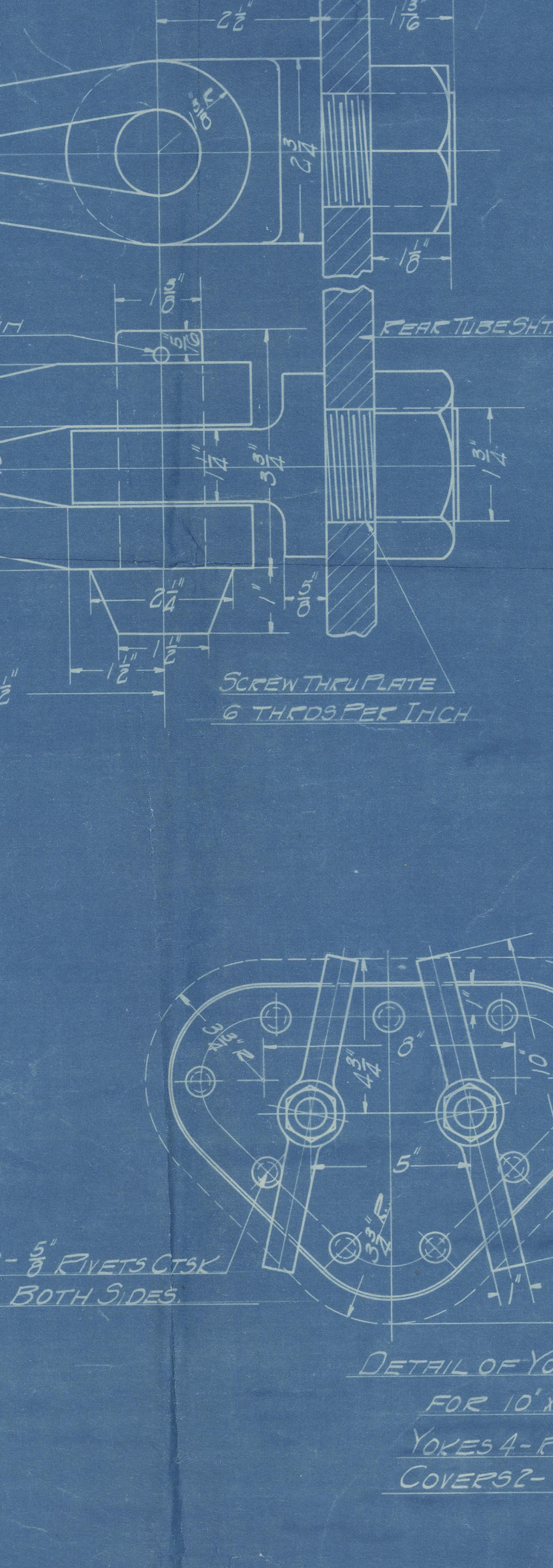
