Diagrams and Instructions - Regarding

Recovery of Solder from Ration Tins.

RCR 12/41

B & C Section Printing Staff

FIRST AUSTRALIAN DIVISION. 165/81.

Divisional Headquarters,
17th January, 1918.

.....

Saving of Solder.

In view of the heavy demands for solder required by Army Workshops in France, it is proposed to recover as much solder as possible from bully beef tins.

Trials have been made on the L. of C. and a considerable amount of solder has been recovered from these tins.

All bully beef tins that can possible be collected will must be sent to DAYLIGHT CORNER, N.33.d.1.6., where a plant will be placed for the purpose of melting solder from same.

All empty tins will be put into bags. Units in Forward Area may utilise Light Railway for the purpose of forwarding these tins to DAYLIGHT CORNER.

for [illegible]

Lieut.-Colonel,
A. A. & Q. M. G.,
1st Australian Division.

RECOVERY OF SOLDER FROM RATION TINS.

Attached diagram shows a simple form of kiln for the recovery of solder from bully beef and ration tins.

Its construction is as follows - Four angle iron pickets are driven into the ground at the corners of a square with two foot sides. Three sheets of corrugated iron are then wired on to the pickets thus forming three sides of the square. Ten pieces of bar iron two feet long are fitted into the square about two feet from the ground to form fire bars. A piece of corrugated iron is placed under the fire bars to form a sloping ramp down which the ash and soldor will roll. A sheet of iron cut down in length by two feet is fitted to slide down the front of the kiln.

Action of the Kiln.

A small amount of kindling is placed on the firebars and the front of the kiln closed down. The tins to be dealt with are then piled into the kiln and the kindling lighted.

It will be found that the fat remaining in the tins will burn and generate sufficient heat to melt the solder which will run down the sloping ramp.

The solder is collected by sieving or preferably washing the ashes and the resultant lumps are then melted into solid blocks.

File

FIRST AUSTRALIAN DIVISION.

Divisional Headquarters,
17th January, 1918.

A.A.I.Gale.

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Lieut.-Colonel,
A. A. & Q. M. G.,
1st Australian Division.

2 a. I Bde L138.

HEADQUARTERS,
2nd Aust. Infantry Brigade,

19th JANUARY, 1918.

HEADQUARTERS,
2ND
INFANTRY BRIGADE.
No. S/98
Date 19-1-18

AUSTRALIAN WAR RECORDS SECTION
D873/5/1
CLASSIFICATION SUB-SECTION

5th Bn.
6th Bn.
7th Bn.
8th Bn.
2nd M.G. Coy.
2nd A.L.T.M. Bty.

SAVING OF SOLDER.

With reference to the above, it is requested that every effort be made to collect all bully beef tins whilst in the forward area, and have same placed in to sand bags and returned. In the case of 5th and 6th Battalions they will be returned to their ration dump and then to DAYLIGHT CORNER by limbers returning from delivering rations. In the case of the 7th and 8th Battalions and 2nd A.M.G. Coy and 2nd A.L.T.M. Bty they will be taken by parties to tramhead and placed on trollies and brought to the rear ration points by the pushing parties, who take forward R.E. material, and then be unloaded at the ration points.

From these points they will be taken by ration limbers to DAYLIGHT CORNER and a receipt obtained by all Units for same.

Whilst out of the line all Units will use every endeavour to make the returns worthy of the Brigade, and material collected will be taken by limbers to DAYLIGHT CORNER. A return of amount collected and handed in at Dump will be forwarded to Brigade Headquarters by 1100 on Thursday 24th instant.

A. Rodgerson Lieut
~~Captain,~~
for Staff Captain,
2nd Aust. Infantry Brigade.

8351

AUSTRALIAN CORPS

Headquarters,
11th February, 1918

Headquarters,
1st Aust. Division.
2nd Aust. Division
3rd Aust. Division
4th Aust. Division
5th Aust. Division

Recovery of Solder. Reference the attached A.R.O. 1439, of 2-12-17 and Q.M.G./G.H.Q. 53/9 (Q.A.3) of 6-10-17.

1. Returns for January show that the recovery of solder is not yet proceeding in accordance with the above instructions sent out under this office 170/208 of 6-1-18 and 12-1-18 : only 12 pounds was recovered during the month the whole of which was recovered by two Divisions.

