

(No Model.)

W. A. & B. S. H. HARRIS.
AIR BRAKE COUPLING.

3 Sheets—Sheet 1.

No. 544,253.

Patented Aug. 6, 1895.

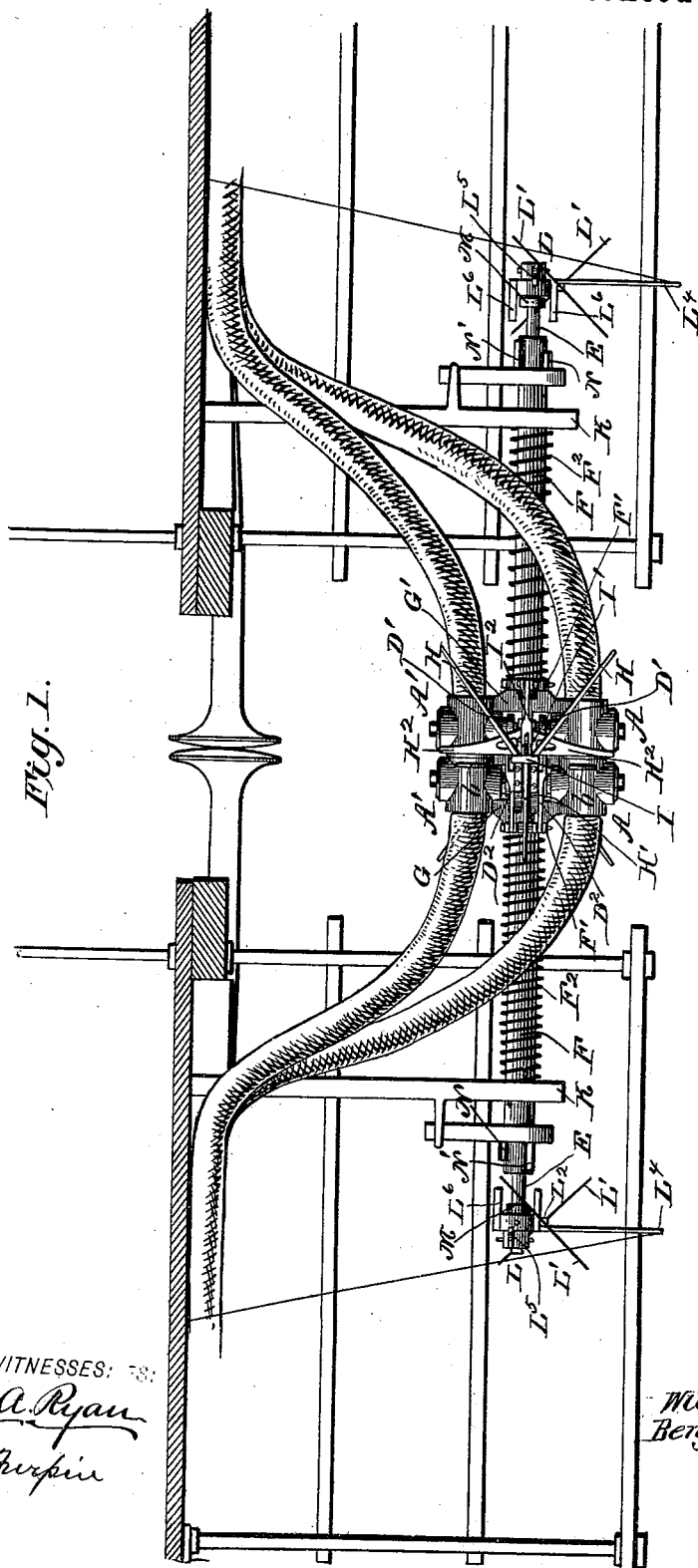


Fig. 1.

