

AUG.
1921

Vol. 4 No. 5 TORONTO—Published by A. P. Pearson & Co.

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10½ "				190	228	266				304	364	424			416	500	582	10½ "				
11 "				198	238	278				318	382	444			436	524	610	11 "				
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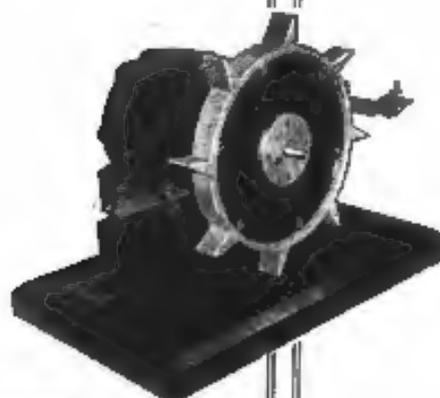
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1. TO PROMOTE AND MAINTAIN A SOCIAL ORGANIZATION OR CLUB FOR THE ADVANCEMENT AND ENCOURAGEMENT OF VARIOUS FORMS OF AVIATION.
2. TO ADVANCE THE DEVELOPMENT OF THE SCIENCE OF AERONAUTICS AND ITS PRACTICAL APPLICATION.
3. TO ENCOURAGE AND ASSIST THOSE DESIROUS OF TAKING UP AVIATION WITH A VIEW OF RENDERING SERVICE TO KING AND COUNTRY.

OBJECT NO. 1

Club quarters are being maintained, including lounge, billiards, cardroom and lunchroom.

* Until further notice the Clubrooms are open daily from 9 A.M. to 6 P.M. except Sundays and public holidays.

* Meals are served daily to members and their guests.

* THE DIRECTORS ARE NOW CONSIDERING PROPOSITIONS FOR MORE ADEQUATE QUARTERS IN WHICH IT IS HOPED TO PROVIDE BEDROOM ACCOMMODATION FOR VISITING MEMBERS.

* As soon as deemed advisable and practicable, the Club will endeavour to maintain and operate an airharbour and suitable aircraft for the use of members, or to make suitable arrangements with an existing concern.

* Out-of-town members are invited to write in to the club on any matters in which the Club can reasonably render personal service for members.

OBJECT NO. 2

Ways and means are being provided for making the Club a clearing house and information bureau in matters of aeronautical interest.

* Members and others are invited to correspond with the Club—especially those who are engaged in commercial aviation, or are in a position to teach flying.

* Owners of aircraft open for contract work are invited to register with the Club. Full information with regard to equipment and terms should be given.

* It is desired to obtain costs of operation in order that reliable data may be compiled for the use of members and aviation interests.

OBJECT NO. 3

The Club is in favour of the Government maintaining an Air Force on adequate and economical lines consistent with the considered opinions, as to organization, of those competent to advise.

* The Club will use its influence and organization in encouraging the youth of our country to engage in aeronautical work for the development of our commerce and natural resources, and for service to the Empire when necessary.

MEMBERSHIP

Membership is open to Officers of the Canadian Air Force, Officers and Cadets of the Royal Air Force, and other branches of the Canadian and Imperial United Services; also to civilians wishing to take up or become interested in aviation generally. Apply to the Secretary for terms of membership and application forms.

Membership carries privileges of visiting membership in all Aero Clubs throughout the world affiliated with the Federation Aeronautique Internationale.

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AND
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ADAM F. FENTON, *Publisher*

G. LINCOLN MITCHELL, *Publication Manager*

Volume 4.

TORONTO, AUGUST, 1921,

No. 6

Position Finding by Wireless

The following note on the determination of the position of aircraft by radio compass bearings was issued by the authorities in the United States and is known as "Notice to Aviators, No. 5, 1921":—

All aircraft equipped with radio apparatus which can be tuned to 800 meters (or 600 meters in case of emergency) can make use of radio stations to determine their position or direction of flight in thick weather or conditions of low visibility. The procedure for obtaining compass bearings is as follows:—

The compass station should be called in the usual manner, using the 800-meter wave length (or 600-meter in case of emergency); the call to be followed by the signal "QTE," meaning, "What is my true bearing?" When told by the compass station "K" (go ahead), the aircraft operator should follow the procedure outlined below:—

- (a) Transmit the planes radio call for 30 seconds.
- (b) Make dashes, each five seconds long, for one minute with the planes radio call after each dash.
- (c) Terminate with the signal "K."

If satisfactory bearings are obtained, the operator at the compass station will call the plane in the usual manner and reply "QTE," followed by the true bearing in degrees (0 to 359) spelled out in words, and the name of the radio compass station from which the bearing was obtained, otherwise a repetition of the test will be requested. The aircraft operator should acknowledge receipt of the bearings by answering the compass station in the usual manner, and repeat in numerals the bearings received. This procedure enables all stations concerned to check the bearings.

When a single bearing is furnished, there is a possibility of an error of approximately 180 deg., as the operator at the compass station can not always determine on which side of his station the aircraft lies. Certain radio compass stations, particularly those on islands or extended capes, are equipped to furnish two corrected true bearings for any observation. Such bearings, when furnished aircraft, may differ considerably from 180 deg. from each other, and whichever bearing is suitable should be used. Pilots should, therefore, never attempt to correct a bearing furnished by a radio compass station, by the application of the 180 deg. correction, as such correction does not take into account the deviation at the compass station, which may be of different sign and unequal amount in opposite directions. The error introduced by the use of a 180 deg. correction may amount to as much as 30 deg. Aircraft receiving bearings requiring approximately 180 deg. correction, should request the reciprocal bearings from the radio compass station, in case the same is not furnished.

There are difficulties encountered at compass stations in obtaining very accurate bearings of aircraft in flight, due to the following conditions:—

1. The high speed of planes and their customary proximity to the shore line, which results in a rapid change of bearings.
2. The compass stations of a group will not observe bearings at the same moment of the test and it is possible for two or even three minutes to elapse between the times of observation by two stations in a group, during which period the bearing of a plane will change from 10 deg.

to 100 deg. Another minute or two will elapse before the control station will forward position or bearings to the aircraft concerned.

3. Single bearings can be furnished fairly accurately. The difficulty exists in obtaining cross bearings, or a fix.

4. Bearings and resultant positions are incorrect when the aircraft is inshore, as the majority of the stations are calibrated over the arc to seaward only. The following procedure is recommended for trial, in order to determine its feasibility and degree of accuracy:—

Example:

- (a) Plane requests QTE (bearings).
- (b) Station tells plane to test.
- (c) Plane tests—Call letter followed by 10-sec. dash.
- (d) Station forwards single bearing.
- (e) Plane tests—Call letter followed by 10-sec. dash.
- (f) Station forwards single bearing.

For (d) and (f) a group of two stations might with experienced observers be able to forward a fairly accurate position.

The salient points for pilots to consider are that the closer the plane is to the compass station, the less accurate the bearing becomes, due to the rapid change in bearing. If a pilot's position is unknown to himself, a single bearing from a station will provide a leading course to the station.

To overcome some of these difficulties, an excellent method is for the aircraft, when practicable, to fly in circles when endeavoring to obtain a single bearing or a fix from two or more stations. This relatively small change of position will insure more accurate results.

To prove that direction finding by radio is both useful and practicable, Naval F-5-L planes have made flights, navigating entirely by the bearings furnished them from a vessel or station over 100 miles distant. The distance from which aircraft may receive bearings from shore radio compass stations depends on the power or range of the aircraft set; hence, the strength of the signals sent out from the aircraft. If the signals are strong enough to be clearly heard at the compass station, a bearing can be readily taken. If the signals are weak or the aircraft is out of range of its set, no bearings can be furnished. This condition may occur when an aircraft requests a bearing, receives an acknowledgment from the compass station, but while waiting for the signal to test, the plane, on account of its high speed, passes out of range of its own set, hence another reason for flying in circles.

MANUFACTURERS' AIRCRAFT ASSOCIATION ELECTS OFFICERS

J. K. Robinson, Jr., President of the Gallaudet Aircraft Corporation, East Greenwich, R.I., was elected President of the Manufacturers' Aircraft Association, Inc., at the annual meeting of the association, 501 Fifth Avenue, New York City, to-day. G. M. Williams, General Manager of the Dayton Wright Company, Dayton, Ohio, was elected Vice-President; F. H. Russell, Vice-President of the Curtiss Aeroplane and Motor Corporation, Garden City, N.Y., Secretary, and F. B. Rentschler, President of the Wright Aeronautical Corporation, Paterson, N.J., Treasurer. In addition to these there were elected to the Board of Directors the following: A. H. Flint, L.W.F. Engineering Co., College Point, N.Y.; I. M. Upperco, Aeromarine Plane and Motor Co., Keyport, N.J.; Glenn L. Martin, Glenn L. Martin Co., Cleveland, O.; F. L. Morse, Thomas-Morse Aircraft Corp., Ithaca, N.Y., and Col. J. G. Vincent, Packard Motor Car Co., Detroit, Mich. S. S. Bradley was re-elected General Manager and Assistant Treasurer.

Develop Radio for Aeroplanes

The use of radio telegraphy and telephony in the United States Air Service is becoming increasingly more important, as shown by present activities of the engineering division at McCook Field, one of the United States aviation fields. Work at this time is being done on various types of apparatus, including a 5-kilowatt spark transmitting set which has a range of about 1,000 miles, a 2-kilowatt tube set which has a range of about 600 miles, a 1-kilowatt telephone set which has a range of several hundred miles, as well as various smaller radio telephone sets which have ranges of from 15 to 100 miles.

In addition to this apparatus, tests are also being conducted with telegraph and telephone apparatus which is used on aeroplanes and including a telegraph set having a range, from aeroplane to ground, of 100 miles, and various telephone sets having range of from 15 to 100 miles. Thus in the course of tests it is possible to carry on conversation from the radio laboratory with an aeroplane which is flying at a distance of 50 miles from the field as easily as it is to carry conversation over the ordinary wire telephone from the house to the office.

In addition to communication, radio is also being used in the air service to-day for the purpose of assisting in navigation, particularly in the case of "above-the-cloud" flying. By means of direction finding loop stations located on the ground, it is possible to ascertain the bearing and location of any aeroplane that is flying in the vicinity. Thus, if an aeroplane is flying above the clouds and is in doubt as to its exact location, the radio operator in the aeroplane calls these ground direction finding stations and asks that he be informed as to his whereabouts. These stations immediately take bearings on the aeroplane, and by means of triangulation determine its location. This information is then transmitted to the aeroplane by either radio telephone or telegraph.