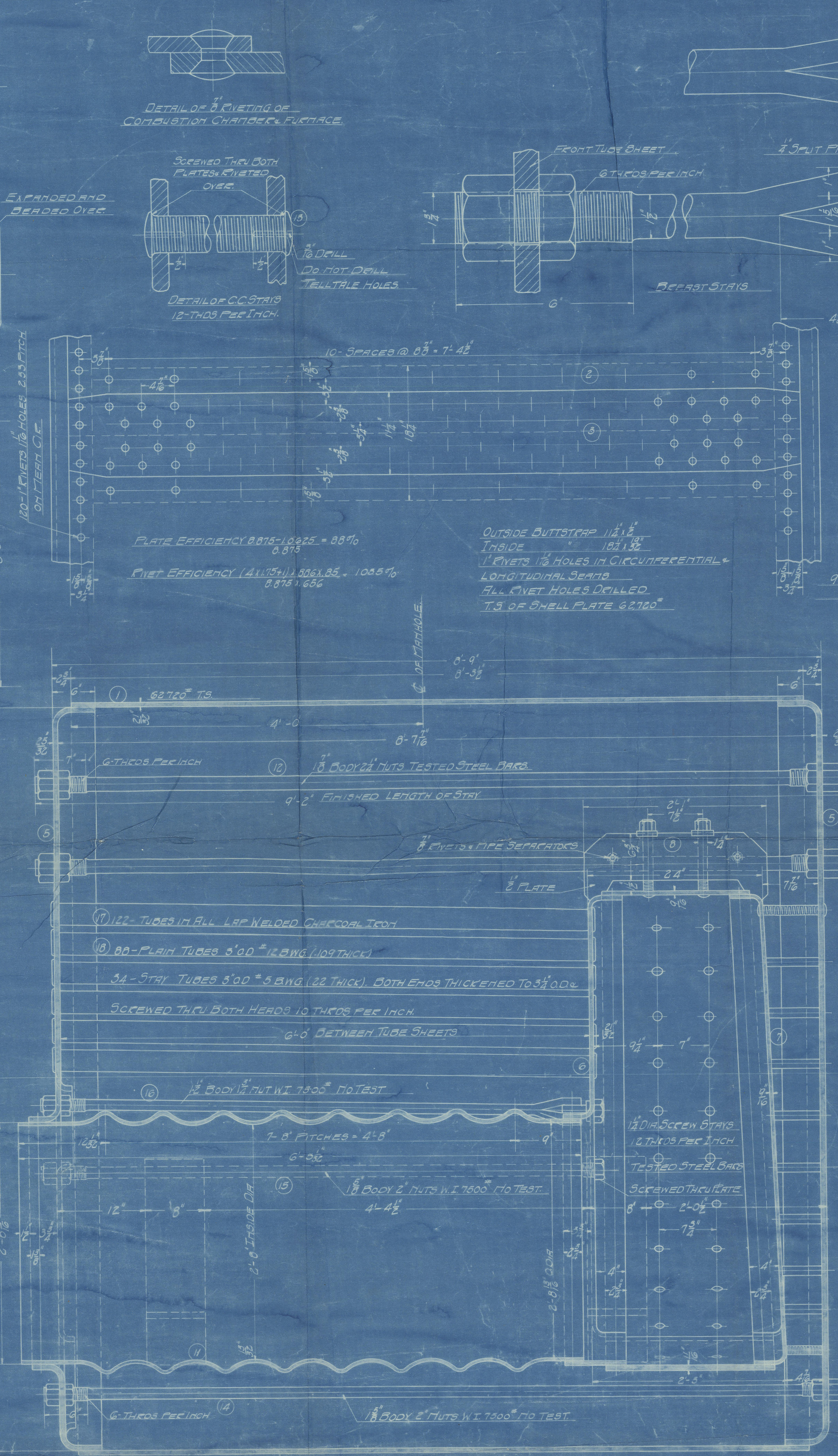
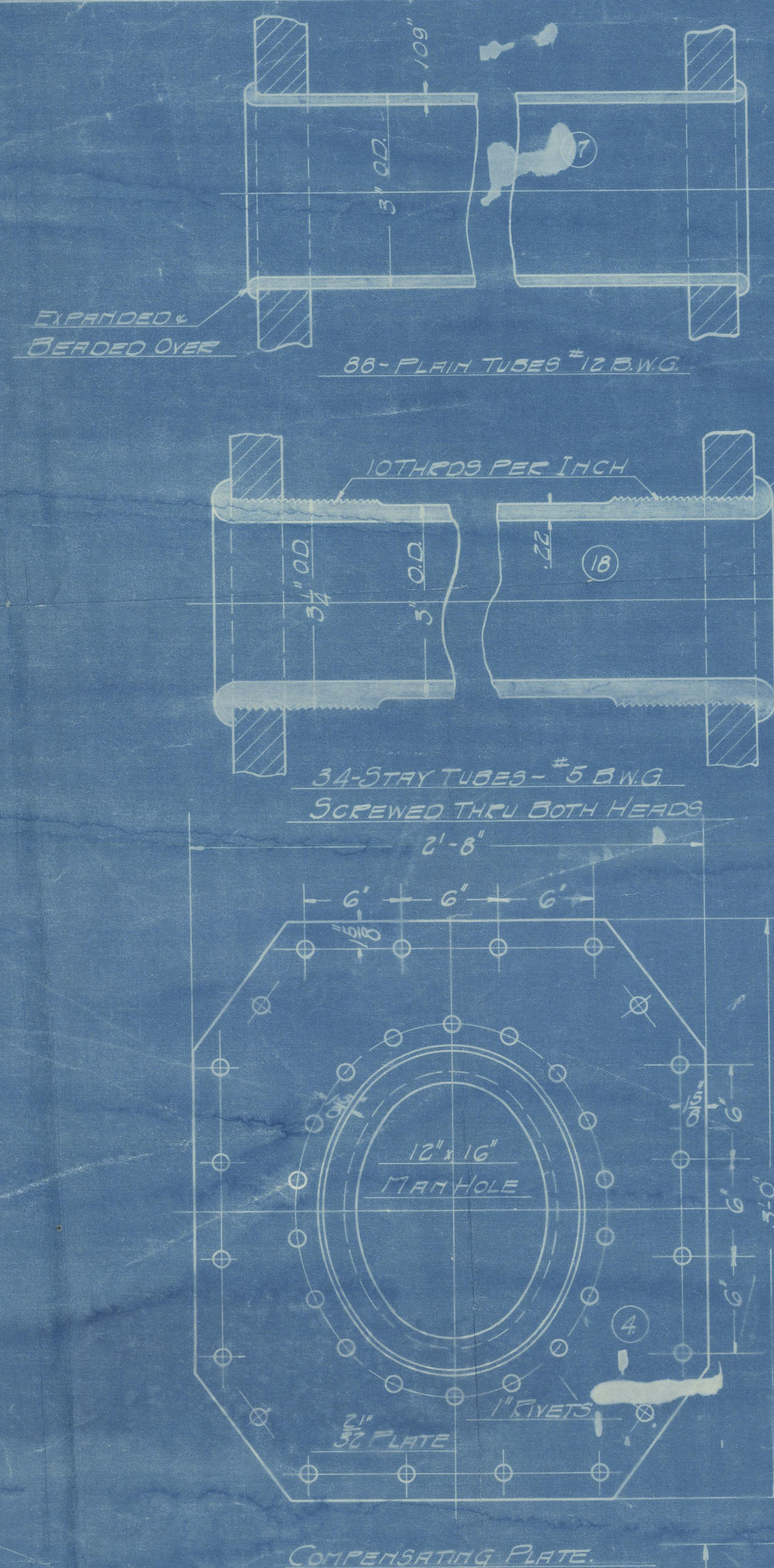