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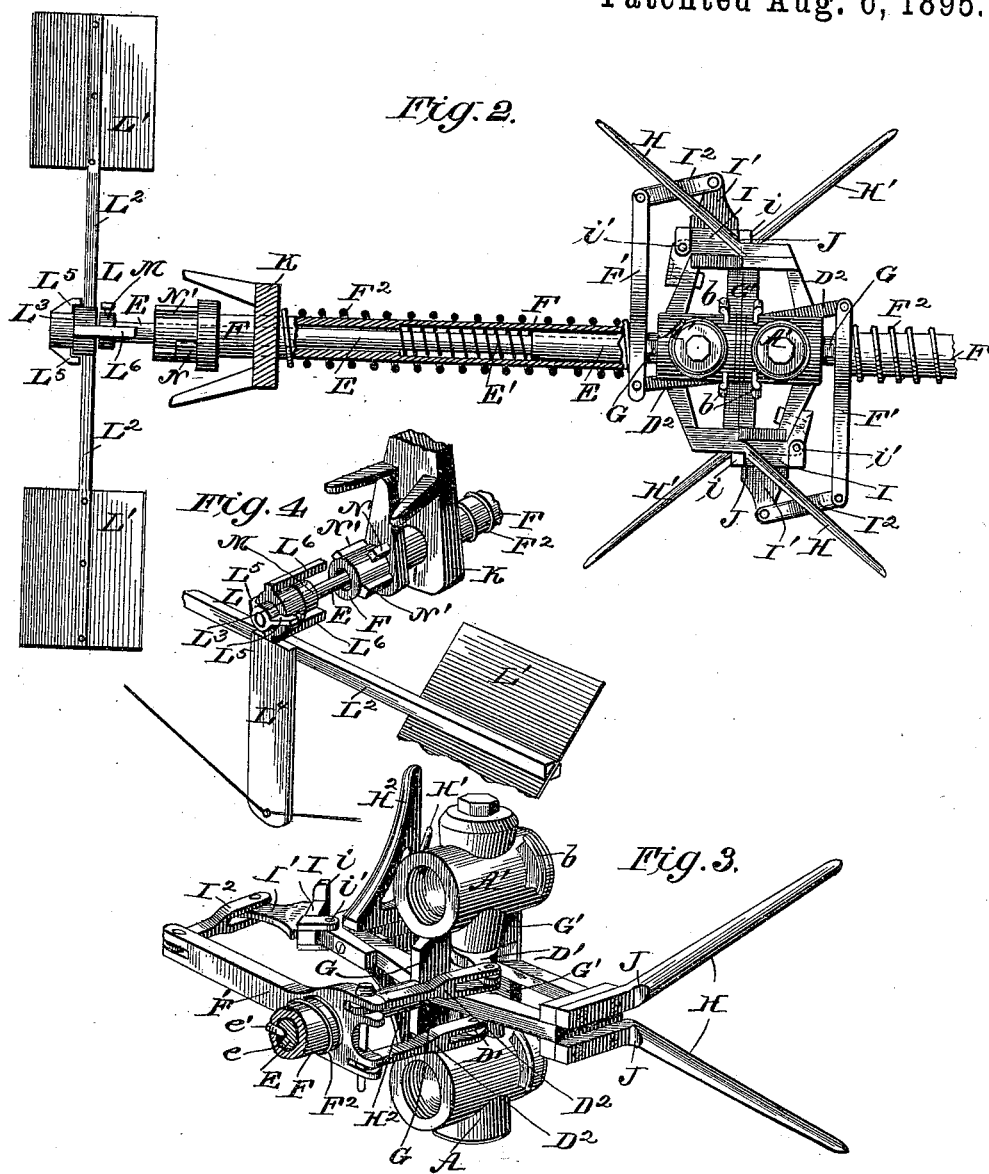
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