J. E. FORSYTH.

COUPLING FOR TRAIN PIPES, &c.

APPLICATION FILED OCT. 15, 1908.

941,066.

Patented Nov. 23, 1909.

4 SHEETS—SHEET 1.

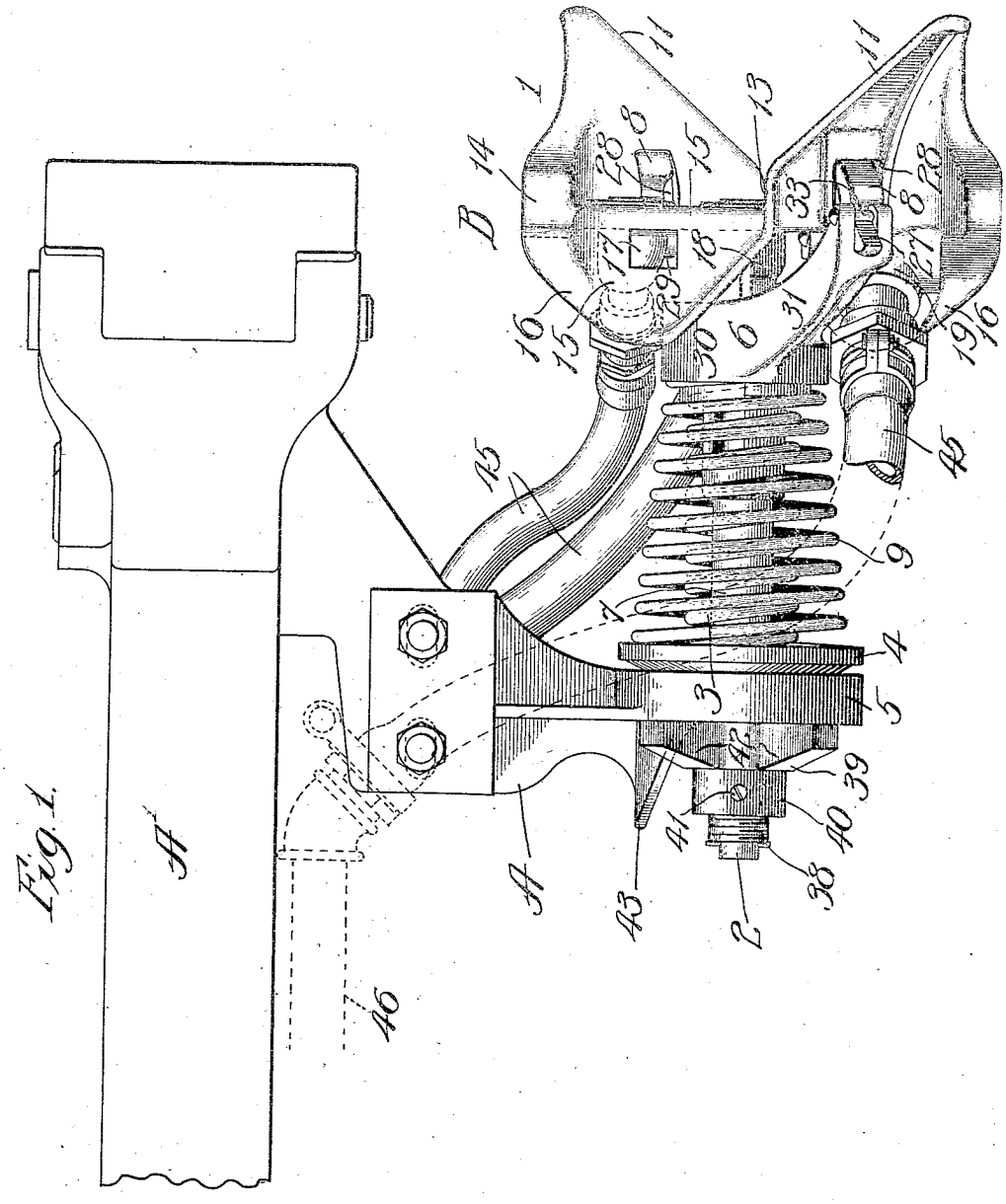

Fig. 1.

Witnesses:
Edw. E. Gaylord.
Chas. H. Buell.

Inventor.
Joseph E. Forsyth,
By Dyrenforth, Lee, Chritton & Wells,
Attys.

