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3,472,121.
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[51] Int. Cl. **B60t 11/14**
[50] Field of Search **188/153,**
196, 197, 198—263PRR, 265; 303/89; 91/41

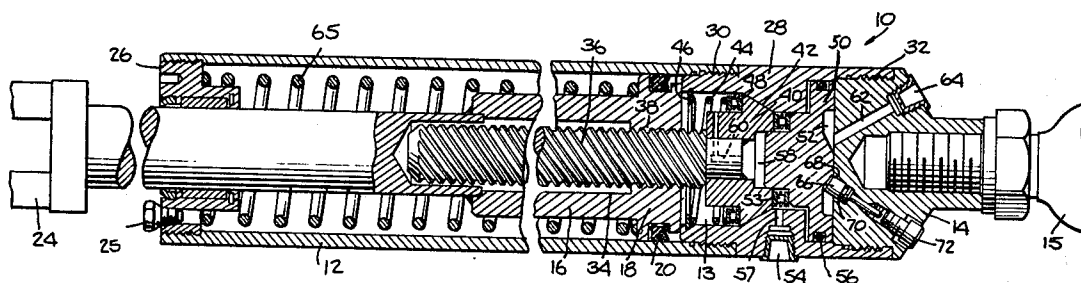
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[54] **RAILWAY CAR BRAKING APPARATUS**
13 Claims, 16 Drawing Figs.

[52] U.S. Cl. **188/153;**
91/41; 303/89

ABSTRACT: This invention relates to a railway car having a frame member carrying a cylinder assembly, and lever means connecting the cylinder assembly to a braking system, the cylinder assembly including a piston having an inner mechanical locking mechanism for retaining said braking system in locked condition for long periods of time.



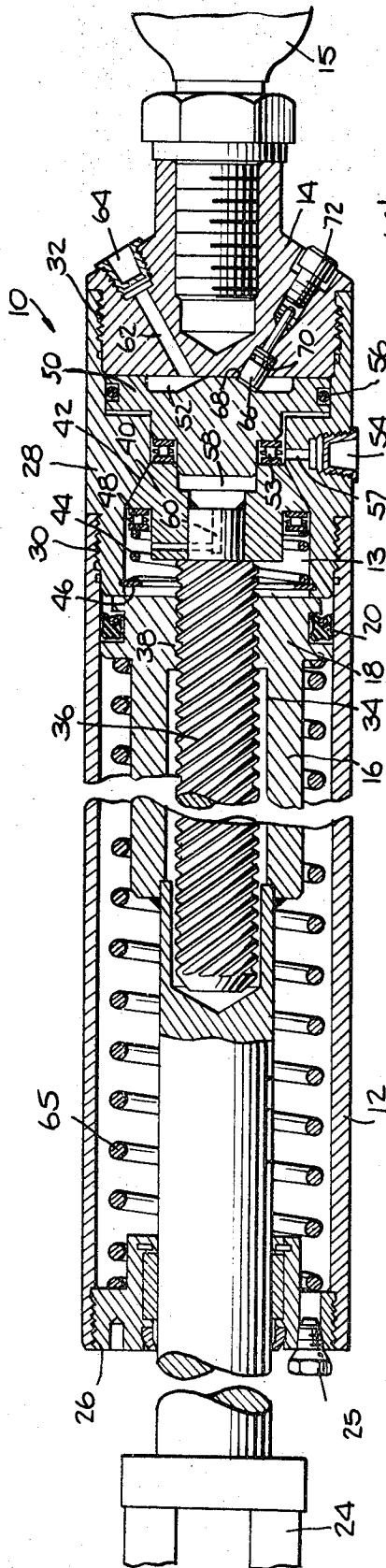


Fig. 1.

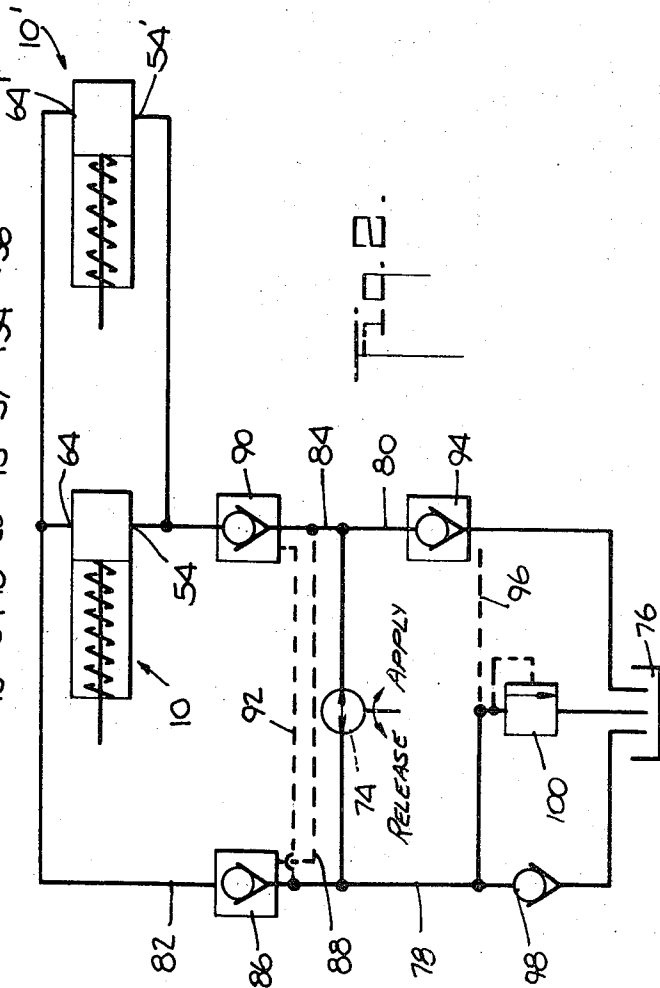


Fig. 2.