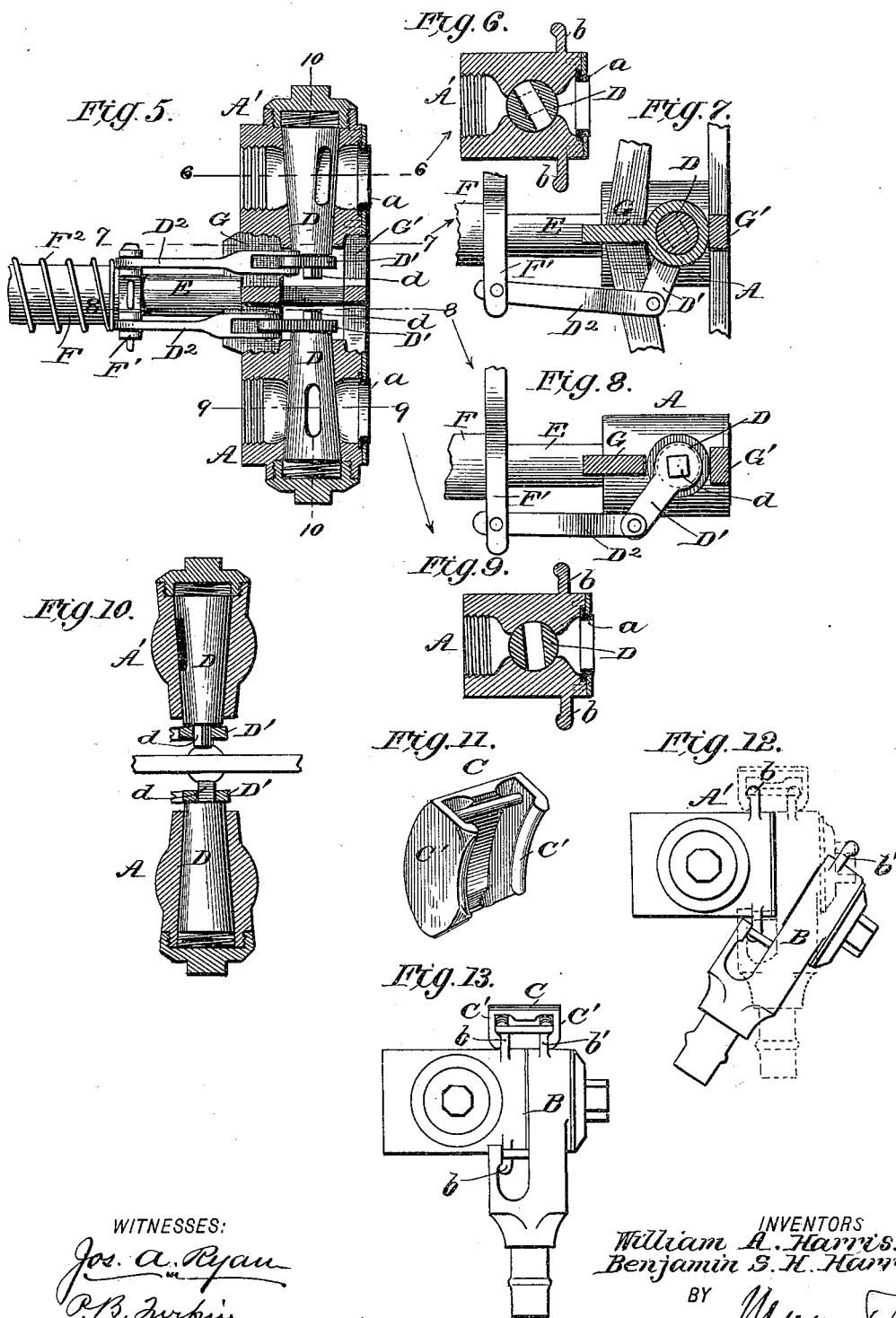
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3 Sheets—Sheet 3.

