When inspecting boilers that have not been open to inspection during construction the case should be submitted to the Chairman

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as to the factors to be used. ‡ P‡ 1, Q‡ 2, R‡ 1, S‡ 1, shall not apply to the end or circumfer-ential seams, if such seams are sufficiently stayed by through bolts; nor to the seams between the square and round part of the shell, in cylindrical boilers with square furnaces, when such seams are double riveted.

(d.) Then take iron as equal in tensile strength to 47,000 pounds per square inch and use the smallest of the two percentages as the strength of the joint, and adopt the factor of safety as found from the preceding scale :--

47,000 × percentage of strength of joint × twice the thickness of the plate in inches. inside diameter of boiler in inches × factor of safety. =Pressure to be allowed per square inch on the safety-valves.

(e.) Plates that are drilled in place must be taken apart and the burr taken off and the holes slightly countersunk from the outside.

(f.) Butt straps must be cut from plates and not from bars, and must be of as good quality as the shell plate, and for the longitudinal seams must be cut across the fibre.

(g.) The rivet holes may be punched or drilled when the plates are punched or drilled out of place, but when drilled in place, must be taken apart and the burr taken off and slightly countersunk from the outside.

(h) When single butt straps are used and the rivet holes in them punched, they must be one eighth thicker than the plates they cover.

(i.) The diameter of rivets must not be less than the thickness of the plate of which the shell is made, but it will be found when the plates are thin, or when lap joints or single butt straps are adopted, that the diameter of the rivets should be in excess of the thickness of the plate.

(j.) The distance of the rivet holes from the end or edge of the plates shall not be less than the diameter of the rivets.

(k.) Dished ends that are not truly hemispherical must be stayed; if they are not theoretically equal in strength to the pressure needed they must be stayed as flat surfaces, but if they are theoretically equal in strength to the pressure needed the stays may have a strain of 10,000 lbs. per effective square inch of sectional area.

(1.) Inspectors will remember that the strength of a sphere to resist internal pressure is double that of a cylinder of the same diameter and thickness.

Sec 26. (a.) The neutral parts of boiler shells under steam domes

must be sufficiently stiffened and stayed. (b.) The sides of boilers having square furnaces and half round tops must be stayed from side to side of the shell, over the furnace, one or more rows of these stays to be placed well above the centre of the cylindrical part.

(c.) Screw stays are not to be used when supporting flat surfaces at any angle but a right angle to the surface supported, their diameter to be measured inside the thread.

(d.) The longitudinal seams in the cylindrical shell of boilers should be as far as possible from the bottom.

(e.) The inside diameter of the outside strake or course in the cylindrical shell of a boiler is to be taken as the measure of its diameter.

Sec. 27. (a.) In cylindrical super-heaters the strength of the joints and the factor of safety is found in a similar manner as for cylindrical boilers and steam receivers, but instead of using 47,000 pounds as the tensile strength of iron, 24,000 pounds is adopted, unless where the heat of flame impinges at or nearly at right angles to the plate, then 18,000 pounds is substituted.