D. D. & G. HOWE.

AUTOMATIC AIR AND STEAM COUPLING.

APPLICATION FILED JULY 28, 1915.

1,182,684.

Patented May 9, 1916.

4 SHEETS—SHEET 1.

Fig. 1.

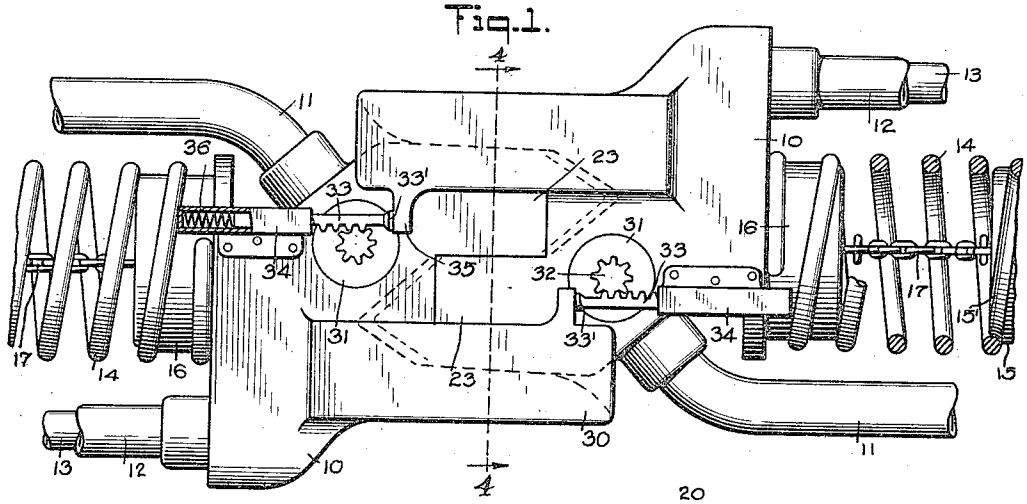


Fig. 2.

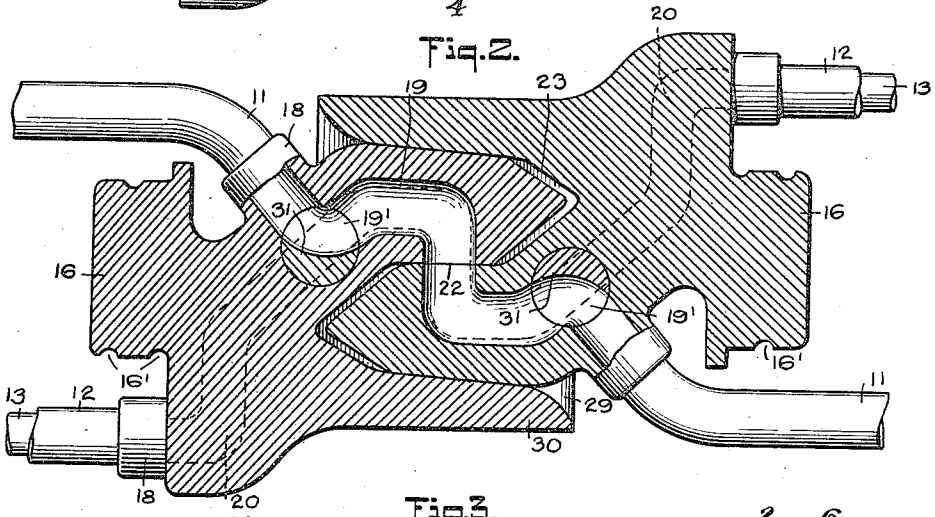
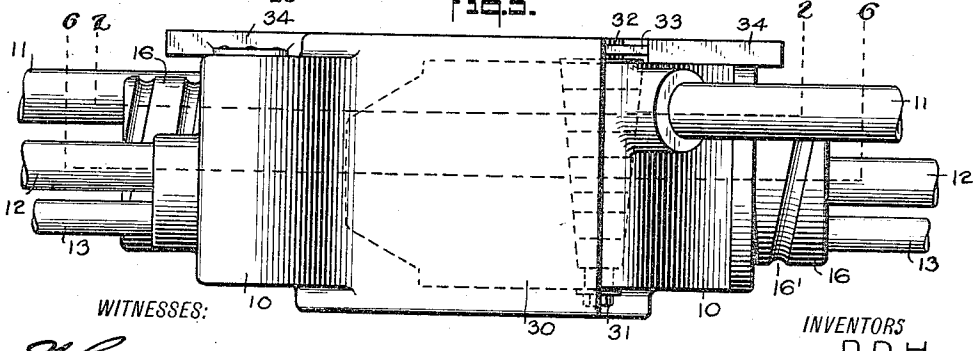


