How Aeroplanes Have Developed

Some Armament Changes on German Machines Described.

Engineering gives details and illustrations of the armament of German aeroplanes. At first, says our contemporary, the aeroplanes were simply armed with rifles; then they were made to carry quick-firing guns, fitted on an extempore mounting. Being "tractor" machines, they carried these guns in the rear, and the dead angle was in front, under the supervision of the pilot. There was in the early days of military aviation a lack of precision in the firing, which was due to several causes. In the first place, errors were made in aiming, due to the relative speed of the two machines; there were, further, errors caused by the vibrations of the guns themselves, which were of too light a calibre; and also errors attributable to the difficult position which the gunner had to take to fire. Moreover, difficulties surrounded the working of a gun in a wind velocity of sixty-two miles per hour. Further the trajectories of the rounds fired were influenced by different forces, i. e., the lateral initial velocity due to the speed of the aeroplane, the side wind on the bullet, also due to the speed of aeroplane, two forces which compounded with the initial velocity modified the trapjectory. The next period of aerial warfare, Engineering continues, is that in which the armament was organized on board aeroplanes specialized in regard to the missions they had to fulfill. Three main arrangements were adopted, both in France and by the enemy. (1) Fixed quick-firing guns, firing through the propeller(single seaters) (2) fixed quick-firing guns, one as in the former instance, to which was added a second gun mounted on a turret for astern firing (two-seaters); (3) front-firing by a quick-firing gun mounted on a turret astern firing by a similar gun, and firing below the fuselage by a quick firing gun mounted on a pivot (three-seaters).

The Nieuport chasing biplanes were the first to mount a fixed quick firing gun to fire above the propeller. The main disadvantage of mounting the gun in this position, besides the great air-resistance it offered, was the difficulty of feeding the ammunition. The pilot had to pivot the gun down to remove the empty disc and replace it by a fresh one containing forty-seven rounds, and these were rapidly expended when firing at the rate of from 300 to 400 rounds per minute. The difficulties were such that the pilot of the first Nieuport machines was compelled to abandon a fight when he had not obtained a decisive result with his first disc of cartridges.

Firing Through the Propeller

Garros was the first to fire a fixed quick-firing gun through the propeller. The gun was worked at its normal speed, and two very hard steel sleeves were fitted in the propeller blades, forming passages for the bullets. The number of balls which struck the sleeves and were lost amounted to less than 7 per cent. or 8 per cent., a negligible quantity. But this method was rapidly abandoned since it entailed a loss of speed of over twelve miles per hour. Owing to the transformation the propeller lost a part of its tractive force. The Germans mounted a quick ring gun firing through the propeller on the chasing Fokker of 1915-16. The gun fires through the propeller. The application of synchronous firing with the running of the engine has been adopted on most of the French and enemy machines. The cartridge magazines can contain belts of 800 to 1,000 rounds. The German serries—Albatross, Halberstadt, Roland, Ago and Fokker—have each two fixed quick firing guns firing through the propeller,

Another type of armament, used each supplied with 1,000 rounds. by two-seater and less fast machines, whose duty is to regulate gunfire, to take photographs and to carry out bombardments on a small scale, comprises the Albatross Rumpler, Aviatik, L. V. G., all machines having a speed of 87 to 100 miles an hour. Their armament is defensive; a quick firing gun forward fires through the propeller; the rear quick firing gun is mounted on a turret. A further type of armament is that which is provided for the three-seater aeroplane, such as the Gotha, 1916-17. In order to free the front part of the fuselage the machine has two engines and two propellers. In this series are the Gotha, Friedrichshafen, A.E.G. and Rumpler. Their speed is about 93 miles per hour. The armament consists of a quick-firing gun movable on a turret forward, and one aft, a third gun being mounted on a pivot and firing downwards below the fuselage. This large machine is difficult to attack; it is bound to develop,since the adequate protection of medium-sized aeroplanes is a difficult problem, and the bombing of centres at a distance becomes more and more a necessary undertaking for paralizing the enemy's industrial activity and as a reprisal for his barbarity.

