J. C. WRIGHT.

AUTOMATIC AIR COUPLING.

APPLICATION FILED JULY 15, 1911.

1,048,120.

Patented Dec. 24, 1912.

3 SHEETS—SHEET 1.

Fig. XIV.

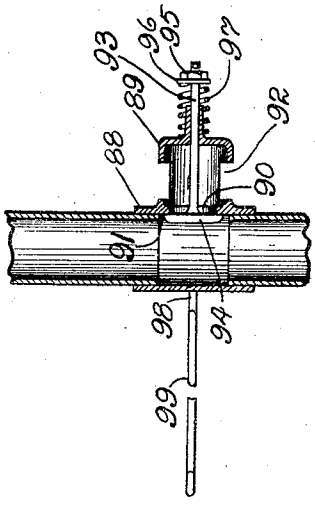


Fig. XV.

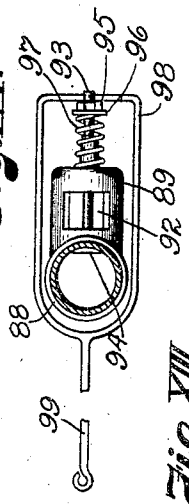


Fig. XII.

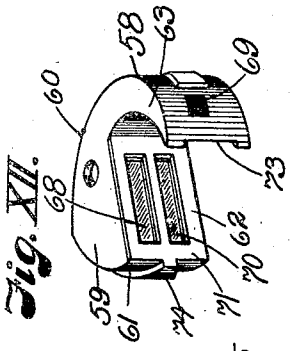


Fig. XIII.

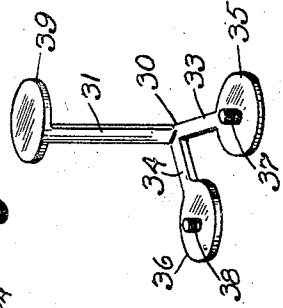
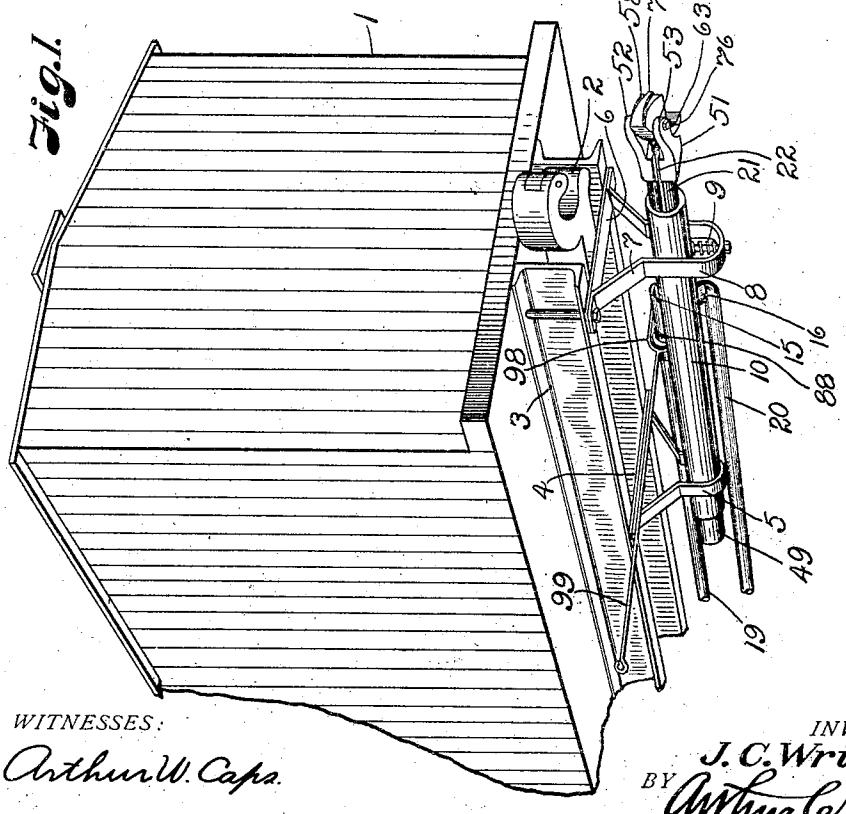


Fig. I.



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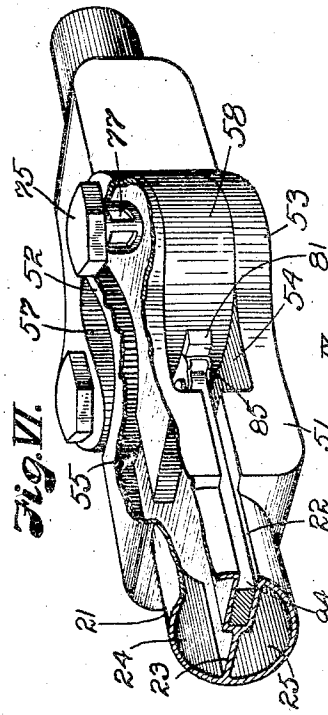

Fig. VII.