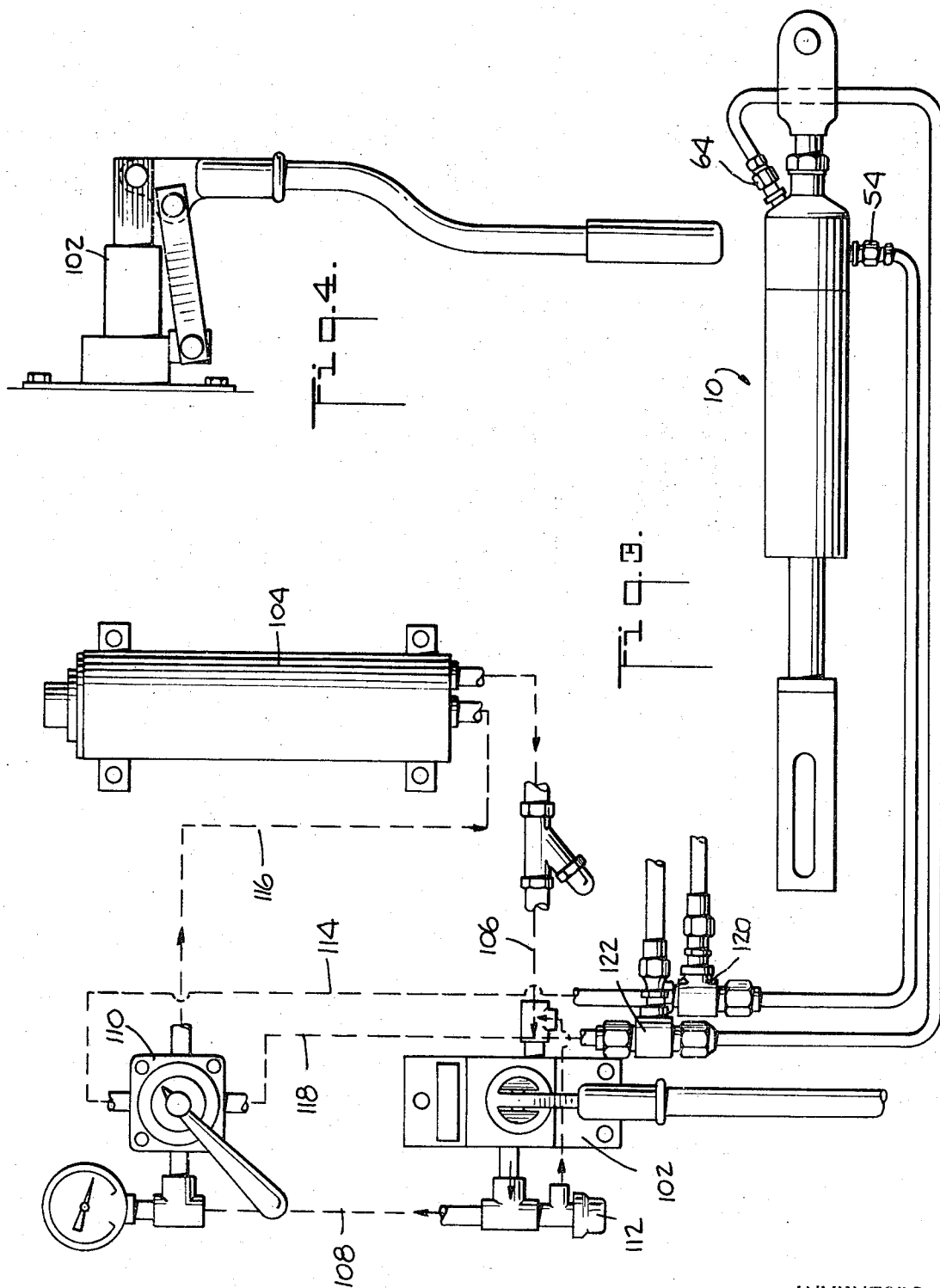
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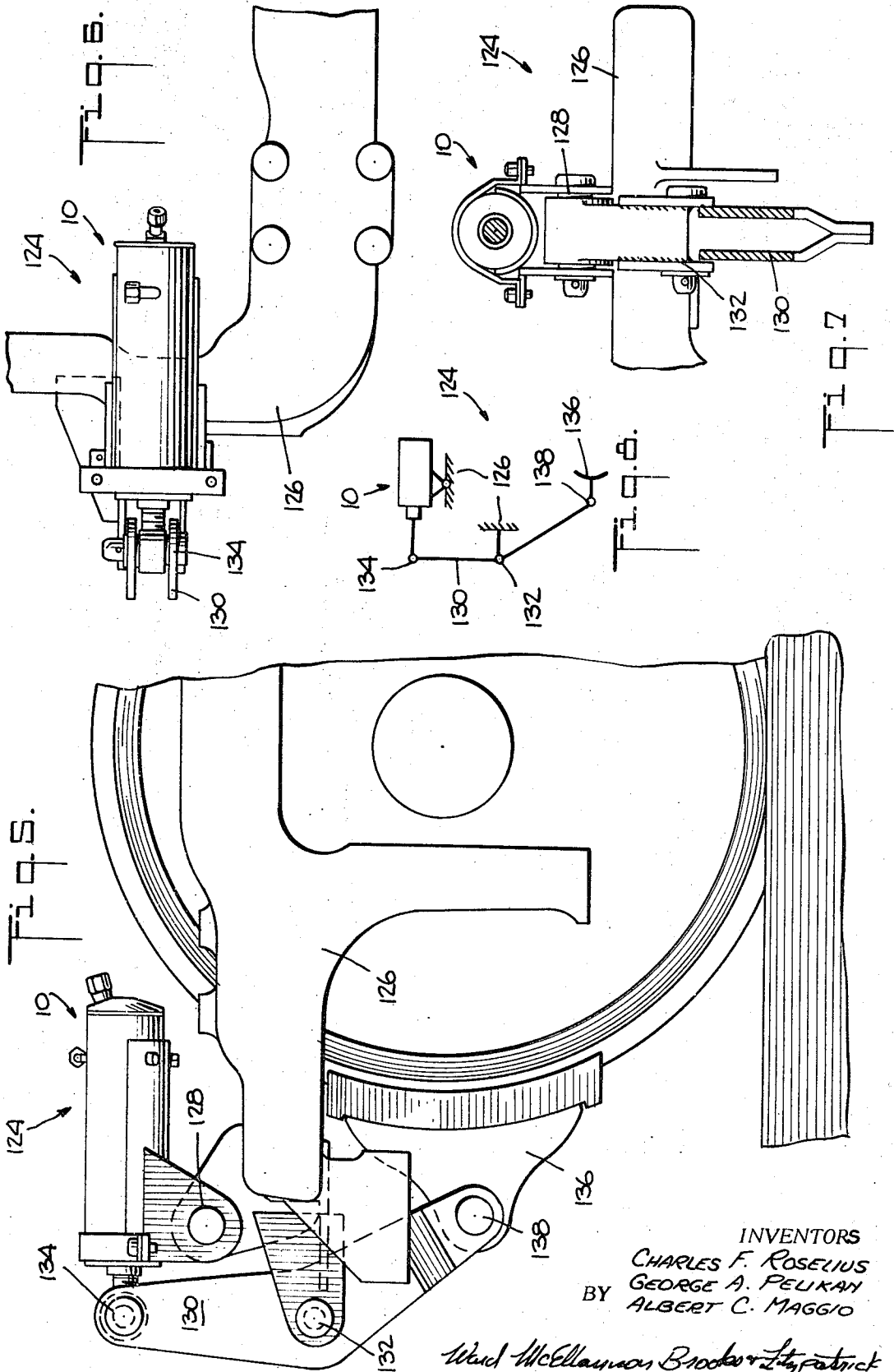
