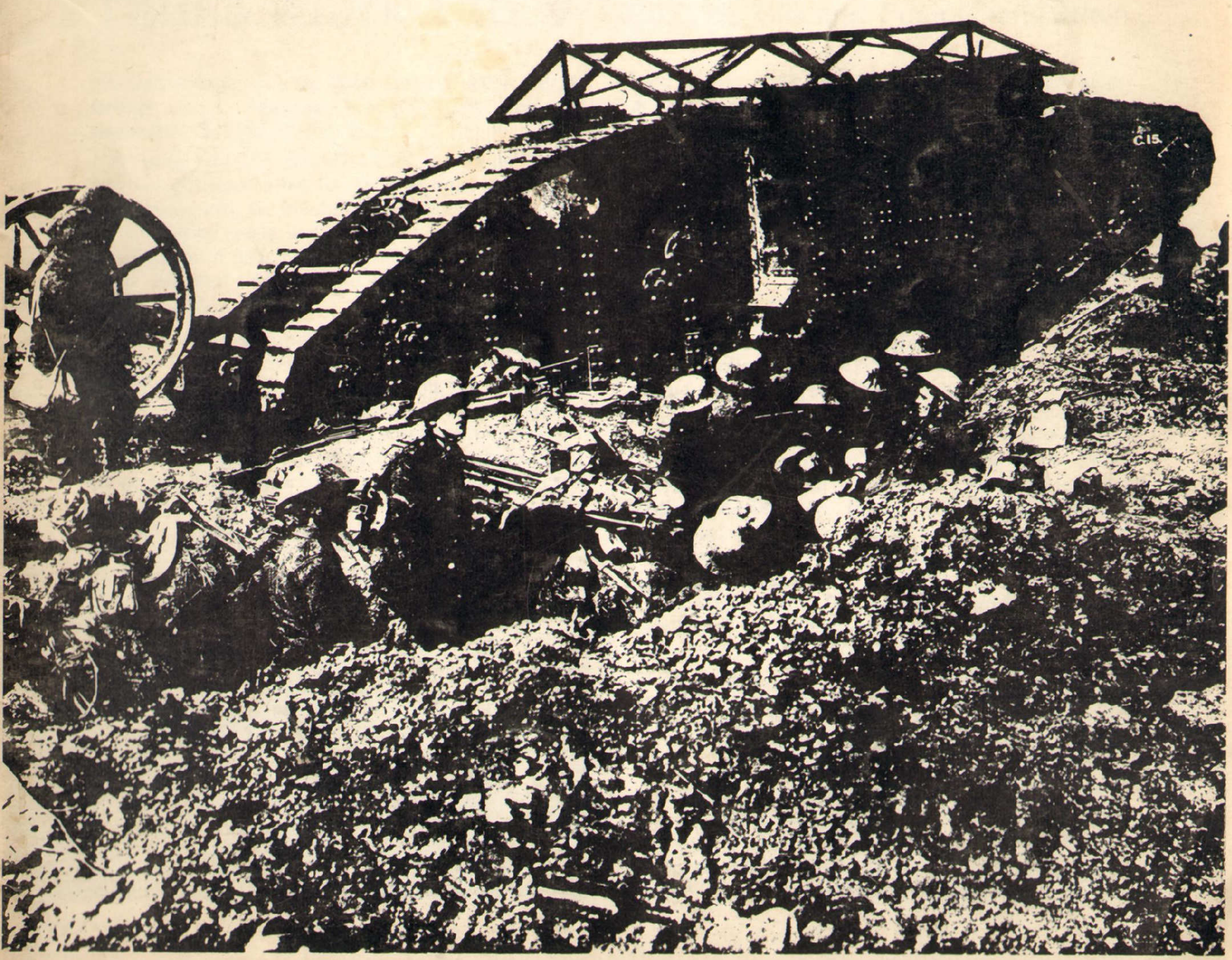
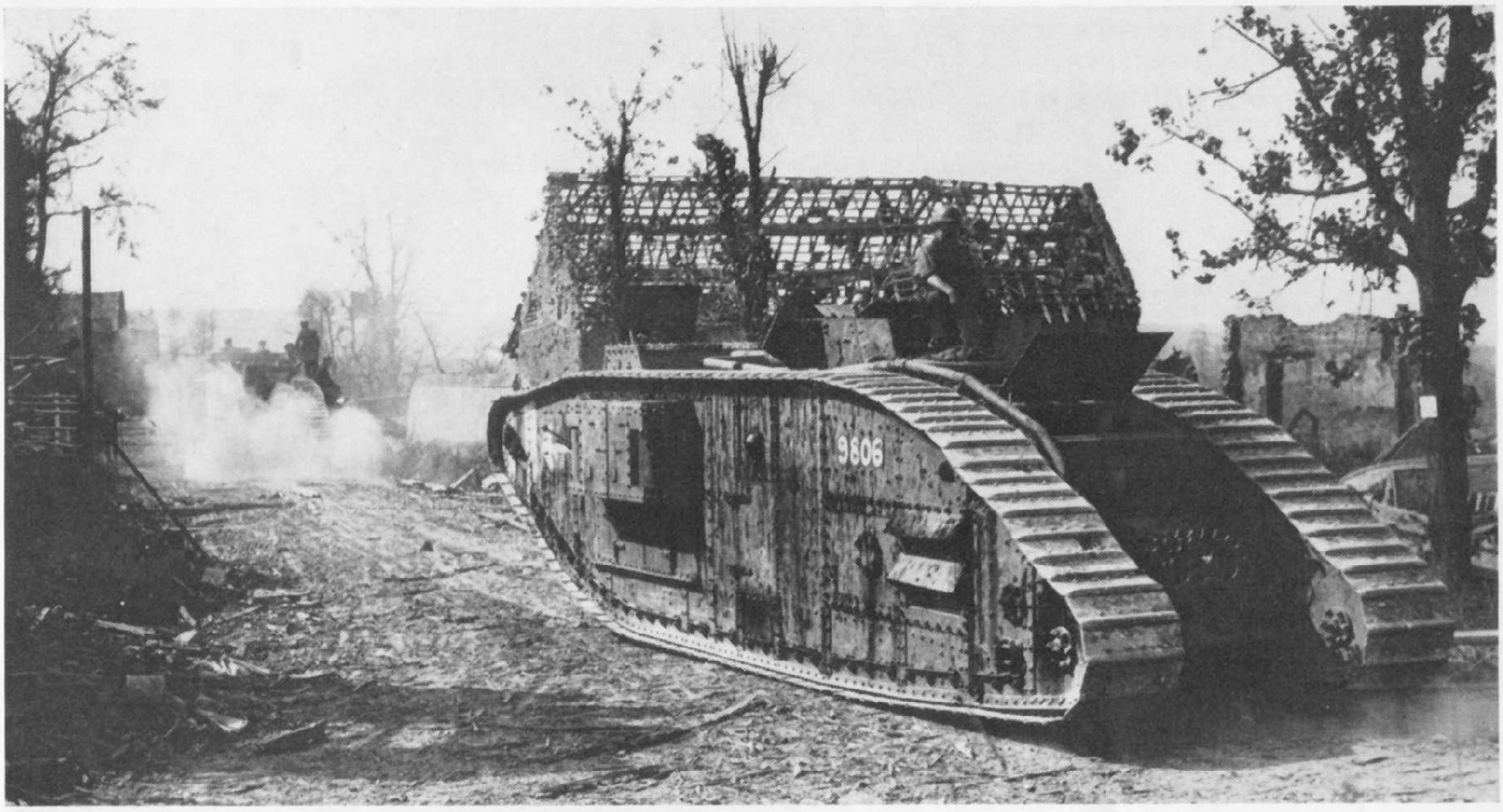
AFV 3

TANKS MARKS I to V

FIVE SHILLINGS





A Mk. V moves forward during the Battle of Amiens in August 1918. Note the spare sprocket carried between the rear horns.* (Imperial War Museum)

Tanks Mark I to V

By Chris Ellis and Peter Chamberlain

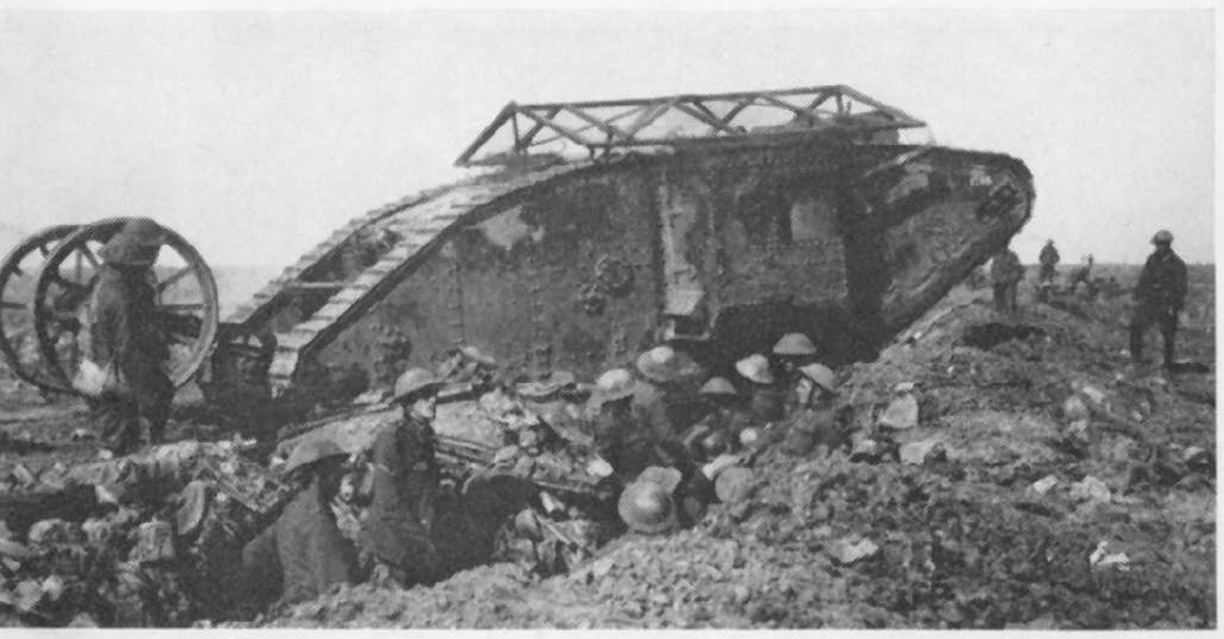
"A tank is walking up the High Street of Flers with the British Army cheering behind"—Press message, September 15, 1916.

"Our new heavily armoured cars, known as 'Tanks' now brought into action for the first time, successfully co-operated with the infantry, and coming as a surprise to the enemy rank and file, gave valuable help in breaking down their resistance"—Somme Despatch by Field Marshal Sir Douglas Haig, Commander-in-Chief, B.E.F.

THEY had moved up from their concentration point at "The Loop"—a rail depot near Bray-sur-Somme—on September 13. The following night, under cover of darkness, they contrived, not without difficulty in unfamiliar surroundings, to take up their positions on the start-line as prescribed by the orders from GHQ. Luminous tapes were a help, but there was a lot of mud and they had mechanical troubles. Nobody slept, despite their fatigue, because there was more than enough checking and repair work to do; and besides that they were deafened by the incessant roar of the near-by gun batteries which had been pounding the enemy lines non-stop for the past three days. At 6 o'clock on the morning of September 15, 1916, zero hour, the barrage started to creep forward, and 32 tanks of the "Heavy Section, Machine Gun Corps" clanked, wheezed, and groaned forward in the morning mist in the direction of the German lines. A new era in the history of land warfare had begun.

The Battle of Flers-Courcelette, as this action has come to be known, was no glorious military victory. It was an attempt to bolster the flagging Somme Offensive which had started on July 1, 1916, with 60,000 British casualties on the first day alone as an almost ritual sacrifice to the supremacy of the machine-gun. The Somme Offensive, on a 14 mile front, had largely fizzled out within days and the well-defended German lines remained stubbornly intact save for one or two local gains. Clearly the "break through" which Haig, C-in-C of the British Forces, had hoped for would not be achieved, and the stalemate which had characterized the previous 18 months' fighting on the Western Front would remain. An added impetus was required and this led to Haig's requesting the transfer of a hitherto untried force, the newly-formed tank companies, to France at the earliest possible date. At this time, late July, neither the tanks nor their crews were ready for combat. No more than 75 crews were under training, the training ground itself had only recently been established, and fewer than twenty tanks had been delivered. However, protests from the tank men that the new arm was insufficiently prepared for the mass

The tanks go to war; a Mk. I male of C Company, Heavy Section, Machine Gun Corps, crosses a British second-line trench on its way forward near Thiepval during the Flers-Courcelette action, September 15, 1916. (Imperial War Museum)