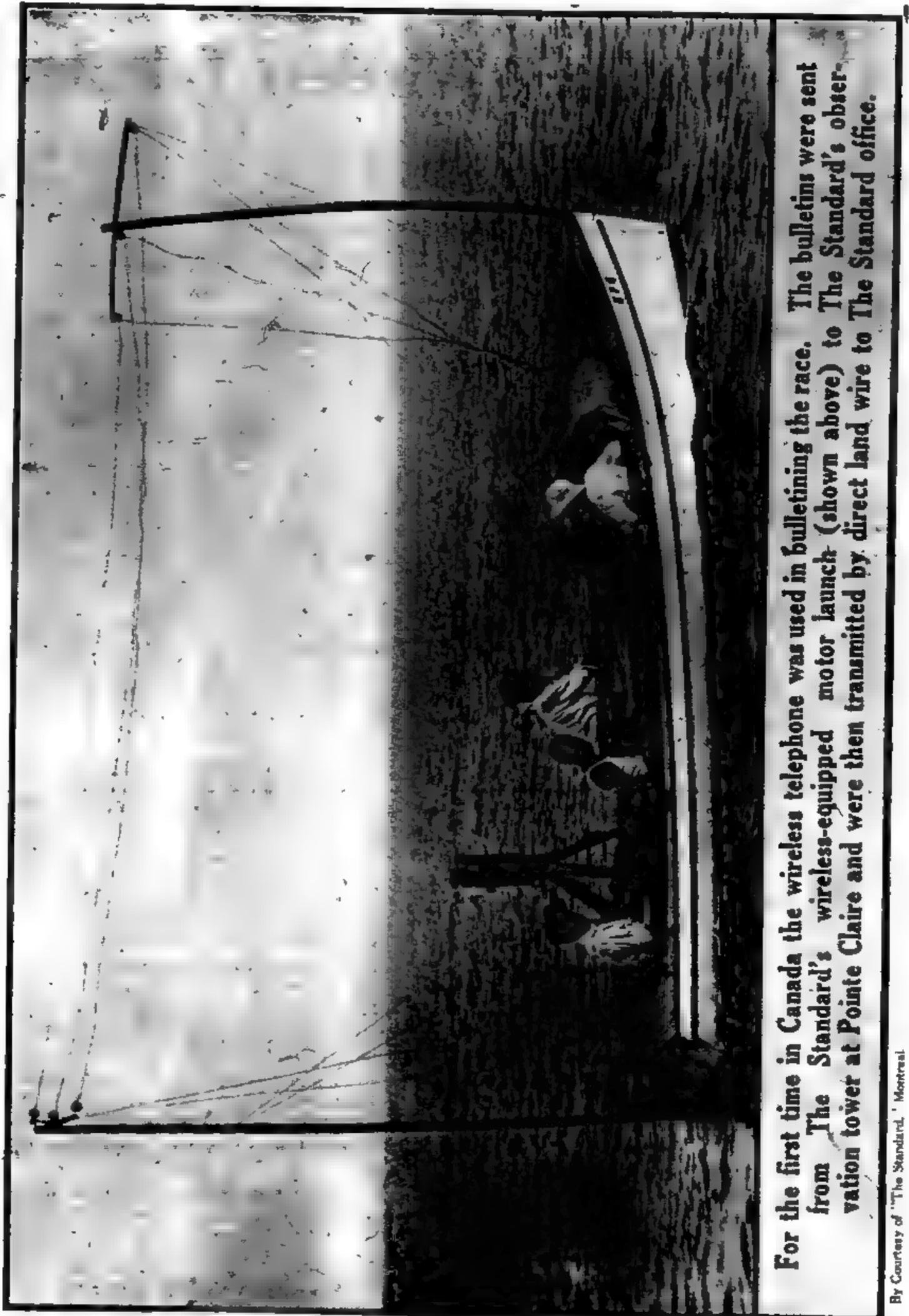
By means of special radio direction finding loops installed on an aeroplane, it is possible to fly directly towards any radio transmitting station. Thus it is possible for aeroplanes to rise above the clouds and to fly directly to another station without seeing the ground until its arrival and landing.

WIRELESS STATIONS ON AIRWAYS

A paper by D. Sinclair before the Wireless Society of London describes the wireless telegraph service established in connection with British civil flying routes.

Some 60 per-cent. of this is devoted to meteorological work. The various local reports come in at a wave length of 1,400 m., and the Air Ministry transmits the consolidated results in the form of "hourly route meteor messages" at 1,680 m. (C.W.). The remaining 40 per-cent. comprises principally traffic signals. The wave length of 900 m. is reserved for radio-telephone working from machines in flight, and a constant watch is maintained during flying hours on that wave. A full description is given of the equipment and range of the three stations on the London-Glasgow route, which are 250-watt valve stations with a range of about 400 miles for telegraphy or 100 miles for telephony, as well as the equipment of several other stations and the standard apparatus employed on aircraft. *Wireless World*, Feb. 19, p. 21.

Results of International Yacht Races on Lake St. Louis Sent by Wireless Telephone



For the first time in Canada the wireless telephone was used in bulletining the race. The bulletins were sent from The Standard's wireless-equipped motor launch (shown above) to The Standard's observation tower at Pointe Claire and were then transmitted by direct land wire to The Standard office.

By Courtesy of "The Standard," Montreal



Experimental Wireless Telephony

The subject of wireless telephony has always been one of especial interest to the radio worker since wireless communication first became practicable. It is one of still greater interest at the present time when a comparatively easy solution is within the reach of all. The commercial development of the three-electrode valve, or tube, has rendered possible this success.

I do not wish in this paper to give merely a resumé of the historical development, or to chronicle the multitudinous attempts at radio-telephony communication that have been made by various workers up to the present time, as such information can now be found by all who wish to make use of it in the text books of wireless communication, together with accounts of the many and various methods and apparatus with which such attempts have been made. I wish rather to deal with one or two aspects of the subject that may possibly be of interest to the wireless amateur or experimenter, particularly from the point of view of the conditions imposed upon experimental work in this country.

1. Differences between Telephonic and Telegraphic Communication.

In many quarters there is a tendency to over-emphasize the difference between radio-telephonic and telegraphic communication. Some, I believe, would even regard wireless telephony as a different branch of science altogether. In reality the differences between the two are small, and with modern apparatus tend, if anything, to become less, as continuous wave working becomes more general. In the days when the spark transmitter was the only one for telegraphic communication, the differences were undoubtedly greater, but with such we have not to deal this evening.

At the present time, when reduced to its essentials, the differences between radio-telegraphic and radio-telephonic signalling resolve themselves merely into the different methods of controlling or modulating the high-frequency energy in the aerial of the transmitting station. In the one case this modulation takes the form of abrupt changes in either (or both) the frequency or intensity of the radiated waves so as to form the Morse Code signals, while in the other the corresponding changes are effected gradually, and in varying degree, so as to reproduce the waveform of the speech it is desired to transmit. Certain other small differences must also be taken into consideration in designing a commercial station, for instance, but such need not concern us here.

It has often been stated that it is almost immaterial at what point of a wireless telephone transmitter the energy is modulated in accordance with the speech to be transmitted, and in most cases this is approximately true, provided, of course, that the modulation apparatus employed is suitable for the part of the circuit in which it is situated, and that it is designed for the type of current that it has to handle. With three-electrode valve transmitters there is less difference between the modulation apparatus requisite for effective control of the energy in different parts of the circuit, and this fact is evidently

of importance from our point of view, as it means that less apparatus is required for experimental work.

I also wish particularly to draw attention to the fact that the modulation or control unit is, in effect, quite separate and distinct from the real transmitter or oscillation generator, and that therefore, particularly for low-power amateur work, an appropriate control unit can readily be applied to any given C.W. transmitter in a number of different ways. Hence it is comparatively easy for anyone possessing a good C.W. transmitting apparatus to fit the necessary additional modulating apparatus for the transmission of telephony. Bearing in mind what has already been mentioned with regard to the differences between telegraphic and telephonic signalling, it follows that a microphone can be applied in all places in a C.W. transmitter where can a key for telegraphic signalling, and also that the same general type of control unit can therefore be used for telegraphic, telephonic or tonic-train signalling, as well as for any other special type of radio signalling—such, for example, as the transmission of pictures from place to place.

2. Methods of Modulation.

The most important methods of modulation by means of an ordinary pattern of microphone, and applicable especially to low-power C.W. transmitters of the valve type, may be summarized briefly as follows:—

(1) Aerial Modulation.

- (a) In series.
- (b) In shunt.
- (c) Coupled.

(2) Grid Circuit Modulation.

(3) Anode Circuit Modulation.

(4) Modulation of Power Supply to Valve

- (a) In series, or coupled—i.e., arrangements in which the modulator controls a separate power supply
- (b) By the "Quiescent-Aerial" method—i.e., arrangements in which the modulator unit furnishes the power supply to the oscillation generator.

(5) Valve Modulation

- (a) Methods using the valve or valves as simple amplifiers in connection with any one of the preceding arrangements.

(b) "Choke-Control" Modulation—also called (principally by the Americans) "Constant-current" control, and the "Heising Method" of modulation

- (c) Shunt Control—usually applied to the aerial circuit

These various methods of control will be discussed more in detail later in the paper

(To be continued)

MONTREAL WIRELESS ASSOCIATION

The officers of the Montreal Wireless Association are busy in an endeavor to secure new quarters and to have them ready for their members by September 1st. They formerly had rooms in the Wilder Building, on Bleury Street, but as the arrangements regarding same expired recently, it was necessary to vacate.



AVIATION —&— WIRELESS NEWS

[Official Journal of the Aero Club of Canada]

PUBLISHED MONTHLY.

60-62 Adelaide Street East, Toronto, Ont.

ADAM P. PENTON, Publisher. G. LINCOLN MITCHELL, Publication Manager.

Subscription price \$1.50 a year. Single copies 15 cents.

Advertising Rates upon request.

BRITISH EMPIRE CHAIN

One of the matters discussed by the Empire Premiers' Conference in London has been the possibility of using airships as a method of improving communications between the Mother Country and the far-flung Dominions of the British Empire.

A committee was appointed to report on the subject, and its unanimous decision is that any scheme of the kind would be too costly. The Dominion Premiers and British Government have to decide whether they will go shares in maintaining British airships and their personnel as a nucleus of great Imperial trans-oceanic air service.

The committee estimated that it would require an expenditure of ten millions sterling to run airship services for five or six years, and it came to the conclusion that from a commercial standpoint the experiment would not be worth the expense in view of the present financial position.

REFLECTIONS ON THE BOMBING TESTS

Although it may be some little time before the United States Naval Board's report on the result of the recent aerial bombing tests is made public, almost any layman is able to draw a few very definite conclusions as to what the true finding will be. If the experiments disclosed nothing of greater importance, they at least demonstrated two things conclusively. One of these is that the dreadnaught no longer is a dreadnaught—that it has substantial reason to fear the aeroplane. The other point is that, contrary to popular impression, the bombing plane of today, as well as the missiles it carries, is a far more dangerous weapon than during the late war.

Before the armistice was signed, there was no aeroplane in the service of any of the contending forces successfully rigged to carry bombs weighing anywhere near one ton, and neither had a 2,000-pound aerial bomb ever been constructed. The United States Navy in its recent tests, however, demonstrated the effect of concussion bombs of this size dropped from Martin planes capable of flying approximately 115 miles an hour. It is not generally known, but is nevertheless a fact, that Glenn L. Martin is designing a plane which will make his present giant craft look diminutive in comparison. This plane, which is expected to be able to travel at a high rate of speed despite its size, is to be equipped, it is said, with a 5,000 h.p. steam engine and will be designed to carry bombs weighing as much as seven tons. If the present Martin bombing plane carrying one ton bombs can sink a battleship such as the German Ostfriesland almost in

less time than naval-gunners can get the vessel's range, it stands to reason that bombs of seven times the size might be expected to play much greater havoc. Battleships costing \$40,000,000, in other words, cannot be expected to hold their own against a fleet of aeroplanes costing between \$25,000 and \$50,000 apiece.

In view of the fact that the United States Navy saw fit to conduct its tests in the open, it is interesting in this connection to note that Great Britain is conducting its experiments in secret and that while service regulations prohibit public comment, that great interest is being aroused in naval circles by the result of the air tests as cabled by British naval observers.

U. S. BOMBING TESTS

The United States Government is now conducting a series of very interesting bombing experiments, the results of which are not yet to hand. These experiments are being jointly conducted by army and navy air forces with the radio-controlled Iowa and with ex-German warships as targets. An interesting feature is the test of communications from aircraft to shore stations, and from aircraft to aircraft, working through radio interference in getting concentration after the scouts have picked up the objective.

UNITED STATES MAY PROHIBIT STUNTING

Various American aviation journals are now taking up the question of prohibiting stunting, and reference is always made to the lead taken by Canada in that respect. The general opinion seems to be that since it is practically impossible to draw a line between what is safe and what is unsafe in stunting, that the only sensible course is the absolute prohibition of civilian stunting.

PLAN NON-STOP FLIGHT TO INDIA

Plans are now being made for a great flight by R-36, England's latest and largest airship, to Malta, Egypt and India.

All sorts of proposals are being considered at this time, however, and instead of a trip to India, it may be decided to make a non-stop journey to Malta and return.

Should a decision be reached to make the trip to India, the R-36 will make a stop in Egypt for replenishment of fuel. It is expected that the flight to India will take six days. The fastest time by rail and steamer is 21 days.

110-MILE SPEED WITH 5,000-POUND LOAD

While many aviation enthusiasts have talked loud and long of the fast freight plans of the future, several aeroplanes actually designed and built entirely for freight service have lately been developed. The latest is the product of Geo. C. T. Remington and was designed by Vincent J. Burnelli, already famous in aeroplane design.

