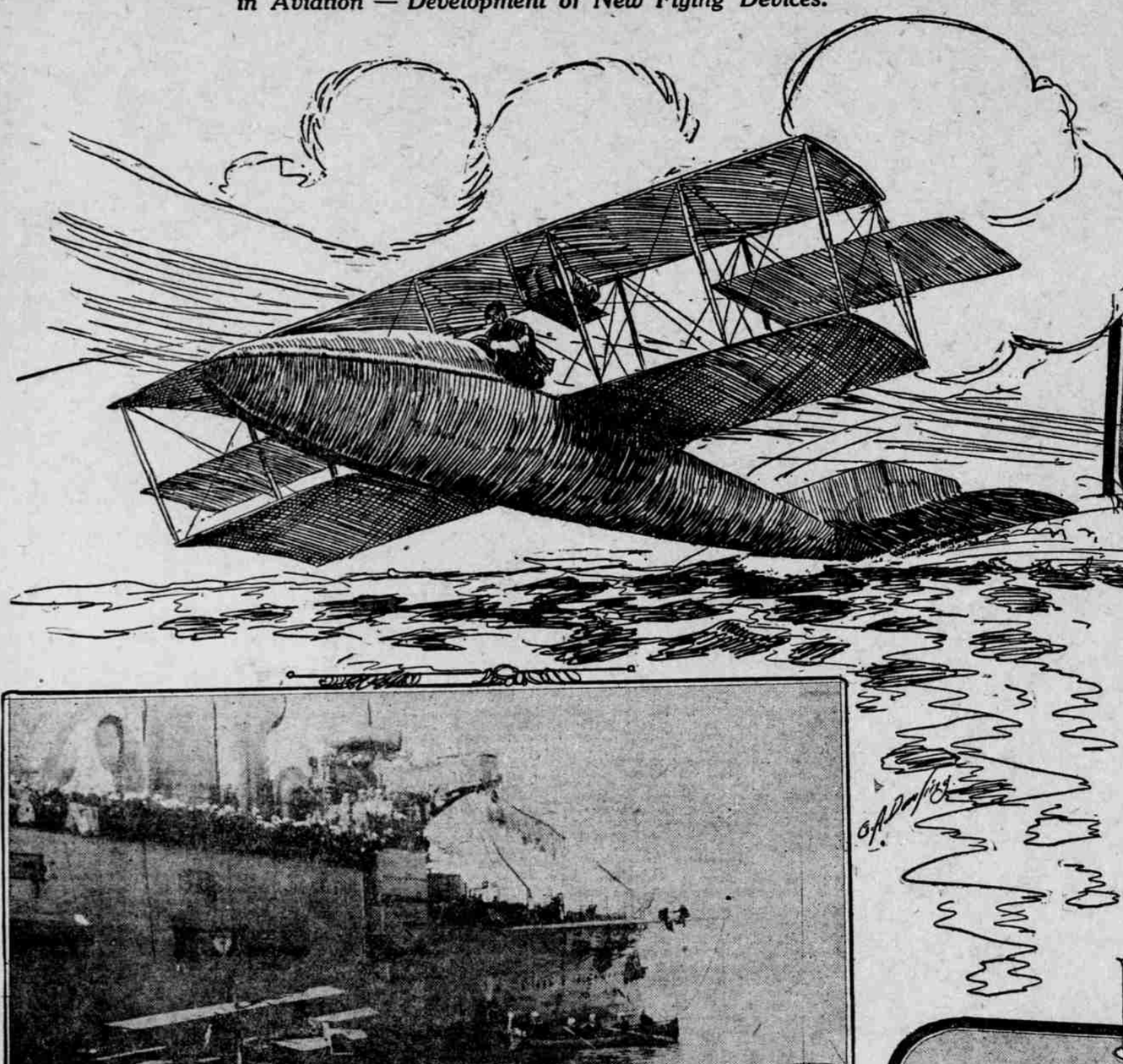
AVIATION TO BE MADE AS SAFE AS AUTOMOBILING.

And Within the Next Year Says Official.

Commander of U. S. Navy's Airship Fleet Describes Ingenious Devices by Which Sudden Shifts of Wind Automatically Steady His Aeroplanes—Navy Trying Out Many New Inventions in Aviation — Development of New Flying Devices.



Hoisting Hydroaeroplane Aboard U. S. Warship.

BY JOHN ELFRETH WATKINS

"I FULLY believe that within a year or two at the most, aviation will be practically as safe as automobiling."