MILK IN THE HOG RATION

In order to raise and finish all the extra pigs that will be farrowed in Canada this year as a result of the campaign for increased production, it will be necessary to exercise the utmost economy in the use of concentrated foods. Pig raisers who have access to dairy by-products have a great advantage over others. Experiments have proven that when meal is worth $40 a ton, milk is worth more than $8 for an equal weight, that is, provided it is fed economically. Experiments carried on at the Dominion Experimental Farm and Stations show that for growing hogs, 60 lbs. and over, 400 lbs. of skim milk produced results equal to 100 lbs. of mixed meal. Buttermilk fed fresh is equal to skim milk .Whey is not so valuable. One hundred pounds of whey was proved equal to 19.2 lbs. of milk, that is, provided it is fed in not too large quantities and before it has soured.

A study of experiments with skim milk show that for young pigs 1 lb. of milk fed with 2½ or 3 lbs. of meal gives best results. For larger hogs less milk may be used. For hogs over 100 lbs. in weight not more than 5 lbs. of skim milk daily should be fed in order to get the greatest value from the milk.

At the Nova Scotia Agricultural College it was shown that the best gains were made by feeding a lot of pig ration composed of 148 lbs. of grain, 900 lbs. of skim milk, and 110 lbs. of mangels. At the Ontario Agricultural College the best results were obtained where the proportion of milk to meal was 2.5 to 1. In one trial in which this proportion was used, 365 lbs. of skim milk were equal to 100 lbs. of meal. This agrees fairly closely with the results obtained at the Ottawa and Branch Farms.

In a series of articles that appear in the May number of the Agricultural Gazette, both the Ottawa and Guelph authorities agree that it does not do to change the diet from sweet to sour milk. For young pigs it seems to make little difference or not if it is fed sweet or moderately sour, provided whatever condition favoured is uniformly kept up, that is to say, if the milk cannot be obtained always sweet, then it should be fed sour as a rule.

REASONS WHY YOU SHOULD SEE "WOMANHOOD, THE GLORY OF THE NATION"

Some reasons for the remarkable success of Commodore J. Stuart Blackton's soul-stirring drama, "Womanhood, The Glory of a Nation," starring Alice Joyce and Harry Morey with an all-star Vitagraph cast which is shown at the Star Theatre, Aylmer, on Monday and Tuesday, June 3rd and 4th, are listed below:

New York is shown bombed from the sky.

Theodore Roosevelt makes a rousing patriotic speech.

Submarines are shown discharging torpedoes under water.

The capitol at Washington is the background for a scene containing thousands of people.

Two high-blooded European gallants fight a duel with rapiers.

Navy yards and muition factories are seen in full blast.

Zeppilins are witnessed maneuvering in action.

A new invention, the "aerial torpedo," is demonstrated.

A Clever secret wireless telephone is employed to send dispatches from a daring girl in the enemy headquarters to the American lines.

The legendary Columbia is brought to life with an invincible sword and shield.

A pacifist meeting turns into a riot that is anything but pacific.

A human militaristic machine slays his own son to enforce discipline and to gain time for a battle.

A Civil War battlefield strewn with hero dead is transformed into terrain peopled with restored armies.

A heroine of the nation is kidnapped in an aeroplane by foreign agents.

A whole navy is destroyed in a sea of burning oil.

The stoke room of a battleship is seen engulfed as the vessel founders.

Gas attacks as conducted on the battlefield are reproduced with fidelity to actual conditions.

President Wilson is presented delivering an oration to a victorious nation.

CONTROLLING POTATO DISEASE FROM THE START

Potatoes are plentiful this spring. Procure your seed from a field which produced a good heavy crop the previous year. The smooth appearance of the seed alone is no guarantee of a heavy crop. Disinfect the potatoes before cutting the seed. Soak them for three hours in a barrel containing either of the following solutions:

Corrosive sublimate: 2oz. in 25 gal. of water (Note, fatal poison to man and beast.)

Formalin: 1 pint in 25 gallons of water.

In cutting for sets, throw out all potatoes showing rot or brown spots, or rings near the stem end and in the flesh.

