The Trench Tractor

By H. Gernsback

BEFORE the advent of the monstrous 14-inch field guns, it was thought impossible to take a well-manned fortress by the then existing means. But since we have learned that the strongest fortress can be reduced within a few hours to a mere scrap heap it has become necessary to keep the enemy so far away from the fortress that his guns cannot reach it.

So the curious paradox has come to pass, as witnessed in the great war, that concrete and steel fortresses are protected no longer by stone or steel walls, but by human flesh sheltered by trenches.

Once two contending armies dig themselves in trenches, these armies practically cease to exist for their respective countries. They become deadlocked and up to this time, as the European war demonstrates so clearly, nothing has been invented whereby one army can effectively drive the other from their trenches. For over eighteen months at this time of writing the Germans and the French have been deadlocked, neither contending army having moved forward or backward for more than five miles. To be sure, local successes occur here and there and sometimes one or the other carries a few hundred yards of trenches only to lose them the next day.

The Germans being the first to realize the unsatisfactory results of trench warfare set out to devise some means to drive the enemy from his trenches. We are all familiar with the result whereby poisonous or asphyxiating gases were used. This plan worked well for a time till the enemy learned to wear respirators, and it is now a rare occurrence that a trench is won by means of gases alone.

What is needed to-day is a machine to effectually combat the men in the trenches by either destroying them or otherwise putting them out of action. This must be accomplished with great rapidity in order to quickly repeat the operations with the second and the third line of trenches. Then when a successful gap has been made, it will be a comparatively simple matter for the men to rush up into the break and "*consolidate*" the new advanced positions, as the French term this process.

The writer desires to advance a new idea by which to accomplish the foregoing, and while it may appear fantastic at first thought it is nevertheless not an impossibility. We need but remind the incredulous that but eighteen months ago the wisest military engineers outside of Germany would have laughed at the idea of running a 14-inch 140 ton gun over land. It was accomplished, nevertheless.

While the Trench Tractor as conceived by the writer is of course purely imaginary, we are not at all sure that a machine of this type will not roll over the ground in the not very distant future.

Briefly, the Trench Tractor is a huge two-wheeled monster, propelled by electricity and of sufficient size to "walk" over ordinary trenches with ease.

The imaginary tractor, as shown in our illustration, has two wheels, each 40 feet high and 15 feet wide. The business part of the machine is about 70 feet long and about 15 feet square. In it are carried 200 fully armed men, bomb throwers, a number of 3-inch and 6-inch guns, as well as machine guns, ammunition stores, supplies, wireless apparatus, a steam generating plant, the two power plants, etc., etc. The tractor is to run at a speed of about 20 miles and is estimated to weigh 10,000 tons. It is needless to say that the body of the machine is armored with a heavy plating so as to protect the men in the interior from the enemy's shell fire.

At first thought one would imagine that such a huge machine requires an enormous amount of power to move it at a speed of 20 miles an hour, but this is not the case. Moving over level ground but 2,600 horsepower are required, which is but 2,000 kw. The average electric train of 3,000 tons requires 605 kw. to move it at 20 miles an hour.

Thus our imaginary tractor, to run over rough ground or to ascend hills (in a zigzag line) would not require over 3,500 horsepower at the utmost. This is very much less than is used by a moderate-sized steamship.

The right wheel, which shows the detail of the motor which propels the former, is illustrated with the plating broken away to show the interior; both wheels, however, are of course heavily plated with armor to protect the motors.

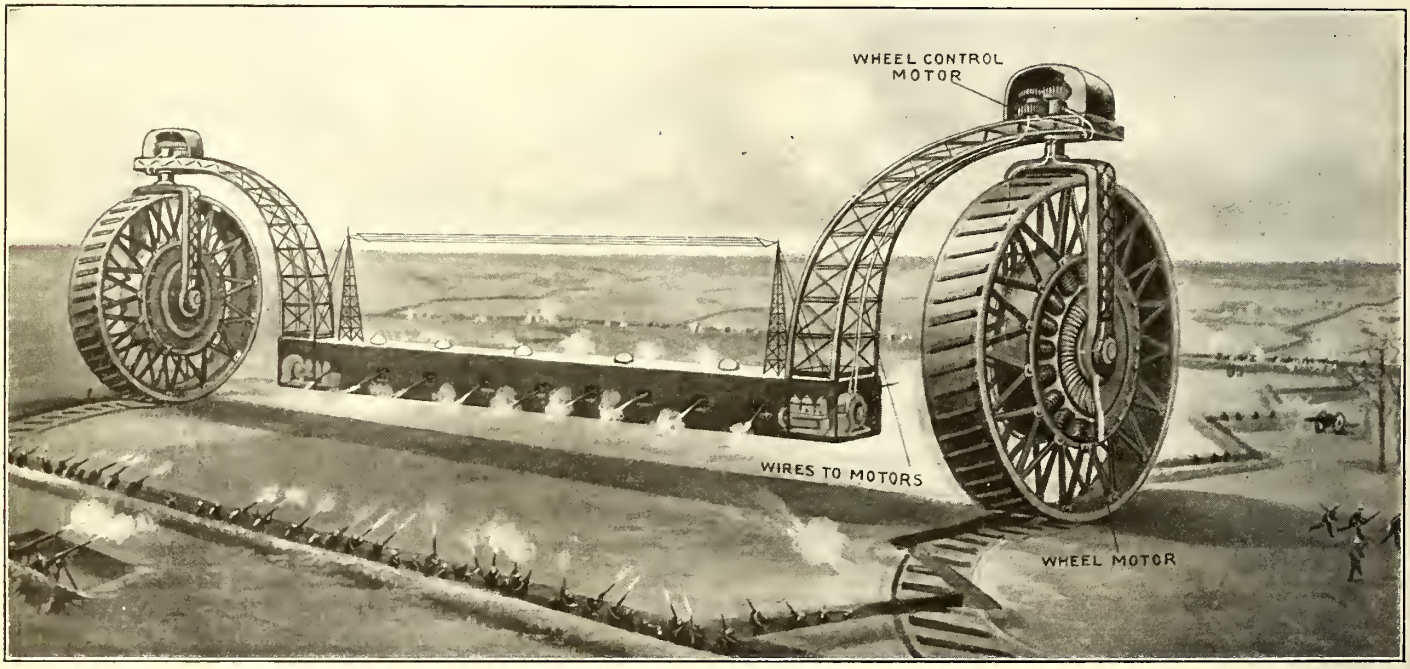
Two independent high speed gasoline or oil engines are used to drive the dynamos, which in turn supply the current to the slow running wheel motors. As the wheels are so large they need but run at 14 revolutions per minute in order to drive the tractor at a speed of 20 miles per hour. For this, and other self-apparent reasons, the electric mode of propelling the machine is necessary.

