Outer's Book November 1909

THE NEW SJOGREN GUN

A NEW IDEA IN SELF-LOADING ARMS

By EDWARD C. CROSSMAN

(Editor's Note—It is but fair to Mr. Crossman to state that this article was submitted by him and accepted by us some months ago, several weeks before a similar article appeared in another magazine.)

SOLOMON may have been right when he stated that there was nothing new under the sun. If he was, then it has taken our gun makers an unconscionably long time to apply principles, apparently known to the wise Hebrew, to the firearms of the world.

For seven hundred years our progenitors—at least the firearms using branch of the family, placed their shoulders against the butts of their guns and cheerfully submitted to the vicious punch with which the gun rewarded their confidence. They might have been shooting at game, at target, or merely trying to keep down the surplus population. They were interested in the accuracy of their weapons from the first, then the matter of a better way to ignite the charge began to occupy their attention. Quicker methods of getting in a second shot—in case the part of the surplus population with which they were engaged, refused to stay dead—were next in line, after a reasonably quick method of igniting the powder in the gun had been found. But still nobody thought about the inevitable kick of the gun, except perhaps with reviling and the hearty wish that it were condemned to eternal purgatory, already bulging with the things which mankind have consigned there—in thought and word, at least. The thoughts of taming this kick and making it work for them, as our ancestors tamed wild horses and compelled them to servitude, apparently never entered the heads of the early gun users.

With the arrival of the repeating rifle and shotgun, using fixed ammunition, progress in firearms construction—excepting slight refinement in details—appeared to be at a standstill. But—that kick still remained. An age so resourceful that it found a use for about every sort of by-product formerly considered useless, would hardly overlook the power wasted in driving the gun back against the user's shoulder.

It wasn't that the kick was so unbearable, it was simply the same spirit of economy that invented a use for waste coal tar products, for cotton seed, for the blood of the slaughtered animals in our stockyards and which even hated to see a brook babble among the stones of its bed instead of being compelled to run down a dark flume and turn various turbines before being allowed to pass.

The question was, what to do with this power. It could not be applied behind the bullet, it couldn't be used to turn a dynamo or run a grindstone. The brilliant thought, the gun had to be reloaded, occurred at last and the rest was easy, the automatic—self-loading arm was with us. Another one of Solomon's old things had been disinterred.

On the market at present, are two well known, distinct types of self-loading mechanism as applied to sporting arms and two more plans as applied to the automatic machine guns used in our army and navy. In the automatic machine guns one type uses the recoil and some of the gases rushing forth from the muzzle to operate a moveable breech block which in its motion cocked the firing mechanism, disposed of the empty shell and placed a new one in the chamber. The other type utilizes some of the gases of the explosion, stealing them through a hole bored in the barrel part way to the muzzle compelling them to press down a lever or push back a piston.

In the sporting arms—"self-loaders," not automatics—there are also two distinct types, but both of them depend upon the recoil or backward pressure of the gases to operate their mechanism. Both of them are objectionable, from a theoretical standpoint.

One of them, the older type and the best known, keeps the breech bolt and the barrel locked firmly together but permits both bolt and barrel to slide backward under the blow of the explosion. They are prevented from sliding too enthusiastically by a strong spiral spring, one end butting against the back end of the bolt and the other fastened in the stock. The barrel is also attached to another coil spring, fastened firmly to the barrel a few inches from the breech, sliding along the magazine tube under the barrel and its rear end butting against the receiver. Thus when the barrel and bolt were at their extreme rearmost position, they had compressed two springs, one of them pushing against the bolt and the other trying to throw the barrel forward to its normal position. The bolt is unlocked from the barrel at this point, the barrel driven emphatically back to its forward position, while the bolt is left in its rearward position. The bolt having previously taken a firm grip of the collar of the shell by its extractor, when the barrel went, forward the shell was left to the tender mercies of the bolt and it is promptly kicked out

of the gun in the separating process. A new cartridge from the magazine under the barrel, tripping the catch holding the bolt, its spring drives it forward against the barrel and the locking bolt fastens it firmly in place, behind the new shell.