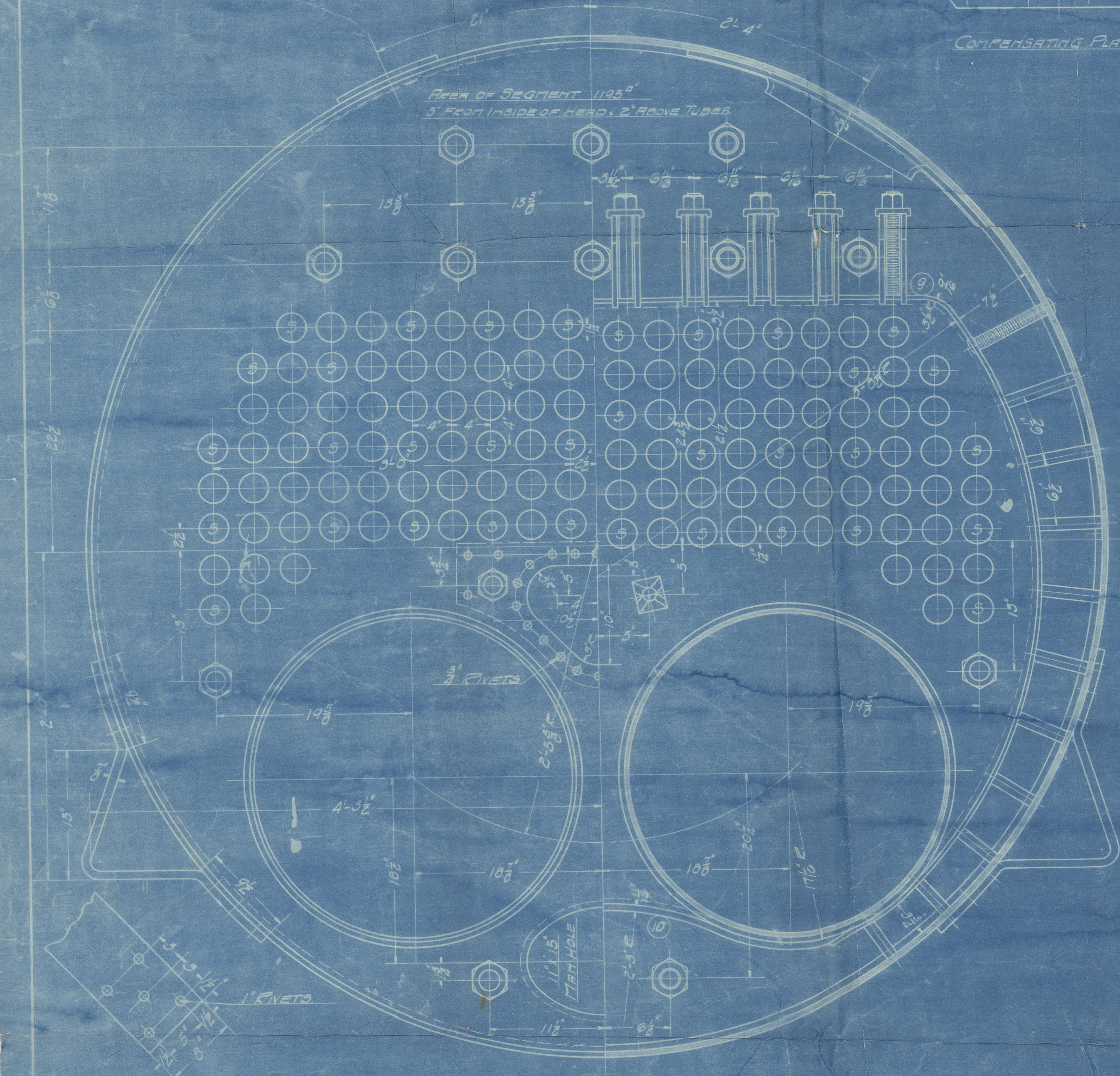