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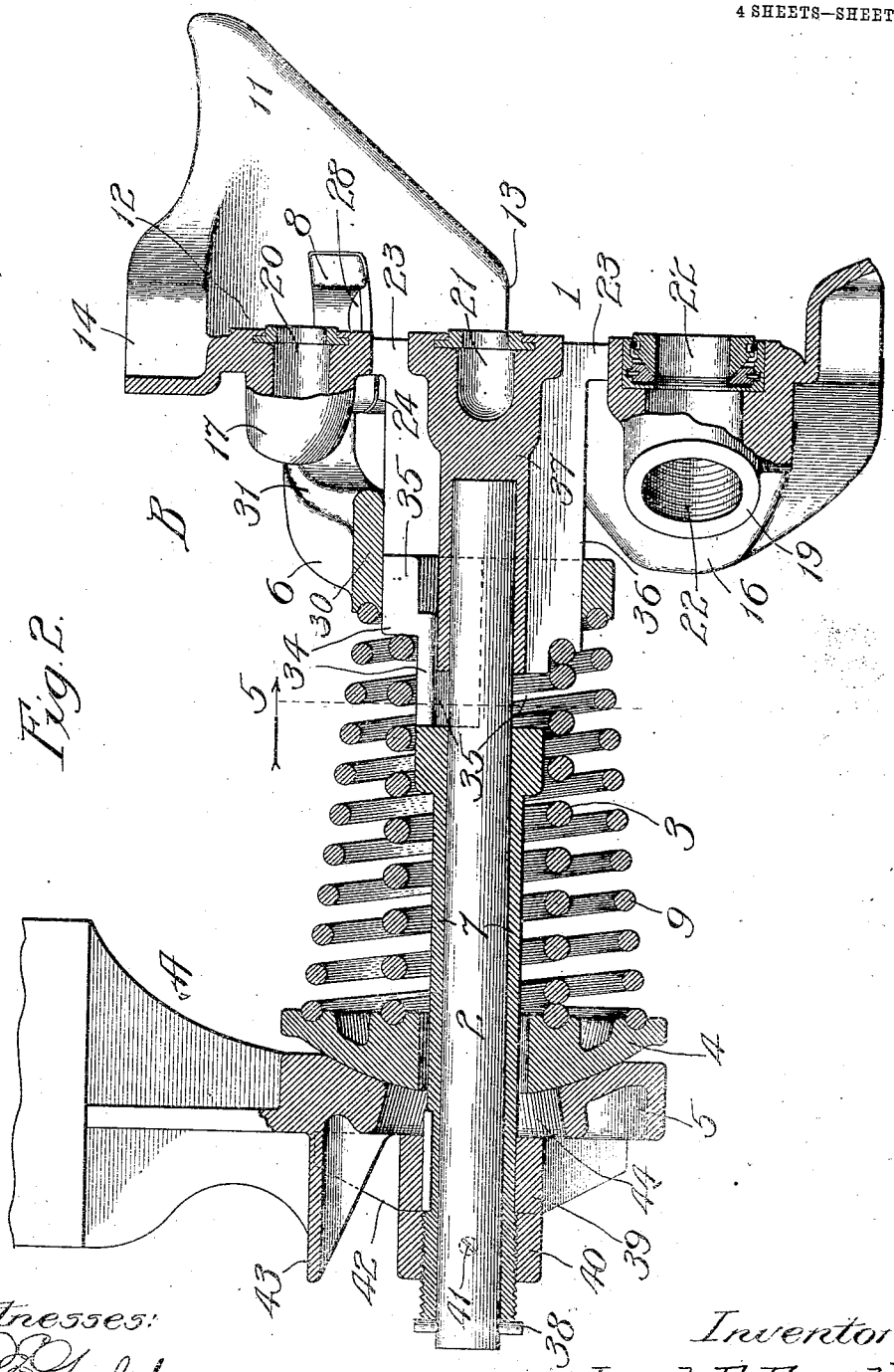

Fig. 2.

Witnesses:
Geo. E. Gaylord.
Chas. A. Bull.

Inventor:
Joseph E. Forsyth,
By Dyrenforth, Lee, Chritton & Wilkie,
Attys.

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4 SHEETS—SHEET 3.