This plan of mechanism works well with shotguns but when the makers attempted to apply it to the rifle, a cumbersome, bulky, clumsy, ugly weapon was the result. Not wishing to have the barrel and sights move back with the recoil, they p aced a separate cover over the real barrel and attached the sights to the cover. This tends to make the rifle inaccurate and makes it as hideous a beast of an arm as can be turned out. It is hard to take down and assemble and as mean to handle as it is ugly in appearance. A great, homely doorknob protrudes from the side of the bolt like a sore thumb, assisting in the general effect.

The other plan is applied only to rifles and is more objectionable than the first one mentioned. This scheme ignores the necessity for locking the bolt in place until the explosion is over, but depends simply upon a heavy bolt held in contact with the head of the cartridge by a spring, to keep the barrel closed until the bullet and gases have left it. The makers have wisely confined themselves to weaker cartridges in this arm. The bolt is driven away from the base of the cartridge by the explosion, allowing the cartridge to blow partly out of the chamber before the pressure is all over. The cartridge is made much heavier around the head and for one-quarter inch forward to take this extra pressure. The bolt, driven back by the blow of the explosion, cocks the hammer, ejects the empty cartridge and allows a new one to be placed in front of it by the magazine spring. On going forward the new cartridge is pushing into the chamber and the bolt is again held up to the base of the cartridge by the spring.

This is manifestly a makeshift style of mechanism, opposed to the best theories of gun making and only safe as long as nothing unexpected happens. An increase in the powder charge, running up the breech pressures to a dangerous degree or an obstruction in the barrel would not result pleasantly with a rifle of this type.

A new plan of self-loading mechanism, invented by a Swede, and called after him, the "Sjogren system," seems to be the nearest to perfection in the self-loading type of fire arms. Tests made in England of his mechanism, applied both to the shotgun and the rifle, have proven it to be well nigh perfect and the English Government is experimenting with a rifle of this type, with a view to its possible adaption to military use.

In this new plan of mechanism, instead of using the recoil to push directly back on a locked bolt and barrel, or using it to simply push a bolt away from the barrel, the bolt is locked solidly and the inertia of a heavy, sliding "breech bolt cover," sliding freely on the guides on the receiver, is used.

The arm is built with an ordinary breech bolt of the Browning class, but having a striker, and circular main spring of the bolt type of rifles. Back of the bolt and fitting snugly over the rear of the bolt itself, is another heavy piece of steel, called the "Breech bolt cover." This slides freely on its guiding ribs on the sides of the receiver and it is not fastened to the bolt itself, except through the recoil spring.

When the rifle is fired, the bolt itself is locked solidly to the barrel and recoils with the gun. The bolt cover, being heavy and free to slide, through its *inertia* does *not* move back under the recoil with the rest of the gun but remains still. The gun actually *slides under* this breech bolt cover but *it apparently* lurches forward against the back of the bolt. It is on the same principle as placing a small board on a larger one and striking the one underneath a heavy blow. The board struck will move under the influence of the blow but the board above will remain still, the lower one sliding under it. Its inertia prevents it from moving back with the lower board.