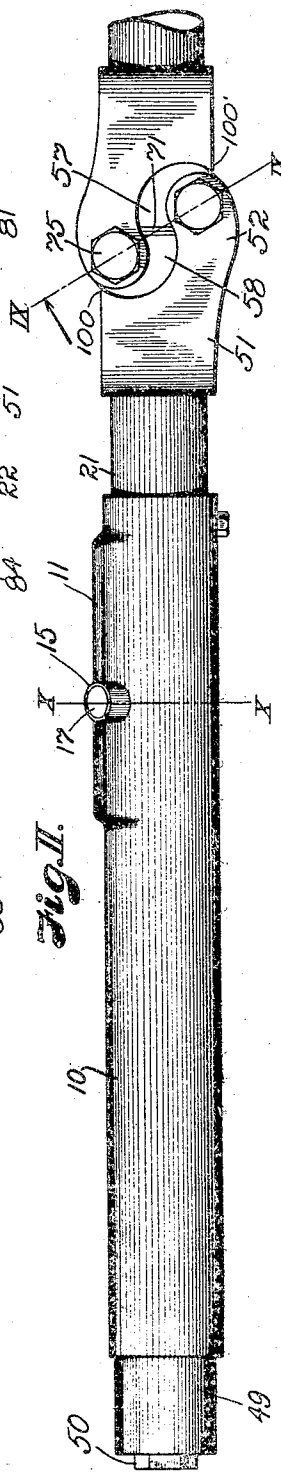

Fig. II.

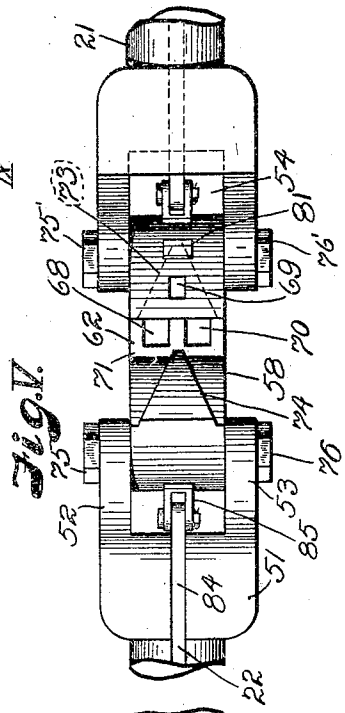

Fig. V.

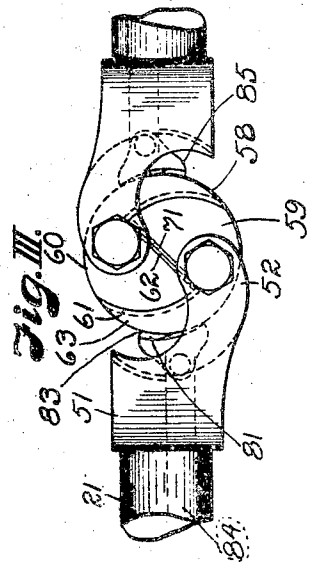

Fig. III.

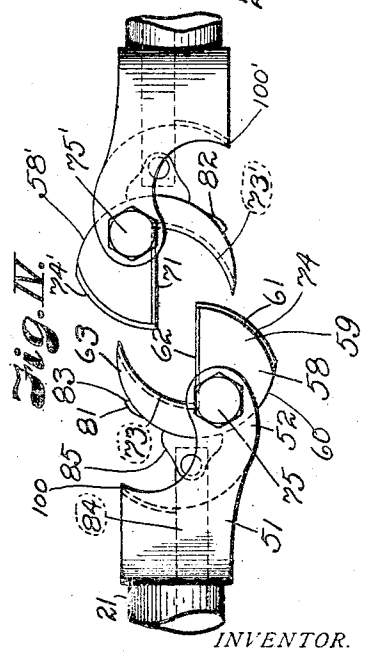

Fig. IV.

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3 SHEETS—SHEET 3.

