Italy

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Engineer Technical Bulletin No. 25

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ENGINEER HEADQUARTERS, FIFTH ARMY
A. P. O. #464, U. S. ARMY

1 November 1944

ENGINEER TECHNICAL BULLETIN NO. 25

I N D E X

I. MINES, BOOBY TRAPS, AND DEMOLITIONS

1. German Improvised Anti-Personnel Mine: The sketch on page 2 shows an improvised anti-personnel mine found on Highway 64 and reported by the 1108th Engineer Combat Group. Whether or not the mine was found buried or sitting on top of the ground is not known. It appears, however, that the mine would be most effective if placed on top of the ground (and, of course, concealed).

2. Wooden Improvised Mines: The increased use of numerous types of wooden improvised mines by the enemy has been reported on all sectors of the Fifth Army front. Details on some of the mines found are shown on pages 3 - 5.

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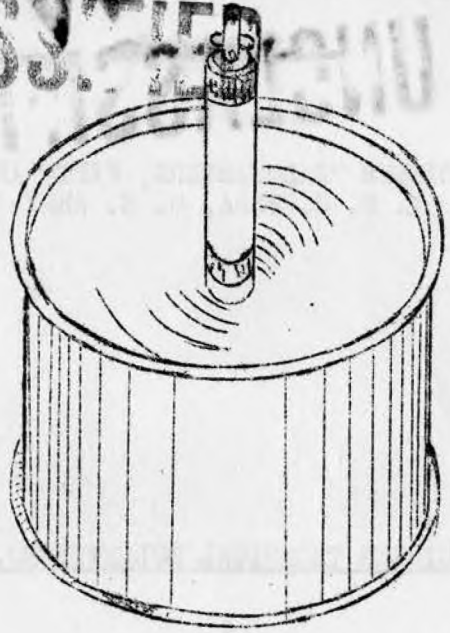
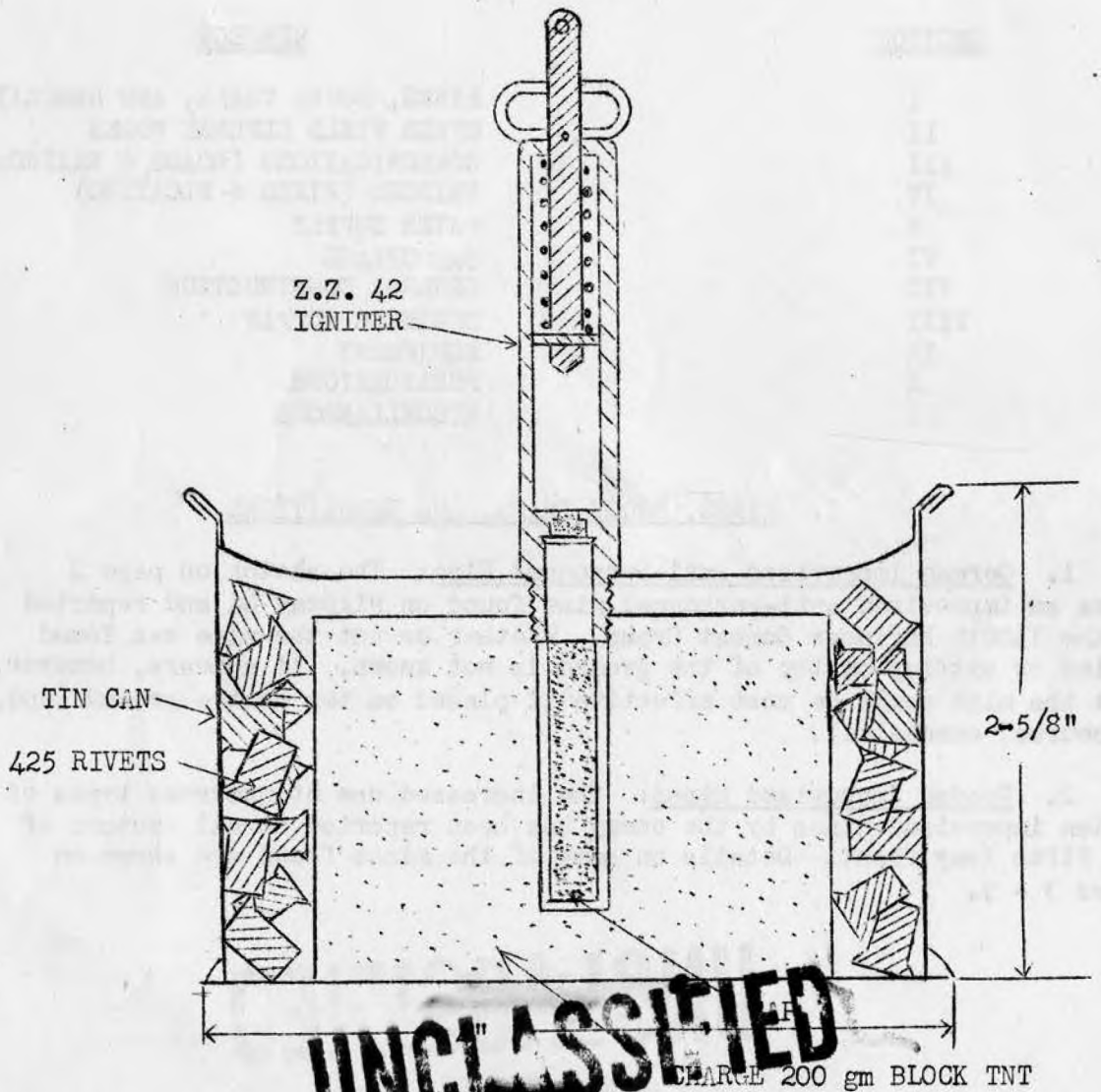
GERMAN IMPROVISED A.P. MINE

1 - 4

UNCLASSIFIED





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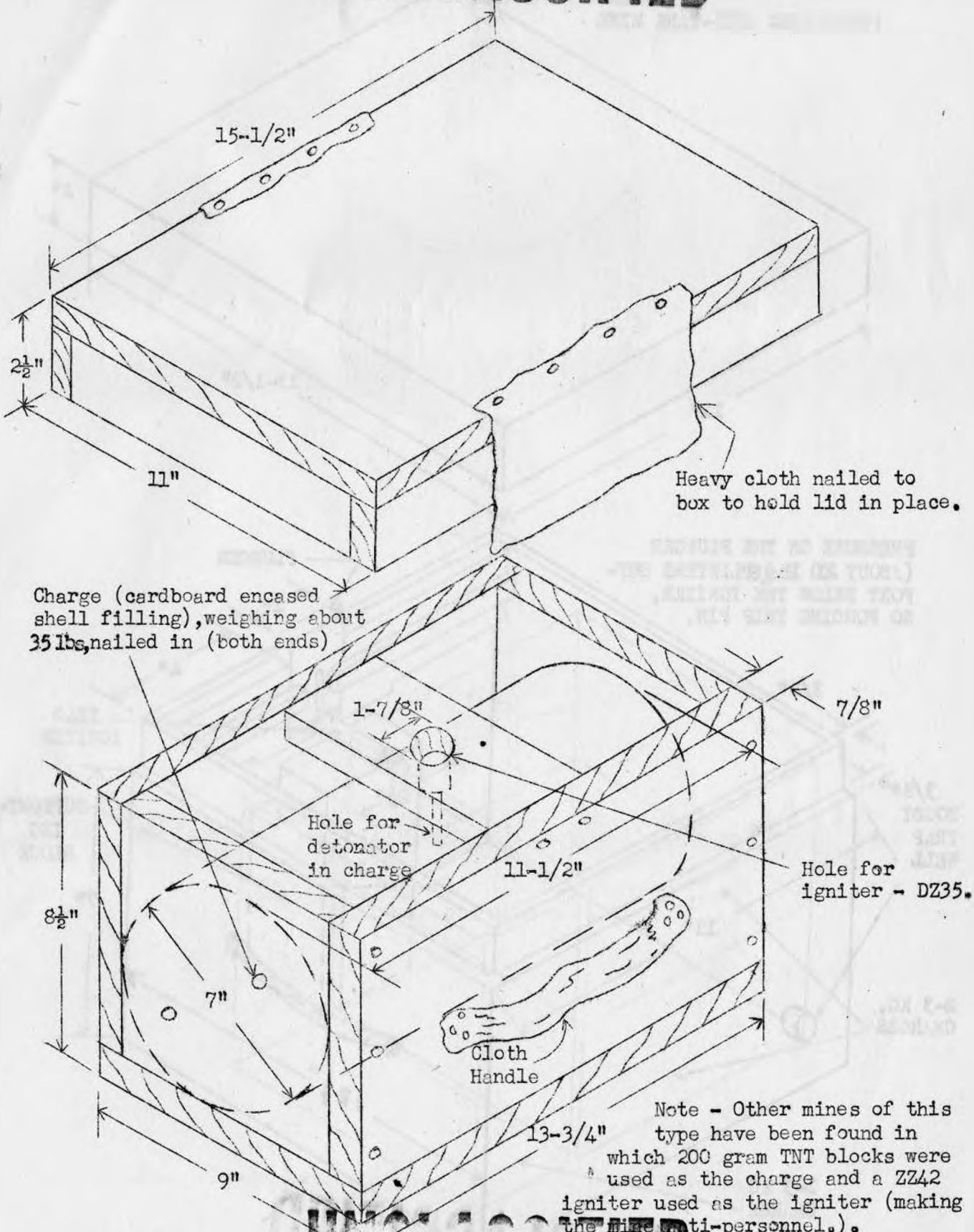
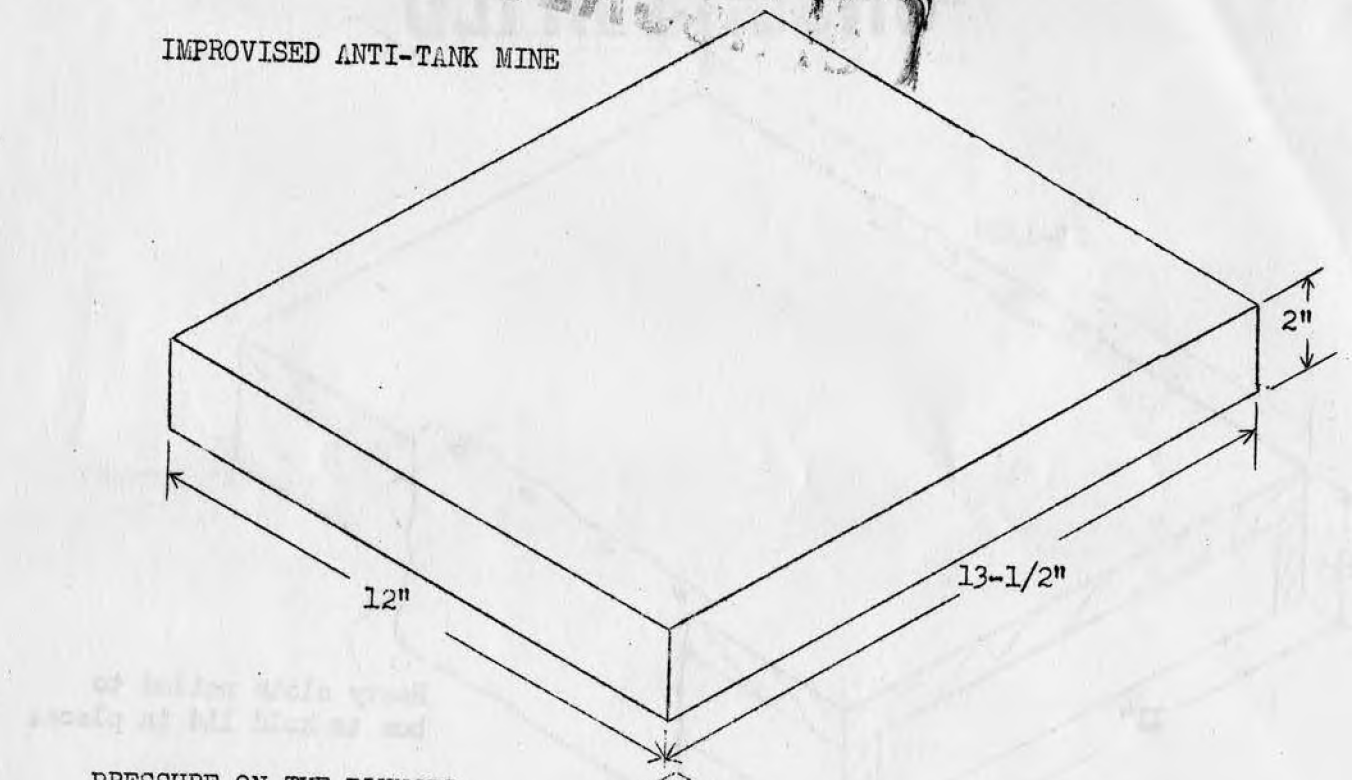
IMPROVISED WOODEN ANTI-TANK MINE

