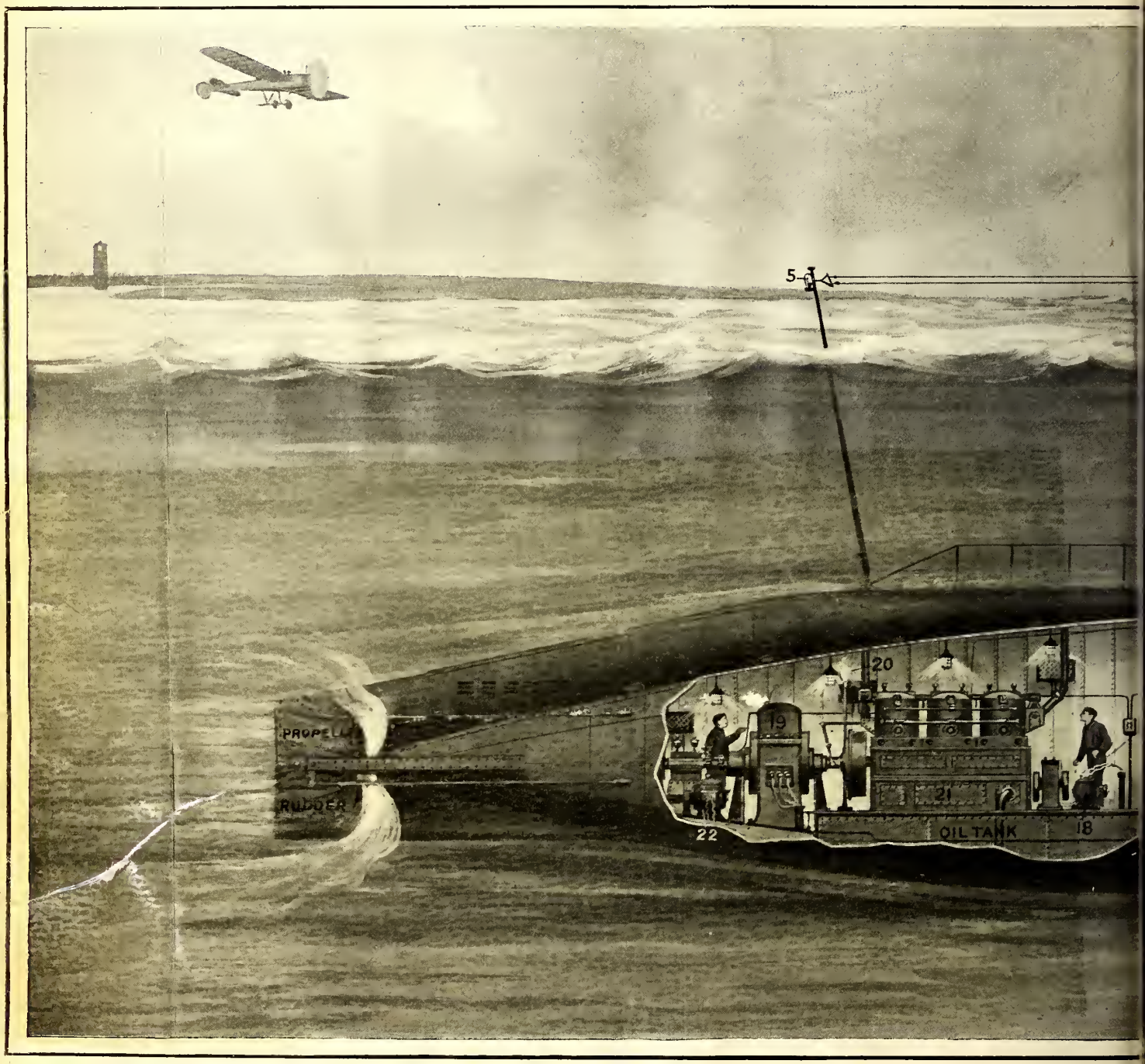
ELECTRICITY, THE POWER

By

THE submarines have proven, even thus far in the great European war, that they are indeed of extremely valuable service and that even though they are much cheaper to construct than the wonderful "dreadnoughts" costing ten to twelve million dollars apiece, they can on the surface of the water they invariably make use, of course, of gasoline or internal combustion engines, using crude oil such as the Diesel type.