In the illustration the tractor is shown running with its wheels parallel to each other. This is the fighting position. As the length of the entire machine, measured from one side of one wheel to the other is over 140 feet, the tractor could not of course run on a road. For this and other reasons the wheels can be turned about, bicycle fashion, so that the machine can run lengthwise. In this position it measures but 18 feet wide and it will roll comfortably on a road and even over a steel bridge. In this position also it offers but small surface to the enemy's fire.

The body of the tractor swings about 10 feet above the ground, and as our illustration shows the machine has just run over the enemy's first trench. It therefore *attacks him in the rear.* In a few minutes the men from the tractor's regiment trenches will rush up and the enemy *will be under fire from two sides.* The enemy is overpowered while the tractor rolls over the second trench and repeats the operation there, and so on if other trenches are left. A less bloody variation of this may be had when the tractor stops right above the enemy's trench. By means of its steam plant live steam in great quantities may be let loose on the men in the trench below, and this method presents several advantages.

First, it is a very powerful argument to

(*Continued on page* 587.)



A Powerful Land Fighting Machine That Can Travel Sidewise or Longitudinally. It is Capable of Carrying Heavy Guns as Well as Rapid Fire Machine Guns.

THE TRENCH TRACTOR.

(*Continued from page 536.*)

induce the men to leave their trench, and, secondly, if they persist in remaining they stand a good chance of being bayoneted or otherwise becoming exterminated by their foes. Incidentally the tractor, being enveloped in a cloud of steam, is protected in a certain degree from the enemy's shell fire.

If a dozen or more tractors of this kind were sent against a line of trenches, it is difficult to see how the enemy could hold them.

"So far so good," my wise friends will observe; "but suppose the enemy, too, has Trench Tractors. Suppose that the 12 French Tractors rush against the 12 German ones. What then?"

In answer to this the writer points to the submarine war and its recent collapse. As long as the submarine could not be combated it raised havoc, the same as the Trench Tractor will raise havoc till it can be combated. But the submarine is now combated by the electric submarine "ear," and the battleship—but a few months ago relegated to the scrap heap—has come into its own once more.

So it will be with the tractor. It will make trenches untenable and thus its importance becomes inestimable indeed, for it will put the men in the field, *where they belong*, not in the trench scrap heap. No war can ever be won if the men stay in the trenches. If there had been no trenches the European war would have been over in six months.

THE ELECTRO GYRO-CRUISER.

(*Continued from page 543.*)

mor of (h), serves double purpose as armor and as the bearing seat and guide for a system of huge ball bearings; (m) is a ball bearing five feet in diameter and probably of solid steel; (m) and its fellows roll in the space between (1) and (l).

This system of bearings will be able to carry a weight of thousands of tons at a rotation speed of 60 miles an hour—which would be only 30 miles an hour between the ball and either one of the bearing surfaces—with minimum friction, wear and trouble, and with the maximum reliability of any system which may be devised, even as it is so with more modest types of ball bearings.

(n) is a section of the armature res of the very powerful two-speed electric driving motors. The two multi-polar motors are each about 70 feet in diameter. On low speed they will be able to force the gyro-cruiser over rough country and directly up steep grades, while very steep grades will be overcome by a zigzag ascent. On high speed the twin motors will be able to rotate the great wheel at 15 or 16 revolutions per minute, a rate at which the cruiser will be making 60 miles an hour over the road.

(o) is an armature coil; (p) is a field coil; (q) is the field core; (r) is the commutator; (s) is a brush which plays between the commutator and the slip rings (t).

The brushes are mounted on miniature electric trucks which run upon a circular track laid inside of the commutator, and their velocity of movement over the track, as well as their position at any time, is controlled from the bridge. The significance of this method of control may be seen upon a little reflection.

(t) slip rings mentioned; (u) is the space in which is the commutator controlling the rotating magnetic fields of the liquid gyroscope; (v) feeders running from gen-