

Flame Across Britain – Part Two

On land, progress was better, and the first weapon the PWD developed was the Static Flame Trap. Perforated steel pipes (easily available from the gas and water industries) were laid along a stretch of

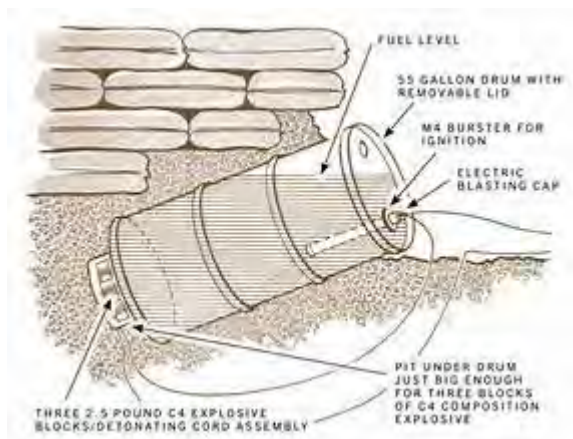


Flame trap (*left*). Remains (*right*).

road up to 50 yards in length. The pipes were fuelled from a gravity fed fuel tank using a mixture of 25% petrol and 75% gas oil. This mixing would render the fuel useless for running motor vehicles if it were captured. The best place to set one of these traps was in a sunken road, where men and vehicles would be unable to get out easily. Ignition was achieved by a Home Guard with a Molotov cocktail. Other, more sophisticated systems of ignition were later built. One of these was tested in Scotland, and according to eyewitnesses it burned much of the surroundings and melted the top surface of the road.

A development of the flame trap was the Mobile Flame Trap. The first model had a 200–300-gallon tank mounted on the back of a lorry (depending on what was available) with a pump, and could project flame about 20 yards. I'm not quite clear about the circumstances where a lorry and all the equipment could be used to mount an ambush, as ambushes are supposed to be a surprise and I'm not convinced about the possibility of camouflaging a lorry so it remains invisible at a range of 20 yards. The pumps were needed for firefighting during the blitz so this type was not developed for use.

A simpler sort was designed using smaller tanks and pressurised gas to spray the fuel mix. They could be deployed on a roadside. When the Germans arrived, the valves would be opened by a man pulling a string and the spray was ignited by a Molotov cocktail. It seems slightly comical now, but it was a serious matter to the PWD, charged with defending the nation, and to the soldiers who would be deploying them.



The third development of the flame trap was the flame fougasse (*left*). Fougasses had been used for several hundred years, being, at their most basic, a hole in the ground filled with stones and a propellant charge – crude forerunners of the Claymore Mine. The PWD, by this time, had the help of William Livens. He was the inventor of the Livens Projector of WW1, a large, cheap, single-use mortar, capable of throwing a drum of chemicals over a



thousand yards. They were used extensively during the war to deliver gas and were still standard British Army equipment in WW2. Livens was educated at Oundle School and Cambridge University, his father being the Chief Engineer, and later Chairman of Ruston and Hornsby in Lincoln.

Basically, the flame fougasse was a 40-gallon oil drum (*left*), filled with an inflammable mixture which was ejected by an explosive charge, resulting in a flame variously reported as “a jet of



Left, Intact Flame Fougasse in Kent. *Right*, Remains of a fougasse, Danskinne Bray, East Lothian.

flame 10 ft wide and 30 yards long”, “a 50-foot fireball” or “a 50 square yard sea of flame”. They came in several varieties – two of them being the fougasse and the safety fougasse. Neither of them seems particularly safe – being 50 gallons of oil resting on 7.5 pounds of explosives. The difference was that



the fougasse was installed ready to go, where the safety fougasse needed priming before it could be fired. The safety fougasse became the preferred option as it was more reliable (the permanently installed charge of the non-safety fougasse tended to become damp). It also didn't need guarding to preserve it from curious members of the public. They were generally dug into roadside sites and installed as batteries, usually of four barrels, but up to fourteen were used. Half the barrels were to be filled with the 40/60 petrol/oil mix and half with the mixture known as 5B, a mixture of tar, lime and petrol, which stuck to things when it hit them and carried on burning. *Left*, flame barrage.

