

8. *Cylinder lug* (lug which holds front lock pin). Shape is non-functional.

9. *Mottling of hammer and trigger.* The heat-treating and coloring are done by an expensive and intricate process, and S&W claimed they had accepted it as a style point, while plain grey-hardening would have done just as well.

10. *Checkering of stocks was distinctive pattern.* The placement of the center lozenge, border, etc.

11. *Gold monogram, and sideplate stamping.* The prevalence of the fake monogram inserted in the top section of the grips caused S&W to discontinue temporarily that feature of their own arms. The interlaced "OH", for Orbea Hermanos, or the like, were close simulations of the S&W cipher, even to the top and bottom words "Trade" and "Mark."

When the case came to trial in the Spring of 1926 Smith & Wesson had their big guns loaded, for a couple of brothers in their employ had been engaged in the hobby of gun collecting. These enterprising young men

were William and Arthur Desellier, and they ventured out into the canyons of New York, their pockets laden with Springfield gold, to buy some revolvers. Arthur wrote to Paramount Trading Co., asking for "a Smith & Wesson revolver," and received instead a Spanish gun, "which is substantially a simulation of a Smith & Wesson." William also wrote to Paramount, ordering a genuine Smith & Wesson, and received a Spanish revolver, Beistegui make. Arthur then wrote a note to Import Trading Co., asking that they send him a "Smith & Wesson 32, with the longest barrel you make; the price is \$17.00 and 25c for parcel post, which makes \$17.25 I am sending you."

He, of course, got another Spanish revolver made by Guisasola. Of these guns, the tariff commission head said that they showed "an almost irresistible inference of intent to deceive."

Yet not all these Spanish guns were junk, nor all "fakes." J. L. Galef, still in business as a reliable firm importing better European arms and jobbing all American arms including Smith & Wessons, received guns from two main sources. Of the Orbea-Galef revolver, Smith & Wesson was able to show that it had dimensions similar to those set up on the comparable S&W blueprints. There was evidence introduced to show that the pitch and fineness of the threads which screwed the barrel into the frame had been originated by S&W.

The tariff commission found that the importation of the Beistegui, Guisasola Hermanos, Orbea, Alfa, Trocaola y Aranzabel, and Garate Anitua revolvers, or the sale thereof, "constitute an unfair method of competition . . . and is therefore unlawful." They were forbidden entry and confiscated arms presumably destroyed, although, of course, many had already been imported. The Galef-Manuel Escodin arms were specifically named and permitted entry.

Two good names suffered from this fiasco. Smith & Wesson lost prestige among victims who thought that the fraudulent pistols they bought had actually been made by that company (this happened especially in South America where the name *Smith y Wesson* was almost synonymous with "revolver"). And the once fine metal working of which Spain is capable, as well as the fine weapons it has produced, were blanketed by a contemptuous epithet—"the Two-Bit Spanish Pistol." ©

BRANT

(from page 22)

Full automatic . . .

and the barrel return spring pushed the barrel forward again, the block held in the open position.

The empty case was held by the extractor, and the barrel pulled from it, whereupon it was ejected and a fresh cartridge brought into line. The block return spring, compressed during recoil, now drove the breech-block forward, and the gun was locked when the two parts returned to battery.

In a *gas operated* weapon, the functioning of the breech-block and locking mechanisms, as well as feed belt if any, depends on the reciprocating movement of a gas-actuated piston.

A modification is the *impinging gas principle* introduced by the Baron Odkolek—a gas cylinder placed parallel to the bore was connected to the bore by a small passage or port. Within the cylinder was a piston, the rear end of which was connected to the breech locking mechanism as an operating rod. The gas was tapped from behind the bullet and impinged violently against the piston, driving it to the rear with terrific acceleration.

To soften these stresses, the gas ports in guns of the Odkolek pattern, such as the Hotchkiss, Bren, Browning automatic rifle, and others, were placed close to the muzzle—and consequently lower pressures.