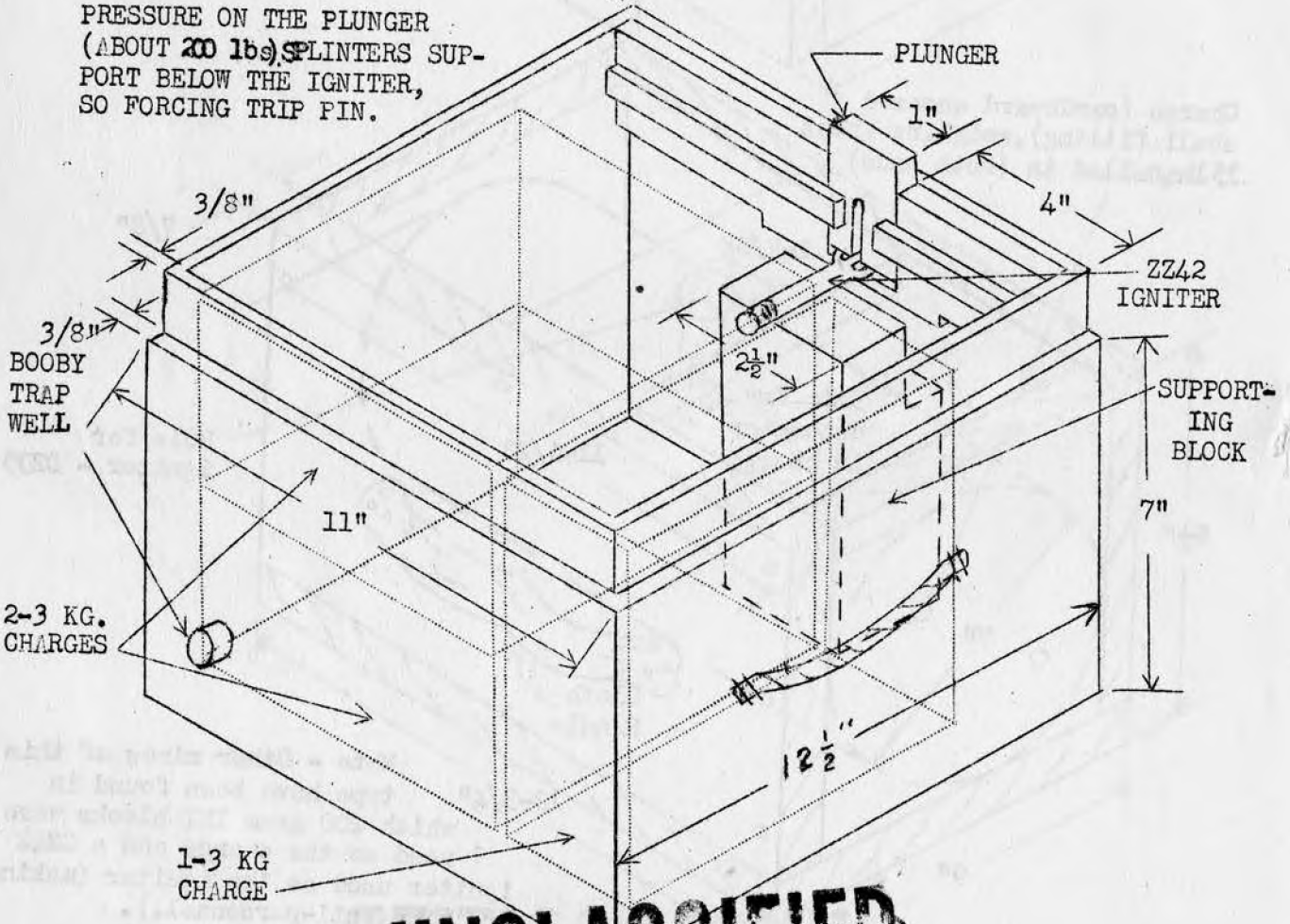


Note - Other mines of this type have been found in which 200 gram TNT blocks were used as the charge and a ZZ42 igniter used as the igniter (making the mine anti-personnel.).

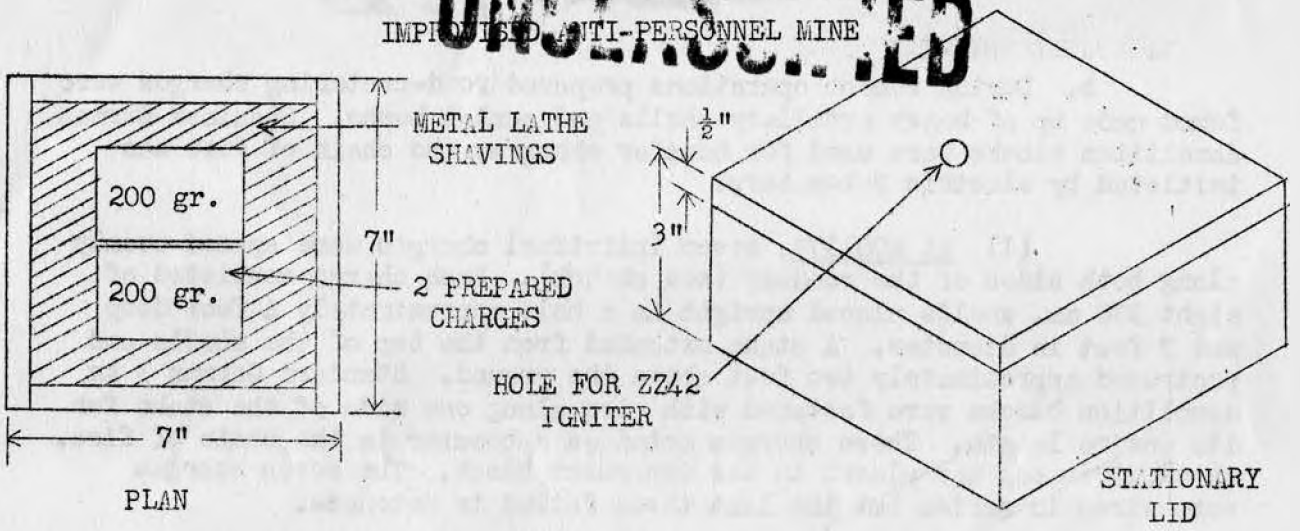
IMPROVISED ANTI-TANK MINE



PRESSURE ON THE PLUNGER (ABOUT 200 lbs) SPLINTERS SUPPORT BELOW THE IGNITER, SO FORCING TRIP PIN.

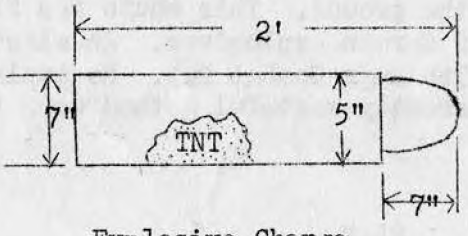


IMPROVISED ANTI-PERSONNEL MINE

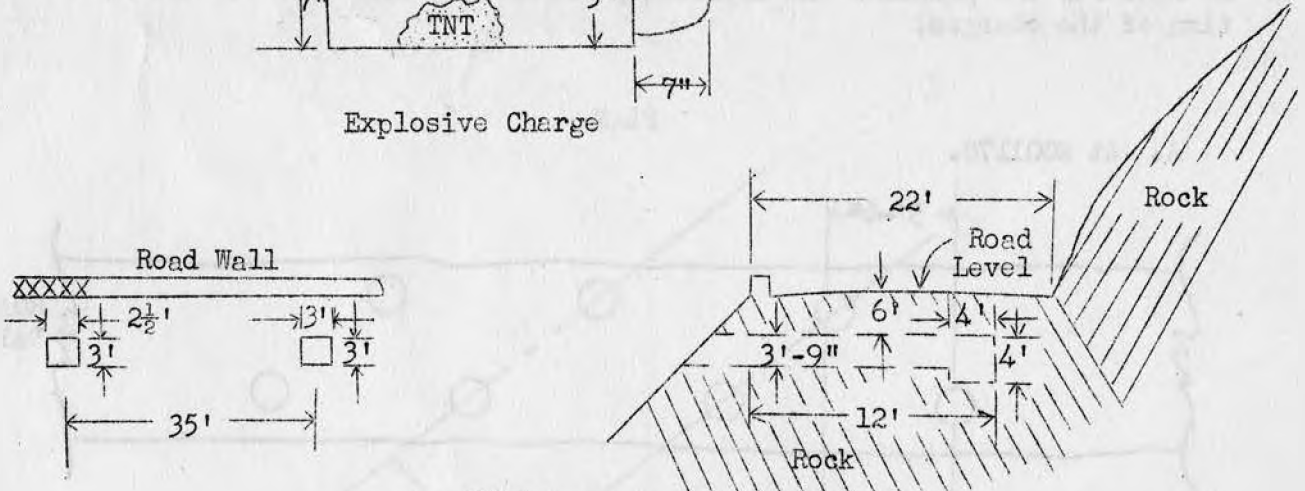


3. German Methods of Road Cratering:

a. While widening Route 6524, where it had been blown, in the vicinity of Q9098, two demolition chambers were found close to the crater. The first was about fifty feet east of the crater, and the second was thirty-five feet east of the first. Eighteen prepared charges were removed from the first chamber and sixteen from the second. There were no wires or caps. A sketch of the chambers and one of the charges (which were cardboard encased shell fillings) is shown below. (Source: 19th Engr Combat Regt)



Explosive Charge



b. During recent operations prepared road-cratering charges were found made up of heavy artillery shells and aerial bombs. Standard German demolition blocks were used for booster charges; the chain of fire was initiated by electric detonators.

