

Can This Be Done?

Joseph A. Steinmetz of Philadelphia would mine the air above London against Zeppelins as the Dardanelles are mined against battleships. He would send aloft captive hydrogen balloons carrying explosives, grappling-hooks and torches. It would be hard for the balloons to maintain their level. The wind would toss them about. What is more, a Zeppelin's machine gun could pick them off and drop them into London itself with dreadful results

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Mining the Air Against Zeppelins

By Carl Dienstbach

THE failure of the English high-angle anti-aircraft artillery to destroy Zeppelins attacking London has been repeatedly demonstrated, and it has stimulated many a scientific mind to invent some more efficient means of defense. At night the English aeroplanes are at a serious disadvantage, since the glare of the ground searchlights renders it almost impossible to drop bombs on the enemy with any degree of accuracy. Instead, they fall into London, causing explosion and conflagration. The same danger exists in firing upward against the almost invisible and swiftly moving Zeppelins.

Joseph Steinmetz, an American inventor, proposes to mine the air with bomb-carrying balloons. Small hydrogen balloons, connected in pairs or groups by piano wire (weighing about ten pounds to the mile) are to be set adrift when the Zeppelins are over London. According to the inventor, they would rise rapidly and enmesh the enemy's aircraft. Attached to the balloon units are small hook-trigger bombs of high explosive contact and incendiary torches, which are to be drawn into the Zeppelin's gas bag with destructive results. The method is to be further elaborated by carrying nets of very wide mesh, an idea successfully applied in submarine warfare. In the opinion of Mr. Steinmetz, even though the chance of a Zeppelin's fouling the balloon-connecting wires is only one in a thousand, that one chance is well worth the attempt and expense.

At first blush this scheme of mining the air as a defense against Zeppelins is attractively plausible. Undoubtedly, if the atmosphere above London were

full of floating air-mines, it would not be so easy to bombard the town from aloft. When it comes to making this arrangement practical, however, serious difficulties are immediately encountered. Flotation in air is not like flotation in water. A balloon left to itself invariably goes up or comes down. It is generally considered a wonderful accomplishment if a balloonist knows the aerial ocean well enough to keep his craft in regions where sun, winds and vapors do not continually force it from its level, thus causing him to use up gas and ballast and shortening the trip. Over a great city, this procedure would be extremely hazardous. After the air has been thoroughly sown with mine-balloons, it may snow. Imagine the result! With a wind blowing the balloons about during a snow storm, and their bombs striking roofs right and left, the inhabitants of London might prefer the attacks of the Zeppelins. Think of the conflagration these clusters of balloons might cause!

The whole plan harks back to the experiment made in Austrian campaign against Venice in 1849. Nothing was done by halves at that time. No less than two hundred small hydrogen balloons, each carrying a twenty-five or thirty pound bomb, were liberated, but they refused to stay at the right level. They continued to rise until an upper current of opposite direction found them and returned them to the senders.

Even if the mine-balloons remained over London in their allotted places, there are other factors to be considered which could very likely result in a catastrophe. To carry the smallest bombs,

balloons must be many times larger than the heaviest floating mines. At short range they would furnish ideal targets to a Zeppelin's machine-guns. A Zeppelin may easily shade its lights and yet clearly illuminate a near object in the air. Let a good marksman with a machine-gun be stationed at each side of the front car, and before any balloon-mine could do any harm, it would be shot down and fall into a city street.

The Plan Is Feasible in Water

Interconnecting cables such as Mr. Steinmetz proposes, are more satisfactory in water than in the air, where they are liable to slip off upward or downward. If caught by airships below them, the bombs will be drawn together harmlessly beneath the level of the hull. The chances are that the Zeppelin would gather a trailing mass of wires, empty balloons and live bombs in its wake, to be cut off for the benefit of those below. The steel propellers would cut the thin wire, and since they are as big and heavy, would hardly be damaged. It would also be easy to shape a Zeppelin so that single wire must slip off wherever it strikes the hull, simply by slanting the outlines of all projections.

It does not look as though the Steinmetz plan would make Zeppelin destruction assured. The three dimensions of the air necessitate the use of mines in large numbers, yet the risk is proportionately increased. Here comes the question of the practical value of the plan.

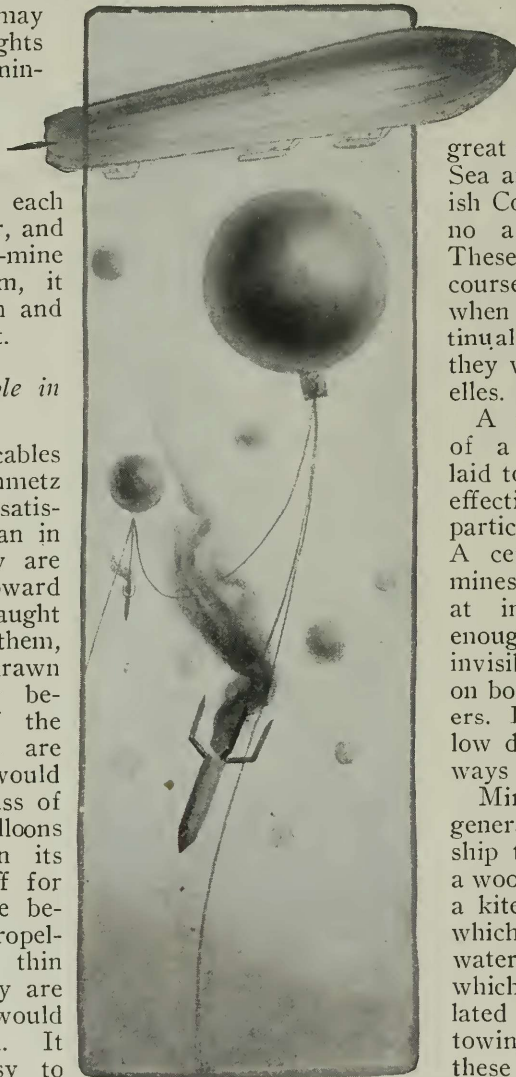
Sweeping a Channel for Mines

THE operation of mine sweeping is one of the most dangerous and arduous of the many tasks that fall to the lot of a navy. The dangers of mine sweeping are great even in the North Sea and around the British Coasts, where there is no active opposition. These dangers are, of course, greatly increased when the ships are continually under fire, as they were in the Dardanelles.

A mine field consists of a number of mines laid together. It will most effectively block off any particular area of water. A certain number of mines are generally laid at intervals just deep enough to render them invisible to the look-out on board the mine sweepers. For such work shallow draught ships are always employed.

Mine sweepers work generally in pairs. Each ship tows over the stern a wooden apparatus called a kite, fitted with planes which dive beneath the water. The depth to which it dives is regulated by the speed of the towing ship. Each of these kites is fitted with a pulley block. A wire rope is passed from the stern of one ship through the pulley on its own kite across the water through the block on the second

kite and so up to the stern of the second ship, where it is fastened. Both ships steam ahead at the same speed, the kites dive to the depth corresponding to the particular speed, and the steel rope is stretched out between them. When the rope strikes a mine, it fires it.



Hooks and flaming bombs as a terror of the air for Zeppelins and, indeed, for any denizens of the air. But is the terror not as great for the houses below?