

# Electricity and the Modern Automobile Torpedo

By Samuel Cohen

**A**MONG the most ingenious weapons of modern warfare is the automobile torpedo, a cigar-shaped shell constructed entirely of steel, with an electro-mechanical brain and carrying a high-explosive guncotton charge.

This self-propelling demon is shown at Fig. 1 with its clever devices for steering and diving. It measures 22 feet long and 21 inches in diameter, with a weight of one ton. This modern fighting

roscope herewith shown, is entirely driven by electricity, supplied by a small turbo-dynamo set. The turbine itself is operated by compressed air from the air flasks 6. This electrically operated gyroscope consists of an alternating current induction motor, with its rotor and stator 12, while 13 is a gimbal ring. The gyroscope wheel acts upon a small crank lever 15, which is connected to the control lever 16, operating the vertical rudders 21.

with a "fixed rudder" or steering gear on same, which shall cause this weapon to absolutely maintain its natural course along a straight line, as was previously intended when discharging same.

Therefore when the torpedo shell is deflected from its course, even to a slight degree, by tidal or wave currents, etc., it will be maintained in practically a *dead straight course* by the correcting action of the electrically driven gyroscope.

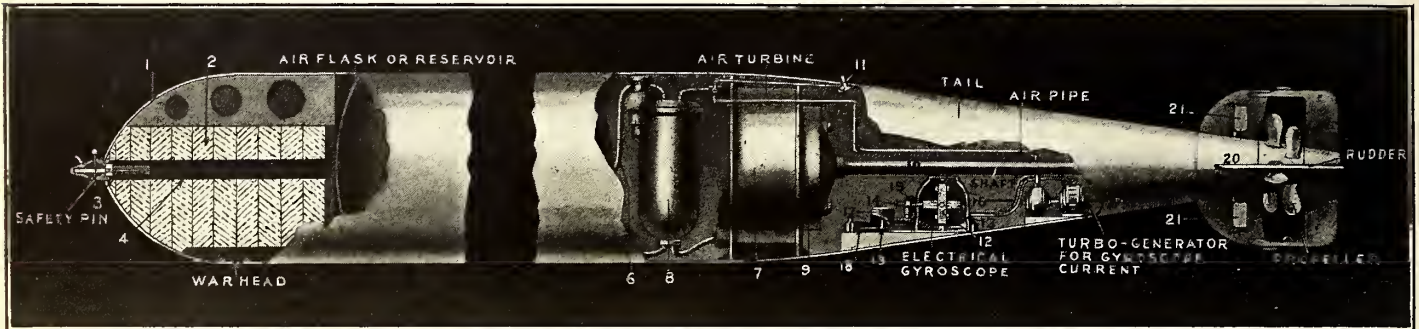


Fig. 1. Semi-Sectional View of Latest Type Automobile Torpedo.

(C) Experimenter Pub. Co.

machine consists of three parts, viz., a War Head, carrying 250 pounds of high explosive; the central Flask, charged with compressed air at 2,250 pounds per square inch, and an after-body or Tail, in which the propelling and controlling mechanisms are enclosed.

The "war-head" (1), Fig 1, differs from the "practice-head" and is used only in actual fighting. It is loaded with a charge of guncotton (2) containing 25 per cent. moisture. At 4 is the detonating charge, which is fired by the plunger or striking rod 3. A safety pin is provided at the end of the plunger, as depicted, this being used for safety when loading the torpedo in the firing tube.

The central flask or air reservoir 6 (Fig. 1) is connected to the turbine through the superheater 8. This turbine is connected to a reducer gear 9 and then to the propeller shaft 10 which operates the two propellers 22. These are rotated in opposite directions. The power developed by the turbine is 110 horsepower and the shaft runs at 1,200 R.P.M., enabling the missile to travel at the rate of 35 to 40 knots, with an extreme range of 10,000 yards.