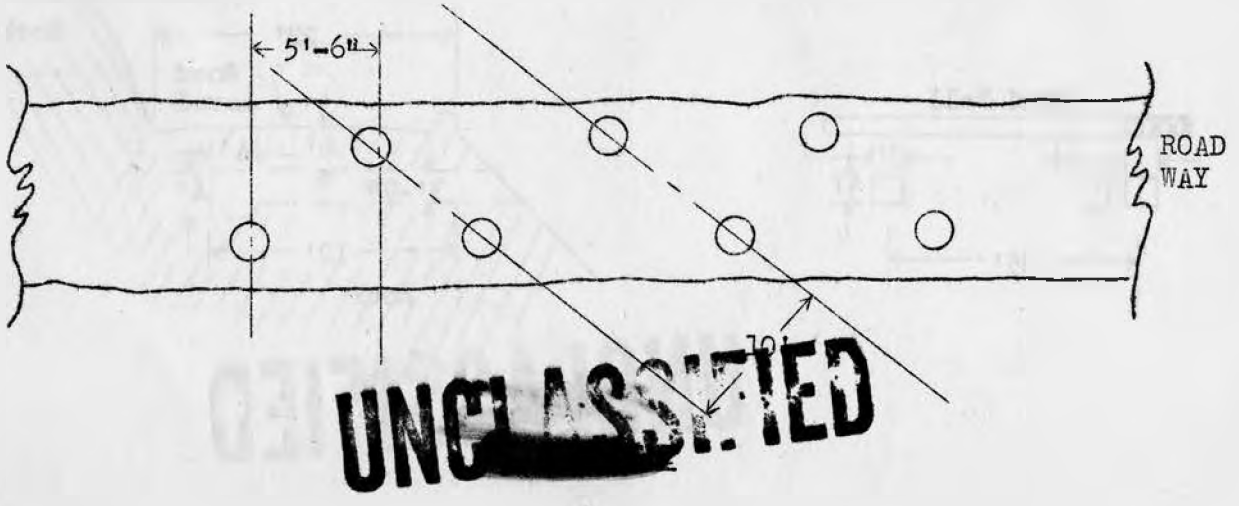
(1) At M001178, seven individual charges were spaced evenly along both sides of the roadway (see sketch). Each charge consisted of eight 170 mm. shells placed upright in a hole approximately 4 feet deep and 3 feet in diameter. A stake extended from the top of the shells and protruded approximately two feet above the ground. Standard German 3 kg demolition blocks were fastened with wire along one side of the stake for its entire length. These charges acted as a booster in the chain of fire. An electric cap was placed in the uppermost block. The seven charges were wired in series but the last three failed to detonate.

(2) At L994199, three individual charges, each consisting of twelve 170 mm. shells, were placed upright in a hole approximately 5 feet deep and 4 feet in diameter. In this case the stake with the 3 kg charges wired to it extended only about halfway down to the shells (see sketch). A wooden chute approximately 6" square was placed between the top of the shells and the bottom of the stake. The chute was filled with German dynamite. An electric cap was placed in the uppermost demolition block.

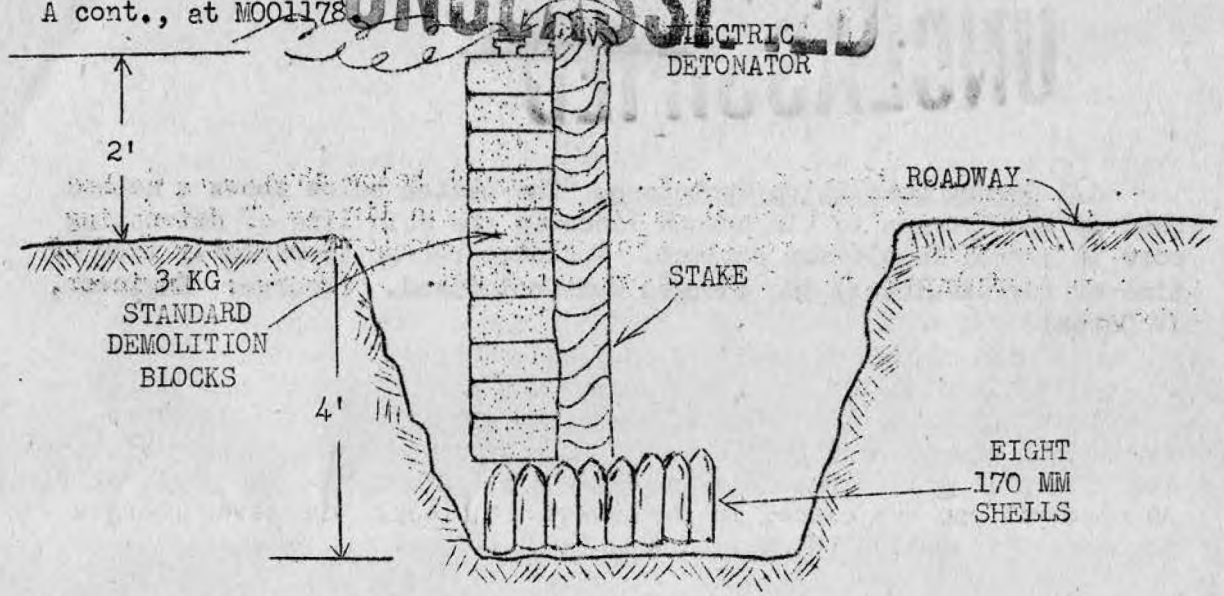
(3) At L987197, eleven cratering charges had been prepared--two failed to detonate. Of these two, one consisted of an Italian aerial bomb shaped similarly to the 100 lb. Italian aerial bomb but weighing approximately 250 lbs.; the other charge was a large artillery (?) shell (325 mm. diameter, 121 cm. long). Both of these charges were buried approximately 4 feet deep. A wooden chute 4" x 6" x 5' long connected the charges with the surface of the ground. This chute was filled with small blocks of assorted sizes of German explosives. An electric cap completed the charge. (Source: 313th Engr Combat Bn). No explanation can be made for the peculiar and apparently wasteful method used for initiation of the charges.

PLAN

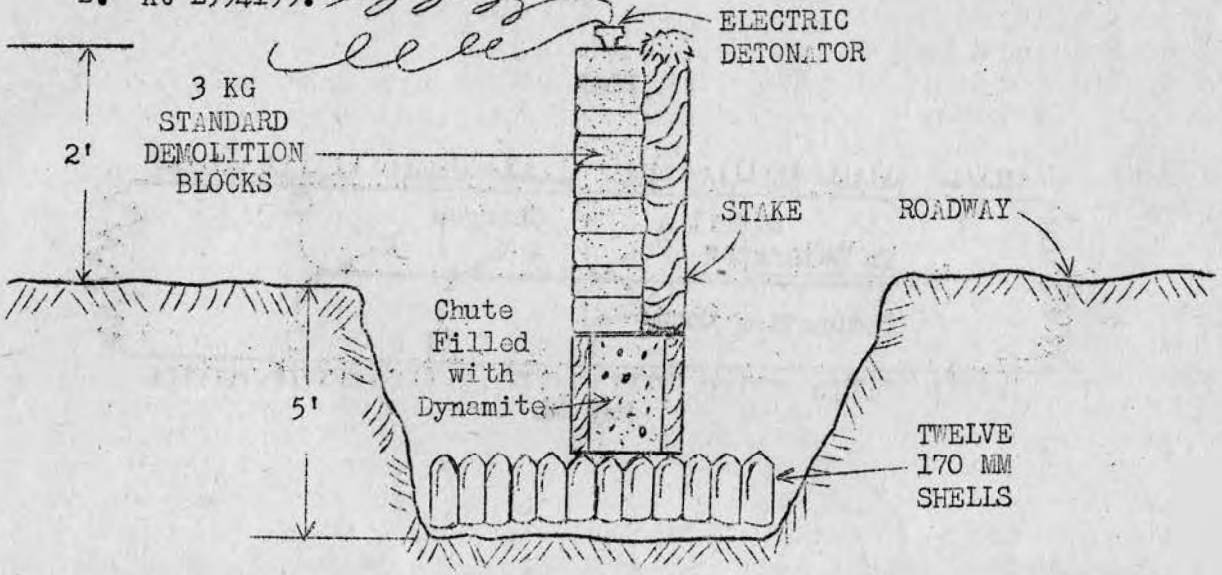
A. At M001178.



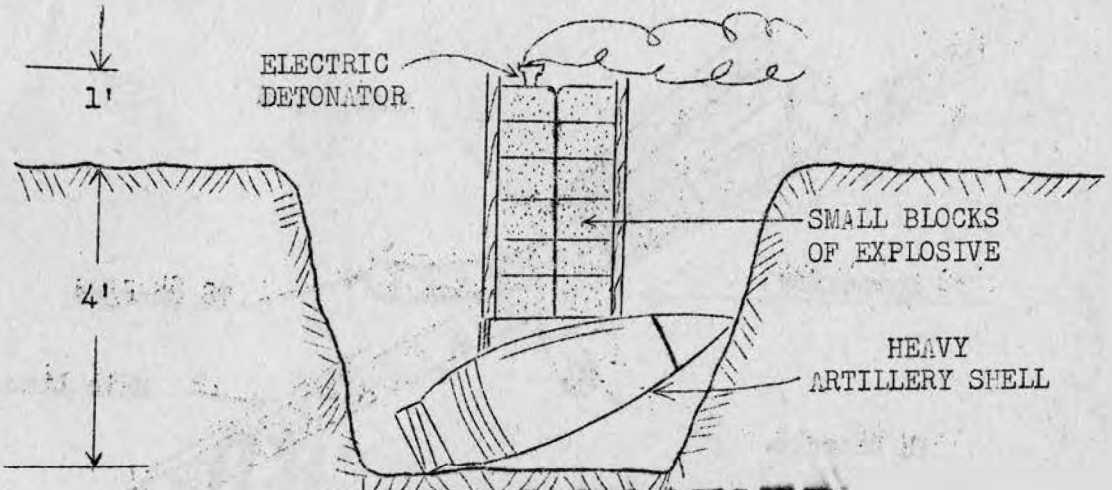
A cont., at M001178.



