

TABLE 5—TRIPLE RIVETED BUTT JOINTS*

Thickness of Plate	Thickness of Straps	Diameter of Rivet Holes	Efficiency %	Long Pitch	Short Pitch	A	B	C	D	E
1/4"	1/4"	1 1/16"	87.5	5 1/2"	2 3/4"	12"	7 3/4"	1 1/16"	1 3/4"	2 1/2"
9/32"	1/4"	1 1/16"	87.5	5 1/2"	2 3/4"	12"	7 3/4"	1 1/16"	1 3/4"	2 1/8"
5/16"	9/32"	1 3/16"	87.5	6 1/2"	3 1/4"	13 5/8"	8 3/4"	1 1/4"	1 7/8"	2 7/16"
11/32"	9/32"	1 3/16"	87.5	6 1/2"	3 1/4"	13 5/8"	8 3/4"	1 1/4"	1 7/8"	2 7/16"
3/8"	5/16"	1 3/16"	88.4	7"	3 1/2"	13 5/8"	8 3/4"	1 1/4"	1 7/8"	2 7/16"
13/32"	5/16"	1 3/16"	88.4	7"	3 1/2"	13 5/8"	8 3/4"	1 1/4"	1 7/8"	2 7/16"
7/16"	3/8"	1 5/16"	87.9	7 3/4"	3 7/8"	15 1/4"	9 3/4"	1 7/16"	2"	2 3/4"
15/32"	3/8"	1 5/16"	87.9	7 3/4"	3 7/8"	15 1/4"	9 3/4"	1 7/16"	2"	2 3/4"
1/2"	7/16"	1 5/16"	88.3	8"	4"	15 1/4"	9 3/4"	1 7/16"	2"	2 3/4"
17/32"	7/16"	1 5/16"	88.3	8"	4"	15 1/4"	9 3/4"	1 7/16"	2"	2 3/4"
9/16"	7/16"	1 1/2"	86.7	8"	4"	17"	11"	1 5/8"	2 1/4"	3"
19/32"	1/2"	1 1/2"	86.7	8"	4"	17"	11"	1 5/8"	2 1/4"	3"
5/8"	1/2"	1 1/2"	86.7	8"	4"	17"	11"	1 5/8"	2 1/4"	3"
21/32"	1/2"	1 1/2"	86.7	8"	4"	17"	11"	1 5/8"	2 1/4"	3"
11/16"	1/2"	1 3/16"	85.6	8 1/4"	4 1/8"	18 1/2"	12"	1 13/16"	2 3/8"	3 1/4"
23/32"	1/2"	1 3/16"	85.6	8 1/4"	4 1/8"	18 1/2"	12"	1 13/16"	2 3/8"	3 1/4"
3/4"	1/2"	1 3/16"	85.5	8 1/4"	4 1/8"	18 1/2"	12"	1 13/16"	2 3/8"	3 1/4"
25/32"	9/16"	1 5/16"	84.6	8 1/2"	4 1/4"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
13/16"	9/16"	1 5/16"	84.6	8 1/2"	4 1/4"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
27/32"	9/16"	1 5/16"	84.2	8 1/2"	4 1/4"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
7/8"	5/8"	1 5/16"	84.1	8 3/4"	4 3/8"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
29/32"	5/8"	1 5/16"	83.6	8 3/4"	4 3/8"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
15/16"	1 1/16"	1 5/16"	83.7	9"	4 1/2"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
31/32"	1 1/16"	1 5/16"	83.2	9"	4 1/2"	20 1/4"	13 1/4"	2"	2 5/8"	3 1/2"
1"	3/4"	1 7/16"	83.4	9 1/2"	4 3/4"	22"	14 1/2"	2 3/16"	2 7/8"	3 3/4"

*Joints for plate thickness from 27/32" to 1" (both inclusive) fail by tearing the plate between rivet holes in the second row and shearing a rivet in the outer row. This also applies to the joint for the 3/4" plate. All other joints in the above table fail by tearing the plate between rivet holes in the outer row. For convenience in driving rivets, either of the dimensions for back-pitch (D and E) may be increased without affecting the joint efficiency, but not decreased.