In the course of an interview which he granted to me yesterday, thus predicted Captain Washington Irving Chambers, U. S. A., a long-tried and well salt-seasoned officer to whom has been intrusted the important task of developing an efficient hydro-aeroplane squadron to be operated over the high seas or their surrounding coast line as an auxiliary to our fleet of fighting ships.

A glance at this experienced officer will suffice to convince any interviewer that he is no dreamer. His eyes twinkle with circumspection and he weighs his words with care and deliberation. After skinning a herd of cub reporters who have misquoted him of late, and nailing their hides to the wall—after expressing grave doubts as to the wisdom of granting interviews, anyhow, and after eventually yielding to the plea that the popular mind yearns for information anent the newest phase of aviation, he climbs onto the high stool of one of his clerks, lights a fresh cigar and, as they would say in the classics, "comes across with the goods."

Captain Chambers is none of your revolving-chair aviators. He occasionally mounts the empyrean in one of his aero-amphibious craft. With a career in the skies he is topping off a long stretch of service upon the seas, including exciting duty with the Greely relief expedition, in the frozen north, and in the Philippine wars. He was engaged in important torpedo development at our naval torpedo station during the Spanish War and had commanded five warships on the seas before he was placed in charge of naval aviation last year. He has always been a progressive, up-to-date officer. He was practically the first, while yet an ensign, in 1884, to outline a policy of reconstruction for our then decadent Navy, the principles of which are still regarded as safe guides to modern practice.

Greatest Perils Described.

"Wherein do the greatest perils of aviation now lie?" I asked him.

"In a combination of personality and inherent mechanical defects," he replied. "All aviators are not endowed with the same bird instincts, mechanical ability and temperament. A number of them are careless. Some of the most efficient are the most careless, and the tendency among the majority for some time has been to cater to the popular demand for sensational performances. It is particularly unfortunate that here in America aeroplaning has been conducted principally on an exhibition basis, and even now is restricted largely to hippodrome performances. The great strides of advance abroad have been made largely in the course of practical, cross-country flights, for which certain patriotic citizens are always ready to put up large prizes.

"But even the best aviator one can possibly imagine is unable to anticipate the perturbations of the wind which he is flying, or the actions of the machine under him. Corrections for counteracting any upsetting tendency have to be made quickly. Time enters as an important factor in the safety problem, and the aviator naturally does not respond to the necessity of correcting his flight until he sees some visible effect—for example, sees his machine beginning to tip.

Automatic Safety Devices.

"Now there are automatic devices which soon will anticipate these effects. By their aid the same cause which produces such perturbations as tipping, for example, will correct the movement of the machine automatically.

"Such automatic safety mechanism may not be actually necessary in smooth, calm weather and under perfect flying conditions, but we have to consider that aviation, if to be of any practical use, will demand flying under very uncertain conditions, and if a certain degree of equilibrium can be attained by automatic mechanism not weighing too much that mechanism must be provided and is as much of a necessity as the steam steering engine is to a large ocean steamer."

Will Eliminate Greatest Dangers.

"Have such devices been perfected?"

"Many have been designed to accomplish this object and some have lately been tried with brilliant success. Many experimenters are now actually engaged in improving them. To my mind the way in which they will eliminate the greatest danger of aviation is perfectly clear. Manufacturers of aeroplanes are becoming more open-minded on the subject and more willing to install them on their machines.

"These devices relate mostly to the automatic control of the stabilizing organs of aeroplanes, now controlled by hand—principally the elevators which guide machines up and down, and the movement of the ailerons, or wing warping, which control the lateral balance. When the automatic appliance is not needed to work these parts it can be thrown out of gear. It can be used or not, as the aviator, while flying, sees fit. Its use in the control of longitudinal stability, through the elevator, is by far the most important element in the entire problem of stabilization. But such of these devices as are designed to automatically correct lateral perturbations through the control of the ailerons are not, to my mind, of equal importance."

"Will you adopt these for the naval machines?"

"We expect to provide our hydro-aeroplanes with them, so that our men may test them out. We already have installed some safety instruments known as 'speed indicators,' which afford a great stride toward safety over progress made up to a year ago. They show the conditions under which an aeroplane is working. By following their indications the aviator need depend less on his bird instinct than heretofore.

Other Steps Toward Safety.