It is in the "Tail" that the *brain* of the weapon is installed, and the little electric gyroscope 16, which a few years ago was considered a toy, steers the torpedo to the right or to the left. It is an almost human pilot and steersman, so to speak. The gy-

As is well known, a gyroscope will always attempt to maintain its center of gravity with respect to a certain point or angle. That is to say, if we have a wheel of any type revolving at very high speed in a certain position, with respect to its axis of rotation, then any effort to change the plane of this wheel, in so far as its rotation is concerned, will be found to cause considerable effort necessary in or-

The rapidly revolving gyroscope element 12 will, as seen from the foregoing description, tend to rotate from in the same axial plane as at the moment previous to the deviation of the torpedo's true course. Hence the gyroscope will swing about, so as to maintain its *original* plane of rotation, even though the hull of the torpedo may be pointing several degrees off its true course at the moment due to interfering

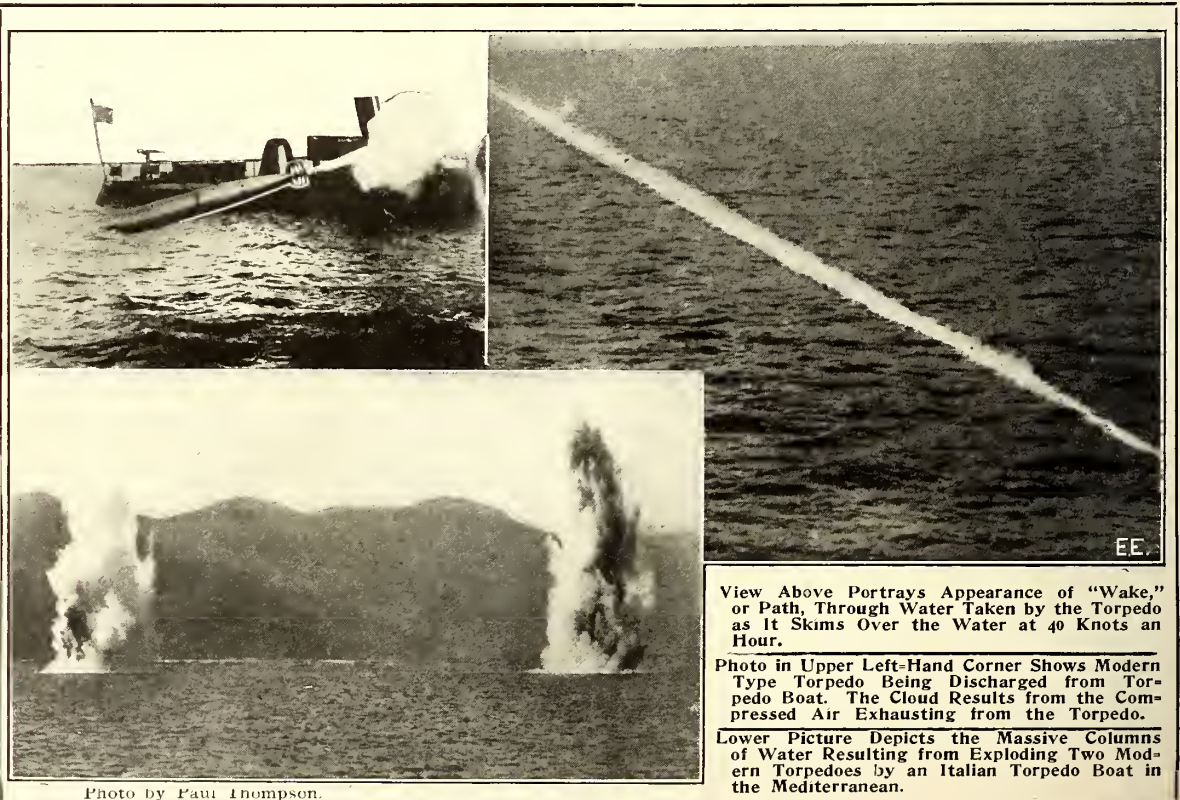


Photo by Paul Thompson.

View Above Portrays Appearance of "Wake," or Path, Through Water Taken by the Torpedo as It Skims Over the Water at 40 Knots an Hour.

Photo in Upper Left-Hand Corner Shows Modern Type Torpedo Being Discharged from Torpedo Boat. The Cloud Results from the Compressed Air Exhausting from the Torpedo.

Lower Picture Depicts the Massive Columns of Water Resulting from Exploding Two Modern Torpedoes by an Italian Torpedo Boat in the Mediterranean.

der to accomplish this change. Thus, the gyroscopic principle is brought into play in order to keep the modern automobile torpedo in a true course. As becomes evident, and especially when the water is very rough, it is practically impossible to discharge one of these high-speed torpedoes

water currents, etc.