The Remington-Burnelli ship has a wing spread of but 70 feet, yet has a lifting power of 5,000 pounds. It is powered with two 450 h.p. Liberty motors, has an air speed of about 110 miles per hour, and is said to have a cruising radius of 750 miles without landing.

The new plane has many features in design and construction which are relatively new in American aviation. Chief among these is the fuselage, which is much wider and roomier than anything before attempted. A safety feature is the placing of the engines within the body, where they are easy to reach when in need of mechanical attention.

Canadian Air Force Activities at Camp Borden

SWIMMING AT CAMP BORDEN

Men of the Canadian Air Force Have a Big Day in the Water.

Camp Borden, Ont., July 20.—A grand swimming gala took place at Camp Borden yesterday, in which officers and men of the Canadian Air Force showed their ability for water sports as well as the wonders in the air. The events were as follows:—

One length breast stroke—1, Airman Merritts, A.R.S.; 2, Airman Docker, W.H.Q.; 3, Airman Cohen, A.R.S.

Springboard dive—1, Flight Sergt. Burroughs, G.I.S.; 2, Airman Shipman, G.I.S.; 3, Airman Shipley, E.R.S.

Go-à-s-you-please, two lengths—1, Capt. Home Hay, M.C., D.S.C.; 2, Airman Murphy, A.R.S.; 3, Airman Shipman, G.I.S.

One length, any style, officers—1, Capt. Home Hay, M.C., D.S.C.; 2, Capt. Tudhope; 3, Lieut. Dougherty.

Plate diving—1, Lieut. Davidson; 2, Airman Meen, A.R.S.

Relay race, four lengths, officers' team—1, Officer commanding, Major Gordon, O.F.C.; Capt. Home Hay, M.C., D.S.C.; Lieut. Dougherty; Lieut. Aikens. 2, air team, Second Airman Murphy, Cohen, Morriller, Hopkins, Stewart. 3, Sterner, Clark, Decker, Sterloughson.

High dive—1, Airman Murphy, A.R.S.; 2, Airman Shipman, G.I.S.; 3, Airman Sharpley, E.R.S.

One length back stroke—1, Airman Decker Stewarts; 2, Airman Merrilles, A.R.S.; 3, Airman Cohen, A.R.S.

One length, any style—1, Capt. Home Hay, M.C., D.S.C.; 2, Airman Murphy, A.R.S.; 3, Airman Shipman, G.I.S.

Walking the greasy pole—1, Airman Barton, B flight; 2, Capt. Tudhope; 3, Airman Flettoughson, W.H.Q.

One length under water—1, Airman Sutherland, M.T. section; 2, Airman Murphy, A.R.S.; 3, Airman Parsons, E.R.R.

Long distance, 10 lengths, any style—1, Airman Hewitt, A flight; 2, Airman Shipman, G.I.S.; 3, Airman Sutherland, M.T. section.

The judges were: Capt. N. R. Anderson, Flight Sergt. Ward, Flight Sergt. Sheppard. The starters were: Capt. A. L. Cuffe, Capt. J. F. Tupper, Sergt. McLaughlin. Timekeeper: Second Air Mechanic Comes.

There were more than a hundred entries and the spectators taxed the standing capacity of the enclosure.

BASEBALL AT CAMP BORDEN

In addition to impromptu games, the following have been played by the Canadian Air Force this season:

League Baseball Games

May 12—Camp Borden vs. Ivy.
May 28—Minnesing vs. Camp Borden
June 1—Camp Borden vs. Thornton.
June 8—Camp Borden vs. Cookstown
June 21—Thornton vs. Camp Borden.
July 5—Camp Borden vs. Minnesing
July 9—Ivy vs. Camp Borden.
July 13—Camp Borden vs. Barrie.
July 20—Barrie vs. Camp Borden

Friendly Baseball Games

May 4—Officers vs. Men.
May 10—Camp Borden vs. Everett
May 17—Officers vs. Men.
May 29—Officers vs. Men
June 3—Camp Team vs. Scrubs
June 12—Officers vs. Men.
June 14—Beeton vs. Camp Borden
July 1—Barrie vs. Camp Borden

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BROKEN ANKLE STOPS FEATS OF AERIAL ACROBAT

Daredevil Mark Campbell, the oldest living aerial acrobat on the continent since Lieut. Omar Locklear's tragic death last year, will never leap from a plane again.

An X ray examination recently showed that the ankle which he injured in a 2,000-foot parachute leap at the Saskatoon Exhibition is broken, and will leave him with a stiff ankle for life.

"Talk about a warning," said Campbell. "I guess this is a real one."



Welcome Dinner to Major Gordon at Camp Borden

Squadron Leader J. L. Gordon, D.F.C., was given a welcome dinner at Camp Borden on the evening of July 20th. Guests from most of the surrounding towns and from Toronto and Ottawa were present in force. Many of the old guard at Camp Borden came long distances to attend. The toasts were: "The King," proposed by Major Gordon; "Our Commanding Officer," proposed by Captain N. R. Anderson, who said that the new C.O. had entered upon his duties with "a good start." Major Gordon in reply said that he had received the hearty cooperation of all the officers and men and considered it an honor to be in command. "The Canadian Air Force" was proposed by Lt.-Col. J. Stanley Scott, M.C., A.F.C. Capt. O. Berry then proposed the toast to Lt.-Col. Redpath, who has completed his tour of duty as Commander

of the C.A.F. at Ottawa. Colonel Redpath in a very happy speech told of his days with the force and wished his successor every good wish. Capt. Logan proposed a toast to Capt. Oscar Berry, who has been Adjutant at Camp Borden since the early days of the C.A.F., and who is shortly to leave the camp. In reply, Capt. Berry thanked those who had said such nice things and wished the camp continued success. The toast to the ladies was proposed in a very witty speech by Lieut. Mawdesley. Mr. Leslie, of Barrie, was called upon and in an address in which he complimented the C.A.F. very highly, he pointed out that if the public was better acquainted with the work of the force it would be backed up by such a strong public opinion that its prosperity would be greater than it is.

WIRELESS TO MAKE NAVIGATION OF AIR SAFER IN FUTURE

Admiral W. H. Bullard, Director of U. S. Naval Communication Service, in a recent address, said wireless telegraphy is making navigation simple and safe.

"There will be a time when ships will be without chronometers and will be in constant wireless touch with New York until they reach the British Channel," said Admiral Bullard. "This is not a dream; it is near at hand.

"By means of the radio compass a ship can get her bearings when she calls for it, anywhere along the coast of the United States. This instrument has already saved ships which were headed straight for the shore.

"The depth of water under the ship can now be accurately determined by the reflection from the ocean bottom of the sound of the ship's propeller. By this device shallow water can be avoided and even the proximity of icebergs detected. Ships can also communicate with each other by underwater waves, sent out by oscillators.

"By means of a cable laid along the bottom of New York channel and energized with current, a pilot, blindfolded, guided a destroyer safely to port, never getting more than 50 yards from the cable. The waves sent out by the cable were detected in telephoning him whether he was to the right or left of the guiding cable.

"Hurricanes can be detected by sensitive radio telephones, and even the general direction of storms are felt on wireless receiving apparatus. The time is now sent broadcast by coastal stations, and by the time given for certain longitudes the ship can tell its location. Weather warnings and locations of wrecks, derelicts and icebergs are given out."

GERMANY DESTROYS 14,270 AEROPLANES

Germany, in accordance with the terms of the peace treaty, has destroyed 14,720 aeroplanes and 24,000 aeroplane motors, according to word received here from Paris. In addition to this Germany has delivered to the Allies 2,775 aeroplanes and 1,800 motors

When Money is Tight

Practically all classes of investments—bonds, stocks, debentures, real estate—depreciate in value to a ruinous extent. Investors are often forced into bankruptcy at such times through conditions over which they have no control.

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DEVELOPMENT OF INDUCTANCE COIL

Among the several features that distinguish the highly practical wireless telegraph and telephone equipment of to-day from that of pre-war days, is the compact, efficient and inexpensive inductance coil now being offered in various sizes and styles for a multitude of applications. Indeed, the development of this type of coil is undoubtedly the greatest step forward in the art of radio communication since the introduction of the vacuum tube.

RADIO CONVENTION

The First National A.R.R.L. Convention and Radio Show will be held at Chicago August 30, 31 and September 1, 2 and 3 next. Full particulars regarding same may be obtained from Mr. G. E. Cunderlich, Publicity Manager, whose address is, Care of office of the Show Director, 4533 North Sawyer Ave., Chicago, Illinois.

It is to be regretted that the Marconi Wireless Telegraph Co. of Canada do not see their way clear this year to go on with their plans for an exhibit at the Canadian National Exhibition. Their two exhibits of last year were of great interest, not only to operators, but to the public generally.

The Marconi Wireless School in Toronto closed on July 31st for a vacation period of two weeks.

Mr. Shaw, of Shaw's Wireless School, Toronto, is away till September 1st. It will be remembered that Mr. Shaw was recently very ill, and it is to be hoped that this vacation will have the desired effect.

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MEDICAL SERVICE BY WIRELESS

All ships at sea within a wide radius of New York may obtain free medical advice by wireless telegraphy. This unique free dispensary is the first of its kind in the world. It will be available for hundreds of ships in New York Harbor, up and down the Atlantic Coast and for half way across the Atlantic. Except for the great liners few ships carry doctors, but practically all are equipped with radio. The new service will be carried on by the Seaman's Church Institute on South Street, which meets all the expenses of the undertaking.

This long-distance dispensary work has already proved thoroughly practical. There have been many cases of ships calling for medical advice for considerable distances, and lives have been saved in this way.

Under the new system of wireless medical service installed by the Institute, any ship can obtain this service at any time throughout the day or night. Wireless operators are constantly on guard listening in on wireless calls. By using three sets of operators the service is thus made continuous throughout the 24 hours. The service has been organized so that medical assistance is available at any hour, at an instant's notice.

To prevent confusion a new signal has been decided upon, the "H D K E," which is wireless for "Help wanted for an individual." This call has precedence over every other wireless message except S O S.

WIRELESS SERVICE FOR DEAD SAILOR

The burial service at sea by wireless was the unusual story brought to Liverpool recently by the incoming Cunarder Carmania.

When the Carmania was 300 miles west of Fastnet a wireless message was received from the Canadian Government freighter Canadian Trapper, London bound, asking: "Can you oblige us with a copy of the burial service?"

The Canadian Trapper was about 200 miles distant. A fireman aboard the freighter had died and no burial service was available. The full service was sent by wireless, the dictation lasting an hour, and at the end the body was committed to the deep.

OPERAS BY WIRELESS BECOMING POPULAR

The State Opera of Berlin, Germany, recently gave a performance of "Madame Butterfly" that was transmitted by wireless and could be heard by all European wireless stations. Microphones placed on the stage bore the music to the wireless station at Koenigswuesterhausen.

The experiment was organized by the Post Office Department, which intends to establish a concert and opera service by telephone for villages in the rural districts as a means of raising revenue. If the new device for the transmission of music works out satisfactorily, telephone subscribers will be furnished with performances at stated times and all they will have to do to hear the best artists of the German capital will be to take up their telephone receivers and listen.

A given wave-length will be used exclusively for the transmission of these performances by wireless to avoid interference by other wireless sending stations.

It is safer to buy advertised goods. The advertising in this magazine is a safe index to reliable business.

THE TWENTIETH CENTURY AERIAL TOURIST

Few persons perhaps plan vacation trips by airplane. On the other hand fewer persons still, with a short vacation at their disposal, contemplate a complete tour of Europe in so brief a period. In view of this, it is rather interesting to know that Major W. T. Blake, the aeronautical correspondent of the London Daily Mail, is planning both of these undertakings.

"This year," he writes, "I propose taking my holidays by air—not that I am especially anxious to spend my time rushing through the atmosphere at high speed, but because there are many places I wish to visit, which are too distant to be reached by other means of transportation in the time at my disposal. I shall leave England for Paris. From the French capital I shall fly to Prague, the capital of Czecho-Slovakia; thence I shall go to Warsaw and from there back to Paris or possibly Strassburg. On Saturday, the last day of the week, I shall return to England. All of this traveling will have been accomplished in three or four hours, actual flying time each day, allowing me to spend the rest of the time as I see fit.

