

No. 807

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

* Kerempis *

Report No. 793 No. in Register Book 1328

NELKON *

S.S. "Como"

Makers of Engines Amos & Smith Ltd.

Works No. 1467.

Makers of Main Boilers Amos & Smith Ltd.

Works No. 1467.

Makers of Donkey Boiler —

Works No. —

MACHINERY.



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Foundation

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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 793 No. in Register Book 1328

Received at Head Office 11th October 1910

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the S.S. "Como"

Port of Registry Hull

Registered Owners Thos. Wilson Sons & Co. Ltd.
Hull.

Surveyor's District Hull

Date of Completion of Engines September 1910.

" " " " Main Boilers September 1910.

" " " " Donkey " ✓

Trial Run at in River Humber.

Date 21. 9. 10.

First Visit 8-3-10

Last Visit 20. 9. 10.

Total Number of Visits 35.



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ENGINES.

Made by *Amos Smith & Co.*
 " at *Hull* Works No. *1764*
 Description *Triple expansion, Inverted. 3 Cyl.*
 No. of Cylinders, each Engine *3.* Diars. *16½" - 27" - 45"* Stroke *33"*
 Cub. feet in ~~each~~ L.P. Cylr. *30.37* Revols. per Min. *77* I.H.P. *650*
 Pressure in I.P. Receiver at full Power *50 lbs* 2nd I.P. L.P. *6½ lbs*
 Thickness of Metal in H. P. Cylr. *1"* L.P. *1½"* " " *1½"*
 " " " " Liner *1"* " " "
 " " " " Valve Chest *1"* " *1"* " " *1"*
 Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cylr.? *Yes.*
 " " " " each Receiver? *Yes.*
 Number of ~~Ball~~ Studs in H.P. Cylr. Cover *18* I.P. *18* 2nd I.P. L.P. *22*
 Eff. Diar. " " " *1½"* " *1½"* " " *1½"*
 Pitch " " " *3¾"* " *5⅞"* " " *7"*
 Type of H.P. Valves (Piston or Slide) *Piston* " *Piston* " " *Slide*
 " Valve Gear *Stephenson's Link Motion.*

Diameter of Piston Rods (plain part) *4½"* At Bottom of Thread *3¾"*
 Makers " *J. Spence & Sons* Material *High Tensile Steel.*
36 to 40 TONS.

Diameter of Connecting Rods (smallest part) *4½"* Material *Iron*
 Makers " " *Bagnall & Sons*

Diar. of Crosshead Gudgeons *5"* Length of Bearing *5"* Material *Iron.*

No. of Top End Bolts (each Rod) *4* Effective Diar. *1 25/32"* Material *Steel*
 " Bot. " " *2* " *2 7/32"* " "
 " Main Bearings *6* Lengths *9½"* " "
 " Bolts in each *2* Effective Diar. *2 1/32"* Material "

No. of Holding Down Bolts, each Engine *40* No. of Metal Chocks *17.*
 Eff. Diar. " " " *1.067* Average Pitch *17"*
 Are the Engines bolted directly to the Tank Top? *No.*
 Are the Bolts tapped through the Tank Top and fitted with Nuts inside? *No.*
 Date of Test of Tank by Water Pressure with Holding Down Bolts in place

SKETCHES.



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SKETCHES.

2025 1948

$$D = \sqrt[3]{\frac{180 \times 45^2 \times 33}{594 \times (2150 \times (\frac{45}{16.5})^2 + 2)}} \times 9.44$$

Como

= 8.4" 20300

Thrust Shaft = 1.05 × 8.4 = 8.82" made 9.25"

1910

$$D = \sqrt[3]{\frac{180 \times 45^2 \times 33}{618 \times 19440}} \times 1 = 8.51 \text{ made } 9.25$$

8.756"

per Machy Booth

0124 2/2

SM 29-1-48

Description of Thrust Blocks

Horse shoe type

Number " " Rings

5

Diar. of Thrust Shafts by Rule 8.756" Actual (at bot. of Collars) 9 1/4" Over Collars 14 1/2"

" " at Forward Coupling 9 1/4" After Coupling 9 1/4"

No. of Thrust Collars 4 Thickness 1 7/8" Distance apart 5 5/8"

Thrust Shafts Forged by Gatchoffnungshuty Material Steel

" Finished by Amos & Smith Ltd.