Fig. 3.



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Fig. 4.

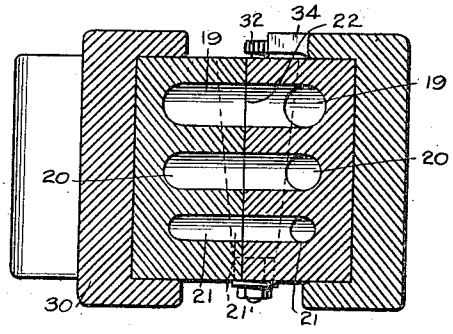


Fig. 5.

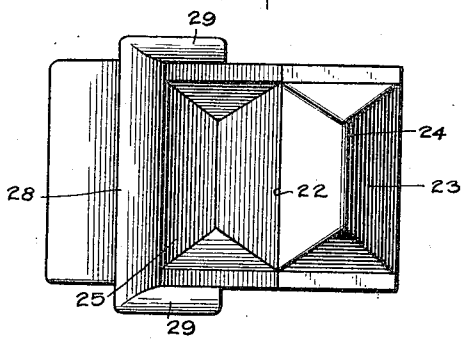


Fig. 6.

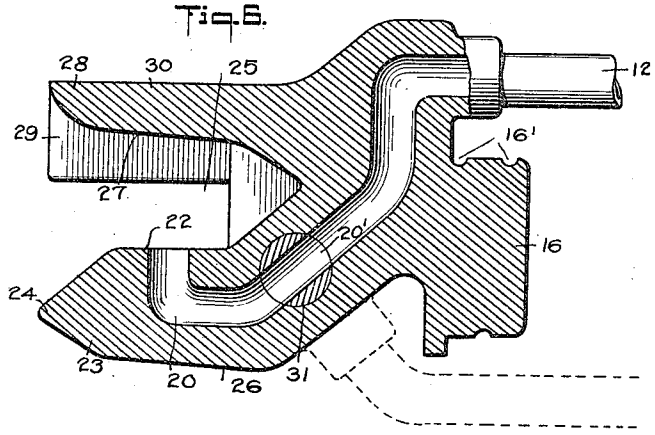
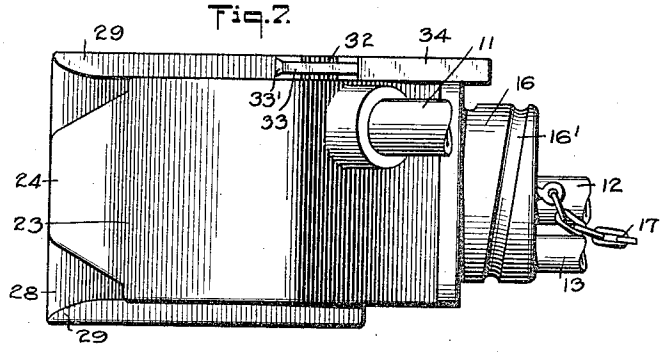


Fig. 7.



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4 SHEETS—SHEET 3.

Fig. 8.

