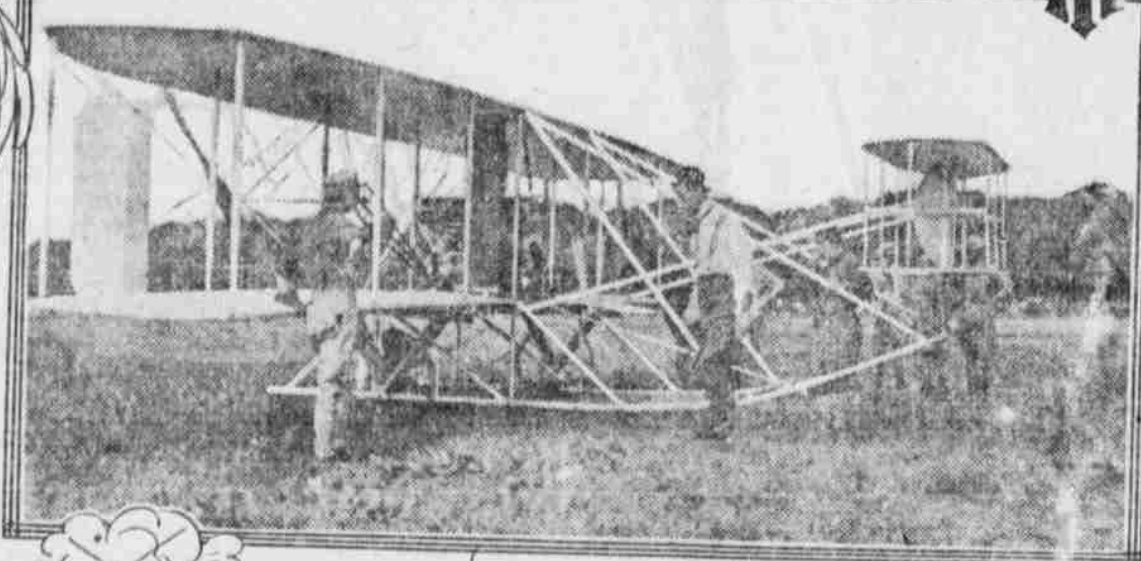




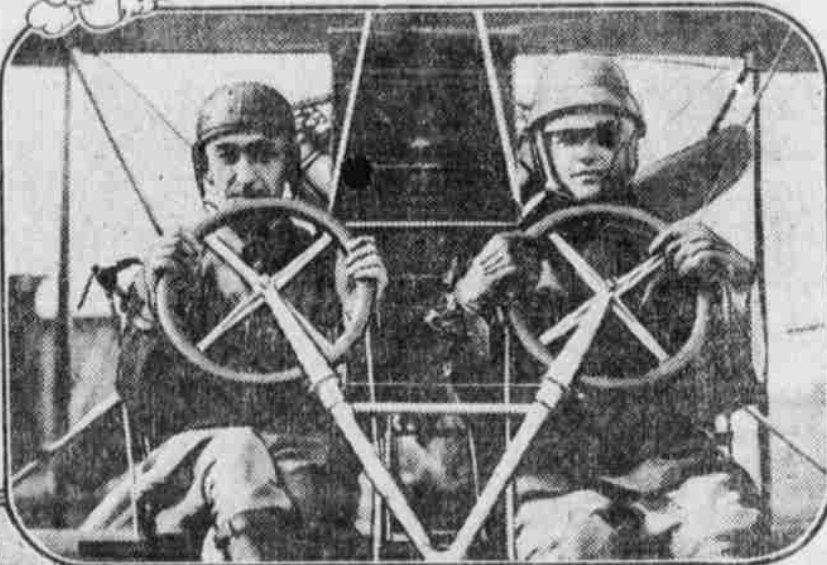
THE LEWIS AEROPLANE GUN

A NEW FORCE IN MILITARY SCIENCE

BY ROBERT H. MOULTON



AN ARMY AEROPLANE



ARMY OFFICER LEARNING TO FLY

IN THE early part of last June a group of United States army officers stood watching an aeroplane as it soared aloft from the Army Aviation school at College Park, Md. The machine carried two men, Capt. Charles De Forest Chandler, commandant of the school, and Lieut. Thomas De Witt Milling, one of the army aviators, who acted as pilot. Between the knees of Captain Chandler was strapped a queer-looking object, resembling somewhat a large inverted telescope with a disk-like attachment at the rear end.

When the aeroplane had reached a height of 600 feet and was skimming along at a speed of fifty miles an hour, suddenly above the roar of the engine there came to the watchers below a quick ripping sound. At the same instant a score of little dust clouds spurted up from the ground a few hundred feet away. This was repeated twice. Then as the aeroplane glided to earth, at the spot where the dust had arisen, the officers ran forward to meet it.

