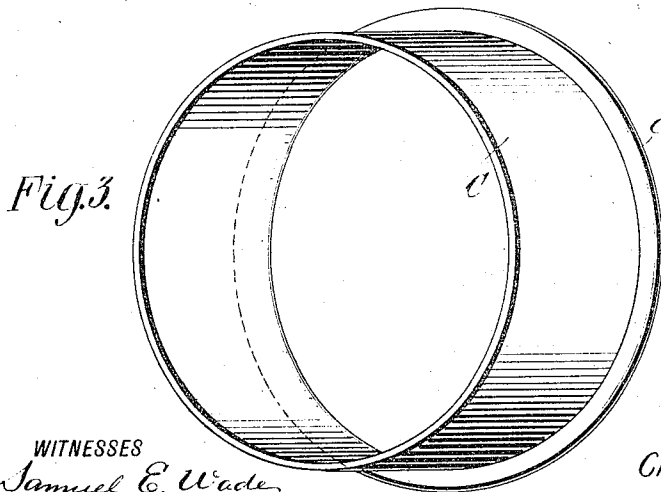
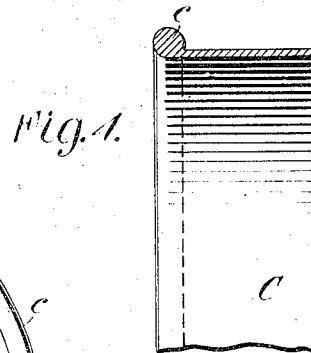
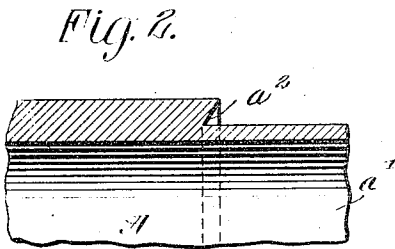
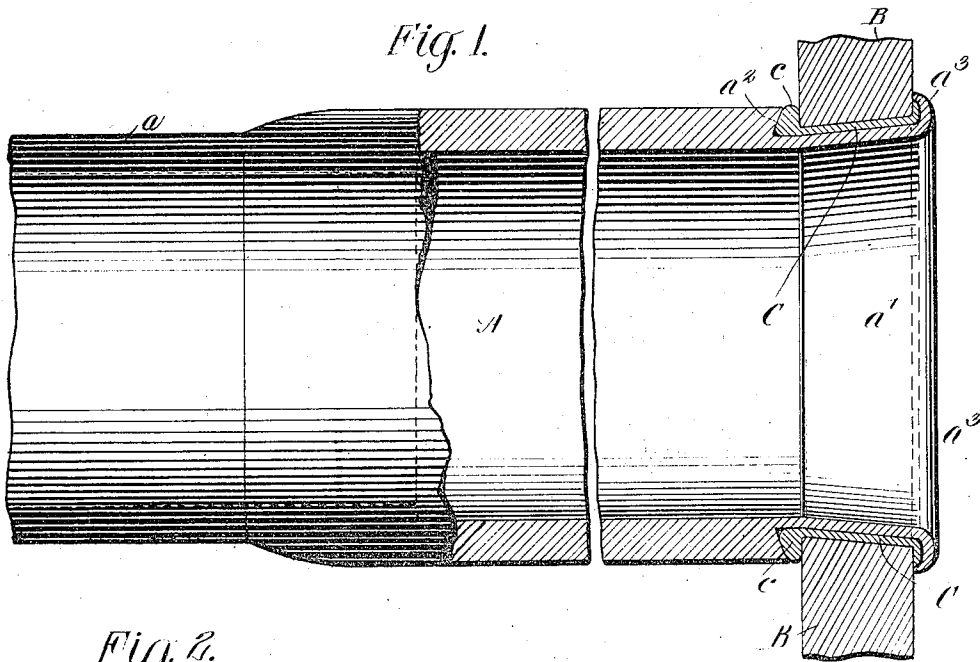


C. S. COLEMAN.
 FLUE POINT AND ITS ATTACHMENT TO FLUE SHEETS.
 APPLICATION FILED JUNE 2, 1908.

949,621.

Patented Feb. 15, 1910.



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CHARLES S. COLEMAN, OF SPOKANE, WASHINGTON, ASSIGNOR TO RAILWAY IMPROVEMENT COMPANY, OF SPOKANE, WASHINGTON, A CORPORATION.

FLUE-POINT AND ITS ATTACHMENT TO FLUE-SHEETS.

949,621.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed June 2, 1908. Serial No. 436,222.

To all whom it may concern:

Be it known that I, CHARLES S. COLEMAN, a citizen of the United States, residing at O 2612 Adams street, Spokane, in the county of Spokane and State of Washington, have invented an Improvement in Flue-Points and Their Attachment to Flue-Sheets, of which the following is a specification.

