

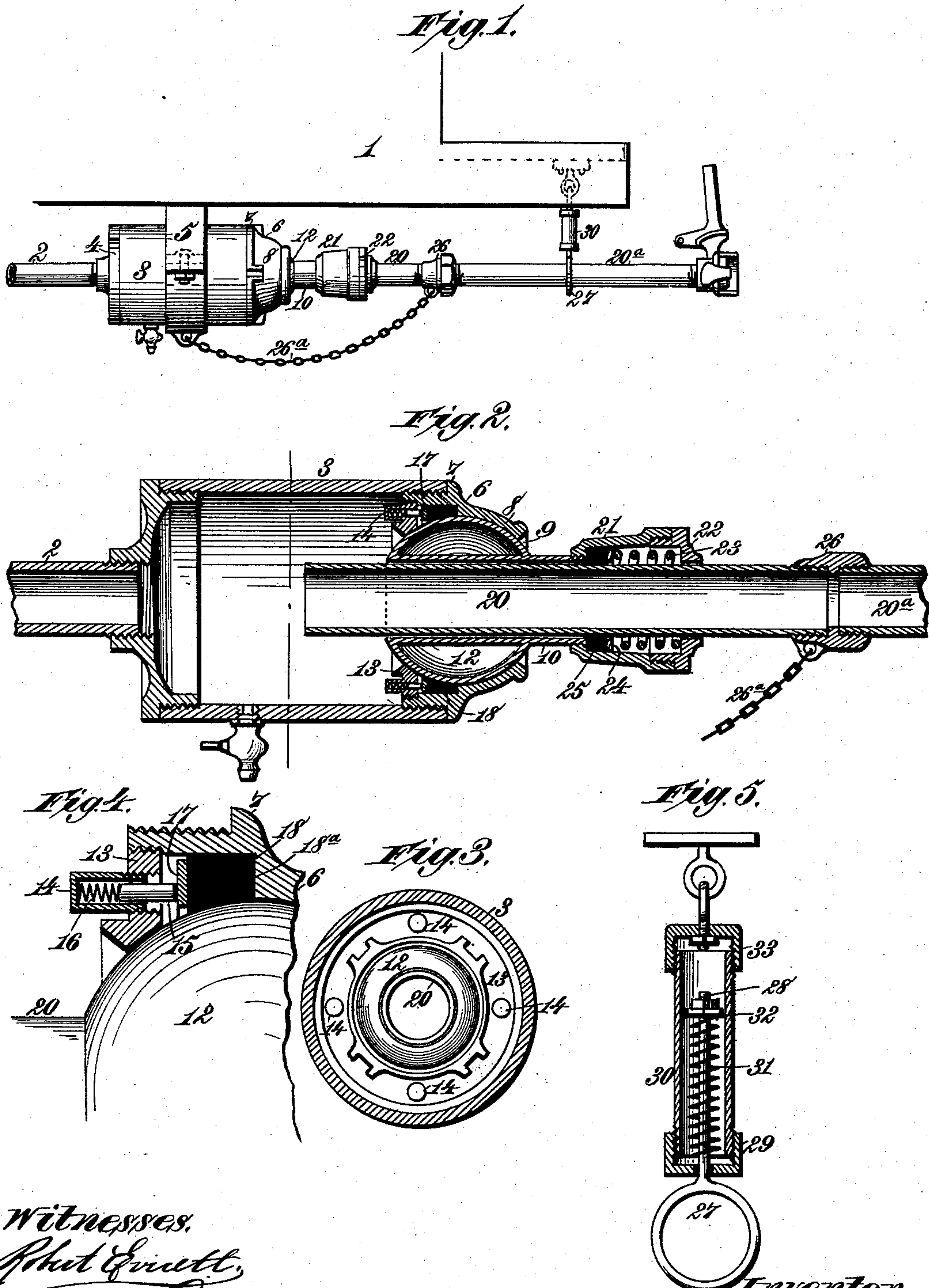
(No Model.)

E. A. LELAND.

COUPLING FOR STEAM PIPES FOR RAILWAY CAR HEATING APPARATUS.

No. 407,671.

Patented July 23, 1889.