B. At L994199.

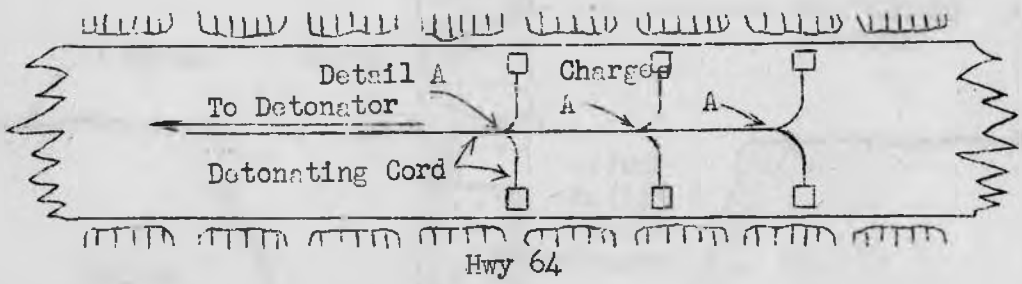


C. At L987197.

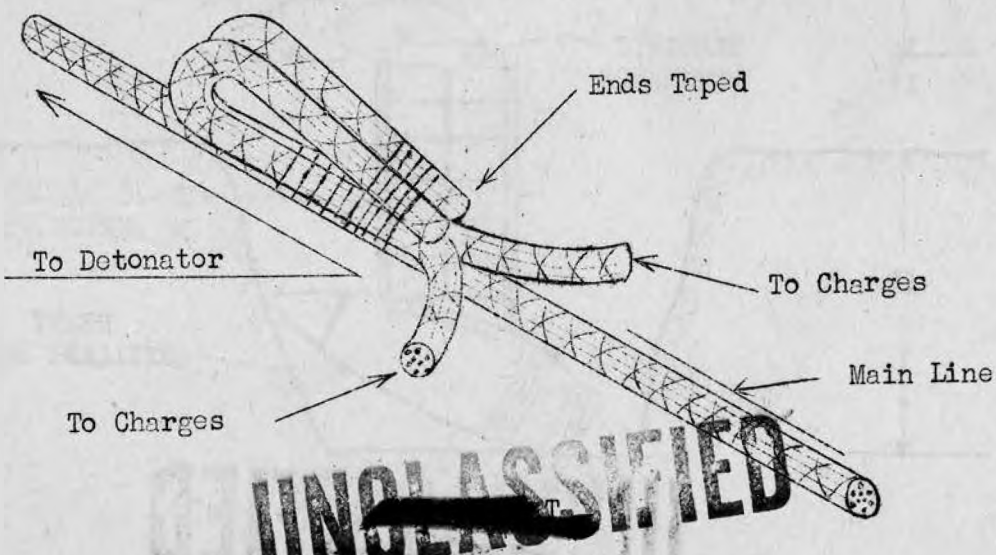


4. German Demolition Technique. The sketch below shows a method used by the Germans to tie branch lines to the main line of detonating cord in a road demolition project. For some reason (apparently lack of time or forgetfulness) the charges were not fired. (Source: Engineer, IV Corps)

PLAN



DETAIL "A"



5. Beehives as Anti-Personnel Mines. The following paragraphs, submitted by the CRE, 78th Division (British), show the effectiveness of beehives as anti-personnel mines. They can be used singly to cover tracks etc., or in large numbers to cover a length of front.

a. Method of Laying. The beehives can either be tied to a stake or tree, or lain on the ground. In the latter case the all round lethal effect might be increased by surrounding them with stones (leaving the cone exposed). This would also improve concealment. It is considered that the beehives are best laid with the hollow cone pointing along the trip wire, or slightly towards the enemy side with the line of blast at about waist level, or, if laid on the ground, at a slight elevation. The igniter assembly consists of a pull igniter, two feet of primacord and a detonating cap. The trip wire can either be arranged to operate from both directions, or by a man approaching from the enemy side only (see sketch). Ten yards is considered a suitable length of trip wire in a continuous belt.

b. Effect. There is a considerable blast effect in all directions, and a very strong blast and some shrapnel effect in the line of the cone, where trees were splintered over 20 yards away during a trial. A belt 100 yards long, consisting of 10 beehives, was laid recently in operations, about 400 yards from our leading infantry positions. An attack was later made on our positions from a flank, and repulsed. While attempting to regain their own lines, the enemy ran into the booby trap belt. It is thought that another enemy force was forming up just on the enemy side of this belt at the same time. Four beehives were set off and although it has not been possible yet to approach the area in daylight, observers have reported 15 corpses in the immediate vicinity.

6. Enemy Engineer Methods in the Mountains before BOLOGNA.

a. Mines. In the sector recently covered by the 85th Division, the enemy has primarily relied on the Holzmine (wooden box mine) for his minefields. These have been found in two types: the first is the standard Holzmine 42 fitted with a ZZ42 igniter; the second is a rather crude improvisation of local manufacture which has been found armed with DZ35, DZ35A and ZZ42 igniters. The standard Holzmine 42 contains 12 lbs. of TNT while the product of local manufacture has been found to contain either 200-gram blocks of TNT, 3 kg. TNT prepared charges, or picric acid cylindrical shaped charges broken up to fit the box. The amount of explosive in the improvised Holzmine has been found to vary. Twenty pounds of it have been found. Both types of mine are presumed to be mainly anti-vehicular; but since the DZ35 igniter is activated by 165 lbs. pressure and the DZ35A and ZZ42 by approximately 15 lbs., all types have their AP value.

According to PW statements, the shortage of standard Holzmines and other mines has forced the Germans to resort to the use of the improvised mines. This shortage is further borne out by another PW statement that shortly after they had placed one minefield some cattle walked across it and exploded the field. Though the enemy engineers were instructed to wait for replacement mines to be sent up immediately, these never arrived.

This shortage of mines would explain why only the improvised Holzmines were found in the vicinity of FIRENZUOLA, LA MARTINA (L9017) and on the road passing along the ridge just north of M. CANDA (L8814). North of FIRENZUOLA, at L905083, 42 improvised box mines were found with about 40 lbs. of TNT packed around some of the mines as an additional charge. More recently only standard Holzmines have been encountered as in the minefields at L928282 and L941270.

Due to the lack of prepared mines and to the shortage of infantry personnel which has necessitated the use of enemy engineers as infantry, the minefields found have not been extensive. Usually, they contain about 40 to 80 mines or less, and their placement seems to indicate that they are primarily intended to impede the movement of tanks, deny the use of secondary roads and prevent easy circumvention of demolitions.

Generally the minefields encountered have been rather slovenly laid (no definite patterns have been found), indicating lack of enthusiasm on the part of enemy engineers or the employment of inexperienced personnel. Several areas have been found which had been marked off by the enemy as minefields and were found to contain no mines. Another field was found where the mines had been laid and igniters inserted but the igniters did not have any caps, so that the mines were still inactive. In a third instance, according to PW statements, a minefield was planned to contain 150 mines, but the enemy engineers found the work too tedious after they had placed 110 mines and hence left the remaining 40 stacked on the edge of the field. In this same field, only part of the mines were armed with igniters, again, according to PWs, because it was too much work. Further indications of hasty and slovenly work is shown in that recently found minefields seldom have warning signs, as has been the case in the past, but were only lined off with barbed wire.

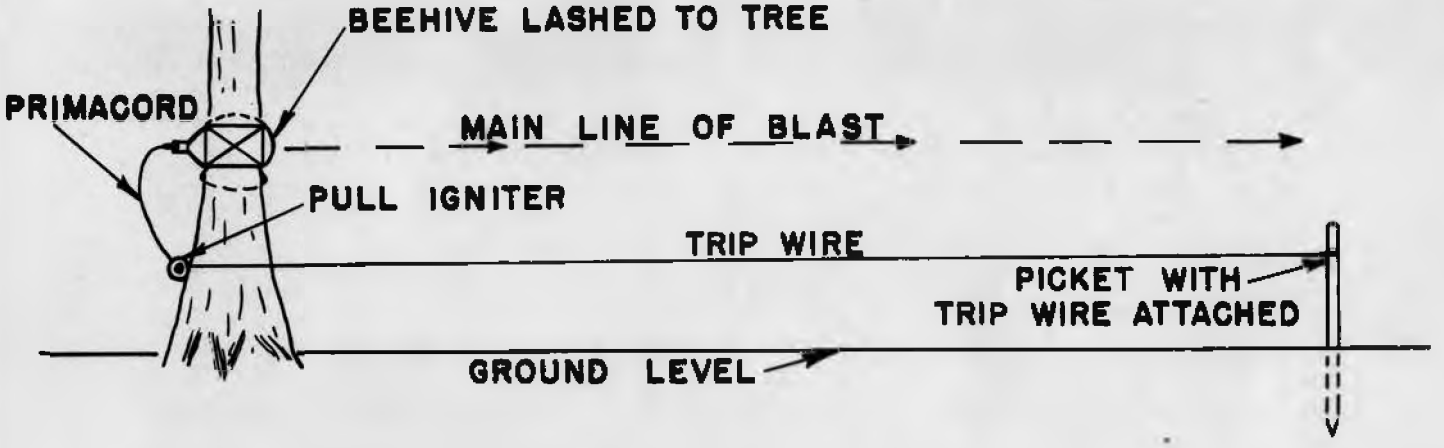
The only other mines encountered recently were some improvised AP mines which were at best, a poor substitute for the "S" mine. The mines were found in a dump near FIRENZUOLA. A few "S" mines were found cased and stacked by the side of the road vicinity L910143. In the same area several cases of Schu mines have been found stored along the road but no minefields containing this type of mine have recently been discovered.

b. Booby Traps. The only booby trap reported was at BISANO (L9123) in the form of a German rifle with the barrel stopped up and a wire to the trigger so fastened that when the rifle was lifted it would trip the the trigger causing the rifle to explode.

c. Demolitions. The German demolitions encountered first were not up to their previous standard, as many of them either did not explode or did so with very little damage. On the road CAMPEGGIO (L8818) - L915196 eight crater charges were prepared and only four were exploded. The damage caused by explosion was repaired by a squad of engineers in one hour. Upon examination of the material used to blow the crater it was found to consist of 200-gram blocks of German TNT (one case), German pink penthrite (two cases) and Italian blasting gelatin (one case). Similarly several crater-

