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ANTI-TANK MINES, R.E. Nos. 1 and 2

FIELD ENGINEERING PAMPHLET No. 8

1942

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FIELD ENGINEERING PAMPHLET, No. 8—1942

ANTI-TANK MINES, R.E., Nos. 1 and 2

PREFACE

This pamphlet should be read in conjunction with Military Training Pamphlet No. 40, with the proviso that anti-tank mines R.E. will be handled by R.E. personnel only.

PART I—DESCRIPTION

Section 1.—Anti-tank mine, R.E. No. 1

1. *Metal container—see* Figs. 1 and 2.

The container is a cylindrical tin about eight inches in diameter and three-and-a-quarter inches deep fitted with an airtight lid which forms the base of the mine. The outline of the mine shown in Fig. 1 clearly defines the top and bottom of the mine in the position in which it is laid.

When issued the lid should not be pressed home; if it is pressed fully home, a screw driver is necessary to extract it.

The firing mechanism is housed in a waterproof tin sleeve situated in the inner cover; the detonator fits into a tube at the bottom of this sleeve.

The container lid provides a completely waterproof seal for the explosive filling when pressed fully home.

2. *Striker mechanism*

The striker mechanism is shown in detail in Fig. 1. It consists of a hollow metal sleeve in which works a piston headed striker which is held against a compressed spring by a shear wire of 17 gauge dead-soft copper, shearing in double shear at about 80 lb.

Into the lower end of the striker sleeve screws a cap holder containing a 1·7 gram cap.

When the shear wire is sheared, the striker is driven by the spring on to the cap, the flash from which passes through a hole in the base of the cap holder into the detonator.

The striker mechanism is fitted with a rubber sleeve to prevent moisture entering the mechanism after assembly in the mine. The rubber sleeve is fitted to, and packed with, the striker mechanism.

When assembling the striker mechanism into the mine (*see* Sec. **5**, 4, iii), care must be taken to ensure that a water-tight seal is made. The rubber sleeve may not be a tight fit, in which event tallow can be smeared on the sleeve to seal the joint. Instructions are supplied in each package containing the striker mechanisms.

In the event of striker mechanisms being issued without the caps being inserted, the caps are fitted as detailed in Sec. **1**, para. 4.

3. *Spider cover*

The spider cover, which is a variation of the conventional method of actuating centrally fired mines, consists of a 14 gauge steel disc with the edge turned down to provide a skirt, which prevents the entrance of stones and earth between it and the mine when it is being buried.

Three spider legs are spot welded to the spider cover ; these legs clip over the rim of the container lid.

Spot welded to the spider cover and as near the skirt as possible are also three metal saddle projections one inch high. These ensure that a vehicle passing over the edge of the buried mine will bring direct pressure to bear on the spider cover, and thus facilitate the functioning of the mechanism.

To guard against the spider cover being forced against the firing mechanism during assembly, and thus possibly shearing the wire with fatal results, a one inch hole is provided in the centre of the spider cover. This hole is closed by a screwed plug which cannot be screwed beyond the inner face of the cover. When the cover is being put on, this plug is removed, and it is thus impossible to bring any pressure on to the striker of the firing mechanism. The safety plug is replaced by screwing in as far as it will go after the mine has been buried to the required depth.

Special provision has been made in the design to ensure that when the three spider legs are clipped on the rim of the container lid, the spider cover is held at its correct distance from the top of the striker by means of a hollow three-leaf steel wire spring.

4. *Method of packing*

The empty containers and the spider covers will be issued in bales of 12.

The striker mechanisms, with caps inserted, will be issued in boxes of 96, the boxes being labelled " loaded."

ANTI-TANK MINE R.E. No 1.

