

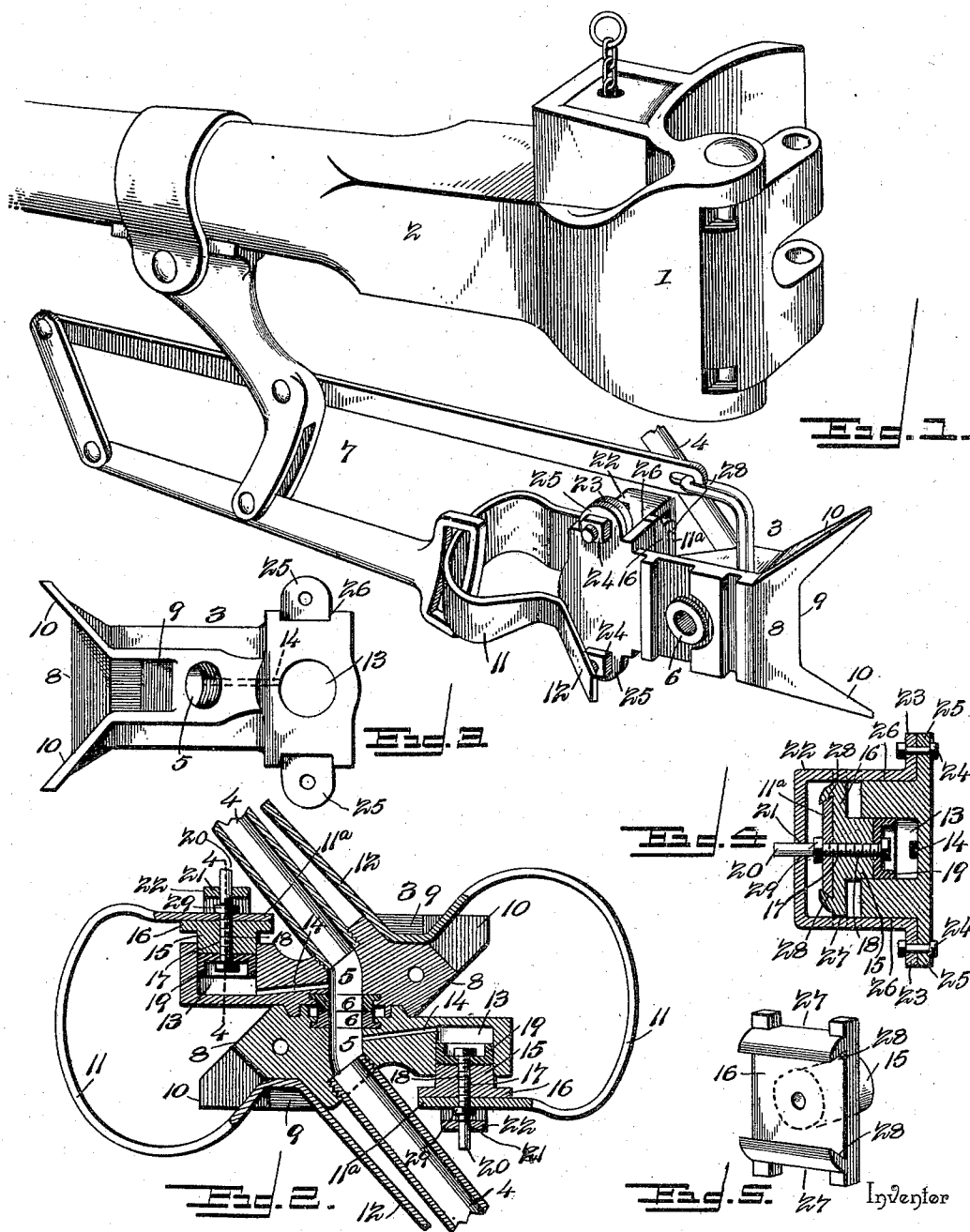
(No Model.)

2 Sheets—Sheet 1.

J. B. THOMAS.
COMBINED CAR AND AIR BRAKE COUPLING.

No. 581,891.

Patented May 4, 1897.



Witnesses

E. H. Stearns
S. O. Hollaender

By *his* Attorneys,

James B. Thomas

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(No Model.)

