

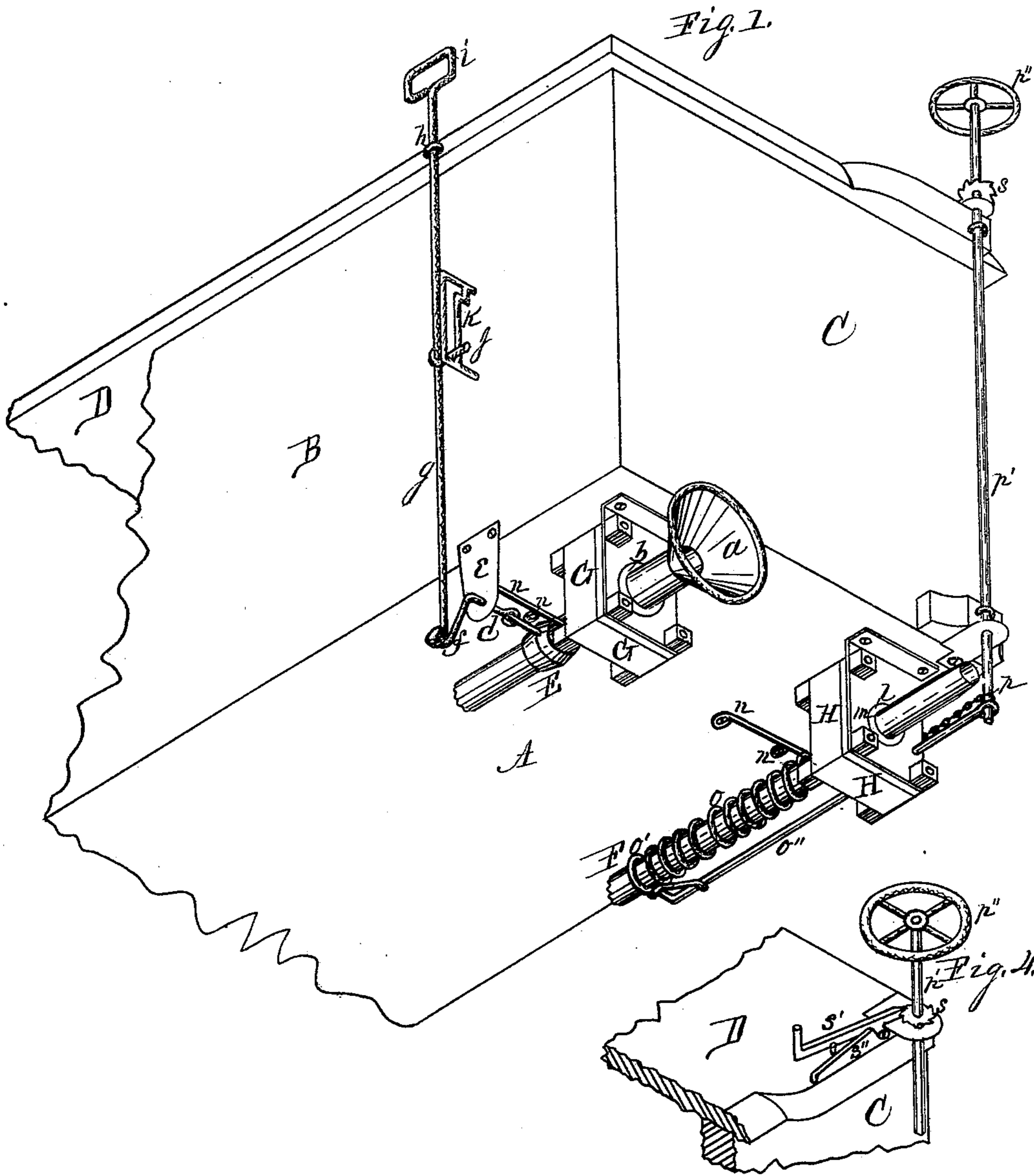
(No Model.)

2 Sheets—Sheet 1.

H. B. HOWARD.  
Steam and Air Brake Coupling.

No. 233,513.

Patented Oct. 19, 1880.



Attest:  
a. Behel,  
M. E. Haight.