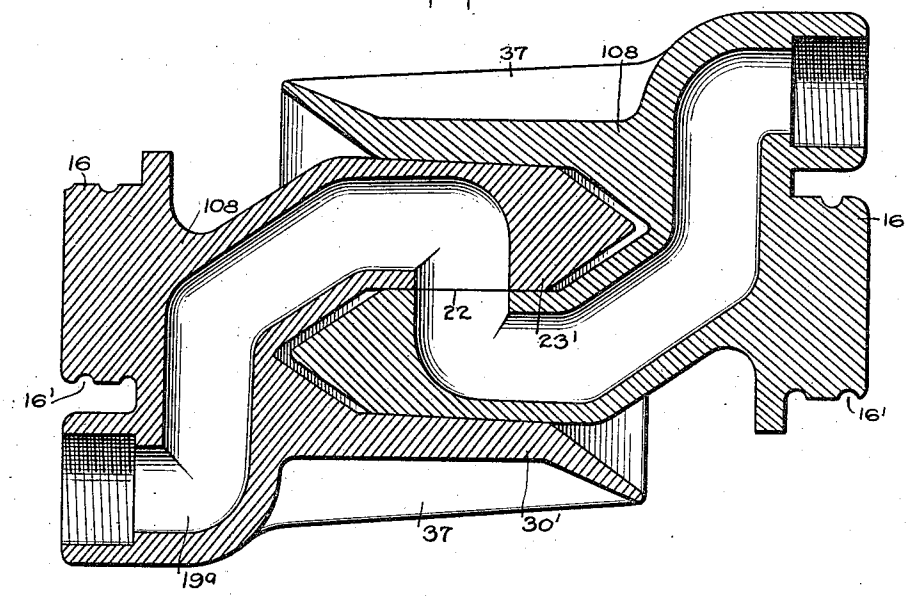
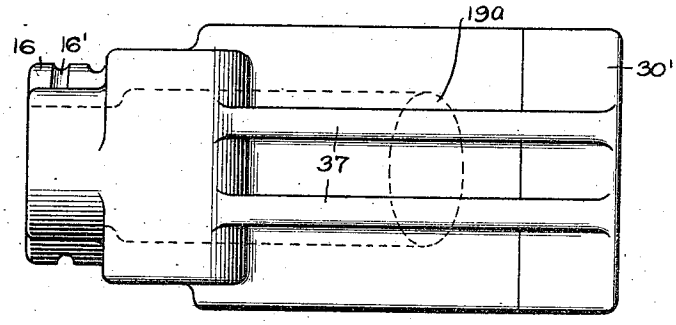


Fig. 9.



