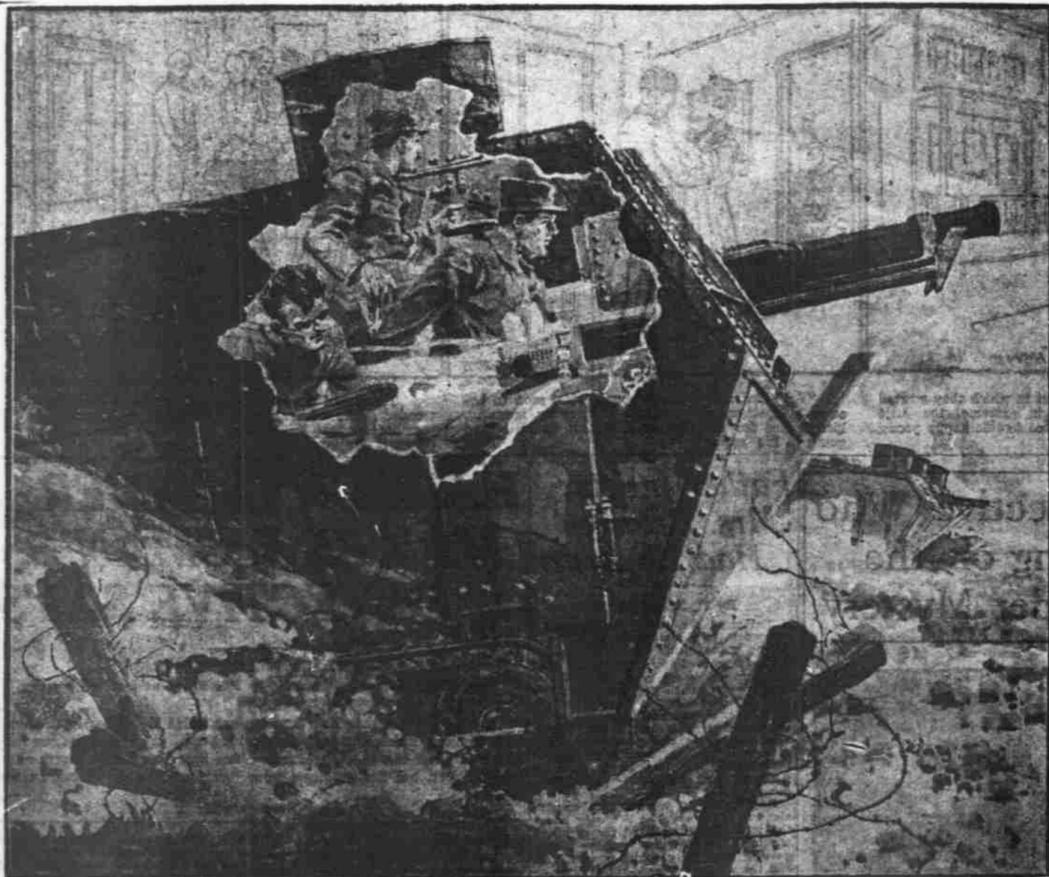


# New Fighting Methods, in Actual Use or Proposed, for the Great European War



INTERIOR VIEW OF A FRENCH "TANK."

Here is shown a glimpse of the interior of a French "tank." In the conning tower above sits the observer, who directs the movements of the monster. Below are the gunners. The "tank" is an adaptation of the American caterpillar tractor. It can crush

through almost any obstacle, leveling wire entanglements and crossing trenches with the greatest ease. These "tanks" are daily proving their worth in the Allied offensive now under way in Flanders.

## TANKS RANK FIRST AMONG NEW INVENTIONS FOR WAR

"Gasoline cavalry" is the name bestowed upon the armed caterpillar tractors of France and England by a writer in the current issue of the Scientific American, which contains a highly interesting article concerning these awkward-looking but highly effective engines of destruction.

The "tanks," although originating in England, has reached its highest development at the hands of French mechanicians and designers. As the Scientific American correspondent points out, the novelty of the huge iron juggernaut, with its machine guns and its "thousand legs," appeals to the Frenchman's irrepressible sense of humor and enabled him to develop the idea with remarkable alacrity and elasticity.

The tank—called a "metal rhinoceros" by the grinning poilu—is the most remarkable and efficient piece of mechanism which the war has developed, with the possible exception of the submarine. The latter, however, was well on its way toward practical realization before hostilities began, so the tank has a clear title to the honor.

