

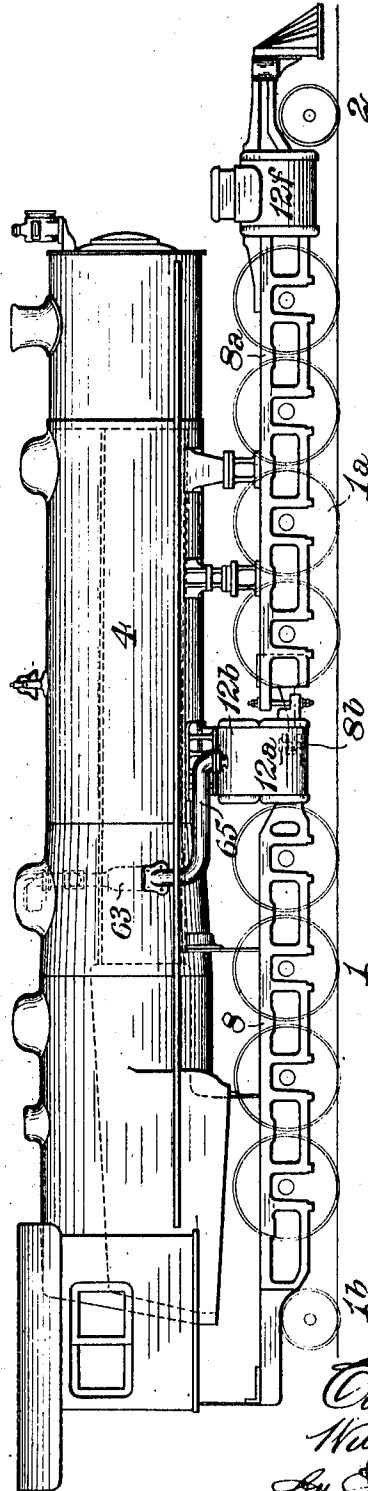
C. J. MELLIN & W. L. REID.
 STEAM PIPES FOR ARTICULATED LOCOMOTIVES.
 APPLICATION FILED SEPT. 29, 1910.

978,323.

Patented Dec. 13, 1910.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

James C. Heron
 S. R. Bell.

INVENTORS

Carl J. Mellin
 William L. Reid
 by Henderson Bell, atty

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FIG. 3.