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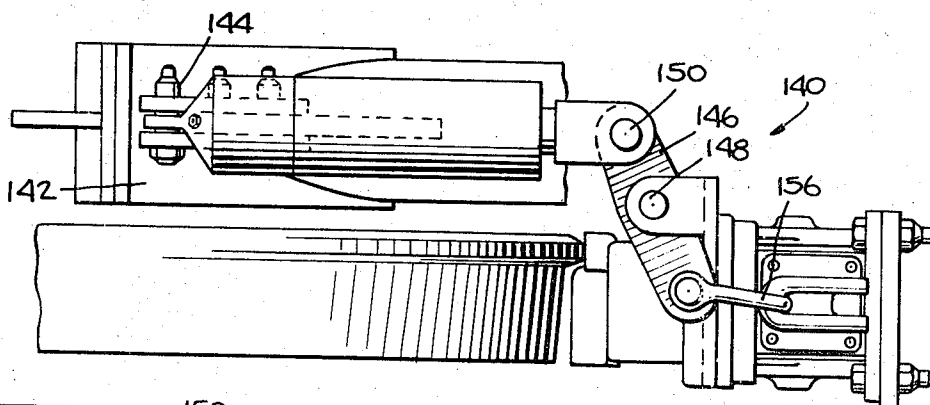