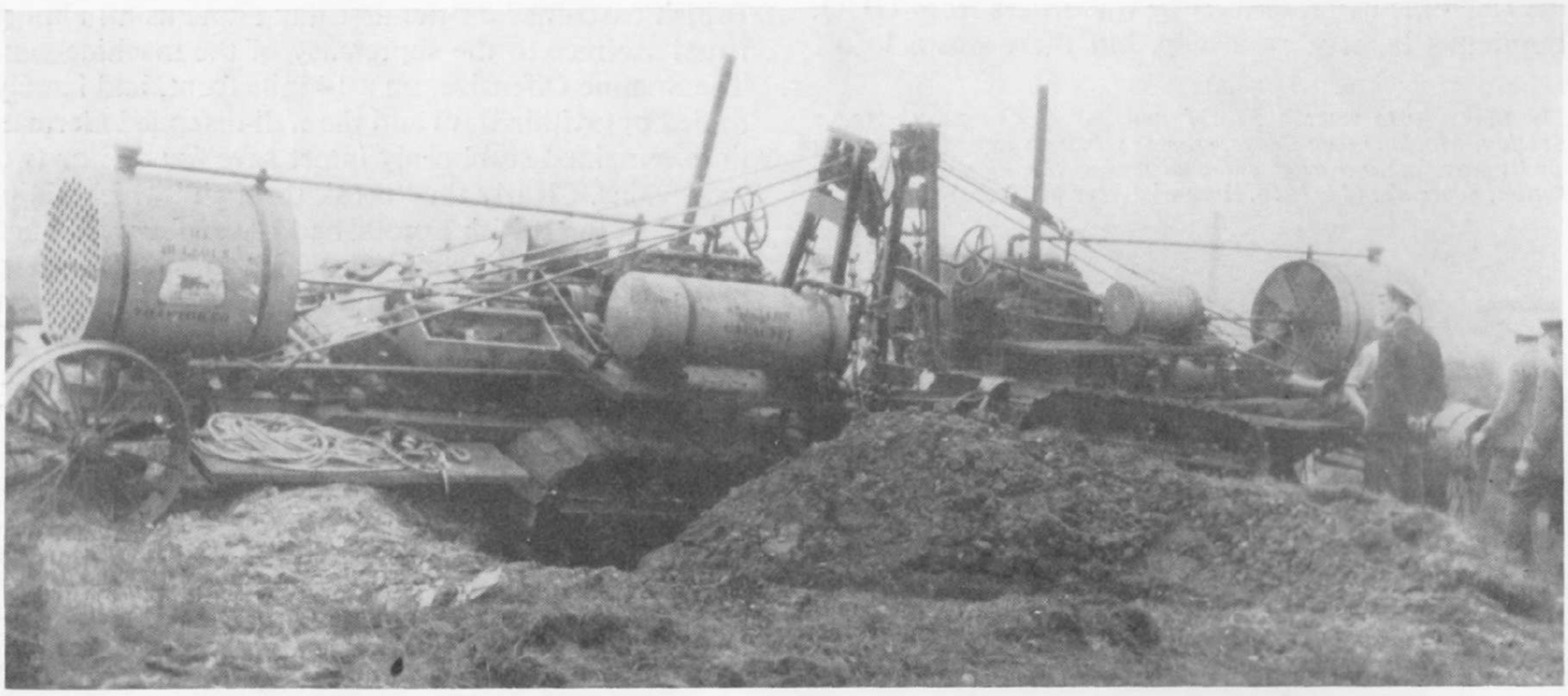


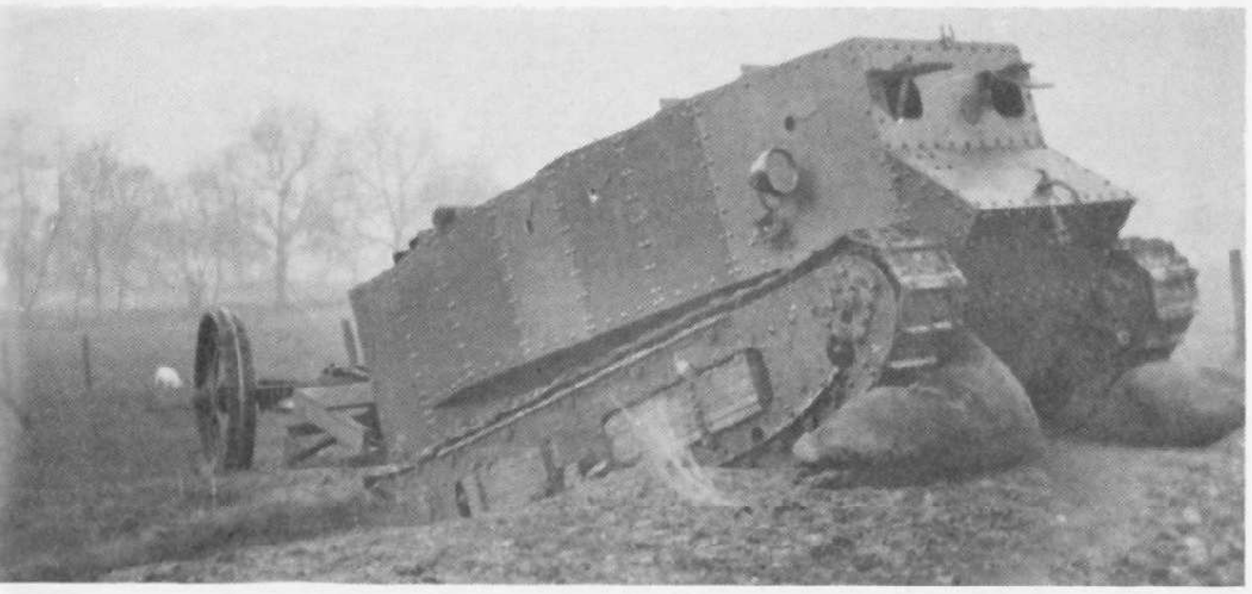
Progenitors of the Tank 1: the Foster-Daimler petrol (gasoline) tractor (shown in use by the Royal Marines Artillery), the engine of which was to be used for the projected "big wheel" machine and which was subsequently used to power all tanks Mk. I–IV.
(Chamberlain Collection)

surprise attack which they themselves advocated, were not heeded. The War Office prevailed, and by mid-August 1916 the still only partially equipped C and D companies of the "Heavy Section, MGC" were on their way to France, earmarked for employment in a new "break through" attack which was being planned for a three mile sector of the Fourth Army front in mid-September. The September 15 attack was to punch at the German lines from Thiepval in the north, through the villages of Courcelette and Flers to Combles in the south.

The fifty available tanks were to be allocated to work with the various divisions taking part all along the sector, with the result that vehicles were distributed in "penny packets" only and were not used *en masse* at any one point. Breakdowns reduced the number of vehicles to only 32 on the start-line, and the small numbers engaged proved inadequate to have any decisive effect in forcing a "break through", though the German line was pushed back about a mile, and Flers and Courcelette were captured. Individual tanks performed prodigious feats of valour by the standards of the day; one vehicle (D.17) led two others to Flers and drove right through it followed by the infantry it was

Progenitors of the Tank 2: the two Bullock Creeping Grip tractors which were to form the basis of the projected articulated "landship", seen on test by the RNAS at Burton-on-Trent, July 1915. When this was abandoned, Bullock tracks were used on the experimental "No. 1 Lincoln Machine". (Imperial War Museum)





Progenitors of the Tank 3: "Little Willie" seen on test at Lincoln on December 3, 1915 as fitted with the new Tritton tracks in place of the Bullock tracks it originally carried. Dummy turret originally fitted had been removed during the re-building. Note the "steering tail". (Imperial War Museum)

supporting—leading to the somewhat exaggerated report quoted above—another penetrated the German lines and forced more than 300 enemy soldiers to surrender, while German troops fled in panic wherever tanks appeared rumbling towards them. If the action at Flers-Courcelette was militarily indecisive, it did prove to Haig (though not straightaway to the General Staff) that tanks had a future. Haig called instantly for a thousand more (which were ordered on September 19), expansion of the "Heavy Section, MGC" to three brigades of three battalions each was authorized, and a young lieutenant-colonel (later promoted to General), Hugh Elles, who had been GHQ liaison officer on tank matters, was appointed to command the tanks in France and was charged with setting up headquarters and repair and maintenance workshops for the tanks in the field.

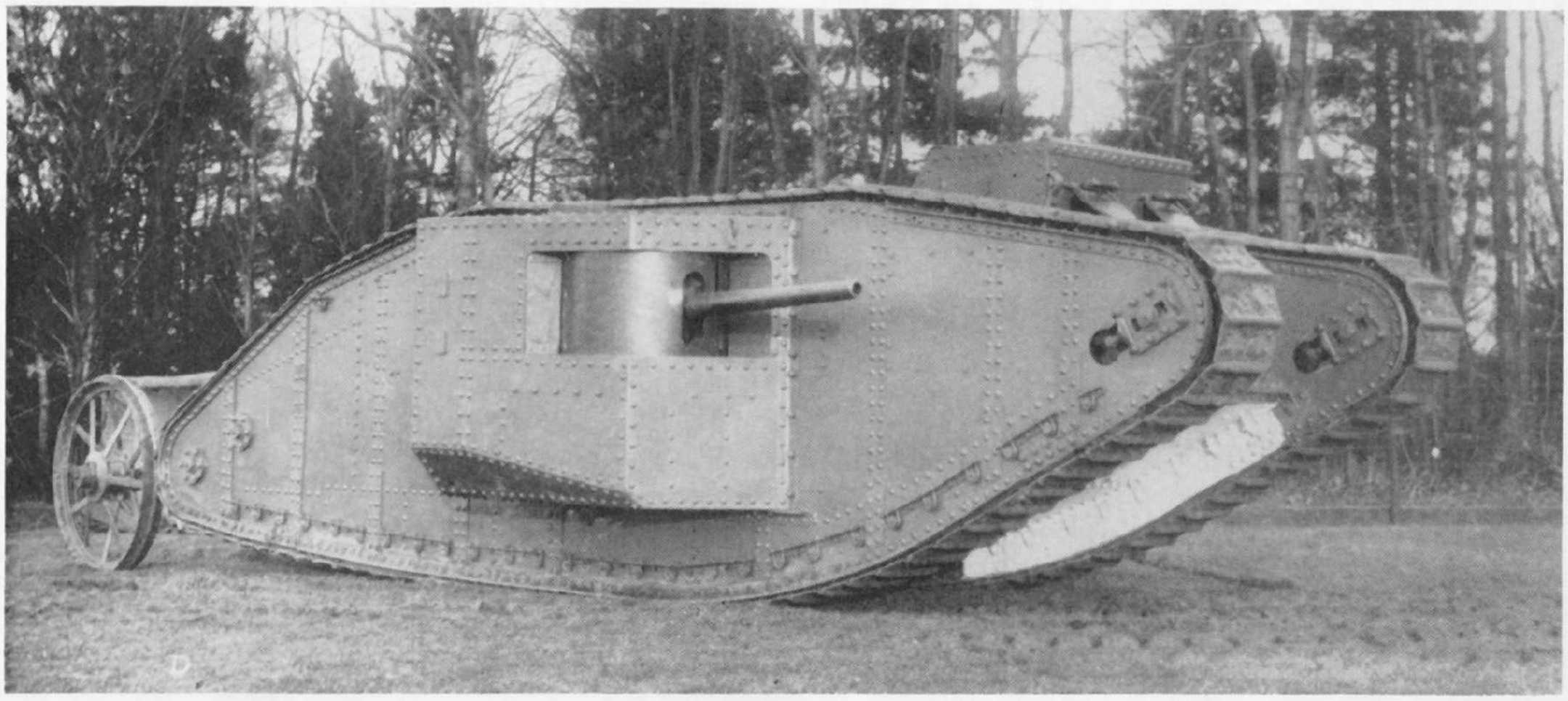
Such was the effect of the first impact of the tank on the British High Command. Its acceptance was by no means unanimous and the tank men had to fight more battles with authority before they finally got their way. Within two years the tank was to prove one of the most decisive weapons of World War I, and certainly the only one which, almost on its own, could break the bloody stalemate of trench warfare. In two years, also, the British tank arm grew mightily. By February 1917 its personnel numbered 9,000 and by the Armistice in November 1918 the total had reached about 20,000. Tank output increased nearly one hundred-fold—from about 50 in fighting trim in September 1916 to some 2,000 at the end of 1918.

In July 1917, the "Heavy Section, Machine Gun Corps" shed its now unnecessary "secret" title and became "The Tank Corps". For a badge it adopted an outline representation of its first tank, the Mark I of Flers-Courcelette fame, the simple lozenge shape which to this day symbolizes a "tank". The Tank Mark I and its immediate successors formed the bulk of British tank strength in World War I and these vehicles represented the first practical realization of the "landship" idea in the mechanized age; the first tanks in production, the first in service, and the first in action. The immediate pedigree of the Mark I tank was relatively short, but the inspiration and effort which put Britain first in the field with tracked armoured vehicles demonstrates clearly the tactical problems which the tank was designed to overcome. Its arrival on the battlefield was the achievement of a small band of dedicated and far-sighted individuals.

THE PROGENITORS

The idea of armoured "landships" for military use in a modern mechanized form had an early public airing in late nineteenth and early twentieth century "science fiction" from, among others, Jules Verne and H. G. Wells. Prior to World War I several individuals offered ideas for armoured fighting vehicles to the military authorities of most of the great powers. In Britain, F. R. Simms, an automotive engineer, had built and demonstrated a "war car", armour-plated, and armed with several guns in 1900. For service in the South African War in 1899, the British War Office had actually ordered armoured traction engines, but for defensive rather than offensive purposes. Tractors with

"Mother" or "Big Willie" or "Centipede" which became the prototype for the production heavy tanks featuring all-round tracks. Made of boiler plate only it had closer spaced rivets than production vehicles (boilermakers pitch instead of the normal engineering pitch) but was otherwise virtually identical. (Imperial War Museum)

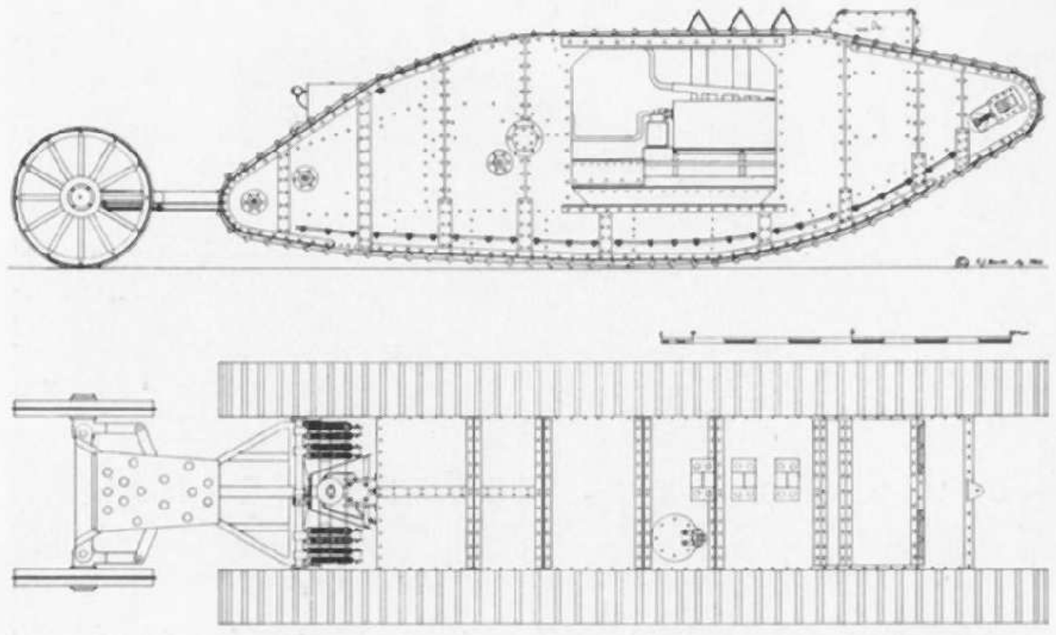


"Mother" shows its capabilities on an initial test run before the official demonstration. Note access door in sponson. (Imperial War Museum)

crawler tracks were demonstrated (as gun towers) to the War Office in 1908, but were never adopted, and in 1912, and again in 1914, an Australian engineer, L. A. de Mole, had sent plans and specifications for a lozenge-shaped fully-tracked offensive vehicle to the British War Office, all of which were filed and promptly forgotten. Thus the essential characteristics later incorporated in tanks—tracks for cross-country performance, armour for defence, and guns for attack —had been postulated, or even demonstrated, prior to the outbreak of war. But military authorities in peacetime are notoriously resistant to innovation and the British War Office (and indeed the French and German High Commands) saw little need for armoured offensive vehicles before 1914, simply because no practical demonstration of the need had ever been given. The closing months of 1914, after the declaration of war, changed all that.