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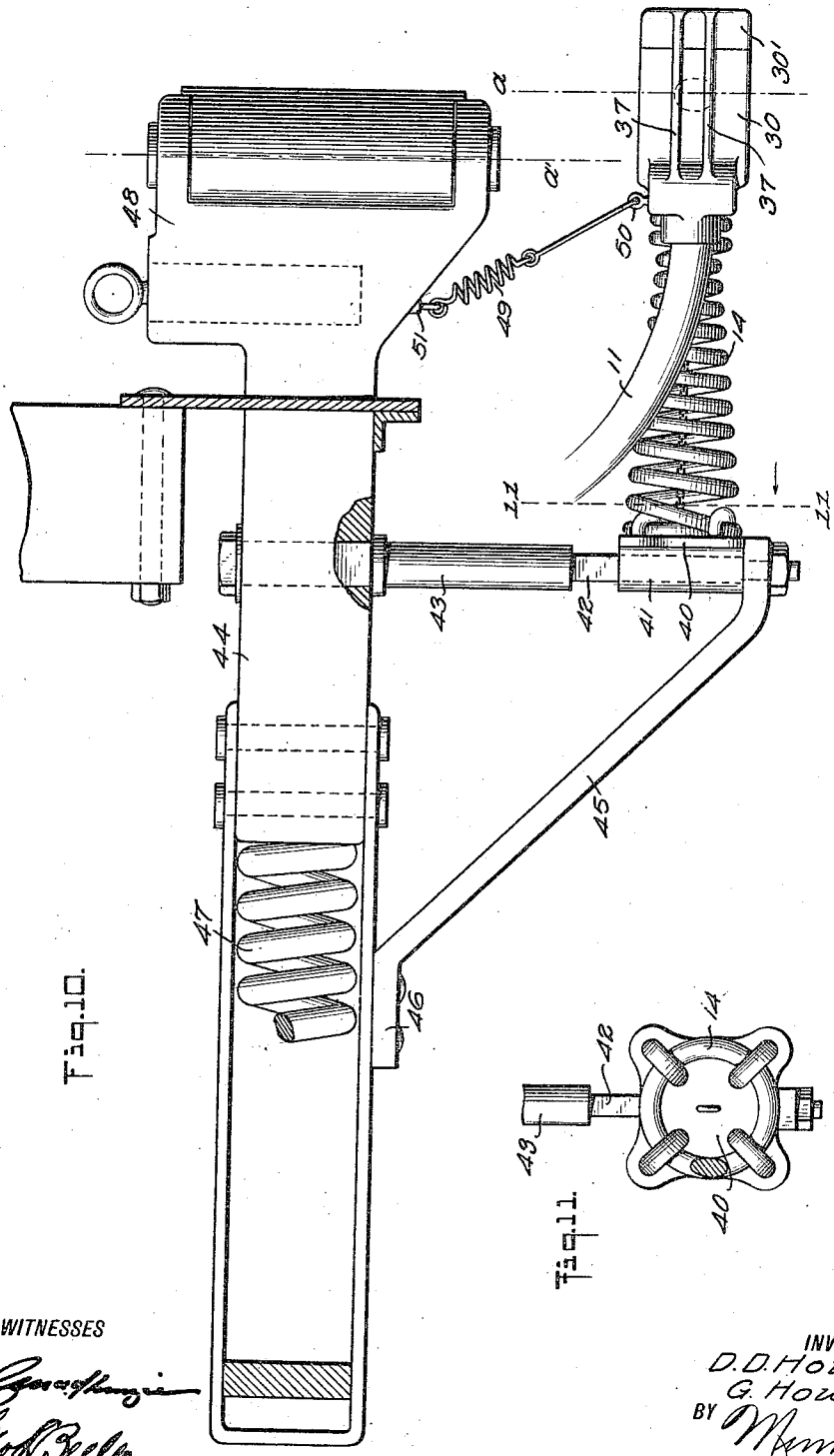


Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE.

DAN DUNBAR HOWE, OF NORFOLK, VIRGINIA, AND GEORGE HOWE, OF SPARROWS POINT, MARYLAND.

AUTOMATIC AIR AND STEAM COUPLING.

1,182,684. Specification of Letters Patent. Patented May 9, 1916.

Application filed July 28, 1915. Serial No. 42,392.

To all whom it may concern:

Be it known that we, DAN D. HOWE and GEORGE HOWE, citizens of the United States, and residents, respectively, of Norfolk, in the county of Norfolk and State of Virginia, and of Sparrows Point, in the county of Baltimore and State of Maryland, have invented a new and Improved Automatic Air and Steam Coupling, of which the following is a full, clear, and exact description.

This invention relates to railway appliances and has particular reference to automatic couplers for railway cars or the like and adapted to make connection for the steam, brake air, and signal air pipes coincidentally with the coupling of the cars in the regular way.

While various attempts have been made heretofore to provide means for the automatic connection of the pipes above referred to for passenger and freight cars, such devices have not come into general use mainly because of unsatisfactory conditions of various kinds, due to the danger of leakage of air and steam or because of the difficulty encountered in causing the head portions of the couplings to properly come together because of irregularities in the traffic equipment or differences in structure between various cars.

Among the objects of the invention, therefore, is to provide a construction adapted either for freight or passenger traffic, making it possible and expedient for the air pipes of freight cars or all of the pipes of passenger cars to automatically connect in a simple, reliable and satisfactory manner.

The foregoing and other objects of the invention will hereinafter be more fully described and claimed and illustrated in the drawings forming a part of this specification in which like characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a plan view of a device adapted especially for passenger cars; Fig. 2 is a horizontal longitudinal section of the same, substantially on the line 2—2 of Fig. 3; Fig. 3 is a side elevation of the same; Fig. 4 is a transverse vertical section substantially on the line 4—4 of Fig. 1; Fig. 5 is an end elevation of one of the coupling heads; Fig. 6 is a horizontal longitudinal section of the same along the line 6—6 of Fig. 3, one head only being shown; Fig. 7 is a side elevation of the same; Fig. 8 is a view corresponding to Fig. 2 but representing a freight equipment; Fig. 9 is a side elevation of one head of the same; Fig. 10 is a side elevation of the improvement attached to the draw bar of a freight car and indicating the action thereof with respect to the draw bar; and Fig. 11 is a front elevation of the anchor means for the new coupler spring, the latter being in section on the line 11—11 of Fig. 10.

