

The Trench Destroyer

By H. GERNSBACK

IN the February, 1916, issue of this journal, the author described a formidable war machine, termed the "Trench Tractor." This machine was conceived primarily to force a breach in an existing, well defended trench. Once across the trench, the infantry could force its way thru and then perhaps attack another portion of the trench from the rear, conditions being favorable. As will be remembered, the Trench Tractor was no mere bagatelle, it measuring 140 feet from wheel to wheel, while the tractor wheels themselves were over 40 feet high.

On account of its novelty, the Trench Tractor enjoyed a remarkable publicity. Several hundred American papers and a score of European journals described and discussed it, and now, a year after its description in THE ELECTRICAL EXPERIMENTER, it pops up every once in a while. Whether the Trench Tractor will ever be constructed, matters very little; what is more important tho, is that it has set many able people to thinking.

Imitations and improvements on the original design have not been lacking, the latest appearing in a New York Scientific Journal as described by one Frank Shuman.

He simply takes the Trench Tractor and enlarges it three or four times. He then added a superfluous third end wheel for steering purposes, and palms it off as a brand-new war machine.

Recently we have heard much about the British "Tanks" which are a form of Trench Tractor themselves, but on account of their foolish disregard of war conditions as they actually exist, these "Tanks" at once proved a total failure. The writer is confident that the "Tanks" will not appear again in their original make-up.

A war machine of this class is at once foredoomed to failure for the following reasons. The "Tanks"—which are mere re-constructed agricultural tractors, carrying armor for protection—cannot advance at a faster pace than 4-6 miles per hour. On account of this ridiculously low speed the enemy finds but little trouble to plant shells upon it. Then again the "Caterpillar" tractor arrangement is a delicate piece of machinery—even a comparatively weak shot into a caterpillar will almost certainly disable the entire machine.

It is with these and other reasons in mind, that the author suggests in this article, a machine which may prove useful in future, to keep armies from entrenching. He has pointed out before that once an army entrenches itself, the usefulness of that army has ceased to exist for its country, except as a defensive measure. No war will ever be won or lost with the opposing armies dug in, in trenches. Both are deadlocked, as witness the contending armies in northern France to-day, now entrenched for over two years.

If we can invent a practical machine

which will make trenches uninhabitable, wars will not last as long as the present one and consequently much bloodshed will be saved. Furthermore, and of far greater importance, is the fact that once governments come to realize that armies cannot be successfully entrenched, even for a defensive measure, they will be much more reluctant in declaring war upon each other.

Contrary to public opinion, the more terrible war machines can be constructed, the less the likelihood of the next war. Each

electric motors. A heavily armored car, housing 10 to 12 men, and the necessary artillery and propelling machinery hangs from the connecting shaft. The armored car measures about 16 feet long by 11 feet high, and hangs some 6 feet above the ground.

It will be noted that the wheels, as well as the car and all vulnerable parts of the machine, are so constructed as to be practically shell proof, except for shells of extra large caliber. The wheels are of the open lattice-work type, constructed similar to the American battleship fighting masts. The largest shell will thus pass thru both the wheels with ease and granting that a few spokes are damaged, the machine will not be disabled thereby. As the Trench Destroyer moves at the rate of from ten to twenty miles an hour, it should be rather difficult for heavy artillery to place shells in it accurately. If the pilot of the Trench Destroyer knows his business and runs the machine constantly at varying speeds, it will be almost impossible for the enemy to damage it by shell fire.