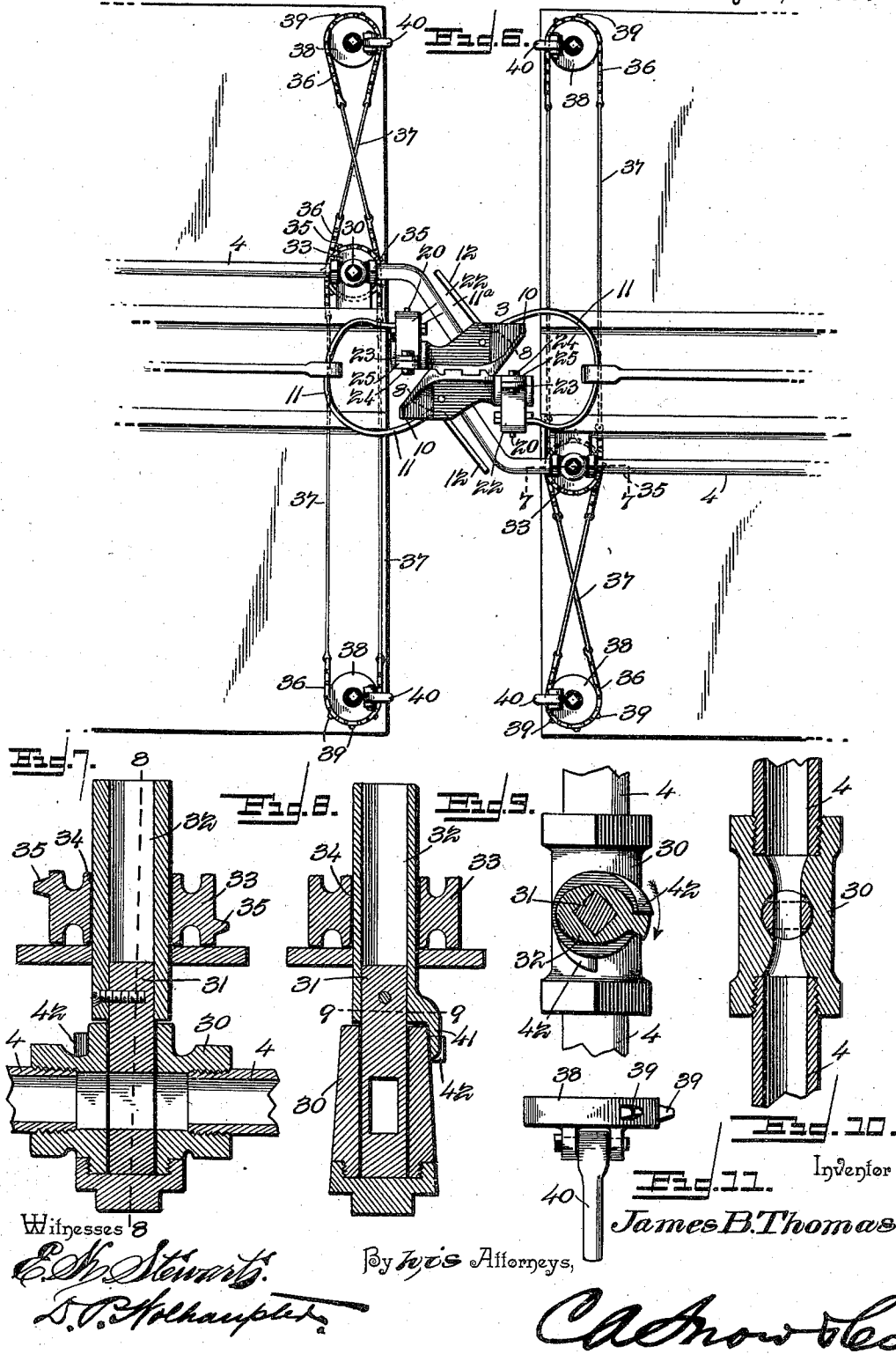
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UNITED STATES PATENT OFFICE.

JAMES BRYANT THOMAS, OF ST. LOUIS, MISSOURI.

COMBINED CAR AND AIR-BRAKE COUPLING.

SPECIFICATION forming part of Letters Patent No. 581,891, dated May 4, 1897.

Application filed July 11, 1896. Serial No. 598,882. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRYANT THOMAS, a citizen of the United States, residing at St. Louis, State of Missouri, have invented a new and useful Combined Car and Air - Brake Coupling, of which the following is a specification.

This invention relates to combined car and air-brake couplings.