There were two principal defects to such a design. First, the weight of the moving parts—the gas piston and operating rod was nearly the length of the barrel—makes such guns unduly heavy.

Furthermore, the gas tapped from near the muzzle was of relatively low pressure, and cooler than at the breech. Consequently carbon would be chilled and deposited on the cylinder and piston surfaces, eventually causing sluggish operation.

These defects made some designers pause and ponder. Thus the principle of *expanding gas operation* was discovered.

In this design, the gas is tapped from nearer to the chamber, with pressures much higher. Only a small portion of gas is tapped off before a sliding sleeve valve shuts off the gas port, and the gas is permitted to expand without being sustained by the

higher pressures obtaining in the bore.

While of course this gas, in cooling, also deposits carbon on the cylinder surface, the blast from each successive intake serves to clean out the preceding deposit, so that fouling is minimized.

With an initially shorter and lighter operating rod, the expanding gas operation allowed lighter parts to be used, for the acceleration of the breech-block and other components was "softer" and less abrupt than in impinging gas designs.

To permit tapping gas at high temperatures, with less fouling, yet have the advantages of the expanding gas system without the complexity of the sleeve valve, the *short-stroke piston* was developed. The story of Dave Williams and his design for the piston which came about while he was serving a sentence for manslaughter is well-known to viewers of the movie, "Carbine Williams."

In the world-famous U. S. Carbine, cal. .30M1, the gas is tapped from directly in front of the chamber, and impinges violently against a short steel piston which slams back 1/32", striking the front of a massive operating slide which carries a bolt-cam. The slide is accelerated at a high speed, but the impact lasts so briefly that this acceleration soon reaches a peak.

However, when this massive breech operating slide goes into motion, its inertia is such that it spends the rest of its rearward travel in getting over the shock.

The bolt cam rotates the bolt, unlocking the breech. Residual pressure here, as in others, to some extent extracts the cartridge. But the extractor hook is so strongly built that to an even greater extent the case is actually pulled from the chamber by the movement of the slide and bolt, rather than pushed by remaining internal forces.

As the Patent Office files became more crowded, and ordnance purchasing agents more blasé, *variations* in these *basic designs* appeared. Although the straight blowback design is normally considered suitable only for light cartridges, the very heaviest of portable automatic guns have been designed around this function: large caliber aircraft automatic cannon. The Oerlikon is the classic example of the type.

The breech in this gun is not locked at the moment of firing. A very heavy breech-block in motion together with heavy recuperator springs is relied

upon to obturate the chamber during the firing of the cartridge. The fresh round is picked up from the drum or clip feed and commences to run into the chamber, as the bolt moves forward at high speed.

Some little distance before "battery," the round is fired, the bolt continuing to close as the pressure rises. The forward inertia of the bolt is eventually overcome, and the cartridge case, which is lubricated to slide freely in the chamber, commences to set back while the bullet is still in the bore.

The bolt is accelerated to the rear but has moved only a few thousandths of an inch before the bullet leaves the muzzle. Residual pressure then operates the rest of the cycle, compressing the recuperator springs and actuating the feed assembly.

At no time is the breech-block solidly locked behind the cartridge! To some extent this has been used in smaller guns: the Schwarzlose (Austrian) service machine gun is an example. Of a retarded blowback design, the Schwarzlose employs a toggle working against springs at a mechanical disadvantage to slow the opening of the breech while pressure is high. A built-in oil pump lubricates the cartridges to permit easy extraction.

With warfare ranging from temperatures of 135° at the tropics to -65° at the poles, it may be seen that lubrication could become a problem, and oiled parts which might slide freely in warm climates would appear to have been covered with molasses toffee in colder places. Far more popular for aircraft mounting was the reliable gas-operated Hispano-Suiza 20mm cannon, which was made in great quantity and several different models for United States' use in World War II.

Among variant principles is the so-called *blow forward* principle. Guns using this notion were designed by Ferdinand, Ritter Von Mannlicher, and Andrea Schwarzlose.