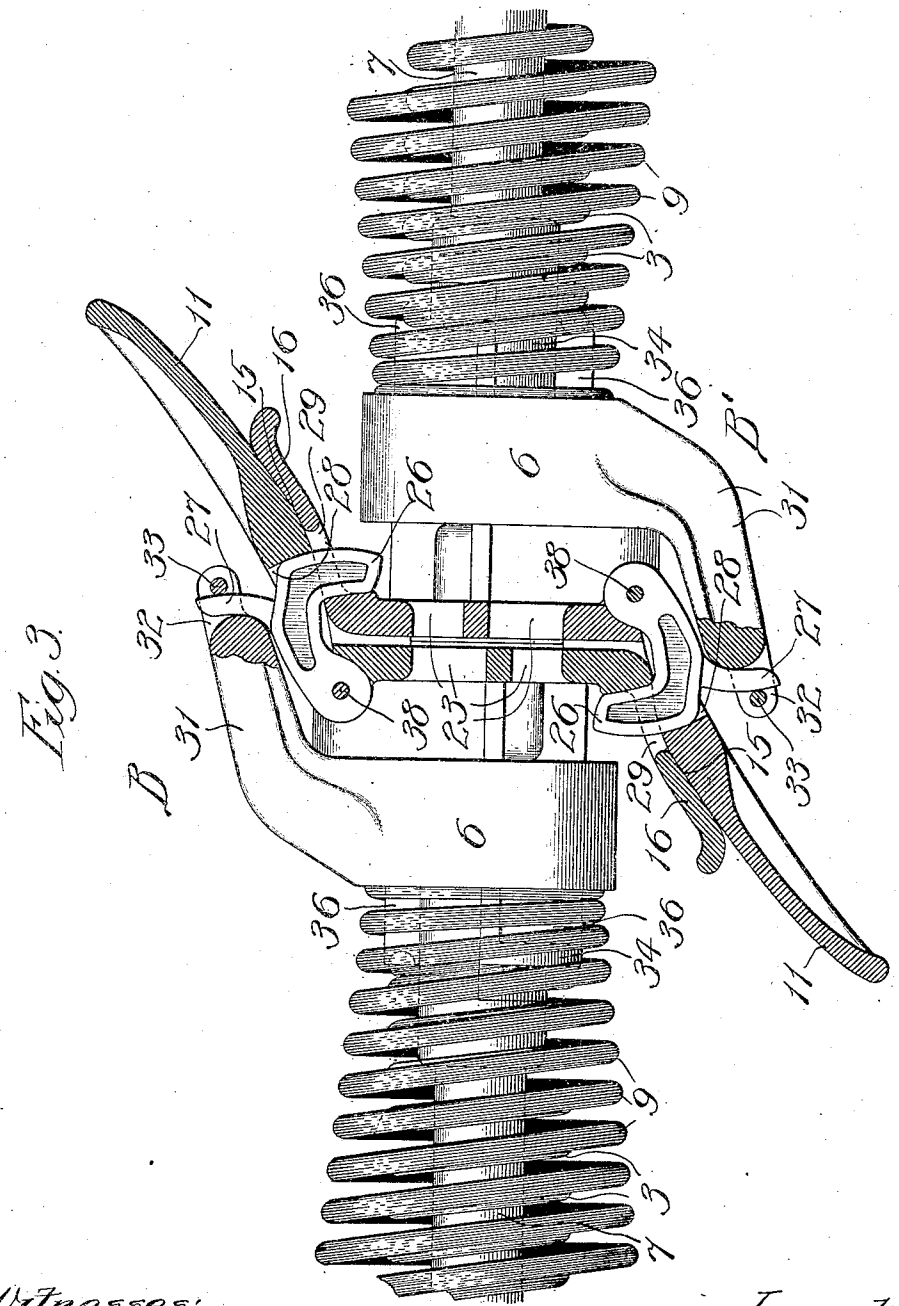

Fig. 3.

Witnesses:
Edw. E. Gaylord.
Chas. A. Buell.

Inventor:
Joseph E. Forsyth,
By Dyrenforth, Lee, Christy & Wiles,
Attys.

J. E. FORSYTH.

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4 SHEETS—SHEET 4.