"A little later on I shall take my second holiday of a week through sunny Spain to Morocco, flying first to Paris, where I shall spend Monday, and going by easy stages from there to Toulouse, Madrid and Casa Blanca.

"By what other means could I hope to travel so far afield and see so many foreign countries and get such value for my money."

That road construction and maintenance should be so handled as to avoid leaving holes or improperly drained ditches and culverts in which stagnant water may accumulate and afford a breeding place for mosquitoes and thus contribute to the spread of diseases like fever and malaria is urged by public spirited men.

VETERAN BICYCLIST WINS 10,000-FRANC PRIZE

Gabriel Poulain, with a bicycle equipped with aeroplane wings, has won the 10,000 franc prize offered for the first man-propelled aeroplane to leave the ground and travel a distance in excess of 30 feet in the air.

Poulain, a veteran bicycle racer, has been experimenting with planes of this type for a number of years, and in several attempts has been able to make hops of ten feet or less. In a more recent attempt he attained a distance of 18 feet and in the final trial managed to leap through the air for a distance of 35 feet.

Poulain's vehicle looks like the ordinary racing bicycle equipped with small wings. In making his record the rider pedaled furiously along the ground until he reached his maximum possible speed and then, with a device of his own invention, shifted the angle of the wings so that they lifted him into the air.

THE U. S. BALLOON RACE

The recent national balloon race, which took place in United States, was won by Ralph Upson and C. G. Andrews.

Mr. Upson is of the firm of Alexander Klemm & Associates, who piloted the balloon "Birmingham" with Mr. C. G. Andrews of the United States Weather Bureau as aid. They covered a distance of 425 miles, remaining in the air for thirty-four hours and forty minutes. It will be remembered that Mr. Upson won the Gordon Bennett Balloon Cup in 1913. He will now represent United States in the coming Gordon Bennett Balloon Race, which will be held in the fall in Belgium.

FIND NEW ENGINE SAVER OF TIME

Washington.—The Aeromarine type U-S-D, eight-cylinder engine has just completed a successful 50-hour test by the Engineering division at McCook Field. This engine has a bore of 4¼ inches, a stroke of 6½ inches, and a total piston displacement of 738 cubic inches. The weight is 567 pounds dry. The normal power output is 190 horse power at 1,750 revolutions per minute, but the engine will be choked down to 160 horse power at 1,600 revolutions per minute for training purposes.

This engine possesses several original features of design. The water-jackets of the two cylinder blocks are cast integral with the upper half of the crank-case. The cylinder sleeves are steel tubes, which are inserted in the jackets from the top. A removable head is used for each cylinder block, consisting of an aluminum casting with cored water passages and steel inserts for the valve seats. The removable head will prove a great convenience in the maintenance of this engine, as it can be removed for valve grinding in a very few minutes. It will also be possible to remove the head and replace it with another in which the valves have been ground without removing the engine from the airplane or keeping the airplane out of flying condition for more than two hours.

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THE VETERAN AVIATOR

By Glenn L. Martin.

The brief but far-reaching history of the automobile and motor truck suggests a thousand and one possibilities bearing on the future expansion of air travel. Indeed, it is quite possible that 25 years hence this world of ours will be spun over with a cocoon-like web of aerial trade routes, just as our country is now interwoven with thousands of miles of steel rails and country roads.

Unless the experience of those who have been in the airplane industry from its inception is for naught, the airplane transportation business of the future will involve not only millions, but billions, of dollars.

The tremendous capital necessary for universal air service will represent the investments of no single nation, but a joint ownership of the countries of the world, which will absorb the efforts and talents of many thousands of men and women.

Every realm of the ether in which the earth revolves will be pierced by the commerce of the sky, as the Leviathans of the heavens silently and swiftly ply their courses between the markets of the old and new worlds.

Unlimited Future

It is beyond the imagination of the human mind to conceive to what definite extent and in what identical manner aerial navigation will affect the social and political order of the world.

It is at least conservative to say in estimating the scope of aerial transportation as an industry, that the incomparable flexibility of the airplane points to an unlimited future, boundless as the sky in which it flies.

Heretofore unvisited corners of the world are bound to become as well known as our present popular watering places. The world will be re-explored and exploited in giving up its hidden treasures for the utilization and universal benefit of mankind. Will not a better and closer understanding among the peoples of the world result? Will not a finer spirit of interdependence, co-operation and democracy be established?

Tend to End War

When the aerial limiters of the nations cruise over one another's territory, as the U.S. aerial mail planes now fly over a score or more of the States each day, will there not be an international legislature providing laws that will be administered by an international tribunal? Will not mutual understanding based upon closer association tend to rid the world of its most dreaded plague—war?

In the future the manufacturer, instead of establishing his centre of production at the dictation of the labor market and transportation facilities, will very likely economize both in time and expense by uniting his base of supply with his centre of production. His distribution, in all probability, will not be made through middle men and jobbers, but direct to the retailer, regardless of distance.

Just how this reorganization of labor, production and marketing will affect the economic situation cannot as yet be predicted, but surely a more direct method of distribution should aid materially in reducing costs and prices.

Will not the world readjustment wrought by future aerial transportation make big business enterprises bigger, and great men greater, when Europe is only 30 hours from the United States? Will not the future world-wide scope of national and international business affairs broaden man's mental horizon?

Near a New Life

It is natural for those of us who are especially interested in the development of the aircraft industry to look forward to to-morrow, believing and seeing through the mists of doubt and skepticism the coming transformation in the world's affairs.

Are we not on the verge of a new life—a commercial renaissance which cannot but lead us to a period of world-wide reform socially and economically?

Shall we not, within the next 25 years, cast our vision skyward and greet vessels of "magic sails"—aerial freighters that circumnavigate the globe with tonnage unknown even to our greatest ocean liners—carrying the riches of the east directly to New York, and from thence to London or Berlin and across Europe and Asia to Tokio, or down to Calcutta, or even to isles yet to be discovered when all the world will be re-explored and reclaimed?

FRENCH "ACE" FEARS GERMAN AIRPLANES

New York.—Considerable alarm over the development of the German "commercial airplane" is voiced by Rene Fonck, French ace and member of the Chamber of Deputies. In a statement published in the New York Herald, M. Fonck said:—

"We know that there is really no difference between a military air machine and a camouflaged commercial airplane. It is only a question of whether passengers or bombs are carried. If we disarm Germany in the air and on land as thoroughly as England has disarmed her on the seas, there will be no danger, but to-day we are right in fearing the gravest results of this neglect on our part, for the Germans are able to turn out three or four thousand airplanes monthly of a type which is convertible for military purposes."

M. Fonck has gathered evidence of Germany's unprecedented activities in aviation since the armistice, particularly regarding the use of light alloys in couplings and motors and of air compressor appliances for the highest altitudes.

"German laboratories are working night and day," he continued. "We know that the Göttingen laboratories are the most perfect in the world and are being helped by important German capitalists. Not only is high resistance steel being used in the new airplanes in Germany, but also aluminum, the use of which is just beginning here. Moreover, a German invention known as elektron and being manufactured at Butterfeld, is giving surprising results. Although we have been offered large supplies of elektron for our own use, we cannot accept it as in the event of war it would be useless, as we have no knowledge of the process of its manufacture."

New Type Planes Win Navy Awards

Washington.—Secretary of the Navy Denby has approved the final awards under the navy competition for ship-board airplanes.

The first award goes to the Dayton-Wright Company, whose designs will be purchased for \$16,000; the second award goes to G. Elias & Bros., Inc., who will receive \$10,000 for their design; the third award to the Curtiss Airplane & Motor Corp., whose design will be purchased for \$5,000; and the fourth award to Alexander Klemin, whose design will be purchased for \$3,000.

The board who passed on the designs was composed of Commander Jerome C. Hunsaker, Construction Corps, Aviation Section; Lieutenant Commander Sidney M. Kraus, Aviation Division, Bureau of Engineering; Lieutenant Commander Wadleigh Capehart, of the Material Section, Naval Operations (Aviation); and Lieutenant Raymond D. MacCart, Construction Corps, Aviation Section, as recorder.

At the preliminary competition the designs of the four concerns above mentioned and A. L. Morse, of the Massachusetts Institute of Technology, were judged of sufficient merit to compete in the final competition. The board convened on May 24 to examine the designs under the final competition.

The board states that in their opinion, while useful information has been obtained from all five designs and the competitors have shown a praiseworthy zeal in attempting a difficult problem, that the designs only of the Dayton-Wright Company and G. Elias & Bro., Inc., are sufficiently promising to warrant experimental construction at this time.

New York.—David R. Davis, of Los Angeles, and Eric Springer, chief pilot for the Davis-Douglas Co. of that city, will attempt a non-stop flight from Los Angeles to New York late this month or early in August, the Manufacturers' Aircraft Association has announced.

They will fly the "Cloudster," a giant plane especially designed for the trip, which will take them over the 2,500 miles airline separating the coasts. If they succeed in their attempt, they will have broken the world's record for distance in a non-stop flight made by Alcock and Brown in their 1940-mile trans-Atlantic flight in 1919, and also the world's duration record of 24 hours and 19 minutes held by the Farman Goliath.

Davis and Springer believe it will require approximately 30 hours for them to reach New York without stopping en route.

The machine was designed by Donald W. Douglas. It is a tractor biplane with a 400 h.p. Liberty motor, and has a wing spread of 56 feet, is 35 feet long and stands 13 feet from the ground. Empty, it weighs 3,800 pounds. It is entirely of American design and construction, even the wing curve being of recent American development.

The "Cloudster" is equipped with huge tanks holding 60 gallons, or more than two tons of gasoline. Fifty gallons of lubricating oil are carried. This fuel, tests have shown, will carry the plane at a cruising speed of 85 miles an hour for 33 hours, or 2,800 miles.

The machine will carry big landing flares and rockets along with navigation lights and the latest instruments for flying at night. Each occupant will wear a parachute. The fuel tanks are so arranged that they may be released

and dropped from the machine if a forced landing is imperative, thereby, by decreasing the weight, cutting down the speed to about 36 miles an hour and enabling the plane to alight in a comparatively small space.

Davis and Springer plan to set out in the early morning of a day when the weather bureau reports favorable winds across the continent. They will rise to an altitude of 12,000 feet over the mountains, and hope to reach the plains of the middle west that evening, following the route of the Santa Fe Railroad to Kansas City, and thence straight to New York, arriving at Curtiss Field, Garden City, before nightfall of the second day.

NEW CONSTRUCTION IS SHOWN IN BIG PLANE

Chicago.—What is considered one of the longest steps in the advance of commercial aviation is believed to have been taken in the completion of a giant airplane which is scheduled to make its maiden flight to this city soon.

The new craft is designed to carry 30 passengers and is the product of L. Charles Cox, who piloted the Lawson air liner on its tour around the United States, and Geo. C. T. Remington, millionaire, who was in navy aviation at Great Lakes training station. The craft was designed by V. J. Buranelli, who assisted in the building of the Lawson craft.

According to the information given Cox, the cabin design is a departure from the accepted American construction. The cabin is built to perform the service of a wing. It is 14 feet wide, 6 feet 6 inches deep, and 45 feet in length.

The wings have a large upper chamber, so popular with the German engineers. The wing section at its deepest point measures 22 inches.

The ship was built for two 500 horse power Packard motors, but instead two 400 horse power Liberty engines were installed in the nose of the cabin. It had been the plan to put the motors in the wings.

AVIATORS STUDY BATS FOR HINTS ON NIGHT FLYING

Experiments being conducted here with bats promise to add materially to the safety and precision of night flying. Aviators, following the example of the Wright Brothers and other pioneers of flying, are studying the birds with scientific care for hints on the art of aviation.

Several bats were blindfolded and released in a room crossed by many wires and separated from another room by a grid with holes just large enough for a bat to fly through. The blindfolded bats succeeded in avoiding the wires and in flying through the holes in the grid.

The secret, it is reported, was found to be in a note the birds emit continuously, often inaudible to man, but which echoes from an obstacle and effectively warns the birds.