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AIR-BRAKE COUPLING.

SPECIFICATION forming part of Letters Patent No. 544,253, dated August 6, 1895.

Application filed July 14, 1894. Serial No. 517,587. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. HARRIS and BENJAMIN S. H. HARRIS, of Greenville, in the county of Greenville and State of South Carolina, have invented a new and useful Improvement in Air-Brake Couplings, of which the following is a specification.

This invention is an improvement in automatic air-brake couplings, and has for an object to provide a coupling with devices whereby in case a train is broken the valve or valves of the broken off or detached car will be adjusted to set the brakes thereof, and the valves of the engine portion of the train will be adjusted to cause the engineer's whistle to blow.

The invention has for a further object to provide locking devices whereby when the couplings are brought together they will be locked in such position until the cars are uncoupled and move apart.

The invention has for a further object to provide a coupling-carrier composed of sections or slides movable longitudinally one upon the other, whereby the movement of one upon the other may operate to actuate certain movable parts, hereinafter more fully described.

The invention has for further objects other improvements; and it consists in the novel constructions, combinations, and arrangements of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side view of our improvements, portions of two coupled cars being also shown. Fig. 2 is a plan view of one of the couplings, a portion of the other coupling being shown to complete the illustration of the guiding devices. Fig. 3 is a perspective view of the front portion of one of the couplings. Fig. 4 is a perspective view of the rear portion of one of the couplings. Fig. 5 is a vertical longitudinal section of the front portion of one of the couplings. Figs. 6, 7, 8, and 9 are cross-sectional views on, respectively, lines 6 6, 7 7, 8 8, and 9 9 of Fig. 5. Fig. 10 is a vertical transverse section on about line 10 10 of Fig. 5. Fig. 11 is a detail view of the clamp for connecting the standard coupling-head with the improved coupling. Fig. 12 illustrates the manner of applying

the standard-head to our improvements; and Fig. 13 shows the standard and improved heads coupled.

The heads A A', of which we show two for each coupling, are suitably packed at *a* to form an air-tight union when the meeting heads are pressed tightly together. The heads A' carry the signal-pipe sections and the heads A the train-pipe sections. The signal and train pipe sections are connected with the signaling and breaking devices in any suitable manner, and as such devices may be of the well-known types it does not appear to be necessary to show or describe the same herein. The two heads A A' are employed in passenger traffic, but on freight-trains, when the signal-pipe is not used, the head A' may be a dummy, something in the nature of a head being preferred to maintain a proper balance of the parts and the desired even pressure of the train-pipe heads together.

To permit the coupling of our heads A A' to the standard coupling-heads B, such as shown in Fig. 12, and thus permit the ready coupling of the cars equipped with our improvements with cars having the standard-heads we provide our heads on opposite sides with ribs or flanges *b*, one of which forms a bearing for engagement by the standard-head and the other for a box-like clamp C, whose jaws C' slip over and bind together the flange *b* and a corresponding flange *b'* on the standard-coupling, thus securing a secure locking together of the standard and the improved heads.

The heads are provided with valves D, which in their detail construction are similar to ordinary plug-valves, the valves of the signal and train heads being usually alike; but they are so set that in practice the valve of the signal-head A' is opened slightly before that of the train-head A, as will more fully appear hereinafter. The heads are so supported, as presently described, that they are movable backward and forward, and we provide valve-operating devices which serve to open the valves as the heads move back, and close them as the heads move forward, and this is an important feature of this improvement.

Now, ordinarily in automatic couplings the valve of one head is opened by engagement

with some part of the meeting heads so that the valves of such meeting heads are opened by the impact thereof. Our coupling is different, in that each coupling carries with it the device for opening and closing its own valve or valves, so that it is not dependent upon the perfection of any valve-tripping device carried upon its mate. The detail construction of the valve-operating devices will appear more fully hereinafter.

The head-carrier is composed of two members E and F, sliding one upon the other. The member E supports the coupling-heads A A', being to such end provided at its outer end with an end carrier-frame composed of an inner section G and an outer section G', secured respectively to the inner and outer ends of the heads A A' and serving to rigidly and securely support such heads in place. These front and rear sections in addition to supporting the heads support the guiding devices presently described, and serve to protect the stem extensions *d* of the valves D and the crank-arms D' leading from said valve-stem and connected by pitmen D² with the member F, and preferably to the cross-head F' at the outer extremity of said member.

The guiding devices for directing the heads properly together are supported on the head-carrying member, and are composed of the flaring fork H, arranged at one side of the head, the finger H' arranged at the opposite side and in line centrally between the tines of the fork H, and the upright H² at the base of the finger H'. By means of the fork-finger and upright co-operating with similar parts on a meeting coupling the heads will be brought accurately into conjunction. While the members E and F may obviously be arranged to move one upon the other in various ways, it is preferred to construct them as shown, the member E sliding in the member F, the latter being a hollow tube and the member E sliding in and projecting beyond the opposite ends thereof, as shown. The member E is keyed from turning in the part F preferably by providing a groove *e* longitudinally in said member or rod E to receive a pin *e'*, projecting from the member F.

The rod E is spring-actuated and normally pressed forward or outward by a spring E', which may preferably be a coil-spring surrounding the rod E within the tube F, and bearing at its ends against suitable abutments upon the parts E F. This spring is of sufficient strength to throw the member E outward to its extreme outermost position and to effect the proper movement of the valve-operating devices, and of the devices for locking the meeting heads.