2. Divisions will establish one or more solder recovery plants in their areas. they will probably most conveniently be placed under Area Commandants who will notify units in the area of their situation.

3. As far as possible all bully beef tins will then be collected and sent to the nearest solder recovery plant.

4. The tools necessary :-
One iron melting pot. (a camp kettle will do)
Two large forks
One large shovel.
can beobtained from Ordnance (Authority Q.M.G. G.H.Q. 53/9 , Q.A.3, of 6-10-17)

5. The solder recovered will be returned to R.O.O. for despatch to the Base : a record of the amount sent will be kept and reported by Divisions to this office on the last day of each month.

6. Divisions will notify this office by 28-2-18 the situation of their solder recovery plant, and on 1st of March and each succeeding month the amount of solder recovered in the preceding month.

for Brigadier-General,
D.A.&.Q.M.G.
AUSTRALIAN CORPS.

P.T.O.

The Commanding Officer
1st Aust San.Sect.
2nd Aust.San.Sect.
4th Aust.San.Sect.
5th Aust.San.Sect.

For information.

Headquarters
13th Feb.1918

for COLONEL
D.D.M.S. Australian Corps.

Copy to :-

A.D. Ordnance.
Corps Salvage Officer.
Area Commandants, (11)
B.G. Heavy Arty (6)
G.O.C. R.A. (4)
D.D.M.S. (5)
C.E. (4)
"K" Siege Park
"K" Amman Park
"K" Supply Col.
Camp Commandant.
"K" Sig. Coy
Corps Rfct Camp.

INSTRUCTIONS REGARDING RECOVERY OF SOLDER FROM EMPTY BULLY BEEF TINS

1. All that is required is a simple form of kiln, in which the tins can be fed in through a lid at the top, heated to a moderate temperature, and raked out through a door at the bottom as soon as the solder has had time to melt and run off on to the floor.

The floor should be smooth and slope downwards towards the door to facilitate the collection of the molten solder.

2. Any sort of kiln , however roughly designed and constructed will do, provided some means is adopted of regulating the draught so that the kiln does not get too hot. The tins must not be allowed to get red hot as the solder will be burnt (oxidised) and will then not run off.

3. The design and construction of the kiln depend on what material can be obtained locally . Two sample designs are shown in the attached drawings, but kilns of even simpler construction can be used successfully . A concrete floor is preferable if circumstances permit but well rammed earth with a covering of baked clay is quite satisfactory.

4. In the designs given the destructor is built so as to avoid a large opening.

The top opening or charging hole should be covered over by an iron plate, and the discharging hole should also be covered by an iron plate, the latter being only large enough for extracting the tins etc, (say- 12" x 15")

The combustion should be regulated by opening or closing either of these doors.

If the tins show signs of becoming red hot, the draught must be decreased by closing the door.

5. Method of working. Kindle a small fire of wood, straw or any light combustible rubbish, and throw in a suitable number of tins through the top. The amount of fat etc, that is left adhering to the inside of the tins is quite sufficient to keep the fire going when once well started.

When a temperature has been reached sufficient to melt the solder the latter will run off along the cloping floor under the door where it can be collected in a small gutter and allowed to solidify.

When the solder stops running, rake out the tins while still hot, turning them over well so as to allow any molten solder that may have collected inside them to fall on to the floor of the kiln.

A little more fuel may then be put in and the process continued.

6. When the burnt tins are cleared away, the ash should be taken out and sifted through a sieve of about ½" mesh.

The residue should then be taken and melted down in an iron saucepan or lid of a camp kettle; any portion of broken tin etc, that may have adhered to the solder should then be skimmed off the surface and the remainder allowed to solidify. When cool, it can be knocked out by a sharp bang on the ground, and it is then ready for disposal, together with the solder obtained as indicated at paragraph 5.