Fig. 10.

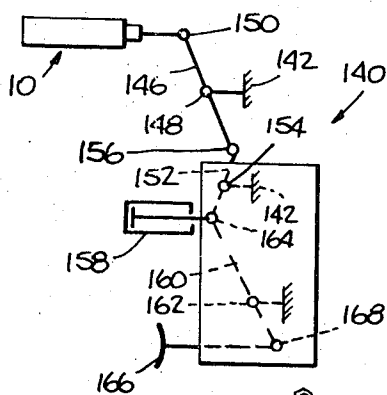


Fig. 11.

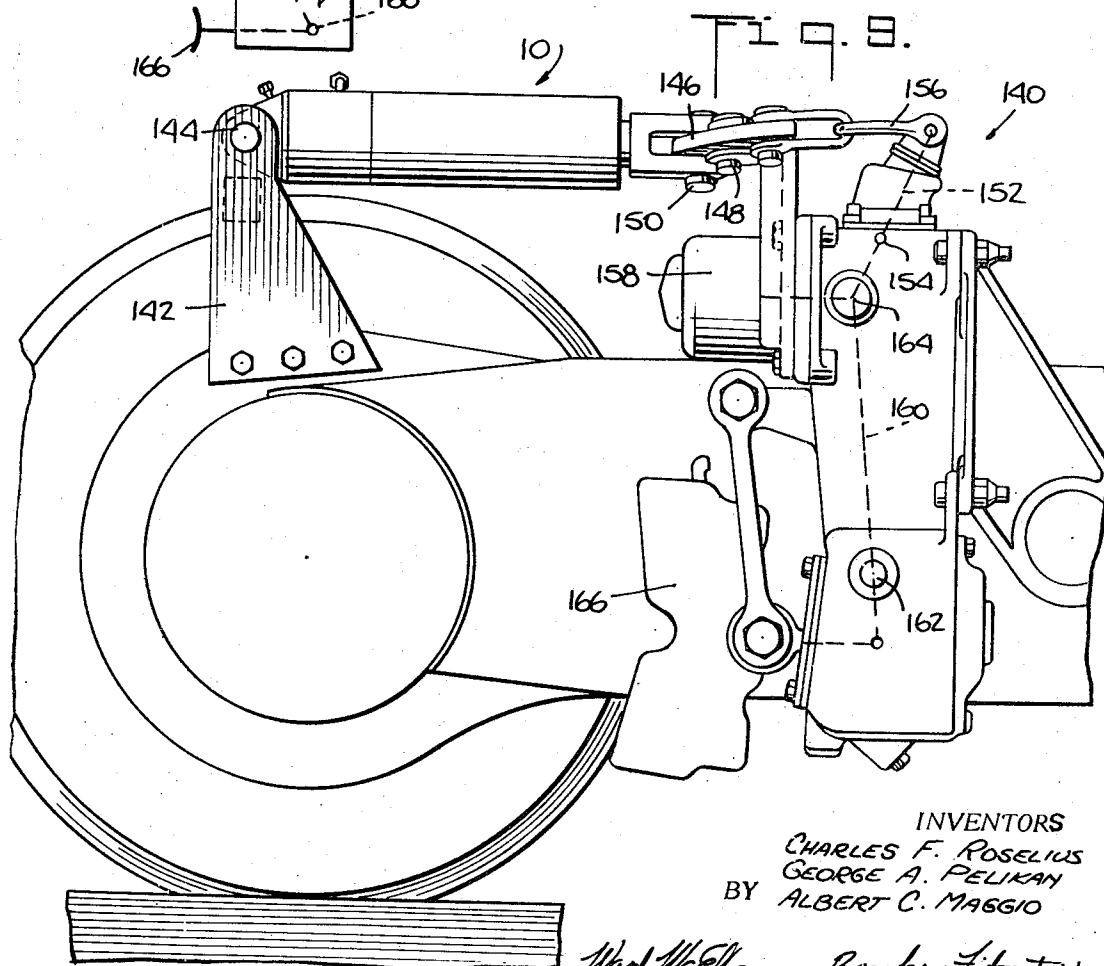
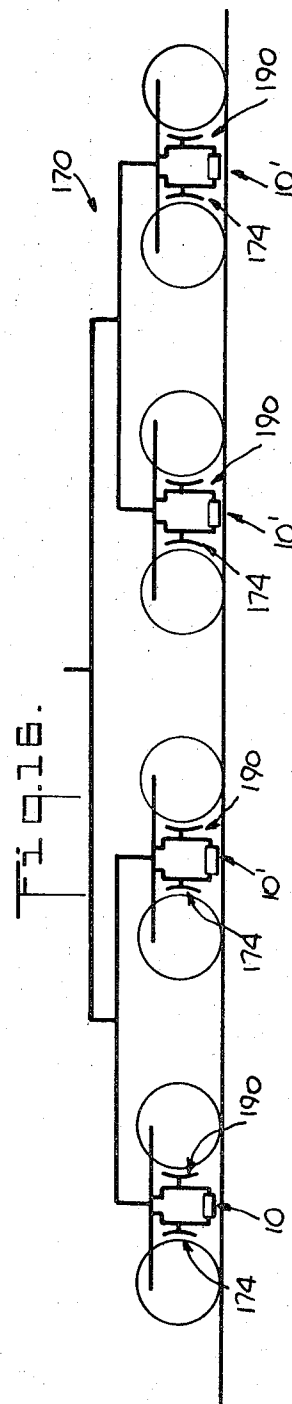


Fig. 9.