The main and primary object of the present invention is to provide a new and useful improvement in connection with combined car and air-brake couplings whereby the automatic air-brake coupling heads or shoes shall more readily and positively couple and uncouple without the expenditure of the excessive force usually required to operate couplings of this character, and especially those of the type employing heavy bowed clamping-springs.

The invention, therefore, primarily contemplates a pneumatic spring-adjusting device for automatic air-brake coupling heads or shoes employing clamping-springs, whereby such springs will readily open and close in the act of coupling and uncoupling without depending entirely upon their resiliency, which by the present invention is made a secondary consideration.

In connection with the combined car and air-brake coupling the invention further contemplates new and useful means for controlling the usual cut-off valves from either side of the car, and thereby greatly facilitating the use of the air-brake couplings, the use of which heretofore has been hampered by the attendants having to go between and entirely under the cars to operate these valves for opening and closing the line of communication through the train-pipe.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a perspective view of a combined car and air-brake coupling equipped with the improvements contemplated by the present invention. Fig. 2 is a horizontal sectional view of a pair of the companion air-brake coupling heads or shoes

coupled together. Fig. 3 is an outer side view or elevation of one of the air-brake coupling heads or shoes. Fig. 4 is a vertical sectional view on the line 4 4 of Fig. 2. Fig. 5 is a detail in perspective of the piston-plate. Fig. 6 is a bottom plan view of two cars equipped with combined car and air-brake couplings and the valve controlling or operating mechanism contemplated by this invention. Fig. 7 is a vertical sectional view on the line 7 7 of Fig. 6. Fig. 8 is a similar view on the line 8 8 of Fig. 7. Fig. 9 is a detail sectional view on the line 9 9 of Fig. 8. Fig. 10 is a horizontal sectional view of the ordinary cut-off valve in connection with which the valve-controlling mechanism is employed. Fig. 11 is a detail elevation of one of the adjusting sprocket-wheels arranged at opposite sides of the cars.

Referring to the accompanying drawings, the numeral 1 designates an ordinary car-coupling head at the front end of the usual draw-bar 2, and arranged directly below and in vertical alinement with the car-coupling head 1 is the automatic air-brake coupling head or shoe 3, to the outer side of which head or shoe is connected the usual train-pipe 4. The automatic air-brake coupling head or shoe 3 is employed in the same manner as the air-brake coupling-head disclosed in my former patent, No. 481,984, and is preferably of that type illustrated in Patent No. 526,119. The said automatic air-brake coupling head or shoe 3 is adapted to automatically couple and uncouple with a companion head or shoe in the usual way, and the train-pipe 4, which is connected to the outer side of the coupling head or shoe 3, is fitted in the outer end of the fluid-passage 5, extending through the head or shoe, and having fitted in its inner end the ordinary gasket 6, which projects beyond the plane of the inner coupling-face of the head or shoe to form an air-tight joint with the gasket of the companion head or shoe, as is well understood. The said air-brake coupling head or shoe 3 is suspended from the draw-bar 2 of the car-coupling head 1 by means of a self-adjusting hanging device 7, which forms no part of the present invention and requires no further description, as it simply subserves the function of supporting the air-brake coupling head or shoe directly un-

der and in vertical alinement with the car-coupling head 1, which, it will be understood, is of an automatic type.

The air-brake coupling head or shoe 3 is provided with a beveled front end 8, a recessed outer side 9, having flared guiding-flanges 10, and at its inner end the said head or shoe 3 carries a bowed clamping-spring 11, the front end of which spring is provided with an offstanding guide-tongue 12, disposed opposite and projecting outwardly from the inner coupling-face of the head or shoe 3. The guide-tongue 12 of the spring 11 is adapted to ride in engagement with the recessed flanged outer side 9 of the companion head or shoe, as illustrated in Fig. 2 of the drawings, so as to guide the two air-brake coupling heads or shoes together and insure their tight interlocking connection, as fully described in the patents herein referred to.

Heretofore in using the bowed clamping-springs 11 it has been necessary to construct said springs sufficiently heavy to withstand the jarring and strain placed thereon, while at the same time to make them of sufficient resiliency to open and close in the coupling and uncoupling of the heads or shoes, but in securing these two results the springs necessarily have been so stiff as to require a tremendous force to open and close the same in the coupling and uncoupling of the cars, and to overcome this serious objection to the use of the clamping-spring 11 the present invention contemplates a pneumatic adjusting device and cushion for the said springs and which will now be particularly referred to. Each automatic air-brake coupling head or shoe 3 is provided in its outer side and at the rear end thereof with a circular air-chamber 13, open at its outer side and communicating at its inner closed side with one end of an air-port 14, piercing the head or shoe 3, and communicating at its other end with the fluid-passage 5 therethrough, so that when companion heads or shoes 3 are coupled together the same pressure of air which exists in the train-pipes of the system and in the fluid-passages 5 of the coupling heads or shoes will also exist in the air-chambers 13 of such heads or shoes.