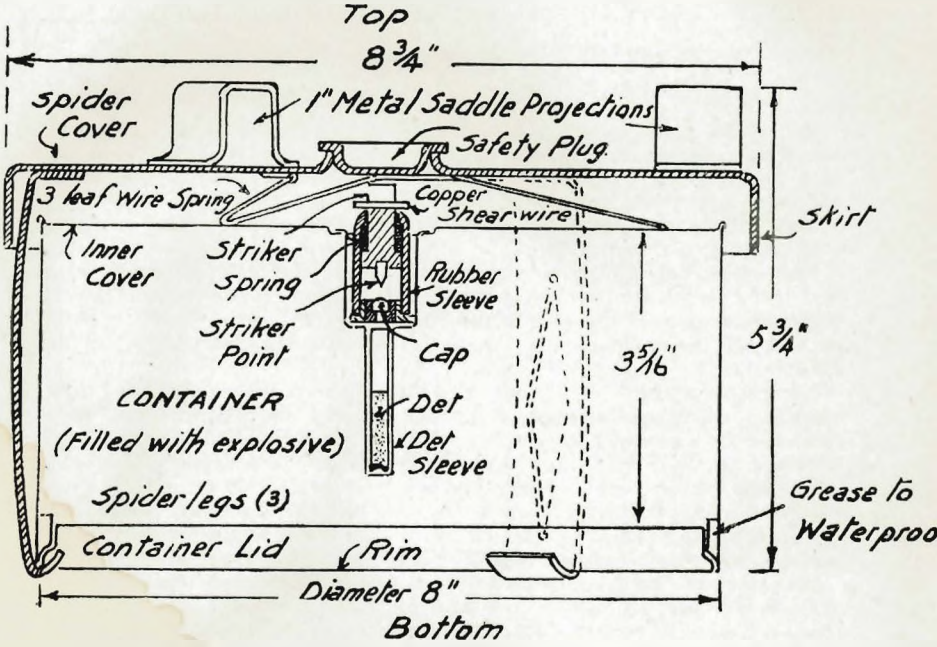

FIG. 1. SECTIONAL ELEVATION.

ANTI-TANK MINE R.E. No 1.

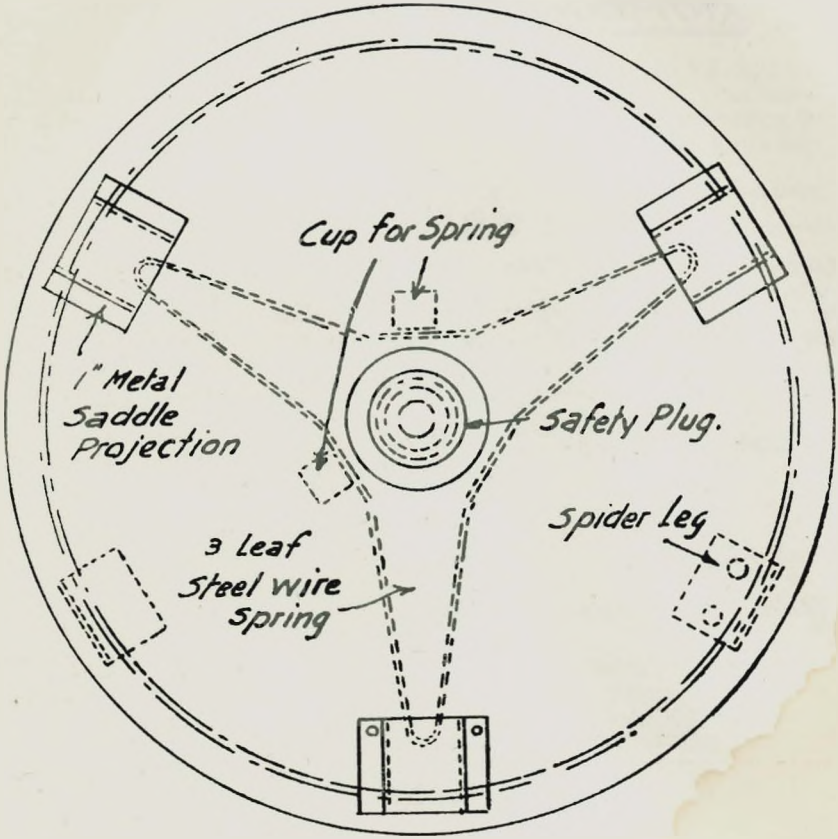

FIG. 2 PLAN

If for any reason the striker mechanisms are issued without caps, the boxes will be marked accordingly and the caps issued separately in boxes of 96. In this event the caps must be inserted by units as follows :—

i. Unscrew the cap holder from the base of the firing mechanism.

ii. Insert a small dab of shellac varnish into the recess of the cap holder and insert cap with the domed top uppermost. It will be noted that the domed top of the cap has a small hole in the centre through which the striker of the firing mechanism passes.

Section 2.—Anti-tank mine, R.E. No. 2

1. *Metal container—see* Fig. 3

This container is similar to that of the anti-tank mine, R.E. No. 1 except that the sleeve in the inner cover is designed to take a detonator only.