INVENTOR:  
Horace B. Howard,  
Per Jacob Behel,  
Atty.

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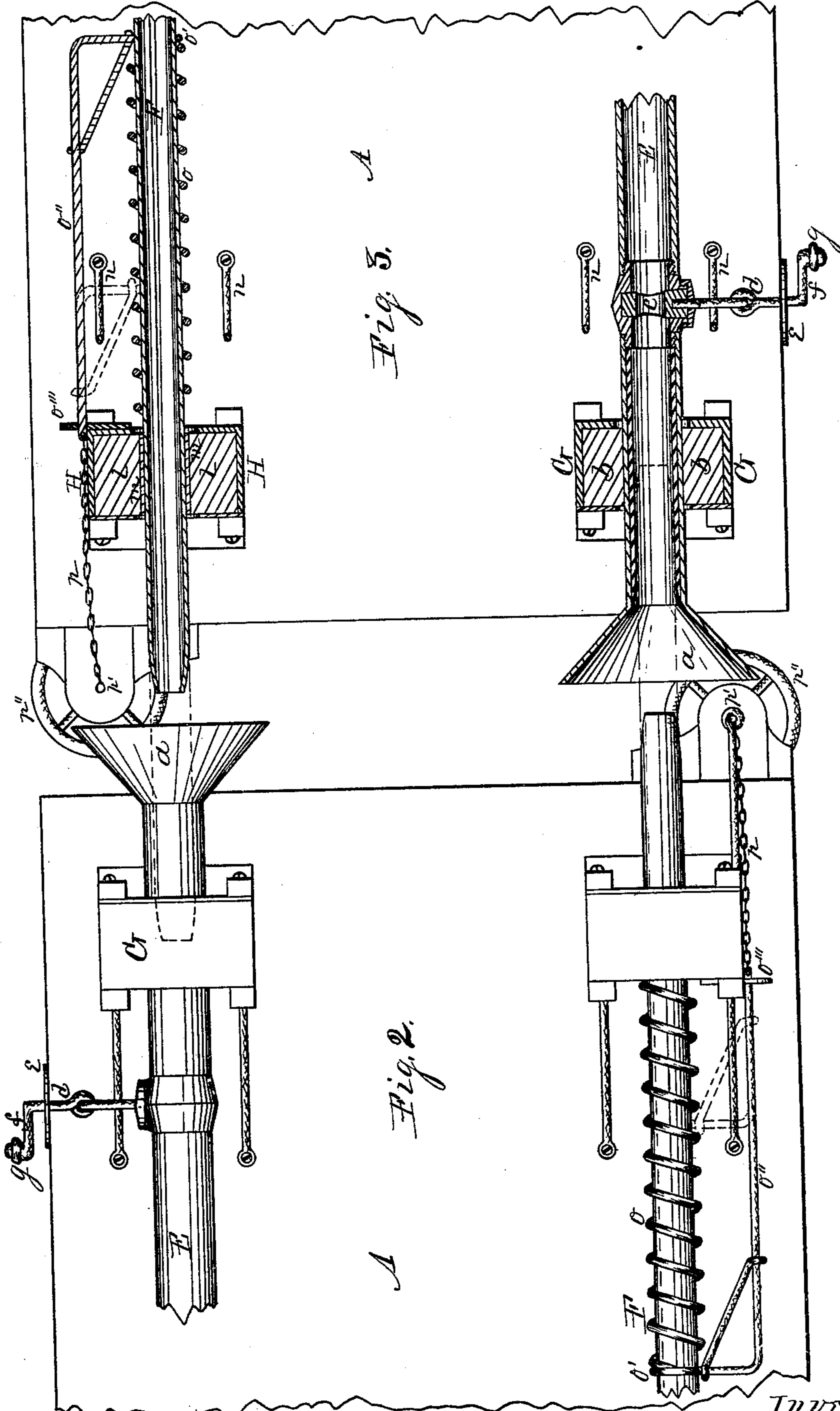
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# UNITED STATES PATENT OFFICE.

HORACE B. HOWARD, OF BELVIDERE, ILLINOIS.

## STEAM AND AIR BRAKE COUPLING.

SPECIFICATION forming part of Letters Patent No. 233,513, dated October 19, 1880.