HIGH RIVER AIR STATION

The report for June of the High River Air Station gives 23 days completed out of thirty and of the remainder there were four partial days and only three days missed due to weather. Time in the air on patrol, 71 hours and 45 minutes. Special, 4 hours and 35 minutes. Number of miles travelled, 6,575.

CREW ARE RESCUED BY USE OF WIRELESS

The utility of the wireless-direction-finding apparatus was signally illustrated in the recent rescue of the Norwegian steamer "Ontoneda" by the British steamship "Fauad Head" in the North Atlantic off the Newfoundland coast.

A heavy gale had left the "Ontoneda" drifting helplessly with a list of 50 degrees, in a heavy sea. Her captain sent out signals for help, but owing to the thick weather he had to estimate his position by dead reckoning. His calculations proved to be 90 miles out.

Whilst vessels which went to his assistance were steaming about near the position given without finding a trace of her, the "Fauad Head," by means of her Marconi direction-finder, discovered the true position of the doomed vessel and the distressed sailors were rescued in time.

AEROPLANES USED IN CALIFORNIA RICE FIELDS

Many in Canada are familiar with the use to which aeroplanes have been put by the pulp and timber companies. In somewhat the same way aeroplanes are now being used in California for the patrolling of large acreages of rice lands. The aviators who do this work are ex-service men. The remuneration is worked out on a basis of fifty cents an acre, so that a season's work nets the boys a handsome profit. In one case three aviators took care of a tract of 32,000 acres. The maintenance which they were obliged to pay amounted to about \$11,000.

PLAN AIR MAIL NASSAU TO MIAMI

Miami, Fla.—According to an Act already passed its first reading in the Bahamas House of Assembly, by which certain concessions are given to the Bermuda & West Atlantic Aviation Co., a British limited company with registered offices in London, a subsidy of £5,000 per year is provided in the decree for the purpose of carrying mails between Nassau, Bahamas and Miami, Fla. It is expected that the hangar and repair shops constructed by the company will be open to the airplanes of all nations on reasonable terms, although at present the bill provides for this only by inference.

RENO WOMAN MAKES FLYING VISITS

Reno.—When a woman is the owner of a string of ranches and has social engagements in the city, time is one of the most scarce commodities with which she deals.

So Mrs. W. A. Keddie, millionaire ranchwoman, found her time. Whereupon she bought herself an airplane, hired an experienced aviatrix and solved the problem.

It is not an unusual sight to see Mrs. Keddie's plane come soaring over Reno from almost any direction, settle on the outskirts, wait while she transacts business at the bank, and then dart away to whichever ranch needs its mistress' attention next.

AIR BOARD OFFICIALS VISIT HALIFAX

The Halifax Herald of August 20th announces the arrival of Lieutenant-Colonel Robert Leckie, D.S.O., D.S.C., D.F.C., Director of Flying Operations, pilot, and Lieutenant-Colonel J. Stanley Scott, M.C., A.F.C., Commanding Officer of the Canadian Air Force, as a passenger, in the big F-3 flying boat from Ottawa. These officers took part in the combined military, naval and air force manoeuvres. A great deal of interest was taken in these manoeuvres by military and naval men throughout Canada. Other officers who took part in the manoeuvres are Major A. B. Shearer, Superintendent of the Halifax Air Station, and Captain C. H. Fitzherbert, Assistant Superintendent, also a number of other Halifax officers, who saw active air service during the war.

BRITISH HOSTESS VISITS CANADA

Among the recent visitors to Camp Borden, C.A.F., was Miss Wilson, of London, England, who was associated with the Countess of Harrowby and Lady Ryder in entertaining officers from the Overseas Dominions. Lady Ryder is continuing this excellent work in the hope of introducing worth-while people to the best homes of Great Britain. Any officer of the Canadian Air Force intending to visit England who wishes a letter of introduction, can obtain one from the Chaplain at Camp Borden. This will enable him to meet many desirable people whom he might not otherwise get to know. Any Canadian citizen, either lady or gentleman, will be introduced to hostesses in any part of Great Britain by Lady Ryder, providing they bring with them a letter from Capt. J. F. Tupper, the Chaplain to the Canadian Air Force. To get this letter they must be known by the Chaplain personally or furnish him with satisfactory letters from others. It will be understood that much splendid patriotic work can be done in this way.

AEROPLANE EXPEDITION INTO TIMISKAMING

An aerial expedition, including in its number Dr. James M. Swaine, Assistant Entomologist of the Department of Agriculture, left Ottawa the latter part of July for a three weeks' tour of the Lake Timiskaming area, where a disease of spruce budworm has been rampant for some time. The aerial party will be under the charge of Capt. C. H. Fitzherbert, D.S.C., noted Government pilot and aircraft specialist.

AIRPLANES TO RUSH BELATED PASSENGERS TO FRENCH LINES

Passengers for the United States who miss the boat trains running between Paris and Havre will be able to catch their steamers at Havre by using an airplane service of the French line steamship Paris. The line announced that planes hereafter will leave Le Bourget two hours after the boat trains have departed, which will enable passengers who have missed the trains to make connections with boats.

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Canadian Writer of the Fair Sex becomes Converted to Flying

A well-known Canadian writer, Miss Agnes Laut, contributing to the Green Book, an American publication, recites in graphic style her first experiences while flying in Western Canada, and in doing so admits how completely she has been converted to a favorable opinion regarding aerial navigation.

Yet only four years ago I sat in my office on Fifth avenue and used every persuasion in my power to prevent a young aviator trying to fly across the Rockies: it was unsafe; the atmospheric conditions and winds among the peaks created pockets of air, into which the aeroplane might "lump" or fall; a dead engine among peaks meant certain death, for the fogs were thick as wool at cloud line. Hadn't I been caught in blizzards on Mount Stephen? Didn't I know? Didn't two of us sit roped to a Swiss guide for three hours in a snowstorm waiting for the air to clear, so we could come down? Didn't we strike the heavy timber line coming down after dark and have to do the rest of a six-mile bridlepath at a fast dog-trot, stubbing toes and banging into trees where we failed to get "the feel" of open way ahead? I ought to know, for we put the old Swiss guide on the rope aft so he would brace us if we fell coming down over the iced rocks, and I had to set the pace to the fore through the dark, when we hit the timber line! What if your aeroplane went dead in that kind of a predicament? If you came down through a blizzard in that sort of a landing place you would be smashed on the rocks, or amid the big timbers. I recall I finished up my advice to the young aviator: "Flying will never, never be either possible or safe in the Rockies. I have climbed mountains all my life. I know."

That was four years ago; and here I was, doing exactly what I had said could not be done—doing it because I had to, not because I wanted to; and when I came down from thirty-five hundred to twenty-five hundred feet above the clouds lying in white banks between the high shores of Peace River, with my ears humming from the roar of the propeller making fourteen hundred revolutions a minute and the throb of a ninety horse-power engine making a distance of one hundred and sixty-five miles in one and a half hours, my first words were: "Safe as a rocking-chair. Easier than a motor-ride! The only way to do this north country of immense distances and mountain grades!"

The only inconvenience of which I was aware as I climbed out of the cockpit was that voices seemed very far away and faint; for we had come in a two-seater training plane, and I had occupied the mechanic's seat to the fore and had forgotten to tie something over my ears, or plug them. When I say I did not need to right my Panama hat a woman will understand, for you cannot take many fast motor spins without hat or hair slightly askew.

"Safe as a rocking chair—the only way for the immense distances of the Far North," was my first verdict.

An important cattle-man of the Peace River ranch country, and a wheat-farmer, the first man to demonstrate wheat's possibilities on the Peace, saw our machine land from the other side of the river. "I wouldn't have missed that for a thousand dollars," said the cattleman, "and it is not because you are a woman who did it, but because,

by Jove, if you could do that, do it in an hour and a half, when canoe and fur-steamer and motor and train fall down in service, you have given us the key to unlock the wealth of the North at last.

"Why, do you realize it takes from eight to twelve days to get out from the North Peace to the rail terminal? In rains and thaws the railroad may be held up. Then when the train does get away, it's two to three days to Edmonton. Do you realize you have demonstrated how we can get in and out of the North in four hours?" This from the wheat man.

Then from another: "Why, when I came into Peace River country, we travelled on a sleigh from Edmonton. It took us twenty days. Your flight has proved it could be done in four hours with ease."

The saving in time can best be expressed by giving figures on going down Mackenzie River to the Arctic Circle, where oil has been struck. To go in and out by the ordinary fur-trade steamer with its tie-ups for freight, wind and weather, means a trip of two and a half to three full months. Were gasoline provided ahead, you could go from Edmonton to the Arctic circle and back in six days with as great ease and comfort as you take a train from New York to Philadelphia.

Yet four years ago I had persuaded a flyer not to try the Rockies. I predict that in four more years the aeroplane will be as much in vogue to carry passengers in the North as canoes and dog-trains have been in the past.

I want to disclaim any credit for the flight because I am a woman. That has always seemed to me the silliest and most inane of poses. If a thing is extraordinary because a woman does it, the woman must accept the boomerang that she is congenitally subordinate. I don't know anything that will turn my enthusiasm more quickly into an icebox than that kind of stuff. All the credit was due to my pilot, Captain May, one of the youngest of the Canadian aviators in the war, and one with a wonderful record. It was May who lured Baron von Richthofen across the Allied lines, where he was shot by the Anzacs below. As I heard Captain May, at the banquet in Grand Prairie the night before the flight, describe his experiences dodging among church steeples, shot at by Richthofen's whole Red Circus, while the Canadian's two guns both jammed and did not give him a chance to fire back or beat off the great birds closing in on him, I felt I had a pretty good pilot. If "Wop," as his friends lovingly call him, could dodge church steeples chased by the Red Circus birds of Germany's best flyer, I'd trust him to dodge mountain peaks and heavy timbers even in a fog, and find a landing place even on mountains that looked steep as Smoky.

Picture a cold night late in September, dark as a black cat. It had rained, then frozen, and by morning a glassy glaze had veneered sidewalks and roofs. I had asked Captain May the night before if it would make him nervous to take a woman as passenger. (I knew the regulations as to navy and aircraft in the war: a woman friend was supposed to endanger a young steersman's life owing to his nervousness for her safety. He answered it would not. The banquet tendered to us jointly had kept us up late the night before. When we said good-night the arrangement was the Captain should arise at 5 in the morning. If the rain had stopped, the clouds were clearing

and the wind was not a twister that would confuse us among fogs when we came to cross the Smoky Mountains, I was to be downstairs fifteen minutes after word was sent up. The knock came on my door at 6. I was downstairs drinking a cup of hot coffee at 6:11. I am a bad sailor in a choppy wind, and as I was not sure how air voyaging would affect me, I held my breakfast down to coffee. Mr. McDonald and Mr. Fitzallen of the Grand Prairie Board of Trade motored us out to the pasture field where the plane was anchored. It was raw and chilly; our teeth were chattering. Icicles hung from the engine of the plane and from the wings. As I had not planned to fly out, I had no fur coat with me—only a double-ply Scotch motor coat; and in the hurry of the early scramble we all forgot I should have covered my ears. The sun was not yet up, but wind-clouds scored one side of the horizon, and the rolling cloud-banks of the rain receding north lay on the other offing. It took the mechanic an hour and a half to thaw out the engine so it no longer skipped beats or chugged an asthmatic cough in its punctuated whirl. I was to sit in the mechanic's seat and the mechanic was to be left behind. The mechanic would set the propeller whirling, then jump aside with the cry "Contact."

The Captain with his hand on the engine would respond "Contact!" But I was conscious that if the thawing process kept me standing much longer on the iced grass, my teeth would not be suffering any form of "contact" whatever; they would be clicking castanets, for there is no cold so raw as the first blast that comes without the snow.

Finally the propeller was going round in invisible streaks and the engine humming. She was stopped till we got in. Goggles were fastened on. It was a question what to do with my bags; for they could not be strapped outside without interfering with the air currents; so they strapped me into the front seat and strapped the bags on my lap, leaving only elbow room to lean over the edge of the cockpit to take photographs.