By September 1914, the fighting on the Western Front was degenerating from a war of movement to a stalemate of trench systems opposing each other from

The first tank driver: CPO Hill, RNAS, was a member of 20 Squadron RNAS, the unit which provided personnel for the early RNAS "landship" experiments and trials. Hill drove "Mother" on the official demonstration runs in Hatfield Park, January 26–February 2, 1916, and on February 8 he gave a further demonstration run this time for King George V who was also given a ride in the vehicle. (Chamberlain Collection)

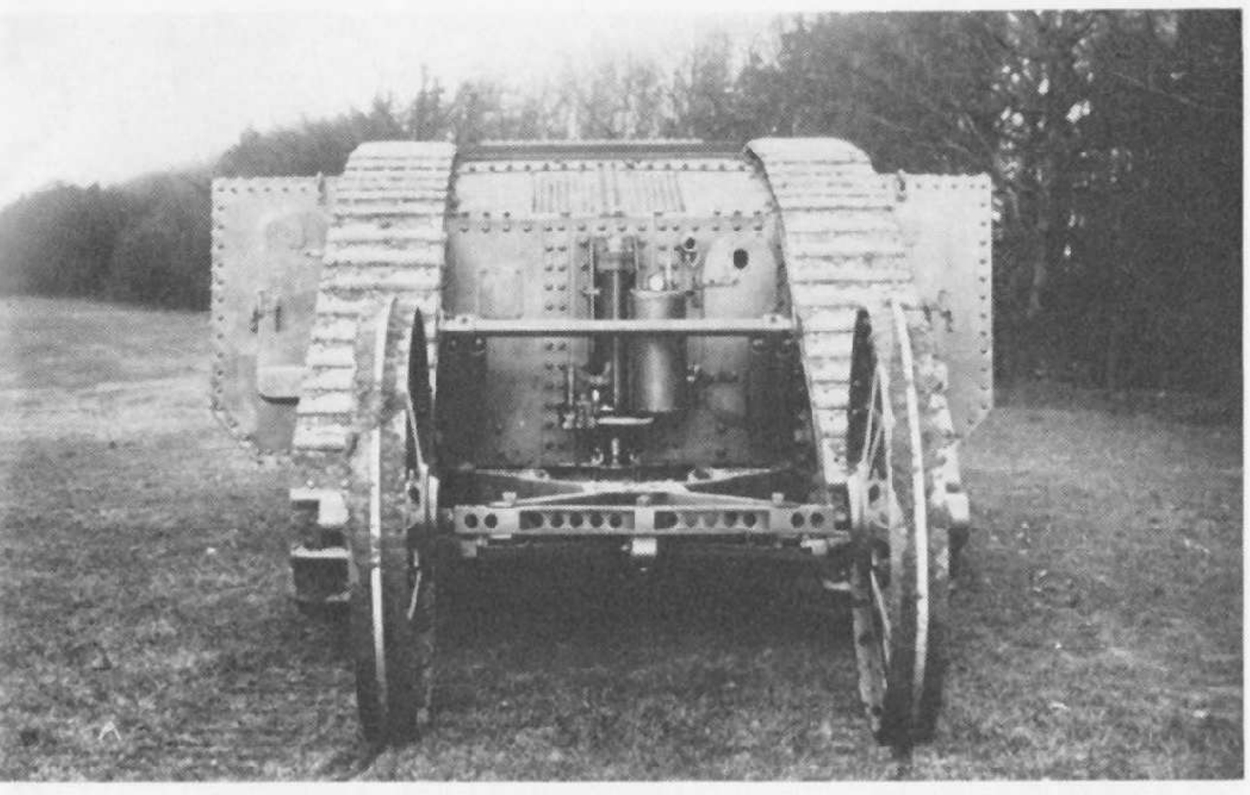


General arrangement of the Mk. I tank with sponsons omitted to show the engine location, starting handle, and exhaust pipes. (Copyright: Bellona Publications)

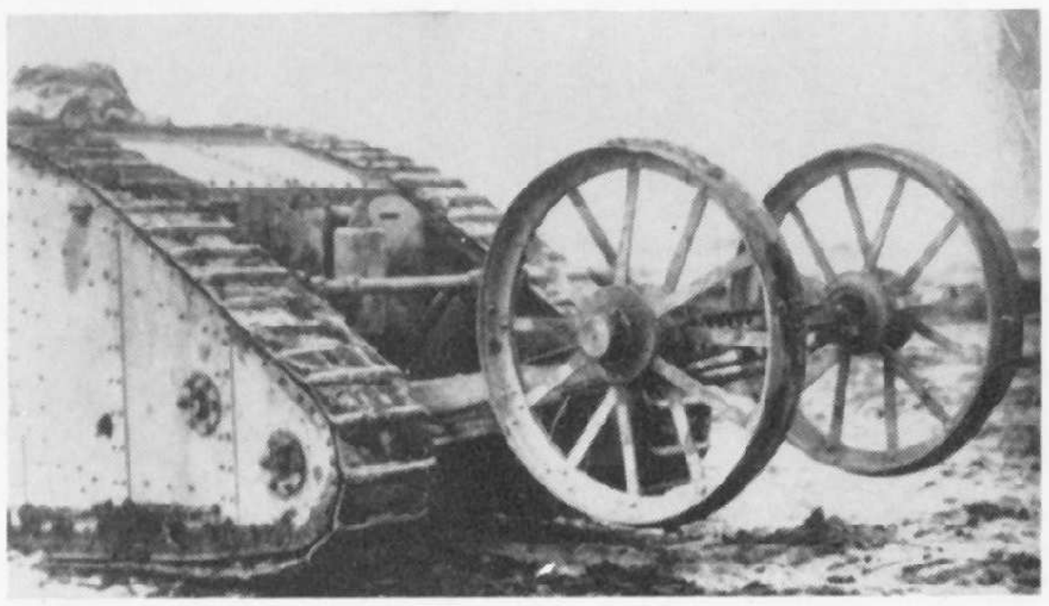
the Belgium coast to the Swiss border and dominated by the fire supremacy of the well-sited machine-gun, with the trenches protected by massive wire entanglements. In such conditions cavalry was rendered impotent and infantry assaults could only be mounted under the covering fire of a huge artillery bombardment, generally with only limited success and heavy troop losses to the attackers. Continual shelling of the same limited area of ground, plus the vagaries of the European weather, led to a secondary problem, that of getting attacking forces and their equipment across rough bare terrain which often became a sea of mud for weeks at a time.

While the British Generals accepted these conditions of warfare, and in the absence of a better alternative committed larger and larger forces and more and more guns into what rapidly became a costly war of attrition, a few more imaginative individuals had applied themselves to the problem almost since the start of hostilities, obviously influenced, if only subconsciously, by the earlier ideas of "landships". One who was to play an important rôle later was Lieut-Colonel E. D. Swinton, assistant secretary of the Committee of Imperial Defence who was sent to France as an official war correspondent in September 1914. From previous study, Swinton appreciated more than most that the machine-gun was likely to be the major defensive weapon of the war. Hearing of the American Holt crawler tractors which were being used

Tank pioneers: (right to left) Tritton, Wilson (in boots), Hetherington, and Swinton confer during "Mother's" test run. (Imperial War Museum)



Rear view of "Mother" showing the "steering tail" and hydraulic ram. (Imperial War Museum)



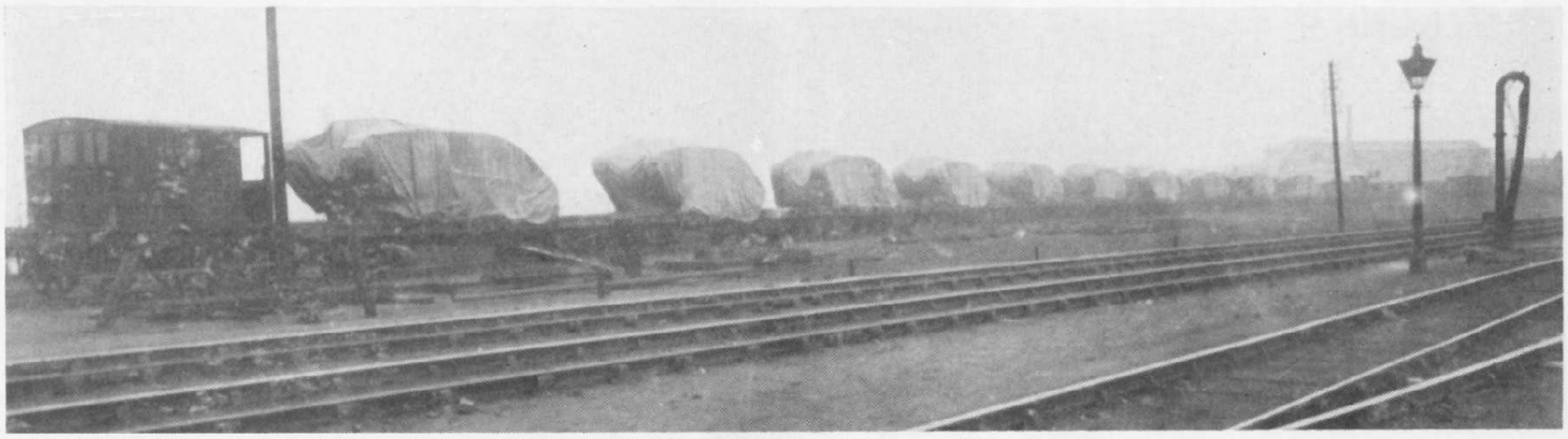
A close view of the "steering tail"—in the raised position—on a Mk. I tank.

as gun towers by the artillery gave Swinton the idea that such a vehicle fitted with a suitable armoured body would make an excellent means of storming enemy trenches by carrying infantry or guns with impunity across "no man's land". On his return to London Swinton communicated these ideas to Lieut-Colonel Maurice (later Lord) Hankey, secretary of the Committee of Imperial Defence, who in turn passed them on to the General Staff and to Lord Kitchener, Secretary of State for War, only to be rebuffed on the grounds that such vehicles would be very vulnerable to shell-fire. Meanwhile, over Christmas 1914, Hankey drew up a memorandum on the war situation to date which included special mention of the need for some sort of armoured protection for infantry attacks. This memorandum was circulated to the Committee of Imperial Defence, one of whose members was Mr. Winston Churchill, First Lord of the Admiralty. Churchill was already aware of efforts being carried out by the Royal Naval Air Service to provide armoured vehicles for its own use, and Hankey's memorandum inspired Churchill to submit a memorandum on the subject to the Prime Minister, Asquith. This was critical of the Army's apathy in tackling the problem of storming enemy trenches by the use of suitably protected cross-country vehicles, and among other things called for a committee "of engineer officers and other experts" to be set up by the War Office to study ideas. It also warned that the Germans might already be working on similar lines.

As a direct result of this memorandum, Kitchener was persuaded by Asquith to set up a committee to examine Swinton's (and similar) ideas. This committee comprised the directors of fortifications, of artillery, and of transport, from the War Office. On February 17, 1915, they witnessed cross-country trials of a Holt tractor towing a trailer loaded to simulate the weight of troops, armour, and armament, but the severe weather conditions at the time caused the vehicle to give a very poor performance—though it should be noted that Swinton's original idea did not envisage the use of a trailer. Unimpressed, the committee reported adversely on the project, raising once more the previous reason for rejection (vulnerability) and taking the then still prevalent optimistic view that the war would be over within months, before development could be perfected. There for the moment War Office interest in "landships" terminated, and it was left, paradoxically, to the Royal Naval Air Service to take the initiative.

The R.N.A.S. had become involved in the use and development of armoured vehicles at the very beginning of the war when they had modified some ordinary touring cars with machine-guns and armour plate to protect the landing strips and seaplane bases (at Calais and Dunkirk) which they had set up for their air squadrons in France. These vehicles had a very limited offensive ability, but did serve to prove to the R.N.A.S. the value of armour protection. As a result the commander of the R.N.A.S., Captain (later Rear-Admiral Sir) Murray Sueter, had suggested to Winston Churchill the use of a tracked armoured device for land warfare, utilizing the British-made Diplock Pedrail crawler tracks. Meanwhile Flight-Commander T. G. Hetherington the R.N.A.S. armoured car transport officer had proposed to Sueter the idea of a

Sheeted over for security, a first batch of Mk. I tanks leaves Foster's for the training ground at Thetford, June 1916. Imperial War Museum)



giant "land battleship" with three 40-foot diameter wheels arranged tricycle fashion round a platform which mounted three turrets each with twin 4-inch naval guns, the whole contraption being driven by a 800 h.p. submarine diesel engine. The 40-foot wheels were considered necessary to enable this monster to cross the widest (9-foot) German trench. This vehicle was not unlike a similar type of "landship" which had featured in one of H. G. Wells' novels.

THE LANDSHIPS COMMITTEE

On February 15, 1915, two days before the quite unrelated Army trials of the Holt tractor, Hetherington was able to describe his "land battleship" idea personally to Churchill, who, greatly impressed by this imaginative scheme, set up a committee—known as the Landships Committee—under the chairmanship of Mr. (later Sir) Eustace Tennyson d'Eyncourt, the Director of Naval Construction, to consider its practicability. Formed on February 20, the committee included Hetherington and various co-opted transport experts and engineers. Its first task was to report on the two types of "landship" suggested, tracked (Sueter's idea) or "big-wheeled" (Hetherington's). On March 26, Churchill, on his own initiative, authorized construction of 12 tracked and six "big wheel" "landships", the design for the latter having been scaled down considerably by the committee in the intervening month to a more practical size with 15-foot diameter wheels. In the meantime, Lieut Albert Stern, another R.N.A.S. armoured car officer, was appointed secretary of the committee.

The contract for the "big wheel" machines went to Foster's of Lincoln, whose commercial Foster-Daimler petrol (gasoline) tractors were already being used to haul big guns for the Royal Marines Artillery in France; it was proposed that components from the tractors could form the basis of the "big wheel" machines. Concurrently work proceeded on the crawler track "landship" under the supervision of Colonel Crompton, a veteran engineer whose transport experience dated back to the Crimean War. One of his assistants was Lieut W. G. Wilson, another

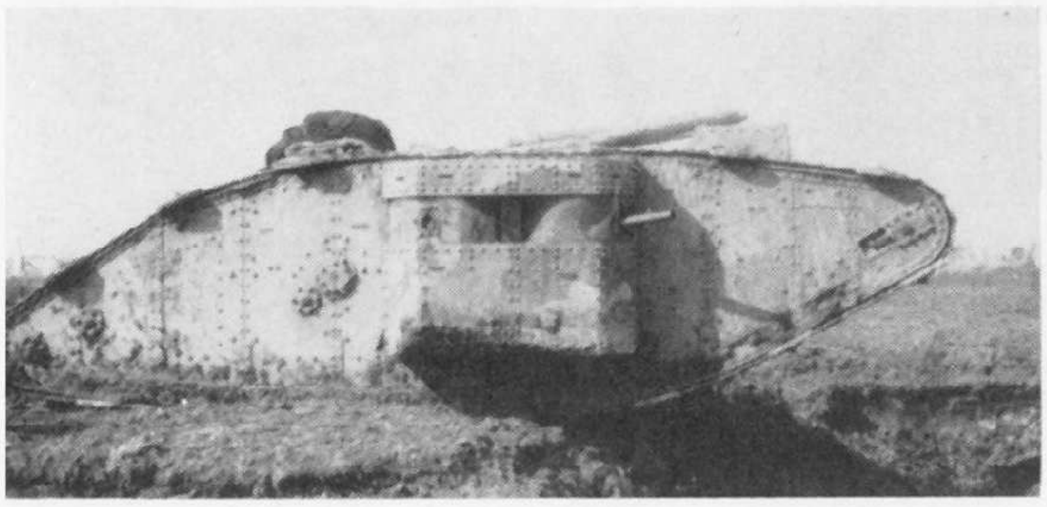
The King of the Belgians inspects a knocked out Mk. I after the Flers-Courcelette action. This is a female. Note the door in the sponson, the bomb roof and the "tail". (Imperial War Museum)

An old Mk. I in use for training at the Tank Corps depot in France in 1917 demonstrates trench-crossing techniques to pupil drivers. (Imperial War Museum)

R.N.A.S. armoured car officer who had been a notable automotive engineer before the war. The Diplock Pedrail tracked "landship" design proved impractical when it was realised that the vehicle was too long (over 40-feet) to negotiate corners in the narrow lanes of France. Also the Pedrail and its mode of drive was complicated and under-powered. In early May 1915, therefore, work on these vehicles was suspended, the prototype being eventually handed over to the Army for another purpose though it was never subsequently used. An articulated chassis was now deemed necessary to give the required flexibility for manoeuvring and an R.N.A.S. officer was sent to the

A Mk. I female in December 1916 after the tail and bomb roof had been removed, showing addition of the stowage tray at the rear. (Imperial War Museum)

Fine view of a Tank Mk. II male at Arras, April 13, 1917, shows the modified hatchway in hull top and the widened track shoes. Note the cavalry on the horizon. (Imperial War Museum)



A Mk. II female ("The Perfect Lady)" seen during the Battle of Cambrai, on November 20, 1917. The Mk. IV had by this time largely replaced the earlier Marks. (Imperial War Museum)

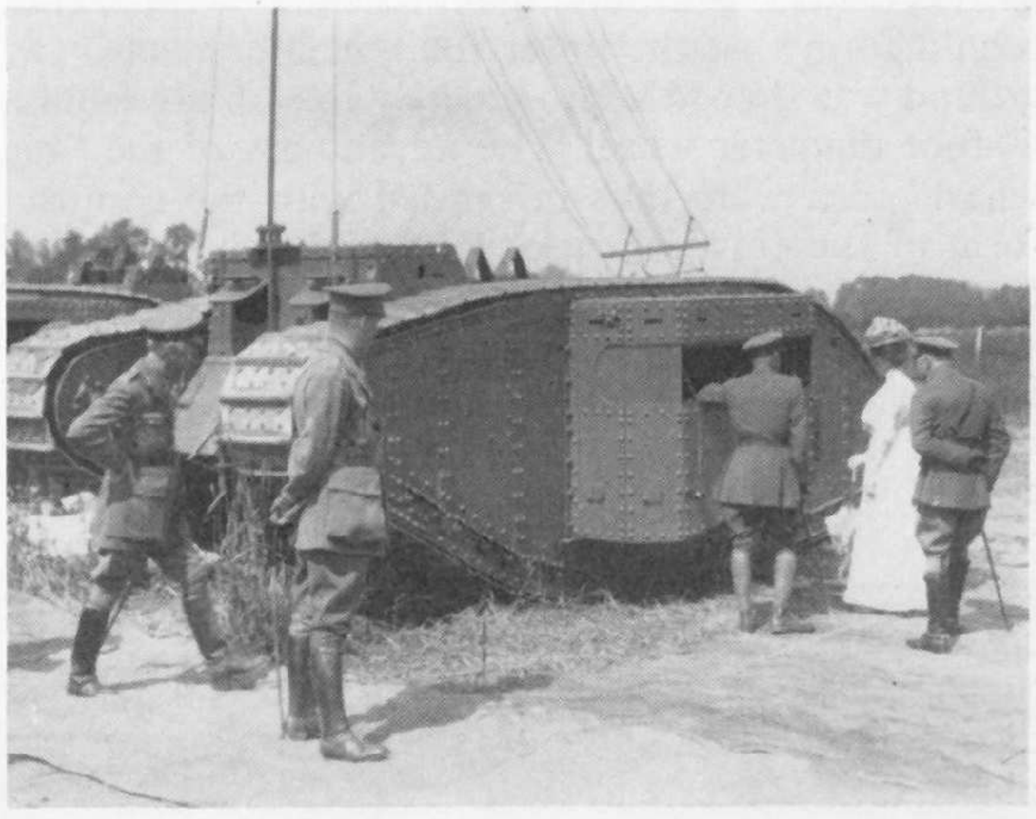
United States to purchase two Bullock Creeping Grip Caterpillar tractors to serve as a basis for the articulated design. While in the U.S.A., the officer was also instructed to order two sets of lengthened Bullock tracks and suspension components since those on the standard Bullock tractor were a little short for crossing a 5-foot trench or surmounting a 2½-foot parapet—the minimum performance characteristics thought desirable by the committee. The Bullock tractor was an agricultural machine, chosen as being most suitable for the job after the Landships Committee had witnessed a demonstration of its capabilities on Greenhithe marshes.