Application filed June 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, HORACE B. HOWARD, of Belvidere, in the county of Boone and State of Illinois, have invented a new and useful  
5 Coupling in Steam or Air Car-Brakes, of which the following is a specification.

My invention relates to the coupling of the tubes in steam or air car-brakes as applied in railroad-cars; and it consists in producing an  
10 automatic self-coupling of the steam or air tubes necessary to be employed in the use of such brakes, and the devices, their construction, arrangement, application, and operation will be hereinafter more fully described.

15 In the accompanying drawings, Figure 1 is an isometrical representation of a portion of a car-body to which my improvements are fixed in place, of which Fig. 2 is a view of the under side. Fig. 3 is also an under-side view, in  
20 which the tubes and their supports are represented in horizontal section, and Fig. 4 is an isometrical representation of the hand-wheel and ratchet-connection with its shaft located on the deck of the car.

25 In the figures is represented a portion of what is known as a "box-car," in which A represents the bottom portion, B the sides, C the end, and D the top or deck. These portions may be of any suitable material, framed  
30 or joined in any of the usual or known forms to produce the body or box portion of the well-known box-car now in general use on railroads. These cars are fitted with self-coupling air or steam tubes E and F, of a capacity to render them capable of use in connection with air or  
35 steam brakes as now used on railroad-cars. Of these the tubes E are receiving-tubes, fitted with a tunnel or hollow conic outer receiving end, *a*, and are placed on the under side  
40 and on diagonal opposite end corners of the car, supported in flexible bearings, in this instance consisting of a rubber block, *b*, supported in a metallic case of chest or box like form, as represented at G, which are firmly  
45 fixed in position on the under side of the car on its diagonal opposite end corners. These tubes, thus flexibly supported, permit their ends to accommodate themselves to the various oscillatory movements of the cars. These  
50 tubes, rearward of their flexible support, are fitted with a single-way valve, (represented at *c*;) when in the position represented, its

opening will coincide with the opening in the tube and produce a free passage to the air or steam employed, and when turned with its  
55 opening at right angles therewith will completely close the opening and prevent the passage of air or steam.

At *d* is represented a shaft, which is connected with the valve-stock by an eye-joint  
60 hinge, and is supported in a suitable bearing, *e*, depending from the side of the car. The outer end of this shaft *d* is fitted with a crank-arm, *f*, to which is connected a rod, *g*, which extends up the side of the car, rising through  
65 a suitable guide-support, *h*, to a proper distance above the car, having its upper end fitted with a hand-loop, *i*, as a convenient means by which to operate the valve from the deck  
70 of the car to open and close the tubular passage. This vertical shaft, near the center of its length, is fitted with a stud, *j*, projecting laterally therefrom, fitted to slide vertically in a guide-loop, *k*, fixed to the side of the car, having its upper end portion fitted with a notch  
75 to receive the stud, into which it enters by torsional-spring action of the shaft, and operates to hold the valve in position to close the tubular passage, and from which it may be disengaged by means of the hand-loop, to slide it  
80 down in the guide-loop to change the valve to open the tubular passage, as represented in the drawings. The inner surface of the tunnel end portions of the receiving-tubes is fitted with an elastic lining, in this instance of  
85 rubber, fitted to receive a suitable tube to produce an air-tight joint.

At *l* are represented rubber-block bearings, supported in a metallic case, H, of chest or  
90 box like form, and are firmly fixed to the under side of the car on the diagonal corners thereof, opposite to the incased bearings of the receiving-tubes. These parts to this extent are in every particular substantially the same as like parts employed in connection  
95 with the receiving-tubes. In this instance the rubber bearings are provided with a tubular thimble, *m*, adapted to receive a suitable air-tube fitted to slide therein lengthwise freely. These bearings, and also the bearings of the  
100 receiving-tubes, are provided with bracing-supports *n*, to render them more secure in their position on the cars.