Fig. 5

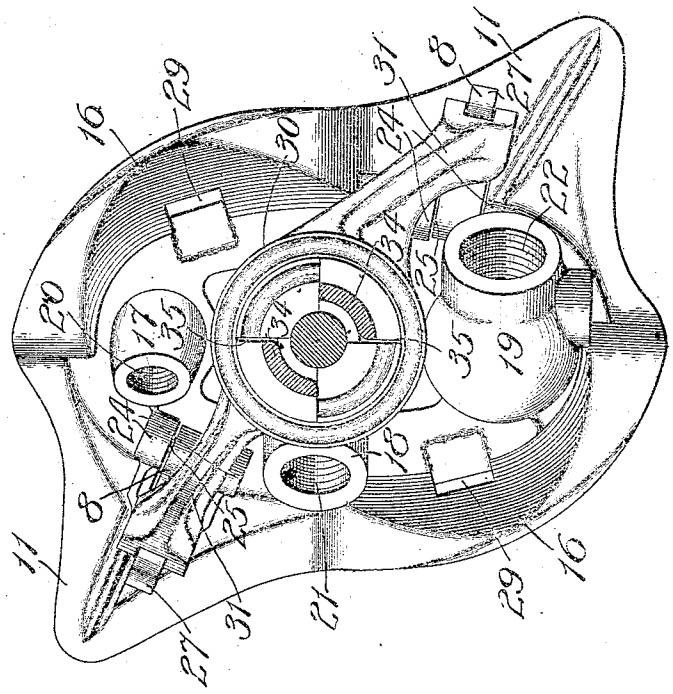
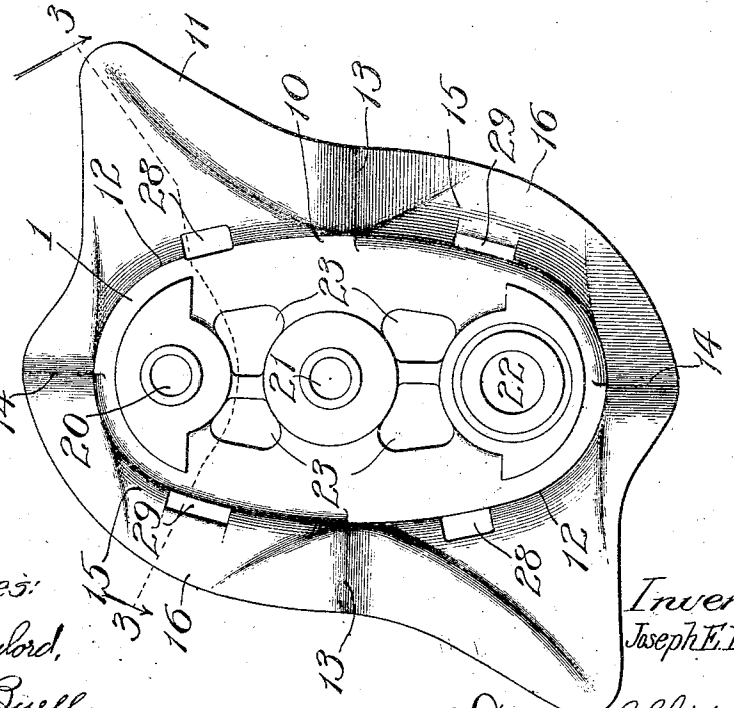


Fig. 4



Witnesses:
Chas. L. Gaylord.
Chas. H. Buell.

Inventor
Joseph E. Forsyth,
By Dyrenforth, Lee, Christy & Wells,
Attys.

UNITED STATES PATENT OFFICE.

JOSEPH E. FORSYTH, OF CHICAGO, ILLINOIS.

COUPLING FOR TRAIN-PIPES, &c.

941,066. Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed October 15, 1908. Serial No. 457,833.

To all whom it may concern:

Be it known that I, JOSEPH E. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Couplings for Train-Pipes, &c., of which the following is a specification.

My invention relates particularly to automatic couplings for train-pipes, electric conductors, etc., employed on railway trains; and my primary object is to provide an improved construction of coupling having provision for the automatic locking together of the companion coupling-heads when the cars are coupled together.

The invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 represents a broken side elevational view of a draw-bar of a car supporting a train-pipe coupling constructed in accordance with my improvements; Fig. 2, a sectional view of my improved train-pipe coupling; Fig. 3, a transverse sectional view taken approximately as indicated at line 3—3 of Fig. 4, and showing two coupling-heads locked together; Fig. 4, a face view of the coupling-head employed; and Fig. 5, a sectional view taken as indicated at line 5 of Fig. 2 and showing the rear side of the coupling-head.