Diam Riv. ins	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"
Min. Spc'g ins	1 3/4"	2"	2 1/4"	2 5/8"	2 7/8"	3 1/8"	3 3/8"	3 5/8"

MINIMUM RIVET SPACING FOR SINGLE ROW

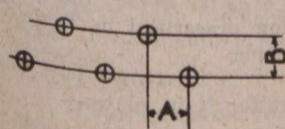
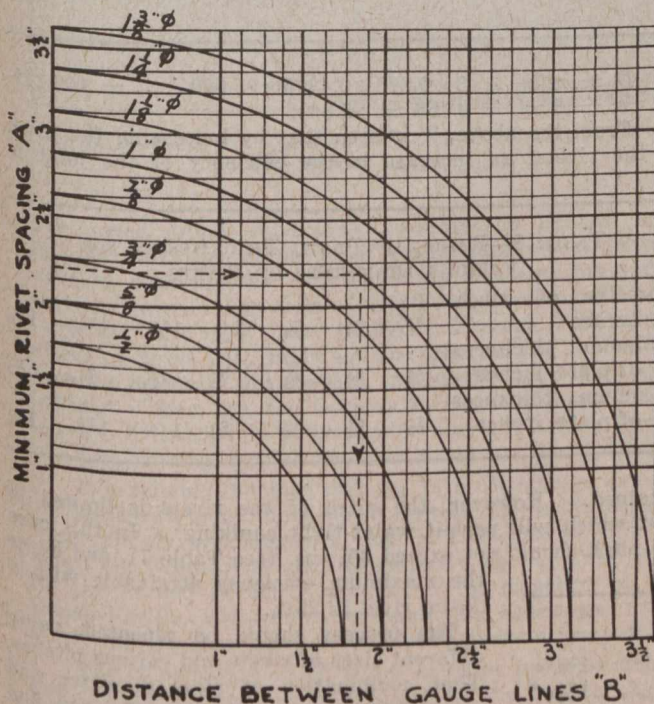


FIG. 7—CURVES FOR MINIMUM RIVET SPACING AND DISTANCES BETWEEN PARALLEL ROWS OF STAGGERED RIVETS

on the rules formulated by the Massachusetts Board of Boiler Rules.

Numerical Examples

Design of a triple-riveted lap joint for a 7/16-in. plate.

From Table 8, the sizes of rivets that may be used in 7/16-in. plates range from 5/8-in. to 1 1/4-ins.

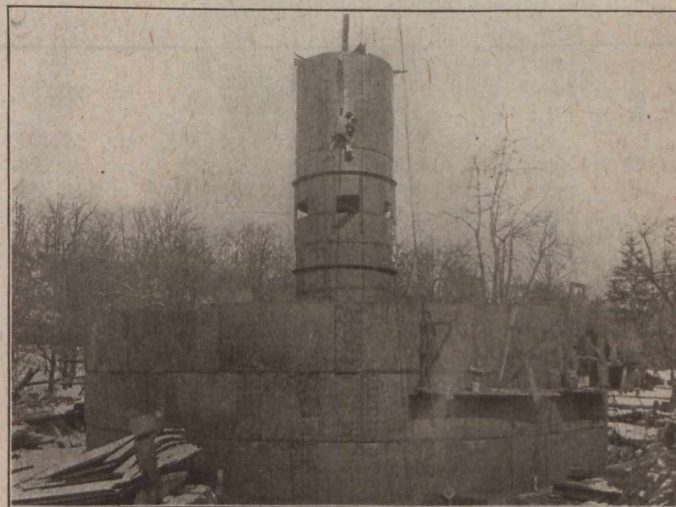


FIG. 8—ONTARIO POWER CO.'S TANK, 60-FT. DIAMETER, WITH QUADRUPLE-RIVETED BUTT JOINTS ON LONGITUDINAL SEAMS AND SINGLE-RIVETED LAP ON GIRTH SEAMS

First trial: Assume the same size and pitch of rivets as shown in Table 3, that is 7/8 in. diameter and a pitch of 3 3/4 ins. Then

$$\begin{aligned}
 t &= 7/16 \text{ in.} = 0.4375 \text{ in.} & f &= 55,000 \text{ lbs. per sq. in.} \\
 P &= 3 3/4 \text{ ins.} = 3.75 \text{ ins.} & s &= 44,000 \text{ lbs. per sq. in.} \\
 d &= 1 5/16 \text{ in.} = 0.9375 \text{ in.} & e &= 95,000 \text{ lbs. per sq. in.} \\
 a &= 0.6903 \text{ sq. in.}
 \end{aligned}$$

From the formulae for determining the efficiency of lap joints, we have:—