When the rotating gyroscope element 12 makes this swing about its plane it will carry the gimbal ring 13 with it. On this ring is a trigger release cam which, as the ring 13 moves around, allows the spring-actuated cam rod 14 to slide forward.



When this cam rod slides forward, as described, it ejects or pushes upward the rudder control trigger 15. When the torpedo has been thus automatically brought back into its true course it will be seen that the gyroscope will then have its gimbal ring 13 brought back into its normal plane, and in so doing it will, of course, reset the cam rod 14 to its normal position, and so on.

The depth of the torpedo is regulated

**TENNESSEE TRI-STATE FAIR TO HAVE RADIO.**

Visitors to the Tri-State fair at Memphis, Tenn., who want to send their regards to the Kaiser or Kitchener, can step into a wireless office, write out the message, pay a fee of a few dollars a word, and let 'er zip.

This became known recently when Frank Fuller, secretary of the fair association, stated that the Tri-State Wireless Asso-

**MODERN APPLICATIONS OF THE LOUD SPEAKING TELEPHONE.**

The "loud talker," or more properly the loud-speaking telephone, is now being extensively employed in places where the ordinary telephone cannot be used, and the illustrations herewith presented depict some novel applications. Fig. 1 portrays a stenographer taking dictation from her employer by means of these loud talkers. The transmitter is placed on the left of the apparatus, as seen, and is utilized in ordinary talking, as for instance, when the stenographer desires repetition of a sentence, etc.

This method of dictating is very efficacious as a time saver, and eliminates the use of a buzzer or bell in calling the stenographer.

Fig 2 illustrates a field-type loud talker employed in high-tension line work, where the linemen need to keep in constant touch with the switchboard operator at the power station. This instrument is constructed entirely of an insulating material, so that the high voltage of the line does not enter the instrument in proximity to the person talking. The square-shaped horn leads to the receiver, and the long, round tube in the center is connected to the microphone transmitter. The small handles in front are the two switches operating the calling and talking circuits.

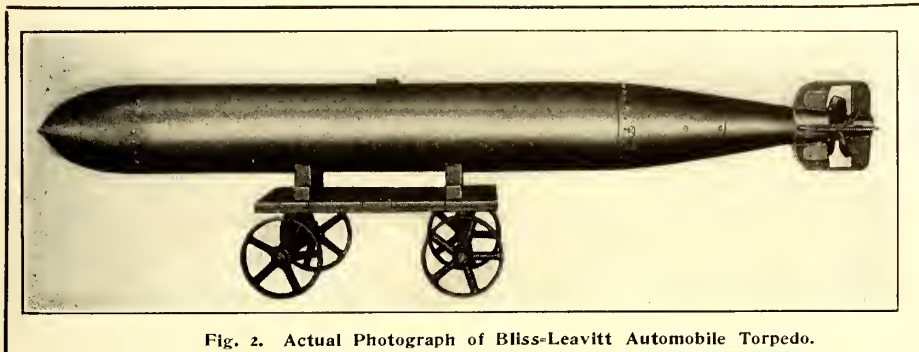


Fig. 2. Actual Photograph of Bliss-Leavitt Automobile Torpedo.

by a depth-control mechanism 17. It consists of a metallic diaphragm 18, actuating lever 19 and in turn operating the rudders 20. This device is usually "set" for 15 feet below the surface of the water, so that when the tube is fired it will go below this mark, but the diaphragm immediately is actuated by the greater pressure of the water and in turn lowers the rudders 20, which raises the torpedo to its proper level.

A new method of controlling the depth of torpedo tubes has been recently tried which employs electricity. This is kept secret at present and information on the details of this system is unavailable now.

The torpedoes are launched from a discharging tube by an impulse charge of compressed air. As soon as the torpedo is launched the trigger 11, at the center of the flask, is released, which disengages the high pressure valve of the reservoir and the turbine, and in turn operates the two propellers. As soon as the torpedo strikes the water it submerges to the proper depth and rushes with a mad pace straight to its target.