The several parts of this device may be made of any suitable materials, and the relative sizes and proportions, as well as the general design of the mechanism, may be varied to a considerable extent without departing from the spirit of the invention hereinafter more fully described and claimed.

Referring more particularly to the drawings, Figs. 1 to 7 inclusive will be described first with reference especially to passenger car equipment in which a head 10 having provision for a steam pipe 11, a brake air pipe 12 and a signal air pipe 13, is designed to be carried by each end of a passenger car, the same being supported resiliently in position to be engaged and interlocked with a similar head of the next adjacent car. The supporting means comprises a spring 14 which is connected in any suitable manner at its inner end to the car as upon a hub 15 and at its outer end it is connected to a hub 16 extending inwardly in longitudinal alinement with the center of the coupler as a whole. The hubs 15 and 16 are preferably provided with spiral grooves 15′ and 16′ into which the ends of the spring extend and whereby longitudinal displacement of the same is prevented. A chain 17 or its equivalent is connected loosely between said hubs and within the spring for the purpose of preventing too great separation between the head and the fixed hub 15 due either to accident or the sticking together of the heads by friction or otherwise. The foregoing general description of one of the heads will be understood as applicable to both since they are necessarily made duplicates of each other so that any car equipped with this apparatus may readily connect with any other car as occasion may require.

The several pipes referred to may be connected to bosses 18 carried by the heads and

of any suitable design known in the art, such features *per se* constituting no part of this invention, it being understood that the pipe connections with the heads will be sufficiently permanent and of a steam and air tight nature. The steam pipe 11 leads to a port 19 and the pipes 12 and 13 lead likewise to ports 20 and 21 respectively. These ports of each head are cored in substantially parallel horizontal planes through the head and terminate in a vertical face 22, the plane of which coincides with the central longitudinal axis of the entire coupling.

As will be observed especially from Figs. 2 and 6, the ports 19, 20 and 21 lead through the head and are formed mainly in what may be termed a prong 23 having a tapered outer end or point 24 for coöperation with a corresponding opening or socket 25 of the other head.

Fig. 5 indicates an end view of the prong and said socket 25 and shows the beveling of the point thereof in all directions. The outer wall 26 of the prong lies in a vertical plane inclined to the vertical plane 22, providing for a taper of the prong toward its point. This necessitates a corresponding taper of the wall at 27 on the opposite side of the wall of the socket 25 to accommodate the wall 26 of the main head. The springs 14 not only carry the heads in position to automatically come together in the desired manner, but maintain a constant pressure of the heads toward each other and thereby serve to hold the prongs well seated in their respective sockets with the result that the contacting walls 26 and 27 will insure the longitudinal walls 22 in constant intimate contact. No packing means in the nature of gaskets or the like, therefore, are required to maintain substantial steam and air tight connection even though the contacting parts may wear in practice. The vertical surfaces 22 will always maintain tight contact.

The tapered end or point 24 of each prong is sure to be guided into its place by reason of the outward flare of the opposite prong point and the side wall 28 and the upper and lower flaring lips 29 bounding the inclined wall 27 of the gathering part of the head indicated as a whole at 30.

The air pipes preferably enter the head on the opposite side of the vertical plane of the face 22 from the point where the steam pipe enters, but the invention is not to be unnecessarily limited in this regard.

