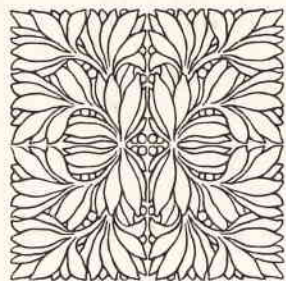




THE
HALLE
RIFLE





***THE HALLÉ
AUTOMATIC
FIREARMS
SYNDICATE.***



***18, St. Helen's Place,
LONDON, E.C.***  

THE HALLÉ RIFLE.

Military Pattern.





The Hallé Rifle.



THE HALLE RIFLE differs from all other known automatic rifles, as being the only one operated by a positive mechanism, actuated by the momentum of the recoiling barrel.

By means of a system of multiplied levers (lazy-tongs) the recoil of the barrel and bolt sleeve is utilised to withdraw the bolt from the barrel during the recoil, by multiplying the travel of the barrel some thirteen times, so that the bolt travels over a distance of three-and-a-half inches while the barrel is travelling back only one quarter of an inch.

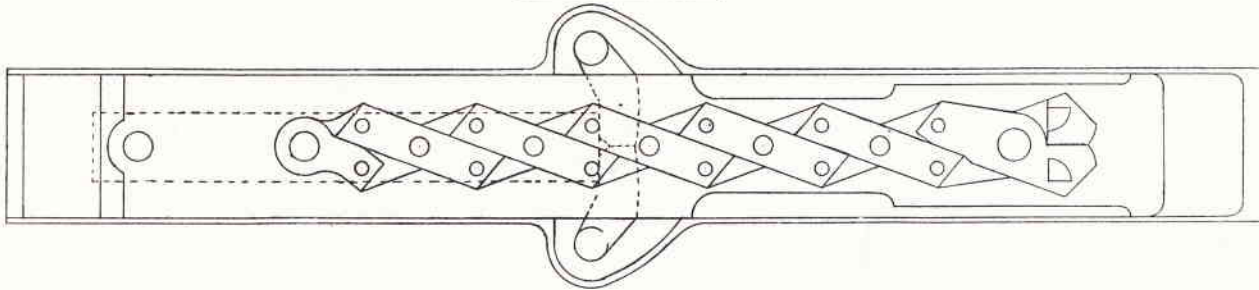
It will be at once evident that, by this means, any amount of power can be obtained without any shattering shock to the parts of the gun.

The recoil is not suddenly arrested while the barrel is travelling back at a velocity that is sufficient to cause the bolt to fly back of its own momentum against a long spiral spring, but the recoiling barrel is gradually brought to a stop by doing work, viz. : extracting the used cartridge, and withdrawing the bolt from the barrel by means of the multiplying levers.

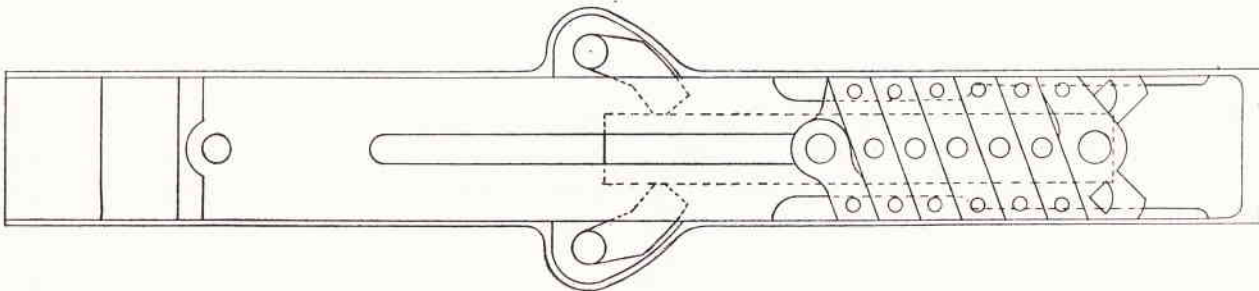
THE HALLÉ RIFLE,

Sectional View of the Breech.

BREECH CLOSED



BREECH OPEN



The recoil does not stop until the bolt is right back over the magazine, and by this time the energy of recoil has been transferred from the barrel to the bolt, and there is no shock when the barrel stops moving, as besides the work the momentum of the barrel has to do on the bolt, from the beginning of recoil the backward motion is resisted by a very powerful spring, which is regulated so as to leave just sufficient power to work the mechanism.