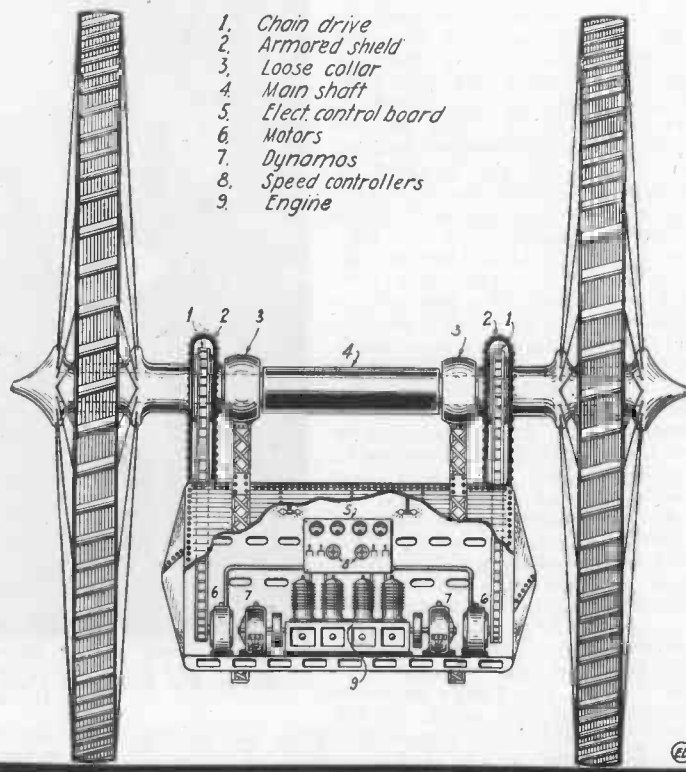
At any rate there is nothing delicate on the outside of the car, except the chain drive and this is encased in exceptionally heavy armor. Both extreme ends of the shafts are cone-shaped, to deflect shells. The same is true for the ends of the car body facing the enemy. It is shaped in the form of a pyramid and is thus certain to deflect small shells.

The battle action of the Trench Destroyer would be as follows:—First let it be understood thoroly that a single machine is of but small value; from six to twelve and more are needed if success is desired.

The first Destroyer approaches the trench at right angles. At the edge of the trench (or parapet) it slows down to almost nothing, only one wheel being run slowly. This has the effect of turning the machine around, and parallel to the trench. One wheel—remember it measures thirty feet high—now rides easily over the trench and in a few seconds, the Destroyer is astride over the trench. Power is then applied to both wheels and the machinery gathering speed rides over the trench, one wheel on each side of it. Parapets, wire entanglements, lateral connecting trenches, et cetera, will not impede the progress of the Destroyer. The wheels are so large and heavy, that small obstacles of this sort count for little more than an empty grocery box to a five-foot cart wheel—it simply passes over the obstruction.

In the mean time the ten machine guns—five in front and five in back of the car—have not been idle. They fire away into the trench below, raising terrible havoc as the machine rolls on. If there is much fight left, the next machine continues the work and by the time the last machine has

(Continued on page 765)



View of the "Trench Destroyer," Showing the Electrical and Mechanical Features of the Propelling Mechanism. The Machine Is Steered by Running One Motor Faster Than the Other. Its Speed Varies from 10 to 20 Miles Per Hour and Its Armament Comprises 10 or More Rapid-Fire Guns.

government will be afraid of the other, for with a war fought by machines against machines, the outcome can never be foreseen accurately. In other words, the aggressor stands as good a chance of losing as the defender.

As stated above the function of the Trench Tractor was to approach the trench at right angles, riding over it, thus making a gap for the infantry to pour thru. This maneuver, however, does not win a trench from the enemy.

The function of the writer's new "Trench Destroyer" is entirely different. It sets out to effectively drive the enemy from the best defended trench—in fact making intrenching impossible.

The Trench Destroyer is not a huge monster but a machine of rather modest proportions. Our front cover illustrates it better than a long, extended description could. There are two broad steel-rimmed tractor wheels, about 30 to 40 feet high and some 2 to 3 feet wide. The outside distance from wheel to wheel is not more than thirty feet. A shaft connects the two tractor wheels, which are operated individually by chain drive from two independent

AMONG the hundreds of new devices and appliances published monthly in The Electrical Experimenter, there are several, as a rule, which interest you. Full information on these subjects, as well as the name of the manufacturer, will be gladly furnished to you, free of charge, by addressing our Technical Information Bureau.

STANDARD RADIO TERMS DEFINED.

Approved by the Institute of Radio Engineers.

Under this head we will define the most important radio terms each month. Save them and by pasting each in a book (properly indexed) you will have a handy radio dictionary.