Cut the seed immediately before planting. The longer you keep them cut the smaller the yield. Be prepared to meet the ravages of the potato bug. Spray your potatoes. Spraying pays! Use poisoned Bordeaux mixture. The poison for the bug, the Bordeaux for Late Blight. This is the solution: 6 lbs. bluestone, 4 lbs. lime, 40 gallons water. Dissolve bluestone first in 15 gallons of water. Slake the lime in another vessel, strain it if lumpy. Pour both solutions together and make up to 40 gallons by adding water. Add arsenate of lead paste, 2 to 3 lbs. per 40 gallons of solution; or use 8 oz. Paris Green and 1½ lbs. of arsenate of lead for 40 gallons solution. Stir well, and fill pump through fine meshed sieve. Particles will clog nozzles and are most annoying. Spray thoroughly, and cover all leaves well with spray. Don't drench. Commence as soon as the plants are a few inches high and continue every two weeks throughout the season.

For a large field use a high pressure horse power outfit. For smaller areas, there are many good hand sprayers on the market.

Get your spray chemicals right away and arrange for the purchase of a sprayer; sometimes it is a good practice for several farmers to club together and buy a good power sprayer.

Watch the field and throw out any sickly looking or dying individual plants. Mark the one hundred best hills for future seed supply. From these select 80 which yield the largest number of uniform potatoes and plant these separately next year, and increase this practice until your strain yields highest in the neighborhood.

SPRAYING

Unless many kinds of both useful and ornamental plants are protected from injurious insects and fungus diseases by spraying the loss in fruit and vegetable crops may be very great, and, in the case of ornamental plants which would otherwise have attractive foliage and bloom, they may be rendered unsightly.

The spraying of fruit trees should be begun just after the buds have broken in the spring and repeated at the times recommended in the spray calendars and pamphlets which are issued by both Federal and Provincial governments and in which is given information in regard to the treatment of the different kinds of insects and diseases most likely to cause damage.

The apple scab causes perhaps, more loss than any other plant disease in Canada, yet this can be controlled and clean fruit obtained, by thorough spraying with either Bordeaux mixture or Lime Sulphur. Other diseases and insects can be kept well under control also by the spray which has been found best for each.

Spraying is a rather expensive operation and it should be done in an intelligent manner, otherwise it may be wasted money. For instance, if the spray to kill the codling moth, which affects the apple, is not applied within a very few days after the flowers fall, the sepals or lobes of the calyx will have closed over the opening or "calyx cup" in the end of the apple into which it is important to spray the poison. As it is in the calyx cup where most of the insects begin work, they are not likely to be poisoned if spraying is delayed and the apples will be wormy. A spray mixture or solution which will control one insect or disease may be of little or no use in controlling another. Arsenical poisons are the best for biting insects, while soap or tobacco sprays are best for those which suck their food and which have to be killed by contact, and certain sprays intended to kill insects will not control fungous diseases.

Get the spray pamphlets and study them carefully before spraying, but spray and spray thoroughly.

THE AMERICAN SOLDIER

Written by Edward Markham, editor of the St. Peter Herald,the night before he enlisted in the United States army.

"I am a mother's son. I am the pride of a family and part of a home. I love my life as you love yours. I am a youth in years and experience in life, yet I am a gambler, betting the highest stakes that a man can wager—my life. If I win, you win; if I lose, I have lost all. The loss is mine, not yours, and there is a grieved mother, a saddened family and a broken home to which I can never return. I ask only for the God speed and support of my nation in return for laying upon the alter of my country my all. For bravery and blood will you furnish bullets and bread? Will you pawn your shekels if I pawn myself? Will you bet your gold while I bet my blood? Will you hazard your wealth where I risk my life? I am the American soldier. I am the Boy in the Trenches.

CANADA

MILITARY SERVICE ACT, 1917

PUBLIC NOTICE is hereby given that, by the effect of the regulations of the Governor General of Canada in Council of the 20th of April, 1918, and the Proclamation of 4th May, 1918, recently published, every male British subject resident in Canada, born on or since the 13th of October, 1897, who has attained or shall attain the age of 19 years and who is unmarried or a widower without children must, (unless he is within one of the classes of persons mentioned in the schedule of Exceptions to the Military Service Act) report as hereinafter directed on or before the 1st day of June, 1918, or within ten days after his 19th birthday, whichever date shall be the latter.

Such report must be in writing and must give his name in full, the date of his birth and his place of residence and also his usual post office address.

The report must be addressed to the Registrar or Deputy Registrar under the Military Service Act of the Registration District in which he resides (see below) and shall be sent by registered post, for which no Canada postage is required.