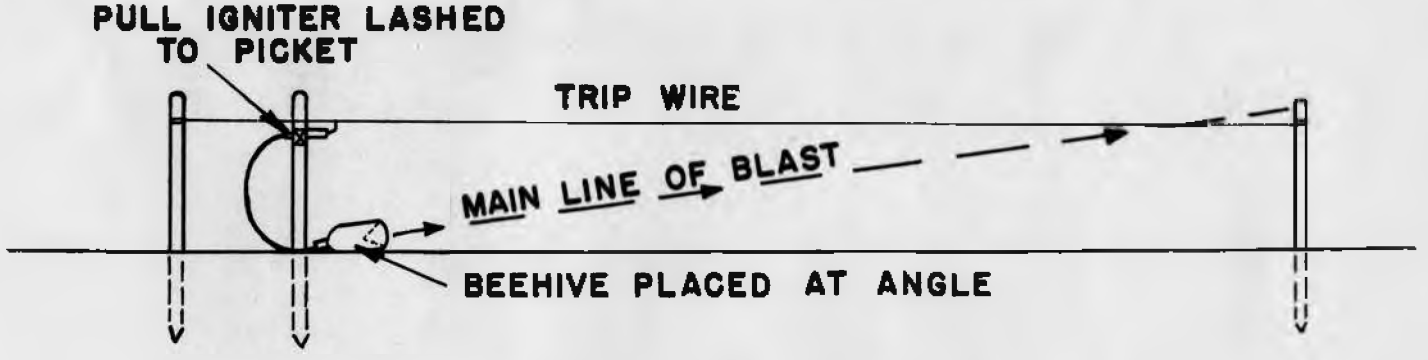
BEEHIVE BOOBY TRAPS

FITTED TO OPERATE FROM HOME AND ENEMY SIDE



FITTED TO OPERATE FROM ENEMY SIDE ONLY

ELEVATION



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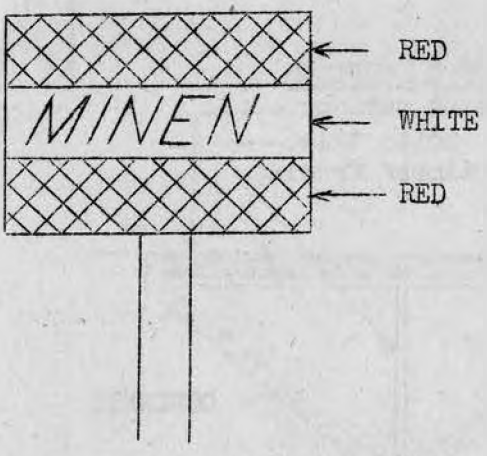
ing charges were removed on the road LA MARTINA (L9017) - L914168. Those charges were composed of cylindrical picric acid shape charges and TNT. In most instances where such unexploded charges were encountered the charges were found to lack detonators.

At the bridge vicinity L891186 an interesting demolition was encountered. A crater had been blown on the southern approach, the bridge itself remaining intact. Recently the enemy's demolitions have been more complete, indicating that he is taking greater pains with his work. Apparently, he has more time. According to PW reports, engineer personnel is stationed at each prepared demolition from the time it is planted, and it is their mission to explode the charge at the proper moment.

d. Future Operations. From PW statements it seems that the enemy has already prepared many demolitions along the main roads and is continuing the practice of mining secondary roads. It can, therefore, be expected that many small minefields and demolitions will be encountered in the near future where they will cause us most delay. The quality of this type of work should deteriorate rather than improve,

since, according to PWs, most engineer personnel in this sector are now either being committed as infantry or shifted north of the FO. If this be true, it also seems likely that the enemy has completed his engineer preparations in this area. (Source: Engineer Intelligence Report No. 1, 310th Engr Bn)

7. German Minefield Marking. A German Engineer Manual suggests that dummy minefields should be marked by signs with slanting letters, as shown below. (Source: Engineer Intelligence Memorandum No. 28, First U. S. Army).



II. OTHER FIELD DEFENSE WORKS

1. German Tank Trap. The sketch below shows a German Tank Trap on Route 1 at Q057706, as reported by the 175th Engr. G.S. Regt.

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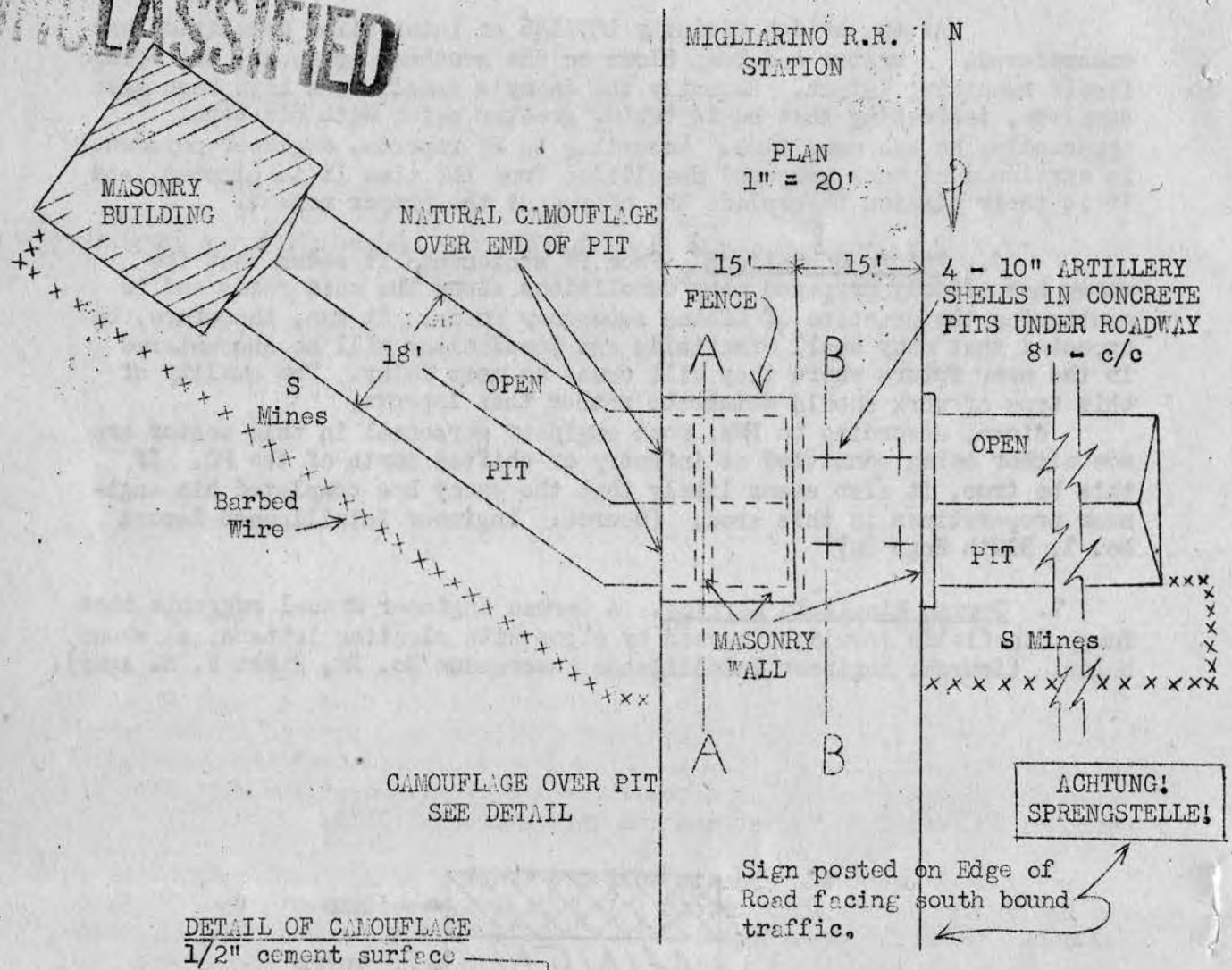
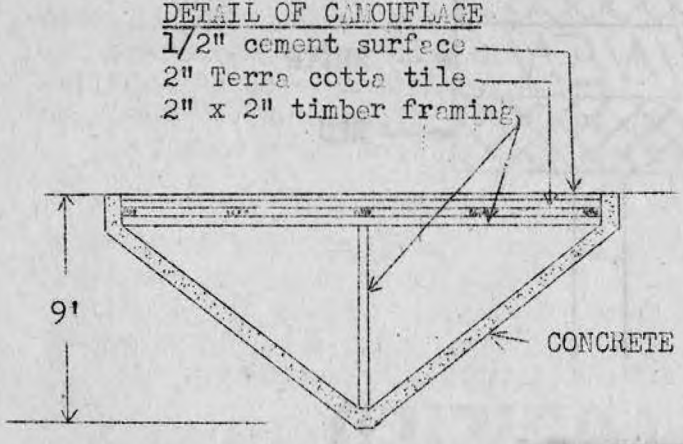
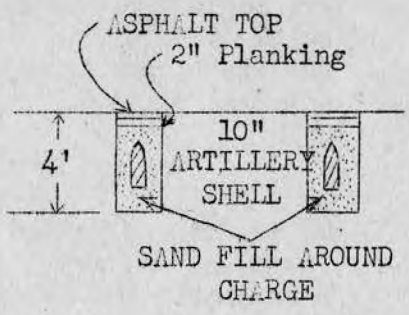




SECTION - AA
1/8" = 1'0"



SECTION - BB
1/8" = 1'0"

ENEMY TANK TRAP ON ROUTE 1 - Q057706

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III. COMMUNICATIONS (ROADS & RAILROADS)

Nothing

IV. BRIDGES (FIXED & FLOATING

1. Report on Bridge Failure. On 5 October 1944, a company of the 235th Engineer Combat Battalion began construction of a Class 40, Bailey Bridge at 569013, on Route 64. The site required a 130 ft. DD Bailey. Due to a slight curve in the road and the steep mountain side on the right, it was impossible to launch the bridge by ordinary methods. A shift to the left on the near bank would have facilitated launching, but a longer bridge of TD construction would have been required.

A launching nose of SS construction, as prescribed in Plate XID-A Military Engineering, Vol. III, Part II, Pamphlet 12, was used. The bridge was launched in the usual manner until the launching nose was even with the far bank and about 20 feet to the right of it. Plain rollers were then placed laterally under the main bridge near the point of balance and the whole structure was jacked to the left until the launching nose was over the far abutment. This was successfully accomplished, but the slowness of the procedure carried construction into the hours of darkness. Weather was continuously cold and rainy.

At about 2245 hours, the launching nose had been placed on rollers and the bridge pushed across far enough until all but 40 feet of the nose had been removed. It was intended to push it another 20 feet before removing more, but when the bridge had rolled about 10 feet (i.e. when the far bank rollers were approximately 30 feet from the end of the main bridge) the left side of the launching nose collapsed near the junction with the bridge proper. As a result, the forward end of the structure dropped 20 feet into the stream and twisted to the left.