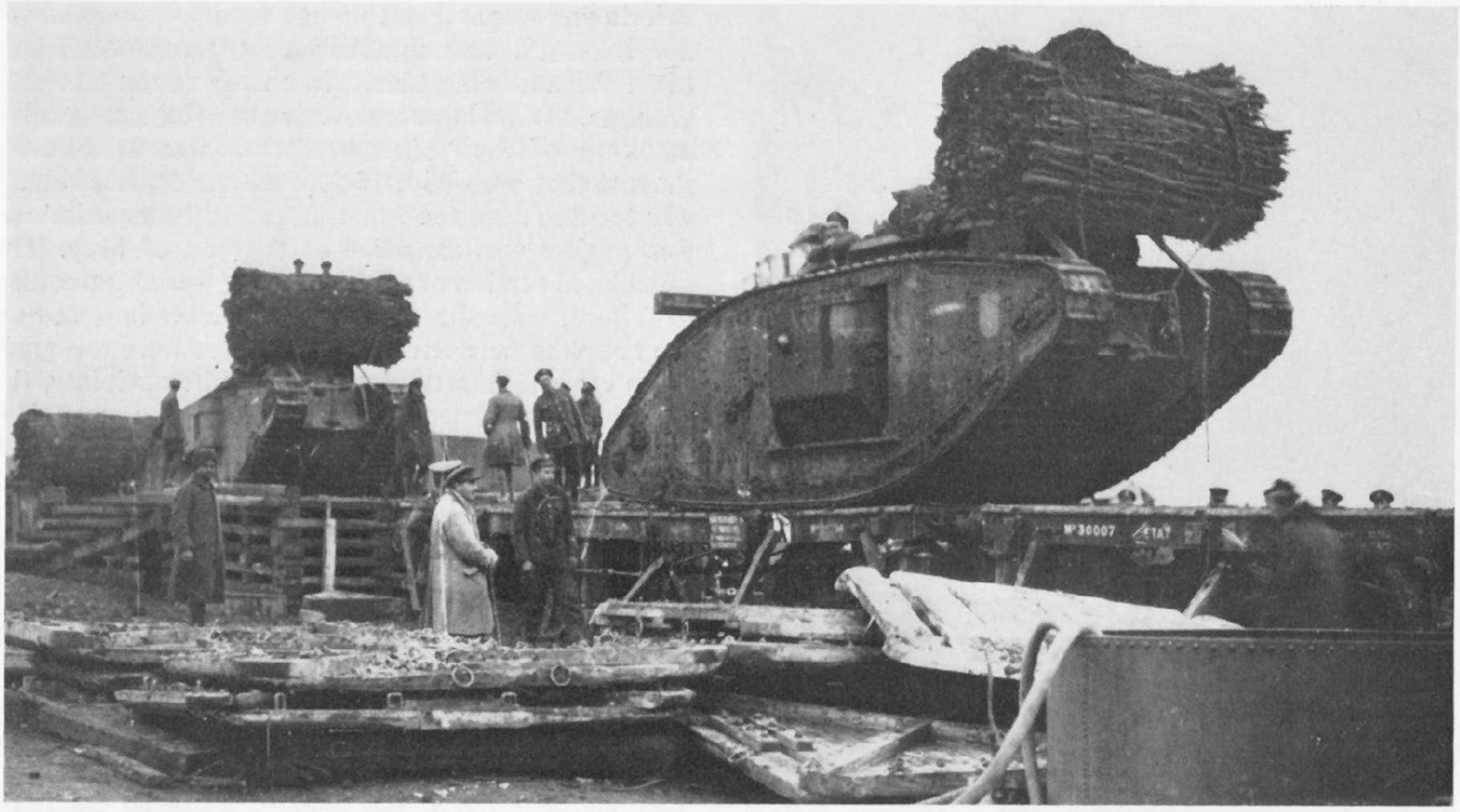
In June 1915 the two Bullock tractors arrived in Britain and were taken to a new testing ground which the R.N.A.S. had established at Burton-on-Trent, Lieut Wilson being placed in charge of the test programme. Meanwhile construction of a full-size wooden mock-up of the "big wheel" machine at Foster's showed that even with 15-foot wheels, such a vehicle was too big (and too big a target) to be practical, so this project was cancelled at the end of May. The articulated version of the "landship" was also doomed to failure; tests showed that the stresses imposed on the coupling between the two tractors were too great when crossing trenches and, despite its flexibility, the complete articulated vehicle was still too unwieldy. Work on the articulated "landship" was abandoned therefore, and the Landships Committee decided instead to build a new experimental "landship" equivalent to one half of the articulated version. On July 22, Mr. (later Sir) William Tritton, chief executive of Foster's, was asked to undertake this task utilizing the lengthened Bullock tracks which had been brought over from America. The order was confirmed two days later, and Lieut Wilson was seconded to Foster's to help Tritton with the design as a service (and Landships Committee) representative.

Utilizing the Bullock track and suspension units ready to hand, plus a standard 105 h.p. Foster-Daimler petrol engine, also readily available, work on the new design, known as the "Tritton" or "No 1 Lincoln Machine", was rapid. By August 11 construction had started, the machine having a box-like body of boiler plate while a dummy turret simulated a revolving turret with 2 pdr. gun which was planned to be fitted later. Overall height was 10 ft. 2 ins. and the weight was about 14 tons. To aid stability and assist steering a hinged steering "tail" of two 4½ ft. wheels on a bogie frame was fitted at the back. On September 10, 1915, the "No 1 Lincoln Machine" had its first trials and promptly ran into trouble, since its tracks proved inadequate for a vehicle of its size. The track centres were narrow, the grip was poor, and the tracks had a tendency to shed. Improvements were needed, and Tritton and Wilson took the vehicle in hand accordingly. After much experimentation they produced an entirely new design of track with lengthened

Mk. IV tanks under construction at Foster's, showing the Daimler engines and differentials in the centre. Simplicity of the basic design is well apparent in this view. (Imperial War Museum)

A Mk. I female converted to a wireless tank is shown to Queen Mary during a visit to Tank Corps Central Workshops at Erin, France. Note that guns are removed. General Elles, Tank Corps Commander in France is nearest to the vehicle. (Imperial War Museum)





Mk. IV male (with a female behind) being unloaded from a flat car at the Plateau railhead to take part in the Cambrai offensive, November 20, 1917. Note how the sponsons are swung inboard for transportation. Note also the early use of the fascine. (Imperial War Museum)

track frames, rollers, and shoes of cast steel which were riveted to links which in turn had guides to engage the insides of the track frames. This new—and much simplified—form of track and suspension became standard for all future British tanks produced in World War I. With new tracks, the vehicle was re-built by December 1915 and in its modified form it was named "Little Willie". It was, however, already outmoded before completion.

While the "No 1 Lincoln Machine" was running its trials the previous September, Wilson had already perfected the brilliant idea which was to evolve into the tanks which eventually reached production. A major drawback of the "No 1 Lincoln Machine" was its instability, which threatened to overturn it if it tackled a parapet higher than 2½-feet. The standard German trench parapet was 4 ft. high and the "big wheel" machine had been calculated mathematically to run over parapets of this height. Wilson therefore drew up a new scheme for the vehicle which retained the hull of the "No 1 Machine" more or less unaltered but carried the tracks around the full height of the hull in such a form that the lower run which contacted the ground was shaped approximately like an arc from a 60-foot diameter wheel. The advantages of the "big wheel" idea were thus integrated with the compact form of the crawler track "landship", giving rise to the now -classic lozenge shape associated with the tank. A wooden mock-up of the idea was shown to the Landships Committee when they witnessed the trials of the "No 1 Lincoln Machine" in September. The advantages of the new design were obvious, particularly as it met new requirements laid down by the Army, and recently passed to the committee, for a trench-crossing ability of 8-feet. To keep down the height and thus reduce the centre of gravity, the modified design dispensed with the turret and the armament was placed in sponsons, one each side of the vehicle.

REVIVED ARMY INTEREST

Meanwhile Colonel Swinton had continued his efforts to get the Army interested in "landships". He submitted a paper on the subject to GHQ in France and with the help of an interested staff officer was put in contact with the Landships Committee which Churchill had set up. This staff officer, Major Glyn, was instrumental in persuading the General Staff to liaise with the Landships Committee, as a result of which four War Office representatives were invited to join the committee at the end of June. Swinton's ideas, including his views on armament and trench-crossing ability for future "landships", could thus now, through the committee, reach the men who were actively working on the "landships" experiments. Features suggested by Swinton, including 6 pdr. rather than 2 pdr. guns and 10–12 mm. armour thickness, were incorporated in the new lozenge-shaped machine

Front view of female tank shows observation ports.

A standard Mk. IV male showing the short calibre 6 pdrs. and the Lewis gun secondary armament. This vehicle lacks rails for the unditching beam though the supports for it are seen. This particular Mk. IV was a presentation vehicle by a Chinese business man. (Imperial War Museum)

Tank communication: releasing a pigeon from the vision flap in the sponson of a Mk. V tank. Note the Hotchkiss machine-gun in its ball mount. (Imperial War Museum)

which Wilson and Tritton were building. This vehicle, known variously as the "Centipede", "Big Willie" and, finally, "Mother", was first run on December 3, 1915, at Foster's works. At about this time the name "tank" was first adopted (originally "water carrier") in place of "landship", for security reasons.

"Mother" was fully completed by January 26, 1916, and sent secretly to Hatfield Park for a full scale demonstration to the members of the Landships Committee and other interested parties. A tough obstacle course was laid out, simulating British and German type trenches and parapets, craters, ditches, barbed wire entanglements, streams, and so on. "Mother" took all in her stride including a 9-foot trench which was a foot wider than the maximum width of crossing asked for. On February 2 the same demonstration was repeated for the benefit of cabinet ministers and senior officers, including Lloyd George, who was then Minister of Munitions, and Lord Kitchener. Though Kitchener remained sceptical (calling "Mother" a "pretty mechanical toy"), the others present were very impressed. Lloyd George had been kept informed of developments over the previous six months and it had been agreed that the Ministry of Munitions would become responsible for production once a satisfactory prototype tank was ready. The Landships Committee was thus now re-constituted as the Tank Supply Committee with Lieut.Stern as chairman and Swinton as a member.

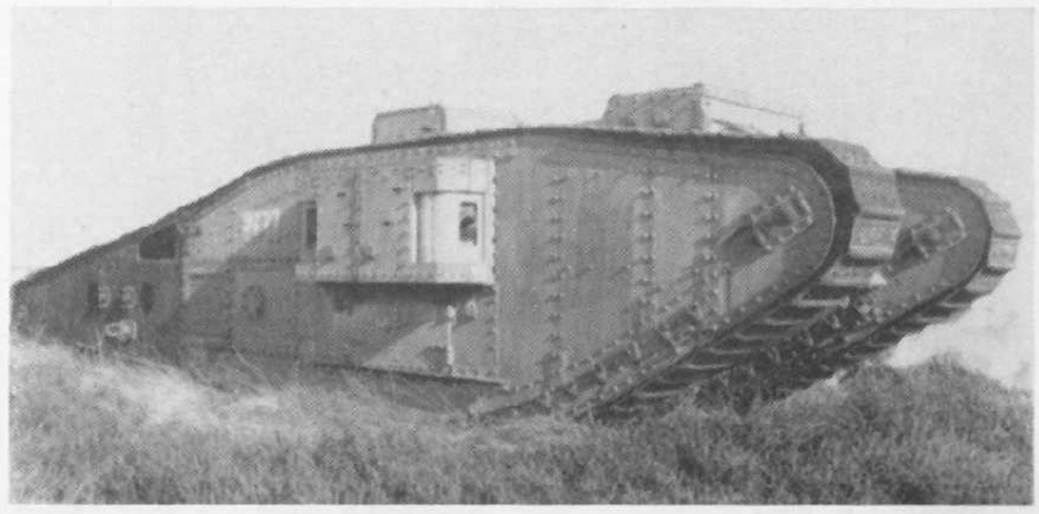
Events now moved swiftly and on February 12 the first production order for 100 tanks based on the "Mother" design was placed with Foster of Lincoln (25) and the Metropolitan Carriage and Wagon Co., Wednesbury, Staffordshire, near Birmingham (75). Churchill had not been involved in these latest developments since he had resigned from the government the previous November following the failure of the Dardanelles campaign. He was now a serving officer in France, but had kept abreast of events and at the end of 1915 sent a memorandum on "Variants of the Offensive", including the subject of "attack by armour", to the new C-in-C, Haig. Haig's interest was aroused and he appointed a staff officer, Major H. J. Elles, as a liaison officer to the Tank Supply Committee. As we have seen, Elles later became commander of the tanks in France.