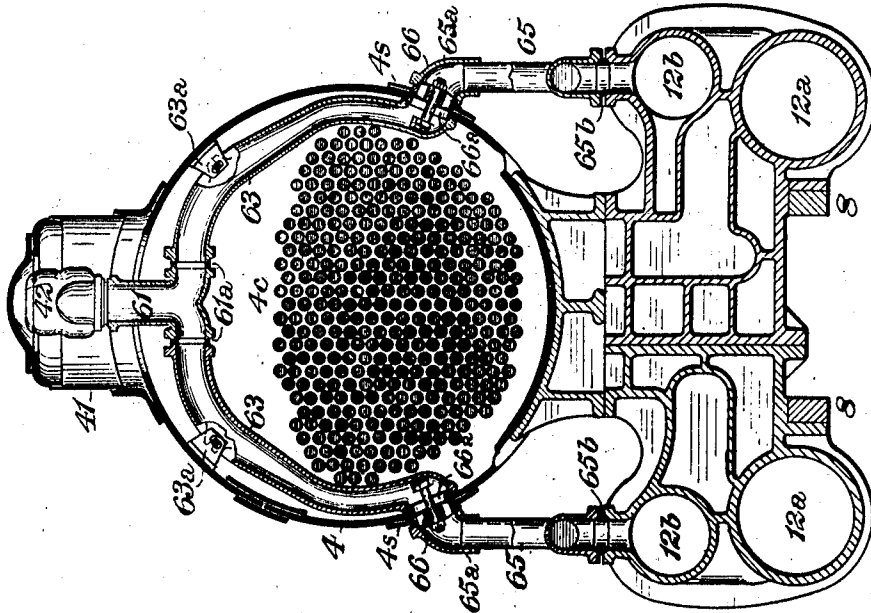
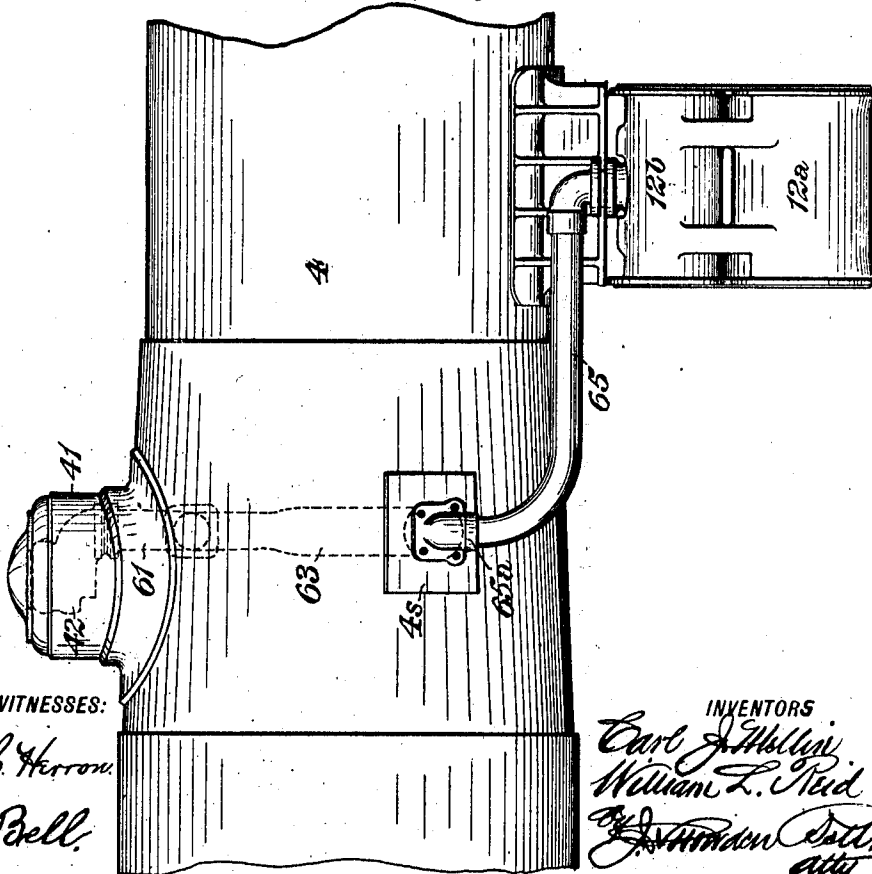


FIG. 2.



WITNESSES:

James C. Heron.
S. R. Bell.