On the ground lay a piece of cheese cloth, three yards by fifteen, punctured with numerous small holes. And then the secret was out. The curious-looking object carried by the passenger was an aeroplane gun and the piece of cheese cloth was the target at which he had aimed while flying above at almost a mile a minute.



CAPT. E. B. HENNESSY OF THE AVIATION SQUAD

Careful examination of the target showed that out of the full magazine of fifty cartridges discharged by the gun operator, forty-five shots had hit the mark. The other five shots, the gunner explained, had been sent into a nearby fish-pond in order that he might get, by the splash of the water, an instantaneous report of the accuracy of his aim. The fact that this was the first time the gun had been taken aloft, together with the truthfulness of the aim as shown by the examination of the target, spoke emphatically then and there of the great possibilities of fleets of aeroplanes loaded with these rapid-fire guns, soaring over a column of the enemy's troops.

The potential result of swooping air-craft, armed to the teeth with death-dealing bullets, is staggering to ordnance officers of the army and navy who discuss it. "Where will this lead?" they ask. It is possible that the air is to harbor the greatest destructive forces in modern warfare? There seems nothing to prevent it.

This remarkable aeroplane gun is the invention of Lieut.-Col. Isaac N. Lewis of the United States army coast artillery corps. Curiously enough, the gun was designed primarily for infantry and cavalry use. Later, however, Colonel Lewis was impressed with its possibilities for use in aeroplanes.

Heretofore the difficulties which have stood in the way of serviceable guns for aeroplanes have been difficulty in manipulation, too great weight, terrific recoil which would knock the frail craft out of gear, and flame from the rifle which would endanger the machine.

In the Lewis gun these difficulties are eliminated. There is no smoke—no flame—only the sound of the explosion tells that the gun has been fired. There is no recoil and the gun is so balanced by the magazine that the aim is not even interrupted while the gun is being fired. It can be fired at as high a rate as 750 shots a minute, but the rate may be reduced to 350 shots per minute, or to any number between these limits, by a simple adjustment of the gasport valve controlling the admission of the gas to the piston cylinder. When firing at full speed it takes approximately four seconds to discharge a magazine of fifty cartridges, and the empty magazine may be replaced by a full one within two seconds.

It might naturally be supposed that such rapidity of firing would soon overheat the barrel of the gun and render it temporarily useless. One of the distinguishing features of the gun, however, is a device whereby the barrel is kept continually cool by automatically produced blasts of air. The barrel of the gun is surrounded by a close-fitting aluminum jacket, cylindrical in form and having some twenty deeply-cut longitudinal grooves extending from breech to muzzle. Outside of this jacket is a light steel tube, three and

three-quarters inches in diameter at the breech and two and seven-eighths inches at the muzzle end of the gun. The grooves in the steel jacket have full access to the atmosphere at the breech, thus forming a series of inclosed air ducts running the entire length of the barrel. Each time the gun is fired the ejector action of the discharge blast sucks through these ducts, from the rear, a draft of air which serves to carry off the heat transmitted to the jacket from the barrel. The cooling is automatic in action, without the use of water or other cooling liquid and without mechanism or moving parts. As aluminum has six times the heat conductivity of steel and but one-third its weight, this very effective method of cooling the gun adds but a few pounds to the total weight carried.

Another novel feature which differentiates the Lewis gun from all other gas-operated guns is the small inclosed operating spring which is located near the trigger-piece at the breech far removed from all injurious heat effects. The temper of this spring cannot be affected by either direct or transmitted heat, no matter of rapid and long-continued firing.

The development tests of the gun, which have been in progress for two years, show that the barrel does not become overheated under continuous fire at full speed, and that it will not therefore be necessary to carry along an extra barrel when on the firing line. Since no cooling water is necessary, and no special mount except a small stake or "cowboy" mount weighing about eight pounds, the field equipment of the Lewis gun is reduced to a minimum. The gun may be fired from any natural support found in the field, such as a rock, log, stump, tree or mount of earth. It is even possible to empty a magazine while holding the gun to the shoulder or from the hip, as the recoil effect is scarcely noticeable.

It is a matter of note that one of the most conspicuous things on the battlefield in South Africa was the jet of steam from the boiling water which was being used on the barrels of the rapid fire guns for cooling purposes.

The gun is simplicity itself. It has only forty-seven parts, as compared with twice that number for other rapid fire guns. On the battlefield or in the air where tools are necessarily scarce, and where they are needed more than anywhere else when they are wanted, the Lewis gun would certainly cause no worry, should some piece of the mechanism be broken or otherwise get out of working order, since the only tool required to disassemble or assemble the gun is the point of a bullet.

The sustained rapidity of fire of which the gun is capable makes it a far more dangerous and effective weapon than any bomb-dropping device as yet devised.