It may be stated preliminarily that a train-pipe coupling-head of the improved construction is suspended from the draw-bar at each end of a car, the equipments at both ends of a car being duplicates of each other, and each coupling-head being located directly beneath the draw-bar, so that the coupling-heads will meet and interlock properly when the adjacent ends of two cars are brought together.

In the accompanying drawings, the coupling-heads are shown connected with the train-pipes which they are designed to connect, but it will be understood that, if desired, electric connections may be applied to the coupling-heads, so that the electric circuits will be automatically made when the coupling-heads are coupled.

In the preferred construction, which is that herein illustrated, A represents a bracket suspended from the draw-bar A^1 of a car; and B, a coupling-device supported on the bracket A.

In Fig. 3, B^1 represents a companion coupling-device of the same construction as the coupling-device B. Each coupling-device comprises a coupling-head 1 from the rear side of which extends a stem or shaft 2, through the medium of which the coupling-head is supported and guided, a coil spring 3 serving normally to project the coupling-head a short distance in front of the face of the car-coupler; a spring-plate 4 having a convex rear surface which fits in a concave front surface of a ring 5 with which the lower end of the bracket A is equipped; a yoke 6 carried by a tubular stem 7 through which the shaft, or stem, 2 extends; locking members 8 pivotally mounted on the head 1 and adapted to be actuated by the yoke 6, thereby to lockingly engage the companion coupling-head; and a conical coil spring 9 confined between the yoke 6 and the spring-plate 4.

Each coupling-head 1 is preferably of the oval form shown in Fig. 4, has a flat transverse face 10, and is equipped with diagonally opposite guide-prongs 11, whose points diverge and whose base-portions are provided with inner concave surfaces 12, said guide-prongs having flanking shoulders 13 lying in substantially the horizontal central plane of the coupling-head and flanking shoulders 14 lying in substantially the vertical central plane of the coupling-head. Between the prong-bases, the coupling-head is provided with diagonally opposite convex surfaces 15, from which extend rearwardly oblique guide-flanges 16 upon which the prongs of the companion coupling-head may ride when the coupling-heads are brought together. Each coupling-head is equipped on its rear side with bosses 17, 18 and 19 through which extend, respectively, the signal passage 20, the air-brake passage 21 and the steam passage 22. Said passages 20, 21 and 22 have orifices opening at the front transverse face of the coupling-head and equipped thereat with suitable gaskets. Each coupling-head also has the metal cut away affording openings 23, serving to lighten the casting.

The rear side of each coupling-head is equipped with bosses 24 which support pivots 25 by means of which the locking members 8 are connected with the coupling-head. Each locking member 8 is of approximately bell-crank form, having an arm 26 adapted to engage the rear side of the companion coupling-head, and having also an actuating arm 27 connected with the yoke 6. As illus-

trated, there is a pair of locking members 8 connected with each coupling-head, the locking members being diagonally opposite each other and in a position corresponding with the position of the guide-prongs of the coupling-head. The guide-prongs of the coupling-head have their base-portions provided with slots or openings 28, in which the extremities of the arms 26 of the locking members 8 are normally housed. The rearwardly directed guide-flanges 16 of each coupling-head are provided with a pair of diagonally opposite slots or openings 29, through which the arms 26 of the locking members 8 of the companion coupling-head are adapted to pass to enable said arms to engage the rear surface of the coupling-head in the locking position, as will be clearly understood from Fig. 3.

Each yoke 6 comprises a ring 30 equipped with diagonally opposite forwardly-extending arms 31 provided with slots 32 which receive the arms 27 of the locking members 8, said slots 32 being illustrated as the spaces between furcations connected by pins, or rollers, 33. The base-portion of each slot 32 affords a cam adapted to act upon the locking member and force the same to the locking position, after the coupling-heads have been brought together, and the pin 33 serves to withdraw the locking member when the coupling-heads are separated. The tubular shank 7 has an enlarged portion 34 which carries the ring 30 and may be formed integrally therewith. The enlarged tubular portion 34 is provided with slots 35 to receive segments, or enlargements, 36 carried by the shaft, or stem, 2. The enlargements 36 may be formed integrally with the boss 37 on the rear side of the coupling-head with which the shaft 2 is connected, or the shaft 2 may constitute an extension of the boss 37. It will be understood that the shaft, or stem, 2 may move longitudinally within the tubular stem 7, the slots 35 permitting the enlargements 36 to slide therein, whereby the yoke and coupling-head are guided with relation to each other and maintained in proper angular relation.