"Greater safety in flying will result from other improvements besides these automatic devices. Of course, after the first aeroplanes were invented, amateurs in all part of the world put sticks together in a more or less haphazard way, and in the machines thus constructed many would-be aviators came to grief. Although the principal manufacturers of carefully constructed machines are still building pretty much according to original patterns, and are not departing from these unless convinced of very good reasons for change recent developments show that such craft can be greatly improved and makers are now adopting the latest and best improvements.

"Disposition of weight is a great factor in safety. In an aeroplane a great deal more depends on weight and its distribution than in a ship. There has been but little effort so far to dress down dimensions to suit actual strains. What is needed in our field is a genius like Nat Herreshoff, who in designing racing yachts, could cut down weights in all possible ways and yet continue to get more and more power out of his dispositions. Take the matter of weight in the plane surfaces of an aeroplane's wings for example. Nearly all builders continue to put as much weight in the tip as in the middle of a wing. As they learn better to distribute weight scientifically they will increase the power as well as the safety of aeroplanes. To save weight they now look principally to skimping the weight of engines.

"Disposition of the plane surfaces with respect to one another is an additional factor in the problem of greater safety, as are the camber of planes and the development of more flexible rear edges of wings. These are all questions of improving the inherent stability of the aeroplane. It now appears to me as a certainty that some of the Blériot monoplanes, which have wonderful records are also very unsafe. Miss Quimby's accident at the recent Boston meet, which revealed its inherent defects, was similar to others that have been caused by this machine. You will remember that both she and the passenger with her were killed.

Return to Langley's Idea.

"Recent discoveries by M. Eiffel, in his laboratory in France — the same genius who designed the famed Eiffel tower—now indicate that the Langley aeroplane model of 16 years ago would have been a superior aeroplane for safe flying. Langley arranged his planes in tandem. But, singular to relate, none of the designers of modern machines have tried out the Langley idea. It has remained for M. Eiffel, a scientific investigator, to prove that the tandem arrangement is more efficient in lifting than the monoplane of the same area and that it is also safer, providing the rear plane is set at a negative angle of from 5 to 2½ degrees to that in front."

"Do you anticipate a revival of the Langley pattern?"

"For a long time I have been under the impression that sooner or later we would find advantage in his scheme for the disposition of plane surfaces, but of course it will take some time to induce manufacturers to try so radical a departure. But I hope that before long there will be established here a national aerodynamic laboratory which can continue Langley's researches. Aviation today would be in an almost helpless state but for the work of such laboratories abroad, notably that of Eiffel. Nearly all of the information which we now get on the subject of aerodynamics comes to us second-hand—a condition that ought not to exist.

"Bird Instinct" Essential.

"Now after all has been said about greater safety of aeroplanes, you must bear in mind that, regardless of how perfect the inherent stability of machines may be made, or how promptly perturbations may be offset by automatic devices, safety in flying will still fall short of being absolute. The aviator will always be obliged to fly even the perfect machine with what I have referred to as 'bird instinct.' Skill will always be required, and he must sense the peculiarities of the air, as well as know those of his machine. He must have air sense and the faculty of responding instantly to any emergency. It is therefore very unjust to supply him with anything short of the most up-to-date aeroplane and still expect him to overcome its defects by exercising his athletic prowess alone."

"What is the extent of the Navy's air squadron at present, and what are you doing with it?"

"We now have three machines—all hydroaeroplanes, which can either rise from or alight upon a ship's deck or the surface of the water. These machines can also skim over the sea, touching the surface. We are going to add more and more of these machines as the manufacturers turn out improvements. I regard this type of aeroplane as of the greatest value in case of war.

"Thus far we have been working our three machines hard, for both experimental and instruction purposes. We are now devoting considerable time to the development of a compact, portable wireless telegraphic apparatus to be used from the sky, also to the perfection of the hydroplanes which keep our machines afloat when they settle upon the water. In the past year we have established an aerodrome and practice field at Greenbury Point, opposite Annapolis, Md. Here we will assemble some of the most up-to-date hydro-aeroplanes that we can induce manufacturers to build for us. First, we desire to encourage American builders to do the very best work possible to meet our requirements. Then we will thoroughly test out their product with the fleet in service, and I fully anticipate that we will still find some points in which they can be greatly improved.

Future of the Navy's Sky Fleet.

"What will be the Navy's ultimate equipment in these machines?"

"Our ultimate aim is to equip all of the large ships of the service—the scouts, cruisers and battleships, and several shore stations—with hydroplanes, so that instruction in the use of these machines may be continuous. To make effective their use, we have got to use them. It is a question of constant practice, the same as gunnery."