With the barrel so constructed as to move forward, it performs the usual functions of the ordinary pistol breech-block or slide.

The cartridge case is kicked aside and the magazine lifts a fresh cartridge in line to be picked up by the barrel as it returns to battery. If the barrel is held still, the frame will blow back; if the frame is held, the barrel will blow forward.

The dictates of modern war have developed automatic guns which are a long way from the simple designs of

Browning and Maxim. Yet oddly enough, one of the most modern and efficient of these guns, the U.S. Air Force M39 20mm automatic cannon, harks back to one of the most classic of designs—the revolving chambered breech. Shades of Samuel Colt!

The M39 was the result of design groundwork by the Mauser Works at Oberndorf, Germany, and was improved by the Armour Research Foundation of Chicago. Mauser had been working on an experimental revolving breech machine cannon during the last stages of the war.

One of the experimental models on this principle was seized by Army Ordnance in 1945 and subsequently delivered to Armour for further study leading to the development of a fully engineered production model.

Today's weapons must fire faster than ever dreamed possible. Mounted in aircraft flying at the speed of sound, radar aiming devices have obviated human error. But the same old cycle of load, fire, extract and load goes on. Ways were constantly being sought to speed up this routine—ways to reduce what might be termed "chamber time."

The part of the cycle during "fire" requires the chamber to withstand the explosion, but during loading, extracting, and reloading, the chamber in a single-barreled aircraft gun is "idle time." Nothing effective is being accomplished at the target.

The M39 gun, as perfected in several variations by Armour, and produced for fighter plane use during the Korean war by Pontiac, used a 5-chambered revolving cylinder behind the bore proper, to carry the 20mm shells. Interchangeable cylinders and barrels permit use of either 20mm shells or the World War II experimental .60 caliber machine gun cartridge.

Details of the gun, which has been operational on a field level for three years, are still classified. However, a number of things can safely be assumed. The gun is gas-operated. It may, indeed, be short-stroke piston operated like the M1 carbine. A camming slide set into rearward motion will both shift the cylinder one chamber space and set in motion the other elements of the cycle—load, extract, and fire.

While the bottom chamber is lined up with the bore in firing position, the top right chamber is ready to receive the cartridge stripped forward from a "U" clip link belt. The left horizontal

chamber is in a position to eject the fired shell through a curved tube, to clear the mechanism. Because of the four extra chambers available for other parts of the cycle while the bottom chamber is firing, a rate of fire approaching the maximum is possible.

At the instant the bullet clears the muzzle, if the gun is timed neatly enough, the cylinder can be shifted one notch and the cartridge fired.

The adjacent chamber is loaded, and during the cycle other chambers, not the one in line with the bore, are engaged in loading, extracting, and ejecting. A rate of fire "considerably" higher than the .50-caliber M3's 1,200 rounds per minute is attained. Unofficial statements place this as high as 1,700 rounds per minute.

By comparison with the M3 .50-caliber gun, this means about five times the weight of metal on the target in a given time, with the added advantage that the 20mm projectile can be explosive, which the .50 caliber bullet is not.

Though the M39 gun is phenomenally fast in operation, ways are still being sought to speed up the operation. Even if no immediate profit can be visualized, projects are under way to eliminate other elements of the automatic cycle. Extracting, for instance.

In the beginning, it was the metallic cartridge case which made automatic guns possible. Yet it brought with itself an insurmountable deficiency—after firing the empty case had to be disposed of. A revolving breech gun has proved to be one partial solution. Yet in other fields of operation, perhaps such a gun would be impractical. Nearly half the motion of an ordinary automatic cycle is devoted to extracting and ejecting the fired case—and fully half the jams and malfunctions are related to this phase. But if there were no metallic cartridge to kick out . . . ?