At F are represented air-tubes fitted to slide

lengthwise freely in the thimble-bearings. The rear portions of these tubes are fitted with a spiral spring, *o*, placed between the rubber bearing and a yoke, *o'*, fitted on their rear portion, operating to retract the tubes and hold them in the position represented in solid lines. The yokes *o'* are fixed to the rear portion of their respective tubes *F*, and are each provided with an arm, *o''*, which extends toward the end of the car parallel with the tubes, and their forward end portions are supported in guides *o'''*, fixed to the metallic casing containing their rubber bearings. The forward end of these arms, extending through the guides, are each provided with a cord or chain, *p*, which is connected to a shaft, *p'*, supported in suitable bearings in a vertical position on the end of the car, and extending above the deck thereof, having a hand-wheel, *p''*, mounted on its upper end, by means of which the shaft may be rotated to wind the cord or chain thereon, which action will cause the tube *F* to move endwise through the thimble-bearing, to extend it forward of the car, as represented in dotted lines, to enter the receiving-tube, as represented in dotted lines, to produce an automatic coupling when the cars are run together. These vertical shafts *p'*, connected with the endwise-moving tubes, are each fitted with a ratchet-wheel, *s*, at or near the upper surface of the car-deck, fitted to receive the free end of a pawl, *s'*, pivoted to the car in position to engage the teeth of the ratchet-wheel, and is actuated by a spring (represented at *s''*) to hold it in contact with the ratchet, to prevent the tube from running back by the action of the spiral spring *o*.

From the foregoing it will be seen that with these parts in place on the cars, as above described, there will be a tunnel-mouthed receiving-tube and a tube fitted to enter its elastic-lined portion on opposite sides of each end of the car and on opposite ends of each side, and that like parts will be placed on diagonal opposite corners of the car. The ends of these tubes toward the center of the car are designed to be connected by a flexible tubing or hose, either in line parallel with the lengthwise direction of the car or diagonally therewith, to produce a continuous tube throughout its length.

From this description it will be seen that a series of cars fitted in this manner with my improvements will always be in position for the couplings to engage each other, irrespective of which end or ends of the cars are brought in contact; and it will also be clearly understood that with the pointed tubes *F* extended as in the dotted lines, when the cars are run together on the track, the pointed tube will enter the tunnel-mouthed tubes on both sides of the cars, and by means of the elastic lining of the tunnel-mouthed tube will produce an

air-tight joint, and the flexibility of their bearings will permit of the oscillatory movements of the cars without disturbing the joint to injure it, and when thus coupled the opening of the valve of the car to which the coupling is made will permit the passage of the air to operate the brakes when suitably connected therewith.

When the cars are not in use the pointed tubes *F* may be retracted within the dimensions of the cars by disengaging the pawl *s'*, to permit the spiral springs to exert their force to retract the tubes to the position represented in the solid lines.

My improved system of connecting the tubes of the air or steam brakes is capable of use on cars fitted with any of the usual draft-couplings now in use, but especially on cars fitted with a self-coupling device, and when so applied renders the cars completely self-coupling.

I claim as my invention—

1. The combination, with a receiving-pipe provided with a flaring mouth, of a longitudinally-adjustable coupling-tube, a spring for retaining it in its retracted position, and devices for forcing its outer end into the flaring mouth of the receiving-pipe on the next adjacent car, substantially as set forth.

2. The combination, with a receiving-pipe constructed with a flaring mouth, of a longitudinally-adjustable coupling-tube, a spring for retaining it in its retracted position, and a flexible connection with a winding-shaft for moving the coupling-tube against the force of the spring, substantially as set forth.

3. The combination, with a receiving-pipe constructed with a flaring mouth, of a longitudinally-adjustable coupling-tube, a spring for retaining said tube in its retracted position, a chain-winding shaft, and ratchet and pawl for forcing the coupling-tube outwardly into engagement with the mouth of the receiving-tube and retaining it in contact therewith, substantially as set forth.

4. The combination, with the tube of an air or steam brake, of a valve, jointed valve-rod, crank-arm, and connecting-rod extending to the top of the car, substantially as set forth.

5. The combination, with the tube of an air or steam brake, of a rubber block supported in a casing, said block serving to support the tube and allow it to move either laterally or vertically, substantially as set forth.

6. The combination, with the coupling-tube of an air or steam brake, of a rubber block supported in a casing and a thimble located in said block and encircling the coupling-tube, substantially as set forth.

HORACE B. HOWARD.

Witnesses:

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