The following excerpts from the Scientific American article will provide a good idea of the manner in which the French engineers adopted the British invention and turned it to good account:

**FIRST USED ON SOMME.**  
"At about the same time that the British began the construction of their land fleet, or tanks, the French also started on similar work. But it was the British who first made use of these novel weapons during the battle of the Somme, and thus gained title to the invention of the tank."

"The first French tanks to see action were of small size and of radically different design from the British, although in principle they were the same; that is to say, they consisted of heavily armored cars equipped with machine guns and quick-firing pieces, and propelled by caterpillar tractor belt driven by heavy-duty internal combustion engines."

"The original French tank has been eclipsed by a larger and more powerful tank which made its debut on May 5 during the second great offensive of the year to be undertaken by the French forces, in which Craonne Plateau was captured. This tank is known as the St. Chamond type, and while it retains the general outline of the smaller one, it is a far more powerful machine."

"As an additional feature, it is provided with three turrets well up toward the front, as well as a long-range quick-firing cannon which protrudes through a porthole in front, slightly to one side of the center line. The bow-shaped front is retained in the St. Chamond model, although the slanting steel outrigger appears to have been curtailed. Access is gained to the interior of this steel leviathan through one or the other of the turrets which are provided with hinged tops."

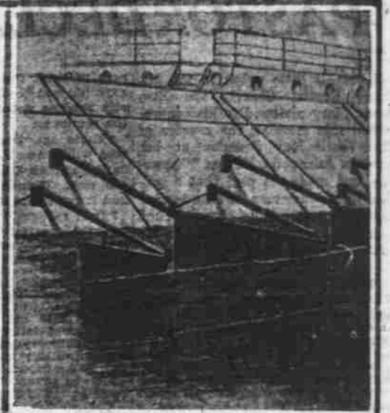
**HAS GREAT POWER.**  
"Because of the large surface of the caterpillar tractor belts, which comes in contact with the ground, as well as the potency of its engine, the new tank has remarkable power; indeed, it is capable of overcoming practically any battlefield obstacle. As a test of its power a tank of this type was recently driven through a dense wood, and

it made its way without any appreciable delay, leaving in its wake a trail of crushed and broken trees. The first impression one gains upon examining one of these machines is that the tank, not unlike the submarine, is a veritable mass of levers and pipes and gauges and control wheels. And this is precisely correct; for the interior of a land ship is given over entirely to the power plant and the armament. It is due to this lack of space and air that the crew of a tank is greatly discomforted during

an engagement, but for this there is no ready remedy. There was no element of surprise in the attack of the tanks; for the Germans, occupying all the high positions and possessing excellent observation posts, spotted them the moment they deployed on the ground leading to the slopes of the Craonne Plateau. Furthermore, the Germans were well aware of the impending tank attack, for they had made provision in the form of special batteries to be devoted entirely to anti-tank work. These batteries, assisted by large numbers of machine guns, opened a hot fire on the advancing tanks.

**GERMAN GUNS HELPLESS.**  
"The alert German machine gunners, hoping to pierce the steel walls by firing repeatedly at the rounds at their targets, and even explored the sides of the tanks with their leaden streams in the hope that a chance shot might find its way through a loophole or a peephole, killing or wounding some

of the crew, or destroying some vital part of the mechanism. The net result of the concentrated artillery and machine-gun fire was merely the cleaning off of the camouflage paint here and there, exposing the bright steel plates, in the majority of cases. "Service aboard a tank is anything but a sinecure. It is fully as trying and as dangerous as the work of the aviator or the submarine hand. During actual combat it is said that the crews suffer greatly. Machine gunners, artillerymen and engineers have only the space absolutely necessary for carrying out their work, and only such peepholes and loopholes as are positively required. "The commander of the tank sits under one of the turrets, and has a view of the battlefield through a narrow slit; and his spirit, his nerves, his muscles, and his skill are the very life of the tank. When the tank is put out of action; when it meets obstacles; when it fights the enemy—these and many other



This view, looking up, shows the tail end of the first line of protective plating, the towing vessel at the head of the second line, and the transports steaming in line ahead.

Here is shown part of the system of steel plates, which automatically maintain themselves in a vertical position.

The picture at the top shows the conveying of transports within two lines of overlapping nets, towed by gunboats. The towing vessels are protected by the overlap of the net ahead. As

a means of further protection ahead and astern of the column of transports is a large number of destroyer patrol. This method, experts agree, will prove most effective in beating the U-boats.