In the Halle Rifle, therefore, there is a known and calculable force working at each discharge upon a mechanism akin to any other engine.

As steam works upon the piston of a steam engine and the piston turns a crank, so in the Halle Rifle does the explosion work on the barrel, and the barrel actuate the compound levers.

From this it follows that the Rifle, given the same energy in the cartridge, must infallibly function with persistent regularity.

There is nothing left to a chance jerk from a suddenly arrested, rapidly moving body, but a certain and easily controlled power is put into play upon a mechanism as certain in its action as any other steam or gas operated engine.

Many years of study have enabled the inventor to devise a mechanism that is compact and light enough to be placed within a rifle that in appearance and weight compares favourably with any magazine rifle.

The total distance of recoil of the barrel is only seven-tenths of an inch, of which the first four-tenths is utilised for the purpose of freeing the bolt from the barrel, the next half-a-tenth for the purpose of loosening the cartridge in the chamber, and the remaining quarter of an inch to actuating the compound levers and withdrawing the bolt by their agency away from the barrel and right over the magazine.

THE HALLÉ RIFLE.

Sporting Pattern,



The simplicity of the mechanism is such that the veriest tyro can fully understand its working at the first view.

The bolt is locked to the barrel by two swinging claws, that are jammed between the end of the bolt and the recoil shoulders, thus making the barrel, bolt and sleeve practically one solid piece at the moment of firing.

As the recoil takes place, however, these swinging claws are left behind so to speak, as their ends are pivotted upon the immovable portion of the gun. Consequently they are gradually withdrawn from behind the bolt, though still offering a complete lock until they have separated sufficiently for the bolt to pass between them.

At this moment a swinging cam, which up to this point has been running along a fixed pin, is deflected by the pin and caused to exert a squeezing action on the bolt, by which the cartridge shell in the barrel is effectually loosened.

Now the levers come into action. The two end links are provided with upward projecting pins of a peculiar shape. These two pins pass along straight slots for the portion of recoil during which the unlocking of the bolt takes place. Therefore during the first portion of recoil the levers go back with the rest of the recoiling portion of the gun without any change of position.

After the bolt is free, however, the slots in which the pins on the end levers travel, turn away at right angles, with the result that the two end levers are caused to open like a pair of scissors, and thus cause the remainder of the levers to do the same. As the top pair are attached to a pin on the bolt, the bolt is withdrawn as the system of levers shuts up, and with the bolt the used cartridge.

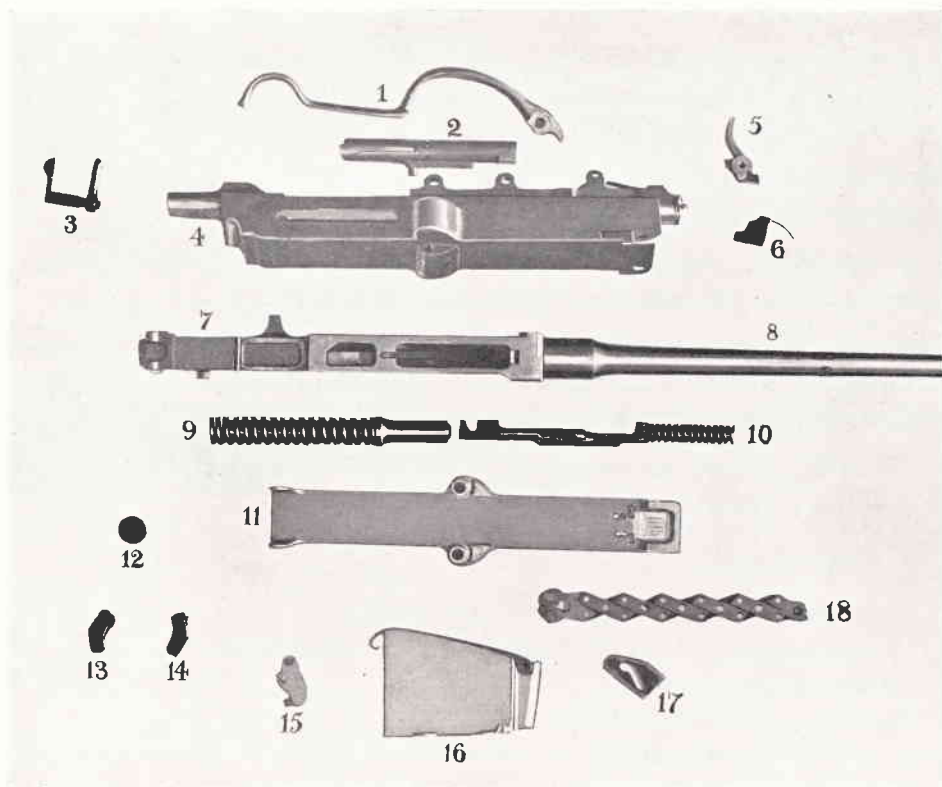
A spring ejector throws the cartridge shell out, and a new cartridge springs up from the magazine.