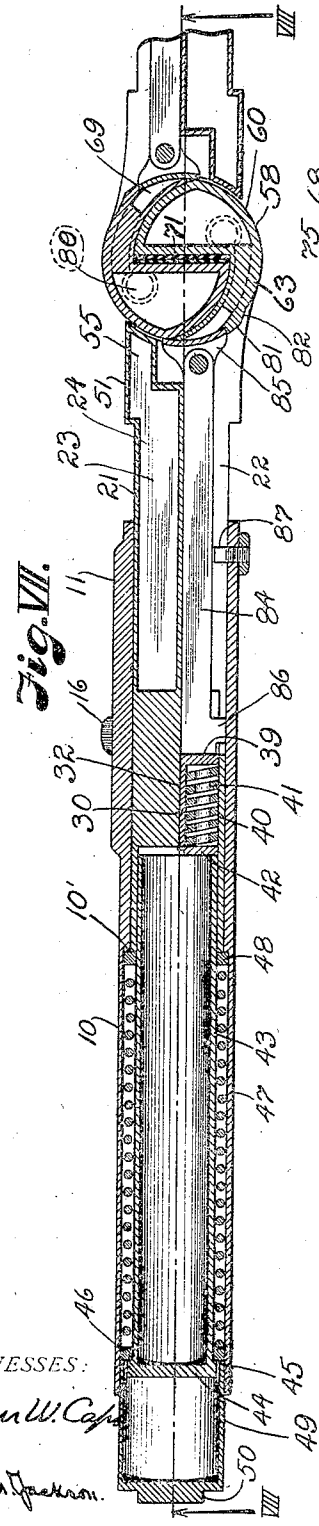

Fig. VII.

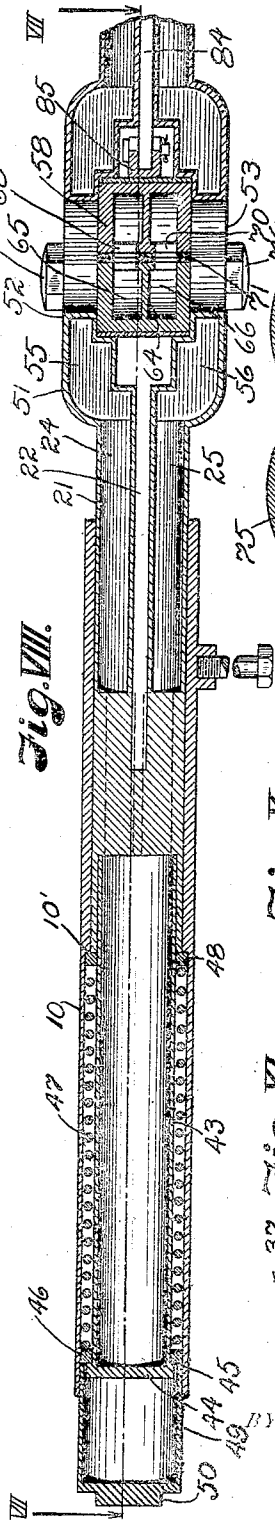

Fig. VIII.

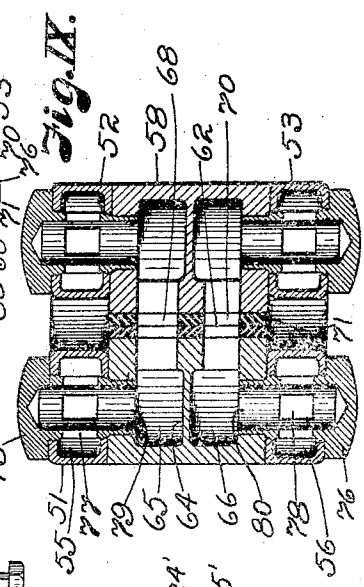

Fig. IX.

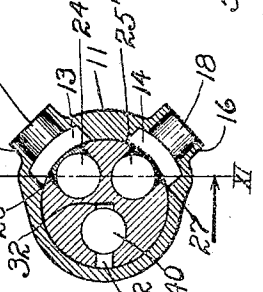

Fig. X.

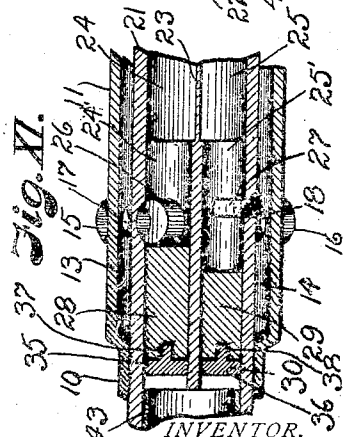

Fig. XI.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC AIR-COUPLING.

1,048,120. Specification of Letters Patent. Patented Dec. 24, 1912.

Application filed July 15, 1911. Serial No. 638,768.

To all whom it may concern:

Be it known that I, JAMES C. WRIGHT, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Air-Couplings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to an automatic air brake and signal line coupling for railway cars and has for its principal object to provide simple and effective means for automatically connecting or disconnecting air equipment of one railway car with another, or with a locomotive simultaneously with the coupling or uncoupling of the cars, and comprising a signal system whereby signals are energized to notify the engineer or conductor of a train when such equipment becomes uncoupled.

It is a further object of my invention to provide my coupling device with means for releasing air therefrom in order that one or more cars may be controlled when disconnected from a train, to facilitate switching, making up trains and the like.