- 2001. *Alternator, Alexanderson:* By General Electric Company.
The Alexanderson Alternator is an alternating current generator for radio frequency having a rotor of solid steel shaped as a disc for maximum strength and provided with inductor poles, and having stationary armatures with radial faces on both sides of the rotating disc.
- 2002. *Audion:* By De Forest Radio Telephone & Telegraph Company.
The Audion is a relay, operating by electrostatic control of currents flowing across a gaseous medium. In its present commercial form, it consists of three electrodes in an evacuated bulb, one of these electrodes being a heated metal filament, the second a grid-like electrode, and the third a metal plate; an input circuit connected to the filament and the grid; and an output circuit connected to the filament and the plate, including a local source of energy and a telephone receiver.
- 2003. *Chopper:* By Federal Telegraph Company.
A transmitting device for repeatedly changing circuit connections at a uniform high rate of speed. The object of the above operation is to cause a continuous variation in audio frequency of the energy radiated at a fixed wave length from an antenna.
- 2004. *Gap, Quenched:* By the National Electric Signaling Company.
A spark gap provided with means for minimizing arcing and generally used under conditions which prevent the re-transfer of energy between the primary and secondary oscillation circuits.
- 2005. *Gap, Synchronous Rotary:* By the National Electric Signaling Company.
A rotary spark gap which produces discharges in synchronism with the supply of alternating E.M.F.
- 2006. *Heterodyne:* By the National Electric Signaling Company.
A receiver for radio frequency signals which operates by the production of interference beats between two radio frequency currents or voltages, the source of one of these radio frequencies being located at the receiving station.
- 2007. *Kenotron:* By General Electric Company.
Kenotron is a name applied to a general class of apparatus having an incandescent cathode and operating with a pure ionic discharge in a vacuum so high that gas ionization plays no essential role. One of the uses of the kenotron is the rectification of alternating current, particularly of high voltage.
- 2008. *Plotron:* By General Electric Company.
A Plotron is a Kenotron provided with a member for electrostatically controlling the ionic discharge.
- 2009. *Telegraphone:* By the Telegraphone Sales Company.
The Telegraphone is an instrument for recording and reproducing sounds by the impression of magnetic fluxes proportional in intensity and frequency to the sound waves, upon a moving steel mass. These magnetic fluxes are set up in the steel mass by a suitably placed electro-magnet in series with the telephone transmitter, and constitute the record. Passage of these fluxes across the poles of the electro-magnet in series with the telephone receiver, reproduces the sounds.
- 2010. *Tikker:* By the Federal Telegraph Company.
A receiving device for changing circuit connections in such a manner as to render the sustained radio frequency electrical energy stored in an oscillating circuit, available for operating a telephone receiver.
- 2011. *Ultraudion:* By De Forest Radio Telephone & Telegraph Company.
The Ultraudion is an Audion connected in a circuit having a type of energy coupling such that a powerful relay action, or even the production of sustained oscillations may be obtained. In one of its present commercial forms its elements are connected in two circuits so arranged that the energy coupling may be obtained through a bridging condenser in its filament-plate circuit.

(Finis)

WORCESTER POLYTECHNIC BRANCH OF THE A.I.E.E.

William J. Hammer, consulting electrical engineer of New York City, lectured before the Worcester Polytechnic Branch of the

American Institute of Electrical Engineers on the evening of December fifteenth upon "The Selenium Cell and its Scientific and Industrial Applications."

Mr. Hammer brought with him various types of selenium cell apparatus and showed, by means of lantern slides, various applications of the selenium cell, such as the telegraphic transmission of pictures, telephoning over a beam of light, seeing at a distance, firing cannon and steering marine and aerial torpedoes by means of a searchlight-beam, protection of safes from burglars, and boilers from explosion. Also recorders of snowfall and eclipse observations, telegraphic relays and signal devices, railway safety devices, methods of control of dynamos and motors, selenium photo-meters, stethoscopes, automatic electric buoys, talking motion pictures, etc.

THE TRENCH DESTROYER

(Continued from page 714)

rolled over it, the best defended trench will be pretty well demoralized. By this time our infantry has rushed up from behind and in a few minutes the trench has been captured. The first Trench Destroyer now turns around and runs up to the second parallel trench of the enemy and here the same maneuver is repeated. In less than half an hour all the parallel enemy trenches have been captured over a broad distance.

Unless the enemy's artillery is stationed on the hills, it will be forced to fall back as soon as the formidable Destroyers creep up close to the gunners. The retreat has begun—once more both the defensive and the offensive are mobile again and the battle can be fought out in the field, as it should.

Our accompanying illustration shows the technical details of the machine clearly for those interested in its study. The Destroyer is a simple matter of military engineering and construction, and it should not cost more than \$25,000 to build one.

There are two 65 horsepower motors, driven by a 160 horsepower gasoline engine. The total weight of the machine is some 60 tons, which is less than a small freight locomotive.

The machine will run across country, will ford small rivers and run up low hills. Rather steep hills can be negotiated by running the Destroyer uphill in zig-zag fashion.

As usual our wise friends will say: "Yes, your machine may be a good idea, but what happens if the enemy too has Trench Destroyers?"