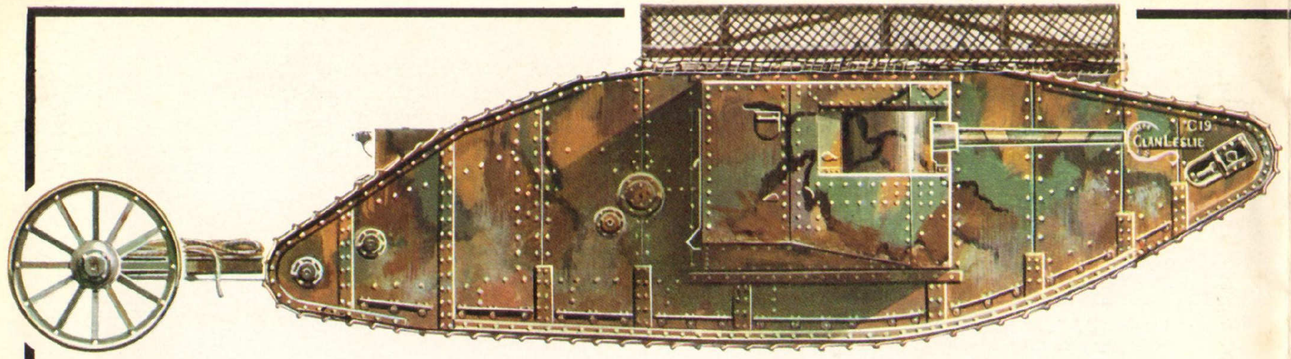
The 23 calibre 6 pdr. Hotchkiss naval gun which formed the main armament of the Mk. IV and V male tanks, seen with tank gunners under instruction. Note Tank Corps Arm Badge on left-hand man. (Imperial War Museum)

PRODUCTION AND ORGANIZATION

It was now necessary to train the men for the tanks, and Colonel (later Major-General Sir Ernest) Swinton was appointed chief of the new arm at the beginning of March 1916. Initially the force was called the "Armoured Car Section, Motor Machine Gun

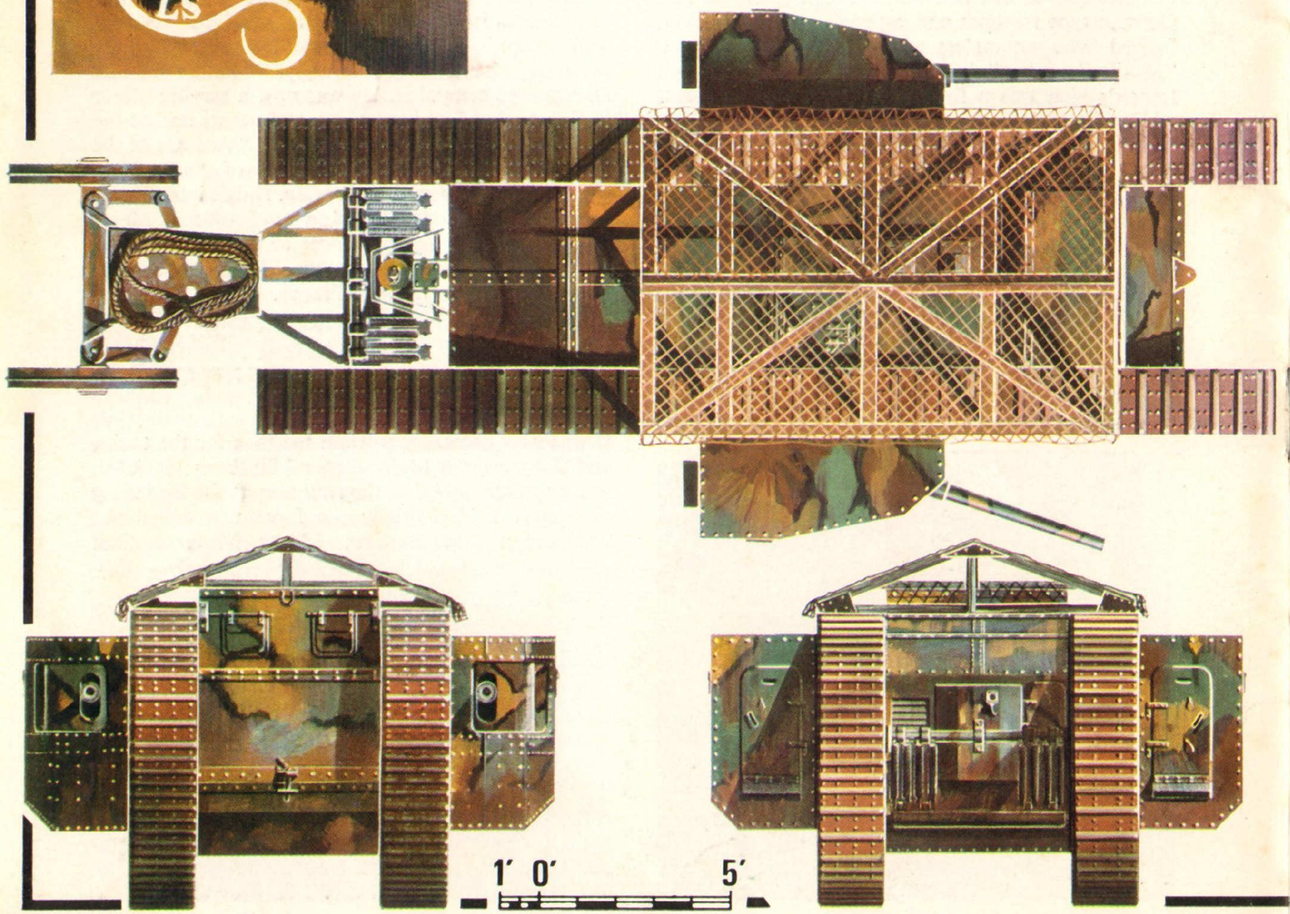
A Mk. IV female with "Tadpole Tail", its extent being clearly visible in this picture. (Imperial War Museum)



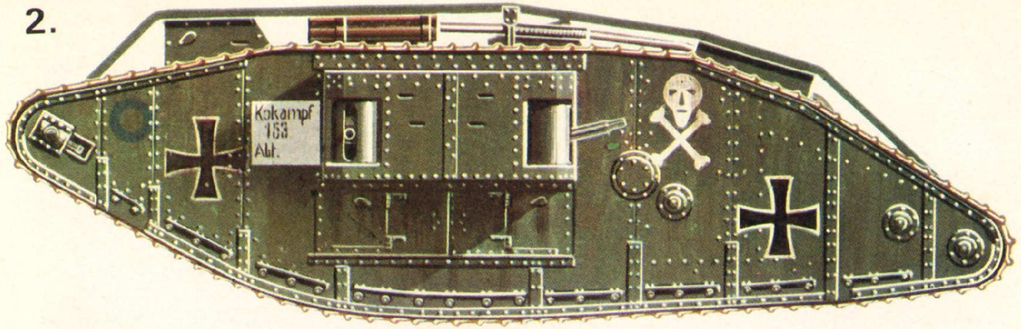


1.
Mark I Male tank of 'C' Company, Heavy Section, Machine Gun Corps: 'H.M.L.S. Clan Leslie', C.19, in camouflage finish for the Flers-Courcelette attack, September 15, 1916, the first tank action.

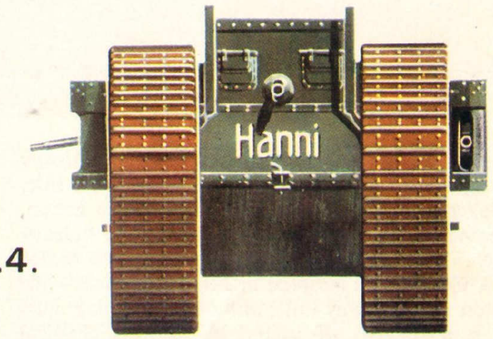
Detail of name style as applied to 'Clan Leslie'.



2.



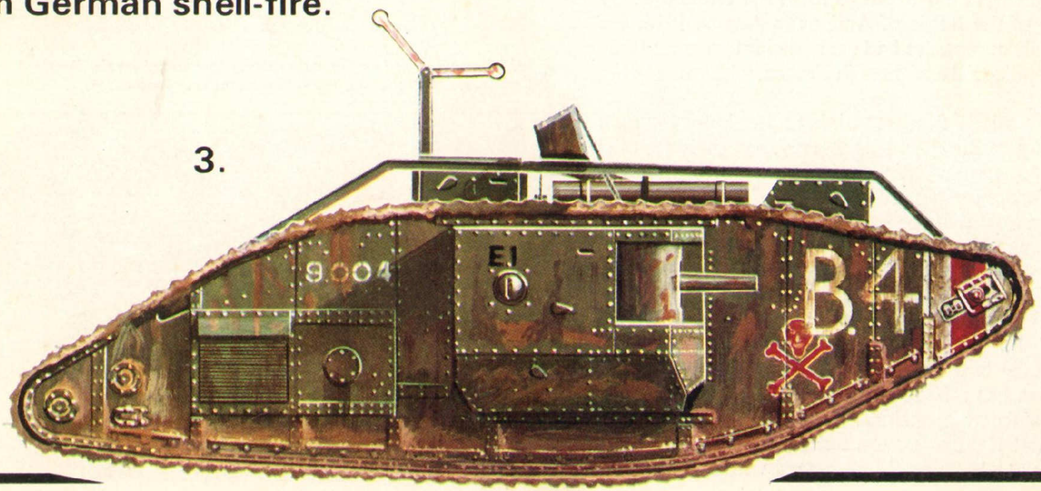
Crews' personal emblem of Mark V B.4.



2.
Beute Panzerwagen IV, (Mark IV Female captured by Germans), 'Hanni' exhibited in Berlin in January 1918.
This vehicle was captured at the Battle of Cambrai and is shown after refitting for German service, but before allocation to a German tank *abteilung,* hence the absence of the company number from the panel on the side. It retains Lewis guns, later replaced by German 1908 pattern machine guns.

3.
Mark V Male tank B.4 of 2nd (formerly 'B') Battalion, Tank Corps, August, 1918. This vehicle took part in the Battle of Albert on August 24 when it was immobilised with a damaged track from German shell-fire.

3.



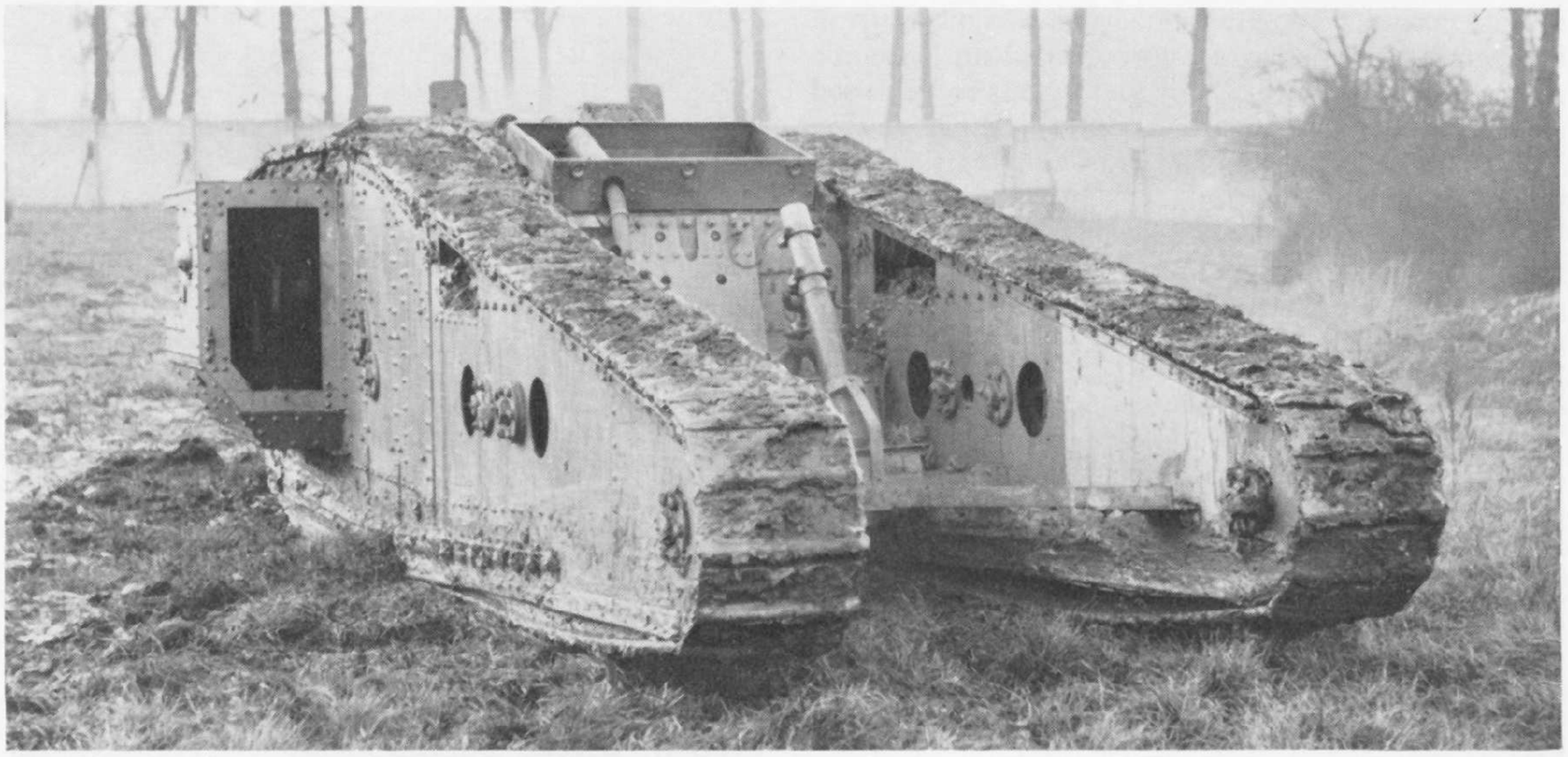
The increased trench crossing ability of the "Tadpole Tail" on a Mk. IV being demonstrated at the Tank Supply Department's test ground, Wembley Park. (Imperial War Museum)

Service", but in May this was changed to "Heavy Section, Machine Gun Corps", a more secretive title. In November 1916, after the tanks had seen action, the name was to be changed once again to "Heavy Branch, Machine Gun Corps", before the name "Tank Corps" was adopted in July 1917. Meanwhile Swinton toured Army units and officer training units picking a nucleus of volunteers with mechanical experience for training as crews, and the R.N.A.S. personnel (including Stern and Wilson) were all transferred to the Army with the appropriate ranks. Swinton planned to build up three complete tank battalions each of five companies with 12 tanks each. His plan was vetoed by GHQ in France, however, who wanted a basic company organization, each with 25 tanks. This was the establishment in force at the time of Flers-Courcelette. There were six companies—A, B, C, D, E and F—of which C and D arrived in France in August, A in September on the very morning of the attack, and B in October. After the tanks had made their mark, however, and were given their own organization in France, the corps was further re-organized (from January 1917) into battalions each with three companies of 25 tanks each. The existing companies were expanded to form the battalions. By the time of the Battle of Amiens in August 1918, the original six companies had expanded into a great force of 18 battalions, 16 of them in France, with more being formed.

In March 1916 the first training school for tank men was set up at Bisley ranges, Surrey, but three months later, in June, on delivery of the first tanks they moved to Thetford, Norfolk, on the estate of Lord Iveagh. It was from here that the first two companies, C and D, followed shortly by A, left for France in August 1916. By the following November a larger establishment was required to cope with the expansion plan, and Swinton selected Bovington Camp, at Wool in Dorset, as a new "home" for the tanks since there was plenty of surrounding heathland available for realistic training. Bovington has remained the training base for British armoured forces ever since.

The first 100 production tanks were all planned to be similar to "Mother" and armed with 6 pdr. guns. In April 1916, however, Swinton was instrumental in changing this schedule to include a proportion of vehicles—eventually settled at half-and-half—to have an all-machine-gun armament, the idea being to provide vehicles capable of protecting the 6 pdr. gun tanks from infantry attack or of chasing fleeing enemy infantry. The tanks with 6 pdr. guns would then concentrate on tackling enemy guns, fortifications, and defences. The tanks with 6 pdr. guns were known as "males"—paradoxically making "Mother" a male —while the vehicles with machine-guns only were known as "females". Approval to increase the initial order to 150 vehicles was obtained at the same time. The 6 pdr. guns were obtained from the Admiralty (who also provided training facilities for them), since at the time "Mother" was designed the Master-General of Ordnance was still unsympathetic to the "landship" idea and refused to make Army guns available. The female tanks had two Vickers machine-guns in place of each 6 pdr. in a modified sponson. Secondary armament in both male and female Mk. I tanks consisted of Hotchkiss machine-guns in ball mounts.