Further objects of my invention are disclosed in the following description, wherein reference is had to the accompanying drawings, in which:—

Figure I is a bottom perspective of one section of my coupler, showing its application to an ordinary freight car, and its relation to the car coupling. Fig. II is a plan view of the coupling section and a coöperating coupler head, shown in closed relation. Fig. III is a plan view of coöperating coupler heads, with the coupling half completed. Fig. IV is a plan view of the same parts in open position, just before a coupling is to be made. Fig. V is a side elevation of same. Fig. VI is an enlarged perspective view of two closed coupling heads, the side conduit of one being in section and its upper part being broken away to illustrate the interior construction. Fig. VII is a horizontal section of one of the coupling sections with a coöperating coupler head and jaw, taken on the line VII—VII, Fig. VIII. Fig. VIII is a vertical section of same on the line VIII—VIII, Fig. VII. Fig. IX is an enlarged vertical section on the line IX—IX, Fig. II, showing the chambered coupler heads and jaws. Fig. X is a cross section on the line X—X, Fig. II. Fig. XI is an enlarged longitudinal section of the valve portion of the coupling section, on the line XI—XI, Fig. X. Fig. XII is a detail perspective view of one of the coupler jaws, showing the air ports. Fig. XIII is an enlarged detail view of the valve actuating device. Fig. XIV is a detail view, partially in horizontal section, of the relief valve for setting the brake of a disconnected car. Fig. XV is an end view of same.

Referring more in detail to the parts:— In ordinary railway practice it is no uncommon occurrence for a freight, and occasionally a passenger train, to accidentally part while in motion, due to defective draft appliance or to other causes. At the present time, a train upon parting breaks the air connection between the two cars at the point of parting, and the escapement of air from the parted or broken air hose immediately sets all brakes upon both sections of the parted train. Before the introduction of air brakes, trains were controlled by hand brakes and a parted train was frequently the cause of a bad accident; either from the rear section overtaking the forward section and crashing into it, or from its running back down hill onto a following train. This was because the trainmen and enginemen had no way of knowing immediately when the train parted.

With the introduction of the automatic air coupler the advantage, if it be an advantage, of the automatic application of the brakes is lost, because the automatic closing of the valves within the coupler, at the moment of parting of the train, prevents the escapement of air necessary to set the brakes. This loss, if any, is offset, however, by the introduction of an automatic air signal, working upon the principle of an escapement of air from the signal line after the closing of the air brake line, by reason of a retarding of the signal air valve behind the brake air valve, the momentary escapement of air from the signal line in the manner hereinafter described producing a warning in the cab of the engine at the head of the front section and in the caboose or coaches of the other section of the parted

train. Thus instantly and automatically warning the engineer at the head of one section and the trainmen in the other section, of the parting of the train. The rear section is immediately brought under control and stopped by use of an emergency valve now a part of the equipment of all coaches or way cars, and the forward section is brought under control and stopped by the engineer in the ordinary manner. Broken equipment being repaired, the train is again coupled up and proceeds; the automatic air coupler suffering no damage whatever by reason of the train parting.

Under present conditions an engineer loses entire control of his engine the instant a train parts, his engine coming to a sudden and violent stop immediately. On unstable bridges or structures the effect may be disastrous. Live stock in transit may be thrown and killed, loads upon cars shifted and explosives, not well secured, set off by concussion, and passengers upon passenger trains may be thrown about and bruised and otherwise injured. These dangers, the danger to the lives of trainmen, by reason of their crawling beneath trains to couple up the present air hose, and the danger engendered by broken air hose upon a rapidly moving train are overcome by the automatic coupler.

The present day, air equipment upon freight trains includes simply the air brakes, and upon the passenger train the air brake and the air signal to the engineer by the conductor, this being gained by an escape valve in each coach controlled by a cord within easy reach of the trainmen. To my best knowledge there now exists no automatic air signal such as I have described.

As before stated, the present structure comprises not only an automatic coupling for the air line, but also an automatic signal whereby the engineer at the front of the train and the conductor at the rear of the train may be notified when the coupling heads between two cars have parted.

Referring to the details of structure, of my invention, 1 designates an ordinary freight car, having a coupler head 2 of common construction, which is located at the center of the car, preferably between two depending angle bars 3. Fixed to the bar 3 is a rear cross member 4, which carries a depending bracket 5. Also secured to the bars 3 is a forward cross member 6, having a depending bracket 7 provided with a U-shaped hanger 8, at the lower end; said hanger extending below the plane of the bracket 5 and being provided with a spring buffer 9 which extends upwardly through the center thereof. Supported in the bracket 5, and upon the buffer 9 in the hanger 8, is the barrel 10, of one section of the air line. Barrel 10 is tubular and has an elongated boss 11 near its forward end for providing the longitudinal chambers 13—14 at the side of the main chamber of the barrel; said bosses having nipples 15—16 near their central portions provided with the ports 17—18, through which the main line conduit 19 and signal conduit 20 communicate with the interior of the barrel. Slidably mounted within the barrel 10 is a coupling pipe 21, the inner end of which normally terminates in line with a shoulder 10′ on the inner surface of the barrel 10, a short distance back of the rear edge of boss 11, and the outer end of which projects from the forward open end of the barrel.