TABLE OF FORMULAE FOR STRENGTH AT 100 PSI			
	BRITISH LLOYDS	U.S. GOVERNMENT	
SHELL PLATES	$2125 \times 105 \times 11.00$ 102	$62700 \times 656 \times 12$ 81.6	$\approx 16.35$
INSIDE BUTT JAP	$51.652 \times (1075-10620) = 569$ $417.675 \times 21.0620$		
HEADS IN STEEL SPACE	$175 \times 12.5$ 102	$175 \times 12.5$ 1373	$\approx 150.8$
IN TUBE	$140 \times 10.5$ 102	$140 \times 10.5$ 1373	$\approx 150.8$
PERC TUBE SHEET	$140 \times 10.5$ 102	$140 \times 10.5$ 1373	$\approx 150.8$
CC HEAD	$100 \times 9$ 81	$100 \times 9$ 741	$\approx 128$
TOP PLATE	$100 \times 9$ 81	$100 \times 9$ 741	$\approx 128$
SIDE	$100 \times 9$ 81	$100 \times 9$ 741	$\approx 128$
FURNACES	$1259 \times (65.2)$ $55.0125$	$15600 \times 1.406$ 741	$\approx 106.5$
GIRDS	$10650 \times (13.75)$ $(22.75 \times 15) \times 16585 \times 1220$	$825 \times (13.75)$ $(24.75 \times 15) \times 16585 \times 1206$	$\approx 109.5$
THIN STAYS	$10400 \times 2.76$ $15375 \times 11.875$	$9000 \times 2.76$ $15375 \times 11.875$	$\approx 106.4$
STAYS IN FIELD	$8000 \times 4.6$ 191	$9000 \times 4.6$ 191	$\approx 176.9$
STAYS	$191 \times 1500$ $121.0 \times 51.7$		$\approx 235$