The search for new designs and improvements for existing weapons goes on constantly. Among the remarkable metals now going into practical use are titanium alloys, wonder metals lighter than aluminum and as strong as steel. Lubricating oils which flow at temperatures of -60°F. are already in use for some guns. Plastics are being investigated; metal-forming processes are undergoing revisions.

Ahead may lie "ray guns" and liquid propellants. Man's devotion to killing his fellow inhabitants unfortunately has no bounds. ©

Shootin' irons . . .

arms the "bored-through" chamber patented by Rollin White, finally made possible the efficient cartridge revolver that was needed in the west. Smith and Wesson took over this patent, and in so doing almost took over the revolver business of this period.

They brought out a little "break-up" .22 rimfire revolver in 1857, and from then on the end of the percussion revolver was an eventual certainty. They had an improved .32 RF revolver ready in 1861, and various forms of these tip-ups in .22 and .32 RF were made until 1879.

Service demands of the Civil War brought a rush of interest in metallic cartridge revolvers. But Smith and Wesson's Rollin White patent assured them exclusive use of the bored-through cylinder. The "lip fire," "teat fire" and Thuer metallic-cartridge conversions did their respective promoters very little good.

In 1869, during the last days of the life of the Rollin White patent, some Remington cap and ball revolvers in service were converted to use .46 rimfire cartridges. By 1871 Colt had a conversion of the Model 1860 Army to use .44 centerfire cartridges. As the New Model Army, it led to the development of a true cartridge revolver, the Model 1872, a .44 RF arm much resembling its percussion forbears. Also in 1872 Colt produced the first of what was to be the Model 1873—the Peacemaker, the Single Action Army Colt.

The 1860 Spencer was the first successful lever action repeater rifle. It had a magazine tube in the butt stock and when the breech was open the magazine spring thrust a cartridge outwards to be held against the face of the breech block by a spring finger. It remained in this position until the rearward movement of the lever thrust it into the chamber. Like the single-action revolvers, the hammer had to be cocked by separate action—usually the thumb.

Following the Spencer came the 1860 Henry, another lever action repeater. The first Henry rifles fired a rim fire cartridge called ".44 caliber" though the bore was .42". Manufactured by

The New Haven Arms Company till 1866, only 10,000 of the Henry rifles were made.

The Henry would never have persisted as an outstanding rifle, and certainly would not have taken a place in history, except for King's improvement of 1866—the side loading gate. Late in 1866 the New Haven company, with the improved rifle, became the Winchester Repeating Arms Co., and the "yellow belly" Winchester—once the brass-framed Henry—became the most famous rifle of the period. It was as necessary a tool as shovel and hoe.

The Winchester 1873 and the heavier 1876 were essentially the same firearm as the Henry 1860 except that when the .44-40 center fire cartridge became popular the action was made stronger.

The Winchester 73 helped make the name "Winchester" practically synonymous with the word "rifle."

About 1870 Smith & Wesson brought out the first of the series which was to include the .44 American, .44 Russian, .45 Schofield and .44 Frontier revolvers—plus a host of related top-break simultaneous-ejection revolvers. Remington produced its solid-frame rod-ejector "Improved Army Revolver" (.46 RF) in 1872 and followed it in 1875 with the new Improved Army Model (.44 CF).

Western revolvers with double-action firing mechanisms came back in 1877 (the earlier Cooper revolver and the Allen pepperboxes, to name only two, had been double-action arms). Colt added a DA revolver in 1877, Smith and Wesson following in 1880. Colt brought out a side-swing-out revolver in 1890, Smith and Wesson, 1896. And with these, the revolver assumed substantially its present form.

It was this heavy military or semi-military class which made up most of what we now think of as the Handguns of the Old West.

There was one class of weapons which occasionally figures in accounts of the West—the stingy gun, the hide-out, the bootleg pistol, the derringer. This was a parallel class, the sort of junior-grade version of the big boys, but it wasn't intended for kiddies.