In each head is fitted a rotary cutoff valve 31 movable in substantially 90 degrees around the vertical axis automatically and coincidentally with the coupling of the cars. Said valve is provided at its upper end with a pinion 32 with which a rack 33 coöperates. The rack is guided for longitudinal reciprocations in a casing or guide 34 shown as attached to the upper part of the head. The outer end of the rack is provided with a head 33′ which is struck by a lug 35 by the approaching head whereby the rack is forced rearwardly against the force of a spring 36 housed within the casing 34 and at such time the pinion and valve plug are rotated as above described. The spring 36 is strong enough to cause the reverse rotation of the valve plug when the coupling heads separate, causing the valve plug to close all of the ports 19, 20 and 21, the valve plug having corresponding ports 19′, 20′ and 21′ respectively. This insures that when the coupling heads separate due to the uncoupling of the cars, the steam and brake and signal air will be prevented from escaping, and when the cars are being coupled, the action of the racks and pinions will cause the valves to open automatically and positively, establishing free communication through the ports above described.

Fig. 8 shows a preferred form of the invention in which the heads 108 are each provided with but one port 19^a for the passage of brake air. As indicated in Fig. 9, this port may be elliptical vertically if desired. The general form of the prongs 23′ and gathering means 30′ are substantially the same as that already described in connection with the passenger equipment. Fig. 9 serves also to indicate the nature of the reinforcing or strengthening ribs 37 formed in parallel horizontal planes along the outer face of each of the gathering means. These provide sufficient strength with a minimum mass or weight of material and thereby increasing the efficiency of the springs 14 coöperating with the hubs 16 as already described.

Figs. 10 and 11 indicate a spring 14 anchored to a base plate 40 carried by a sleeve 41 slidable vertically along a polygonal portion 42 of a shank or standard 43 secured at its upper end to the draw bar 44. The lower end of the standard 43 has a brace 45 extending upwardly and rearwardly to another portion of the draw bar where it is rigidly secured at 46. The main draw bar spring 47 is much heavier and stronger than the spring 14, but the latter is so designed that the coupling head 30 is carried normally about two inches beyond the main coupling 48 when the cars are disconnected as indicated by the lines *a* and *a′* on Fig. 10. In other words, when the fluid couplers connect while the cars are coming together, the springs 14 will be contracted about two inches and will be so maintained while the ordinary knuckles 48 are operative, and thereafter all parts of the coupling are operated together against the force of the springs 47. A spring 49 is connected at 50 and 51 to the two heads.

Claims:

1. The herein described coupler compris-

ing, in combination, a main draw bar, a coupling head carried thereby, a rigid standard secured to the draw bar and projecting downwardly therefrom, a sleeve slidably mounted upon the lower end of the standard, a brace extending from the lower end of the standard rearwardly to the rear portion of the draw bar and serving to limit the downward movement of the sleeve, an auxiliary coupling head below the main head, flexible supporting means between the main head and the auxiliary head serving to hold the auxiliary head elevated, cushioning means between the sleeve and the auxiliary head permitting the auxiliary head to move rearwardly independently of the main head, and a flexible member extending within the cushioning means between the sleeve and the auxiliary head to limit the forward movement of the auxiliary head.

2. In an automatic coupler of the character set forth, the combination with a main support and a rigid standard secured thereto and projecting vertically downwardly therefrom, of a coupling head, a sleeve slidably fitted upon the lower end of the standard, a coiled cushioning spring having one end anchored rigidly to said sleeve and the other end secured to the head, said spring serving to maintain the head in coupling position and permitting the head to move in action toward the sleeve, and a chain extending along the axis of the spring, one end of the chain being secured to the sleeve and the other end to the head and serving to limit the movement of the head away from the sleeve.

3. In an automatic air and steam coupler, the combination of a pair of coöperating duplicate heads, each head having a plurality of ports for the conveyance of fluids for different purposes and adapted to register with the corresponding ports of the other head when the heads are coupled, a single rotary valve for each head movable around a vertical axis and serving to open or close all of the ports of such head simultaneously, a pinion secured to the upper end of the valve, a spring operated rack movable forwardly automatically to close the valve when the heads are uncoupled, and means carried by the opposite head bearing positively upon said rack to cause the valve to open all of the ports of its head when the heads are coupled together, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAN DUNBAR HOWE.

Witnesses:
J. F. BENTON,
JNO. M. BALDWIN.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. HOWE.

Witnesses:
WILLIAM M. SHEETENHELM,
R. F. HOZIER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington. D. C."