Actually the bolt recoiling with the gun, is brought forcibly against the motionless bolt cover. It amounts to the same thing as though the gun has remained still and the heavy bolt cover had been forced forward against the bolt. Between the bolt and this heavy bolt cover is a spiral spring, called the "Recoil spring." There is also the main spring, working on the firing pin, running through both the bolt and the bolt cover. When the bolt, through the motion of the recoil is brought back against this massive bolt cover, the recoil spring is compressed and takes up the shock of the blow. The main spring on the firing pin is also compressed and the firing pin cocked. Thus we have the bolt cover motionless and the bolt brought back with the rifle, jammed firmly against the heavy cover with the two compressed springs between the bolt and the cover. The recoil partly over, the compressed spring of the bolt thrusts the breech cover backwards until its forward movement has ceased and it is moving backward with the rest of the gun. In its backward movement it unlocks the bolt and takes the bolt with it, the two sliding back under the remaining influence of the recoil. In their motion backward a closing spring is compressed, similar to the retractor spring on other types of self-loading arms. The backward motion of the bolt and its cover is stopped by a steel piece at the rear end of the receiver, supported by a spring and acting as a buffer. If there is a cartridge in the magazine, the trip is sprung as in the Browning type of gun and the bolt with its cover are allowed to go forward under the pressure of the returning spring. The empty shell has been extracted and ejected when the bolt and barrel parted company and the new shell is forced into the chamber as in the other automatic types. The cover is forced back from the bolt by the recoil spring and it is again ready to stand still and take the blow of the recoiling rifle against itself.

A safer type of breech mechanism would be hard to find—of the automatic breed at least. Experiments have repeatedly proven that the recoil of a gun does not commence—through the inertia of the gun itself, until the projectile is nearly to the muzzle. In the Sjogren system, the spring between the cover and the bolt is not compressed at all until the recoil is well under way and the bolt cover has to apparently move forward and then backward under the thrust of the spring before the bolt is unlocked from the barrel. The bolt is locked even longer than the Browning type and the projectile and gases have left the barrel long before the bolt has parted company with the fixed barrel. The gun *must* recoil against the bolt cover and the spring must again push the cover backward before the

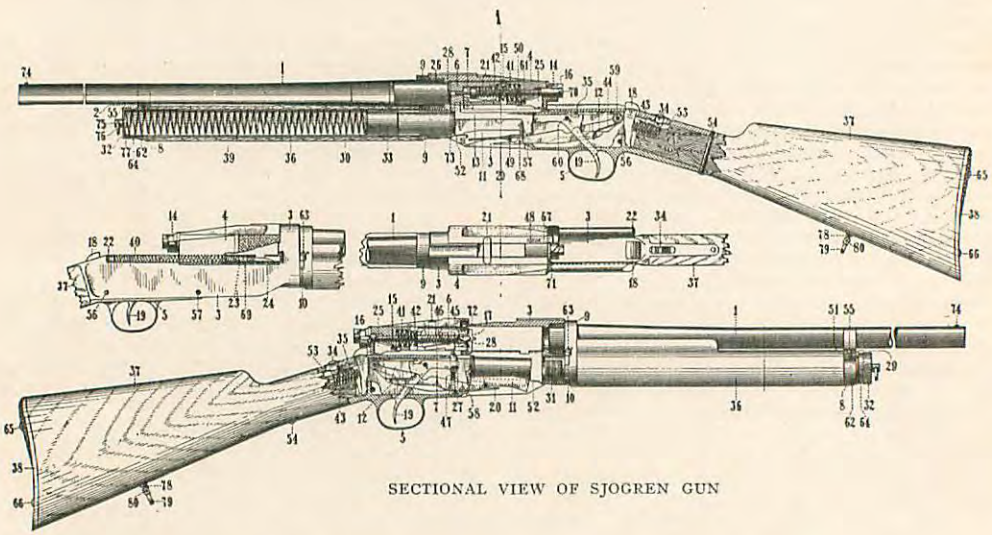
bolt is unlocked, thus preventing any premature opening of the breech or any danger. Heavy loads or obstruction in the barrel would have no effect on the gun—as far as the breech mechanism is concerned for the heavier the recoil, the harder the bolt is brought back against the cover—or the harder the cover is apparently brought forward against the bolt. Thus the heavier the recoil, the longer it would take for the cover to start back again and unlock the bolt. For this reason the heaviest type of cartridges can be used safely as the safety of the bolt depends simply upon the strength of the locking lugs—the automatic mechanism does not have anything to do with the strain of the explosion.

Reduction of recoil is an advantage claimed by nearly all makers of self-loading arms, but the users of arms of this type agree that this reduction is not noticeable. It is changed in character by some arms, from a blow to more of a push, but the difference is not noticeable. With the Sjogren, there is an actual reduction in the recoil of the arm.