A place of special weakness in locomotive boilers is the joint between the flues and flue-sheet. Hence the boiler frequently leaks at this point, even on the first trip, and in no instance in the use of the ordinary flue and flue-sheet have such boilers been known to run without leaking for a longer period than seven months. The result is, that, in the operation of the railroad, every locomotive employed is liable to be tied up practically one-tenth of its entire period of use. The cause of leak between the flues and flue-sheet is chiefly expansion and contraction due to constantly changing the temperature in the fire-box and the quivering of the flues during violent pull upon an upgrade. The expansion is, first, in the length of the flue, and, second, of the bead of the joint formed with the flue-sheet within the fire-box. The flue expands in length, when heated, and correspondingly contracts in length, when cooled. In a flue twenty feet long, the expansion may be one-eighth or nearly one-fourth of an inch, and thus great pressure is exerted by the flues against the flue-sheet. The ends of the flues in the fire box are very highly heated and they give way first. In other words, flues always leak first at the fire box end and seldom leak at the front end of the locomotive. The flues also expand and contract diametrically or circumferentially, so that contact between the flue-points and the flue-sheet soon becomes imperfect or loosened.

I have demonstrated by numerous experiments, that, by providing the flue-point with a recessed shoulder, and by employing a gasket of soft metal, preferably copper, the same being provided with a bead which is interposed between the flue-sheet and the shoulder of the flue-point, and by expanding and beading the outer ends of the flue-point and gasket on the outer side of the flue-sheet, I am able to form a very tight joint

which will compensate for expansion and contraction and by which leakage is practically avoided.

The details of construction, arrangement, and combination of parts are as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a flue-point and gasket and a section of a flue-sheet, all constructed and connected according to my invention. Fig. 2 is a longitudinal section of a portion of a flue-point provided with an under-cut shoulder. Fig. 3 is a perspective view of a copper gasket forming part of the joint between the flue-point and flue sheet. Fig. 4 is a cross section of such gasket.

Referring first to Fig. 1, A indicates a flue-point and B the flue-sheet to which the former is attached. C is the copper gasket forming a part of the joint between the flue-point and the flue-sheet. The ordinary standard flue of locomotive boilers is made comparatively thin, or of about three thirty-seconds of an inch in thickness. I employ a flue-point of at least double this thickness, and it is connected with the ordinary flue *a* by means of a suitable joint. The front end *a'* of the flue-point A is lathed or turned off to about half the thickness of the point, or to the thickness of the ordinary flue *a*, and an under-cut, or acute-angled, shoulder *a''* is formed at the inner end of the portion thus turned off.

The hole in the flue-sheet B, for reception of the flue-point A, is reamed out on the fire-box side, so that it is larger on that side and narrowest at the inner side. Into this opening, the copper gasket C is inserted before the flue-point A is put in place. The said gasket comprises a cylindrical body having at one end or edge a bead *c* which is practically circular in cross section. Then, a heavy weight of iron is held against the front end of the locomotive flue, and with the strokes of a heavy hammer, the flue is brought firmly into place, the roll or bead *c* of the gasket being thus forced against the shoulder *a''* and into the annular recess provided thereby. The lathed off portion *a'* of the flue point A is then expanded together with the body of the gasket C, by means of any suitable expanding tool, or mandrel, and

the outer edges a^s of both flue-point and gasket are turned over on the outer side of the flue-sheet by means of any suitable beading tool.

5 The action of the joint is as follows: The more the flue expands longitudinally, the tighter becomes the contact with the shoulder a^s at the inner end of the lathed-off portion of the point A, so that the flue-sheet
10 presses the roll of the copper gasket tightly into place and the joint becomes therefore correspondingly more water-tight. The more the flue contracts and thus shortens in length, the tighter the lathed-off and ex-
15 panded portion a' of the point A pulls into contact with, or against, the incline or taper of the opening in the flue-sheet, and also against the face of the latter, and, therefore, the tighter becomes the joint.

20 As an incident of use, by force of expansion of the flue and flue-point, the bead or shoulder c of the soft metal gasket may be slightly compressed and distorted, as indicated in Fig. 1, which has the effect, how-

ever, of further increasing the tightness of the joint.

What I claim is:

The combination, with a flue-sheet having an opening tapered or enlarged from the inside outward, of a flue-point having double 30 the ordinary thickness of the ordinary flue and provided with a lathed-off or reduced portion at its outer end, the same terminating in a concave annular shoulder, and a soft-metal gasket comprising a cylindrical 35 body and a thickened bead or roll at one edge, which gasket is interposed between the reduced and shouldered portion of the flue-point and the adjacent portions of the flue-sheet, the outer ends of the flue-point and 40 gasket being turned outward and beaded on the flue-sheet, as and for the purpose specified.

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Witnesses:

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