HS IN ONE BOILER	58 FT
TUBES	570
FURNACES	545
COMBUSTION CHAMBERS	103.5
TOTAL	733.0



BILL OF MATERIAL FOR 2-BOILERS				
NO.	DESCRIPTION	MAT.	LOCATION	QTY.
1	PLATES 100' x 32' x 1/2"	ST.	SHELL	7680
2	" 100' x 32' x 1/2"	"	"	"
3	" 100' x 32' x 1/2"	"	"	"
4	" 36' x 36' x 1/2"	"	TH. SHEET	"
5	" 111' x 11' x 1/2"	"	ST. HEADS	"
6	" 73' x 17' x 1/2"	"	ST. TUBE SHEET	"
7	" 11' x 11' x 1/2"	"	CC. BACK HEAD	"
8	" 20' x 20' x 1/2"	"	GIRDS	"
9	" 22' x 22' x 1/2"	"	TOP WHEEL	"
10	" 51' x 24' x 1/2"	"	BOTTOM	"
11	" 4' x 4' x 1/2"	"	ST.	7231
12	" 1/2' x 1/2' x 1/2"	"	TH. STAYS	"
13	" 1/2' x 1/2' x 1/2"	"	STAYS	"
14	" 1/2' x 1/2' x 1/2"	"	W. DRESS	"
15	" 1/2' x 1/2' x 1/2"	"	"	"
16	" 1/2' x 1/2' x 1/2"	"	"	"
17	" 1/2' x 1/2' x 1/2"	"	"	"
18	" 1/2' x 1/2' x 1/2"	"	"	"
19	" 1/2' x 1/2' x 1/2"	"	"	"

Copy of plan  
originally approved in June 1912

MADE IN U.S.A.  
APR 16 1912  
NEW YORK

NOTE—  
ALL RIVETING 5/16" PITCH UNLESS OTHERWISE NOTED  
TO PASS U.S. GOVT. TESTS FOR STEEL BOILERS  
WORKING PRESSURE OF 100 PSI PER SQ. INCH  
SAFETY VALVE BY U.S. GOVT. FOR OIL BURNING 320° OF  
OIL PER HOUR 1 1/2" WATER PER LB. OF OIL • 4160° OF WATER  
EVAPORATED • EQUIVALENT HEAT SURFACE AT 100° OF WATER PER  
SQ. INCH • 100 • 2311 SQ. INCH OF HEAT SURFACE PRESSURE • 150°  
EVAPORATION PER SQ. INCH OF HEAT SURFACE • 246 SQ. INCHES  
AREA PER SQ. INCH OF HEAT SURFACE OF SAFETY VALVE REQUIRED •  
2311 x 226 = 522,406 SQ. INCHES OR 34.15 DIA. • 7 1/2" INCHES AREA

SCOTCH MARINE BOILER  
8'6" x 8'9" x 130"  
DONKEY BOILER FOR HULL BOILER  
MANITOWOC ENGINEERING WORKS  
SCALE 1/4" = 1'-0" CONT'D TO 6641  
DATE JAN 1912



Chicago Surveyors

W521-0215



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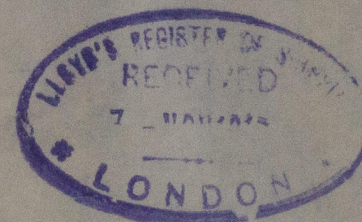
Manitowoc S. B. Co.

Donkey Boilers

Boilers nos. 80 + 81.

"ada"

Approved plan.



RETAIN

W521-0215



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