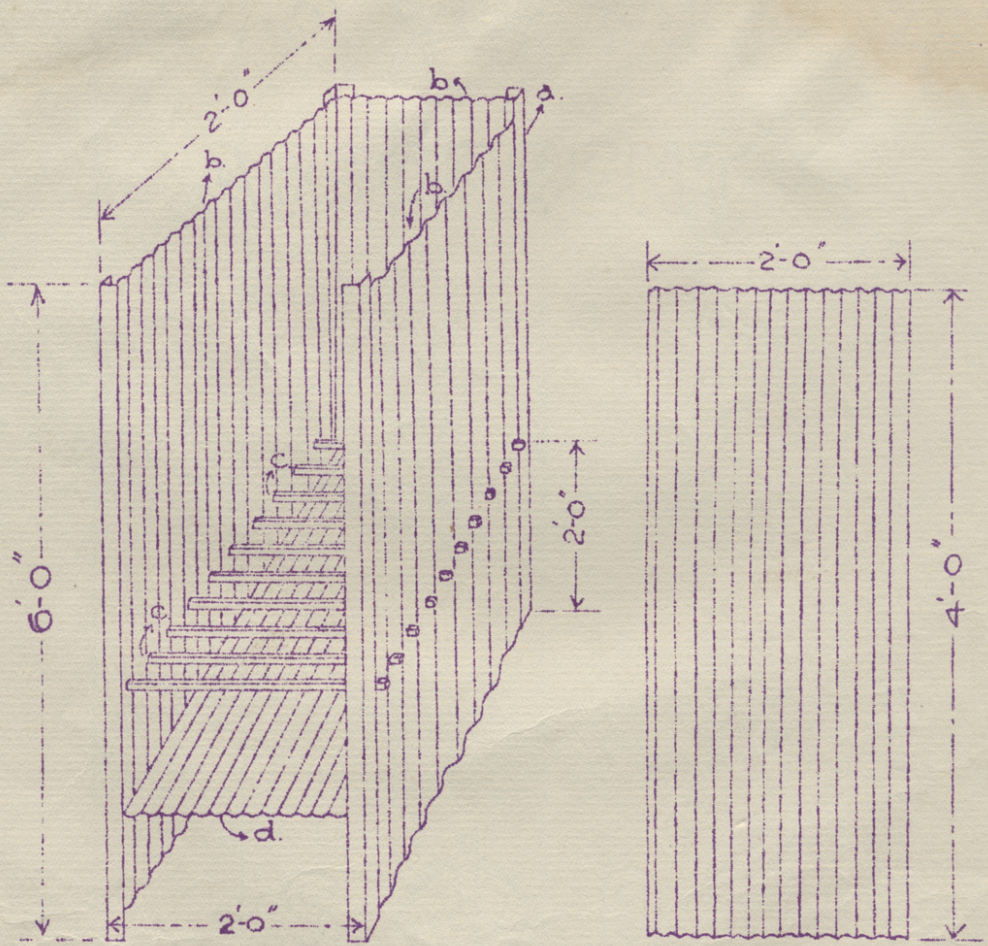
7. It is found that the small tin produces about 10 ozs of solder per 100 tins, the larger variety about 16 ozs per 100 tins.

Second Army Routine Order No. 1439 2-12-1917.

1439. Recovery of solder from Bully Beef tins.

Steps will be taken as soon as possible to carry out the system of recovery of solder from bully beef tins indicated in Q.M.G's letter 53/9 (Q.A.3) dated 6-10-18, a copy of which has been circulated to all concerned. The position of plants will be notified to D.D.O.S. Second Army, and the quantities of solder handed over for despatch to the Base during the preceding month will be reported to him on the first of each month.

SIMPLE FORM OF KILN FOR REDUCTION OF SOLDER.



a. 4- Angle iron Pickets.
b. 5- Sheets corrugated Iron.
c. 10- Lengths bar Iron.
d. 1- Sheet corrugated Iron sloped to front.
e. 1.. " sliding down" angle Pickets. to form front.

Corps Topo Sect.

Solder Recovery Kiln.

Material. 5 Sheets corrugated iron
4 Angle iron staples
10 Pieces bar iron 2' long.

Drive angle iron staples into the ground to form the 4 corner posts. Wire three sheets of iron on to the staples to form three sides of the kiln.
Place the pieces of bar iron to form the fire bars, about two feet from the ground.
Cut the one sheet of iron down by 2 ft. and slide it down the front of the kiln.
The 5th sheet place under the fire bars to form a sloping ramp.
To extract the solder place some kindling fuel on the bars, fill up the kiln with the tins. It will be found that the fat from the tins will burn and the solder will run down the sloping ramp.
Sieve the ashes in the kiln and melt all the solder into a solid block.