2. *Striker*

In place of the usual spring driven striker, a new method has been adopted for the actuation of the mine. Although this method of firing appears doubtful, a large number of tests have proved that it is almost 100 per cent. reliable.

A 1·7-grain cap is dropped into the open end of the detonator in such a way that it rests on the A.S.A. filling, with the convex surface uppermost. On the top of this cap is lowered the striker pin with its point resting on the cap. A rubber waterproof cap is placed over the striker.

The striker pin projects three-eighths of an inch out of the detonator tube and is driven into the cap by the action of the spring cover. The clearance between the cap and the detonator is such that the cap cannot turn over as it slides down.

3. *The domed spring cover*

Over the inner cover of the container fits a circular domed cover plate of work-hardened mild steel, round the edge of which is a welded tin plate skirt. Pressure on any part of this domed cover plate will cause it to spring downwards and deliver a blow on the top of the striker. This skirt serves to position the cover plate on the container and also to prevent rainwater reaching the inner cover of the mine and the striker. Although perfectly reliable in rainy or damp weather, this mine is not completely reliable if water is standing above the level of the inner cover, although

even in these conditions it will probably fire when the appropriate pressure is applied. A domed lid that has been sprung, stays in the operated position and can be reset.

4. *Method of packing*

The mines will be issued in packages containing 20 containers, complete with lever lids and domed covers together with a box labelled " Strikers—Rubber caps—Detonating caps," inside which are three separate packages containing 25 strikers, 25 rubber caps, and 25 detonating caps respectively. The last-named package will be marked in red " Detonating caps (25)." The box will be packed in wood wool, or similar packing *inside* one of the empty mine containers which will be marked to this effect.

ANTI-TANK MINE R.E. No 2.

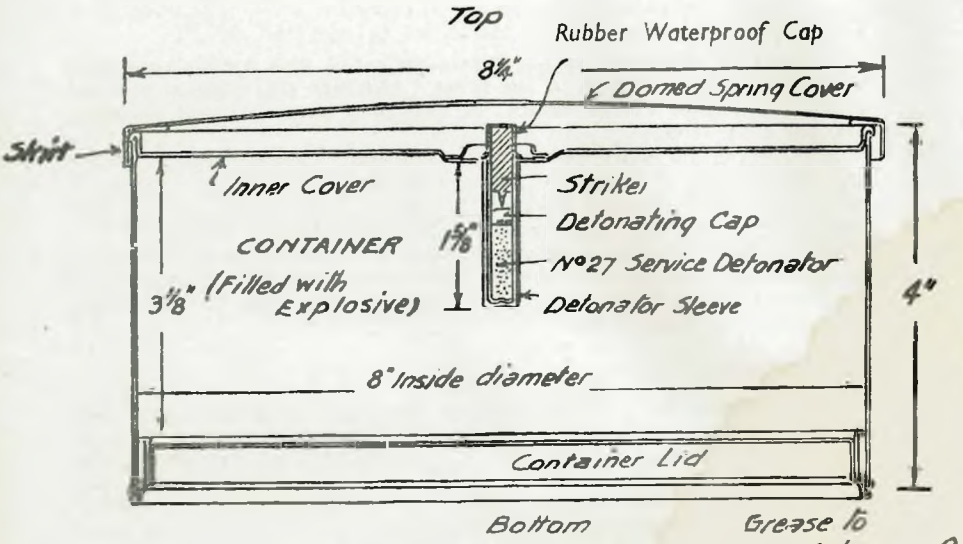

FIG. 3. SECTIONAL ELEVATION.

PART II—EMPLOYMENT

Section 3—General

1. *Use*

The anti-tank mines, R.E., Nos. 1 and 2, have been designed to be issued unfilled, and to be filled locally by any R.E. unit, utilizing readily available commercial explosives such as gelignite, ammonal, blasting gelatine, or dynamite.

They will normally be regarded as a reserve to be filled and used only in an emergency. They will not be laid in minefields which are expected to remain for any considerable time, nor will they be kept filled in store for any long period.

2. *Sensitivity*

In both these mines the firing mechanism has been designed primarily to enable them to be used when buried one inch below ground level. In consequence of this fact, the firing pressure on the mines in the open is very much less than that of any of the previous service anti-tank mines.