"Will our warships have to be remodeled to accommodate this new class of auxiliary craft?"

"I am now endeavoring to work that problem out and so arrange matters that no changes will be required in ships' designs and that no great amount of superfluous paraphernalia will have to be carried aboard to accommodate our machines.

"The temporary platforms which have been used on the decks of ships for the launching of our machines, may always be used as a last resort, but they would doubtless prove to be a considerable nuisance, and soon we shall probably be able to substitute a device upon which we are experimenting and for which we have high hopes of ultimate success. The cranes may require slight modifications and a neat little problem with which we are now at work is to arrange slings of such simple dimensions as may be readily carried by the hydroplanes and which will be suitable for hooking to the tackle very quickly.

"We have just invited all of the responsible American manufacturers of aeroplanes to submit designs for machines especially adapted for hoisting on shipboard from the water, intact, and capable of easy and speedy dissembling as well as ready replacement of parts.

The Hydroplane's Advantages.

"From the very outset, in this work I have insisted upon the development of the hydroplane—the long, shallow, flat-bottomed, boat-like structure upon which each of our machines floats when resting on the water. It was early apparent to me that our Navy would be unable to have enough officers detached from ships for proper instruction in flying at shore aerodromes and that lessons would have to be and could best be given aboard ship, where all hands could be kept familiar with the machines. At first my insistence on the hydro-aeroplane was rather severely criticised—notably abroad, where experimenters have even yet done but little toward its development. That celebrated flyer known to the aviation world as 'Andre Beaumont' who is really an officer of the French navy named Conneau, who has been the winner of three big cross-country flights and whose opinion on aviation matters is highly respected the world over—gave out a very positive statement that he considered the hydro-aeroplane as of no value, and I believe there are certain French officers even today who do not look upon it with favor. But we have met with such success in the development of the hydro-aeroplane in this country that we have spread the fever abroad. Foreigners are everywhere taking it up with avidity. And it is notable that quite recently this same 'Andre Beaumont,' or Conneau, has made flights over Paris in a hydro-aeroplane and he is said to be contemplating a flight in it across the English Channel.

"Incidentally, hydro-aeroplane flights over water are comparatively safe, because the wind conditions are generally safer than over land, and in case of a fall there is less danger to the aviator.

Mechanical Flying Fish.

"The very latest development of the hydroaeroplane—one in which we are now interested—is the new invention of Glenn Curtiss, which he calls the 'flying boat.' I have looked forward to this development for some time, expecting that sooner or later the navy would have important use for such a machine in rough water. In this machine the hydroplane, the body and the tail of the machine are all in one, forming a more or les fish-shaped boat with wings. Besides its advantages in rough water, this machine has the virtue of offering a body more commodious for instruments, more comfortable to the aviator and giving less head-resistance. So, in our recent specifications I have promised special consideration to designs embodying such a boat structure.

"If possible we want to eliminate gasoline-burning motors from the navy's hydroaeroplanes because the storage of this fuel aboard a man-of-war is a dangerous proposition. The small amount of gasoline now carried on board ship for motorboats is stored upon the upper decks, where it can be immediately thrown overboard in case of action or of fire. So I have notified all builders that an extra premium will be given for an efficient motor operated by fuel oil or any fluid whose storage aboard ship is not dangerous.

Fuel Oil Motors Coming.

"A great deal of effort is being expended both here and abroad to perfect a fuel-oil motor for aeroplanes and automobiles. Such fuel oil engines as now exist are out of the question for aeroplanes on account of their weight, but I know of some promising efforts now being made which will probably put a new face on this problem much sooner than is generally anticipated by aeroplane builders. Indeed, from what I know is being done along this line right here in America, I am sanguine of having a fuel oil motor for our hydroaeroplanes within a year. But it is not absolutely necessary to use fuel oil in order to overcome the gasoline problem. Steam could be used in small turbines, it being generated by fuel oil or alcohol, which is less dangerous.

"Are you now able to send wireless messages from your hydro-aeroplanes while they are hovering over the sea?"