Now the action is reversed under the pressure of the mainspring. The pins on the levers meet the opposite side of the slot, and the lazy-tongs are opened out again, pushing the bolt back to the barrel.

THE HALLÉ RIFLE.

The Rifle
dissembled,
showing
mechanism
in detail.

1. Hand Lever.
2. Bolt.
3. Assembling Lever.
4. Outer Case.
5. Trigger.
6. Trip.
7. Carriage or Bolt Sleeve.
8. Barrel.
9. Mainspring.
10. Hammer.
11. Lid or Cover.
12. Assembling Screw.
13. Claws or Grips.
14. Hammer.
15. Magazine.
16. Swinging Cam, for first power of extraction.
17. Lazytongs.



The swinging locking claws have never left the bolt sleeve, and consequently when the bolt is home, the recoil shoulders reach them again and push them before them against the back of the bolt, jamming them firmly into place between themselves and the back of the bolt.

The hammer mechanism is so arranged that a downward projecting pin from the bolt sleeve pushes it back against a spiral spring until the sear catches in the notch.

The trigger has a simple trip action, which enables the rifle to be re-cocked even if the trigger is held down the trip springing into engagement the instant the finger is released from the trigger.

When shown at the Bisley meeting, the improvements on the old model were not yet complete. The cartridges were thrown out with some violence, there was no safety yet fixed on the rifle, and there was no provision made for the easy stripping of the weapon.

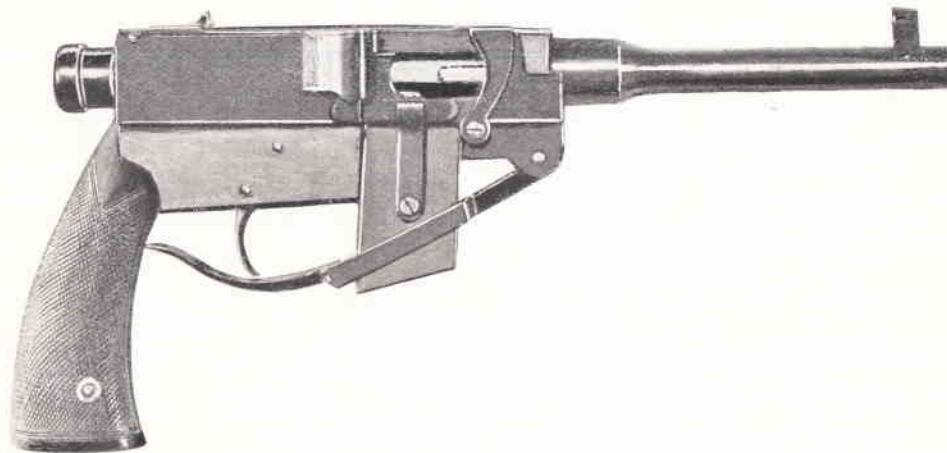
In the New Model the cartridges are thrown out gently, there is an efficient safety, and the removal of two pins allows the whole weapon to come to pieces.

TO TAKE RIFLE TO PIECES.

- 1st. Pull lever (1) to relieve tension of spring (main).
- 2nd. Depress assembling lever (3) to retain main spring compressed.
- 3rd. Remove bands to backsight
- 4th. Remove cotter in cover and screw (12).

Unscrew grip swivel screws and rifle action can then be lifted out. To re-assemble reverse above processes.

THE HALLÉ AUTOMATIC PISTOL.