INVENTORS

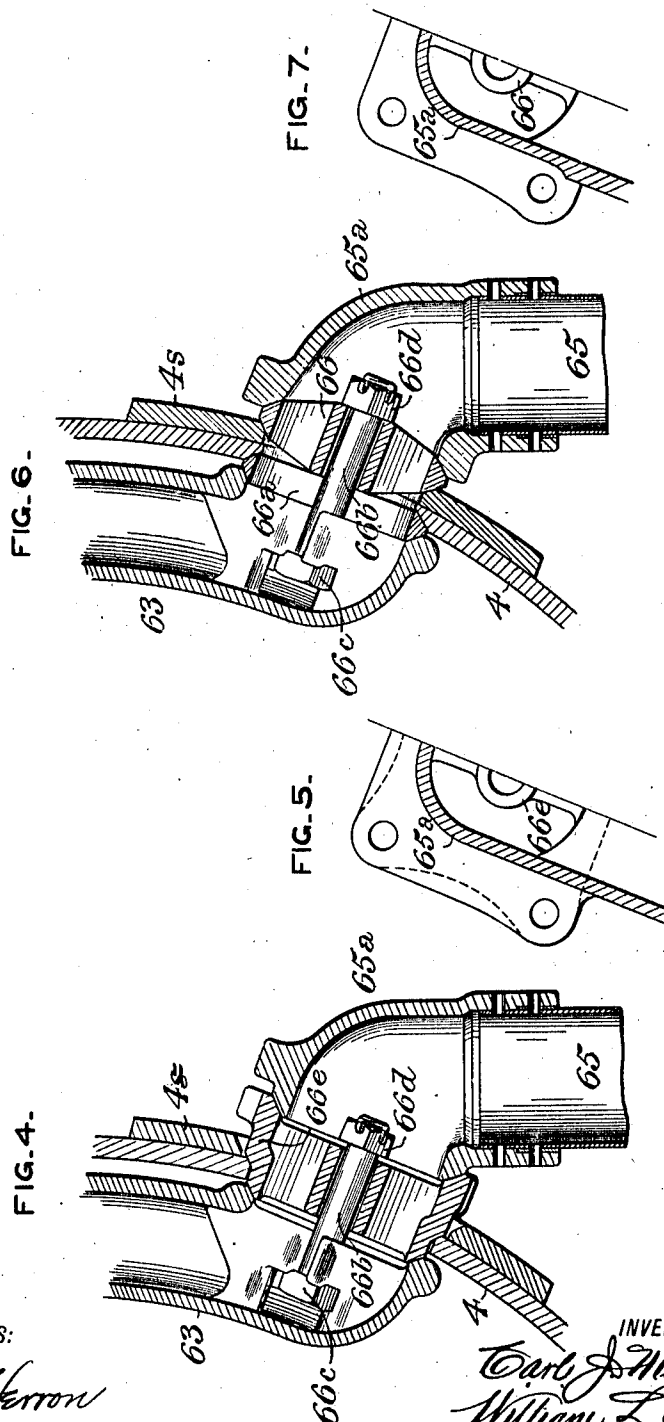
Carl J. Mellin.
William L. Reid.
J. H. Hadden, atty.

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3 SHEETS—SHEET 3.



WITNESSES:

James C. Herron
 S. R. Bell

INVENTORS

Carl J. Mellin
 William L. Reid
 by *[Signature]* atty.

UNITED STATES PATENT OFFICE.

CARL J. MELLIN AND WILLIAM L. REID, OF SCHENECTADY, NEW YORK.

STEAM-PIPES FOR ARTICULATED LOCOMOTIVES.

978,323.

Specification of Letters Patent.— Patented Dec. 13, 1910.

Application filed September 29, 1910. Serial No. 584,461.

To all whom it may concern:

Be it known that we, CARL J. MELLIN and WILLIAM L. REID, both of Schenectady, in the county of Schenectady and State of New York, have invented a certain new and useful Improvement in Steam-Pipes for Articulated Locomotives, of which improvement the following is a specification.

Our invention relates to locomotives of the articulated or Mallet type, in which, by reason of the comparatively great length of the boiler and the position of the high pressure cylinders, it is, as is familiar to those skilled in locomotive construction, not practicable to use branch steam pipes similar to those of the previously known standard types.

The object of our invention is to provide means for connecting the valve chests of the high pressure cylinders of an articulated compound locomotive, with the main steam supply pipe, by which the objections to the present constructions, viz: unduly great length of branch steam pipes, exposure of large area to atmospheric cooling action, obstruction of the view of the engineman, and undesirable appearance, will be eliminated.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a diagrammatic side view of an articulated compound locomotive, illustrating an application of our invention; Fig. 2, a partial side view, in elevation, on an enlarged scale; Fig. 3, a vertical transverse section through the steam pipes and high pressure cylinders; Fig. 4, a vertical section, on a further enlarged scale, through a pipe joint; Fig. 5, a transverse section through the same; and, Figs. 6 and 7, views similar, respectively, to those of Figs. 4 and 5, but showing a structural modification.