The accuracy of the firing of the Lewis aeroplane gun on its first test was not only surprising in itself, but has aroused attention on the part of our army and navy experts to the fact that our battleships and the disappearing gun batteries of our coast defenses are completely unprepared for attack from the air. In the opinion of many, including Colonel Lewis, who is also the inventor of the Lewis depression position finder now employed in the coast artillery service, it marks the beginning of a development that is destined to produce radical changes in our land defense and coast armaments, both for offense and defense.

According to Colonel Lewis, an aeroplane costing not more than \$5,000 will easily be able to carry the gun, 2,000 rounds of ammunition, the gun operator and the pilot. At a height of one mile or greater, and while moving at a speed of fifty miles per hour, it will be possible with this gun to pour in the most destructive fire upon the deck and fire control masts of battleships, and

upon unprotected personnel of land defenses, without endangering the aeroplane or its crew. It being practically impossible to attack successfully the rapidly-moving aeroplane from below, the gun also opens a new field of attack and defense in that it will be used as an effective weapon against other aeroplanes similarly armed. It means that hereafter unarmed aeroplanes will no longer be used in war, even for scouting purposes.

A new 75-millimetre gun, designed for the destruction of aeroplanes, has just been tested at Toulon, France and proved satisfactory.

TELEPATHY AMONG ANIMALS

Birds and beasts receive information through the medium of earth vibrations. John D. Quackenbush, M. D., writes in the North American Review. Certain game birds and animals are sensitive to the faintest earth tremor, and are approached only by the hunter who steps slowly and carefully, without jarring the surface of the ground. The nature of the vibrations also conveys a notion of the direction from which the danger is coming, and wild game depend as much on their apprehension of this as upon detection by the ear. When it comes to cosmic vibrations, the subtle movements communicated to the earth's crust by the tides or the pull of heavenly bodies, animals are mysteriously affected as to appetite, sleep, nervous poise and possibly procreation and migration.

Recent experiments have proved moths and other insects to be capable of thought transference so far-reaching as to impress their fellows miles away with a knowledge of their whereabouts.

It is well known to whalers that a cetacean struck by a harpoon has power instantly to convey intelligence of the presence of an enemy to a spouting school a half mile distant, so that the individuals composing it immediately disappear below the surface. Every angler is aware that if one trout in a pool has caught a glimpse of him all are instantly apprised of his presence, so that his most attractive lures are offered in vain. What one knows all know at the same moment through an interchange of subconscious states. Aristotle noticed that the female partridge is affected by a distant male bird through what he described as a breeze from the male's direction.

Some twenty years ago the late Austin Corbin purchased 25,000 acres of farm and wood land in New Hampshire and stocked the estate known as Blue Mountain park with elk and deer. In 1897 it was predicted that the extinct carnivores, whose natural food is venison, would return to the region. Not long afterward the presence of pumas, or mountain lions, was reported in the park and vicinity, and the black bear lynx and wildcat are conspicuously in evidence today.

PAYING FOR THE SPOONS

If it were not for the souvenir thief no hotel manager would be gray-headed or bald. Their lives would be one long dream of bliss, broken three times daily by a spasm of happiness when they sell 35 cents' worth of food for \$1.25. But the memento grabber ages him. "We tried to make the waiter protect the silver," said one the other day. "And we found that after the waiter worked for us a month he owed us money, because of fines for stolen silver. That wouldn't do. That same waiter would do his waiting elsewhere—first trying to break even with the establishment before leaving. And it is very unpleasant to lock the doors of a private dining room until we audit the teaspoons."

So all hotel managers have adopted a new plan. The cost of stealing silver is included in the bill for the meal you take in the public dining room. That is a matter of average. When you dine with a merry little party—or several merry little parties, as it sometimes happens—in a private room, it is also included in the bill. Not long ago the man who entertains out-of-town buyers in a certain wholesale line ordered a private dining room and a special dinner for a half dozen guests. The hotel manager gave him a figure.

"Tell your cook to spread himself on this dinner," said the prospective host, laughingly. "My guests are all from the west."

"Pardon me," said the manager, hurriedly. "I forgot an item. Your bill will be \$2 more."

The host looked at the memorandum and found an item marked "spoons."

"Much better to charge for the spoons in advance," said the hotel man, without a blush. "The ladies from out of town all take 'em. So do the ladies from in town. This way we're safe and they're saved a sin."

In the PUBLIC EYE

BEARS MEXICANS' PLEA TO PRESIDENT



Senor Zeferino Dominguez, a wealthy Mexican planter, as representative of land owners, agriculturists and other citizens of the twenty-seven states of Mexico, recently submitted to President Taft a plan which, he hopes, will bring peace, and insure permanent freedom from unrest in his country.

Regarding his plans, Senor Dominguez said:

"The plan I have in view is that the land owners of Mexico join with the government in giving the poor people access to the land. At present 7,000 families own all the land in Mexico. There are 12,000,000 persons who own nothing and have no interest whatever in the land.