The spring 3, as clearly shown in Fig. 2, is arranged within the conical spring 9, and the plate 4 is provided on its front face with two annular grooves receiving the rear ends of the coil springs. The larger end of the outer spring is at the rear, so that the outer spring tends to center the coupling-head. By preference, the inner spring is made heavier than the outer spring, to insure a firm contact of the faces of the coupling-heads before the locking members 8 are actuated far enough to engage the companion coupling-heads. Normally, in the projected position of the coupling-head, both springs are under a certain degree of compression, in which condition the forward movement of the coupling-head is limited by a pin 38 connected with the shaft 2 and engaging the rear end of the tubular shaft 7; and the forward movement of the tubular shaft 7 is limited by a stop 39 secured, as by a collar 40 and pins 41, on the tubular shaft 7. The stop 39 normally engages the rear surface of the ring 5 of the bracket A and carries arms 42 adapted to engage a rearwardly pointed member 43 carried by the bracket A, thus maintaining the coupling-head in a proper upright position. The ring 5 has an opening 44 through which the tubular stem 7 extends freely, said opening 44 being large enough to permit all necessary movements of the coupling-head in any direction, such as might be required in rounding a curve or when the coupling-heads are located at different levels. The obliquely-extending bosses 17, 18 and 19 through which the air and steam passages of the coupling-heads extend, are connected by hose or pipes 45 with the train-pipes 46. Armored hose answers admirably the purpose of such a connection.

The operation will be readily understood from the foregoing detailed description. When two cars are brought together to effect coupling thereof, the coupling-heads B and B^1 are thereby brought together, in which movement the guide-prongs 11 of each coupling-head engage the guide-prongs of the companion coupling-head and guide the coupling-heads together. In this movement, the tips of the guide-prongs of each coupling-head ride upon the oblique guide-flanges 16 of the companion coupling-head, thereby bringing the coupling-heads together without injurious shock. After the coupling-heads are brought together, the concave surfaces 12 at the bases of the prongs of each coupling-head engage the convex surfaces 15 of the companion coupling-head, and the lateral shoulders 13 and 14 of the prong-bases of each coupling-head engage the corresponding shoulders of the companion coupling-head. Thus, the formation of the coupling-heads is such as to tend to prevent the transverse faces of the coupling-heads from rocking or prying away from each other, and also to prevent angular rotation of the coupling-heads with relation to each other, so that the gaskets will be maintained in proper relation. In the operation of bringing the coupling-heads together, the springs 3 are placed under considerable compression in advance of the completion of the locking movement of the locking members 8, and in the further movement of compression of the springs the locking members 8 are forced firmly into engagement with the companion coupling-head. Inasmuch as the springs 9 are always under considerable compression while the cars are coupled together, the locking members 8 will be firmly held in the locking position, so that the coupling-

heads will be effectually locked against prying away from each other, and thus is insured an air-tight contact of the gaskets even when the train is rounding a sharp curve, or when the coupling-heads are at different heights, as may occur on an uneven track, or from other cause. When the cars are uncoupled, the compression upon the springs 9 is relieved, thereby permitting the yokes 6 to move rearwardly with relation to the coupling-heads, thereby releasing the locking members.

What I regard as new, and desire to secure by Letters Patent, is—

1. An automatic coupling for the purpose set forth, comprising a coupling-head of oval form having a transverse face and equipped with diagonally opposite forwardly diverging guide-prongs having inner concave surfaces at their bases, each guide-prong having a lateral shoulder lying in substantially the horizontal central plane of the coupling-head and a lateral shoulder lying in substantially the vertical central plane of the coupling-head, said coupling-head having convex surfaces located between the prong-bases and rearwardly diverging guide-surfaces forming a continuation of said convex surfaces of the coupling-head and conforming to the inner surfaces of the prongs of a companion coupling-head.

2. An automatic coupling for the purpose set forth, comprising an oval-form coupling-head having a transverse face and equipped with diagonally opposite forwardly diverging guide-prongs having inner concave surfaces at their base-portions, each of said guide-prongs having a lateral shoulder lying in substantially the horizontal central plane of the coupling-head and a lateral shoulder lying in substantially the vertical central plane of the coupling-head, said coupling-head having convex surfaces located between the prong-bases and rearwardly diverging guide-flanges having surfaces forming a continuation of said convex surfaces and conforming to the inner surfaces of the guide-prongs of a companion coupling-head.