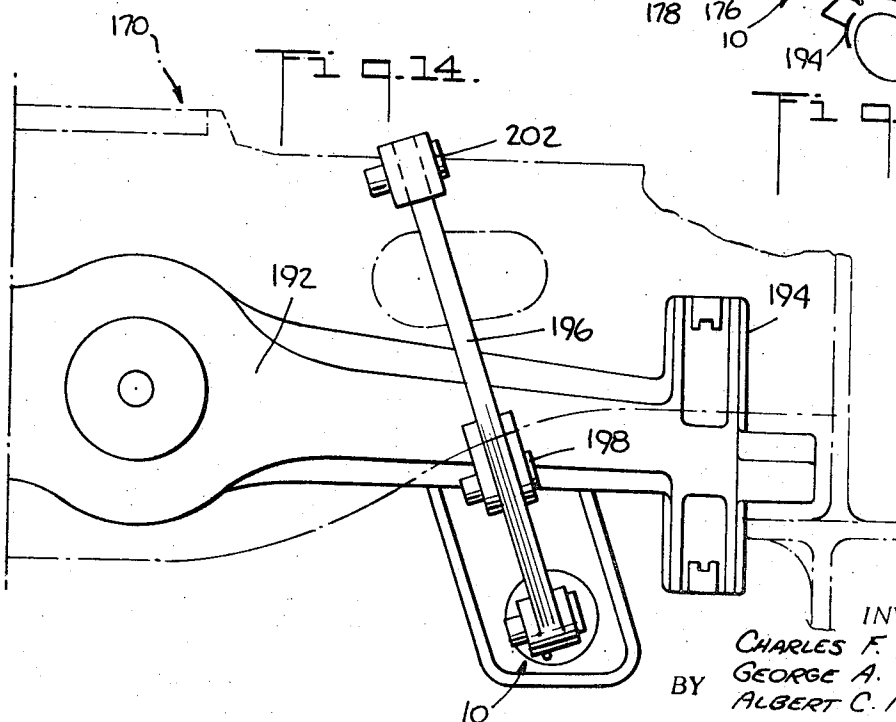
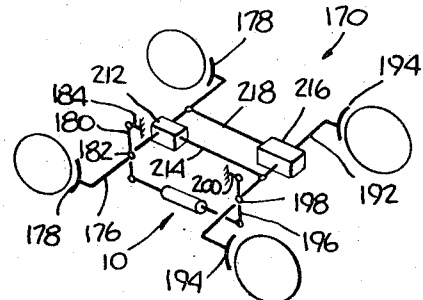
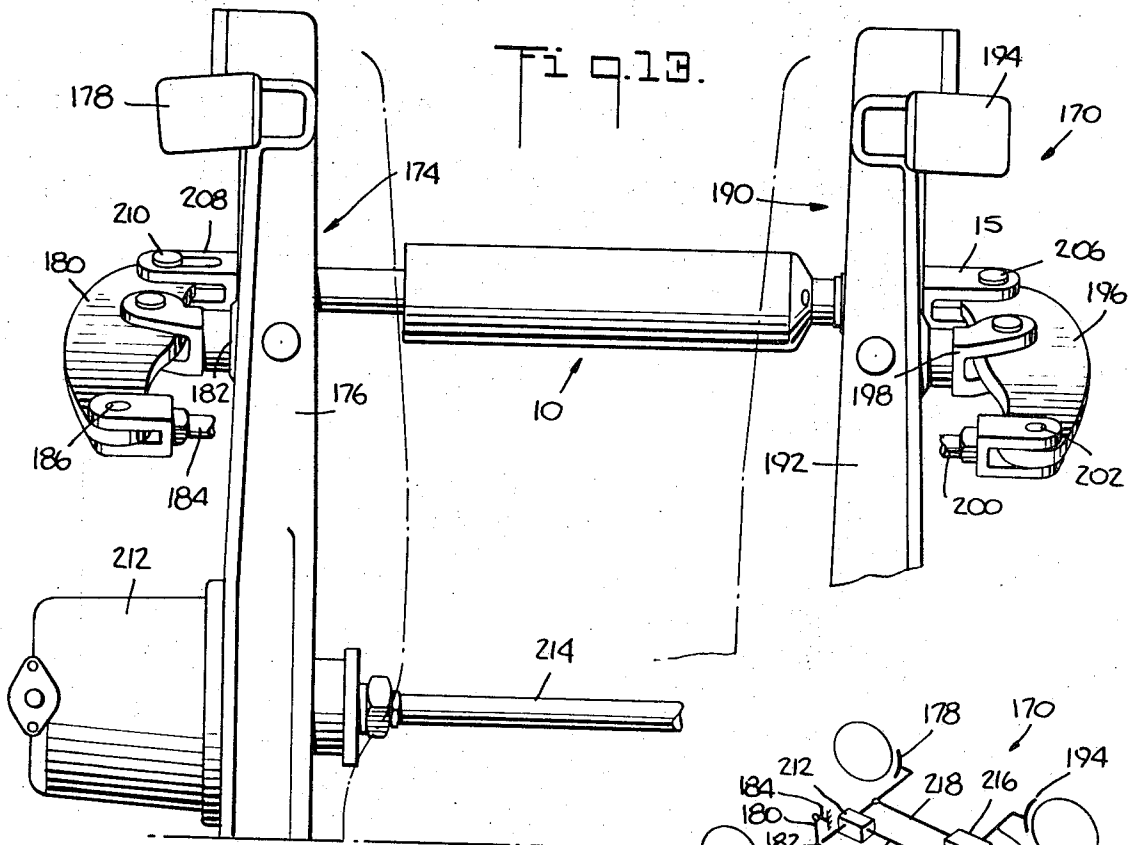
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RAILWAY CAR BRAKING APPARATUS

This application is a continuation-in-part application of our copending application Serial No. 666,419 entitled "Braking Apparatus" filed Sept. 8, 1967 and now U.S. Pat. No. 3,472,121.