Now the means for locking the meeting heads together comprise what may be termed a "latch" I, supported on the end frame of the head-carrying member of one coupling, and having at its swinging end a portion *i* to engage at J with the head-frame of a meeting coupling. This latch is supported on the

member E, being preferably pivoted at *i'* thereto, and is connected with the member F, so that the movement of the member E along said member F either sets or releases the lock. In effecting this operation of the latch we provide it with an outwardly-projecting arm I', and connect to the latter one end of a pitman I², the other end of which connects with the member F, and preferably to the cross-head F' thereof, as shown. Now it will be seen from the foregoing that when the coupling-heads meet and are pressed back to their innermost positions the lock devices are adjusted or set to bind the meeting heads firmly together, so that there is no danger of the heads being forced apart by the air-pressure unless the cars be uncoupled. In fact the more pressure exerted between said heads to force them apart the more securely and firmly are the lock devices caused to bind them together.

While the member E slides in the member F and is spring-actuated therein, it is preferred to arrange the member F to slide in its support or bracket K and to actuate the said member F by a spring F² stronger than the spring E', so that the spring F² will not be compressed until after the spring E' has been compressed and the end frame of member E has been moved back against the outer end of the member F. By this relative strength of springs E' F² when the meeting heads about the spring E' is first compressed, the valves opening, and coupling locking devices are operated. After such operation has been effected, a further forcing of the heads together partially compresses the spring F² and the meeting heads will be pressed together so tightly as to avoid any leakage. By supporting the member F, to be pushed back or repressed as described, we are able to so set or adjust the brake-couplings that the car-couplings may have the desired limited play without in any degree releasing the lock connection of the brake-couplings and without closing or to any extent partially closing the valves unless the cars be uncoupled. If the cars be uncoupled, the spring F² will first expand and then the spring E', the latter throwing the heads and attached parts forward. The initial or slightest forward movement of the member E, by the expansion of its spring E', releases the lock devices, and the further forward movement of said member E first slightly opens the signal-valve and then opens the train-valve, and the extent to which said member moves outward or forward determines whether the engineer's whistle will blow or the brakes be set, and this extent of movement is controlled by automatic shifting regulating devices caused to operate by the movement of the cars and serving to limit the closing movement of or hold open one—the signal-valve if at the rear end of a car or to hold open both valves if at the front end of a car and the train be accidentally broken at such coupling. By "front" and "rear" ends of

the car it should be understood we mean with respect to the direction of motion of the train, the engine being at the front. This shifting regulating device, as suggested, operates to
 5 limit the movement of the valve-closing devices variably—that is to say, it permits a certain movement of such closing devices if its respective coupling is on the rear end of a train that happens to break while in motion,
 10 or it permits a further motion of said devices if its particular coupling be on the front end of the rear or broken-off section of the train, whether that section be one or more cars, the result being that the engineer's signal-whistle
 15 is sounded, but the brakes are not automatically applied to his end of the train, while the brakes on the rear or broken-off portion of the train will be applied.

It will be seen, therefore, that, broadly, our
 20 invention contemplates a shifting regulating device operated by the movement of the train operating to limit the movement of the valve-operating devices variably under different conditions, limiting it to a certain extent under
 25 one condition and to a further extent under opposite conditions, such conditions being the position the particular coupling occupies with respect to the direction of movement of the train.

30 In the construction shown and as preferred the shifting regulating device is what may be termed a "vane" L, acted upon by the draft created by the movement of the train, and we find it convenient to make this vane in the nature of a wheel having its sails L' fixed on the
 35 ends of arms L², connected with a hub L³, it may be, by casting or welding the arms integral with the hub, the latter being journaled on the rear end of the member E, and it is preferred
 40 to secure it upon the said member by a collar or collars M, as shown, so it can be adjusted to accurately stop the member E at the proper point to secure the desired closing or partial closing of the valves. We also provide
 45 the wheel with a counterbalance L⁴, by which it is brought back to normal position to permit both the valves to fully close when the car is at rest and is uncoupled. Stops L⁵
 50 L⁵ are provided on the member E to restrict the turning of the wheel to a partial revolution, and on the member F we provide short and long stops N and N' for engagement by the portion L⁶ of the wheel when said wheel
 55 stops L⁶ engage the short stops N the member E is stopped in position to only hold slightly open the valve in the signal-pipe, while if the stops L⁶ engage the longer stops N' both valves will be held open, while if
 60 the wheel be at normal position its stops L⁶ will pass up between the stops N N' and the valves will both close.