Diar. of Intermediate Shafting by Rule 8.318" Actual 8 3/4" Lloyd's Register Foundation

No. of Lengths, each Engine 4 No. of Tunnel Bearings 3

Diar. of Bearings 9" Length 13" Distance apart 13.0" 17.0"

SHAFTING.

Are Crank Shafts Built? *Yes* No. of Lengths in each *One* Angle of Cranks *120*
 Diar. of Crank Shafts by Rule *8.756* Actual *9 1/4"* Diar. in Way of Webs *9 1/4"*
 Makers of " *Gutehoffnungshütte* Material *Steel*
 Diar. of Crank Pins *9 1/4"* Diar. in Way of Web *9 1/4"*
 Makers of " *Gutehoffnungshütte* Material *Steel*
 Width across Crank Webs at Centre of Shaft *18 1/2"* Thickness *5 3/4"*
 " " " Crank Pins *18 1/2"* *5 3/4"*
 " " " Narrowest part *18 1/2"* *5 3/4"*
 Makers of Crank Webs *Glasgow & S Co* Material *Steel*
 Diar. ~~of~~ *Breadth* of Keys in Crank Webs *2 1/8"* Length *5"*
 " of Dowel Pins in Crank Pins *1 1/8"* Length *3* Screwed or Plain *Plain*
 No. of Bolts in each Coupling *6* Diar. at Mid Length *2 1/2"* Diar. of Pitch Circle *14 3/4"*
 Material of Coupling Bolts *Steel*
 Crank Shafts Finished by *Amos & Smith Ltd.*
 Greatest Distance from edge of Main Bearing to Crank Web *1/4"*
 Description of Thrust Blocks *Horse shoe type*
 Number " " Rings *5*
 Diar. of Thrust Shafts by Rule *8.756* Actual (at bot. of Collars) *9 1/4"* Over Collars *14 1/2"*
 " " at Forward Coupling *9 1/4"* After Coupling *9 1/4"*
 No. of Thrust Collars *4* Thickness *1 7/8"* Distance apart *5 5/8"*
 Thrust Shafts Forged by *Gutehoffnungshütte* Material *Steel*
 " Finished by *Amos & Smith Ltd.*
 Diar. of Intermediate Shafting by Rule *8.318* Actual *8 3/4"*
 No. of Lengths, each Engine *4* No. of Tunnel Bearings *3*
 Diar. of Bearings *9"* Length *13"* Distance apart *13.0"*
 " " " " " " " " " " " " *17.0"*

18630
 810
 19440

19530
 18630
 900

TURBINE ENGINES.

Type

No. of H.P. Turbines

No. of L.P. Turbines

No. of Astern

How arranged

Revs. per Min.

Horse Power

Diar. of H.P. Turbine Drums

MATERIAL

THICKNESS OF METAL

Material of H.P. Turbine Casings

Lengths of Blades in H.P. Turbines

No. of Rows of Blades of each Length

Pitch of

Diar. of L.P. Turbine Drums

MATERIAL

THICKNESS OF METAL

Material of L.P. Turbine Casings

Lengths of Blades in L.P. Turbines

No. of Rows of Blades of each Length

Pitch of

Diar. of Astern Turbine Drums

MATERIAL

THICKNESS OF METAL

Material of Astern Turbine Casings

Lengths of Blades in Astern Turbines

No. of Rows of Blades of each Length

Pitch of

Diar. of Turbine Spindles

Length of Bearing

No. of Thrust Collars on each Spindle

Thickness

Distance apart

Diar. of Spindles at Bottom of Collars

Diar. over Collars

Spindles Forged by

Material

,, Finished by

SKETCHES.