Peter Capt

SALVAGE OFFICER,
AUSTRALIAN CORPS.

AUSTRALIAN CORPS

Headquarters,
11th.February,1918.

Headquarters,
1st Aust.Division
2nd Aust.Division
3rd Aust.Division
4th Aust.Division
5th Aust.Division

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3. As far as possible all bully beef tins will then be collected and sent to the nearest solder recovery plant.
4. The tools necessary :-
One iron melting pot.(a camp kettle will do)
Two large forks .
One large shovel.
can be obtained from Ordnance (Authority Q.M.G. G.H.Q. 53/9, Q.A.3, of 6/10/17)
5. The solder recovered will be returned to R.O.O. for dispatch to the Base: a record of the amount sent will be kept and reported by Divisions to this office on the last day of each month.
6. Divisions will notify this office by 28/2/18 the situation of their solder recovery plant, and on the 1st of March and each succeeding month the amount of solder recovered in the preceding month.

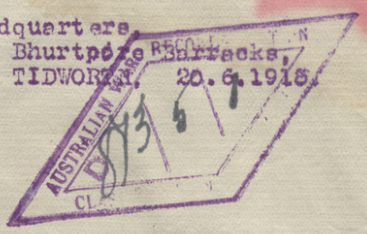
(signed)E.Milne for Major
Brigadier-General,
D.A.&Q.M.G.
AUSTRALIAN CORPS.

AUSTRALIAN IMPERIAL FORCE

DEPOTS IN THE U. K.

Headquarters,
Bhurtpore Barracks,
TIDWORTH. 20.6.1918.

CIRCULAR MEMO. No. 251



SALVAGE.

T I N S.

Old Tins form at the present time by far the most valuable portion of a Unit's Salvage. Their worth varies from £3. to £25. a ton, dependent on their size, condition and treatment.

They may be divided into the following classes:-

(a) Large Tins complete with lids which have contained Jam, etc., which are capable of immediate re-employment without treatment.

(b) Small Tins which have contained Tobacco, Butter Scotch, Metal Polish, Boot Polish, etc., which can be similarly re-employed with or without re-conditioning. These should be kept separately in their different makes.

(c) Large and other Tins which can, by a new process, be cut open and spread into flat sheets. A small machine will be supplied to each Unit for this purpose, which can be operated by one man and deal with the whole of the available supply. The top and bottom of cylindrical Tins are cut off and kept separately and the remainder opened out flat. These Sheets will then be packed in sizes and tied up into bundles of known weight awaiting disposal. The value of such sheets varies with the size, as they are then employed for stamping out new similar tins of a smaller size than the original.

(d) A demonstration of this process will be given shortly at a time and placeto be specified later, and Commanding Officers are requested to make the soldier in charge of their Tin Salvage Dump available to attend for the requisite instruction.

(d) Very rusty and crushed Tins, unavailable to be used as in (c), (Rust is a detriment, and must be avoided, but slightly rusted Tins, and even badly rusted ones, if one side is clean may be employed for (c)).

These must be collected separately and will later be treated by a simple furnace process for the extraction of solder.

NOTE: Tins must be washed where necessary with a 5% hot solution of caustic soda (obtainable on indent) to remove any food or other material which would become insanitary if allowed to remain; otherwise there is no occasion to wash them or remove paper from the outside, and in such cases handling should be confined to one sorting (before cutting) on arrival at the Dump Shed.

B. J. Martin

Captain.
D.A.Q.M.G.
& SALVAGE LIAISON OFFICER, A.I.F. DEPOTS.

60 1st FB

QMS, 12/41

WA

FIRST AUSTRALIAN DIVISION. 165/130.

Divisional Headquarters,
18th May, 1918.