The following pressures are necessary to fire the mines :—

R.E. No. 1 mine	...	40 lb. pressure on edge of cover plate.
R.E. No. 2 mine	...	40-45 lb. pressure two inches from the edge of the cover plate, or 80 lb. in the centre.

They are safe to lay and cover provided that the instructions given in this pamphlet are adhered to, but it must be clearly understood by all ranks that, **once laid, the mines will certainly fire under the pressure of a man's foot.**

Section 4.—Method of filling and fuzing

1. *Method of filling*

Filling must be done before fuzing.

The metal container can be filled with any readily available commercial explosive of the nitro-glycerine group, such as gelignite, blasting gelatine, or dynamite, or with ammónal.

i. When filling with a nitro-glycerine explosive such as gelignite, one cartridge should be unwrapped and pushed over the detonator sleeve to act as a primer, while the remaining cartridges can be packed in their paper wrappings. They should be

pressed together as much as possible, though their power of transmitting detonation is so great that no ordinary gap is liable to cause failure.

ii. Ammonal, if in cartridges, should be unwrapped before filling. The tin should then be filled as full as possible in order that a slight ramming action is achieved when the container lid is pressed home. *No primer is required.*

Ammonal is hygroscopic and deteriorates rapidly in the presence of moisture. In view of this fact the lip of the container lid where it enters the container should be smeared with grease before it is pressed home, to ensure a watertight joint. This precaution is not essential with nitro-glycerine explosives.

When filled loosely with ammonal the mine will hold six and a half lb.; the charge of other explosives depends on the care with which the packing is carried out, but it will not be less than that of ammonal.

The container must not be filled so full that the inner cover which carries the sleeve for the firing mechanism, is forced convex. If this happens, the safety plug in the R.E. No. 1 mine, when screwed home into the spider cover, may depress the head of the striker and shear the shear wire. **This precaution is particularly necessary when filling with gelignite.**

2. *Method of fuzing*

A mine is not "live" until it is fuzed.

i. *Anti-tank mine, R.E., No.* 1

To fuze the mine, insert a No. 27 service detonator, or a No. 8 or other equivalent commercial detonator, into the lower (and smaller) portion of the stepped sleeve. Into the upper (and larger) portion of the sleeve insert a striker mechanism fitted with a cap and a rubber sleeve (*see* Sec. **1**, 2).

The mine is now "live" and care must be taken not to exert any pressure on the top of the striker. The spider cover should now be slipped on, **the safety plug having first been removed.**

ii. *Anti-tank mine, R.E., No.* 2

Remove the domed cover. Insert a 1·7 grain cap with the convex side uppermost into a No. 27 service, or a No. 8 commercial detonator, making certain that there is no sawdust or other obstruction in the detonator tube.

Put a striker into the detonator tube, in such a way that the point rests on the cap.

Slip a rubber cap over the projecting portion of the striker in order that the rim of the rubber cap grips the detonator tube, then insert the complete assembly into the detonator sleeve of the mines. Care should be taken that the rim of the rubber cap is not pushed down over the detonator tube so far that it prevents the detonator tube from resting on the bottom of the detonator sleeve.

Replace the domed cover plate, taking care to see that it has not been sprung, i.e., that the dome is uppermost. The skirt is large enough to permit the cover being placed on the container without any force. If for any reason it will not fit easily, the cover should be discarded and another one used.

Section 5.—Method of laying

1. *General*

As soon as a mine is laid it must be made live by fuzing. Delay may lead to failure in fuzing mines through enemy action, miscarriage of orders, or difficulty in finding some of the mines.

2. *Spacing*

Both R.E. mines are subject to actuation by blast, and, in addition, if filled with nitro-glycerine explosives, they are liable to detonation by the penetration of splinters and rifle bullets.

They should normally be laid at a minimum spacing of 15 feet, which will ensure against their being actuated by blast effect should one adjacent mine be fired.

At road blocks and in narrow defiles they may have to be laid closer for tactical reasons. Six feet spacing should be the absolute minimum, and it must be realized in such cases that there is a definite risk of the whole block being actuated by blast effect.

Some suggested methods of laying minefields are given in Military Training Pamphlet No. 40.

3. *Burying*

Anti-tank mines, R.E. No. 1, should be buried in such a way that the top of the spider cover is not more than one inch below ground level, in which position the top of the metal saddle projections should be flush with the ground. R.E. No. 2 mines should be similarly buried with the domed spring cover not more than one inch below ground level.