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PUMPS ETC

No. of Air Pumps 1 Diar. 16 1/2" Stroke 16"
 Type of " Single acting ordinary
 Diar. of Air Pump Rod 2 1/2" Material Navy bronze
 How are Air Pumps Worked? from L.P. engine

No. of Centrifugal Circulating Pumps ✓ Maker -
 " Reciprocating " " 1 Diar. 9" Stroke 16"
 Diar. of Circulating Pump Rods 2 1/2" Material Navy bronze
 How are Circulating Pumps Worked? from L.P. engine

Diar. of Circulating Pump Suction from Sea 5 1/2"
 Has each Circulating Pump a Bilge Suction with Non-return Valve? Yes Diar. 4"

No. of Feed Pumps on each Engine 2 Diar. 2 3/4" Stroke 16"
 Where do they pump from? Hot well
 " " discharge to? Boilers

Are Spring-loaded Relief Valves fitted to each Pump? Yes
 Can one Pump be overhauled while the others are at work? Yes

No. of Bilge Pumps on each Engine 2 Diar. 2 3/4" Stroke 16"
 Where do they pump from? Bilge, sea, tanks.
 " " discharge to? Overboard + deck.
 Can one Pump be overhauled while the others are at work? Yes

No. of Bilge Injections connected to Condensers ✓ Diar. -
 Are all Bilge Suctions fitted with Roses? Yes
 Are the Valves, Cocks, and Pipes so arranged as to prevent unintentional connection between Sea and Bilges? Yes

Are all Sea Connections made with Valves or Cocks fitted direct to the Hull Plating? Yes

Are they placed so as to be easily seen and accessible? Yes

Are the Discharge Chests placed above the Deep Load Line? Yes

Are they fitted direct to the Hull Plating and easily accessible? Yes

Are all Blow-off Cocks or Valves fitted with Spigots through the Hull Plating and Covering Plates or Flanges on the outside? Yes



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No. of Rows of Rivets in Centre Circumferential Seams ✓
 Are these Seams Hand or Machine Riveted? ✓
 Diam. of Rivet Holes ✓
 Pitch " ✓
 Width of Overlap ✓
 No. of Rows of Rivets in End Circumferential Seams *Two*
 Are these Seams Hand or Machine Riveted? *Back machine, Front hand.*
 Diam. of Rivet Holes *1 1/16"*
 Pitch " *3 1/4"*
 Width of Overlap *5"*
 Size of Manholes in Shell *16" x 12"*
 Dimensions of Compensating Rings *3' 4" x 2' 6"*

Thickness of End Plates in Steam Space by Rule *14.9"/16"*
 " " " " " Approved *1"*
 " " " " " in Boilers *1"*
 Pitch of Steam Space Stays *16 1/2" x 14 1/2" and 18" x 12"*
 Eff. Diam. " " " by Rule *2.537"*
 " " " " " Approved
 " " " " " in Boilers *2.537"*
 Material of " " " *Steel*
 How are Stays Secured? *Front end, Secured through plate with nut outside. Back end Double nuts & washers.*
 Diam. and Thickness of Loose Washers on End Plates *8 1/4" x 1/16"*
 " " Riveted " " " ✓
 Width " " Doubling Strips " " " ✓

Thickness of Middle Back End Plate by Rule *13.9"/16"*
 " " " " " Approved *7/8"*
 " " " " " in Boilers *7/8"*

Thickness of Doubling in Wide Spaces between Rivets
 Pitch of Stays at
 Eff. Diam. of stays of plate
 Approved
 in Boilers
 Material of
 Are stays fitted with nuts outside?
 Thickness of Back End Plates at Bottom by Rule
 Approved
 in Boilers
 Pitch of Stays at Wide Spaces between Rivets
 Thickness of Doubling in
 Thickness of Front End Plates at Bottom by Rule
 Approved
 in Boilers
 No. of Long Stays in Spaces between Rivets
 Eff. Diam. of Stays by Rule
 Approved
 in Boilers
 Material of



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Thickness of Doublings in Wide Spaces between Fireboxes

Pitch of Stays at " " " " 14 ¹/₄ "

Eff. Diar. of Stays by Rule

" " " Approved 1.747 "

" " " in Boilers 1.747 "

Material " Steel

Are Stays fitted with Nuts outside? Yes. machine Bolt heads.