I forgot a confession. I had been in Jasper National Park when the American aviators landed at Henry House on their way to Nome. I was just entering the park by the morning train. The river was roaring down from the mountains in a turbid flood; the mountains closed steep and precipitous and formidable on each side the landing field, where the game wardens had put up flags to signal safe landing spots. I couldn't but wonder what the sense of aviating mountains was when—with fogs lying on these knife-sharp rock walls and timbers so dense that they were shaded to a night gloom—a false landing would smash the delicate cigar-box wings to chips. I call the wings cigar-boxes advisedly because the fine layers of wood in the cross-spars of the wings and body of the plane are thin like cigar-box wood. I once spent the better part of five weeks going through aeroplane factories during the war and saw the girls varnishing with shellac the wings to keep the cotton from fraying in the terrific rush of air, and the women and men, fine fingered as violinists, fitting the layers of light wood into body and beams—if you can call cross-spars beams, when they are framed light and fine as a goose quill.

Then I saw the American aviators at Prince George in the heart of the Rockies, where there was a slight mishap that might have been a bad one. It was a bad landing place, stumpy and constricted, and the landing was awkward. Now as I had been coming along the Fraser where the heavy forests are dank and dark as Rackham's

drawings of witches' domains, I had been wondering how in the world aviators would expect to negotiate such landings in a fog. If their engines went dead above these heavy timbers—what? It confirmed my condemnation of flying above mountains four years ago; and here was I about to cross mountains in an aeroplane myself. It struck me that if a plane came down amid the dark forests of the steep Smoky, some one would have to walk-out for aid ninety to ninety-five miles, and some one would have to stay with the "bird"; so I had taken an old trapper's advice and put into the bags chocolate enough for two or three days, raisins, capsule proteins. I don't know that I confessed this to the Captain till afterward. But I was sure flying mountains was unsafe till I tried it.

As you look at an aeroplane set off bouncing over the ground, you recall your sensations on your first horse back gallop. That is the first surprise when you fly. You are unconscious of a bump. You hear two voices cry "Contact"—"Contact." You see a blur flying round in front of you. It is the propeller. Your ears are deafened by a roaring throb. You snuggle down behind the little windshield to keep the flap of your hat from beating your eyes, and you turn to wave good-bye to your friends. They are not there! They are away behind and below! The earth is falling away. The bushes are swimming past. There is a barbed wire fence in front rushing at you with the speed of an express train. It somehow skims under you. So does a browsing cow, who starts up with a bellying gallop at the shadow of a great bird on the ground. Why, is it *your* plane's shadow? You are up and away and off, up and up and up, with the familiar landmarks of the town kaleidoscoping below you like a moving picture. You don't rock; you don't bounce; you don't bump. You glide—glide—glide at incredible speed and incredible lifts; and the emerald-green lakes are silver below you with the shadow of a great hawk on their surface—no, not a hawk, but one of those flying monsters you read of as prophecies in the Book of Daniel, as with great wings and wheels and a snout with whirling horns and sneezings of fire, and the face of a man between the wings.

Anyway, you see the Prophet Daniel's vision in replica in the shadows on the ground below, on the silvered lakes on the rainbow-tinted clouds just where the sunrise throws your shadow against their white banks, a snouted thing with a single horn in front, great roaring wings, sneezings of fire—and a man's face between the wings. Read the prophecies on the airplane.

Your first shock is the discovery of how comfortably and evenly you are riding. You could write on your wind-sheltered lap.

Your next shock is in the appreciation of how much more clearly you see from above than below. I could gauge pretty well how high we were climbing, for I know cloud-line on mountains. We averaged perhaps twenty-five hundred feet above surface, perhaps thirty-five hundred when we came to the clouds in snowy banks above the Peace and Smoky. You know the thrill and exhilaration when you get above the five thousand foot level in mountains. The earth is below your feet. Your lungs are full of ozone, and your brain of a champagne of sunlight and piney odors; but clearly as you seem to see from mountain heights, you do not see as clearly as from an aeroplane, for you are looking through layers of air close to earth; in the aeroplane you are looking through layers of high rarefied air far above earth. From below, when you look up to an aeroplane, it has the appearance of a remote huge hawk. You cannot see the man's face, but from above, when you look down, you can discern the upturned faces of lonely settlers in front of their cabins, a

hen gathering her baby chicks to shelter under her wings from the great hawk, cows galloping from the shadow, and horses undisturbed by it. The haystacks look like ant-hills. The fields are checker-board patches with silver ribbons for rivers and mirrors in green and blue for lakes; and you see velvet moss on steep mountain sides, where the forests had looked like dark, dank, eerie places far below. I began photographing over the edge of the car, and changing films in my lap in spite of the wind.

Now, note what follows — for it completely reversed my verdict on flying in mountains. I recalled a mathematically demonstrated fact I had picked up when visiting the aeroplane factories during the war: For every mile you are vertically up, you can slide or glide down, if your engine stops, eight miles. That gives you a possible landing area of at least sixty-four square miles. Now as I looked over the edge of the cockpit I became aware of what I had known perfectly well before but had not realized. If you have a landing radius of sixty-four square miles, for every mile you are up, there is no area of sixty-four square miles in this moisture-infected northern region where there are not rivers, sloughs, lakes. As we banked down one steep slope of the Smoky Mountains I deliberately photographed the steepness and the bare spots to show that in the most heavily forested areas are bare patches. These bare patches are too steep for a landing, but you can count twenty on that slope. But how about landing in an aeroplane on water? Wouldn't the weight of the engine sink you like a stone — and you strapped in? Yes — if you use an aeroplane. But how about a flying boat? It can "land" or make its home perch on a space the width of a warship's deck. It can take off in the same space. It is roofed over like a great whale, with mica windows and easy chairs — no wind, no rock, no straps. It can spank down to the countless sloughs, lakes and rivers of the North as safely as to its own landing fields. Change "aeroplane" to "flying boat" and you have at last unlocked the treasures of the North as surely as key ever unlocked a treasure box. And think what these treasures are!

Only ten years ago Peace River was a great hunting field about the area of Texas and Missouri combined — eight hundred miles in one direction by five hundred to six hundred in the other direction. That is not the entire length of the river. That is the area of the Peace River country where farmers are now raising wheat and cattle — 40,000 American farmers there are in the wheat district only in the great bend south of the river radiating out from Grand Prairie.

Along the Peace and the Mackenzie are gas and oil deposits that have been burning and escaping in seepage constantly since 1792, when Sir Alexander Mackenzie first reported them. There is one gas well on Mackenzie River which has burned ten million cubic feet a day from 1792 down to 1919, when it was at last cased down.

Since 1871 it has been known that between the Peace and the Liard lies a gold area giving indications of a second Transvaal — the head vein of the Yukon placers; but how could white men get in and out from such a region? This was no second Alaska which you could reach by sea. It was an area eight hundred by six hundred miles, at least twelve hundred miles from the jumping-off place into the big timbers; and through the big timbers you could only go by canoe in summer, for the snows are too heavy for dog trains in winter. That meant that a man going in this summer could not come out till next; but what if he and his provisions could go in by flying boat? They could arrive in twelve hours with fifteen tons of provisions a trip. In 1920 over a million dollars' worth

of freight had been conveyed to Great Britain by aeroplane, and over twice that much freight taken out. Over thirteen hundred aeroplanes have arrived with passengers and freight from the continent. The cost runs about two and a half times that of rail and steamer carriage, but the saving in time cannot be estimated. Three months in the Canadian North, it would be — as against twelve hours! In other-words, you can do in an hour by flying-boat what would take you a week by canoe or fur-trade steamer.

It has all the exhilaration and sensations of mountain climbing without the climbing. It has all the glide of canoeing, without the exertion of paddling, and an almost incredible speed.

The one and only disadvantage is while you cover immense distances with extreme rapidity and get a reconnaissance map of the country in your mind, you do not get intimate contact with the humanity on the map. You do not get accurate, close knowledge of values and conditions as when motoring or canoeing. Before I left Grand Prairie by aeroplane I had motored over hundreds of miles of the wheat country. Then years ago this was a no-man's hunting field; and now I motored through and photographed Marquis wheat shoulder high. I met many of the forty thousand settlers, people of the same character as crossed the hard trails to Texas, the hard trails to California, the hard trails to Oregon. How did they do it? Four hundred miles the trains now run from Edmonton; eight hundred miles the river comes down in a great curve from the mountains before it takes another thousand-mile sweep to join the Mackenzies.

It is easy to see to-day the mistake made in the direction followed by the railroad. The Peace River country is a great oblong, longest from west to east. When the railroad went in there were no settlers. Sherdan Lawrence had grown wheat at Fort Vermillion, but that was regarded as a sort of freak. The railroad followed the low grade to Lesser Slave Lake, which is about the area of Lake Erie. Here were fisheries to provide bulk freight, but unfortunately the fisheries for the bulk freight led over muskeg, through bush land, first along the end of the oblong, then up along its north side — the two long sides. Now, the wheat area was in the very heart of the oblong. Following its two sides, the railroad ran over four hundred miles. By cutting to the heart of the oblong it could have penetrated the wheat country in one hundred and eighty-six miles from Edmonton; but when the line was built there was no wheat country. All that has followed later; and where roamed the grizzly and the moose ten years ago, yellow wheat fields sell to-day at twenty-five to forty-five dollars an acre; and within another twenty years central cities like Winnipeg or Kansas City will grow up. How can wheat grow so far north? Look up a geography of fifteen years ago! This section is marked hyperborean. It is — in winter; but in summer are twenty-three hours of sunlight, and that does the trick, forcing rapid growth to beat the early frosts.

By aeroplane you don't meet people in neighborly fashion. You don't hear experiences that are human documents, like the Minnesota families that came in by caboose four hundred miles in forty below-zero winter and home-steaded I forget how many quarter sections — there were nine sons — made good, sold at twenty dollars an acre, went back to Minnesota, grew lonely for the long daylight and snowy peaks framing the emerald lakes in fields of gold wheat, rented their Minnesota farm at twelve dollars an acre, came back and bought into Peace River again at forty dollars. You don't hear of the man who wintered nine hundred head of cattle in a fifty-below zero winter

climate north of the Peace and lost only three per cent. of his herd in the worst winter the North has known for fifty years; nor of the young Minnesota girl who married a Canadian boy and who, when he went to the war, carried on the wheat-farming herself and in addition raised seven colts, which, grown to horses, put him on his feet financially when he came back. You don't see a Russian out at seven in the morning cutting oats, while his wife stacks the sheaves, and see the same couple out at nine o'clock at night still toiling to beat the weather. You don't see little Austrian children playing round a school, being trained into good little Canadian citizens unconscious of the aftermath of hate from a great war.

I looked over the edge of the car and thought of these people whom I had visited below. What of it? Was it Nietzsche who said we think clearest when we are high up; we stride in thought from mountain peak to mountain peak? What was Canada's future? Here was a melting-pot—an area the size of Texas and Missouri, supporting Americans in the preponderance, with some Austrians, Russians, Canadians and a few, a very few English. The war has wakened Canada suddenly to an acute national consciousness. She is older than the United States in point of history, and has only eight million people compared to the United States' one hundred and five millions. Why? Her returned men are asking that question and will not be gainsaid. What sustains the British Empire? All the world knows to-day that the era of sea-power has passed forever in history. Aeroplane and submarine remain the undefeated instruments of war. The dreadnought is a beautiful bubble to be pricked by either aircraft or submersible. We are entering on another great world era—land-power. Admiral Mahan's book must be rewritten, for the submarine and aeroplane remain undefeated. What will land-power entail in world history—an unlimited supply of food, an unlimited supply of fuel for aeroplane and submarine flotillas.

We were leaving the golden wheatfields far behind us on the south. As we came to the junction of the Peace and the Smoky we could see the oil derricks where this same rich land promises to pour out not only food for an empire but fuel for the defense of the empire.

If one sees farthest when highest up, we were now climbing to get above the thick cloud-banks lying between the high mountain shores of the Peace. If one sees clearest highest up, what did all this change from sea-power to land-power imply to Canada? Below was an empire of fuel and food. Below were American settlers, Russians, Austrians, Canadians, a few, a very few, English. If England pours in English colonists, not in thousands, but millions, undoubtedly the change from sea-power to land-power implies the future Great Britain in Canada, not a little island fenced from land enemies in Europe by a line of submarines and aeroplanes, but a Great Britain like the United States, north of the boundary; but if England does not pour in English colonists, if the Americans increase and the Austrians increase and the Russians increase, and the Canadians succeed in nationalizing them all. The Captain touched my shoulder from behind. The sun was coming up over the snowy mountain peaks like the sunrise of a new nation. The clouds were racing below us. We were dropping in careful glides to land. I leaned over and photographed the clouds at each level till we were swirling through them.