3. An automatic coupling for the purpose set forth, comprising an oval-form coupling-head having a transverse face and equipped with diagonally opposite forwardly diverging guide-prongs having inner concave surfaces at their base-portions, each of said guide-prongs having a lateral shoulder lying in substantially the horizontal central plane of the coupling-head and a lateral shoulder lying in substantially the vertical central plane of the coupling-head and each guide-prong having an opening through the base-portion thereof, said coupling-head having convex surfaces lying between the prong-bases and rearwardly diverging flanges whose surfaces form continuations of said convex surfaces, each of said flanges having an opening therethrough, locking members mounted on said coupling-head and movable through the openings of said guide-prongs, and actuating means for said locking members.

4. In an automatic coupling for the purpose set forth, the combination with the draw-bar of a car, of a bracket suspended therefrom, a coupling-head having a stem mounted to slide in said bracket, a spring confined between said bracket and said coupling head, said coupling-head being of oval form and equipped with diagonally opposite forwardly diverging guide-prongs having inner concave surfaces at their base-portions, each of said guide-prongs having a lateral shoulder lying in substantially the horizontal central plane of the coupling-head and a lateral shoulder lying in substantially the vertical central plane of the coupling-head, said coupling-head having convex surfaces lying between the prong-bases, the base-portion of each guide-prong being provided with an opening, locking members supported on said coupling-head and adapted to move in said openings, means slidable on said stem serving to actuate said locking members, and a spring confined between said last-named means and said bracket, for the purpose set forth.

5. The combination with a draw-bar of a car, of a bracket suspended therefrom, a prong-equipped coupling-head having a stem extending loosely through said bracket, a locking member mounted on said coupling head and adapted to engage a companion coupling-head, an actuating member for said locking member having a tubular stem extending through said bracket, springs surrounding said tubular stem having a bearing against said bracket, one of said springs having a bearing on said coupling-head and the other having a bearing on said actuating member, and stops connected with said stems in the rear of said bracket and limiting the forward movement of said coupling-head and said actuating member, for the purpose set forth.

6. The combination with a draw-bar of a car, of a bracket suspended therefrom, a tubular stem extending loosely through said bracket, a spring-plate located in front of said bracket and having universal connection therewith and through which said stem loosely extends, a yoke carried by said tubular stem, an inner stem extending through said tubular stem and equipped at its front portion with spring-bearings projecting through slots provided in said tubular stem, an inner coil spring contacting at its front end with said spring-bearings and at its rear end with said spring-plate, an outer coil spring confined between said yoke and said spring-plate, a coupling-head carried

by said inner stem equipped with guide-prongs provided with openings therethrough, locking members mounted on said coupling-head and adapted to move in said openings through said guide-prongs, connections between said yoke and said locking members, and stops limiting the forward movement of said stems.

7. The combination with a bracket adapted to be suspended beneath a car, of a tubular stem extending loosely therethrough and equipped at its front end with a yoke, said tubular stem having openings therein, an inner stem extending through said tubular stem and equipped with spring-bearings projecting through the openings in said tubular stem, an inner coil spring encircling said tubular stem and confined between said spring-bearings and said bracket, an outer coil spring confined between said yoke and said bracket, a coupling-head carried by the forward end of said inner stem and equipped with forwardly diverging guide-prongs having openings therethrough and equipped with rearwardly diverging flanges located between the bases of said guide-prongs and provided with openings, locking members pivoted on said head and movable through the openings in the guide-prongs thereof and through the openings in the rearwardly diverging flanges of a companion coupling-head, connections between said locking members and said yoke, and stops limiting the forward movement of said stems.

8. The combination of a bracket adapted to be supported beneath a car, a tubular stem extending therethrough provided at its front portion with an opening, an inner stem extending through said tubular stem and equipped with a spring-bearing extending through said opening, springs encircling said tubular stem and having a bearing on said bracket and serving normally to project said stems, a coupling-head carried by said inner stem having an oval form and a transverse face and equipped with diagonally opposite forwardly diverging guide-prongs having inner concave surfaces at their base-portions and having lateral shoulders lying in substantially the vertical and horizontal central planes of the coupling-head, said coupling-head having convex surfaces lying between the prong-bases, a locking member carried by said coupling-head, and an actuating member for said locking-member carried by said tubular stem.

JOSEPH E. FORSYTH.

In presence of—
R. A. RAYMOND,
R. A. SCHAEFER.