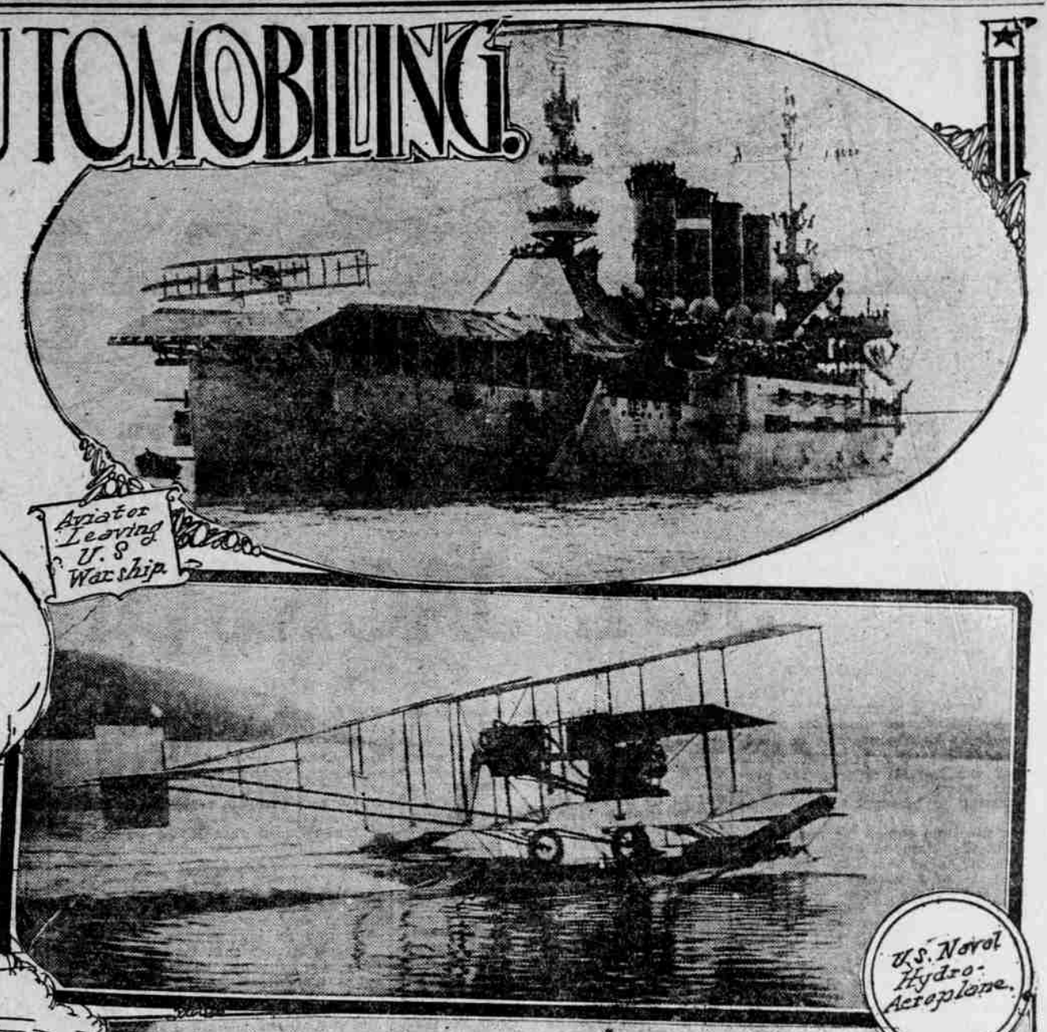
"Yes, but neither here nor abroad can this be done from aeroplanes of any kind with entire satisfaction as yet. We can transmit over distances of from 10 to 12 miles, but the apparatus still weighs more than we want to allow. However, improvements along this line are going forward so fast I anticipate that we will soon have an instrument transmitting for 60 miles and weighing not more than 50 or 60 pounds.

"Means for keeping aeroplanes at a safe distance from battleships will doubtless be perfected by our Navy. But aeroplanes will not be as dangerous to men-of-war as will submarine boats. I have little patience with those geniuses who lay so much stress upon the artillery side of aviation.

Hydro-Aeroplane Fleet in War.