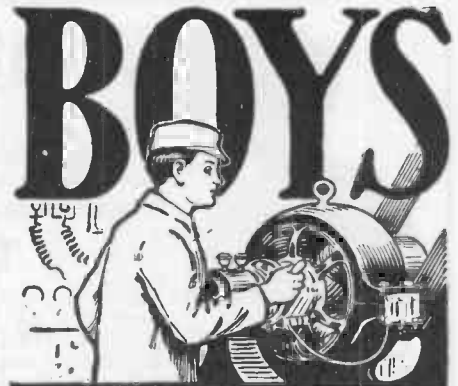
Nothing at all happens. When the commanders of the contending armies KNOW that the opponent has Trench Destroyers, neither will allow his men to entrench themselves. Both commanders know it would be useless. Herein lies the usefulness of the machine. It keeps the men in the field where they belong.

WIRELESS PLANT FOR THE NAVAL MILITIA.

Preparations are being made for the installation of a wireless system at the headquarters of the 10th deck division at the high school building in Marblehead, Mass. Lieutenant Chester L. Dane has secured enough funds from the State to install the system, which will be the first to be installed for any deck division in the State.

The wireless station will be equipt for receiving calls, but none will be sent.

Several members of the division will be in charge of the station and later an instructor will be furnished by the State to instruct other members of the division.



Big Money in Electricity

The Electrical industries offer wonderful opportunities to boys with a liking for Electricity. The salaries paid to trained men are large, promotion comes rapidly and, best of all, the work is fascinating.

The discovery and development of new lines (such as wireless telegraphy and telephony), from time to time, promise attractive and paying fields to those who wish to specialize. The will to do and Special Training will bring success to you.

The International Correspondence Schools can help you to become an expert in electrical work, no matter what branch you like best. Thousands of young men have already won success through I. C. S. help. You can do as well as anybody, if you try. Everything is made so clear that you can learn in your spare time, regardless of where you live or what your work. No books to buy.

There's big Money in Electricity. Get after it by marking and mailing the Coupon today. Finding out costs you nothing.

MARK THE COUPON NOW

TEAR OUT HERE

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 5333, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position before which I mark X.

- | | |
|--|--|
| <input type="checkbox"/> ELECTRICAL ENGINEER | <input type="checkbox"/> Commercial Law |
| <input type="checkbox"/> Electrician | <input type="checkbox"/> CHEMICAL ENGINEER |
| <input type="checkbox"/> Telegraph Expert | <input type="checkbox"/> SALESMANSHIP |
| <input type="checkbox"/> Practical Telephony | <input type="checkbox"/> ADVERTISING MAN |
| <input type="checkbox"/> Electric Wiring | <input type="checkbox"/> Window Trimmer |
| <input type="checkbox"/> Electric Lighting | <input type="checkbox"/> Show Card Writer |
| <input type="checkbox"/> Electric Railways | <input type="checkbox"/> Outdoor Sign Painter |
| <input type="checkbox"/> Electric Designer | <input type="checkbox"/> RAILROADER |
| <input type="checkbox"/> MECHANICAL ENGINEER | <input type="checkbox"/> ILLUSTRATOR |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> ARCHITECT |
| <input type="checkbox"/> Gas Engineer | <input type="checkbox"/> Architectural Draftsman |
| <input type="checkbox"/> CIVIL ENGINEER | <input type="checkbox"/> GOOD ENGLISH |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Teachers Course |
| <input type="checkbox"/> Metallurgist | <input type="checkbox"/> Common School Subjects |
| <input type="checkbox"/> STATIONARY ENGINEER | <input type="checkbox"/> CIVIL SERVICE |
| <input type="checkbox"/> Concrete Engineer | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> AGRICULTURE |
| <input type="checkbox"/> BOOKKEEPING | <input type="checkbox"/> Navigator <input type="checkbox"/> Spanish |
| <input type="checkbox"/> Stenographer and Typist | <input type="checkbox"/> Poultry Raising <input type="checkbox"/> German |
| <input type="checkbox"/> Cert. Pub. Accountant | <input type="checkbox"/> AUTOMOBILES <input type="checkbox"/> French |
| <input type="checkbox"/> Railway Accountant | <input type="checkbox"/> Auto Repairing <input type="checkbox"/> Italian |

Name _____
Occupation, if any, and Employer _____
Street _____
and No. _____
City _____ State _____
If name of Course you want is not in this list, write it below.