Witnesses.  
*Robert G. Smith,*  
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Inventor.  
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By *James L. Norris,*  
*Att'y.*



# UNITED STATES PATENT OFFICE.

EDWIN A. LELAND, OF BROOKLYN, NEW YORK, ASSIGNOR TO LEONARD RICHARDSON, OF SAME PLACE.

## COUPLING FOR STEAM-PIPES FOR RAILWAY-CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 407,671, dated July 23, 1889.

Application filed April 16, 1889. Serial No. 307,430. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN A. LELAND, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Couplings for Steam-Pipes for Railway-Car-Heating Apparatus, of which the following is a specification.

My invention relates to steam-heating apparatus for railway-cars; and the particular purpose thereof is to provide an all-metal coupling or connection whereby the train-pipes may be connected between the several cars, said coupling having the capacity of permitting universal movement of the connected sections in every possible direction without leakage and without material wear of the metallic packings. It is my purpose, also, to provide a comparatively simple and durable construction whereby the wear of the packing shall be compensated and the joints between the coupling-sections rendered tight and durable, the wear of the packing being taken up by automatic means. I also propose to combine with the coupling-section attached to each train-pipe a spring-buckle by which the coupling-piece is supported.

The invention consists in the several novel features of construction and new combination of parts hereinafter fully set forth, and then definitely pointed out in the claims following this specification.

Referring to the accompanying drawings, Figure 1 is a side elevation of one end of a car with the coupling mounted therein. Fig. 2 is a central longitudinal section of the coupling-section enlarged, together with a portion of the train-pipe and the intermediate expansion-chamber. Fig. 3 is a transverse section of Fig. 2 on the line  $x x$ . Fig. 4 is a detail section of one part of the packing-joint connecting the coupling-section with the expansion-chamber. Fig. 5 is a detail section showing the spring-buckle.

In the said drawings, the reference-numeral 1 shows the body of the car, beneath which the train-pipe 2 is arranged in the usual manner. This train-pipe at each end makes communication with an expansion-chamber 3, arranged beneath the end of the car and supported in any suitable manner.

The expansion-chamber 3 consists of a cylindrical shell 3, into one end of which is threaded a cap 4, through which the train-pipe 2 enters. The shell 3 is supported under the car by means of a loop or bracket 5 or by any other suitable means.

Threaded into the end of the expansion-shell 3, next to the platform of the car, is a short cylindrical section 6, having a collar 7, which abuts against the end of the shell 3. Outside this collar the metal is contracted to form a zonoidal section 8 of a sphere, an opening 9 being formed in said portion to admit a short sleeve 10, upon which is formed a spherical section 12, which accurately fits the zonoid cap 8.

Threaded into the inner end of the short cylindrical section 6 is a packing-ring 13, having at equal intervals nipples 14 tapped through said ring and containing plungers 15 and springs 16 acting thereon, said plungers bearing against an annulus 17, by which a suitable packing 18 is compressed, said packing lying in a packing-chamber 18<sup>a</sup>, which contracts in the direction of spring-tension between the wall of the short cylindrical sleeve 6 and the surface of the spheroid or spherical section 12, the wear of the packing being instantly taken up by the tension of the spring-actuated plungers.

The spheroidal or spherical section 12 is formed upon one end of the short sleeve 10, which projects a little in front of the opening 9, through which said sleeve projects, and whereby its movement in all directions, not exceeding forty or forty-five degrees of movement upon the longitudinal radius, is permitted.

Entering and sliding within the short sleeve 10 is a coupling-pipe section 20, the end of which projects somewhat within the expansion-chamber 3. This pipe-section passes through a packing-box 21, having a substantially conical or flaring form and screwed upon the outer end of the sleeve 10. Into the end of this box is tapped a cap 22, which closely surrounds the coupling-pipe section and bears upon a strong spiral spring 23, which rests in turn upon an annular packing-piece 24, by which the packing 25 of whatever material composed is tightly compressed



within the contracted end of the packing-box. A collar 26 is mounted on the coupling-pipe section, and is connected by a chain 26<sup>a</sup> or other suitable means to the bracket or loop 5, supporting the expansion-chamber 3, whereby the telescoping movement of the pipe-section is limited in both directions.