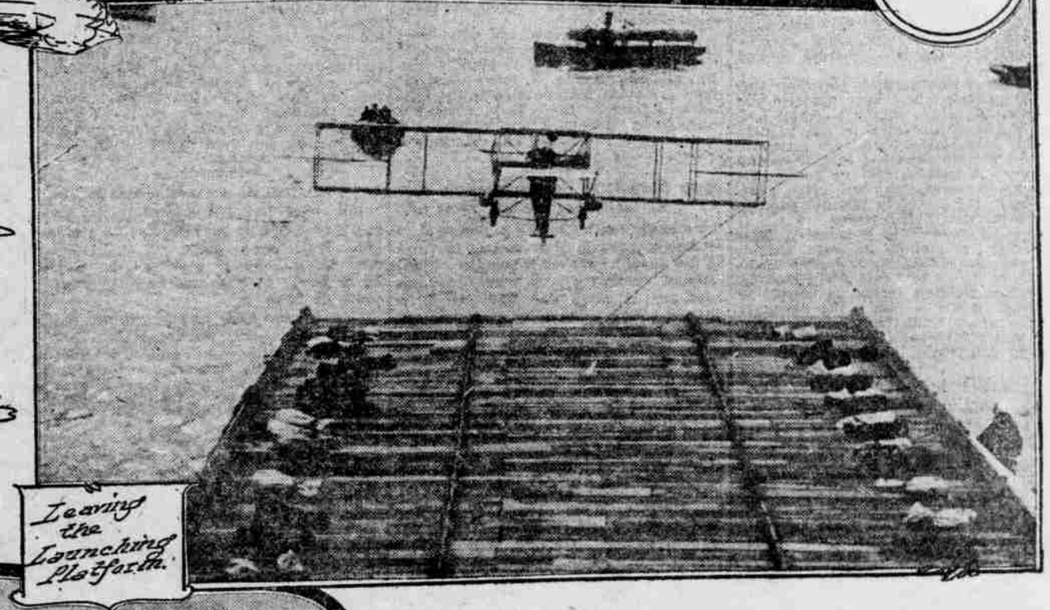
"What, then, will be the principal function of your hydro-aeroplane fleet in case of war?"

"Principally for scouting and observing," replied the captain. "They will be very useful in many ways to battleships—reconnoissance of harbors, observation of an enemeny's submarines and mine fields. You know, the aviator when up above the water has the ability of the fish hawk to look deep down below the surface of the waves. Lately there was taken from an aeroplane the photograph of a submerged vessel 40 or 50 feet under water. The outlines of the hull came out perfectly clear. This achievement suggests the hydro-aeroplane's further value as a means of discovering submerged derelicts endangering navigation."

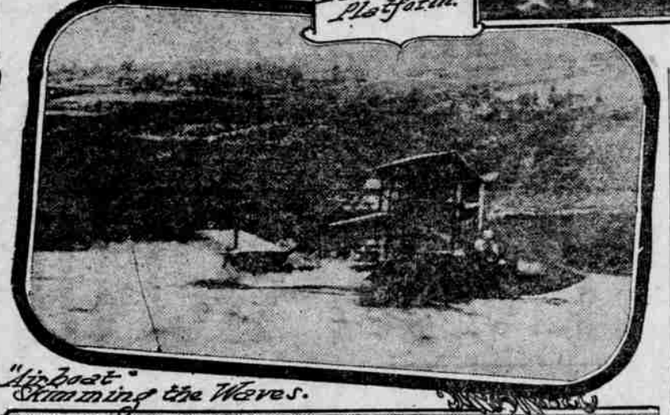


Aviator Leaving U. S. Warship.

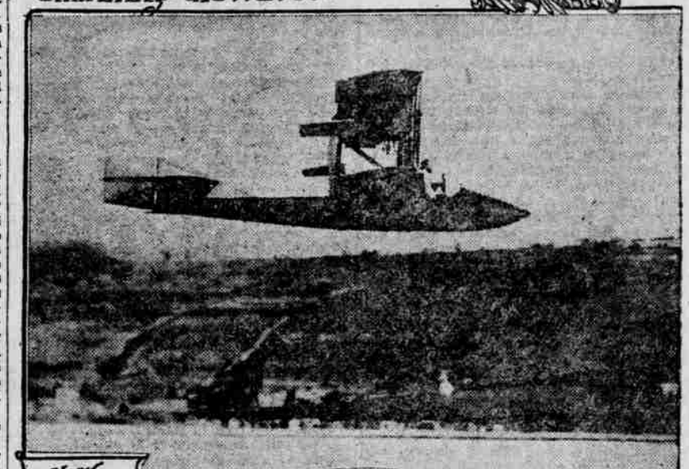
U. S. Naval Hydro-Aeroplane.



Leaving the Launching Platform.



"Hinboat" Running the Waves.



New "Hinboat" Flying.

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Capt. W. S. Chambers, U.S.N. Commander of Navy's Hydroaeroplane Fleet