It will be noticed that the vanes are so inclined that the vane at the rear of the car
 65 with respect to the direction of movement will be thrown by the draft into position to cause the stops L⁶ to engage the short stops

N, and in case of breakage of the train only the engineer's signal-pipe valve will be held open, signaling that the train is broken, but
 70 not applying the brakes to the engineer's portion; but it will be seen that the vanes on the front end of the car broken off from the engineer's section are set to bring the stop L⁶ against the long stops N', so that the train-
 75 pipe valve of the broken-off car will be held open, and the brakes of such car will be applied as a result of the air exhausting out of such valve, as is well understood. This operation results from the draft causing the wheel
 80 to turn in one direction if the draft strikes against one of the faces of said wheel and in the opposite direction if it strikes the opposite face.

It will be understood that when the train
 85 is broken the wheels controlling the valves of the broken sections remain in such position until the cars are coupled up again or until the said wheels are released by hand.

To permit such wheels to be conveniently
 90 manipulated if at any time it is desired to move them when the car is at rest, we prefer to extend a light wire or cord from the same to the side of the car, taking care that such wire or rod be not too heavy to interfere with
 95 the free movement of the wheel in the operation thereof, as before described.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

100 1. In an air brake coupling the combination with the coupling heads and their valves, of a shifting regulating device set or adjusted by the movement of the train and operating to limit the movement of the valve controlling devices variably under different conditions substantially as set forth.

2. An air brake coupling provided with valves and with a shifting regulating device automatically set or adjusted by the movement of the train and operating to limit the movement of the valve closing devices variably under different conditions substantially as set forth.

3. In an air brake coupling the combination
 115 with the valves of a wind vane operated upon by the draft created by the movement of the cars and movable thereby into one or the other position and devices intermediate said vane and valve whereby the said vane may
 120 control the closing of said valves substantially as set forth.

4. In an air brake coupling the combination with the valves of a wind operated device arranged for operation by the draft created by
 125 the movement of the cars and intermediate devices between said valves and wind operated device whereby the closing of the valves should the train break may be regulated substantially as and for the purposes set forth.

5. In an air brake coupling the combination of the head and its valve the carrier member supporting said head, the carrier member
 130 along which said head carrying member slides

a wind vane movable upon the head carrying member and stops upon the other member for engagement by said vane and operative connections between the valves and the member in relation to which the valve carrying member slides substantially as set forth.

6. In an air brake coupling the heads the valves and the carrier composed of members sliding one upon the other combined with an automatically shifting regulating device supported on one of said members and engaging stops upon the other member and operative connections between the valve and the member in relation to which said valve slides, substantially as set forth.

7. In an air brake coupling the combination with the carrier members sliding one upon the other, the heads and their valves and operative connections between said valves and the member in relation to which the valves slide of the wind vane journaled upon one of the carrier members and limiting stops upon the other member for engagement by said vane substantially as set forth.

8. In an air brake coupling the combination of the valves the carrier members sliding one upon the other, one of said members being provided with stops arranged one in advance of the other, a wind vane having its hub journaled upon the other member and provided with projecting portions arranged to engage one or the other of the stops of the other member in case the train breaks and operative connections between the valves and the member in relation to which the valves slide substantially as and for the purposes set forth.

9. In an air brake coupling the combination of the valves, devices by which said valves are opened and closed independent of devices on the meeting coupling, and an automatically shifting regulating device by which to control the said valves in case the train breaks substantially as set forth.

10. In an air brake coupling the combination of the heads and their valves operative connections with said valves, a wheel like vane journaled centrally and having the opposite sails and the intermediate counterbalance and stops for engagement by the said vane whereby to limit the movement of the operative connections and thereby control the closing of the valves substantially as set forth.

11. In an air brake coupling substantially as described a coupling head carrier composed of longitudinal members sliding one upon the other combined with a shifting regulating device by which to control the extent of such movement substantially as set forth.

12. In an air brake coupling a coupling head carrier composed of members sliding one upon the other a spring operating between said members, a support in which the carrier is movable bodily and a spring operating between said support and carrier the valves and their operating devices and wind operated regulating devices whereby to con-

trol the longitudinal movement of the carrier members, substantially as set forth.