Here was the only danger spot in the flight. On each side were rough steep hills. We were in the clouds above the water. If the careful pilot had miscalculated there and "landed" us in the water we would have gone down

like a stone and stayed until the spring floods covered over a sunken engine. But we took our glides in easy spirals. When high above the milky folds of clouds we could see through them as a woman sees through her veil; but now they lay below us in billows of shining white silk. We no longer saw the mountains lining the river, nor the hilltops coming up through the ocean of clouds in islands. Wisps of clouds went racing past us in ragged whorls. Then you had a sensation of the clouds passing you in streaks of torn, ragged gauze through which you caught glimpses of shining water below and islands where the Smoky joins the Peace, and of people running out of little roofed houses and looking up.

Once where the sunrise struck aslant just level was the shadow of a hawk on the clouds, and in iridescent gleams were rainbows in the mist, gone like the vision of a dream. Then we were circling very slowly just above the river and went bounding over a shingly beach not much wider than a vessel's deck, and certainly not so long. I got my bags out, then the big belt unstrapped from around my waist, and slipped my big motor-coat off before I could unlimber and climb out from the cockpit of the fuselage.

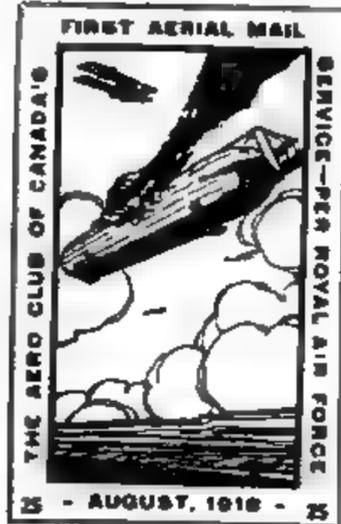
My limbs were not stiff; for I had had stretching room in front towards the engine; but my ears hummed as if the drum had snapped, and the Captain's voice sounded like a faint echo. If I had had a fur collar strapped across my ears, I think this could have been avoided. The deafness wore off in a couple of hours. Apart from that I had been as comfortable as sitting at home in front of my own fireplace—and the two-seater training plane is notoriously not the most comfortable traveller.

The North Peace River Country raises sereals, but it is essentially the great cattle country. I never saw such cattle. The vetches and wild grasses are belly-deep, and the cattle sleek and shiny. The North Peace is also the jumping-off place for the northern fur trade—and for the last stand of the whiskey bootlegger and the dope fiends and the backwash of indecency before decency. It is in a transition stage that will not last; and it is well for the North Peace to see that it does not last. On the train on which I came out were a man from California with money to invest, and a scout for a European banking house. The track bed had to be negotiated at about three miles an hour over a bad section of muskeg.

As we ground slowly over this rocking section of gumbo, wash and bog, six whiskey bootleggers took possession of the car. A gentleman from the Holy Land was called a name by a gentleman of thick lips and very, very thick voice and very unclean brogue. I judge the other four men—who were very young and very green indeed, or they would not have allowed themselves to be corrupted by a pair of unclean middle-aged toughs—sat on the gentleman of the loud thick brogue and took his gun away from him; for his protests were the choicest streams of a cesspool undiluted that could defile the ears of a car. The reaction on the prospective investors doesn't need telling.

Many places have to go through a typhoid-fever stage before they put in a good sewerage system. The North Peace hasn't put in its moral sewerage system yet, and is apt to drag some good material in its slime before it does so. For instance, next day when a provincial constable who was on board tried to make a sham investigation of the bootleggers, whose names he had in his notebook, they hid themselves and their baggage in the stateroom of a local fur manager—whose door the six were about to kick in the night before.

In fact, not a little of the present demoralization is due to the transition stage of the fur trade.



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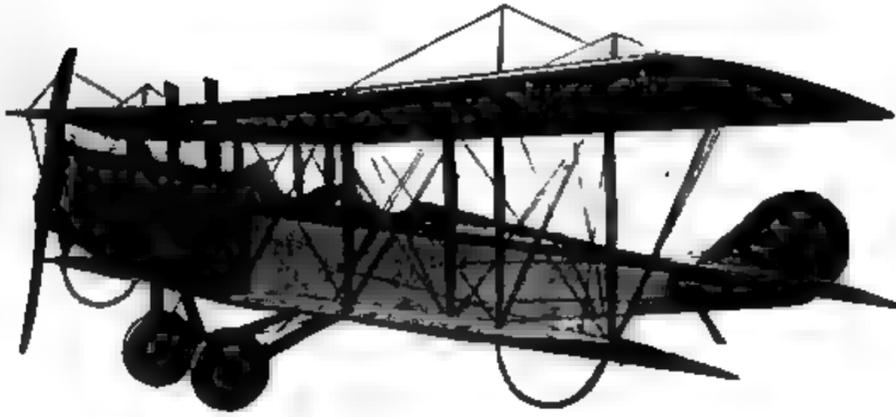
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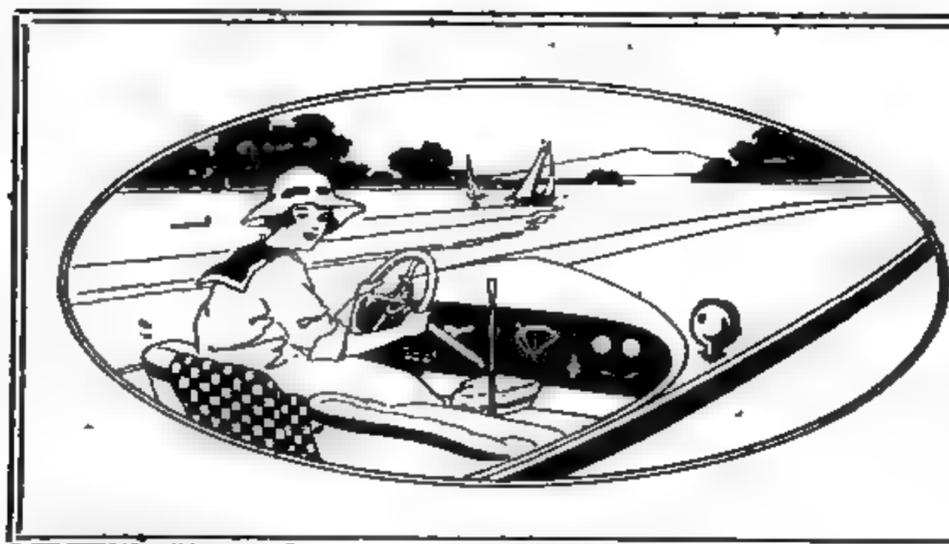
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MOTOR-- BOATING

And Last of All Came The Propeller

THE LAST THING IN THE BOAT SOMETIMES GET THE LEAST CONSIDERATION AND CARE

It is a usual thing to buy the engine and propeller together. When this is done, if the yachtsman will let the engine man know the kind of boat the propeller is to go on, there will not be much danger of a misfit.

But if you think these misfits are rare, go to some large boatyard where scores of yachts are hauled out for the winter. Here you will find broad-beamed cruisers having wheels of high pitch and comparatively narrow diameter. In the effort to get speed some yachtsmen buy wheels of much higher pitch than the engine can handle. Result: Speed is cut down and engine fails to develop its rated power.

Of course, the engine builder is to blame.

Sometimes, but very rarely. Usually it is somebody else.

Power is developed by speed. If you overload your engine you cut down the speed and, of course, the power.

We have speed wheels, towing wheels, weedless wheels, architect's wheels, etc. If you have a beamy cruiser the chances are you will want a wheel of the same diameter and pitch. Sometimes you may use a wheel with a slightly higher pitch on this kind of a boat and get away with it. Then again, you may not--the chances are you won't.

In the effort to get speed the wheels are sometimes made too light. This we believe to be a mistake, for it often happens that a knock that would not affect a wheel of fairly heavy construction will put one of the light weight class out of business. Wheels made of monel metal are light but strong, and it may be that you take no chances in using these wheels.

When you stop the engine and resort to sail on the auxiliary the problem is to dispose of your propeller in such a way as that it will not set up a drag in the wake of your yacht.

Some wheels are noted for their speed. But a speed wheel isn't the proper kind to put on a cruiser.

You may say that this is true and not open to debate. You may also say that it isn't necessary to offer an aphorism as a bit of news.

In reply we might say that aphorism or no aphorism, hundreds of yachtsmen have done this very thing in

the past, and in spite of all that can be said by the trade papers and manufacturers it is a safe bet that it will be done again by many hundreds more of yachtsmen before the season of 1921 closes.

The architects are not likely to make these mistakes, and if the yachtsman who builds will be guided by their advice there is no danger that this palpable error will be made.

But this is an era of experimentation. We think if we put another wheel on we will get a little more speed, and so we make the change. And we keep on changing, only to find in the end that in nine cases out of ten we are worse off than when we started. But it is worth while to gamble on that one chance.

The chart tables giving the speed of wheels of the various sizes are interesting, but the unknown quantity--the slippage--often robs them of their chief value. Hull formation, the adjustment of load, form of power installation and other factors not accounted for in these charts must be included in our calculations.

There are other types of wheel, known under the general term of adjustable propellers. Their theory is good, but in actual practice, there has been much to cause dissatisfaction. Yet some have used them with success and are enthusiastic in their praise. In these propellers forward, neutral or reverse is secured by the shifting of a lever, no clutch being required. But the old type wheel of solid construction is the more popular and is less likely to get out of order.

It is a curious thing that the propeller we now have is practically the same as it was at its inception. True, different shapes have been worked out in the effort to adapt the wheel to a multitude of uses, but the principle remains the same without any essential variations.

Whether something new will develop along this line cannot be predicted at this time. Progress is inevitable. The propeller as we now have it in its multi-forms is a wonderfully effective accessory, but there is always a chance that some restless genius will butt in with something so radically different as to make all the patterns we now have promising candidates for the scrap heap.

Gasoline and Kerosene Carburetors in Boats of Various Types

The regulation float feed carburetor is known to the trade generally and to yachtsmen as well as the most efficient accessory on marine engines. Not that they are trouble proof, or fool proof, or that there is no room even yet for improvement, but in comparison with the old-style mixing valve, which required almost constant attention to prevent flooding, they are in a class by themselves.

The float feed carburetor, as its name implies, feeds gasoline to the engine, the supply being regulated by the cork float which rises, as the bowl fills, and automatically cuts off the flow. The supply of air by which the mixture assumes the proper proportions is obtained in various ways by the different carburetors. Some by set screws with adjustable springs, some by balls of different sizes which uncover the air ports as the engine increases its speed, thereby securing a variable automatic adjustment. The underlying principles are similar, the chief effectiveness of the carburetor being in its proper adjustment and in the right selection for the uses intended.

In general it may be said that the most effective carburetor is the one that will deliver maximum power to the wheel on a maximum use of air. The less gasoline used the better—not only for the owner's pocket, but for the engine as well.

These suggestions embody nothing in the nature of news to builders and experienced yachtsmen, but there are many who buy carburetors after having used their engines for a number of years, and some of these buyers do not know that certain types of carburetors that give good service on slow speed engines would be failures on racing machines. Some men change their carburetors every year or two, and the price tag is very alluring to such, forgetting that the practical service of the carburetor is what sets its value and not the price asked.

Some carburetor manufacturers claim they have a carburetor that is good for all kinds of service and engines. Perhaps they have, but when we hear a statement like that we assume the mental attitude of the gent from Missouri.

In selecting a carburetor for your engine get one that is adapted to the work required. Don't get one that is

too small; better have it too large. Be sure that the piping leading to the carburetor is large enough. Also make sure that there is sufficient fall from the tanks to the carburetor to insure adequate pressure. It is good practice to install wing tanks connected by good sized copper pipes, to which the direct pipe to the carburetor is connected. Then in a seaway the engine is always sure to get plenty of gas, even when the supply is low.