This invention relates to braking systems for railway vehicles, and more particularly to fluid braking apparatus incorporating a mechanical lock. It is applicable to any type of railroad equipment such as freight and passenger cars, locomotives and transit cars, for example.

Brakes for railway vehicles are usually operated by two different means. An automatic air actuated brake system is employed for normal train operation, and a second manually operated emergency or parking brake system is employed which is operated through mechanical linkage, and is commonly referred to in the art as the hand brake system.

Heretofore, the brake shoes were applied against the wheels of a railway car by means of a single air brake cylinder on each vehicle, operating through a linkage system. The hand brake was connected into the brake rigging at the air brake cylinder so that the hand brake would apply the force through the same linkage to the brake shoes. With the advent of new high speed cars and locomotives, multicylinder application became common. Each truck of a railway car or locomotive has one or more brake cylinders and in some installations each wheel has one brake cylinder directly applying braking force to the brake shoe at the wheel. It will be appreciated that with these arrangements it is difficult to provide the usual mechanical hand brake linkage because of the number of sheave wheels, levers, rods, et seq., required to connect the mechanical hand brake with such various brake shoe locations. In order to overcome this problem it has been proposed to provide a hydraulic hand brake system because it is relatively simple to develop fluid pressure at the various points on the railway car or its trucks. Such a hydraulic system may be independent of the air brake system, or it may be combined with the air brake system. Related patents in this art include the following U.S. Pat. Nos.: 2,632,426, issued Mar. 24, 1953; 2,643,642, issued Jun. 30, 1953; 2,689,585, issued Sept. 21, 1954; 2,705,939, issued Apr. 12, 1955; 2,774,336, issued Dec. 18, 1956; 2,801,615, issued Aug. 6, 1957; 2,804,053, issued Aug. 27, 1957; 2,859,734, issued Nov. 11, 1958; 2,886,008, issued May 12, 1959; 2,887,991, issued May 26, 1959; 2,904,961, issued Sept. 22, 1959; 3,238,847, issued Mar. 8, 1966.

Heretofore, in a fluid braking system, the pressure developed was sustained by the tightness of the entire system. However, difficulty was experienced with this system due to the leakage developed in the cylinders, pistons, valves, lines and other points in the system, particularly after relatively long periods of sustained application. This loss of pressure, of course, rendered the brakes ineffective. Accordingly, it is an object of this invention to overcome this prior art problem.

In order to accomplish the desired results, we provide a new and improved railway car braking apparatus characterized by a railroad car having a frame member, a cylinder assembly mounted on the frame member, a braking system, and lever means connecting the cylinder assembly to the braking system. The cylinder assembly includes a cylinder, a cylinder head, and a piston mounted within the cylinder. The piston has an internal cavity, and mechanical locking means are mounted in the cavity. The mechanical locking means include a nut portion on the piston and a screw which passes through the nut portion. Clutch means are mounted on the locking means for selectively connecting the mechanical locking means to the cylinder in operative relationship. The clutch means has a clutch member which is fixedly mounted on the end of the screw adjacent the cylinder head. The cylinder head has a mating seat for the clutch member. Spring means are provided for urging the clutch member to engage the seat. A fluid actuated release piston is provided for urging the clutch member to disengage the seat. The cylinder has an apply connection and a cavity for selectively receiving high pressure fluid for urging movement of the piston and the

cylinder head to separate from each other, and the cylinder has a release connection and a cavity adjacent the release piston for selectively receiving high pressure fluid for urging the clutch member to disengage the seat. Return spring means are provided for urging the piston and cylinder head toward each other.

According to one aspect of our invention, fluid means are provided for moving the piston with respect to the cylinder head, and the same fluid means serves to disengage the clutch member. These means comprise a reservoir, a pump, a selector valve, and means interconnecting these elements so that actuation of the selector valve in one direction causes high pressure fluid to separate the piston from the cylinder head for applying a braking force, and subsequent loss of high pressure due to leakage in the system causes the spring to urge the clutch member into engagement with its seat to mechanically lock the screw and piston with respect to the cylinder head to retain the braking force indefinitely. Actuation of the selector valve in the opposite direction causes high pressure fluid to release the clutch member and allows the piston and cylinder head to return towards each other thereby to release the braking force.

According to another aspect of our invention, the selector valve is dispensed with and rotary pump means are employed which when rotated in one direction cause high pressure fluid to separate the piston and cylinder head for applying braking force and when rotated in the opposite direction disengages the clutch means for releasing the braking force.

According to still another aspect of our invention, we provide a railway car having a truck frame, a trunnion bracket mounted on the truck frame, and a cylinder assembly mounted on the trunnion bracket. A truck brake lever is centrally pivotally mounted on the truck frame and a braking mechanism is provided. One end of the truck brake lever is attached to the cylinder assembly and the other end of the truck brake lever is attached to the braking mechanism. The cylinder assembly comprises a piston having an inner mechanical locking mechanism for retaining the braking system in locked condition for long periods of time.