An attempt was made to pull the wrecked bridge back lengthwise on to the road. Two tankdozers and a T-2 recovery vehicle were used without success. With the assistance of the T-2, the bridge train, carrying material for a new bridge, was then passed through a ford, and construction was begun from the far bank, where launching conditions were less difficult. Eventually, the wrecked bridge had to be pushed over the side into the stream bed to make room for the new one. Much of the material was salvaged by hand.

The new bridge was constructed with a launching nose consisting of 4 bays of SS and 3 bays of DS. The top stories of the first two bays of the bridge proper were omitted during launching. Final stages of launching and swinging were postponed for safety until daylight hours on 6 October. The bridge was completed at 1455 hours, 6 October.

The cause of failure is not definitely known. Necessity of replacing the bridge as quickly as possible and darkness at the time of failure

precluded the detailed investigation which was desirable. It was found, however, that the top chord of the end launching nose panel on the left side had failed in compression and broken completely. No panel pins had failed. The most likely reasons for failure appear to be:

a. During construction, several panels were rejected as unserviceable due to slight deformation of the members. It is possible that such a panel was overlooked and caused the failure. Inclusion of damaged panels in equipment delivered has been noted in several instances recently.

b. Adequate grillage was used under the rollers, and scrutiny of the site showed no evidence of settlement. It is possible, however, that a minute settlement occurred and was enough to throw an excessive load on the left side of the nose.

c. The theory has been advanced that a slight deformation under load of some defective member, such as a panel pin, may have been sufficient to produce an unequally balanced load. This is possible. No such deformed member was found, but, as stated above, a detailed investigation was impracticable.

Most of the available Bailey equipment has been used a number of times and may be slightly battered. Bridges frequently must be constructed under adverse conditions of site, darkness, and weather. Considering these facts, it is recommended that in launching future bridges of this type, at least the two tail bays of the launching nose be double-trussed.

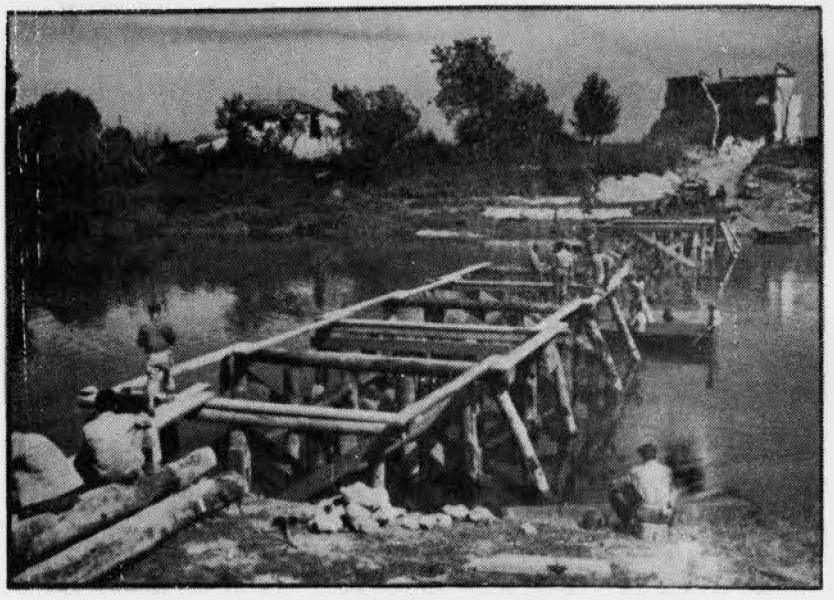
(NOTE: The School of Military Engineering, CAPUA, has directed that all of launching noses be left on Bailey bridges until bridge proper reaches far bank rollers. This was not done in the construction of the above bridge.)

2. Bailey Bridge across SERCHIO River. On 12 September 1944, it was decided that a Class 40, medium level bridge should be constructed over the SERCHIO River at Q059708 a few hundred yards upstream from the demolished bridge on Highway No. 1. At the site were the remains of a German wooden pile trestle bridge. It was proposed to use the remaining piles as supports for a continuous Bailey.

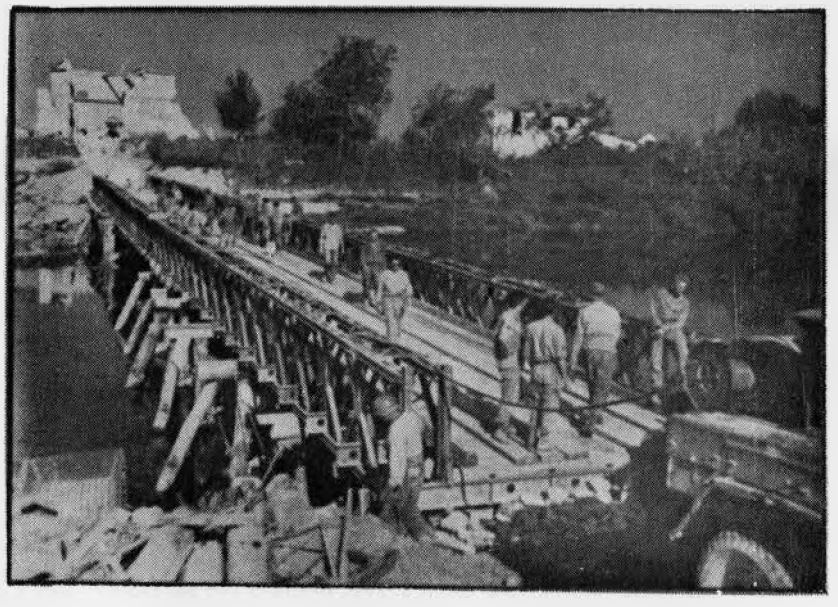
As first planned, the bridge was to rest on the caps of the pile bents and was to consist of an 90-foot double-single portion across the center gap and single-single trusses at either end. But since the bent spacing was such that some of the caps would not be under panel points, verticals, or diagonals, considerable discussion arose as to possible bending in the lower chords and crushing of the caps under the chords of the single-single portion. The two bents adjacent to the north end of the long center span would fit under panel points or verticals, but the one at the south end of the gap would miss a panel point by about six inches.

It was finally decided to cut down the two bents adjacent to the south end of the gap and place four heavy timber stringers on them so as to support continuously the lower chords in this short span. It was fur-

SERCHIO RIVER BRIDGE



PILING



BRIDGE IN PLACE

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ther decided to make the entire bridge continuous double-single in order to increase the strength of lower chords and the bearing surface on caps. Since these decisions were made after all bents had been capped at the same level, construction was delayed several hours while two bents were cut down and the stringers placed.

It was necessary to clear debris, splice posts to piles which had been blown off short, and cap all bents. Mine sweeping and a small amount of dozing and clearing were required on both approaches, which were also graveled. The Bailey was pulled across by the winches of two 2½-ton trucks, plain rollers being placed on several of the intermediate trestle bents. No particular difficulties were encountered. During unloading of the Bailey, a stringer which was dropped with one end slightly outside the swept area struck an "S" mine. The mine jumped up, bounded back from the stringer, and exploded, wounding two men.

Mine sweeping, clearing and dozing of approaches, and work on the pile bents were begun at 1300 hours, 13 September, utilizing one platoon, a D-7, and an R-4. Beginning the morning of 14 September, all available men in Co "C", 235th Engineer Combat Battalion, plus a 20-man unloading detail furnished by another unit were used. Launching of the Bailey started at 1400 hours, 15 September, but was somewhat delayed by the change in plan described above. The bridge was completed and opened for Class 40 traffic at 1100 hours, 16 September. It has since supported an M-25 Tank Recovery Truck Trailer carrying an M-4 Tank without evidence of distress.

(NOTE: The Army Engineer points out that this bridge would eventually have failed because of the excessive piling which would have collected too much drift. Only piles actually needed for support should have been left in place. The bridge, however, was removed a short time after construction.)

V. WATER SUPPLY

1. Well Drilling. During the initial year of the Italian campaign, well drilling has been attempted at twenty different locations. To date, the batting average of the drillers has been .600, an average which a lot of pinchhitters would envy for their season's effort.

At 12 of the selected points yields varying from 100 G.P.M. to 200 G.P.M. were achieved at depths varying from 100 feet to 350 feet. The maximum depth penetrated was 1100 feet in an attempt to aid the City of LEGHORN. The equipment used has generally been the failing rotary type but on four occasions the Star Model Percussion Rig was placed into service. In addition, several deep well pumping installations have been made where wells still existed after the withdrawal of the enemy. These installations were constructed regardless of the damage to the pumping equipment originally in place.

VI. Nothing

VII. GENERAL CONSTRUCTION
Nothing

VIII. ENGINEER SUPPLY
Nothing

IX. EQUIPMENT

1. German Equipment. The following brief description of captured German equipment, and accompanying photographs, are contributed by Captain Carl F. Knabe, commanding Engineer Enemy Equipment Intelligence Service Team, now attached to Fifth Army. Complete reports on the items listed below have already been forwarded to Washington. One copy of each report is available to Fifth Army troops on a 10-day loan basis and may be obtained by a written request to Engineer, Fifth Army.

a. Small Pneumatic Boat. Name of the boat is Kleiner Flossack, 34. Weight with floorboards is 120 pounds and when the boat is inflated it has a rated load capacity of 660 pounds. Three passengers are carried, including a crew of two. Six of these boats with a wooden superstructure will make a raft with a capacity of 1½ tons. The boats are also used in the construction of improvised foot bridges.

b. Wooden Skids. The skids are made of soft wood with a 3-ply, plywood base. They are approximately 6 feet long and 1 foot wide and were apparently designed for moving towed guns and trailers in deep mud or snow.

c. Air Compressor. The F.M.A. Air Compressor was built in FRANKFURT, Germany, in 1937. The 2-cylinder, single-stage compressor is driven by a 4-cylinder, 4-cycle gasoline engine rated at 27 horsepower. The air outlets can be easily adapted for the standard U.S. Army air hose connector with a little filing. Two interesting points should be noted:

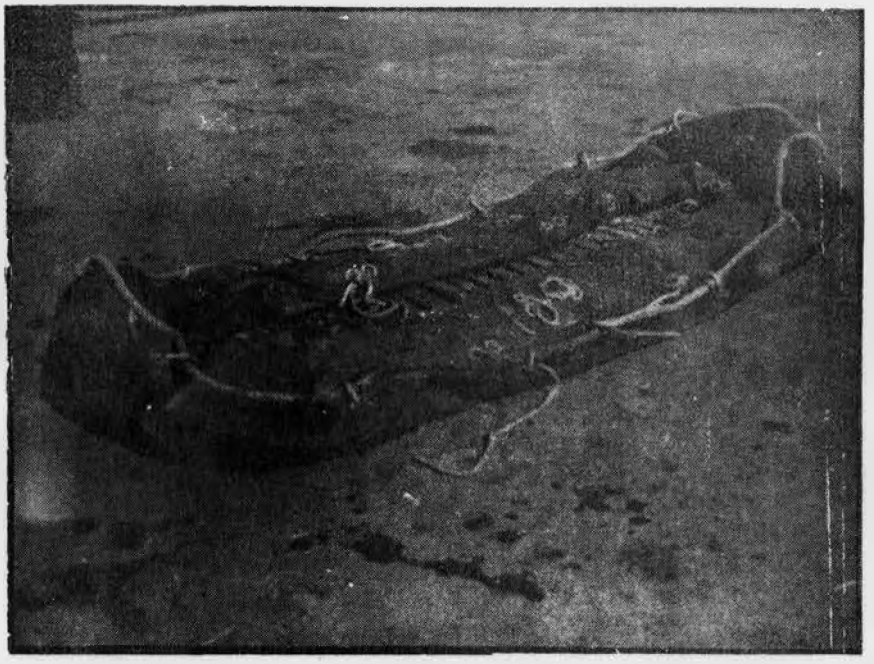
(1) The construction of the air tank and its use as the chassis for the unit.