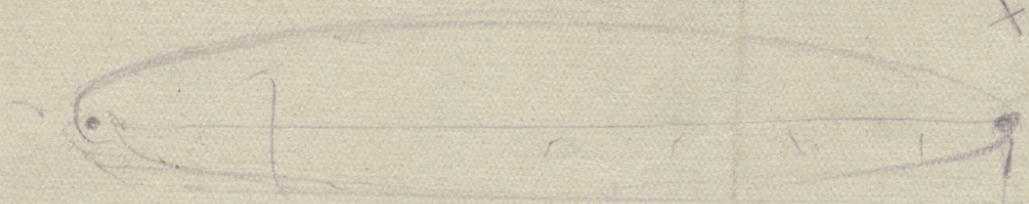
2nd Aust Sanitary Co

SAVING OF SOLDER.

All Bully Beef Tins that can possibly be salved will be sent to U.11.b.8.2. where a plant will be placed for the purpose of melting solder from such tins.

All empty tins will be put into bags and will be returned to this location by empty supply wagons.

R. Kerr. Major,
D. A. Q. M. G.,
1st Australian Division.



4,000/12 Q.B.1.
24th May.

INSTRUCTIONS FOR THE RECOVERY OF SOLDER FROM EMPTY MEAT TINS.

The method described below for the recovery of solder is one of the most simple kind, but is probably the most satisfactory for dealing economically in the field with large quantities of Bully Beef, Bacon and such like greasy tins. The method is an adaptation of the ordinary means employed in burning tins in an open incinerator. It requires very little extra labour. A small quantity of fuel is necessary, but only to start the combustion, and a large percentage of the available solder is recovered.

It should be carefully borne in mind that the method consists in burning these tins *with a limited draught*. If meat tins are placed in an ordinary open incinerator, and a small fire started, there is always sufficient fat, etc., adhering to the tins to ensure so intense a combustion as to entirely destroy the solder. With this fact in mind the objects of the particular design of the kilns to be described can be readily understood.

The Form of Kiln required is one into which the tins can be fed through an opening at the top, heated to a moderate temperature, and raked out through a door at the bottom as soon as the solder has had time to melt and fall on to the floor.

The most durable form is shown in the first sketch, and is constructed of bricks, the inner lining being preferably of fire clay, the outer of ordinary bricks. They should be cut in halves and built in with fire clay to obtain the most lasting structure.

The dimensions shown in the first sketch are for a kiln capable of holding about 200—300 tins, and producing therefrom over 2lbs. solder. A slightly larger form can be used, but the larger such an incinerator becomes the less the percentage yield of metal, owing to the increased difficulty of controlling the temperature in such a manner as to continue the combustion, but at the same time to avoid excessive heat.

The form shown in the second sketch is built of Bully Beef tins filled with clay or mud. A tar or larger barrel forms a support and guide to the construction, and is eventually burnt out. Failing a supply of bricks, this form of kiln serves almost as well as the first.

The floors of kilns must be smooth and slope downwards from all directions towards the door, in order to allow the molten solder to collect in the gutter constructed to receive it. This slope should not be less than 1 in 4. A concrete floor is preferable, but well rammed earth with a covering of baked clay is quite satisfactory.

To prevent overheating and to provide for a proper regulation of the draught the openings of kilns are provided with movable sheet-iron coverings or doors. The combustion is regulated by opening or closing either of these. The openings should be as small as possible consistent with ready charging and discharging of the kiln. The bottom opening should not exceed 12 in. by 15 in.

Method of Working.—Lay a small fire of wood, straw or any light combustible rubbish. Fill the kiln with tins through the top and kindle the fire. The amount of fat, etc., adhering to the tins is quite sufficient to keep the fire going when once well started.

As the tins at the bottom of the kiln become burnt they should be raked out as quickly as possible, and a fresh charge of tins put in at the top. During this operation the combustion should be kept steady. If the tins show any sign of becoming red hot the draught should be damped by closing whichever opening is not in use. The presence of a large quantity of smoke is an indication that the burning is under control.

About every hour the kiln should be cleared out, as the amount of ash collecting on the floor tends to prevent the run of the molten solder towards the gutter. The ash should not be disturbed more than necessary when hot, as the larger portions of molten solder are thereby broken up.

Collection of the solder.—Large lumps obtained from the gutter, or from the floor-ashes, should be picked out.

The ash should then be sifted through a sieve of about $\frac{1}{8}$" mesh. After this treatment it should be thrown on to the top of a final charge of tins, when the smaller particles of solder still remaining will run together and fall to the bottom of the kiln. The sifted ash of the final charge can be discarded.