The air-chamber 13 in each coupling head or shoe 3 loosely receives therein the circular piston projection 15, projected from one side of a movable piston-plate 16, arranged to work at one side of the head or shoe, and said piston-plate 16 and its piston projection 15 are pierced with a bolt-opening 17, which receives the combined clamping and guide bolt 18, the inner end of which bolt serves to clamp a rubber packing-cup 19 against the inner side of the piston projection 15, and the outer end of said bolt 18 forms a guide extension 20, working in the guide-opening 21, formed in the outer side of the U-shaped bracket-plate 22. The U-shaped bracket-plate 22 is provided at its opposite ends with the attaching flanges or feet 23, which are secured by the bolts 24

to the fastening-lugs 25, formed at the upper and lower sides of the coupling heads or shoes 3, near its rear end, and the upper and lower horizontal portions of the bracket-plate 22 register in the recessed seats 26, formed in the upper and lower sides of the coupling head or shoe, in vertical alinement with the lugs 25 and the air-chamber 13. The movable piston-plate 16 works within the bracket-plate 22 and is provided with notched upper and lower ends 27, slidably engaging the upper and lower horizontal portions of the bracket-plate 22, to steady the movement of the piston projection 15, and at its outer side the piston-plate 16 is provided with a dove-tailed seat 28 to receive therein the similarly-shaped rear end 11^a of the bowed clamping-spring 11, thereby providing a self-adjusting connection between the spring and its head or shoe 3. A clamping-nut 29 works on the bolt 18 at the outer side of the end 11^a of the clamping-spring to rigidly fasten such spring to the piston-plate.

When the cars are uncoupled, the normal atmospheric pressure exists in the air-chamber 13, so that the clamping-spring 11 is perfectly loose and can freely move in a lateral direction, so that when two cars come together equipped with the combined car and air-brake coupling the springs 11, connected with the opposing heads or shoes 3, will freely spread away from the inner coupling-faces of said heads or shoes, so as to allow the latter to readily couple or interlock. While the natural resiliency of the springs 11 will allow said springs to spring partly open to assist in the coupling operation, still the lateral play of the springs is nearly sufficient to allow the heads or shoes 3 to be completely coupled together without a dependence upon the resiliency of the spring, which, except when subjected to an excessive force, will not readily spring open.

When two opposing coupling heads or shoes 3 automatically couple together in the manner described, the air in the coupled train-pipes passes into the air-chambers 13 and exerts an outward pressure against the pistons 15, thereby forcing the rear fastened ends of the springs outward and drawing the free or unfastened ends of the springs inward, thereby serving to tightly clamp the coupling-faces of the opposing heads or shoes together. When the cars are drawn apart, the springs 11, with much less expended force than heretofore, will slide out of engagement with the heads or shoes clamped thereby and allow the latter to readily uncouple.

In the use of automatic air-brake coupling-heads it is of course understood that communication through the train-pipes 4 is cut off from the heads or shoes when uncoupled, and to effect this result the train-pipes have usually fitted thereto, adjacent to the couplings, ordinary cut-off valves 30 of a well-known construction. The cut-off valve 30 at the end of each car is provided with a stem extension 31,

on which is fastened one end of a tubular spindle 32, preferably elliptical in cross-section, as shown in Fig. 9, and having fitted thereon a wide chain-wheel 33, having an elliptical opening 34 therein to loosely fit the spindle 32, so as to have a slight play, it of course being understood that the elliptical shape of the spindle 32 and the opening in the chain-wheel 33 prevent the chain-wheel from having any more than a very limited play. The wide chain-wheel 33 is provided with separate sets of sprockets 35, disposed in different horizontal planes and adapted to respectively engage with separate adjusting-chains 36, respectively extending in opposite directions from the chain-wheel 33 toward opposite sides of the car. The oppositely-extending adjusting-chains 36 are preferably provided with rod-sections 37, and one of said chains is illustrated as being crossed, so that the same movement of both chains will turn the chain-wheel 33 in the same direction.

