

J. J. Bakewell W. Sch. Report No. 6145

22/4/86:

Steel Donkey.
BOILER. N° R. 6.

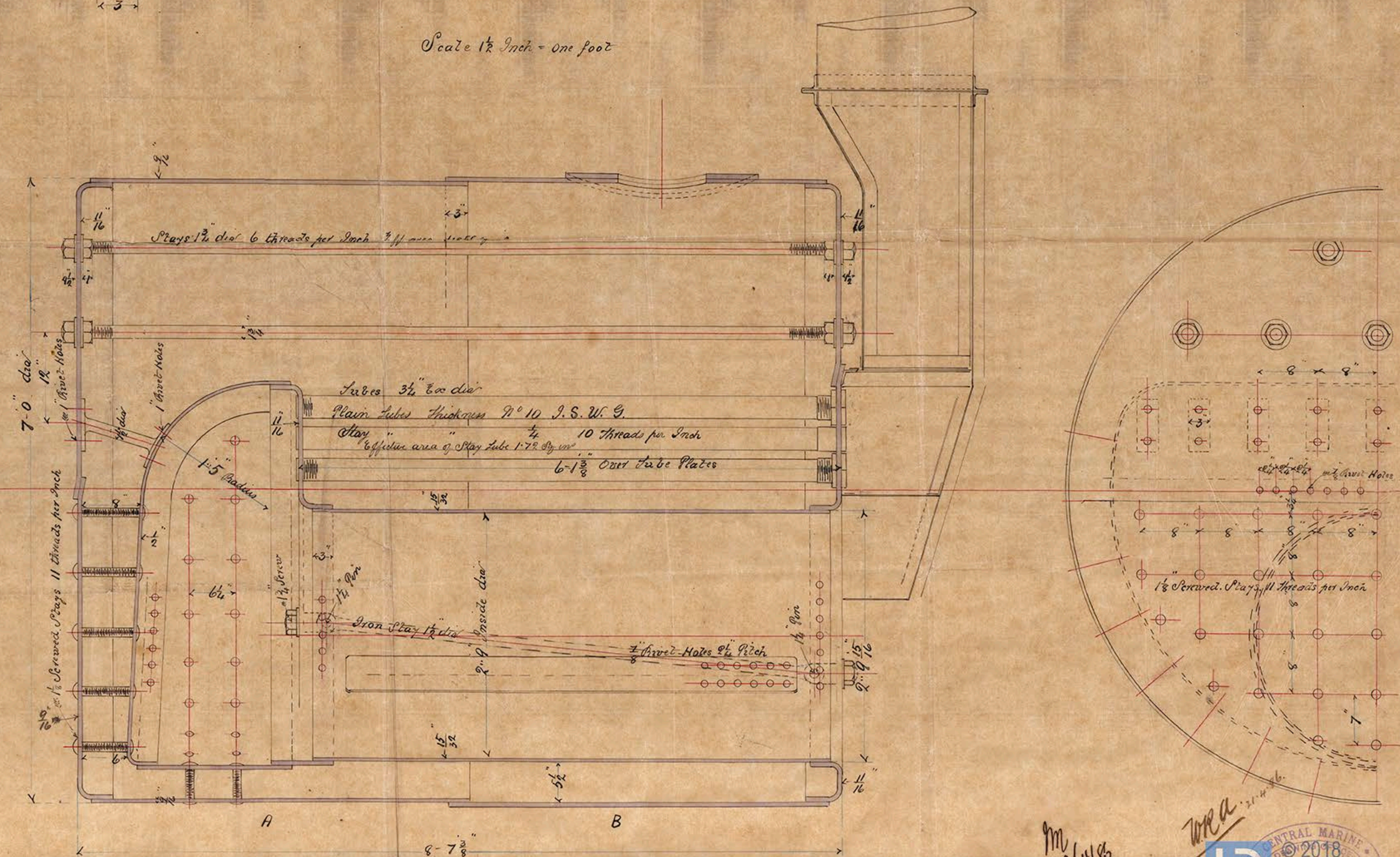
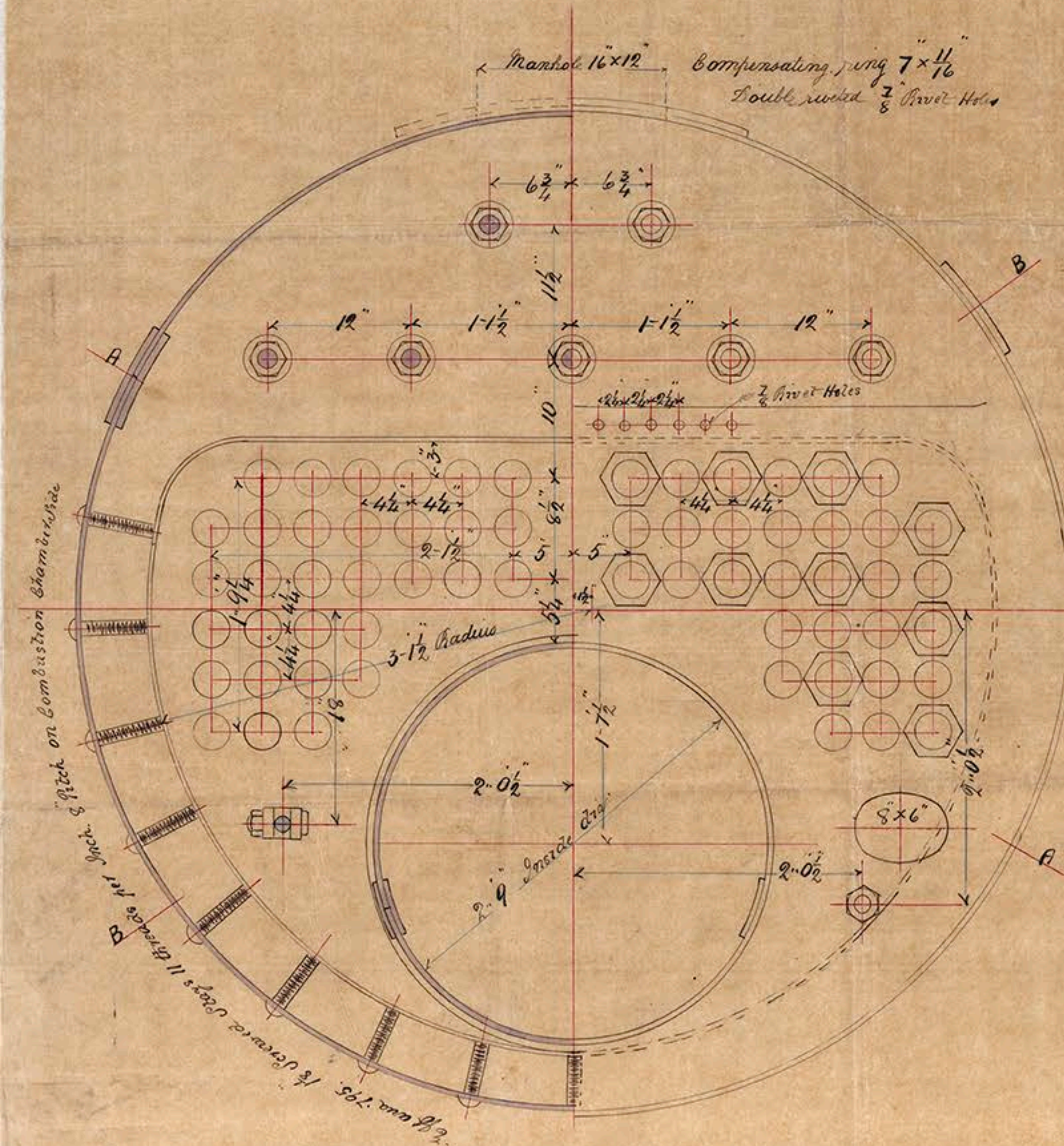