(2) The German inscription on the engine "Early Ignition", which means that low octane gasoline was used.

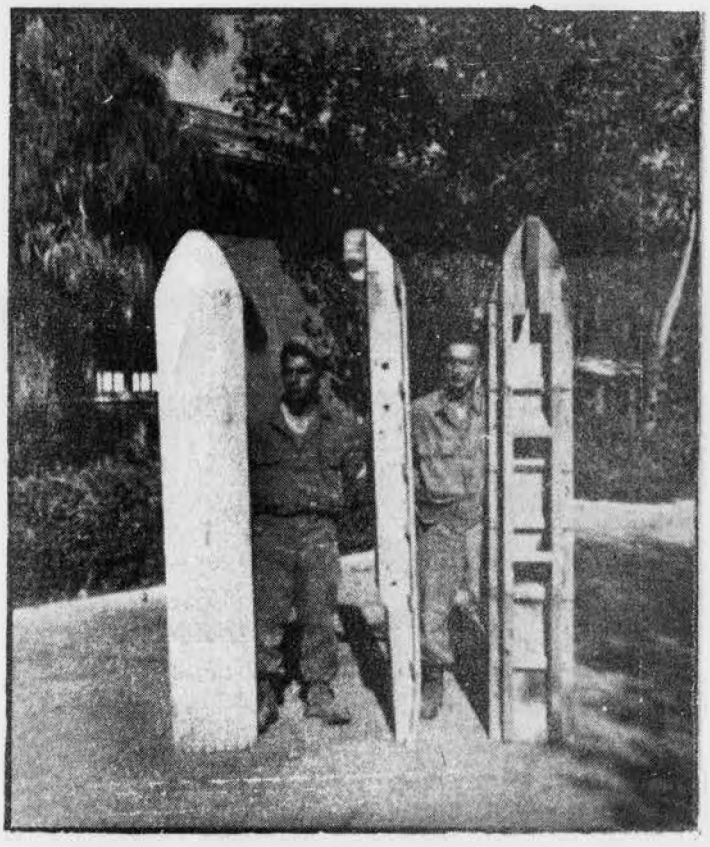
d. Henomag Tractor. The tractor was manufactured in HANOVER, Germany, in 1941. According to the available information, it was captured at ANZIO and used by the 615th Engineers. It is powered by a 4-cylinder, hot-plug diesel engine and is quite sturdy. It was probably used for towing light and medium loads.

e. Ditchdigger. The Dolberg Ditchdigger was made in BERLIN in 1939. It is powered by a 4-cylinder, 4-cycle Diesel engine, with gasoline starting and magneto ignition. Maximum depth of cut is approximately 6 feet and width is one yard. It is a very sturdy machine with an estimated weight of 10 tons. Although ideal for use by civilian contractors, its bulk and weight hamper movement for military use. This ditchdigger is much larger than those used in the U. S. Army.

GERMAN EQUIPMENT



PONTON



MUD SKIDS

PHOTO BY ENGINEER, FIFTH ARMY

GERMAN EQUIPMENT

AIR COMPRESSOR

TRACTOR

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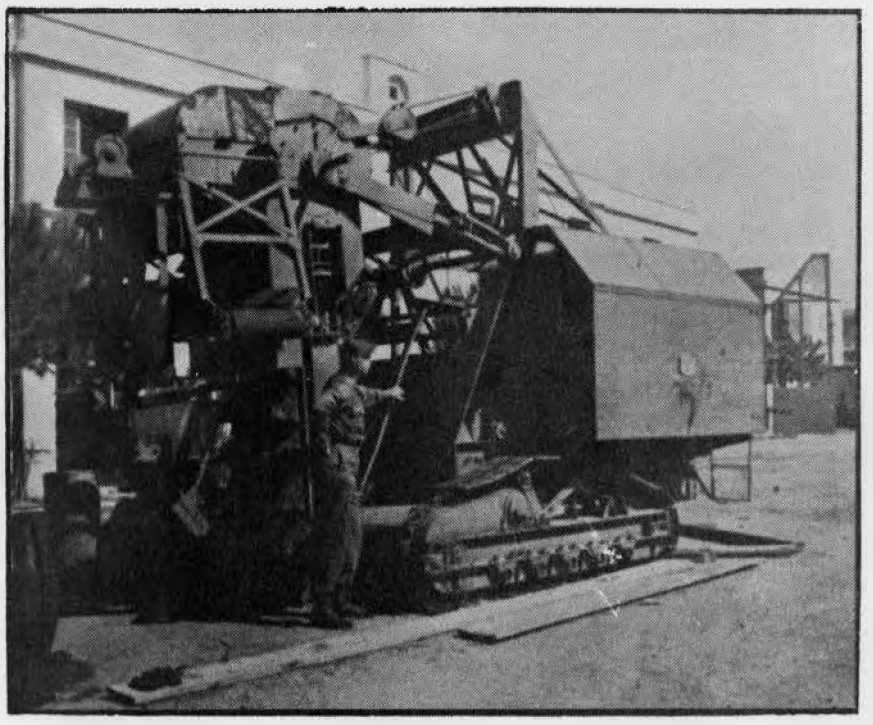
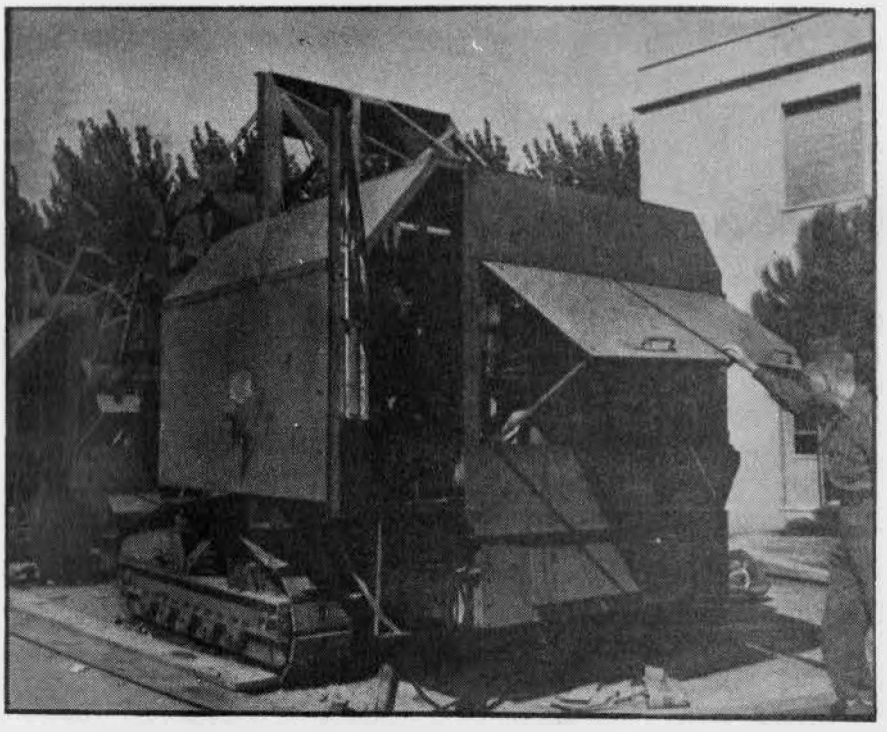
GERMAN EQUIPMENT



TRENCH DIGGER



TRENCH DIGGER

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X. PUBLICATIONS

1. Below is a list of recent acquisitions to the Engineer Headquarters Library. These documents are available on a loan basis to all engineer units in Fifth Army for a period not to exceed five days. Only one copy of each is available and prompt return of borrowed documents is necessary in order that all interested parties may benefit from available information. Requests for items should be accompanied by the document title, number and/or date.

a. Engineer Board Reports.		Date
No. 843	Mosaics for Field Artillery	21 July 1944
847	Tractor-Mounted Earth Auger	1 Aug 1944
853	Passage of Beach & Underwater Obstacles - 14th Interim Report	1 Aug 1944
849	Air Transport of Standard 60-inch Searchlight.	7 Aug 1944
	Addendum No. 2 to Report "Disassembly and Loading of Standard Engr Equip for Transport in C-47 Cargo Plane, dated 24 Jan 1944"	15 Aug 1944
857	Detonating Cord Clips	26 Aug 1944
860	Aerial Bombardment of Minefields	30 Aug 1944
861	Equipment for the Passage of Enemy Minefields - 3rd Interim Report.	1 Sept 1944

XI. MISCELLANEOUS

1. Map Trailers. The peculiar terrain in front of Fifth Army and the uncertainty of the future action of the enemy have required that the Army hold bulk stocks of maps of a very large area. In order to have the required maps readily available for issue to the front-line troops, it was necessary to develop a mobile map depot. This was done by building van type bodies on wrecked 2½-ton trucks made into trailers.

The van body was built directly upon the trailer body. They were built of any material available, 2" x 4" or angle iron frames covered with tar-paper or canvas with an interior of 1" x 12" or plywood. The bins are in general built of rough 1" x 4" lumber. Each trailer will hold approximately 160,000 maps. The Army Map Depot now has nine trailers in operation.

The trailers are stocked at all times with battle scale maps of the immediate front line and forward adjacent sheets, and are used as an advance Map Depot, as far forward as tactics permit. This permits the Corps Engineer and any forward unit to obtain bulk stock in a minimum of time.

Immediately upon arrival at a new site, the doors of the trailers are opened, and the stock is ready for issue. Thus, the ordeal of packing and unpacking is eliminated.

These trailers can be moved by a 2½-ton cargo truck when fully loaded, but it has been found that a heavier prime mover is desirable especially over mountainous roads.

2. Lessons Learned. The following report, "Lessons Learned in Combat (1-30 July, 1944)", was submitted by the 19th Engineer Combat Regiment. Although containing nothing new or startling, the report deals with principles of combat engineering that can never be repeated too often.

a. Road Maintenance:

(1) Best results in sprinkling roads to overcome the dust hazard was obtained by sprinkling them at night. The evaporation is much less at night.