In locomotives of the type to which our invention relates, it has, prior thereto, been the practice to supply the valve chests of the high pressure cylinders with steam either through branch pipes leading from a throttle chest in the dome to the valve chests, entirely exterior to the boiler, or from a T head in the smoke box, connected with the main steam supply pipe or dry pipe, through horizontal pipes extending rearwardly below and on opposite sides of the boiler. Each of these plans involves the objection of exposing the surfaces of almost the entire length of the branch steam pipes to the cool-

ing action of the atmosphere, and that first specified is further objectionable in the particular that the view of the engineman is obscured by the projection of the right hand pipe over the boiler, and these projecting pipes, moreover, impair the neat and good mechanical appearance of the locomotive.

Our invention, by which, it will be seen, the objections above stated are obviated, is herein exemplified as applied in a locomotive engine of the Mallet articulated compound type, comprising a rear frame, 8, supported on a plurality of driving wheels, 1, and a trailing truck, 1^b, and a front frame, 8^a, supported on a plurality of driving wheels, 1^a, and a leading truck, 2. The rear frame, as in the regular practice in locomotives of this type, carries at its front end, which is located nearly at the middle of the length of the boiler, a pair of high pressure cylinders, 12^a, the pistons of which are coupled to crank pins on the driving wheels, 1, and the front frame carries a pair of low pressure cylinders, 12^c, the pistons of which are coupled to crank pins on the driving wheels, 1^a. The boiler, 4, is fixed to the rear frame, 8, and the front and rear frames are coupled, in the longitudinal central plane of the locomotive, by a pivot pin, 8^b, the forward portion of the boiler being thus, as is characteristic in locomotives of this type, free to swing or traverse laterally, relatively to the front frame, 8^a, in passing curves.

In the practice of our invention, the valve chests, 12^b, of the high pressure cylinders, are connected with the main steam supply pipe, 61, which leads from a throttle valve chamber, 42, of any suitable and preferred construction, located in the dome, 41, of the boiler, in the following manner. The steam supply pipe, 61, is bifurcated at its lower end, and an internal branch steam pipe section, 63, is connected to each side, ball joint rings, 16^a, of ordinary construction, being interposed between the pipes 61 and 62. The branch steam pipe sections, 63, are supported, near their upper ends, on brackets, 63^a, secured to the inside of the shell of the boiler, 4, and extend downwardly within the boiler, following substantially the curvature of the shell and being flattened toward their lower ends to clear the outer rows of the boiler tubes, 4^e, to as low a level in the boiler as may be conveniently practicable.

The lower ends of the internal branch steam pipe sections, 63, are suitably connect-

ed to the upper ends of external branch steam pipe sections, 65, the lower ends of which are, in turn, connected to the valve chests, 12^b, of the high pressure cylinders.

- 5 Plates, 4^s, are secured to the shell of the boiler, around the openings therein at the junction of the internal and external branch steam pipe sections, in order to provide firm support at those points, and bearings for
10 ball joint rings interposed between the internal and external pipe sections. Elbows, 65, are secured to the upper ends of the external pipe sections, and as shown in Figs. 3 and 6, ball joint rings, 66, having opposite convex
15 spherical faces, are interposed between corresponding faces on the elbows, 65^a, and plates, 4^s, and are held in position by bolts, 66^b, having heads, 66^c, bearing on internal shoulders in the pipe sections, 63, and nuts,
20 66^d, engaging threads on the outer ends of the bolts. Similar ball joint rings, 66^a, are interposed between the inside of the boiler shell and the lower ends of the internal pipe sections, 63, which are held to a tight bearing
25 on the boiler shell by the nuts, 66^d, when tightened on the bolts.

The construction shown in Figs. 4 and 5, accords, in all substantial particulars, with that just described, differing therefrom
30 structurally in that a single ball joint ring, 66^c, having a concave spherical face on its outer side and a convex face on its inner side, is substituted for the two rings, 66 and 66^a, and that no bearing for a ring on the inside
35 of the boiler shell is provided. Ordinary ball joint rings, 65^b, are fitted in the external pipe sections, 65, at their junctions with the high pressure valve chests, 12^b.