For this kind of cruising some of the latest United States submarines make use of a 900-h.p. Diesel oil engine, which from Florida without incident, under their own power. Thus, it is seen that Uncle Sam's underwater boats are on par with those of the German and other navies.

At present there are about 35 submersibles in actual commission, and the total number, including those being built and



KEY

1. Periscope for viewing the enemy from below the water line, as perceived.
2. Electric search light for use on surface, when cruising.
3. Centralized control standard for surface cruising.
4. Wireless Antenna.
5. Electric signal and running lamps.
6. Periscope view finder.
7. Telephone.
8. Centralized control standard for submarine running.
9. Latest type gyroscopic compass.
10. Electric lights.
11. Wireless switchboard and appara
12. Electric trigger for discharging tor
13. Electric submarine signalling device

very easily and shortly, under certain conditions, dispatch these great fighting-ships to the bottom of the seas in a few minutes' time.

Probably more than is generally realized, electricity is really the backbone of these wonderful underwater engines of destruction. When these submarine boats travel makes it possible for these boats to attain a speed of 14 knots, and sufficient oil fuel is usually carried, enabling them to make a cruise of 5,500 miles.

Several of the submarines of this type, which took part in the recent Naval Demonstration and Review in New York Harbor, made a 1,500-mile run up the coast those undergoing repairs, is 55.

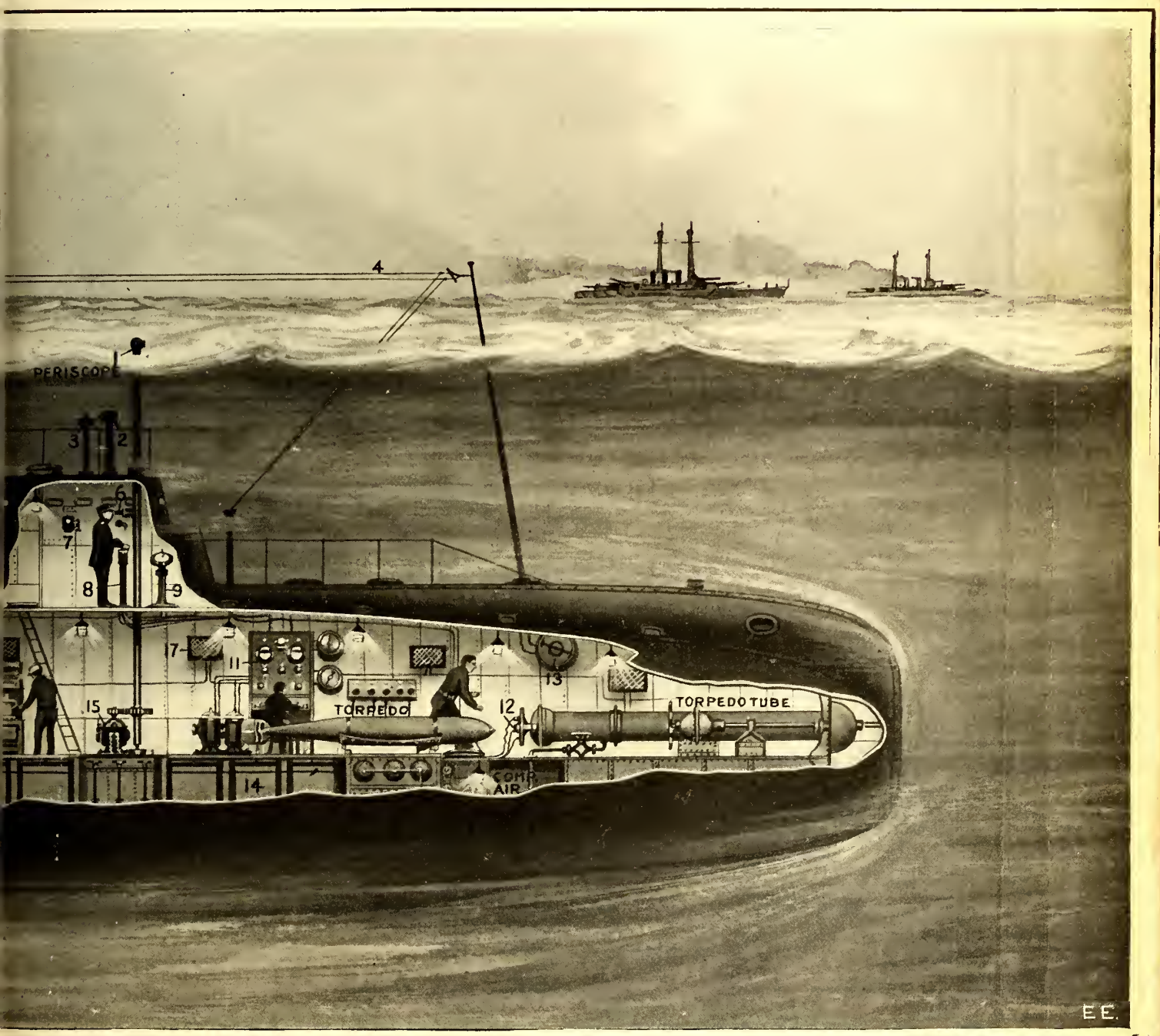
Electricity is the wonderful form of energy which enables these craft to be propelled through the water submerged for distances of 100 and more nautical miles at a maximum underwater speed of from 10½ to 11 knots. Powerful electric motors drive the propeller blades for this under-