The kerosene carburetor is being developed rapidly and promises to become the most popular accessory on marine engines. This is not only due to the fact that kerosene gives a larger percentage of power in actual service, but also because of the manifest economy. It is not intended to do away with the gasoline carburetor, but rather to use the kerosene attachment as an adjunct. More experimentation will need to be done before the kerosene attachment will render the service required by exacting yachtsmen, but the experimenting is being done and the results so far attained are so encouraging as to lead to the belief that ultimate success is in sight.

Kerosene is not so volatile as gasoline and requires a much higher temperature. It has a tendency to carbonize, but this is being overcome by a simple but effective expedient.

With a double equipment of this kind the yachtsman is in a position to secure maximum service at a minimum of cost and labor. The tendency nowadays towards double equipment is shown by the manufacturers of ignition outfits, who were the first in the field in this line.

The kerosene carburetors are designed for the purpose of heating the fuel until it is as easy of combustion as gasoline. After this is done a spray of water is used to prevent the formation of carbon. It will be seen therefore, that the kerosene carburetor has a double function and that its success depends on the perfect action of both. But where this is obtained as it has been in several accessories of this type now on the market, it results in generating a greater power than can be secured through the regular gasoline carburetor.

Other forms of fuel are used calling for different types of accessories in different parts of the country. Crude oil, distillate and similar fuels are treated in different ways to develop power. The gas producer makes an ideal installation on large yachts, but even here difficulties are encountered unless the load be uniform and without great fluctuation. The intermittent use of power on engines of this type soon causes trouble by the igniter points becoming sooted up, and by carbon forming in the cylinders.

But these problems annoying as they may seem are being worked out in a satisfactory way by the manufacturers and their engineers and inventors.

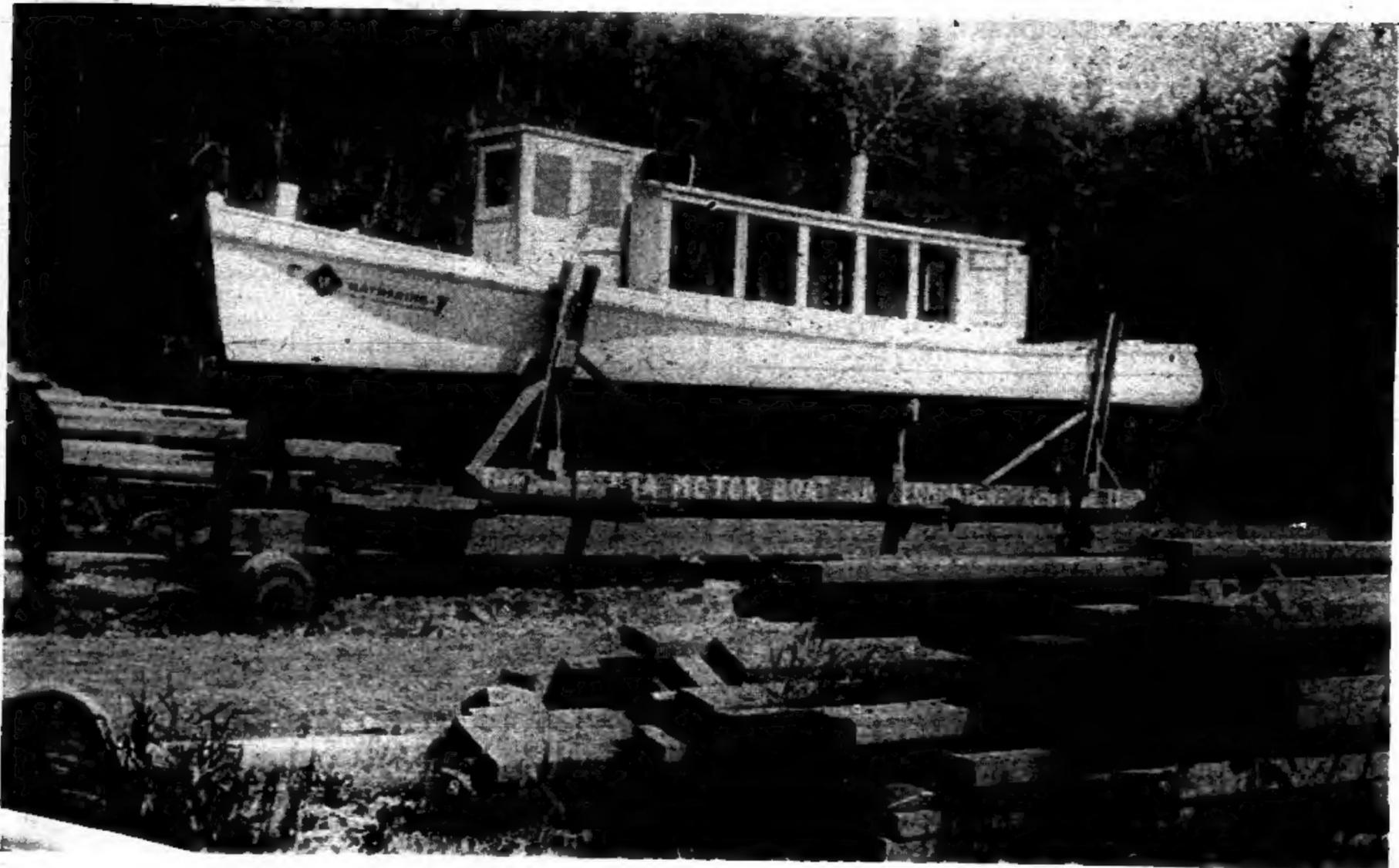
NEW GEAR CATALOG

The Carlyle Johnson Machine Company of Manchester, Conn., manufacturers of the well known Johns or friction clutch, has issued a new catalog describing their line and giving instructions on the care and operation of their marine reverse gears. The company has added a new size gear, a No. 5 to their line.



Passengers in F. S. L. Aeromarine Flying Boat, at Buffalo Yacht Club. Clarence Sidway, Buffalo, C. F. Redden and Commodore Sullivan.

The "Katherine"---Scripps Equipped



The "Katherine," designed and built by the Alberta Motor Boat Company, Ltd., of Edmonton, Alberta, is the property of the Imperial Oil Company of Canada, and the outfit is going to the northern oil fields to be used in connection with the geological work of the company in question. The distance from the factory to the point where the boat will operate is 2,000 miles, the rail haul is 500, and then it will travel on the Peace River to a point 900 miles due north, when it will get into the Peace

River to a point 900 miles due north, when it will get into the Slave River and from there into the Great Slave Lake. This lake is 200 miles across to the Mackenzie River, the balance of the distance will be on this river, which empties into the Arctic Ocean.

The boat is 35 ft. x 8 ft. beam, with draft of 24 in. extreme, and the builders of the boat report a speed of 16 miles per hour. She is equipped with a Scripps Model D-4, 40-60 h.p.

LIGHTING THE MOTOR BOAT

It is generally conceded that a motor boat will return larger dividends in pleasure and recreation, considering the money invested, than almost anything in the same category. A good motor boat is comparatively inexpensive and low in maintenance cost, much more so, in fact, than an automobile. But the present popularity of the motor boat is due to some extent to the activity of boat builders and appliance manufacturers who have combined in developing new ideas and appliances making for comfort and safety.

Electric lighting systems for motor boats have been successfully operated for a number of years, longer, in fact, than for automobiles, and as a result the reliability of the systems used has been proved by long usage. The manufacturers in the field, however, have increased their activities in late years due to the advent of the tungsten filament lamp suitable for this service.

The convenience of reliable electric lighting systems is hardly to be overestimated, while safety is a factor of equal or greater importance. It has often been demonstrated that an open flame illuminant is a positive source

of danger on a gasoline motor boat. This is especially true in the smaller sized boats because the engine and fuel tanks are more likely to be exposed, but there are still people who will investigate a leaky gasoline tank or pipe by the light of a match.

On the usual pleasure craft, quarters are necessarily somewhat cramped and the proper ventilation of the cabin is often made impossible. An electric light consumes no oxygen and does not vitiate the air as does an oil lamp. The adoption of electricity has lessened to a large extent the labor of maintaining running lights in good condition. Spray and wind will not extinguish electric lights, which may happen in the case of oil lamps.

The electric searchlight, too, is a real boon to the owner of a motor boat, being clear, odorless, effective and easily maintained. It is extremely powerful and will easily detect floating logs and debris at a distance of from 500 to 1,000 feet, thus lessening a common source of danger found especially in inland waters. It is also invaluable for picking up buoys and making landings.

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J. WARWICK, Secretary

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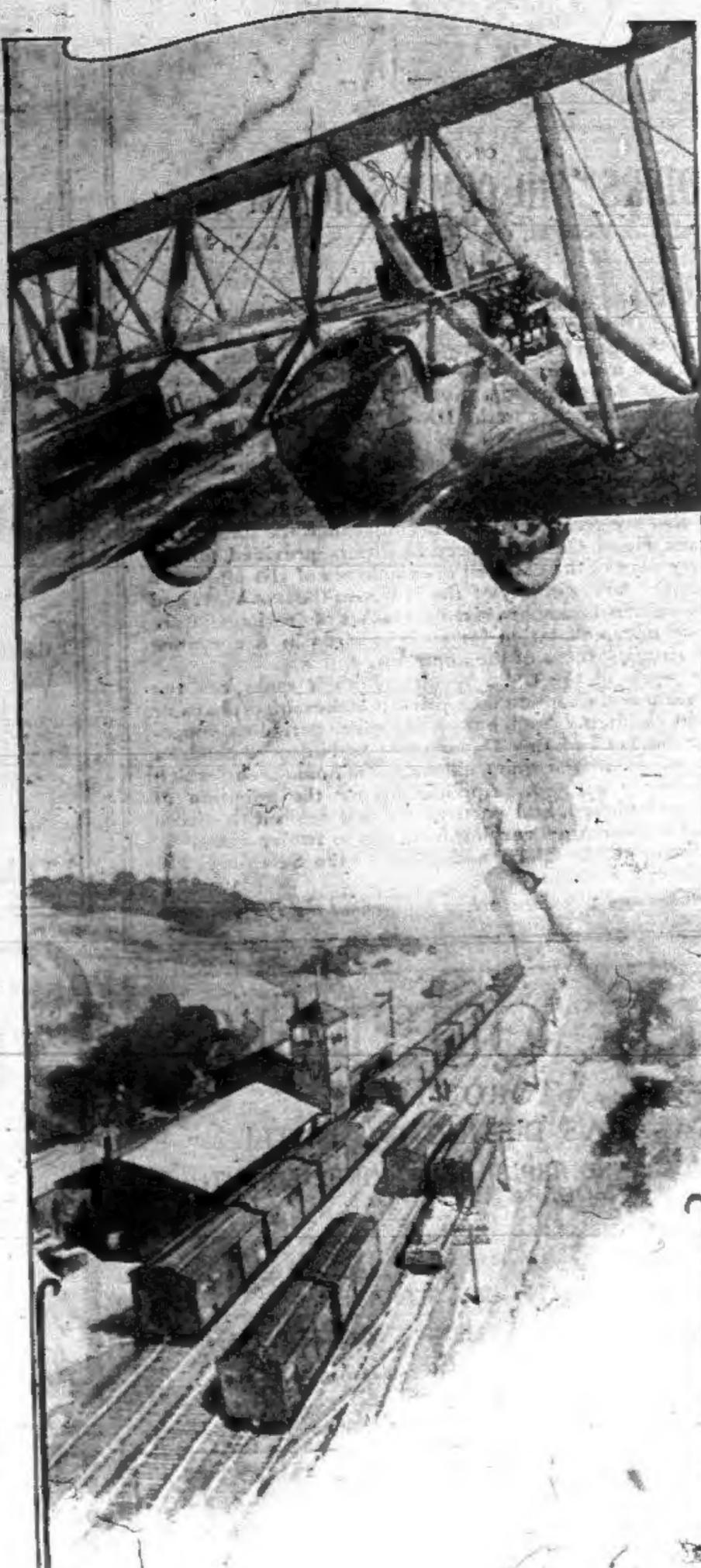
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