It will be seen that the construction above
40 described attains the advantages that the area of steam pipe surface exposed to the atmosphere is materially reduced; there is no projection of the steam pipes over the upper portion of the boiler, to obstruct the
45 view of the engineman or mar the appearance of the locomotive, and the connections of the several pipe sections may be made and maintained perfectly tight without interfering with the capability of readily detach-
50 ing the sections whenever necessary or desirable.

We claim as our invention and desire to secure by Letters Patent:

- 55 1. In an articulated locomotive, the combination of a rear frame, a front frame coupled thereto, a plurality of driving wheels supporting each of said frames, a boiler fixed to the rear frame and projecting, with the capacity of relative movement, over the front
30 frame, cylinders fixed to the rear frame and actuating the driving wheels thereof, a main steam supply pipe within the boiler, internal branch steam pipe sections connected thereto and extending downwardly between
65 the boiler shell and tubes, and exter-

nal branch steam pipe sections extending from the internal sections to the valve chests of the cylinders.

2. In an articulated locomotive, the combination of a rear frame, a front frame coupled thereto, a plurality of driving wheels
70 supporting each of said frames, a boiler fixed to the rear frame and projecting, with the capacity of relative movement, over the front frame, cylinders fixed to the rear frame and
75 actuating the driving wheels thereof, a main steam supply pipe within the boiler, internal branch steam pipe sections connected thereto and extending downwardly between the boiler shell and tubes, external branch steam
80 pipe sections extending from the internal sections to the valve chests of the cylinders, and means for permitting a limited degree of movement of the external sections relatively to the internal sections.

3. In an articulated locomotive, the combination of a rear frame, a front frame coupled thereto, a plurality of driving wheels supporting each of said frames, a boiler fixed
90 to the rear frame and projecting, with the capacity of relative movement, over the front frame, cylinders fixed to the rear frame, and actuating the driving wheels thereof, a main steam supply pipe within the boiler, internal branch steam pipe sections connected thereto
95 and extending downwardly between the boiler shell and tubes to openings in the lower portion of the shell, ball joint rings connected to the internal pipe sections at said openings, and external branch steam
100 pipe sections abutting against said rings and extending therefrom to the valve chests of the cylinders.

4. In an articulated locomotive, the combination of a rear frame, a front frame coupled thereto, a plurality of driving wheels supporting each of said frames, a boiler fixed
105 to the rear frame and projecting, with the capacity of relative movement, over the front frame, cylinders fixed to the rear frame and actuating the driving wheels thereof, a main steam supply pipe section within the boiler, internal branch steam pipe sections connected thereto and extending downwardly between
110 the boiler shell and tubes to openings in the lower portion of the shell, bearing plates secured to the boiler shell around said openings, ball joint rings fitting in the ends of the internal sections, bolts connecting said
115 rings and sections to the boiler shell, and external steam pipe sections abutting against said rings and extending therefrom to the valve chests of the cylinders.

5. In an articulated locomotive, the combination of a rear frame, a front frame coupled thereto, a plurality of driving wheels
125 supporting each of said frames, a boiler fixed to the rear frame and projecting, with the capacity of relative movement, over the front frame, cylinders fixed to the rear frame and
130

actuating the driving wheels thereof, a main
steam supply pipe within the boiler, internal
branch steam pipe sections connected thereto
and extending downwardly between the
5 boiler shell and tubes to openings in the
lower portion of the shell, bearing plates se-
cured to the boiler shell around said open-
ings, inner ball joint rings fitting between
the internal sections and the boiler shell,
10 outer ball joint rings fitting in the bearing
plates, bolts connecting said inner and outer
ball joint rings and internal sections to the
boiler shell, and external steam pipe sections
abutting against the outer ball joint rings
and extending therefrom to the valve chests 15
of the cylinders.

CARL J. MELLIN.
WILLIAM L. REID.

Witnesses:

CHAS. J. ROGERS,
FRANK H. SAUTER.