Thickness of Back End Plates at Bottom by Rule

" " " " " Approved 12.5 ³/₁₆ "

" " " " " in Boilers 7/8 "

Pitch of Stays at Wide Spaces between Fireboxes 14 ¹/₄ "

Thickness of Doublings in " " ✓

Thickness of Front End Plates at Bottom by Rule

" " " " " Approved 27/32 "

" " " " " in Boilers 27/32 "

No. of Long. Stays in Spaces between Furnaces One

Eff. Diar. of Stays by Rule

" " " " Approved 2.537 "

" " " " in Boilers 2.537 "

Material " Steel

Thickness of Front Tube Plates by Rule

" " " " " Approved 14 ³/₁₆ "

" " " " " in Boilers 27/32 "

Pitch of Stay Tubes at Spaces between Stacks of Tubes 14 ¹/₄ "

Thickness of Doublings in " " " " ✓

" Stay Tubes at " " " 5/16 + 3/8 "



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Are Stay Tubes fitted with Nuts at Front End?

Eight only fitted with nuts.

Thickness of Back Tube Plates by Rule

" " " Approved

" " " in Boilers

Pitch of Stay Tubes in Back Tube Plates

" Plain "

Thickness of Stay Tubes

" Plain "

External Diar. of Tubes

Material " "

Thickness of Furnace Plates by Rule

" " " Approved

" " " in Boiler

Smallest outside Diar. of Furnaces

Length between Tube Plates

Width of Combustion Chambers (Front to Back)

Thickness of " " Tops, by Rule,

" " " " Approved

" " " " in Boilers

Pitch of Screwed Stays in C.C. Tops

Eff. Diar. " " by Rule

" " " Approved

" " " in Boilers

Material " "

Thickness of Combustion Chamber Sides by Rule

*13 3/16**27/32"**27/32"**9" x 13 1/2"**4 1/2 x 4 1/2**5/16" x 3/8"**8 W.G.**3 1/4**Iron**11 8/16**13/16"**13/16"**3' 6 1/8"**6' 8"**2' 6"**10 5/16**11/16"**11/16"**7 7/8" x 10"**1.45"**1.494"**1.494"**Steel**10 4/16*

Thickness of Combustion Chamber Sides by Rule

" " " in Boilers

Pitch of Screwed Stays in C.C. Sides

Eff. Diar. " " by Rule

" " " Approved

" " " in Boilers

Material " "

Thickness of Combustion Chamber Backs by Rule

" " " Approved

" " " in Boilers

Pitch of Screwed Stays in C.C. Backs

Eff. Diar. " " by Rule

" " " Approved

" " " in Boilers

Material " "

Are all screw stays fitted with nuts inside C.C.

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Girder

" " " " " "

Depth and Thickness of Girders

Material of Girders

No. of stays in each



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Thickness of Combustion Chamber Sides Approved

11/16"
11/16"

" " " " in Boilers

Pitch of Screwed Stays in C.C. Sides

9" x 8 3/4"
1.17"

Eff. Diar. " " by Rule

1.497"

" " " Approved

1.497"

" " " in Boilers

Material " "

Steel

Thickness of Combustion Chamber Backs by Rule

10.3°
11/16"

" " " Approved

11/16"

" " " in Boilers

11/16"

Pitch of Screwed Stays in C.C. Backs

8 1/2" x 9"
1.44"

Eff. Diar. " " by Rule

1.497"

" " " Approved

1.497"

" " " in Boilers

Material " "

Steel

Are all Screwed Stays fitted with Nuts inside C.C.

Yes.

Thickness of Combustion Chamber Bottoms

11/16"

No. of Girders over each Wing Chamber

4

" " " Centre "

Depth and Thickness of Girders

8" x 7/8" Two plates

Material of Girders

Iron Steel

No. of Stays in each

Two

No. of Stay Tubes, each Boiler

48

" " Plain " " "

126

Size of lower Manholes

16" x 12"

VERTICAL DONKEY BOILERS

If the Donkey boiler are Vertical the following particulars should be stated in addition to those on

previous pages applicable to such Boilers.