The whole of the solder collected is melted down in any suitable iron vessel, and poured into moulds.

The moulds can be prepared from L or X iron of about 40" length pinched together at the ends and at two other places, so as to take three castings, each about 12" in length.

Yield.—Experience shows that this method yields about 15 ozs. of solder per 100 Bully Beef tins. Sliced bacon tins yield more; Maconnachie tins considerably less.

This leaflet cancels the previous "Instructions" on this subject.

TRAVERS CLARKE,
Lieutenant-General,
Q.M.G.

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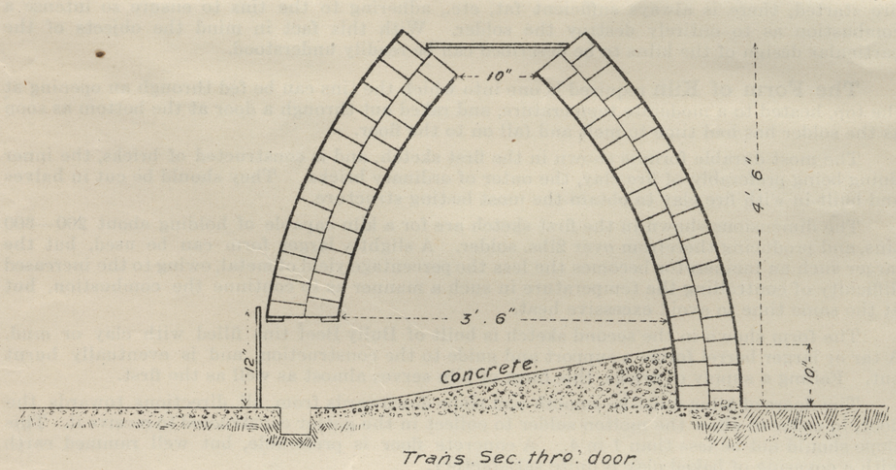
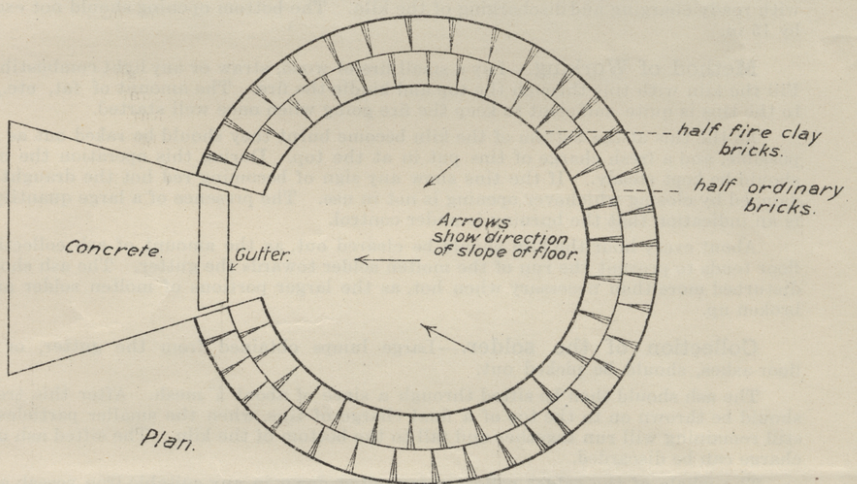
Solder Recovery (Brick Kiln)