13. In an air brake coupling the combination of the carrier composed of members sliding one upon the other, the heads and their valves, said heads being supported on one of the carrier members, and connections between the other member and the valves whereby the movement of said members upon each other will effect the opening and closing of the valves combined with an automatically shifted regulating device by which to control the movement of said members and thereby control the closing movement of the valve operating devices substantially as set forth.

14. In an air brake coupling the combination with the carrier formed in members movable longitudinally one upon the other, the heads and their valves supported on one of said members, connections between the other member, and the valves and a shifting regulating device set or adjusted by the movement of the train and operating to limit the movements of said members variably under different conditions substantially as and for the purposes set forth.

15. In an air brake coupling the combination of the heads and their valves having crank arms, the carrier member to which said heads are secured, such member being movable along a second member and a pitman connecting the latter with the crank arms of the valves whereby the movement of the members upon each other will operate the valves, and a shifting regulating device whereby to control such movement variably substantially as set forth.

16. In a coupling substantially as described the combination of the head provided at one side with a flaring fork and having at the rear side of said fork a seat or bearing for the lock of the meeting coupling, and provided at its opposite side with a finger the lock device pivoted to said head in rear of such finger whereby the latter will direct it into position to engage the meeting-head and devices by which said lock is operated substantially as set forth.

17. The combination substantially as described of the brake valve, the signal valve, a valve closing device common to both such valves and connections between such device and the valves whereby one of the valves may be closed subsequent to the other substantially as set forth.

18. A coupling for brakes having a valve, devices by which said valve may be actuated toward closed position a wind operated regulating device and intermediate devices whereby the said regulating device may control the closing movement of the valve substantially as set forth.

19. A coupling for air brakes, having a valve, devices by which the valve may be actuated toward closed position and a shifting regulating device by which the closing movement of the valve may be controlled, said regulating device being automatically shifted to opposite

position as the coupling is moved longitudinally in one or the other direction substantially as set forth.

20. In an air brake coupling a coupling head provided upon opposite sides with ribs or flanges one of which forms a seat for engagement by the standard head and the other a seat for engagement by a box like clamp engaging therewith and with a corresponding part in said standard head substantially as set forth.

21. The combination with the coupling head having a projecting rib or seat and the standard head engaged at one side with said coupling head and having a rib or seat corresponding to that of the said coupling head of the box like clamp embracing said ribs whereby to unite the two heads substantially as set forth.

22. In an air brake coupling the combination with the valve and its closing devices of a wind operated regulating device journaled centrally and having opposite wind vanes and intermediate devices whereby said regulating device will control or limit the movement of the valve closing devices substantially as set forth.

23. In an air brake coupling the combination of the valve, its closing device and the wind operated regulating device pivoted centrally and having opposite vanes and an intermediate pendent counterbalance and connections between the wind vane and the valve closing device substantially as and for the purposes set forth.

24. An air brake coupling provided at its outer end with guiding devices composed of a flaring fork arranged at one side of the center, a finger arranged at the opposite side of the center and an upright arranged at the base of said finger substantially as and for the purposes set forth.

25. In an air brake coupling the combina-

tion with the heads of the carrier frame having inner and outer sections secured to the front and rear ends of the heads, the head valves having their stems extended between said front and rear frame sections and the valve operating devices connected with said stems substantially as set forth.

26. The combination in an air brake coupling of the heads the carrier frame having inner and outer sections supporting the opposite ends of the heads the head valves having portions projecting between said frame sections and the guide devices supported on said end frame substantially as and for the purposes set forth.

27. The combination in an air brake coupling of the carrier member provided with the head frame having front and rear sections and supporting the heads between the same, the other carrier member and the valve operating and locking devices connected with both such members substantially as set forth.

28. In an air brake coupling the head carrier provided with an end frame having front and rear sections, the guide devices supported by said frame, the heads arranged between the front and rear sections thereof the valve its operating devices and the locking mechanism all substantially as and for the purposes set forth.

29. The combination substantially as described of the brake valve, the signal valve, devices by which said valves may be closed one subsequent to the other, and automatically shifting regulating devices by which to limit the movement of the valve closing devices substantially as set forth.

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