The body of the coupling pipe has an inset channel 22 at the center of one side thereof, and extending between the inner end of the channel and the opposite side of the pipe is a diaphragm 23, dividing the interior of the pipe into the separate chambers 24—25, which extend from the inner end of the pipe to a point above the center thereof, where said chambers are reduced to form the valve channels 24′—25′.

Opening through the side of the pipe 21, from the valve channel 24′ and communicating with the elongated boss chamber 13, is a port 26, preferably circular, and opening through the pipe from the valve channel 25 into the elongated boss chamber 14, is a port 27 which is preferably narrow and located in line with the forward portion of port 26, for a purpose presently described.

Located within the valve channels 24′—25′, are the slide valves 28—29, the valve 28 being longer than the valve 29, so that when the valves are moved forwardly simultaneously, the port 26 will be entirely closed before the valve 29 reaches the port 27, thereby leaving the latter port open after the port 26 has been entirely closed. To operate the valves, I provide a slide 30, (Figs. VII and XIII) comprising a shank 31, which is adapted to travel in a groove 32 in the solid end of the pipe 21, and has the laterally projecting arms 33—34 at one end provided with disks 35—36 for bearing against the ends of the slide valves 28—29, said disks having pins 37—38 which screw in sockets in the ends of the slide valve and anchor the disks permanently to the valves. At the opposite end of the shank 31 is a disk 39, which is adapted to travel in the circular channel 40 with which the open channel 22 communicates.

Located within an extension of the channel 40, is a compression spring 41 which is held by a stop plate 42 and is adapted to yieldingly tension the valve controlling device forwardly by engaging the disk 39. Threaded into the rear end of the pipe 21 is a sleeve 43 having a head 44 at its rear end, the shoulder 45 of which engages a ring 46 which is set into the channel of

the main barrel and is adapted to slide therein.

Located in the annulus between the sleeve 43 and barrel 10, is a spring 47, the rear end of which bears against the ring 46 and the forward end against a ring 48, which engages the barrel shoulder 10′ and the end of the pipe 21, thereby yieldingly tensioning the sleeve 43 rearwardly and holding the pipe 21 yieldingly toward the rear. In the rear end of barrel 10, is a plug 49 for closing the barrel; said plug being preferably provided with a wrench boss 50. On the outer end of the coupling pipe 21 is a head 51, having upper and lower arms 52—53, which are spaced apart to provide the slot 54 therebetween. Both of said arms are hollow, the chamber 55 of the upper arm communicating with the channel 24 in the coupling pipe, and the chamber 56 of the lower arm communicating with the lower pipe channel 25. The arms 52—53 extend forwardly from one side of the head 51 and curve slightly outwardly from the plane of the head, the inner sides of the arms being curved to provide a circular socket 57.

Located between the arms 52—53 of the coupler head is a hollow jaw 58, comprising a body member 59 having a substantially semi-circular rear face 60, curved outer face 61, and a flat side face 62 at about the center of the jaw and extending rearwardly thereacross from the inner end of the outer face. At the inner corner of the jaw 59 is a semi-crescent shaped member 63, which is continuous with the tooth 59, the combined body and crescent shaped member or tooth 63 forming a unit substantially e-shaped in appearance.

Extending horizontally through the jaw 59 is a diaphragm 64 which divides the interior of the jaw into separate chambers 65—66, the latter extending entirely through the boss and through the tooth. The chamber 66 has a port 69 opening through the curved rear face 60, near the point of the tooth, and a port 70 opening through the flat face 62. The chamber 65 has a port 68 similar to the port 70, of chamber 66. On the surface of the flat face 62 of the coupling jaw 59 is a rubber, or like facing 71, having openings for exposing the ports 68—70. On the concaved face of the jaw tooth 63 is a triangular groove or socket 73, and on the curved outer face 61 of the boss 59 is a triangular tooth 74; such parts being adapted to coöperate with relative parts 73′—74′, on a mating coupler jaw 58′, in a manner presently described. The jaw 58 is pivotally mounted on the coupler head by means of pins 75—76, (Fig. IX) each of which extends through the end of an arm 52—53 and through the chamber in said arm. The pins 75—76 are hollow and have ports 77—78 opening through their sides into the relative chambers 55—56 in the arms 54—55, the end ports 79—80 opening into the relative chambers 65—66 in the coupler jaw, so that the upper jaw chamber is in communication with the brake line of the air conduits heretofore described, and the lower chamber 66 is in communication with the signal line. On the convex surface of the crescent shaped tooth 63, just in from the port 69, is a boss 81 having a beveled rear edge 82, the sharp forward edge 83 having but slight clearance from the tooth port.