## Use of Grenade Revived and Highly Developed in Present War

Back in the days of the muzzle-loading musket, used by the armies of the world, it was not surprising to find the hand grenade in common use. With the gun as slow to load as a modern coast defense gun of largest size, of little power, inaccurate, and used in a manner that deprived it of half its possible usefulness, the hand grenade was an instrument that compared quite favorably with the musket in making the gentlemen on the other side of the argument as uncomfortable as possible.

In those days the hand grenade was merely a hollow iron shell, with a fuse that the grenadier lit from his always glowing match; then it was lofted into an assemblage of persons not agreeing with his government. Sometimes it was nicely timed, and when so timed it left a considerable gap in its immediate neighborhood. At other times its targets snuffed out the fuse, or else picked it up and heaved it back to its sender—which was manifestly not playing the game fair. Inside the shell, of course, reposed a quarter or half pound of black powder, which is quite sufficient to distribute jagged bits of cast-iron casing with considerable celerity.

**STATUS OF RIFLE CHANGED.**  
In these days of rifles sighted up to 1,500 yards, however, and having the extreme range of two miles and a half; of slip loading magazines that enable an accurate and sustained fire of twenty-five or thirty shots a minute; of machine guns that chatter forth shots at the speed of an agitated pneumatic riveter on a steel-framed building, and of long-range field guns, the mere mention of a hand grenade is sufficient to provoke snickers among the listeners. The British musketry regulations, containing a grave discussion of the hand grenade and how it is to be used, was as funny as Puck or Judge to these reading it and not believing in the possibility that two and a half mile rifles could be brought down to the dull level of trench fighting at fifty yards' range.

Now, with the war three years gone and the trenches of the allies and their German friends hobnobbing with each other at a distance of fifty yards or so, students of warfare have made some astonishing discoveries. One of them is that while a rifle of two and a half miles range won't hit a man with his head snugly down in a pit fifty yards away, a missile cannily lofted across the intervening space into the pit may do with the aid of gravity just what the bullet failed to do because of its omission to respond early in the game to the blandishments of the gravity air.

**GRENADE REGAINS ITS OWN.**  
The poor, flat-trajectory rifle has to hang its diminished head and confess that its very fatness of flight prevents it from curving gently over the edge of the other



### "TOMMIES" LEARNING TO THROW HAND GRENADES

Hand-grenades, a sketch and a photograph of which are reproduced herewith, play no small part in the trench warfare of Europe. Far from being an acid-filled bottle on the end of a stick—which seems to be the popular idea—these mosquitoes

of death" are intricate mechanical affairs, designed with the idea of rendering the utmost effectiveness at a minimum of risk or exertion on the part of the thrower.

gentlemen's home in the ground and seeking him out. The British hand grenade, a large number of which they had in service when the war broke out, consists, first, of a piece of cane with a metal head on it, containing the bursting charge of lyddite, and the detonator or exploding arrangement to act when the grenade strikes. The handle and head are sixteen inches long over all.

Attached to the end of the cane handle is a three-foot bit of cloth—the tail—to make the grenade fly true and insure that it strikes head first on its detonator, after which

is exposed and in line with arrows on the body of the grenade, and then removes the safety cap. Then the detonator is placed into position on the side of the grenade and given a turn to lock into position in the studs provided for it.

The tail is then unwound from the handle, the cap is replaced and turned to fire position, the safety pin locking the detonator plunger is withdrawn, and the machine is ready to throw.

The soldier is instructed to throw it at an angle of not less than thirty-five degrees with the ground, both to give it the required range and to insure the machine hitting on its head and firing from the impact. It may be thrown under or over handed.

The soldier is told to be sure that the three-foot tail does not become entangled with him or any other object as it leaves his hand. In actual service the machine is always ready—unwinding the tail, withdrawing the safety-pin and turning the cap to "Fire" being all that is necessary.

The bursting charge of lyddite is sufficient to blow the steel head into bits and kill men standing close by it. The explosive is similar in its action to gun cotton, but is made of carbolic acid and nitric acid, being of a form of the better known picric acid. The French melinite and the Japanese shimose are similar explosives under another name.

The grenade differs from the old type in that it is fitted up with percussion cap or detonator, sensitive to shock, to explode on impact with anything after it is set to "Fire," while the bursting charge, due to the great improvement in explosives, is five or six times as powerful, weight for weight, as the old-fashioned black powder formerly universally used in missiles of this character.

The trench fighting in Belgium and northern France has shown the full effectiveness of these miniature bombs, and it is not unlikely that the soldiers of Uncle Sam may find themselves indulging now and then in the gentle art of heaving an infernal machine full of high explosive across a few yards of ground, instead of learning how to hit things at 1,000 yards with the out-of-date rifle.—The Scientific American.

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