Whether you used a pocket revolver, one of the many cartridge derringers available or some trimmed-down howitzer of your own design, the idea was to get a lot of punch into a small enough package so that it wouldn't make too big a bulge in your mole-skin pants or your fancy checkered waistcoat. ©

Varmint rifles . . .

out impairing accuracy to any great extent. Some velocity is lost but it is negligible.

The Arrow is quite similar to the Rocket except that it is shorter and therefore commercial ammunition cannot be fired in its chamber.

There are two variations of the Zipper which have attained a reputation for accuracy—the K-Zipper and the Maximum Zipper.

Both of these chambers have straighter sides and sharper shoulders to secure better powder burning and, powerwise, should be classed close to the Swift. Also, both variations can be made on standard Zipper chambers, and they will still handle standard commercial ammunition without bad effect. After reloading these "formed" cases, they will show superior accuracy and greater velocity without any appreciable rise in pressure.

Another very popular gun (and probably the least critical in its reloading) is the 22/250. This is nothing more than a 250/3000 Savage case necked down to .22 caliber.

It can be loaded to produce velocities less than that of a Hornet, or up to those of a .220 Swift with accuracy. It is perhaps the most versatile for the average reloader.

The .219 Donaldson Wasp, together with a number of other wildcats, has made possible the hunting of varmint at ranges of 300 or even 400 yards. And when our most abundant quarry, the crow, offers a vital area target no larger than that of a four-inch bull, you will understand that phenomenal accuracy is required.

There are commercial guns for a good number of our varmint calibers, and local gunsmiths are regularly making up wildcat calibers and standard commercial chambers on single shot actions as well as on Mausers, Springfields and Enfields.

Costwise, the rifles mentioned earlier will run from \$45 for the cheaper .22 Hornet or .218 Bee, on up to about \$125. If you want to buy something fancier than the regular commercial grades, the sky's the limit. ©

Muzzle loader . . .

was too bad, nothing that a little "freshening" wouldn't cure.

"Freshening," it turned out, meant to refresh the barrel or, to put it more accurately, to work the barrel down to bright metal by re-sawing it. This, Jim explained, took a little patience and time but it wasn't difficult and even an amateur handyman like myself should be able to do it after watching Jim work for a while.

First the barrel was swabbed out with wads of fine steel wool, working from the muzzle end and pushing it through with the ramrod. The first few wads went through with difficulty and came out loaded with brown-red corrosion. Then they gradually came out cleaner.

Finally, with the barrel as clean as the steel wool would make it, the next step was re-sawing. First, a plug was cast to make a pattern of the inside of the barrel with its lands and grooves.

This was done by inserting a metal rod into the barrel from the butt end and extending level with the muzzle end. The rod was first wrapped with masking tape (string or yarn would do) about three inches from the end of the muzzle so as to fit snugly into the barrel. This wrapping held back the molten lead which was now poured into the muzzle end of the barrel.

A tap of the rod brought out the casting—a plug about three inches long which gave the pattern (in reverse) of the rifling.

The next step was to rout out with a knife or small gouge a place for the saw blades which could do the re-sawing job. This routing was first done along the raised ridges of the casting.

Since these old gun barrels are soft iron, all that is needed for the saw blades is something a bit harder. Tempering is not a critical operation. The saw blade must correspond as exactly as possible with the width of the groove to be cut, and it must then be set into the plug so that it just barely clears the groove in the barrel.

Once the saw blade is fitted in the plug at the proper depth, the plug, still attached to the metal ramrod, is gently inserted in the barrel—so that

the saw blade guides into one of the grooves. A few drops of oil in the barrel, and the plug is then worked through. The plug may be pushed or pulled from either end of the barrel though Jim prefers working from the muzzle end.

As the plug is gently worked through the barrel along the rifling, it cuts through to bright metal. With one groove re-sawed in this fashion, the plug is rotated so that the saw blade is guided into the next groove and this procedure is followed until all the grooves have been re-sawed.

After the grooves have been re-sawed, another plug of the barrel is cast and a saw blade is fashioned in the same manner for cutting the lands.