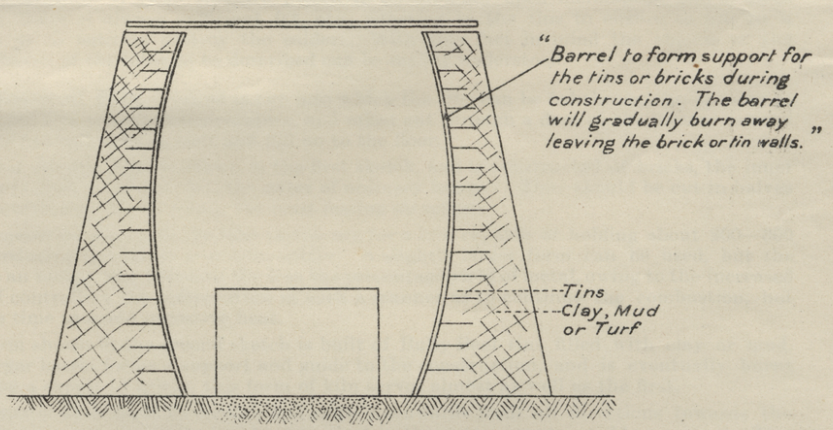


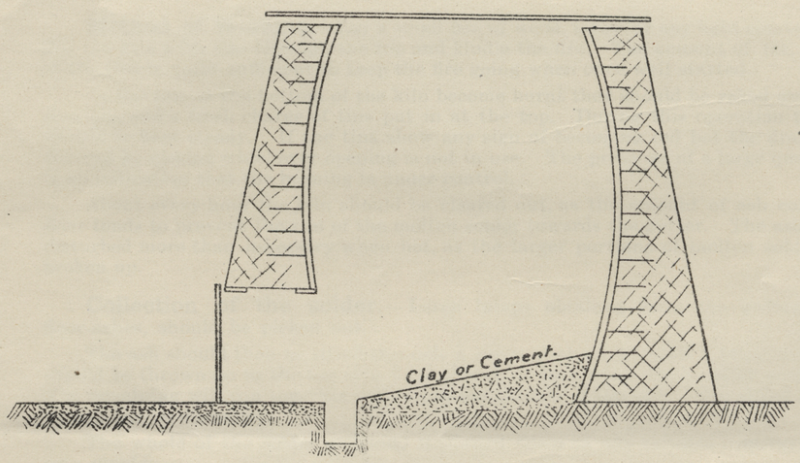
Trans. Sec. thro'. door.



Plan.

Solder Recovery. (Barrel & Clay Kiln.)





L.H.

182/7 (Q.B.1).

Second Army.

The demand for tin at home as become an urgent matter, and every effort should be made to ensure that all empty Biscuit, tins, Tea tins, 4-gallon Petrol tins, etc., not required in Army areas, are returned to the Base for shipment to England.

In order, however, to save bulk, it is suggested that tins should be collected at Railheads, and by means of a blow--lamp the solder seams should be undone, and the sides, tops, and bottoms of the tins packed flat and sent to the Base in empty Supply trucks. At the Base the tins will be dealt with and despatched home.

It is suggested one or two Railheads in Army Areas should be selected for this purpose, where tins could be collect--ed, and the necessary blow-lamps, which burn petrol or paraffin, will be made available. No skilled labour is required, and it is thought the men at present at railheads could do the work. All the solder from the tins should also be collected, and is required in the Ordnance workshops both in this country and at home; its price is now about £150 a ton.

Would you kindly consider and let me know to what extent this scheme could be developed in your Army.

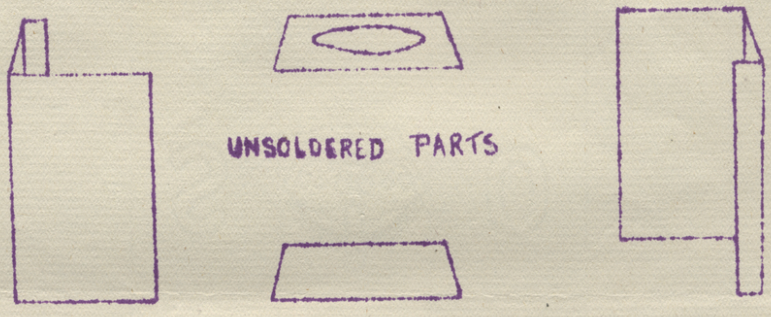
I attach a diagram showing how the ordinary Tea or Biscuit tin becomes detached by application of the blow-lamp. It is of course essential that tins do not get rusty, so some form of rough shed will be required to keep the tin plate in until despatched to the Base.