Automatic Rifles.—



By COLONEL W. F. NUTHALL,
late Inspector of Small Arms,
Army Ordnance Department, and
District Inspector of Musketry,
Bengal.

Extract from "The Broad Arrow," of Sept. 3rd and 10th, 1904.

I.

IN his able article on the Rexer machine-gun that appeared in your issue of the 30th July, Colonel Rogers confines himself to the description of that newest and smallest machine-gun, and an explanation of its advantages as a cavalry arm. A few remarks upon that much more difficult weapon, the automatic rifle, may not be out of place, now that automatic rifles have made their first public appearance at the Bisley Meeting. In the first place it will be well to consider the object of the automatic rifle as distinct from the machine-gun. There is no doubt, from the remarks of the press generally, with the exception of certain military and sporting papers, that the public expectation was disappointed by the performance of the rifles at Bisley. Having heard a great deal of the performances of the Maxim and Colt automatic machine-guns, the expectation of the public was undoubtedly that an automatic rifle would in some sense vie with those weapons, and pump lead in a continuous stream upon an imaginary enemy. Had it not been for this general outcry in the press, that the automatic rifles tried at Bisley were disappointing as to

the rapidity of fire, it would have seemed almost superfluous to point out that an automatic rifle is a weapon of precision, that each shot must be carefully aimed, and that rapidity of fire depends solely upon the quickness with which the marksman can cover his target and the time necessary to replenish the magazine, the actual working of the rifle being always far in advance of the rate that a man can move his finger on the trigger, even if firing blindly into space.

It is possible that the rifles tried at Bisley may still be imperfect weapons and capable of improvement in matters of detail, but the one point upon which all the criticism was directed, viz., the rapidity with which the weapons worked, is, from the nature of the weapon, far in advance of the possibilities of the man who fires, even were he a pianist or a conjurer of the first order. This being a self-evident act to any one who has had experience of the rapidity with which any automatic rifle must function, if it functions at all automatically, we may now consider what are the advantages of an automatic rifle as distinct from excessive and impossible rapidity.

The first and inestimable advantage is the saving of labour to the soldier. Anyone who has witnessed a rapid-firing test with a service rifle, or even a straight-pull rifle, even when the firer is a trained expert who never takes the weapon from his shoulder and fires with his second finger without releasing his hold of the bolt handle, will have noticed the immense physical effort that is entailed by the constant repetition of the motion of the arm. Any sort of accuracy becomes impossible after a very moderate number of shots, while the effort of firing fifty shots as rapidly as possible is positively paralysing to the muscles. Against this let us put the performance of William Grey with the Halle rifle at Bisley, on the days when rapidity of fire for two minutes at a time was the order of the day. He had two rifles, each of which were fired twice for periods of two minutes, making eight minutes in all, with only just sufficient stoppage between to allow of changing rifles and counting the number of hits. The average rate of firing was fifty-five shots in the two minutes. Therefore in the eight minutes he fired some 220 shots, and was as fresh at the end as at the beginning, having had no exertion beyond that entailed in opening his magazine and pouring in fresh cartridges from a charger. I mention the Halle rifle, as the official figures which I have before me show that the highest scoring was persistently done throughout the tests by the Halle rifle, the aggregate of points by the best Halle being 483 against 415 of the best Rexer. The best score made in the rapid firing for two minutes was made by the Halle, being fifty-one hits out of fifty-five shots fired. If anyone is doubtful as to the merits of these performances it is easy to try to equal them with a service rifle. Undoubtedly the rate of firing per minute could be increased materially by using a ten-shot magazine in place of a five, but the question, from a military point of view, is whether greater rapidity is desirable, especially if it entails the sacrifice of other points that are of undoubted advantage.