A Mk. II male tank in a German second-line trench at the Battle of Cambrai, November 20, 1917. (Imperial War Museum)



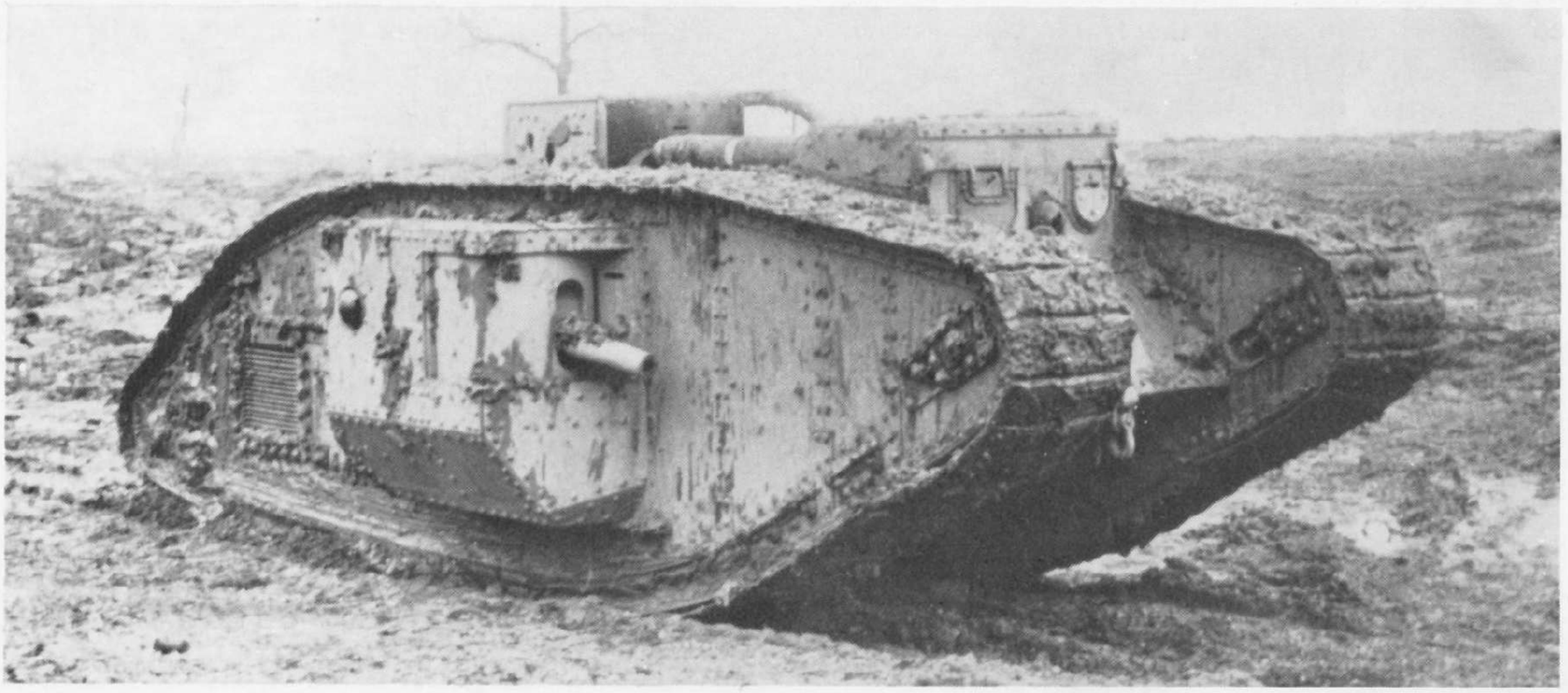
Rare view of a Mk. IV male with "Tadpole Tail" and Stokes mortar carried on a platform between the rear horns as tested in summer, 1918, by the Tank Supply Department at Wembley Park. (Imperial War Museum)

TANK MK. I

The Mk. I tank, which was the type used at Flers-Courcelette and succeeding tank actions until about May 1917, was virtually identical to "Mother" except that it was built of armour instead of boiler plate. Of riveted construction throughout, it was essentially a box with lozenge-shaped sides carrying the tracks. There was a raised cupola in the hull front for the driver and for the commander who was also the brakesman and a sponson on each side carrying the main armament in limited traverse mounts. The sponsons could be unbolted for transportation by rail to reduce the width and the weight. Sometimes the sponsons were towed behind the vehicle on a trailer in confined areas like country lanes, also to reduce overall width. Removing and replacing the sponsons was an arduous task since each weighed 1 ton 15 cwt. and had to be manhandled. There was a round manhole in the roof for observation and egress, but the usual means of getting in or out of the vehicle was through the door fitted in the rear of each sponson.

Other external features peculiar to the Mk. I when it first went into action in 1916 were the bomb-roof and the "steering tail". The former was a tented roof of chicken-wire on a wood or wire frame, carried above the hull top to prevent hand grenades from lodging and exploding on the roof. This was cumbersome, fragile, and in practice hardly needed, so the "bomb roof" idea was soon discarded. The "steering tail" was the device introduced in the "No 1 Lincoln Machine" to aid stability and steering. It consisted of two iron spoked wheels on an Ackermann steering axle controlled by wires from a steering wheel in the

The Mk. V featured a new engine and a raised cupola on the hull top. This is the male version. (Imperial War Museum)



driving position. The entire bogie unit was sprung from the back of the hull which also carried an hydraulic ram which allowed the bogie and wheels to be raised clear of the ground for normal travel. A towing hawser and other stores were normally carried on a platform on the bogie frame. Main aim of the "steering tail" was to give increased effective length for trench crossing and also to assist steering. Very large radius turns or minor course corrections could be effected by the rudder-like action of the "tail" with no need to change gear on the vehicle's tracks. While the "steering tail" was effective on good ground, however, it proved something of a hindrance in combat conditions since it became easily bogged in mud or craters and was vulnerable to shell-fire. As a result the "tails" were completely discarded from November 1916 and steering was carried out by gear changing only. After the Mk. Is had the "tail" removed, most were fitted with a stowage tray on the hull rear between the "horns" to take the hawser and other stores.

The centrally mounted engine was a Daimler 105 h.p. petrol type as had been used in the Foster-Daimler tractor. It had a two-speed gearbox with a differential drive to two cross-shafts. These were connected, inside the horns, to the rear driving sprockets by chain drive and reduction gear. A gravity feed fuel system was used which gave the disadvantages of fuel starvation when the tank was reared at certain angles and a fire risk due to the petrol tank's being mounted high inside the hull. There was a tubular water radiator sited behind the engine with a fan driven from the engine. Outlet louvres were cut in the hull rear but air intake was simply through the normal openings in the hull. The engine exhausts were led straight to holes in the hull roof. To disperse smoke and sparks twin baffle plates were fitted over each hole; some vehicles were later fitted with extemporized silencers and exhaust pipes by the Central Workshops at Erin in France. Steering was effected either by applying the brake on one side, which was tiring for the brakesman (as much effort was required) and bad for the brakes, or by changing gear to neutral on one side and engaging first or second gear on the opposite track. Then the clutch was let in and the vehicle lurched round accordingly. Four men were needed for this operation, two gearsmen at the differential obeying hand signals from the driver and the brakesman commander who sat at the front. Once the new

A Mk. V female on test showing to advantage the flaps in the side of the cupola and the hatch introduced on the driver's cupola. Note also the access hatches beneath the sponson. (Chamberlain Collection)

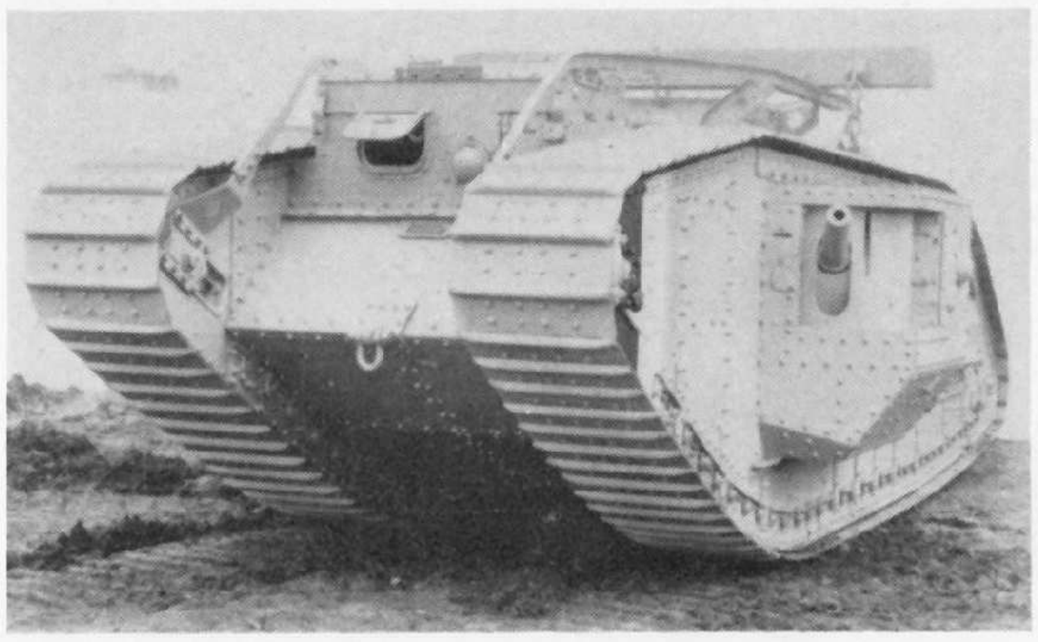
direction was achieved, of course, the gears had to be changed again for straight running.

The Mk. I, like its immediate successors, was a roomy vehicle, but uncomfortable for the crew. Vision devices were crude, just slits or flaps, ventilation was poor, and the ride was rough since the tracks were not sprung. The armour plate was riveted to unarmoured angle irons and girders (while the armour quality was itself crude), so that there was much "splash" particularly when joins were hit by small arms fire. Communications were equally crude; each tank normally went into action with two carrier pigeons but other than that flags (or voice) were the only means of communication. Initially it was planned to pay out a field telephone cable from each tank as it moved forward, but this had obvious limitations and the equipment, though fitted at first, was never (or rarely) used.

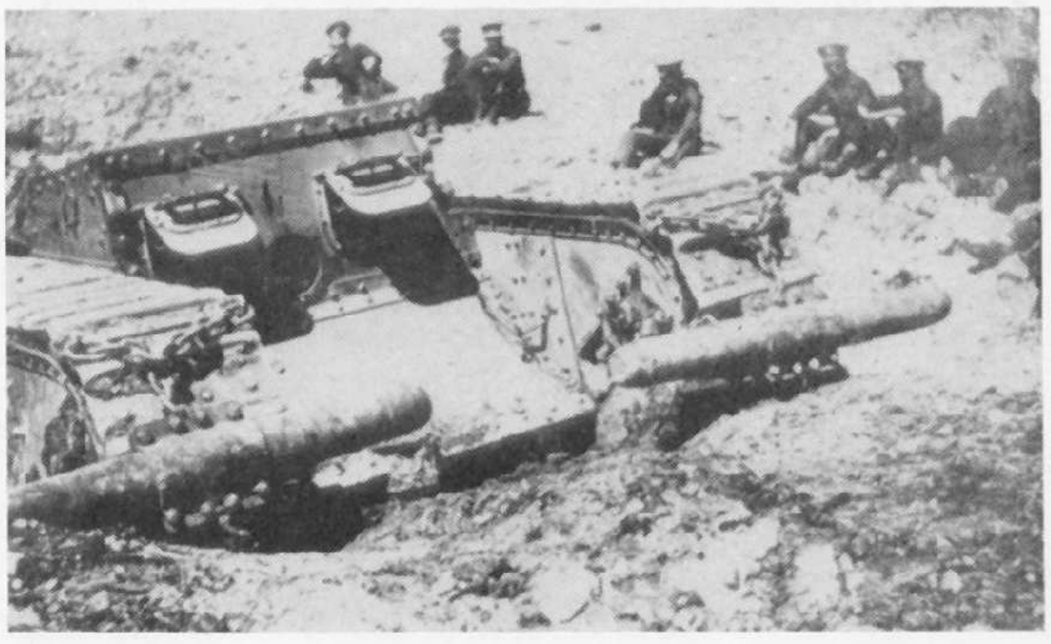
MKS. II AND III

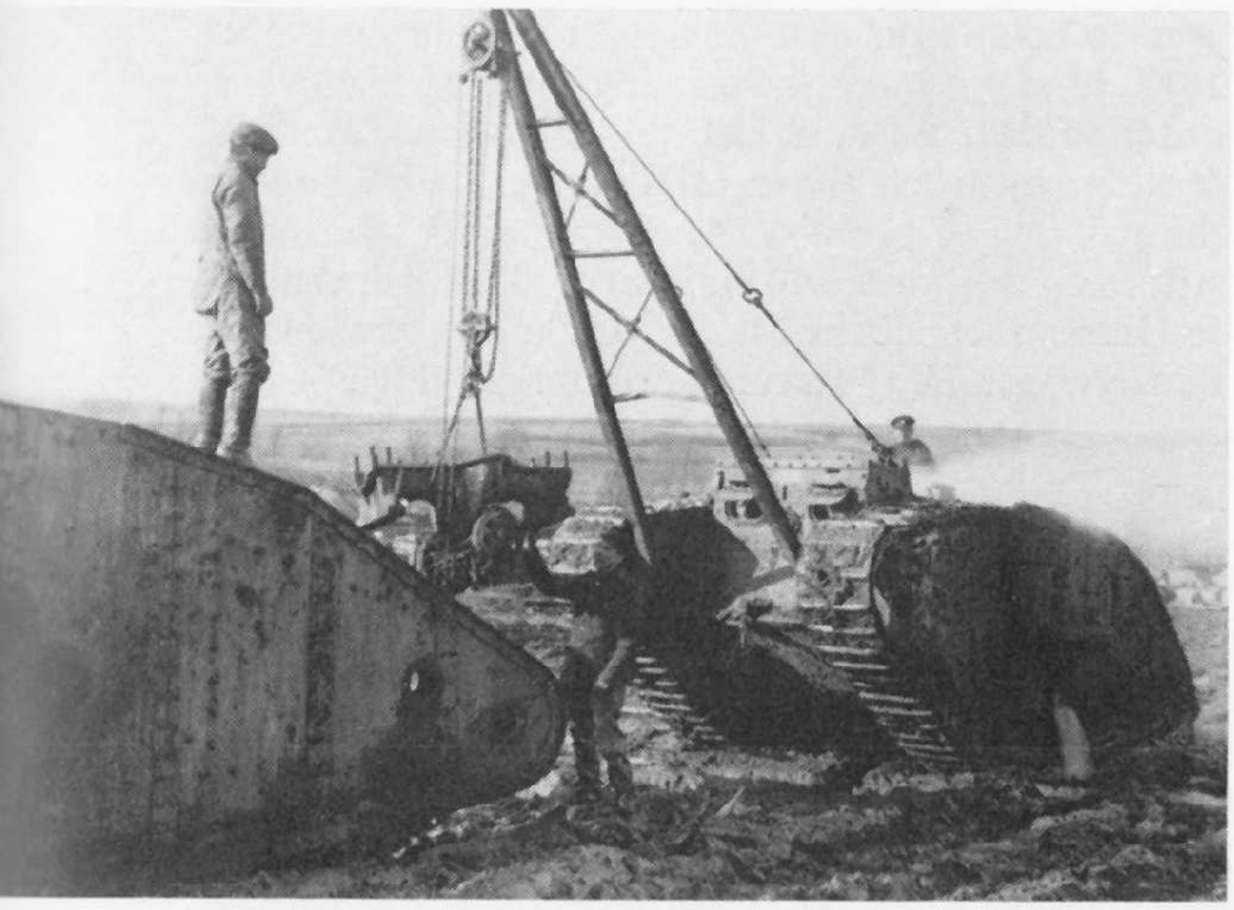
Haig's request for a thousand more tanks after Flers-Courcelette was seen by the tank pioneers as a triumphant vindication of their previous efforts. Stern, now a Major, whose committee had been recently re-organized as the Tank Supply Department, instantly placed orders for the necessary armour plate and engines. A man of great energy and foresight, he also realized that the Daimler engine and its associated

Fine view of a Mk. V male in "mint" condition shows the unditching beam on its rails and the ball mount in the front cupola for the machine-gun.