Young men so reporting will not be placed on active service till further notice. They must, however, notify the appropriate Registrar or Deputy Registrar of any change of residence or address.

On receipt of the report an identification card will be forwarded by the Registrar which will protect the bearer from arrest.

Punctual compliance with these requirements is of great importance to those affected. Failure to report within the time limited will expose the delinquent to severe penalties and will in addition render him liable to immediate apprehension for Military Service.

ISSUED BY THE DEPARTMENT OF JUSTICE, MILITARY SERVICE BRANCH, this 15th day of May, 1918.

NOTE: The men required to report should address their reports as follows:

ONTARIO—To the Deputy Registrar under the Military Service Act, 1917, London, if they reside in the County of Essex, Kent, Lambton, Elgin, Middlesex, Oxford, Waterloo, Wellington, Perth, Huron, or Bruce.

To the Registrar under the Military Service Act, 1917, Toronto, if they reside in the County of Lincoln, Welland, Haldimand, Norfolk, Brant, Wentworth, Halton, Peel, York, Ontario, Grey, Dufferin, Simcoe, or in the Districts of Muskoka, Parry Sound, Algoma and Nipissing north of the Mattawa and French rivers (including the Townships of Ferris and Bonfield.)

To the Deputy Registrar under the Military Service Act, 1917, Kingston, if they reside in the County of Durham, Northumberland, Victoria, Peterborough, Hastings, Prince Edward, Lennox, Addington, Frontenac, Haliburton, Carleton, Dundas, Glengarry, Renfrew, Russell, Stormont, Grenville, Lanark, Leeds, Prescott, or the District of Nipissing south of Mattawa river (exclusive of the Townships of Ferris and Bonfield.)

To the Registrar under the Military Service Act, 1917, Winnipeg, if they reside in the Districts of Kenora, Rainy River, or Thunder Bay.

QUEBEC—To the Registrar under the Military Service Act, 1917, Montreal, if they reside in the County of Jacques Cartier, Hochelaga, Laval, Vaudreuil, Soulanges, Napierville, Beauharnois, Chateauguay, Huntington, Laprairie, Argenteuil, Terrebonne, Two Mountains, Montcalm, L'Assomption, Joliette, Berthier, Maskinongé, St. Maurice, Three Rivers, St. Johns, Iberville, Missisquoi, Brome, Shefford, Rouville, Chambly, Verchères, St. Hyacinthe, Bagot, Drummond, Richelieu, Yamaska, Nicolet, Arthabaska, Sherbrooke, and Stanstead.

To the Deputy Registrar under the Military Service Act, 1917, Quebec, if they reside in the County of Wolfe, Richmond, Compton, Beauce, Bellechasse, Bonaventure, Dorchester, Gaspé, Kamouraska, Lévis, L'Islet, Champlain, Charlevoix, Chicoutimi, Montmorency, Quebec, Portneuf, Saguenay, Lotbinière, Montmagny, Matane, Mégantic, Rimouski and Témiscouata.

To the Deputy Registrar under the Military Service Act, 1917, Hull, if they reside in the County of Timiskaming, Pontiac, Ottawa and Labelle.

NOVA SCOTIA—To the Registrar under the Military Service Act, 1917, Halifax, if they reside in the Province of Nova Scotia.

NEW BRUNSWICK—To the Registrar under the Military Service Act, 1917, St. John, if they reside in the Province of New Brunswick.

PRINCE EDWARD ISLAND—To the Registrar under the Military Service Act, 1917, Charlottetown, if they reside in the Province of Prince Edward Island.

BRITISH COLUMBIA—To the Registrar under the Military Service Act, 1917, Vancouver, if they reside in the Province of British Columbia.

SASKATCHEWAN—To the Registrar under the Military Service Act, 1917, Regina, if they reside in the Province of Saskatchewan.

ALBERTA—To the Registrar under the Military Service Act, 1917, Calgary, if they reside in the Province of Alberta.

MANITOBA—To the Registrar under the Military Service Act, 1917, Winnipeg, if they reside in the Province of Manitoba.

YUKON—To the Registrar under the Military Service Act, 1917, Dawson, if they reside in the Yukon Territory.