G. H. Q.

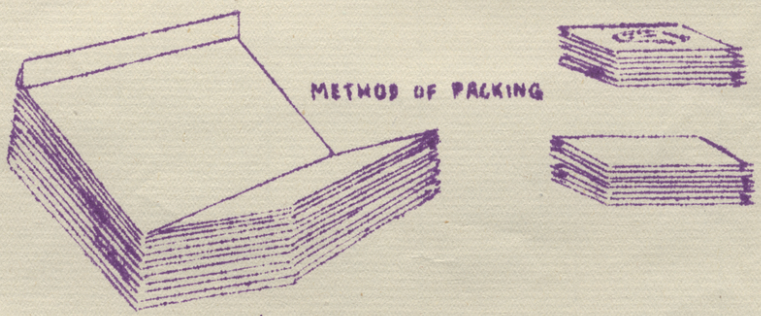
5/8/1917.

(sd) R. FORD, Major-General,

for Quartermaster General.



UNSOLDERED PARTS



METHOD OF PACKING

FLCS.

Confidential.

Extract from

War Diary of Admins. Staff 2nd Aust. Div. for May/1918. App. 4.

30-4-18.
ST. GRATIEN.

Extract from 4th Army A & Q Notes.

Solder. Amount of solder recovered from bully beef tins, etc., during the month of April 1918 was 498-lbs.

53/9 (Q.A.3)

Second Army.

No. 300

G.1 873/14.

With reference to the instructions as to unsoldering Biscuit, tea, coffee and 4-gallon petrol tins sent you under 182/7 (Q.B.1) dated 5.8.17., it appears that some misunderstanding has occurred and it is requested that you will hold the matter in abeyance until the wishes of the Home Authorities have been clearly ascertained.

Adv.G.H.Q. (sd) C.T.Dawkins. Major-General,
21st August,1917. for Quartermaster General.

Q/2332/12.

~~IX Corps.~~
~~X Corps.~~
I/ANZAC.
~~II/ANZAC.~~

For information, reference Second Army Q/2332/12 of 8th instant.

S M Rutter Capt
DA QMG
for Major-General,
D.A.&.Q.M.G. Second Army.

A.H.Q.
22/8/17.

Copies to "G" "ST" "E"

Q.

PA
Inaction is being taken
but

P.A.

C.R.A.
C.R.E.
2nd Aust.Div.Sig.Coy.
5th Aust.Inf.Brigade
6th Aust. Inf.Brigade
7th Aust. Inf.Brigade
2nd Aust.Pioneer Bn.
2nd Aust.Div.Train
22nd A.M.G. Coy.
A.D.M.S.
D.A.D.V.S.
D.A.D.O.S.
Div.Bomb Officer
Div.Salvage Officer
Camp Commandant

Recovery of Solder

~~Reference this office 132/90 of 16th instant.~~

Solder Kilns have been established in this area at A.S.C. lines as follows : -

SAMETTES	4.B.35.41.	(HAZEBROUCK 5a)	5th A.I.Brigade Area
QUESQUES	4.F.25.50.	(CALAIS Map)	6th A.I.Brigade Area
BOURNONVILLE	4.E.3.4.	(CALAIS Map)	7th A.I.Brigade Area

All units in the above mentioned Brigade areas will arrange to transport and dump all empty Bully Beef tins at the Kiln in their area

The 2nd Divisional Artillery will return all empty Bully Beef tins to Refilling Point by their Supply wagons and the Train wagons will then collect and dump the tins at the Kiln near their lines.

The solder recovered will be returned to R.O.O. for despatch to Base by Train supply wagons.

Brigades will keep a record of the amount sent and a return furnished to this office by noon on the second last day of each month.

Brigades will also notify this office on the 27th instant and the last day in each succeeding month the amount of solder recovered during that month.

Captain,
for D.A.Q.M.G.
2nd Australian Division

A. D. M. S., 1st AUSTRALIAN DIV.
M 271/179

AUSTRALIAN WAR RECORDS CLASSIFICATION
D 873 3

Ret. 12/41

WA

FIRST AUSTRALIAN DIVISION.

165/130

Divisional Headquarters,
27th May, 1918.

2nd Aust. Fd Amb. 239

Saving of Solder.

A Solder Plant is now established at 1st Company, A.A.S.C. at location U.17.d.9.8.

All empty bully beef tins will be salved by units, put in bags and sent to this location by empty supply wagons.

On no account are these bags to be allowed to accumulate at the Supply Dumps.

To QM
Turkey

[signature]
Captain.
for D.A.Q.M.G.,
1st Australian Division.