Prior to the introduction of the unditching beam torpedo spuds were used for the same purpose. Here tank crews under training watch a demonstration of their use. (Imperial War Museum)





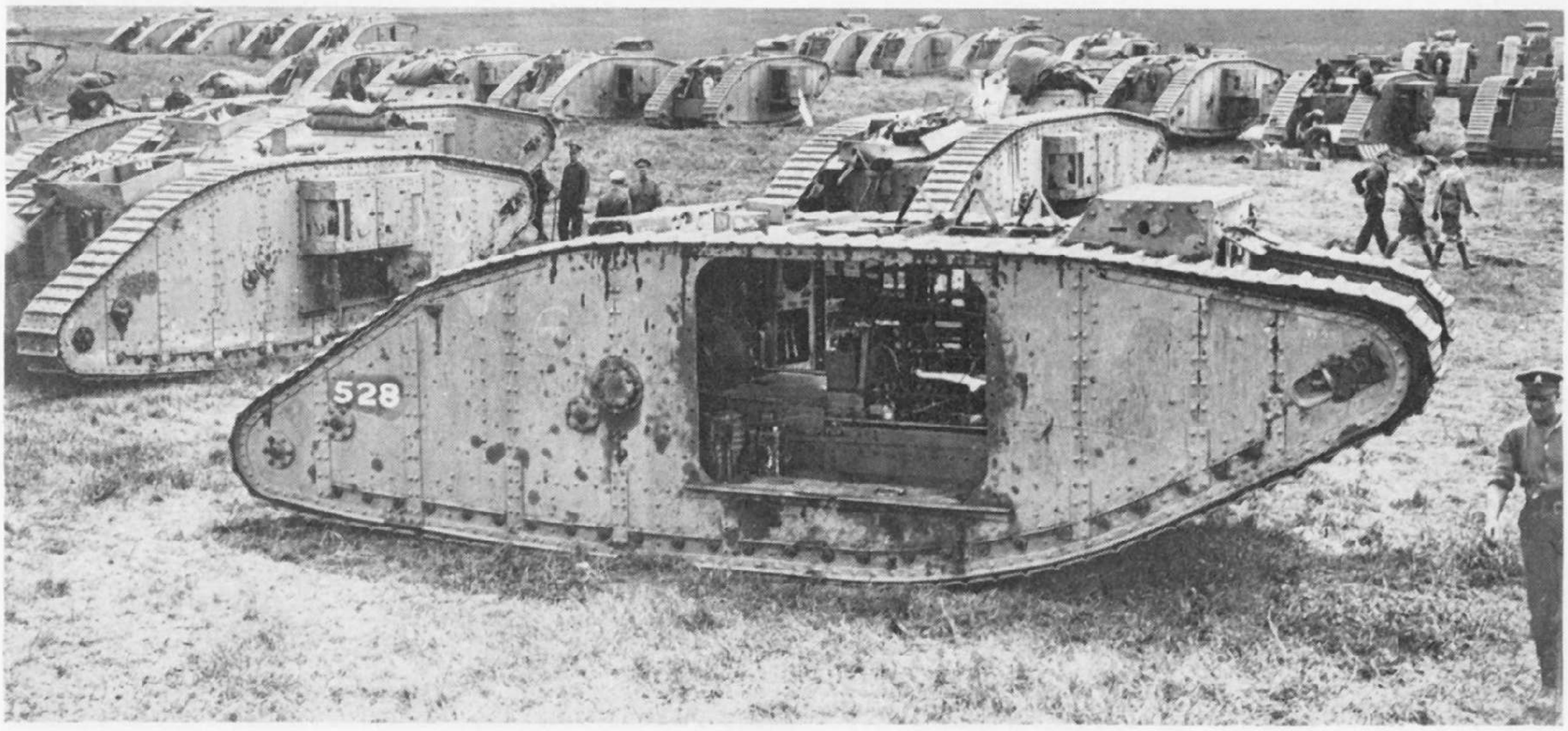
A few Mk. IV's were converted to Salvage Tanks by the addition of sheerlegs and Westons purchase. They were used mainly at the tank parks and at the Erin depot for maintenance work on damaged tanks. (Imperial War Museum)

Chinese labourers hosing down a Mk. V in for repair at the Erin depot. Note the ball mount for the rear machine-gun, the external armoured fuel tank, and the post with semaphore arms for signalling. (Imperial War Museum)

transmission were the least satisfactory part of the existing Mk. I design; at this time, therefore, he took steps to investigate some alternative types of drive and transmission for possible fitting to future vehicles. On October 10, 1916, however, the Army Council cancelled Haig's order for a thousand vehicles—a decision which Stern was now easily able to reverse by an appeal to Lloyd George. Additionally, while an improved design for the new tanks was being worked out he obtained permission for another 100 of the existing design to be built as an interim type to keep the factories occupied. Designated Mks. II and III (50 of each) and produced, once again, in both male and female form, these vehicles were similar in all respects to the Mk I save for detail alterations. Most obvious of these were a revised hatch with raised coaming on the hull top and wider track shoes at every sixth link (in most vehicles) to give improved traction. Mk. III, in addition had thicker armour, to Mk. IV standard. Internally there were several stowage modifications. Produced in early 1917, they supplemented the Mk. Is and some remained in first-line use at Cambrai in November 1917, though largely supplemented by Mk. IVs by then. They were used in all the earlier tank actions of 1917 at Arras, Messines and Ypres.

Once replaced in first-line service by later Marks, Mks I–III were used either for training or for "special purpose" roles. Foremost of these were those converted to Supply Tanks. Guns were removed and the embrasures plated in so that stores could be carried. These vehicles could supplement what they could carry by towing so-called "tank sledges" which were made by the Tank Corps Central Workshops in France. Each sledge held 10 tons of stores and up to three could be hauled by one tank. The other rôle of the redundant Mk. Is was as wireless tanks, unarmed but with an

Rollencourt Tank Park in June 1917 showing Mk. IV's under maintenance in the background with an old Mk. I (D23) nearest. Manhole hatch on the hull top of the latter is just visible. (Imperial War Museum)



"office" built into one sponson and wireless equipment in the other. They had a pole-mast and spreaders for the aerial. Wireless tanks were used at Cambrai to send back messages, the first time wireless was used in action from tanks.

MK. IV

By February, 1917, production was ready to start on the new design to fulfil the main order. Designated Mk. IV, this vehicle retained the engine and transmission of the earlier Marks but incorporated many other refinements in the light of battle experience. Chief among these were an externally mounted fuel tank with Autovac pump fitted between the rear horns, smaller sponsons for both male and female versions which could be swung inboard rather than unshipped for transportation, silencer and exhaust pipe for the engine, improved internal stowage, short calibre 6 pdr. guns in the male to improve manoeuvrability, and Lewis guns (later replaced once again by the Hotchkiss). There was also an "unditching" beam and associated carrying rails on the hull top. Armour thickness was increased to 12 mm. on this vehicle since the Germans had by this time developed an anti-tank rifle and bullet which could penetrate the thinner sides of the Mk. I. The first production Mk. IVs were delivered in April 1917, and 1,015 were built in the ratio of two male to three female.

A full description of the Tank Mk. IV together with an account of its participation in the Battle of Cambrai, the first great tank action where tanks were used *en masse*, is given separately in this Series.

Suffice to say here that the Mk. IV was numerically the most important tank of World War I. By the fortunes of war it also became the most important German tank. Mk. IVs captured at Cambrai and earlier actions were re-fitted by the Germans at their tank base at Charleroi, re-armed as necessary, and used to equip four new tank companies in December, 1917, to supplement the existing three with A7Vs. In order to distinguish British tanks from similar types captured by the Germans, GHQ, in June, 1918, ordered the painting of prominent red and white recognition stripes on the horns and cupolas of all British vehicles. In German service the Mk. IV was known as the Beute Panzerwagen IV ("captured armoured vehicle").

MK. V

On March 3, 1917, several Mk. I and Mk. IV tanks were tested by the Tank Supply Department fitted with the experimental transmissions and power units which Stern had ordered from companies and engineers working in this field. One vehicle had Westinghouse petrol-electric drive which could be controlled by one man and had a motor and generator to each track giving infinitely variable speed control. A similar vehicle had Daimler petrol-electric drive, while a third was fitted with Williams-Janney hydraulic pumps and motors which gave a form of control similar to the petrol-electric vehicles using a pump for steering and speed regulation. A fourth vehicle was a very complicated type with Wilkins Multiple Clutches which involved much gear changing to maintain a straight course. Last of all there was a vehicle fitted with an epicyclic gearbox designed by Major (formerly Lieut.) Wilson who had been involved with the design of the earlier vehicles. Epicyclic gearing and brakes replaced the change-speed gearing in the rear horns as fitted in earlier Marks and there was a four-speed gearbox on the planetary principle replacing the two-speed box and worm gear previously used. Though the petrol-electrics in particular offered attractive features, they were complicated to produce and it was therefore decided to standardize on Wilson's epicyclic gearbox for future vehicles. This was a most important step forward for it now allowed gear changing to be done

The Mk. V showing the lengthened hull. This is a female.* (Imperial War Museum)

Three Mk. V tanks (female) move through the village of Meault after its capture, Battle of Amiens, August 1918.*

by one man—the driver—with consequent improvement in vehicle control and handling.

Major Wilson now designed an improved vehicle to feature his transmission. Designated Tank Mk. V it had hull and armament similar to the Mk. IV but now also featured a new purpose-built Ricardo tank engine of 150 h.p. which Stern had ordered early in 1917 when the transmissions were being tested. The Mk. V went into production at Metropolitan Carriage and Wagon works, Birmingham, in December, 1917 and first deliveries were made to the Tank Corps in France in May, 1918. Aside from the more powerful engine—which had built-in radiator with intake and outlet louvres in the hull sides—the Mk. V had a raised cupola at the rear for the commander, which gave infinitely better visibility from the interior, and which also had flaps giving access to the unditching beam and rails from inside the vehicle. There was a semaphore arm for signalling which could be erected aft of the cupola from inside the tank and an additional machine-gun in the hull rear. Later production vehicles had wider tracks. By the time of the Armistice in November 1918, 400 Mk. Vs had been built, half male and half female. The Mk. V began to replace the Mk. IV in mid-1918 though many Mk. IVs still remained in first-line service at the time of the Armistice.

MK. V DEVELOPMENTS

Though the lozenge-shaped tanks could cross 8–10 ft. trenches there was, by late 1917, a demand for increased trench-crossing ability. Tritton of Foster's offered the solution of the "Tadpole Tail"—longer rear horns to replace the existing horns. These were to be built as a "kit" and sent to France for fitting to existing tanks. The "tail" increased vehicle length by about 9 ft. and was quite effective, but trials showed that it lacked rigidity especially over rough ground. Thus the idea was not adopted for service. In summer 1918 tests were carried out with 6-inch Newton and Stokes mortars mounted on a platform between the rear horns on a "Tadpole Tail" vehicle. The idea was to put down covering fire ahead of a moving formation of tanks. Other tests were made with mortars in the sponsons. Neither of these ideas was put into practice.

A superior solution to the "Tadpole Tail" was evolved by the Tank Corps Central Workshop. An extra 6 ft. of side panelling was simply inserted into a vehicle which had been cut in two. This gave longer ground contact with no loss of rigidity and had the added advantage of giving greatly increased internal capacity, ideal for carrying stores or infantry. Up to

A Mk. V male complete with recognition stripes. Note side door in lengthened section. The 6 ft. long extension was made up of three additional standard 2 ft. wide side panels.*

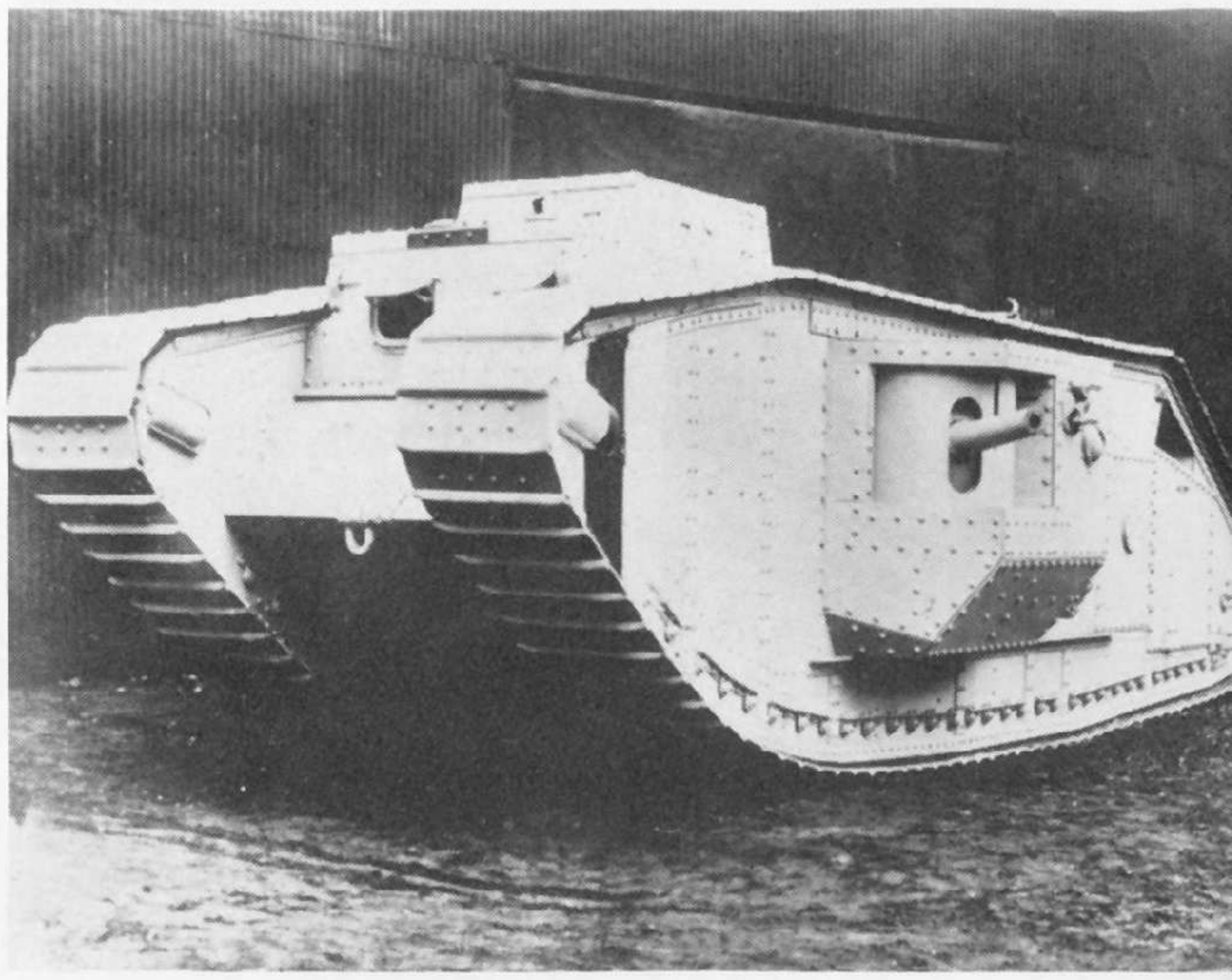
25 infantrymen could be accommodated and the idea of using these vehicles to carry troops was tried at the Battle of Amiens in August 1918. However, due to the poor ventilation in the tank the troops were in no condition to fight when disembarked. As modified the vehicle was designated Mk. V* and was used mostly as a store carrier in the closing months of the war. Of 579 vehicles converted (additional to vehicles used unconverted as Mk. Vs), 327 were in service by the time of the Armistice and another 23 were used by the United States 301st Tank Battalion together with 12 standard Mk. Vs, this unit being the sole U.S. tank battalion with British tanks and operating under British control.