As a further proof of the superiority of the automatic rifle over the magazine, a match was arranged under the auspices of the committee at Bisley, in which one Halle rifle was pitted against two service rifles. The service rifles were handled by two expert shots of the "Excellent,"

who were in the team that had just won the Brinsmead prize. The Halle rifle was fired by William Grey. There were two competitions at a disappearing target, which appeared for three seconds at a time. The two sailors fired at one target, the Halle rifle at the other. In the first match of four appearances the sailors fired fifteen shots combined, made eleven hits, and scored 32 points. The single Halle fired seventeen shots, with eleven hits and 31 points, so the two sailors beat by one point. In the second match the sailors again got off fifteen shots in the twelve seconds of the four appearances, scoring as before eleven hits and 32 points. This time, however, William Grey had got accustomed to firing at a disappearing target, which he had never practised at with the automatic rifle before. The result was that during the first three appearances of the target he got off six shots each time in the three seconds, and five shots on the fourth appearance, making twenty-three shots in all, scoring seventeen hits and 52 points, or 20 points ahead of the two sailors together. Comment on this performance I feel is needless, beyond stating that the match took place before the members of the committee, and in presence of several foreign officers and other spectators, civil and military.

I have no doubt that the Bisley committee was justified in considering that neither of the rifles that competed were, in their present state, entirely suitable as military weapons, but at the same time it should not be lost sight of, that this first public appearance has demonstrated beyond the possibility of dispute that the automatic rifle is a serviceable and efficient weapon, as produced both by the Rexer Arms Company and Mr. Halle. To my mind too much stress has been laid upon matters of small detail, and the immense difficulties of producing a workable automatic rifle at all has not been recognised sufficiently. When we consider that after all we have heard about automatic rifles, privately and publicly, when at last the largest rifle association of the world offers a prize for public competition, when the German Government sends over a special military expert to witness this competition, then only two systems of rifles finally make their appearance at the firing point, some idea of the tremendous difficulty of the problem may be gathered, and therefore the

merits of these two rifles, which both of them lasted out through the five days of very severe testing without proper cleaning, should be recognised, and although neither of them is undoubtedly the final word of automatic rifles, yet they certainly mark an epoch in the history of small-arms.

Next week I will deal with the various systems of automatic rifles, avoiding technicalities as much as possible, but sketching out the lines on which inventors have worked and are working with such remarks as my experience with small-arms of all descriptions will enable me to make, treating of the new weapons entirely from a military point of view.

II.

THE idea of an automatic rifle is by no means new, and the history of the attempts that have been made to produce a workable weapon is instructive. Naturally the first attempts of inventors were directed to utilising the recoil of the barrel to actuate mechanism that would work the rifle in the same manner that a hand gun is worked by the firer. The patent office bears witness to the many attempts that were made in this direction, all doomed to failure on account of the limited space available, and the limited weight permissible. The possibility of automatic weapons was meanwhile fully demonstrated by the success of the Maxim machine-gun, followed by the Hotchkiss and the Colt on a different principle. The Maxim is a recoil-operated weapon, with a positive mechanism for extracting the old and replacing the new cartridge, and relying on one strong spring to reverse the action of the recoil. The Maxim is undoubtedly the most successful machine-gun. The newest type is the Rexer cavalry machine-gun, a full description of which was contributed to "The Broad Arrow" by Colonel Rogers. In this weapon again, which is recoil-operated, a positive action put into play by a short recoil of the barrel is used. In the Colt and Hotchkiss the barrel is stationary, the mechanism being worked by some of the explosive gas that is drawn from the barrel before the bullet has left. We have, therefore, of the four weapons that have fully demonstrated the possibility of automatic weapons two, the Maxim and Rexer,

actuated by a short recoil of the barrel, which sets into motion a positive mechanism which works the weapon, and the other two, the Hotchkiss and Colt, in which the barrel does not move at all. The inference to be gathered from this is that the less the barrel moves the better, otherwise we should have had before this machine-guns made with barrels that recoiled five or six inches.

To return to the subject of rifles. Inventors were unable to produce a weapon that would do what the Maxim does in the way of ejection, cocking and self-loading within the limits of space and weight of a rifle. Then Mauser made his discovery that a pistol would throw out the fired shell and jerk back the bolt against a spiral spring without any mechanism to withdraw the bolt.

Immediately Mauser himself and a host of imitators designed rifles on this shock-operated principle. It is needless to dwell upon this system as applied to rifles, as Mauser himself, in a subsequent patent, fully admits the impracticability of the system as applied to rifles. The Woodgate-Griffiths Syndicate, which had been working on much the same lines as Mauser, also abandoned the system, and as a positive action still seemed an impossibility, both Mauser and the Woodgate Syndicate turned their attention to the long-recoil system, in which the barrel recoils the whole distance of the magazine and then leaves the bolt behind to be pushed forward by an independent spring as soon as the barrel has travelled forward again and thus got rid of the empty shell. The Rexer rifle which was tried at Bisley was on this same principle, differing from the Mauser and the Woodgate only in small matters of detail, and gaining its efficiency over the others by an additional two inches of travel, the barrel going back fully six inches at each discharge.