As another aspect of our invention, a railway car is provided having a truck frame, a cylinder assembly mounted on the truck frame and a cylinder lever having one end connected to the cylinder assembly. A connecting link is medially pivotally mounted on the frame member and a double clevis serves to connect the connecting link to the cylinder lever. A brake mechanism is connected to the other end of the connecting link. The cylinder assembly includes a piston having an inner mechanical locking mechanism for retaining the braking mechanism in locked condition for long periods of time. In addition, means are provided for releasing said braking mechanism.

As still another aspect of our invention, we provide a railway car having a bolster, a first lever, a first braking mechanism attached to the central portion of the first lever, a first fulcrum member mounted on the bolster, a first connecting rod having one end attached to the bolster and the other end attached to one end of the first lever. A second lever and a second braking mechanism are attached to the central portion of the second lever and a second fulcrum member is mounted on the bolster. A second connecting rod has one end attached to the bolster and the other end attached to one end of the second lever. A cylinder assembly is provided having one end connected to the other end of the first lever and having the other end thereof connected to the other end of the second lever. The cylinder assembly includes a piston having an inner mechanical locking mechanism for retaining the braking system in locking condition for long periods of time.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter which will form

the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which this disclosure is based may readily be utilized as the basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that this disclosure be regarded as including such equivalent constructions as do not depart from the spirit and scope of the invention.

Several embodiments of the invention have been chosen for purposes of illustration and description, and are shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a transverse sectional view of the cylinder assembly portion of a railway car braking mechanism constructed according to the concept of this invention;

FIG. 2 is a diagrammatic view of a fluid pressure system employed for actuating the cylinder assembly and piston means of the railway car braking mechanism;

FIG. 3 is a diagrammatic view of another form of fluid pressure system for actuating the cylinder assembly;

FIG. 4 is a side elevation of pumping means utilized in conjunction with the braking apparatus of this invention;

FIG. 5 is a side elevation of a railway car braking mechanism constructed according to the concept of this invention;

FIG. 6 is a plan view of the railway car braking mechanism of FIG. 5;

FIG. 7 is an end view of the railway car braking mechanism of FIGS. 5 and 6;

FIG. 8 is a diagrammatic view of the railway car braking mechanism of FIGS. 5-7;

FIG. 9 is a side elevation of another form of railway car braking mechanism constructed according to the concept of our invention;

FIG. 10 is a plan view of the railway car braking mechanism of FIG. 9;

FIG. 11 is a diagrammatic view of the railway car braking mechanism of FIGS. 9 and 10;

FIG. 12 is a side elevation of still another form of railway car braking mechanism constructed according to the concept of this invention;

FIG. 13 is a plan view of the railway car braking mechanism of FIG. 12;

FIG. 14 is a fragmentary end view of the railway car braking mechanism of FIGS. 12 and 13;

FIG. 15 is a perspective schematic view of the railway car braking mechanism of FIGS. 12, 13 and 14; and

FIG. 16 is a side elevation diagrammatic view of the railway car braking mechanism of FIGS. 12-15, applied to a railway car having one pumping unit and four cylinder units.

Referring in particular to FIG. 1, a cylinder assembly, indicated generally at 10, comprises a cylinder 12 having an internal cavity or bore 13, a cylinder head 14 and a piston 16 mounted within said cavity. The cylinder head 14 has a jaw 15 extending outwardly thereof. At one end of the piston 16 is a piston head 18 which carries sealing means 20 interposed between the cylinder 12 and the piston head 18, and at the other end of the piston 16 is a piston rod 22 having a slotted jaw 24 attached thereto. An end cap 26 is interposed between the cylinder 12 and the piston rod 22. This end cap contains a drain connection 25 for preventing fluid buildup between the piston and the cylinder. A cylinder sleeve 28 is fixedly attached to the cylinder 12, as at 30, and is fixedly attached to the cylinder head 14, as at 32. It will be appreciated that in another form of the invention the sleeve 28 may be integral with the cylinder and/or the cylinder head.

Still referring to FIG. 1, the piston 16 is provided with an internal cavity 34 for receiving a multistart screw and clutch assembly 36. This screw passes through a nut portion 38 of the piston head 18. A cone clutch member 40, which is an integral part of the screw 36, engages seat 42 of the sleeve 28 due to the force exerted by spring 44 which bears against retainer 46 and thrust bearing 48. The clutch member 40 is disengaged from the seat 42 by the actuation of a release piston 50 when

fluid pressure is developed in cavity 52. A thrust bearing 53 facilitates the rotation of the screw 36 and the clutch 40. A packing ring 56 serves to seal piston 50. Fluid under pressure is selectively applied to an apply connection 54 wherefrom it passes through passage 57 into cavity 58 and through passage 60 and to the cavity 13. This fluid under pressure acts on the piston head 18, thereby separating the piston 16 and the cylinder head 14 which moves outwardly, and through linkage, as will be discussed more fully hereinafter, applies the brake shoes against the wheels or brake discs. As the piston 16 and the cylinder head 14 separate, screw 36 is caused to rotate by the nut portion 38, while the clutch member 40 turns freely in its bearings. It will be appreciated that simultaneously the pressure in the cavity 58 urges the release piston 50 towards the cylinder head 14. At the same time the cavity 52 is connected to a return line, which is at substantially atmospheric pressure, by means of a passage 62 and release connection 64.