Type of Boiler	
Height of Boiler Crown above Fire Grate	
Are Boiler Crown Flat or Dished?	
Internal Radius of Dished Boilers	
Description of Seams in Boiler Crown	
Width of Overlap	
Height of Firebox Crown above Fire Grate	
Are Firebox Crown Flat or Dished?	
Internal Radius of Dished Crown	
No. of Crown Stays	
Effective Diar.	
Thickness of Plates	
External Diar. of Firebox at Top	
Internal Diar.	
No. of Water Tubes	
Material of Water Tubes	
No. of Screwed Stays in Firebox Sides	
Eff. Diar.	
Material	
Are they fitted with Nuts inside?	
Outside?	

SUPERHEATERS



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VERTICAL DONKEY BOILERS.

If the Donkey Boilers are Vertical the following particulars should be stated in addition to those on

previous Pages applicable to such Boilers:—

Type of Boilers

Height of Boiler Crown above Fire Grate

Are Boiler Crowns Flat or Dished?

Internal Radius of Dished Ends

Thickness of Plates

Description of Seams in Boiler Crowns

Diar. of Rivet Holes

Pitch

Width of Overlap

Height of Firebox Crowns above Fire Grate

Are Firebox Crowns Flat or Dished?

External Radius of Dished Crowns

Thickness of Plates

No. of Crown Stays

Effective Diar.

Material

External Diar. of Firebox at Top

Bottom

Thickness of Plates

No. of Water Tubes

Int. Diar.

" "

Material of Water Tubes

No. of Screwed Stays in Firebox Sides

Eff. Diar.

Material

Are they fitted with Nuts inside?

Outside?

SUPERHEATERS.

Description of Superheaters

Where situated

Which Boilers are connected to Superheaters?

Can Superheaters be shut off while Boilers are working?

No. of Safety Valves on Superheaters

Diar.

Area

Are " " fitted with Easing Gear?

Date of Hydraulic Test

Test Pressure

Date when Safety Valves set

Pressure on Valves

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3
Cylinder
Steam
3 1/2"
10 M. A.
18 p. 10
300 lb

No. of Tubes
Material
Diam. of Tubes
Internal Diam.
Thickness
How are Joints Sealed?
Date of Hydraulic Test
Test Pressure

REFRIGERATORS.

No. of Machines
Description

When any part of the Vessel is to be used for the Carriage of Refrigerated Cargo the following particulars should be stated:—

Total cubic capacity of Refrigerated space
Nature, Construction, Thickness, &c. of Insulation
Are all Pipes Air Tights, &c. well secured and protected from risk of damage?
Are all high sections, sounding, and Air Pipes in insulated spaces properly insulated?
Are Thermometer Tubes so arranged that Water cannot enter and freeze in the Tubes?
Are Drain Valves fitted with non-return valves?
Are pipes fitted with non-return Valves?
Are the Vessels and Pipes fitted with steam traps?
Are the steam valves or pipes fitted with non-return valves?



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MAIN STEAM PIPES.

No. of Lengths 3.

Material Copper.

Brazed, Welded, or Seamless Seamless.

Internal Diam. 3 1/4"

Thickness 6. W. G.

How are Flanges Secured? Brazed.

Date of Hydraulic Test 13.9.10.

Test Pressure 360 lbs.

REFRIGERATORS.

No. of Machines Makers

Description

When any part of the Vessel is to be used for the Carriage of Refrigerated Cargo the following particulars should be stated:—

Total Cubic Capacity of Refrigerated Spaces

Nature, Construction, Thickness, &c., of Insulation

Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage?

Are all Bilge Suction, Sounding, and Air Pipes in Insulated Spaces properly insulated?

Are Thermometer Tubes so arranged that Water cannot enter and freeze in the Tubes?

Are Sluice Valves fitted on any of the Bulkheads of Insulated Spaces?

Are these fitted with Brass Non-return Valves?

Are they always accessible?

Are the Bilges and Bilge Rose Boxes always accessible?

Are the Steam Suctions to Bilges fitted with Non-return Valves?

Is the Machine Room effectively separated from Insulated Spaces?

Is it properly Ventilated and Drained?