Slidably mounted in the channel 22, in the head 51 and coupling pipe 21, is a bar 84 which extends into the barrel 10 and abuts against the front face of the disk 39 on the valve actuating device 30, which latter is tensioned forwardly by the spring 41. Pivotally connected with the front end of the bar 84 is a shoe 85, having a concaved outer surface adapted to fit snugly over the convex surface of the coupling jaw; said shoe being tensioned into engagement with said convex surface by the spring 41. Near the rear end of the bar 84 is a boss 86, which is adapted for engagement with a pin 87 that is carried by the barrel 10 and extends into the channel 22 to limit the outward travel of the bar. On the main line conduit 19 is a collar 88, carrying a valve casing 89, having a port 90 communicating with a port 91 in said conduit, and having side ports 92. Extending through the casing chamber is a stem 93, having a valve plate 94 at its inner end adapted for covering the port 90, and having a nut and washer 95—96 on its outer end. Seated on the end of the casing and bearing against the washer 96 is a spring 97, which yieldingly retains the valve 94 in closed position. Connected with the valve stem 93 is a yoke 98, having a rod 99 extending beneath the car into position for convenient access to a train operator who may be riding the car step (not shown), so that the rod may be actuated simultaneously with, or immediately after the uncoupling of the main car coupler.

While I have described but a single air coupler, and signal section, it is understood that there is a similar section at each end of the car, so that when two cars are brought together the couplers may coöperate in the following manner. When it is desired to couple two railway cars, one of the cars is moved toward the other and as they come together the jaws of the air coupler heads engage just before the main coupler is closed. As the air coupler comes together, the body 59 and tooth 63 of one jaw engage the tooth 63 and body 59 of the opposite jaw, so that the bodies move the teeth inwardly, revolving the jaws on the pivoted pins 75—76 and 75′—76′, until both jaws have been moved through a quarter of a revolution, when the flat faces 62 of both jaws will extend trans-

versely of the coupling pipe, or at right angles to the line of travel of the cars. Should there be a slight difference in the height of the abutting cars, the V-member on the outer curved faces of one of the jaw bodies engages the V-slot in the opposite tooth and moves the coupling pipes and barrels vertically on the adjustable hangers, in order to bring the jaws together in the proper position. As the jaws are revolved, the edges of the bosses 81 engage the shoes 85 and rock same backwardly against the tension of the springs 41, until the bosses have passed beneath the shoes, when the springs will force the bars 84 forwardly and cause the shoes to again engage the convex surfaces of the jaws, the sharp edges of the bosses locking the shoes to prevent return travel of the jaws. When the jaws have been set, the ports 68, 70 will register so that communication is formed between the chambers of one jaw and the chambers of the abutting jaw, to extend the main line and signal conduits from one car to the other. By providing elongated ports and covering the flat faces of the jaws with rubber, or the like, such communication may be made even though the ports are not in exact registration.

With the coupling made as described, the air line extends from the locomotive to the last car in the train and the air brakes on all of the cars may be operated in the usual manner. When the train is traveling on a curve, a slight play is allowed between the jaws, as one of the shoes will hold against its boss while the other is allowed to turn on the convex surface of its jaw; the two jaws being held against lateral displacement by the ears 100—100′ on the outer edges of the heads. The projection of the air line coupling head is such that when the cars come together, the bars 84 are forced back in the coupling pipes, moving the valve actuating devices backwardly, causing the valves 28—29 to uncover the ports 26—27 to admit air from the main line and signal line to form the continuous conduit. When the cars are uncoupled, the air coupling holds, pulling the coupling pipes outwardly in the barrels, against the tension of the springs 47, until the bosses 86 on the bars 84 engage the pins 87, pulling the shoes out of contact with the jaws and away from the stop bosses, thereby exposing the ports 69, so that air may be released to energize the signals which may be connected with the signal lines and located in the locomotive and rear or other cars of the train, such signals not being illustrated herein as the details of the signal construction form no part of the present invention. When the uncoupling is accomplished, the coupling pipe is moved back into the barrel by the spring 47, the spring 41, which has been relieved from the bar 84, moves the valves 28—29 over the main line and signal ports to prevent the escape of air, a sufficient amount of air having, however, escaped from the signal line to energize the signal.

With a system of this character, the main line conduit may be provided with the valve 88, so that when one or more cars are "kicked in" on a side track, a switchman riding the step may operate the car coupler and set the air brakes without changing his position.