The Rexer rifle has undoubtedly demonstrated that a self-loading rifle can be made on this principle of long recoil. That the principle does not recommend itself even to the Rexer company as the best, is, I think, fully demonstrated by the fact that in its cavalry machine-gun, which it has brought down to the lowest possible weight compatible with a positive mechanism, it does not employ the long recoil, but has devoted all its energies to producing a short-recoil weapon as small and light as

seemed to it possible. This weapon, undoubtedly a splendid arm, is too cumbersome for a hand rifle and weighs close upon fifteen pounds.

The long recoil is therefore evidently what the French would call "a pis aller," taken up as seemingly the only possible way of producing a rifle that would function automatically and would come within the weight and space permissible in a rifle. Now this is where the Halle rifle comes in. The weapon is admittedly not yet absolutely perfected as a military arm, but Mr. Halle has accomplished with a weight of only 9 lbs. 5 ozs. and within a space that in symmetry and slimness vies with any magazine rifle, what the Maxim does with a weight of some eighty pounds, and the Rexer Machine-gun with a weight of nearly twenty pounds. In other words he has derived a positive mechanism that with a recoil of only seven-tenths of an inch of the barrel actually withdraws the bolt the whole distance over the magazine away from the barrel, and under the action of one very powerful mainspring, returns the bolt to the barrel, after ejecting the old cartridge and feeding up the new. That the weapon will function and function well has been amply demonstrated at Bisley; that it will stand the sand test was also demonstrated in the case of the rimless cartridges, and in the case of the rimmed cartridges, although hampered by a few preliminary sticks due to the rims carrying the sand into the orifice of the chamber, it shook itself together after a few shots and fired the last thirty five shots out of the fifty without any mishap. The present defect of the weapon is that owing to the rapidity with which the bolt travels back the cartridges are ejected with considerable violence to the side and slightly to the rear, this is of course a detail that must be overcome before the weapon can be employed by soldiers in any sort of close formation. This is undoubtedly remediable by a buffer to break the force of the ejected shell and direct it forwards. Another defect is this, that the rifle was designed before the new regulations came into force by which every soldier must be capable of taking his rifle to pieces. At the time the rifle was designed only the armourer was supposed to strip any rifle. The Halle rifle is so boxed in that it cannot be stripped without first of

all taking off the stock, this is an easy matter in an armourer's shop, but beyond the power of a soldier in his tent with no tools. In the new model the withdrawal of two pins will allow of the whole weapon coming to pieces, so this defect, is also remediable.

To those who have fired weapons on the two principles, there is no comparison as to the merits of the two rifles from the shooter's point of view. In the Halle you are aware of no recoil, and cannot feel that the mechanism has worked at all, nor can you even see the ejection of the old shell. In rifles of the long-recoil system, the bolt handle flies back towards your face for a distance of five or six inches, the lightness of the springs and the length of recoil causes a very perceptible kick up of the barrel, and in some cases the mechanism does not shut so long as you keep your finger on the trigger, so that the working of the gun is dependent to a great extent on the memory of the firer, who must not dwell on his trigger. Added to this, in the Halle rifle the bayonet can be fixed in the ordinary manner, while in a long-recoil weapon the bayonet has to be fixed some six inches behind the muzzle of the rifle, so that the blade must either be inordinately long, or only project a few inches beyond the barrel. In the Halle the sights are both fixed on the barrel in the ordinary manner; in long-recoil weapons the sights are not on the barrel at all, but on an enclosing tube. This cannot tend to accuracy. The sole advantages of the long-recoil system is the quiet ejection of the empty shells. Apparent simplicity is not always real, and the cycle of operations that has to be performed by a long-recoil weapon at each shot renders its mechanism really considerably more complicated than the positive mechanism of the Halle, which is made up of a number of similar parts like the links of a chain, which are turned out of the same jig in hundreds.

Altogether, as an old soldier with some experience of small arms, I have given my opinion in favour of the Halle system or some other akin to it, if such can be found, for the reasons stated above, which appear to me to be at any rate logical.