When a barrel is so far gone that "freshening" is impractical, the gun may be re-rifled. This, however, involves reaming out the barrel until smooth and then new-cutting the rifling. It usually requires skill and tools beyond the amateur, and should be done by a gunsmith who has the proper equipment.

While ordinarily nothing coarser than fine steel wool should be used to preserve the age-brown appearance of the gun, it is occasionally necessary to scrape the rust off. The correct tool for this is a sharp, square blade, such as the edge of a new, good quality screwdriver.

Lay the blade almost parallel to the bore, and push it along the oil-soaked rust areas, preferably on the underside, where mistakes will not show too badly. In a short while, you'll get the knack. Scraping is especially successful for small heavy rust patches on the barrel surface.

Restoration of the stock and wooden forearm is again a matter of patience. Large cracks and seams had developed on the stock of grandpaw's gun, and patches of copper sheeting had been used to hold it together. After removing these copper patches, a good grade of plastic resin glue was applied deep in the opened seams and dried under pressure.

Long strips of rubber from discarded innertubes are wound tightly about the section glued. The contraction of this rubber winding exerts a constant and even pressure on the section and makes a completely flexible, inexpensive clamp adaptable to any shape.

Deep scratches, cuts or gouges, even missing chips out of the stock and forearm, are fixed by inlay work.

The scratch is cut out evenly with a knife and a splinter of matching wood is fashioned to fit snugly, then glued in place. After the glue has set, the splinter is smoothed down to conform to the shape of the original section of stock.

Care should be taken not to damage the surrounding area of wood, as a little carelessness with an abrasive will destroy the aged appearance so desirable to maintain.

Final work on the stock is accomplished by repeated applications of linseed oil rubbed in well by hand. Only small quantities of linseed oil should be applied at a time—a few drops in the palm of the hand—and they should be rubbed into the wood until it refuses to absorb any more. By this time the wood will have a deep, dark sheen and a fine patina.

All that remained for the gun after Jim was through with it was to see how she shot.

Black powder is the only stuff that old gun was meant for. Jim cautioned me not to empty any modern shotgun shells for the powder.

He assured me that, properly cleaned and tight-fitting, the old muzzle loader in its "freshened" shape was as good as when it was made and as safe—so long as I used the ammunition it was designed for.

If I don't, I'll soon be giving my regards to grandpaw and telling him the old gun still shoots like a ball of fire. ©

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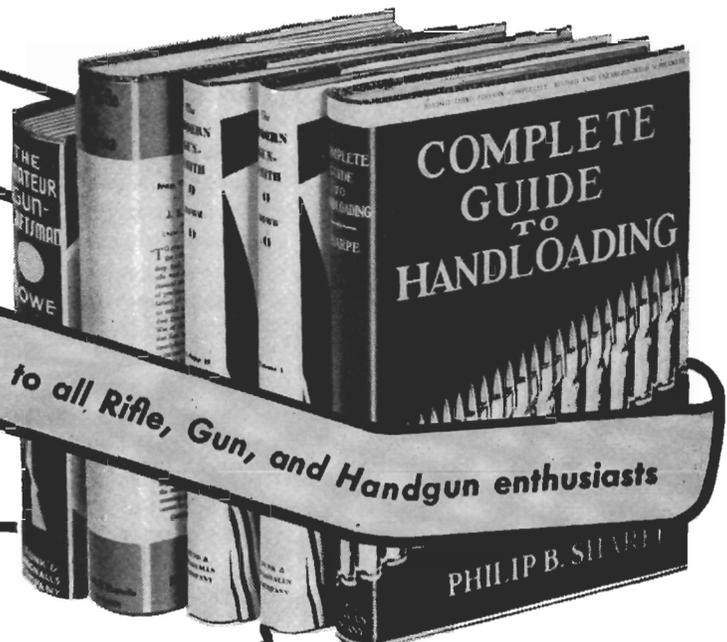
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