The oppositely-extending adjusting-chains 36 have their outer portions pass around the adjusting sprocket-wheels 38, mounted for horizontal movement on the under side of the car-body at directly opposite sides thereof, and said sprocket-wheels are only provided with a sufficient number of sprockets 39 to insure the proper movement of the chains 36. Said sprocket-wheels 38 have pivotally or otherwise connected with their under sides the hand-levers 40, which are easily manipulated from opposite sides of the car to provide for an oscillation of the wheels 38 and the consequent turning of the chain-wheel 33 to open and close the valve 30, thereby entirely dispensing with the necessity of going between or under the cars for the purpose of controlling the valves 30. The tubular spindle 32 is provided at one end with an angled stop-finger 41, which plays between a pair of stop projections 42 on the casing of the valve 30 to prevent the valve turning too far in the opening and closing thereof.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a coupling of the class described, an automatic air-brake coupling head or shoe carrying a clamp, and means for tightening the said clamp against a companion head or shoe by the air-pressure of the air-brake system, substantially as set forth.

2. In a coupling of the class described, an automatic air-brake coupling head or shoe carrying a clamping-spring having a movable connection at one end with the head or shoe, and means for automatically tightening the clamping-spring, independent of its spring action, against the companion head or shoe, substantially as set forth.

3. In a coupling of the class described, an automatic air-brake coupling head or shoe having a clamp supported to move bodily in a lateral direction when moved against by a companion head or shoe, and means for automatically tightening said clamp against the companion head or shoe, substantially as set forth.

4. In a coupling of the class described, an automatic air-brake coupling head or shoe carrying at its rear end a movably-supported clamp, and means for tightening said clamp against a companion head or shoe by the air-pressure of the air-brake system, substantially as set forth.

5. In a coupling of the class described, an automatic air-brake coupling head or shoe, a clamp for a companion head or shoe having a sliding connection at one end with said head or shoe, and means for automatically adjusting said sliding connection by air-pressure when the two heads or shoes are coupled together, substantially as set forth.

6. In a coupling of the class described, an automatic air-brake coupling head or shoe having a fluid-passage therethrough, a fluid-chamber formed in one side, and a fluid-port connecting the air-chamber and said fluid-passage, and a clamp for a companion head or shoe carrying at one end a piston working in said fluid-chamber, substantially as set forth.

7. In a coupling of the class described, an automatic air-brake coupling head or shoe provided with a fluid-passage therethrough, an air-chamber in one side, and a port connecting the said chamber and fluid-passage, and a bowed clamping-spring working opposite the inner coupling-face of the coupling head or shoe and carrying at its inner end a piston loosely working within said air-chamber, substantially as set forth.

8. In a coupling of the class described, an automatic air-brake coupling head or shoe provided with a fluid-passage therethrough, an air-chamber in one side near its rear end, and a port connecting said chamber and fluid-passage, a bowed clamping-spring working opposite the inner coupling-face of the head or shoe, an offstanding bracket-plate detachably clamped to the outer side of the coupling head or shoe, a movable piston-plate working within said bracket-plate and having a sliding connection with the upper and lower horizontal portions thereof, said piston-plate having a seat at one side to receive the rear end of the bowed clamping-spring, and provided at its opposite side with a circular piston projection loosely working in said air-chamber, a flexible packing-cup fitted against the inner side of the piston projection, and a bolt passed through the piston-plate and its projection to clamp the rear end of the spring and the packing-cup thereto, and provided with an outer guide extension working in a guide-opening in the outer side of said bracket-plate, substantially as set forth.

9. In a coupling of the class described, the combination with an automatic air-brake coupling head or shoe, and the train-pipe connected with said head or shoe; of a cut-off
5 valve arranged in the line of the train-pipe and having a stem extension, a spindle fitted at one end to said stem extension, a wide chain-wheel fitted on said spindle and having separate sets of sprockets disposed in
10 different horizontal planes, lever-adjust- ed sprocket-wheels mounted for horizontal movement on the under side of a car-body and at directly opposite sides of such body, and

separate adjusting-chains engaging the separate sets of sprockets of the chain-wheel and 15 respectively extending in opposite directions and engaging with the oppositely-located sprocket-wheels, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 20 the presence of two witnesses.

JAMES BRYANT THOMAS.

Witnesses:

JOHN H. SIGGERS,
THEODORE DALTON.