

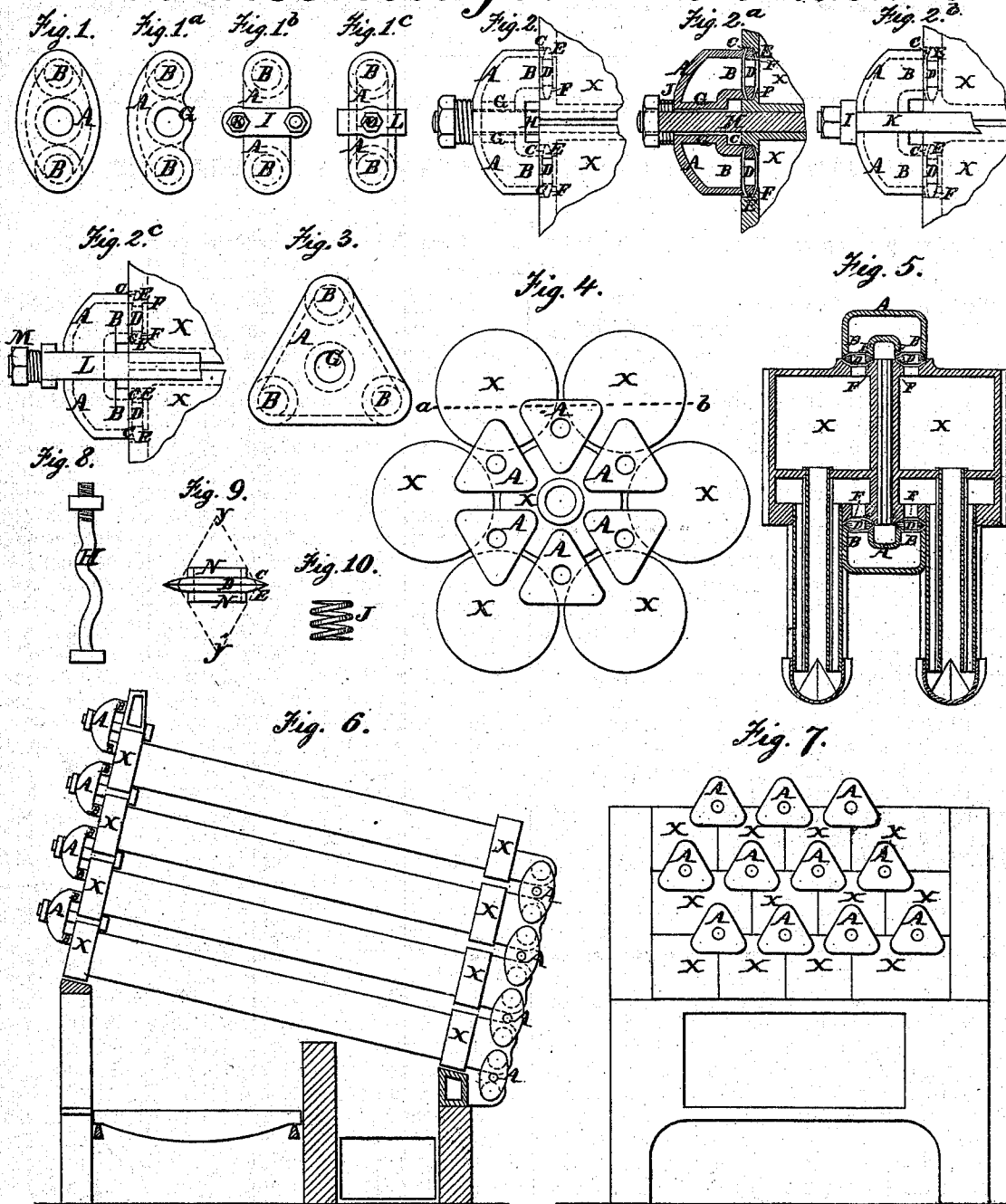
[72.]

No. 119,256.

S. L. Wiegand's

Case. A
Patented Sep. 26, 1871.

Connection for Steam Generators.



Witnesses.

Adrian Hahn
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S. LLOYD WIEGAND, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN RETURN-BENDS FOR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 119,256, dated September 26, 1871; antedated September 6, 1871.

To all whom it may concern:

Be it known that I, S. LLOYD WIEGAND, of the city and county of Philadelphia and State of Pennsylvania, have invented a certain new and useful improvement in the method of connecting the fluid-containing compartments or vessels of sectional steam-generators; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing and letters of reference marked thereon.

The nature of my invention consists in so forming a connecting piece or fitting that I am able to preserve such a degree of flexibility of the apparatus as to accommodate itself to all the variations of position and dimensions of parts arising from unequal expansion and contraction by heating and cooling, and at the same time retain all the joints in fluid-tight contact.

The precise construction and operation of this invention will more fully appear in the following description of the drawing annexed.