"The way to pacify the poor people is to give them an interest in something. As the situation stands, they can earn more in two hours' looting than in one year's work."

"The plan I offer includes also the establishment and maintenance of a strong army for defense and for the suppression of outlawry. We suggest that the army be a form of militia and that the soldiers, when not engaged in military duties, be employed on farms set aside for the purpose. As an inducement to men to enter and remain in the service, each soldier would receive a small farm at the end of his term.

"The situation which confronts us in Mexico is this: We have a government which cannot control the rebels, and we have rebels who cannot defeat the government.

"Intervention would be disastrous to all. The United States might send an army of 500,000 men into Mexico; it might hold the City of Mexico and all the principal ports, but it will not hold the country. There are too many mountains and too many tribes."

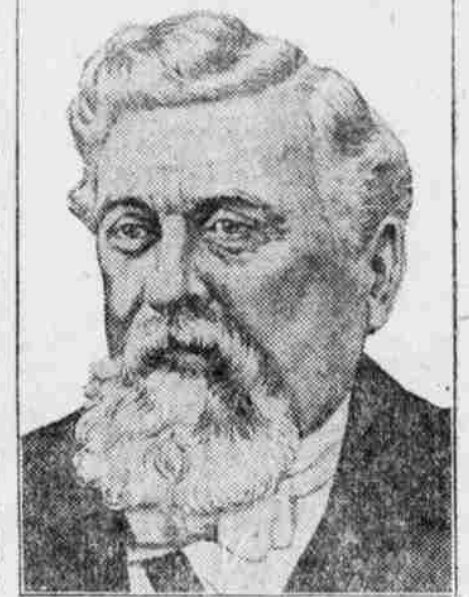
PRESIDENT FALLIERES IS CALLED STINGY

President Fallieres is again being subjected to criticism on the score of parsimony. When, a few years ago, the king and queen of Norway were guests of the republic, an accident happened at Versailles which might easily have had fatal consequences for the queen and Mme. Fallieres.

The postillion who was riding one of the horses drawing the state landau, in which they sat, took too sharp a turn in crossing a bridge spanning the ornamental lake near Trianon, and fell with his mount into the water. Happily the carriage remained on the bank.

It was stated at the time that since M. Fallieres' installation the Elysee stable was farmed out, and that horses and servants were supplied by a contractor. Thus the accident was explained on the ground of the postillion's inexperience. M. Fallieres was then accused of farming out his stables in order to reduce the expenses of his occupation of the Elysee, and a part of the Paris press denounced his efforts to economize at the expense of the prestige of the republic.

Similar attacks are being made now in connection with the visit of the Grand Duke Nicholas Nicholaslevitch, who, with his uncle, has been provided with vehicles of shabby appearance, poor-looking horses, and coachmen in ill-fitting old liveries.



WINS NOMINATION AFTER SIX DEFEATS



William Sulzer, representative in congress from New York city, was nominated for governor of New York state the other day by the Democratic state convention. It was the seventh time he had been a candidate for this nomination.

Mr. Sulzer was born in Elizabeth, N. J., March 18, 1863. His father, Thomas Sulzer, was a German patriot of the school of Sigel and Schurz, and after the revolution of 1848 was imprisoned. Escaping, he went to Switzerland, and came to America in 1851, settling in New Jersey. When William was a baby his parents moved to New York city, and his residence has never been changed since.

William Sulzer was graduated from Columbia college, where he studied law. He acquired a reputation as a speaker and debater in the Cooper Union Debating society. After graduation he took up the practice of law, and also entered actively into politics, his first public appearance being as a speaker for Cleveland in the campaign of 1884.

RAJ RANA OF JHALAWAR A REFORMER

The Raj Rana of Jhalawar, whose portrait is herewith presented, is the representative of a most illustrious branch of the Solar race, the ruler of an important state, and a reformer who is endeavoring to introduce modern conditions without giving umbrage to the upholders of past traditions, than which as we know, there is no more difficult task. The historian of India shows how the British conquered the peninsula from a number of races by converting the enemies of one period into the allies of the next; but it has never been made sufficiently clear that there was one race with which England never warred, the Rajputs of Rajasthan, "the Land of Princes." It was due to the wisdom of an ancestor of the Rana of Jhalawar, that the Rajputs sought and obtained an alliance and protection in the critical period of the eighteenth century, when the Marathas seemed for a moment likely to anticipate Great Britain in the unification of India. This prince was Zalim Singh Regut, and, practically speaking, ruler of Kotah for fifty years. Of him Colonel Tod, in perhaps the most entrancing work that any Englishman has penned on India, has given a vivid picture, as the wise man who conducted his country through the shoals and breakers of a stormy period, and his reflected glory descends on his successor, Bhawani Singh, the subject of this portrait.