(2) Road signs should be prepared in advance and placed as soon as possible after assuming road responsibility.

(3) Side roads must be conspicuously marked and barricaded when they have not been opened.

(4) Barricades of trees and rocks are necessary to block off demolished bridges. Tracing tape cannot always be seen, and is easily lost.

(5) It is possible to make fairly accurate road reconnaissance by piper cub. Blown bridges and craters can be spotted making it possible to anticipate the work and material necessary to open the road.

b. Mine Clearing:

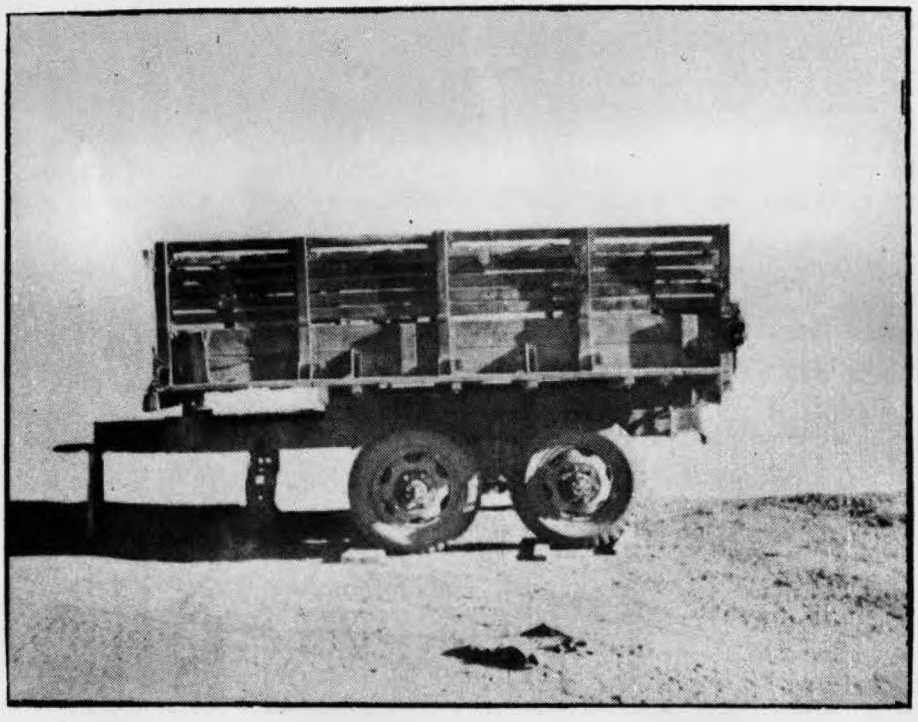
(1) German Holzmines are very difficult to detect. Shoulders and road junctions should be given special inspection for them. Prodding and close visual inspection should always supplement the standard detector.

(2) Pick up only those minefields that are essential to the progress of the campaign.

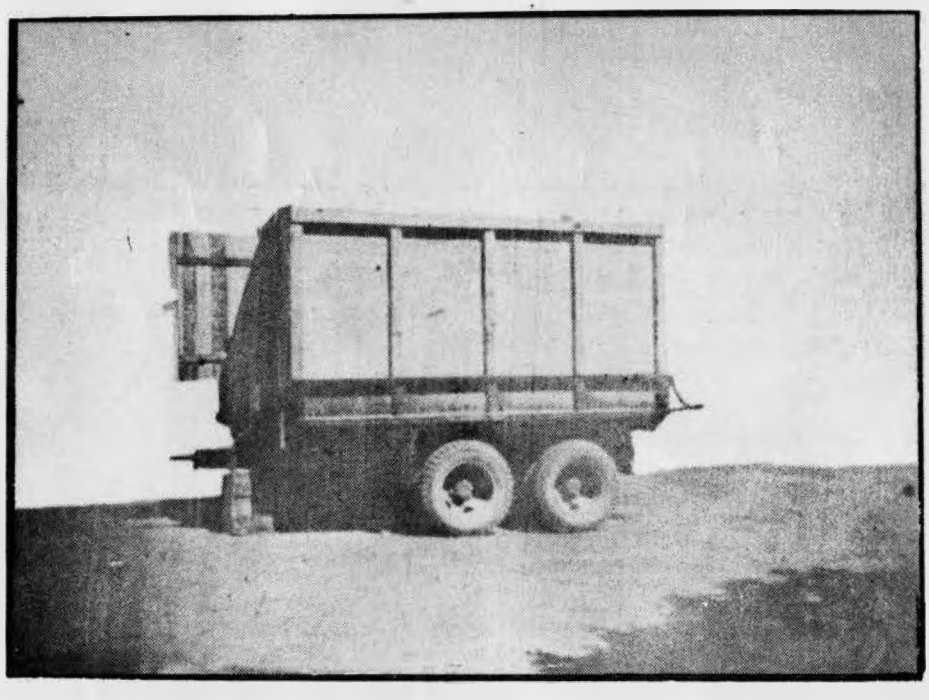
(3) The prescribed methods of lifting mines must be followed. Short cuts are hazardous and will result in casualties.

(4) Italians have proved valuable in locating mines. Some of them had to lay mines for Germans; others had observed where the enemy placed the mines.

(5) Either more mine detectors are required or expert maintenance crews should be readily available. At present, when a detector is out of action, it takes too long to get it repaired or replaced.



TRAILER AS RECEIVED FROM ORDNANCE



TRAILER AFTER BODY HAS BEEN COMPLETED
(LESS CANVAS ON TOP)

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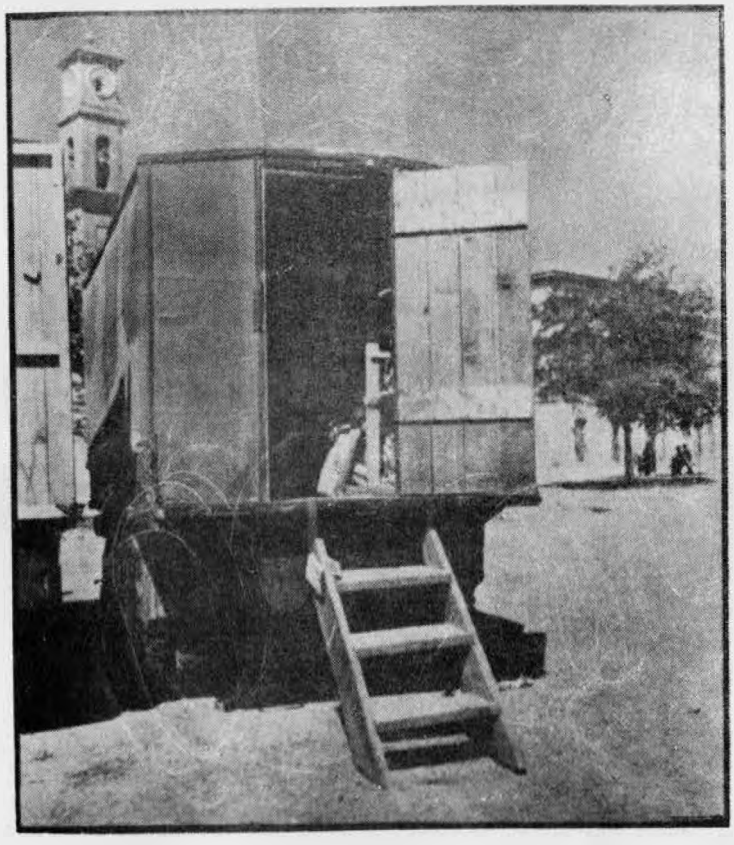
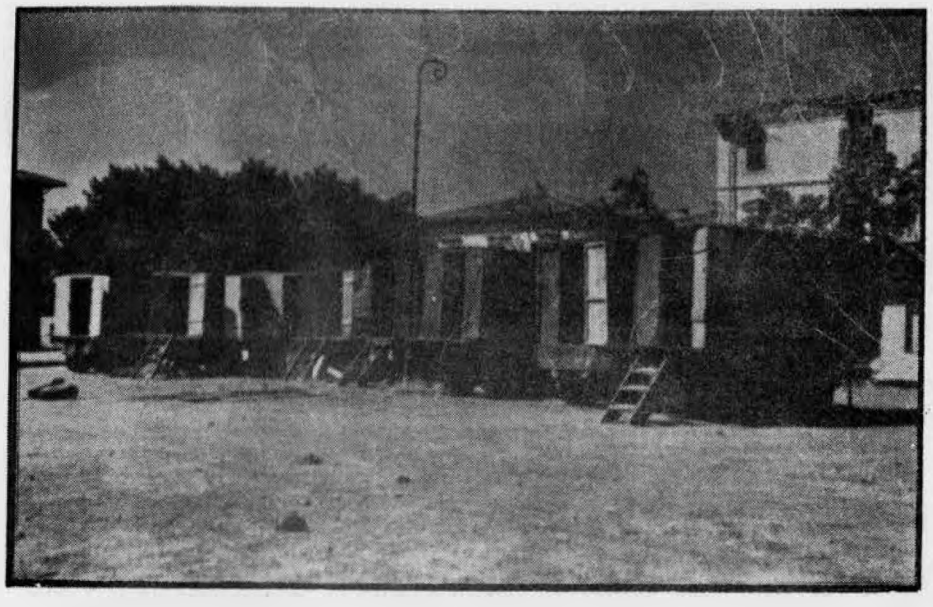


REAR VIEW OF A TRAILER
STOCKED WITH MAPS



MOBILE MAP DEPOT SET UP FOR ISSUE
BULK ISSUES ONLY ARE MADE FROM THESE TRAILERS

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c. Culverts and Bridges:

(1) Gaps should not be filled without culvert pipe except in an extreme emergency. Flash storms are common in this section.

(2) Culvert beds can be rapidly prepared by use of explosives.

(3) Completed by-passes and fills should be graveled to reduce dust hazard.

d. Support of Tanks:

(1) Engineer Units must be mobile and well forward.

(2) Radio contact with tanks is essential.

(3) Tanks draw fire. It is best to request the tanks to remain under cover until the engineers have completed the job. During the last operation, this method speeded up operations because of less enemy interference and reduced engineer casualties.

3. Unusual Fire. An unusual fire caused by spontaneous combustion occurred in the Fifth Army area recently and should serve as a warning to all units handling chemicals. A truck which had been hauling acetylene floodlights had not been swept clean of spilled calcium-carbide. Falling rain set up a chemical reaction, generating heat. Gasoline cans were placed in the truck and spilled gasoline was ignited by the heat. Only the quick action on the part of the truck driver saved the truck from going up in flames.

NOTE: Any description of only enemy equipment or methods, contained in this bulletin, or in any previous edition of the Fifth Army Engineer Technical Bulletin, may be extracted and reproduced with the classification of "RESTRICTED".

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