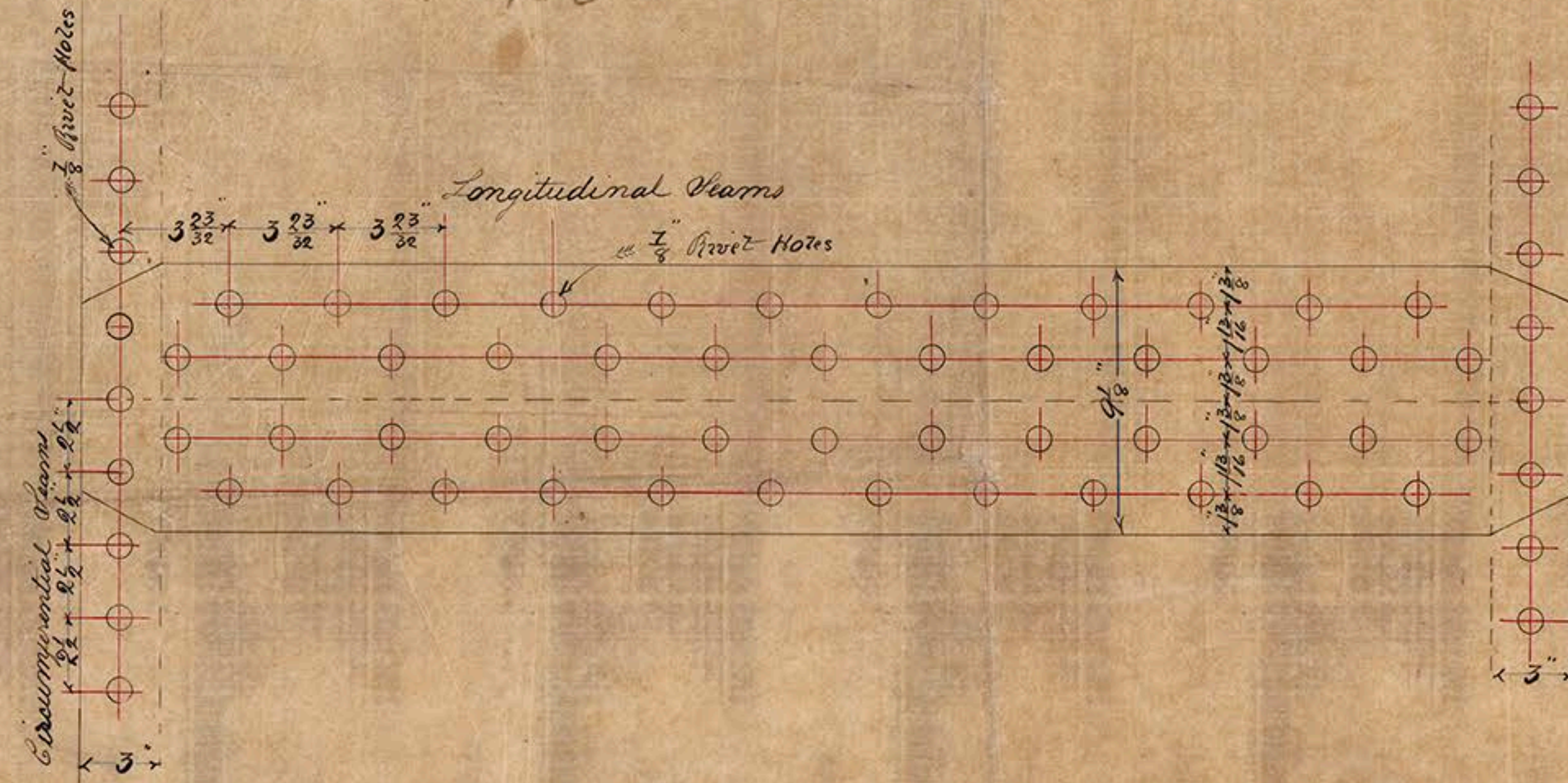
Working Pressure 90 lbs per Square Inch
All Plates & Solid Stays of Steel. Tubes of Iron

