War Inventions Disclosed

DURING the War, the various countries, as is well known, have developed a great many apparatus which have been found very useful in the pursuit of the enemy. Most of these ideas have been kept secret, and only of late is the veil being lifted degree by degree.

We take pleasure to present our readers today with four ideas little known before. Fig. 1 shows a device that was very popular with French airmen. It was used to facilitate landing of the fliers, particularly during the night time, when landing, as is well known, is particularly hazardous.

Several months before the war a German by the name of König invented an apparatus which was later improved on by the French, and which works as follows: Two iron or wooden circles are placed vertically one behind the other on the flying field, one circle being slightly smaller than the other. The two circles are parallel to each other, and are separated about 15 feet. The circles themselves are about 10 feet above the ground. Fig. 1 shows this scheme.

The circles during the night are illuminated by means of electric lamps around the perifery. Consequently, from a distance we see nothing but two luminous circles, and it becomes apparent when the aviator is at different heights or different levels, or in a position either to the right or to the left—he will see the two circles in different perspectives from one to the other.

In Fig. 1 in the small insert, the different positions of the rings as they appear to airplanes is shown. No. 1 shows that the aviator is too much to the left and elevated too high for correct landing. In No. 2 it will be seen that the aviator is too much to the left; No. 3 shows that he is too much to right, and No. 4 shows that he is in perfect alignment with the luminous circles and will make a perfect landing. This position would be considered ideal. No. 5 shows that the aviator is away too high—in other words, in the position shown of the second airplane in our illustration. The first airplane will make a perfect landing. The third airplane would be too much to the left as well as too high. By studying the figures in our illustration the result will become apparent.

Fig. 2 shows what has been termed the "Tele-Periscope." By means of this apparatus, first used by the Germans, it is possible to see at a great distance, inasmuch as the slender metal skeleton which is painted gray merges into the sky, and at a little distance the enemy has great difficulty in seeing the periscope. Furthermore, the entire contrivance is mounted on a sort of carriage which can be attached to an automobile moving from place to place, so there is little danger of an enemy shell reaching and destroying it. It will be noted that in the large periscope shown the light rays do not come thru the skeleton tube but pass thru the open air, as indicated by the dotted lines. This was found to be quite possible, and while the picture obtained in this manner is not absolutely perfect, still it was good enough to observe the enemy and his doings.

Fig. 3 shows an aerial signaling apparatus used a good deal by the French during the war. By means of an air blast and soot chamber it became possible for the pilot or his assistant to send Morse code signals *in smoke* to the observers below. This is clearly shown in our illustration, which also shows this apparatus in procedure better than words can.

The great trouble with this arrangement is that unless the aviator is well behind friendly lines the enemy, by means of powerful field glasses, can read the dots and dashes as well. Of course cipher messages were used mostly, and thus it made but little difference if the enemy saw the signals or not.

Fig. 4 shows the well known Le Boulangé chronograph to measure the speeds of shells and bullets. The principle of this apparatus is to measure the time which elapses between the rupture of two metal wires stretched between frames, which latter are in the line of a projectile as shown in our illustration. The frames are

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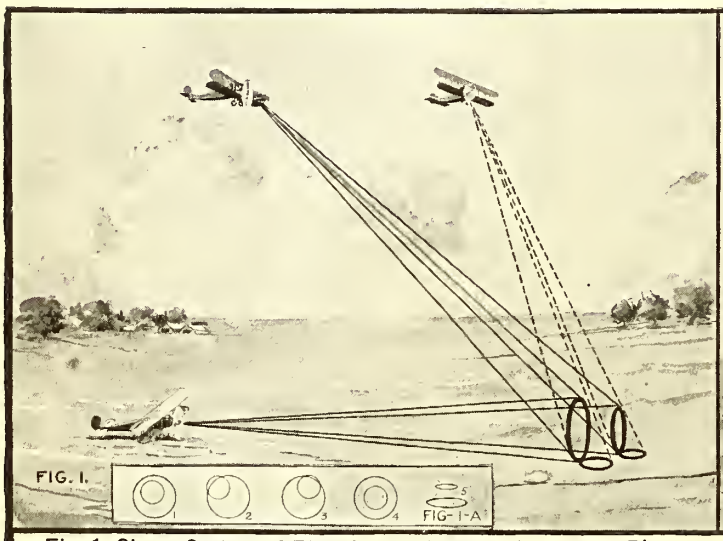

Fig. 1. Clever System of Electrically Illuminated Loops or Rings to Guide Airmen in Making a Safe Landing at Night.