The bases of the mines should be on a firm, level bed.

Provided the filling is scraped over the mines with reasonable care, there is no danger of their being fired. On no account must this filling be rammed.

4. *Sequence of operations when laying*

i. The sequence of operations when laying anti-tank mines, R.E., No. 1, is as follows :—

(*a*) Remove spider cover and fill mine, as described in Sec. 4, 1. This should be done under cover before transportation to sites.

(*b*) Fuze the mine as described in Sec. 4, 2 (i).

(*c*) Replace spider cover, having first removed the safety plug.

(*d*) Bury mine as required in road, etc., surface in such a way that the top of the spider cover is not more than one inch below the surface, in which position the top of the metal saddle projections should be flush with the ground.

(*e*) Screw in safety plug in lid of spider cover as far as it will go.

(*f*) Scrape road, etc., filling over spider cover, level and conceal.

ii. The sequence of operations when laying anti-tank mines, R.E., No. 2, is as follows :—

(*a*) Fill the container with explosive in accordance with the instructions in Sec. 4, para. 1. Filling should be done under cover before transportation to the site.

(*b*) Place the filled mine in the hole prepared and bed firmly. The top of the mine should be not more than one inch below the road surface.

(*c*) Fuze the mine as described in Sec. 4, 2 (ii).

(*d*) Scrape the filling over the spring cover until it is level with the road surface.

5. *Concealment*

It is essential that mines when laid are concealed as much as possible in the time available. Concealment can be effected by covering with thin grass sods, earth, etc., to harmonize closely with the natural surroundings.

As it will be impossible, when burying mines in a road, to disguise the fact that the road surface has been disturbed, it is suggested that an area of the road on the enemy side of the minefield should be similarly disturbed in order that the enemy will not know when they are up against the actual live minefield.

Disturbed road surfaces can be covered with hay or straw in country districts, or covered with chippings and sprayed with tar to give the appearance of repairs.

Section 6.—Safety precautions

1. *Safety device*

The safety device in the R.E. No. 1 mine consists of a safety plug in the centre of the spider cover. Provided the safety plug is removed no pressure can be brought to bear by the spider cover on to the top of the striker mechanism. It is essential that a mine that has been fused should not have its safety plug replaced till after burying and just before concealment.

There is no special safety device in the R.E. mine No. 2. It is essential, therefore, that the following instructions should be strictly observed after placing the mine in the hole prepared for it :—

i. Replace the domed cover carefully on to the mine body. If it does not slip on easily, discard it and use another. The use of undue force in placing the cover on to the mine may lead to an accident.

ii. Replace the earth filling with reasonable care. **Do not throw it heavily on to the domed cover and on no account ram it.**

2. *Laying*

Take special care when laying the mines to lay them in straight lines or mark each mine by a stick or small stone, to ensure that the personnel engaged on burying the mines can get clear of the minefield (picking up sticks or stones as they go) without treading on previously buried mine. Where possible, start laying from the edge of the minefield nearest the enemy.

Where time permits the minefield should be divided into sectors, one man only in each sector being responsible for replacing the domed covers and covering the mines with earth in his sector.

3. *Removing mines*

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4. *Damaged or misfired mines*

Damaged mines must be treated with caution to find out whether they have or have not misfired.

Whenever it is found that a mine has misfired it must be destroyed *in situ*.

With the R.E. mine No. 2, the fact that the domed cover has sprung downwards can generally be taken as an indication that the mine has misfired.

5. *Life of mines*

Laid anti-tank mines, R.E., Nos. 1 and 2, will *NOT* be inspected. These mines are not intended to remain for long periods in the ground. Although they are reasonably waterproof they will not stand continued exposure to damp. If filled with gelignite, damp may render them dangerous owing to seepage of nitro-glycerine between the container lid and the body of the mine. Both gelignite and ammonal will gradually deteriorate through damp until the mine eventually becomes ineffective.

Under fair conditions these mines should last for six months after laying without appreciable deterioration. This period will, therefore, be regarded as their normal effective life. After six months they must be treated as unreliable and will be destroyed as soon as the operational situation permits. The mines may be destroyed where they lie, or they may be disarmed and removed singly to a suitable place for demolition. They will not be loaded and taken away in lorries. On no account will the container lids (as opposed to the spider or domed covers) be removed.

SECTION 6. SAFETY PRECAUTIONS