Calculations

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Shell Plate $\frac{9}{16}$ "	$\text{Pitch} - \text{diam of rivets} \times 100 =$ Pitch	$3.718 - .675 \times 100 =$ $\frac{3.718}{3.718} = 76.46\%$	Norman $34\frac{1}{2}$ " dia 5-8 long	$\frac{89600 \times \text{thickness}}{\text{length} \times 8 \times \text{diam}} =$ $\frac{89600 \times .468}{5.66 \times 3.4} = 101.9 \text{ lbs}$
Shell Girders $\frac{7}{8}$ " dia	$\text{area} \times 98\% \text{ rivets per pitch} \times 175 \times 85 =$ Pitch \times thickness of Plate	$.6 \times 9 \times 175 \times 85 =$ $\frac{3.718 \times .5625}{3.718} = 85.46\%$	"	$\frac{8000 \times \text{thickness}}{\text{diam in inches}} =$ $\frac{8000 \times .468}{3.4} = 110 \text{ lbs}$
Shear 7'-0" dia	$\text{Constant} \times \text{thickness of Plate} \times \% \text{ of joint} =$ Mean diam in inches	$\frac{230 \times .5625 \times 76.46}{8.4} = 117.7 \text{ lbs}$	Stay Tubes	$\frac{\text{Eff. area} \times \text{Constant}}{\text{area supported}} =$ $\frac{1.72 \times 7500}{10 \times 10} = 129 \text{ lbs}$
Front & Back Top $\frac{11}{16}$ "	$C \times (\text{thickness of Plate in 16"}^2 =$ Pitch 2	$\frac{14.0 \times 11^2}{13.5^2} = 99.9 \text{ lbs}$	Main Stay $1\frac{3}{4}$ " dia	$\frac{9000 \times 1.85}{13.5 \times 11.5} = 107.2 \text{ lbs}$
Back Tube Plate	"	$\frac{100 \times 11^2}{10^2} = 121 \text{ lbs}$	Screwed Stay $1\frac{1}{8}$ " dia	$\frac{8000 \times .795}{8 \times 8} = 99.3 \text{ lbs}$
Front Tube Plate	"	$\frac{14.0 \times 11^2}{10^2} = 169.4 \text{ lbs}$		
Chamber Sides	"	$\frac{100 \times 8^2}{8^2} = 100 \text{ lbs}$		

Scale $1\frac{1}{2}$ Inch = one foot



9m
22/4/80