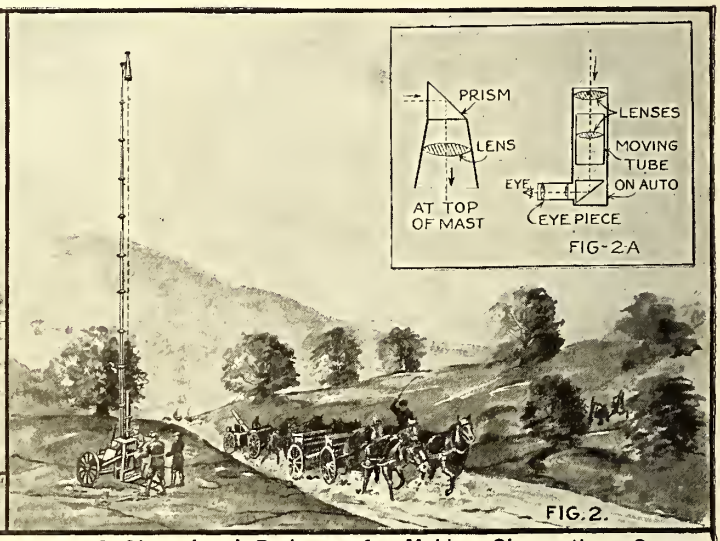

Fig. 2. Giant Land Periscope for Making Observations Over Long Distances. The Image Is Projected Between Lenses Thru the Air.

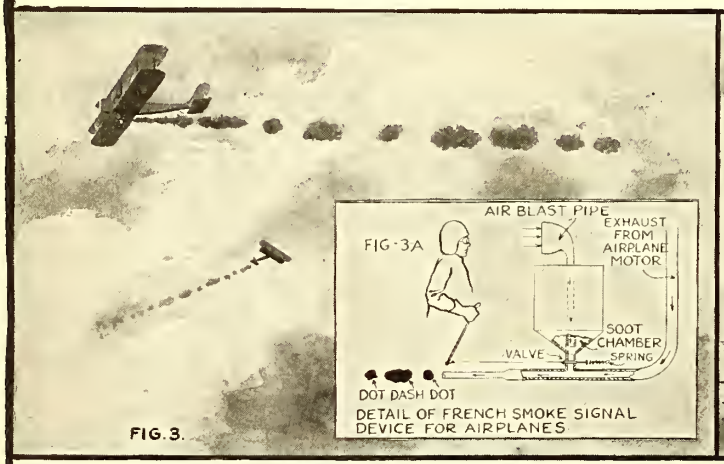

Fig. 3. A War Device—Aerial Signaling by Smoke Puffs Between Airplanes or Airplanes and Earth.

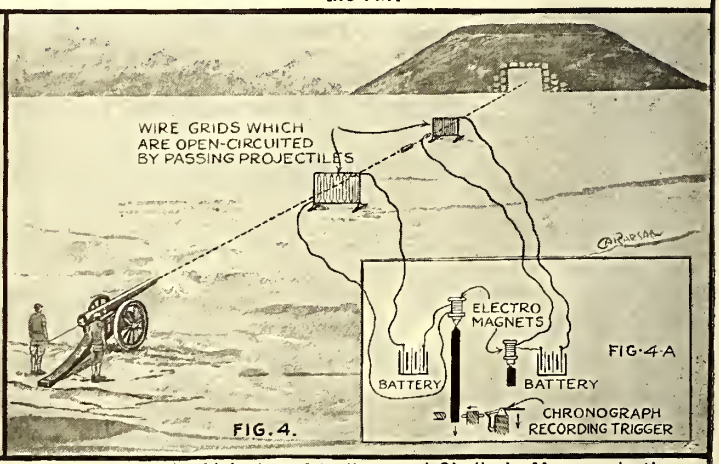

Fig. 4. How the Velocity of Bullets and Shells Is Measured—the Projectile Breaks Two Grids Consecutively, the Chronometer Accurately Registering the Intervening Time.