IND THE SUBMARINE BOAT

Secor

water propulsion, the motors developing 650 h.p. at the above full-speed rating in knots. These motors and all of the other electrical appliances on board the submarine obtain their energy from storage batteries, which, of course, have to be quite large. Practically all storage batteries including Thomas A. Edison, are and have been working for a considerable time toward perfecting a storage battery for this class of work which would not give forth poisonous fumes, etc.

Mr. Edison's latest submarine storage battery promises to fulfil these require- and latest type boats of this character carry a high-grade wireless set to be used with an antenna supported between two steel masts, as will be seen. It is claimed that the Germans have obtained much of their inside or secret information from spies, etc., by means of wireless messages



TRATION

Photo (C) By E. P. Co.

Large storage battery.
Electric motor for turning periscope.
Electric stove for cooking crew's meals.
Electric heaters for warming the interior of the submarine.
18. Circulating pump for engine, driven by electric motor.
19. Powerful electric dynamo used for charging batteries on surface, which acts as electric motor for driving the submarine when below surface.
20. Shifting gear to throw propeller on engine or motor drive.
21. Internal combustion engine, such as Diesel type.
22. Electric motor operating steering gear.

used for these installations are of the usual lead type.

These batteries make use of sulphuric acid, of course, and hence they give off very poisonous fumes, which often endanger the health or even lives of the crew when the boat is submerged for a number of hours. Therefore several inventors, ments in very good shape, besides having several other features which can be turned to good account in the submarine installation, such as revitalizing the air, etc.

The illustration herewith given shows a number of the more important uses to which the electric current is put on board the submarine. Of course, all the larger sent out from secret or hidden wireless stations on land in England, and which messages have been picked up by some of the German submarines lying off the coast a few miles. These submarines can then of course, cruise away until they get within touch of some wireless communication

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it was probable that the sun never reached the bottom. There was but little light and we had to advance cautiously, guided by Buster.

The temperature was rather comfortable, about 50° Fahrenheit, as our subsequent investigation proved.

As we walked on, the canyon seemed to become lighter, but we soon observed that it was not sunlight. The color of the light was of a pale green. We were very much puzzled at this and not a little excited, so we pressed on forward. We finally rounded a projecting corner and beheld a sight such as no humans had ever seen before.

The canyon, which by this time had become entirely closed at the top, suddenly widened out into a colossal cave of immense proportions. We found out later that the cave was roughly 12 miles in length and 8 miles in breadth. Although entirely closed at the top it was almost as light as day inside, the light, however, being of a vivid green. Almost the entire bottom of the cave was taken up with a lake and the light came from the lake itself. Within a few minutes we had reached the edge of the water and we saw immediately why the lake gave forth such a strong light.

We stood fascinated for some time at the sight which presented itself to our eyes. The lake was crowded as far as the eye could reach with a sort of eel fish —*and each fish was luminous.*

You have, of course, seen the common firefly during a hot summer evening. Take your firefly, extend it about four feet to the size of an eel, put it under a clear limpid water, and you have a good description of our lunar luminous fishes.