"guts," the works of their gun, but the Sjogren bolt and bolt cover are left exposed to the gaze of the curious—and the dust and dirt of the open air. The gun looks distinctly unfinished, the bolt and cover, crude and uncouth, and the rear end of the receiver, forming the patch on which slides the bolt, left bare and raw looking. If a Browning gun had the whole top of the receiver sawed off for its entire length, it would look much like this Sjogren, except, of course, there are no small or exposed parts on the foreign gun. The receiver, from stock to barrel is extremely long, probably nearer nine inches than six. The gun would certainly be awarded the prize for ugly guns by a jury of unprejudiced gun makers, although the Browning autoloading rifle would give it a close run for its money.

The finish is very good as turned out by the English makers but then, they get some $60.00 for the gun.

Our own type of autoloading shotgun is good enough for those who like the beasts but it is as a



SECTIONAL VIEW OF SJOGREN GUN

The "kick" of the gun is softened and absorbed materially by the heavy bolt cover, against which the bolt is brought, while the absence of "slam" and vibration, from the return of a heavy barrel that takes place with the Browning type, makes the gun much more pleasant to use. However, these are more "Talking points" than any actual advantages. The average man, shooting a rifle at game or a shotgun at birds, never knows anything about recoil. Trap work or target shooting is of course different.

In appearance the gun is extremely homely, although the makers, in common with all other manufacturers of self-loading arms, claim that their type of gun has Venus backed off the map for graceful curves and beautiful lines. It looks more like the Browning type of shotgun than anything else, receiver, fore-end and all but it looks as though some one had sawed off the back of the receiver about half way to the bottom. The makers of the Browning gun had the decency to cover up the

rifle that the foreign invention is particularly valuable. We have not a single desirable type of self-loading rifle at present, the objections against the ones now on the market are too serious to be overlooked. Either a lack of safety or else a cumbersome, complicated ugly arm that the rifle lover cannot stomach. The foreigner is no beauty but it will be made without the extra cover which makes our American breed so ugly. In the Sjogren mechanism applied to the rifle, the makers use the Browning plan of a box magazine instead of the tubular one under the barrel. The locking lugs are vertical and of a stronger type than those in the shotgun. The collar of the firing pin acts as a supplementary lock when the rifle is fired.

The new arm takes down more easily than any self-loading arm made. The plan of the Winchester repeating shotgun has been adopted, simply pressing in a button at the end of the magazine, turning the knob a quarter of a turn, drawing out the magazine and then giving the barrel a quarter of

a turn, being all that is necessary to take down the gun. This is a great advantage on the take-down system of the Browning type of shotgun and a still greater one over the Browning rifle take down scheme.

The military authorities of all the civilized nations are investigating along the line of automatic fire-arms. Automatic machine guns have been used for years, certain nations have adopted automatic pistols for their army and navy; a certain German regiment is armed entirely with automatic rifles for experiment; the French authorities are working along this line; the United States has experimented thoroughly with the Bennet-Mercie both as machine gun and automatic rifle, and the English military authorities have taken up this new invention with a view to discovering its usefulness for military purposes. For this purpose it is ahead of any arm that has yet put in an appearance, although of course it is of the "self-loading" type and not a true automatic, as the trigger has to be pulled for each shot.

The Sjogren gun has a cocking piece in the rear of the bolt cover, not unlike the saftey on a Mauser or a Mannlicher rifle. By turning up this cocking piece one-quarter turn, the striker is cocked and in case of a miss-fire, the gun can be cocked again without opening the bolt. The gun is provided with an ordinary trigger bolting safety of the familiar double barreled hammerless type and turning this cocking piece clear up, also locks the gun against firing or opening. The cocking piece in this position projects into the line of sight, preventing the shooter from vainly tugging at his trigger, trying to fire a locked gun as is often done. Other customary safety devices, locking the firing pin against touching the cartridge, etc., are provided, and the gun is as effectually guarded against accidental or premature discharge as any arm made. It has one great advantage over our own type of auto-loading shotgun in that no adjustment has to be made for different loads and it will operate whether light or heavy loads be used. With the Browning type, there is an adjustable friction ring on the magazine tube, the pressure of which can be increased or decreased according to the loads used. The writer using one of these weapons frequently had the gun fail to operate on account of having it adjusted for a heavy load and then using a lighter one without changing this friction device. In this case the empty shell would not be ejected but the shooter knowing nothing about it, would pull trigger the next time on an empty shell.