Figure 1 shows a front elevation of this invention, the internal form being shown in dotted lines. Fig. 1^a is a modification of Fig. 1. Fig. 2 shows a side elevation of it with the internal form described by dotted lines. Fig. 2^a is a section of Fig. 2. Fig. 3 shows a modification of the invention, having three apertures or outlets instead of two. Fig. 4 shows in plan an application of it to a multitubular boiler with vertical tanks or sections. Fig. 5 shows the same in vertical section on the line *ab*, Fig. 4. Fig. 6 shows the application of it to a boiler with inclined tubes. Fig. 7 shows, in front elevation, another mode of applying it to a boiler with either diagonal or horizontal tubes. Fig. 8 shows the bolt and nut separately. Fig. 9 shows the short tube or collar separately; and Fig. 10 shows the spring separately.

The same letters of reference apply to the same parts in the several figures. The arrows in the several figures indicate the direction of the channels through which the currents flow.

A shows a return-bend having nozzles or outlets, B B, which are made upon the ends in the shape of concave spherical zones. These concave spherical bearings are applied to corresponding convex bearings, C C, on the short tubes D D. The opposite ends E E of the tubes D D are also spherical, and fit corresponding concavities,

F F, around apertures in the vessels X X to be connected. Through the center of each of the return-bends A I make a tubular aperture, G, through which I pass the bolt H, for the purpose of holding it in position. This tube G divides the channel in the return-bend A and affords a ready means of securing it centrally without liability to leak around the bolt H. The centers, upon which the spherical zones are described, are located, as shown at *yy*, at the points of convergence of the radii shown in dotted lines in Fig. 9. The effect of locating the centers in the manner above described is that, upon applying pressure upon the center of bend A by means of a nut pressing the nozzles B B against the short tubes D D, and the short tubes against the bearings F F on the vessels X X, the tubes D D so adjust themselves between the bend A and the vessels X X as to make the shortest distance possible between the bend A and the vessels X X, making close contact with the several convex and concave surfaces. In the bend shown in Fig. 3 the same operations are performed as in the one already described, the only difference being that there is an additional tube and connecting nozzle, and it is applicable to three vessels instead of two. Between the several bearing-faces I interpose packings or gaskets of gum or other material, although if the surfaces are accurately finished they may be used without. The connection, as hereinbefore described, possesses a greater degree of flexibility than any other now in use, and is tightened rather than loosened by any deviations of the vessels X X from their normal position. To relieve the strain from excessive tightening from this cause I impart elasticity to the bolt by either bending it from a right line, making it in effect a spring, or by introducing a spring, J, under the head or nut. It is not essential that the bolt for fastening the return-bend should pass through the center of the bend, nor, in fact, is it necessary to make it pass through at all, although that mode of making it is, I believe, the best and cheapest. Instead of that a clamp, I, with bolts, K K, might be used, pressing upon the bend anywhere between the two nozzles, as shown in Fig. 1^b and Fig. 2^b; or, instead of the clamp I, a bow or strap-clamp, L, with a set-screw, M, might be used as shown in Fig. 1^c and Fig. 2^c. The requisite elasticity to accommodate the apparatus to any prob-

able changes of relative position of the parts connected, arising from unequal expansion and contraction or other causes, may be obtained either in the bolts or in the clamps. A rim or collar, N, as shown in Fig. 9, may be advantageously added to each orifice of the short tube D, to prevent the gasket from pinching in and obstructing the flow of fluid through it.

This invention may be modified by having the channel-way to pass on one side only of the tubular aperture, as shown in Fig. 1^a.

I am aware that return-bend connections have been made with flat-faced nozzles and used, which were secured by clamps resting upon two adjacent connecting-bends, pressing directly on the portions opposite the nozzles, and in which the nozzles were applied directly to gaskets on the vessels to be connected, which connection I hereby distinctly disclaim. I am also aware that return-bends having spherical bearing faces have been applied directly to correspondingly-shaped surfaces on the tubes or vessels thereby connected, which device I also hereby disclaim. It is difficult to keep joints so formed tight, owing to the unequal expansion and contraction of parts,

changing the central distance between the spherical bearing-faces on the tubes, so that it does not coincide with the central distance of the bearing-faces of the return-bend applied to them. Whenever this takes place and exceeds the limits of elasticity of the parts involved, leakage ensues. In this arrangement a difficulty has been experienced in keeping the parts tight through the variations of temperature to which they are subjected, which difficulty it is the purpose of this invention to avoid.

What I claim as my invention, and desire to secure as such by Letters Patent, is—

1. The short tubes, having spherical bearing-faces, formed as described, interposed between correspondingly-shaped seats in the return-bend, and the vessels put in connection thereby.

2. The elastic bolt, or bolt and spring, in combination with the return-bend and short tubes, as described and shown.

S. LLOYD WIEGAND.

Witnesses:

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