One of the latest 21-inch diameter automobile torpedoes of the Bliss-Leavitt type is shown in Fig. 2. This complicated machine costs nearly \$6,000 to build. Uncle Sam is now expending large sums of money in building these weapons, and the Newport naval factory is turning out about 100 of them annually. These fighting sea machines have proven a great success, as shown in the present European conflict.

**NEW FLY CHASING CEILING FAN.**

The photograph portrays a new fly-chas-

ciation was going to install a service branch at the fair grounds.

An aerial will be erected and apparatus with sufficient power to give the visitors an idea of what a real wireless station is, will be installed.

them in operation. The fans are a special type made up for the purpose, running at 100 revolutions per minute and with a very slight pitched blade so there is practically no breeze developed by them. The blades have a sweep of 90 inches. The purpose of the fan is simply to throw a moving shadow on the meats, fruits and vegetables to scare the flies away.

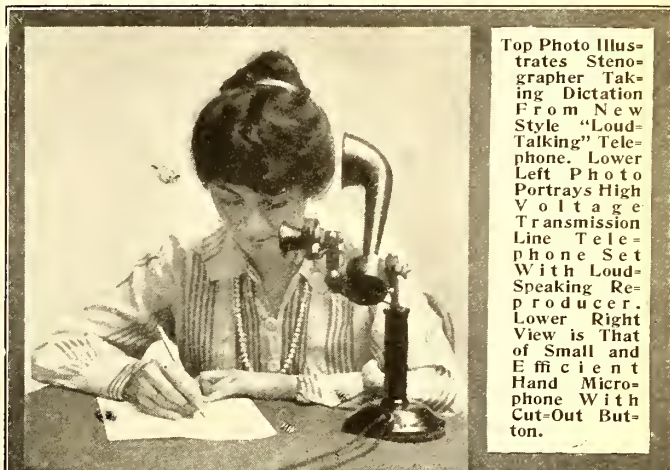
These fans have the advantage over an ordinary ceiling fan with a high speed, in that the ordinary fan causes meats to become black and also hastens the decay of fruits and vegetables, while this new design gives very little breeze and does not affect them. Flies are also in evidence where the



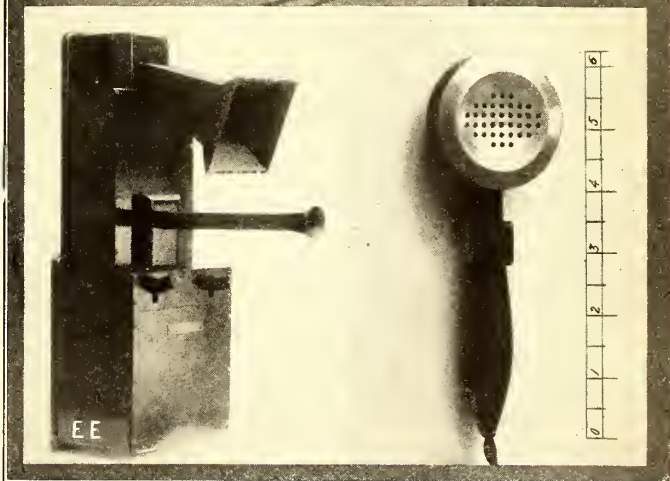
The Shadow, Not the Breeze, Chases the Flies.

ing electric ceiling fan recently installed in the Reading Terminal Market, Philadelphia, Pa., and at present there are 42 of

added to practise has apparently solved a very troublesome problem.



Top Photo Illustrates Stenographer Taking Dictation From New Style "Loud-Talking" Telephone. Lower Left Photo Portrays High Voltage Transmission Line Telephone Set With Loud-Speaking Reproducer. Lower Right View is That of Small and Efficient Hand Microphone With Cut-Out Button.



ordinary fan is used, but the shadow effect scares the flies and has completely solved the problem for market-house people.

Thus a little science added to practise has apparently solved a very troublesome problem.

A miniature hand-style transmitter for general use is shown in Fig. 3. It is of the ordinary carbon-grain type and it measures 6 1/4 inches long by 2 1/4 inches and weighs only four ounces. This transmitter can be placed in the regular telephone circuit. A small push-button is placed near the end, as depicted, and is used for calling purposes. These instruments have been developed by the Stentor Electric Co.