It is the intention of this invention that it displace only the present air hose connection between railway cars and cars and locomotives, and that no other part of the air brake device now in use be affected in any manner. Adding only the pipe necessary to pipe such cars as may not be piped for the signal connection.

Having thus described my invention, what I claim as new therein and desire to secure by Letters-Patent is:—

1. In an air coupling, a channeled coupling head, a jaw pivotally mounted in said head and having a channel in communication with said head channel, the jaw channel being provided with separate coupling and relief ports, for the purpose set forth.

2. In an air coupling, a channeled coupling head, a jaw pivotally mounted in said head and having a channel in communication with said head channel, the jaw channel being provided with separate coupling and relief ports, and means for closing said relief port when the coupling port is in coupling position.

3. In an air coupling, a channeled coupling head, a jaw pivotally mounted in said head and having a channel in communication with said head channel, the jaw channel being provided with separate coupling and relief ports, and yielding means for closing said relief port when the coupling port is in coupling position.

4. In an air coupling, the combination with an air line, of coupling heads adapted for automatically opening the line when brought into coöperative engagement and closing same when released, each head having channels in communication with one section of the air line, coupling members having channels in communication with the head channels, said members having coupling ports and relief ports, and means for automatically closing the relief ports when the coupling heads are brought into coöperative relation and opening said ports prior to the complete closing of the air line, for the purpose set forth.

5. In an air coupling, the combination with a main air line, and a signal line, of coupling heads adapted for automatically opening both of said lines when brought into coöperative engagement, each of said heads having a channel communicating with

the main line, and a separate channel communicating with the signal line, a jaw pivotally mounted in each of said heads and having separate channels communicating with the main line channel and the signal line channel, both of said channels having coupling ports and the signal line channel having a relief port, and means for automatically closing the relief port when the jaws are brought into coöperative relation and for opening said port prior to the complete closing of said lines when the parts are uncoupled, for the purpose set forth.

6. An air line coupling comprising channeled heads, channeled jaws pivotally mounted in the heads and having communication therewith, said jaws having conduit and relief ports, and means for connecting the channeled heads with a main air line.

7. An air line coupling comprising a barrel having separate ports therein, main line and signal line conduits connected with said ports, a coupling pipe slidably mounted within the barrel and having separate channels provided with ports adapted for communication with the barrel ports, a coupling head on the coupling pipe, having channels communicating with the pipe channels, a jaw pivotally mounted within the coupling head and having channels in communication with the coupling head channels and provided with ports adapted for communication with the jaws of a mating section when the jaws are in coöperative relation, valves for controlling the ports in the coupling pipe, and a slide bar adapted for actuation by said jaw to unseat the valves, said jaw having a relief port, and a sliding bar having a shoe for controlling the relief port.

8. An air line coupling comprising a barrel having a port therein, an air conduit connected with said port, a coupling pipe having a port therein adapted for communication with the barrel port, a valve for controlling said pipe port, a coupling head on the coupling pipe having a channel communicating with the pipe channel, a hollow pin extending through said head and having a port communicating with the head channel, a channeled jaw pivotally mounted on said pin and communicating with the channel therein, said jaw having a draft face provided with a port and having a curved tooth provided with a port in its convex face, a bar slidably mounted in the coupling pipe and having a shoe at its free end adapted for engaging the jaw tooth and for closing the tooth port, a valve actuating device having a member adapted for engagement by said bar, a spring normally tensioning the valve actuating device toward closed position, a pin projecting into the channel of the coupling pipe, a boss on said bar adapted for engaging said pin, and yielding means for normally retaining said coupling pipe in a determined position within the barrel.

9. An air line coupling comprising in combination with a main conduit and a signal conduit, a sliding member having valved connection with said main line and signal conduits and having separate channels for conducting air from the main line and signal line therethrough, a jaw pivotally connected with said sliding member and having separate channels therein, both of said channels having coupling ports, and the signal line channel having a relief port, means for conducting air from the sliding member channels to the jaw channels, and means, movably mounted on the sliding members and adapted for actuation by said jaw for controlling the valve connection between the sliding member and the air conduits and for controlling the relief port in said jaw.

10. An air line coupling comprising coupling heads each having separate channels, channeled jaws pivotally mounted on said coupling heads, and adapted for coöperation to form a coupling, said jaws having channel ports adapted for registration when in coupling relation, main line and signal line air conduits connected with separate channels in the coupling heads, valves for controlling the admission of air to the coupling head channels, and means for automatically controlling said valves.

11. An air line coupling comprising a coupling pipe having a head section provided with separate channels, a jaw pivotally mounted on the head section and having separate channels therein communicating with the separate head channels and provided with coupling ports, one of said channels having a relief port, a bar slidably mounted on the coupling pipe and having a shoe for covering the relief port in said jaw, main line and signal line air conduits having communication with the separate coupling pipe channels, valves for controlling said communication, means whereby said valves are moved to open communication between the conduits and pipe channels when engaged by said sliding bar, and a spring for returning said means to close said valves.