The Oracle

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The wave length of an oscillation is exprest generally as follows:

(a). $\lambda = K\sqrt{CL}$

where
λ = wave length in meters
K = constant, depending upon what units C and L are used
C = capacity
L = inductance

Let us assume in one particular case that C will be in microfarads and L in centimeters, then the time period of the oscillation is

(b). $T = 2\pi\sqrt{CL}$

C = in farads = 10^{-9} milli-microfarads
L = in henries = 10^{-9} centimeters

Since the speed of electricity is the same as that of light, namely 186,000 miles per second, then the wavelength of an electric oscillation as compared with that of light will therefore be the same, thus:

(c). $\lambda = T V$
T = time
V = velocity of light (3×10^{10} cms. per second)

Substituting the value of T and V in expression (c) we get:

$$\lambda = 3 \times 10^{10} \times 2\pi \sqrt{C_f L_h}$$
$$= 6\pi \times 10^{10} \sqrt{C \times 10^{-9} \times L \times 10^{9}}$$
$$= 6\pi \times 10^{10} \sqrt{CL10^{-18}}$$
$$= 6\pi \times 10^{10} \times 10^{-9} \sqrt{CL}$$
$$\lambda = 1.884 \sqrt{CL}$$

where: λ = wave length in meters,
C = capacity in milli-microfarads (microfarad $\times 10^{-3}$)
L = inductance in centimeters
1.884 = derived constant

The Airship of To-morrow

By GEORGE WALL

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partments of which the one shown is a single unit, with an electric elevator to carry the passengers from one floor or deck to another.

All the comforts of home will be had on these latest airships which will soon be poking their noses over the horizon of such large cities as New York, London, Paris, Constantinople and even the far eastern cities of Japan, China, India and Australia.

There will be found among other necessary luxuries, if so we may call them, shower baths, music and smoking rooms, an electric kitchen for preparing meals for the passengers, electric lights, and electric fans for the warm weather, electric razors and massage apparatus in the barber shop and private baths, besides an electric heating system for cold weather and telephone service between the guest rooms—and speaking of the telephone it brings to mind some of the joys and pleasures of being an aerial bell-hop!

In the evening there will be motion picture shows operated by electricity, by means of a small and especially compact motion picture projector, and by the use of a powerful audion amplifier, wireless music from ship or shore stations can be picked up on the aerial of the giant aircraft as she swims along thru the clouds, and this music then reproduced thru telephonic "loud-talkers" for the benefit of the audience.

This may sound somewhat fastidious, but by these means a great deal of weight is saved in not having to carry an extra load of pipe organs or band paraphernalia for the amusement of the 1,000 passengers or so aboard!

AIRSHIP ROOMS ARRANGED IN CIRCLE.

As will be seen, the guest rooms are arranged in a circular formation on each deck, and this has many advantages as soon becomes evident. For one thing a single elevator gives impartial service to all of the rooms, in view of its central location, and there are a number of other advantages in the serving of meals to guest rooms, etc., which is more difficult to carry out on an airship such as this where a smaller number of servants would be available, than in a hotel on land.

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made of copper wires forming an uninterrupted circuit by being stretched back and forth vertically. In order that the blast of the gun itself does not break the wires it is necessary to place the frames some 300 calibers away from the gun. The distance between the two frames of the Le Boulangé apparatus is variable, but in general, it is between 20 to 50 meters.

This distance between the frames is of course measured with great precisions when it is considered that the time limit down to the hundredths of a second is calculated, using as a base the distance between the two frames.

The insert, Fig. 4-A, shows how two electro-magnets in connection with the chronograph recording trigger mark the exact time elapsed when the bullet or shell strikes the first frame and when it reaches the second frame. At the moment of firing the projectile first cuts the circuit of the first frame. Instantly the long black chronometer bar begins to fall, but the instant the projectile cuts thru the second frame the second circuit is also disturbed.

The second electro-magnet instantly acts and its armature hits the chronometer recording trigger. A small pin with a knife then strikes the falling bar armature of the first electro-magnet and makes a mark easily distinguishable. Noting the time of falling of the long bar and figuring this time against the point on which the mark was made from the knife, actuated by the second electro-magnet, the time interval is readily calculated—it is in fact, almost automatic.