The demigasse was a smaller device intended to be left by roadsides. It looked like an oil drum, as often seen left by roadsides by road mending gangs. It was left in plain sight and fired remotely, covering an

area of about 35 square yards with burning fuel. As an added benefit it was hoped that German troops would have to think about the possibility of ambush every time they saw a roadside barrel.

Finally, the hedge hopper was a barrel of fuel that was hidden behind a hedge and fired over it by a small charge, going 10 feet into the air and ten yards forward. They were simple to set up and easy to conceal but somewhat random in operation when tested and the War Office did not encourage their use.

A total of 50,000 flame fougasse barrels were filled and 7,000 batteries were installed (mainly in the south east of England). They were also deployed at 2,000 sites in Scotland and at fuel depots in case rapid destruction of supplies was needed.

Flamethrowers, invented in Germany in 1901, were used in the Great War by most of the nations involved, though they were not always effective due to short ranges, poor fuel capacity and the possibility they might incinerate the operator. The Germans used them very effectively with their shock troops. The British went the other way and the Livens Large Gallery Flame projector (yes, him again) was 56 feet long, weighed 2.5 tons and needed a crew of seven (plus 2-300 men to carry supplies into place and actually build the machine). It had fuel for three 10 second bursts with a hundred yards range, and seems to have been effective but impractical - two of the four machines used on the Somme were put out of action by German shells before use. They were used only twice – the first day of the Somme and once at Dixmunde in 1917.

It is little surprise to find that Livens became involved with flamethrowers in the PWD, though the Army was trying to develop flamethrowers too. In the autumn of 1940, the PWD issued approximately 300 flamethrowers to the Home Guard in the form of a kit. It was a 40-gallon oil drum with plumbing fittings, hoses and hand pump. The HG had to find wheels and timber for a cart. It was designed to be used as a weapon in ambushes, with a range of 18 yards and a flame duration of 2 minutes.

Other flamethrowers were available, as the Army continued to develop flame weapons at the same time as the PWD. The Army seems to have taken responsibility for man-portable systems and the PWD for vehicle-mounted systems.



Vehicle-mounted flamethrowers were designed for defending airfields from parachutists. One, designed by the Lagonda car company, had a range of 30 yards, a flame about 10 yards across and used 8 gallons of fuel a second. WASP flame thrower (*left*). Refinements to the design resulted

in a range of 70 yards. The Cockatrice, as it was known, did not go into mass production but a version known as the Light Cockatrice was developed on a Bedford QL lorry chassis and the Admiralty ordered 60, judging them to be useful in defending their landing grounds from parachute attacks. It was calculated that a German paratrooper would take approximately one minute to remove his parachute and get ready for action – a lorry speeding down the runway during that time would enable most of them to be neutralised before they were able to do any damage.

The flamethrower was also fitted to coastal vessels for anti-aircraft defence. It wasn't a long-range weapon, or particularly destructive, but it did make German bombers attack from higher altitude, which affected their bombing accuracy. A version built for Admiralty Landing Craft was not adopted and the Basilisk, a version meant for service with armoured regiments, also met with little enthusiasm.

However, from the Basilisk, grew the Ronson, named after the lighter, which was mounted on a Universal Carrier. Again, the British Army turned it down, mainly due to lack of range, but in this case the Canadian Army adopted and developed it. General Andrew McNaughton, who was an engineer and scientist in addition to being a soldier, saw the potential in it and it went into action as the WASP, seeing much successful service in Europe after D-Day. During the Italian campaign Popski's Private Army fitted one of their Jeeps with a WASP flamethrower but the results did not justify modifying more.



The best known PWD flamethrower project is probably the Churchill Crocodile (*left*). Several development projects using the Valentine were assessed and the PWD project was assessed as being the one with the most promise. It would go on to use the Churchill as the base vehicle and see extensive use in Normandy. The PWD also prepared a number of Sherman-based designs for the Americans, but only four Sherman Crocodiles actually saw action and the other two designs – the

Salamander and the Adder – did not go into production.