12. An air line coupling comprising a barrel having a plurality of ports therein, a coupling pipe slidably mounted within the barrel and having separate channels provided with ports adapted for communication with the barrel ports, valves for controlling said communication, a jaw pivotally mounted on the coupling pipe and having separate channels communicating with the separate pipe channels, both of the channels in each jaw having coupling ports and

one of said channels having a relief port, a bar slidably mounted in said coupling pipe and having a shoe for closing the relief port in said jaw, means for yieldingly tensioning said bar to position for engagement by the jaw, and for moving said valves to position for closing communication between the barrel and coupling pipe.

13. An air line coupling comprising main and signal line conduits, a coupling pipe having separate channels therein adapted for communication with said conduits, valves for controlling said communication, a jaw pivotally mounted on said coupling pipe and having channels therein communicating with the pipe channel, both of said channels having coupling ports and one of said chambers having a relief port, said jaw having a boss on its outer face adjacent to one edge of the relief port, a sliding bar carried by the coupling pipe, a shoe on said bar adapted for actuation by the jaw boss and for closing said relief port, a valve controlling device having communication with both of said valves and having a member adapted for abutment against the end of said bar, and a spring for normally tensioning said valve actuating device to position for closing said valves.

14. An air line coupling comprising main and signal line conduits, a coupling pipe having separate channels therein adapted for communication with said conduits, valves for controlling said communication, a jaw pivotally mounted on said coupling pipe and having channels therein communicating with the pipe channels, both of said channels having coupling ports and one of said channels having a relief port, said jaw having a boss on its outer face adjacent to one edge of the relief port, a sliding bar carried by the coupling pipe, a shoe on said bar adapted for actuation by the jaw boss and for closing said relief port, a valve controlling device having connection with both of said valves and having a member adapted for abutment against the end of said bar, a spring for normally tensioning said valve actuating device to position for closing said valves, a boss on said sliding bar, and a pin on said barrel for engagement by said boss to limit the travel of said bar.

15. An air line coupling comprising a barrel, a coupling pipe slidably mounted within the barrel, a spring for yieldingly retaining said pipe in a determined position, said pipe having separate channels therein provided with ports within the barrel, ports in said barrel adapted for communication with the coupling pipe ports, valves located within the coupling pipe and adapted for controlling communication through the pipe ports, jaws pivotally mounted on the coupling pipe and provided with separate channels having coupling ports, a compressible facing on said jaw around said coupling ports, one of the jaw chambers having a relief port, a bar slidably mounted in the coupling pipe and having a shoe for controlling the relief port in said jaw, and means operable by said bar for actuating said valves.

16. An air line coupling comprising a head member having separate channels therein, a coupling jaw having separate channels therein, both provided with coupling ports, pins carried by said coupling heads and pivotally mounting said jaw, said pins being hollow and having ports whereby communication is established between the coupling head channels and the jaw channels, and main line and signal line conduits having separate connection with the coupling head channels.

17. An air line coupling comprising a coupling head having separate channels, each provided with a port coupling, a jaw carried by said head, said jaw having separate channels therein communicating with the head channels, one of said channels having a relief port and both provided with coupling ports, means for controlling the relief port, main line and signal line conduits adapted for communication with said head channels, valves for controlling said communication, and means for actuating said valves, whereby the main line conduit is closed, prior to the closing of the signal line conduit.

18. An air line coupling comprising a barrel having elongated channels, each provided with a port, main line and signal line conduits connected with said ports, a coupling pipe slidably mounted within said barrel, said pipe having separate channels, one of said channels having a port communicating with the main line channel in said barrel and the other with a port communicating with the signal line channel, a jaw pivotally connected with said coupling pipe and having separate channels communicating with the separate pipe channels, each of said channels having a coupling port, and the signal line channel having a relief port, a boss on the outer surface of said jaw adjacent to the relief port, a bar having free slidable movement within the coupling pipe, said bar having a shoe on its outer end adapted for covering the relief port in said jaw and having a boss at its inner end, a pin on said barrel projecting into the path of said boss, slide valves of unequal length located within the pipe channels and adapted for covering said ports, the shorter valve being located within the signal line channel, a valve actuating device comprising a shank having connection at one end with the said valves and having a disk at its opposite end adapted for abutment against the end of said sliding bar, a spring for yieldingly tensioning said device to close said valves, a sleeve fixed to said pipe and provided with

a shoulder at its outer end, rings located within an annulus between said sleeve and said barrel and bearing against said shoulder and against the inner end of said pipe, and a spring located within said annulus between the rings, substantially as and for the purpose set forth.

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

JAMES C. WRIGHT.

Witnesses:
ARTHUR W. CAPS,
MYRTLE M. JACKSON.