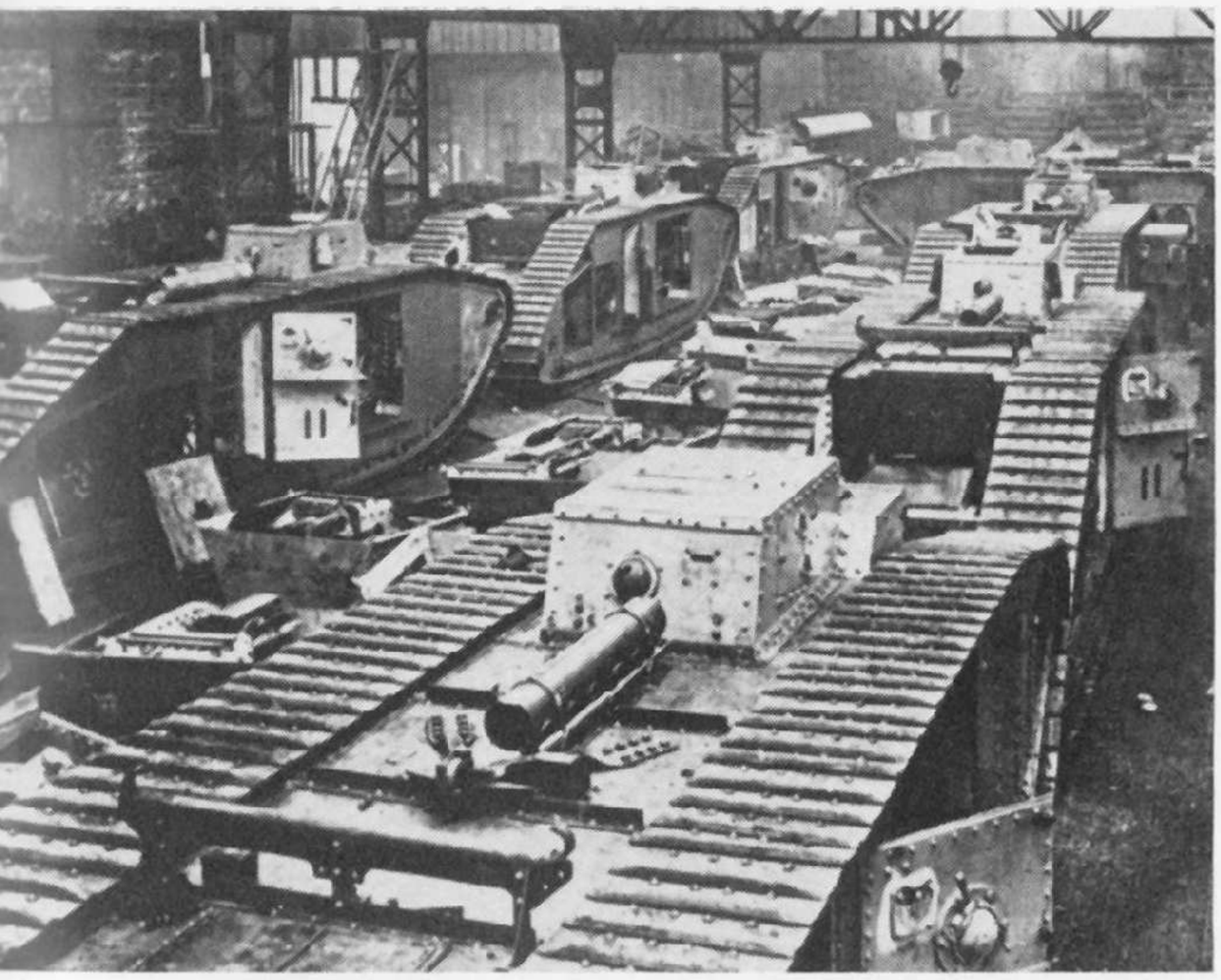
A refinement of the Mk. V* was the Mk. V** which was mechanically and physically similar except that it was built (by Foster's) as a lengthened vehicle from the start. The commander's cupola in the V** was brought forward immediately behind the driver's cupola. Only 25 Mk. V** were built and none were completed until after the war. Most were used in post-war days as the British Army's first bridge-laying and mine-clearing tanks in an experimental R.E. squadron. Initial orders for the Mk. V** had totalled 200 vehicles, but this was reduced just before the Armistice in anticipation of the Mk. VIII which was scheduled to go into production soon.

Fittingly the Mk. Vs were in at the kill. On August 8, 1918, nine battalions of them (324 vehicles in all) spearheaded the great opening phase of the Battle of Amiens—the turning-point of World War I. In September they led the way across the Hindenburg Line, and by the first week in November four British tank battalions were poised ready to push through the Forest of Mormal towards Mons. They never made it because the Armistice of November 11 brought four years of bitter fighting to a sudden end. It would perhaps have been poetic justice for the Army's newest arm, the tanks, to fight their way into Mons in 1918 just as the oldest arm, the infantry, had fought so valiantly to hold it in 1914. But even if they didn't make Mons, the tanks had come a long way in those four years. A new era indeed.

A.F.V. Series Editor: DUNCAN CROW

*The Mk. V** was similar to the V* but was built from the start as a lengthened vehicle instead of being converted from a Mk. V. Cupola was brought forward aft of the driver's cupola.* (Imperial War Museum)





*Mk. V** tanks under production at Foster's. Note the ammunition racks clearly visible inside the farther vehicles.* (Imperial War Museum)

SPECIFICATION—TANK MARK I

General
Crew: Eight—Driver, commander/brakesman (both in hull front). Two gunners (male), two machine-gunners or four machine-gunners (female). Two gearsmen (right and left of rear compartment).
Battle weight: 28 tons (male), 27 tons (female).
Dry weight: 26½ tons.
Power/weight ratio: 3·7 b.h.p./ton (male), 4 b.h.p./ton (female).
Ground pressure: 27·8 lbs./sq. inch (male), 26·8 lbs./sq. inch (female).

Dimensions
Length overall: 32 ft. 6 in. (with tail), 25 ft. 5 in. (without tail).
Hull length: 23 ft. 6 in.
Height: 8 ft. 2 in.
Width without sponsons: 8 ft. 8½ in.
Width over track and sponsons: 13 ft. 9½ in. (male), 14 ft. 4½ in. (female).
Track centres: 7 ft.
Track width: 20½ in.

Armament
Male: 2 × 6 pdr. 40 calibre Hotchkiss QF (Naval pattern); 3 × Hotchkiss machine-guns.
Female: 4 × Vickers ·303 machine-guns (with armoured jackets); 2 × Hotchkiss machine-guns.

Auxiliary Armament
Three Hotchkiss machine-guns (male) plus two more (female).

Fire Control
Voice and hand signal

Ammunition
Male: 6 pdr. shell—332; SAA—6,272.
Female: SAA—30,080.

Sighting and Vision
Peep slots and loopholes.

Communications
Hand signals or voice internally.
Pigeons or flags externally.

Armour
Cut and drilled as soft steel and subsequently hardened. All-riveted construction using angle irons and girders.
Front: 12 mm.
Sides and back: 10 mm.
Roof and belly: 6 mm.

Engine
Daimler 6 cylinder sleeve, in line petrol engine 105 b.h.p. at 1,000 r.p.m.
Fuel: 50 gallons internally in gravity feed tanks.

Transmission
Two-speed main gearbox with worm drive and differential. Two secondary gearboxes on differential shaft and chain drive to rear sprockets.

Suspension
Unsprung; 90 track shoes and 26 rollers.

Electrical system
Nil

Performance
Maximum speed: 3·7 m.p.h.
Vertical obstacle: 4 ft. 6 in.
Maximum trench crossing: 11 ft. 6 in. (with tail) or 10 ft. (without tail).
Wading depth (unprepared): 4 ft. 6 in.
Fuel consumption: 1 m.p.g.
Radius of action: 23·6 miles.

Special features
Some vehicles converted to Supply Tanks with wider sponsons and no guns; some others converted to Wireless Tanks in 1917.

Mark V tanks move forward with cribs to cross the tributaries of the Selle river during the final stages of the War, October 1918, when Britain's tank force was at a peak of 25 battalions, 18 of them in France including one armoured car battalion. (Imperial War Museum)

The features of the Mk. V are well shown in this posed "propaganda" picture of a vehicle crossing a British trench, manned for the occasion by Tank Corps men. This Hotchkiss-armed female shows the radiator intake louvres, the rear cupola, and the unditching beam. It is a 1st Battalion (formerly "A" Battalion) vehicle. (Chamberlain Collection)

SPECIFICATION—TANK MARK V

General
Crew: As Mk. I but with revised duties.
Battle weight: 29 tons (male), 28 tons (female).
Dry weight: 27 tons.
Power/weight ratio: 5·17 b.h.p./ton (male), 5·4 b.h.p./ton (female).
Ground pressure: 22·2 lbs./sq. inch (male), 21·5 lbs./sq. inch (female).

Dimensions
Length overall: 26 ft. 5 in.
Hull length: As Mk. 1.
Height: 8 ft. 8 in.
Width without sponsons: 8 ft. 8½ in.
Width over track and sponsons: 12 ft. 10 in. (male), 10 ft. 6 in. (female).
Track centres: 7 ft.
Track width: 26½ in. First 200, 20½ in.

Armament
Male: 2 × 6 pdr. 23 calibre QF; 4 × Hotchkiss machine-guns in ball mounts.
Female: 6 × Hotchkiss machine-guns.

Fire Control
As Mk. I; telescopic sights for main guns.

Ammunition
Male: As Mk. I.
Female: As Mk. I.

Sighting and Vision
As Mk. I. with addition of rear cupola.

Communications
As Mk. I., plus semaphore arm aft of cupola.

Armour
Construction as Mk. I.
Front: 16 mm.
Sides and back: 12 mm.
Roof and belly: 8 mm.

Engine
Ricardo 6 cylinder in line petrol type 150 b.h.p. at 1,250 r.p.m.
Fuel: 93 gallons in armoured tanks.

Transmission
Four-speed epicyclic gearbox plus chain drive to rear sprockets.

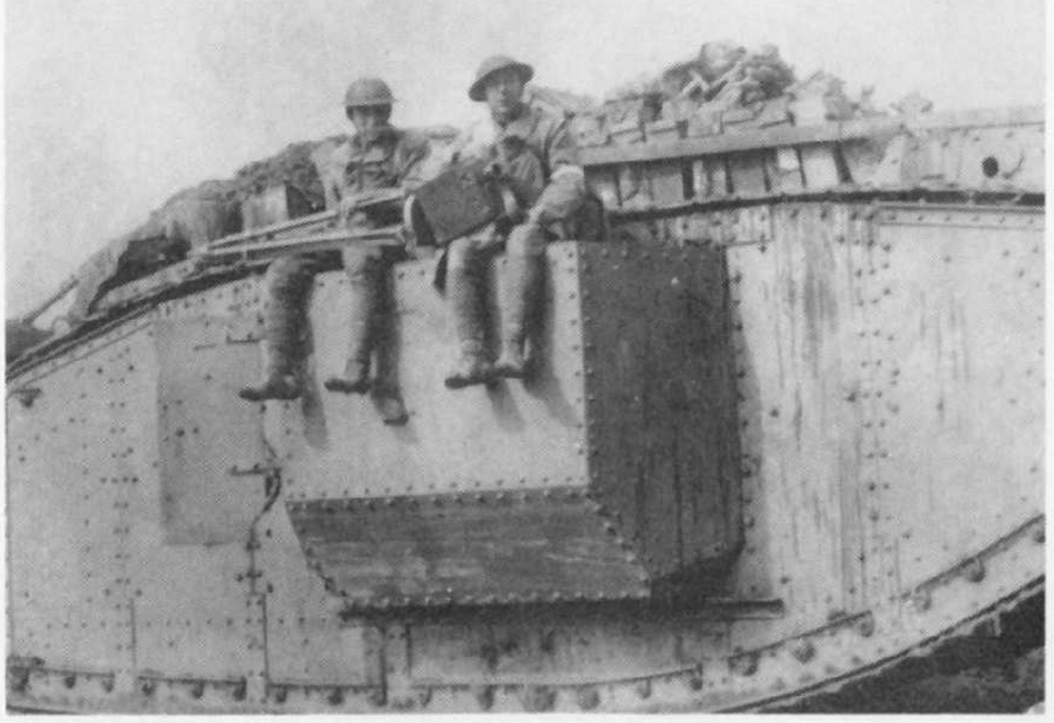
Suspension
As Mk. 1.

Electrical System
Nil.

Performance
Maximum speed: 4·6 m.p.h.
Vertical obstacle: 4 ft. 6 in.
Maximum trench crossings: 10 ft. (13 ft. on Mk. V* and V**).
Radius of action: 45 miles.

Special Features
Unditching beam on most vehicles.
Mk. V* and Mk. V** generally as Mk. V except for length (32 ft. 5 in.), weight (32–35 tons), and height (9 ft.).

A British Mk. IV Supply Tank operating in support of the U.S. 301st Tank Battalion (which also used British tanks), part of the British 4th Tank Brigade, gives a lift to two U.S. Signal Corps newsreel cameramen at the so-called "second battle" of Cambrai (the breaching of the Hindenburg Line), September 29, 1918, when the 301st first went into action. This picture gives a particularly clear view of the enlarged mild steel sponsons fitted to Supply Tanks. (Chamberlain Collection)



AFV

The new **Profile Publications** AFV Series of books on the Armoured Fighting Vehicles of the World, will continue the pattern established by the twenty-four issues of Armour in Profile. But there will be a big difference—in presentation, format, size and cost.

The new Series will be published in thirty monthly parts and each will contain twenty-four pages, up to fifty photographs, plus a full colour centre-spread of the subject tank depicted in five views, plus additional views of modified chassis.

AFV will be Edited by Duncan Crow and contributors will include many well-known names such as Major James Bingham, RTR, Peter Chamberlain, Major-General Nigel Duncan, Chris Ellis, Major Michael Norman, RTR, Walter Spielberger and B. T. White.

The thirty-month programme is as follows and each part can be obtained from your local Profile stockist, or any bookshop, model shop or newsagent, or direct from the publishers.

Part	*Title*
1	Churchill—British Infantry Tank Mark IV
2	PanzerKampfwagen III
3	Tanks Marks I–V
4	Stuart/Honey
5	Light Tanks Marks I–VI
6	Valentine—British Infantry Tank Mark III
7	Mediums Marks A–D
8	Crusader—Cruiser Tank Mark VI
9	Early British Armoured Cars
10	PanzerKampfwagen V Panther
11	M3 Grant
12	Mediums Marks I–III
13	Ram
14	Bren Universal Carrier
15	PanzerKampfwagen I and II
16	Churchill and Sherman Specials
17	Russian KV
18	PanzerKampfwagen 38(t)
19	Armoured Cars—Guy, Daimler, Humber
20	Sherman '75'
21	French Mediums
22	T–54/T–62
23	LVT I–IV
24	German Armoured Cars—Sd Kfz 231–4
25	M48/M60
26	Russian BT
27	Type 97 Medium
28	Saladin Armoured Car
29	Conqueror, M103
30	Leopard, Chieftain

A new and valuable feature of AFV will be the hard back bound volumes, which will appear concurrently with the monthly parts. These volumes, seven in all, will eventually cover in depth the history of the Armoured Fighting Vehicles of the World from the first lumbering giants of World War One, to the Panzers of World War Two and the computerized killers of today.

Each of the seven volumes will include a number of AFV parts, supplemented with additional new material on contemporary AFVs. Thousands of words of text, hundreds of new photographs and pages of new, full colour, general arrangement drawings of AFVs, together with the tank men's uniforms, which will show (in colour) the various battle colours and insignia.

Watch out for the new Profile AFVs and the luxury bound volumes, all at your local retailer during the next thirty months.

Volume One	**AFVs of World War One**
Volume Two	**British AFVs 1919-1940**
Volume Three	**British AFVs 1940-1946**
Volume Four	**American AFVs of World War Two**
Volume Five	**German AFVs of World War Two**
Volume Six	**AFVs of World War Two: Russian, French, Japanese, Italian**
Volume Seven	**Modern AFVs**