The Sjogren has the fault common to all self-loading shotguns and rifles, of a great number of parts and a multitude of springs, any one of which breaking, would put the gun out of commission. The Sjogren has some 70 parts in all, and 15 springs of different sorts. The Browning has 89 parts and 12 springs. A typical hammerless ejector gun of the double type has from 35 to 40 parts, with from 6 to 8 springs. To operate the gun, it is first cocked by turning up the cocking piece one-quarter of a turn and then turning it back. The safety is set at safe and the cover drawn back with the bolt to the rearmost position. A cartridge is dropped into the open breech and the carrier latch is pressed upward, allowing the bolt to close, not unlike the scheme of the Browning. The magazine is filled by pressing cartridges into the tube from the bottom of the gun, the carrier being forced out of the way each time as in the Browning type. The firearms expert, familiar with the Browning type of automatic, cannot but be impressed with the idea, that while the Sjogren people have an entirely new idea for the bolting mechanism of their gun, yet they are indebted to old John Browning for a great many details used in their gun. The similarity is startling in some ways, but of course in the fundamental principle of their gun, they are entirely original and their plan is superior to any yet tried. The gun can be taken apart—as customary with any but American made guns—without the use of tools, except for a screw driver or similar tool used to pry out a couple of parts against which springs butt. It is necessary to use a screwdriver to take the gun apart to its most minute parts for repairs but for ordinary cleaning the bolt can be taken out without unscrewing a screw or driving out a pin. The makers have departed from the usual plan of attempting to cover up the main frictional and oiled parts from dust and grit, by leaving them open to dust, etc., but making them readily accessible also for cleaning. They hold the hypothesis that the parts are bound to become more or less grimy and dirty whether covered up more or less or not and they therefore make these frictional part easy of access and encourage the shooter to give them a hasty wiping now and then by this ease. This theory is borne out by the experience of the writer with an auto-loading shotgun. At the end of a day's shooting, either at trap or field, the breech mechanism of his Browning would be found full of grit and burnt powder and to keep the gun in good order it was necessary to dismount the parts and clean the inside of the gun thoroughly, a great nuisance as the gun was made on the usual plan of American makers—to pin or screw in every part instead of using a little ingenuity and making the parts detachable by hand. Emulation of the simplicity and ease of dismounting of the Mauser or Mannlicher mechanisms would be a good thing for American gun makers.

The gun will be made by a firm of English gun makers, under the Sjogren patents. The shotgun will be made with 28-inch barrel, weighing close to eight pounds, 12-gauge only, the specifications being those of the Browning. The rifle will be made in 7.65 caliber or .30 caliber, for regular military, high pressure cartridges. It can be loaded with a clip, like the Mauser or singly. It will be marketed in England at $60.00, which will effectually prevent it from competing very strongly with our own Browning guns at less than half this price for the rifle, and only half for the shotgun.

While the gun is open to the objections common to all automatic arms and while the genuine gun lover, who can appreciate a fine double gun is not likely to buy one of the new Sjogrens except for curiosity, yet it is true that the Sjogren stands at present at the head of the self-loading guns for its wonderful breech mechanism.

The English people are too staunch admirers of the fine double gun to make the success of the new self-loader very probable in England. It will undoubtedly make its appearance in the United States and it remains to be seen whether by its unequalled plan of breech mechanism it can supplant the old, established Browning auto-loading guns in their own field.