Inasmuch as the coupling-sections 10 are necessarily of better finish and require a closer fit within the universal bearing or spherical section 12, as well as within the packing-box 21, I may utilize the collar 26 as an attachment or connection between the coupling-section 20 and a separate pipe-section 20<sup>a</sup>, the ends of said sections being tapped into opposite ends of the collar and bearing against an interior flange 27. Upon the extremity of the pipe-section 20<sup>a</sup> I employ the construction and combination of parts shown by an application filed by me upon the 11th day of April, 1889, Serial No. 306,787, or any other coupling mechanism adapted to unite the parts.

In order to sustain the weight of the coupling-pipe section and at the same time permit its free universal movement within the spherical joint, I provide a spring-buckle (shown in Fig. 5) consisting of an eye 27, forming part of a rod 28, which is passed through a screw-cap 29, turned upon a cylindrical casing 30. A spiral spring 31 of suitable force surrounds the rod 28 and supports a washer 32, adjustably mounted on said rod. The cylindrical casing 30 is tapped into a screw-cap 33 at its upper end, said cap being suspended from the car. The eye or loop 27 surrounds the pipe, as shown in Fig. 1.

By interposing the expansion-chamber 3 between the train-pipe and the spherical joint, and by so arranging the pipe-coupling relatively thereto that the telescoping extremity of the coupling-section shall have a limited longitudinal play within said expansion-chamber, I am able to provide a coupling in which all the needed play of the rigid coupling-pipe sections, as well as their longitudinal or telescopic adjustments, is amply provided for. Moreover, by forming the packing-chamber 18 in the manner set forth the wear is immediately taken up by the tension of the spring-plungers 15, which may be adjusted as regards tension by simply turning the nipples 14 in or out. A similar advantage is derived from the construction of the packing-box 21, surrounding the telescoping pipe-section shown in Fig. 2.

It will be seen that the telescoping pipe-section may, but for the limiting-chain 26<sup>a</sup>, be withdrawn from the coupling-section, having the spherical joint or globular connection with the end of the expansion-chamber 3. Thus the telescoping pipe-section may, in case

of a rupture of the coupling between the adjacent cars, be withdrawn by a simple break of the limiting-chain 26<sup>a</sup> and avoid the total disorganization of the parts so common in couplings of this character.

What I claim is—

1. In a coupling for the steam and other pipes of railway-cars, the combination, with the train-pipe having a cylindrical shell forming an expansion-chamber and provided with a zonoidal section, of a spherical section fitting the latter and containing an internal sleeve having at its outer end an attached conical packing-box, a packing-ring in said conical packing-box, a spring acting upon the packing-ring, and a coupling-pipe section telescoping in the said sleeve and conical packing-box, substantially as described.

2. In a pipe-coupling for the steam-pipes of railway-cars, the combination, with the train-pipe, of a cylindrical casing forming an expansion-chamber, a short cylindrical section threaded into one end of said casing and having a zonoidal section, a cylindrical section having a spheroidal bearing fitting the zonoidal section, an annular packing located between the spheroid and the inner face of the short cylindrical section, and spring-actuated plungers acting on the annular packing, substantially as described.

3. In a coupling for the steam and other pipes of railway-cars, the combination, with the train-pipe having a cylindrical shell forming an expansion-chamber and provided with a zonoidal section, of a spherical section fitting the latter and containing an internal sleeve having at its outer end an attached packing-box, a coupling-pipe section telescoping in the said sleeve and packing-box and provided at its outer end with a collar, and a chain secured to said collar for limiting the outward sliding movement of the telescoping pipe-section, substantially as described.

4. In a coupling for the steam-pipes of railway-cars, the combination, with the coupling-pipe section having both angular and telescopic adjustment, of a spring-buckle supporting the same and consisting of an eye or loop surrounding the pipe, a rod on said eye passing through a screw-cap turned upon a cylindrical shell or casing which contains a spiral spring supporting said rod, and a screw-cap turned upon the upper end of the shell and connected to the platform-bottom, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWIN A. LELAND.

Witnesses:

A. H. BRADLEY,  
JOHN S. HENRY.