No. of Steam Cylinders, each Machine

Diams.

Compressors,

Diam. of Crank Shafts

No. of Cranks

Give particulars of Pumps in connection with Refrigerating Plant, and state whether worked by Refrigerating Machines or independently

Are Brine and other Regulating Valves placed so as to be accessible without entering the Insulated Spaces?

Date of Test under Working Conditions

Fall of Temperature in Insulated Spaces

Time required to obtain this Result

Articles of Spare Gear for Refrigerating Plant carried on board



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SPARE GEAR.

No. of Top End Bolts	2	No. of Bot. End Bolts	2
" Main Bearing Bolts	2	" Coupling Bolts	6
" Cylr. Cover Bolts Studs	6	" Valve Chest Cover Bolts Studs	6
" Feed Pump Valves	4	" Bilge Pump Valves	4
" Safety Valve Springs	1 Set.	" Fire Bars	1/2 set.
" Piston Rings	✓	" Junk Ring Bolts Studs	6
" Piston Rods	✓	" Connecting Rods	✓
" Valve Spindles	✓	" Air Pump Studs & glands.	2
" Air Pump Valves	1/2 set.	" " Buckets	✓
" Crank Pin Bushes	—	" Crosshead Bushes	✓
" Crank Shafts	—	" Propeller Shafts	✓
" Propellers	1	" " Blades	✓
" Boiler Tubes	8	" Condenser Tubes	✓

OTHER ARTICLES OF SPARE GEAR.

1 set feed chest valves. (main)
 1 " " " (donkey)
 1 ecc. strap
 1/2 set Circ. pump valves.
 8 tube stoppers.
 40 Condenser tube ferrules.
 2 Valves for donkey pump.

1 " Spindles

1 " Studs

1 " Bolts

1 " Nuts

1 " Washers

1 " Gaskets

1 " Packing

1 " Oil

1 " Grease

1 " Tools

1 " Spare parts

GENERAL CONSTRUCTION.

Have all the Requirements under Sections 31 and 32 of the Rules been complied with? *Yes.*

If not, give details of the points of difference, and state when these were sanctioned by the Chief

Surveyor

Are the Steam Pumping Arrangements in accordance with the approved Plan? *Yes.*

If not, state in what respects they differ and when such differences were sanctioned by the Chief

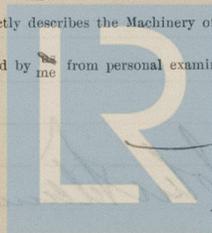
Surveyor

Are the Materials used in the Construction of Engines and Boilers, so far as could be seen, sound and trustworthy? *Yes.*

Is the Workmanship throughout thoroughly satisfactory? *Yes.*

The above correctly describes the Machinery of the S.S. "Coma".

as ascertained by me from personal examination.



Geo. A. ...
 Lloyd's Register
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 Engineer Surveyor to the British Corporation for the
 Survey and Registry of Shipping.

Fees—

MAIN BOILERS. Have all the fittings under test been done in accordance with the Rules of the Board of Trade?

H.S. 2470. Sq. ft. 12 : 0 : 0

G.S. 74-25. " : : :

NO DONKEY BOILERS.

H.S. ✓ Sq. ft. : : :

G.S. ✓ " : : :

£ : :

ENGINES.

L.P.C. 30-37. Cub. ft. 9 : 0 : 0

Testing, &c. It is not stated in what respects the boiler and donkey boiler have been tested.

£ : :

Expenses ... : :

Total ... £ 21 : 0 : 0

It is submitted that this Report be approved,

John King
Chief Surveyor.

Approved by the Committee, *for the class of M B N **
on the 12th September 1890

Fees applied for 24-9-10.

Fees paid

Robert Manning
Secretary.



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Page

MAID PAID

10 2470.00 12 0.0

04 74.25

1/2 DONKEY POLISH

03 4.00

05 2.00

EMERGENCY

10 20.37 9 0.0

PAID

Total 21 0.0

It is submitted that this Report be approved.

John King
Secretary

Approved by the members of the Council of M. B. N. *
on the 12th October 1950

For signed for 24 8 10

See note

John King



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