The sight of these strongly illuminated eels darting back and forward under the water with lightning speed is magnificent; it offers a wonderful spectacle. You can follow each fish to a considerable depth, for the light which they emit is very powerful. We found out that each fish produces some 60 candlepower of light. Here at last we are face to face with an exceedingly practical application of "cold" light, which our terrestrial scientists have been searching for for decades. We also observed that the fishes are luminous only while in motion. As soon as they stop swimming the light vanishes instantly. We have since observed that the light is produced by the friction of the fish's body against the water. Flitternix is not sure as yet whether the action is electric or chemical.

We marveled how nature always finds out a way to favor life, even under the most difficult surroundings. As life was manifestly not possible on the moon's surface on account of the blistering heat (and the extreme cold following) nature promptly produced it *under* the surface. As the higher forms of life require light for their existence and as there was no light under the moon's surface, nature saw to it that its life carriers were equipped with light themselves!

We were naturally overjoyed at our discovery. We knew now that there was at least water on the moon, despite all our scientists' theories. Buster was the first to try it and after a few cautious licks he decided that it was really water. We followed suit and immediately noticed that the water was slightly tart in taste, which, however, made it an excellent thirst quencher.

We discovered later that all of the moon's subterranean waters tasted alike, the tartness undoubtedly being produced by the ever-occurring sulphur which seems to abound on the moon.

We found it was comparatively easy to catch one of the luminous fishes, which was almost 4 feet long, and after killing it we decided to take it along to test its edibility. During the next few hours we also killed several luminous turtles of enormous size. As we did not see any other living creatures on the shores of the lake we decided that it must have been one of these turtles whose footprints we had seen outside of the canyon.

A survey of the cave showed that its southern wall was composed almost entirely of some form of coal similar to our terrestrial anthracite. We knew now that we were in no danger of starving. We had the water from the lake, meat from the fishes, as well as the turtle, and fire from the coal. We naturally felt highly elated, so Flitternix as well as myself decided to extend our visit to the moon as long as practical in order to fully investigate this newest world.

During the next few days (by this I mean a day of 24 hours' duration) we explored the entire cave and we came across many queer animals, mostly of the turtle type. We found few hairy or feathered types and nothing that approached even distantly the human form, as, for instance, the monkey type of our earth. We found that there was quite a little vegetation inside of the cave, mostly of the fungus type; there were also low shrubs and some dwarf forms of a peculiar bread tree. This bread tree is very similar in many respects to the terrestrial bread tree (*Artocarpus incisa*) as grown in some of the Pacific Ocean islands. We found its fruit, after baking it, highly nutritious as well as exceedingly tasty. The turtle meat was excellent and the fishes tasted somewhat like eels, with a fresh-water trout flavor. We found many varieties of mushrooms, some of enormous size and mostly edible. There was, furthermore, an abundance of various curious nut bushes and, with a few exceptions, all were very tasty.

You see we do not starve on the moon, even if it does look dead through a telescope. On the contrary, we are well provided for and could extend our stay indefinitely if we were so inclined. As a matter of fact we are in no hurry just now to return to mother earth, we like it so exceedingly well here.

We discovered soon that there were thousands of caves such as the one which we first discovered scattered all over the moon. These caves are all much the same, all illuminated, by means of their luminous animals. The caves vary, of course, much in size as well as in shape; some of them are hundreds and some even tens of thousands of feet below the surface of the moon. This is quite natural. The moon is a cold world unlike the earth, which is still in a molten state in its interior. The further you descend in the moon's bowels the colder it gets, but the atmosphere becomes denser also. Equipped with electric lanterns, we visited a cave several hundred feet below the moon's surface. The cold was intense, and we saw no living being of any sort, nor any plant life. What had been water once, myriads of years ago, was ice now, frozen down to the bottom. The sight was so desolate and so depressing that we hurried back to the surface as soon as our investigation was completed. We decided not to visit any more caves except those located near the surface of the moon, where the solar heat still could make itself felt.

During the next few days we found immense deposits of various metals, such as platinum, gold, copper as well as iron ore. There seems to be an abundance of these metals on the moon. We also found a curious metal (or it may be an alloy) which melts at a temperature as low as that of tin, but is as hard and flexible as steel.