As long as pressure is maintained in the cavity 13, the brakes are applied by fluid power. When the pressure drops, due to leakage or for any other reason, the clutch 40 moves into contact with the seat 42 due to the action of the spring 44. This prevents rotation of the screw 36 in the nut portion 38, thereby holding the jaws 15 and 24 apart and keeping the brakes in their applied position by this mechanical locking action.

In order to release the braking mechanism, pressure is applied to the release connection 64 and the apply connection 54 is connected to a return line at substantially atmospheric pressure. This causes any pressure in the cavity 13, FIG. 1, to drop to atmospheric pressure. The cavity 52 is subjected to high pressure for urging the release piston 50 to the left, as viewed in FIG. 1, to lift the clutch member 40 off the seat 42. A return spring 65 causes the piston 16 and the cylinder head 14 to come together, as the screw 36 is free to rotate. This permits the jaws 15 and 24 to move toward each other and thereby release the braking mechanism.

In the event that fluid pressure could not be developed in the release or unlocking line due to a malfunction, it would be difficult to release the braking mechanism. A manual release feature is provided comprising a release pin 66 mounted in a bore 68 in the cylinder head 14, the pin being sealed with respect to the cylinder head by virtue of an O-ring 70, provided for the purpose. A socket head cap screw 72 is threadedly mounted in the cylinder head so that by means of screwing the cap screw inwardly it engages the pin 66 and urges it inwardly. The pin 66 engages the release piston 50 and moves it to the left as viewed in FIG. 1, thereby lifting the clutch member 40 off its seat 42 and releasing the brake mechanism in the same manner as described hereinbefore in connection with the fluid release system.

As best seen in FIG. 2, for parking or emergency operation of the railway car braking mechanism, fluid pressure, usually hydraulic fluid is developed by a rotary pump 74, normally manually rotated by a hand wheel. A suitable gear type or rotary piston type of pump could be used. The pump 74 develops pressure on one side thereof when rotated in one direction and develops pressure on the other side thereof when rotated in the opposite direction. The pump means receive fluid from a reservoir 76 through a first pipeline 78. A second pipeline 80 leads from the reservoir to the other side of the pump means and a third pipeline 82 leads from the first pipeline 78 to the release connection 64 of the cylinder assembly 10. A fourth pipeline 84 leads from the second pipeline 80 to the apply connection 54 of the cylinder assembly 10. A first check valve 86 is mounted in the third pipeline 82 to prevent flow from said release connection and a first pilot line 88 extends from the fourth pipeline 84 to release the first check valve 86 when pressure is contained in the fourth pipeline. A second check valve 90 is mounted in said fourth pipeline 84 to prevent flow from said apply connection 54, and a second pilot line 92 extends from the third pipeline 82 to release the second check valve. A third check valve 94 is mounted in the second pipeline 80 to prevent flow toward the

reservoir 76, and a third pilot line 96 extends from said first pipeline 78 to release the third check valve. A check valve 98, without a pilot line, is mounted in the first pipeline 78, and a system relief valve 100 is provided to prevent excessive pressure from developing in the hydraulic system.

In operation when the pump 74 is rotated in its apply direction, pressurized fluid flows from the reservoir 76 through pipeline 78 to the pump 74, and thence through pipeline 84 to the apply connection 54. Simultaneously, the release connection 64 is opened to substantially atmospheric pressure, as a return line. Low pressure fluid flows from the release connection 64 through pipeline 82 and through check valve 86 back to the inlet of the pump 74. Flow is possible through the check valve 86 because high pressure fluid from pipeline 84 passes through pilot line 88 to open the check valve. It is not necessary to open check valve 98 because the flow from the cavity 52, FIG. 1, through the release connection 64, FIG. 2, is very small and it can all be absorbed in the pump inlet.

In operation, when the pump 74 is rotated in its release direction, pressurized fluid comes from the reservoir 76 through pipeline 80 to the pump 74, and thence through pipeline 82 to the release connection 64. Simultaneously, the apply connection 54 is opened to substantially atmospheric pressure, as a return line. Low pressure fluid flows from the apply connection 54 through the pipeline 84 and through the check valve 90. From there, part of the return flow goes to the inlet of the pump 74 and part of the flow passes through the pipeline 80 and the check valve 94 to the reservoir 76. Because of the relatively large volume of the cavity 13, FIG. 1, a substantial portion of the return fluid must be returned to the reservoir 76, FIG. 2. Flow is possible through the check valve 90 because high pressure fluid from the pipeline 82 passes through the pilot line 92 to open the valve, and flow is possible through check valve 94 because high pressure fluid from pipeline 78 passes through the pilot line 96 to open the valve. It will be appreciated that a plurality of cylinder assemblies 10', FIG. 2, may be employed in parallel relationship with respect to the cylinder assembly 10. That is, a plurality of brake mechanisms may be actuated by connecting the apply connection 54 of the cylinder assembly 10 to an apply connection 54' of another cylinder assembly 10' and by connecting the release connection 64 of cylinder 10 to a release connection 64' of the cylinder assembly 10'.

In another form of the invention, as best seen in FIGS. 3 and 4, hydraulic pressure is developed by a suitable pump such as a hand-operated reciprocating lever-type pump 102 which receives fluid from a reservoir 104, through pipeline 106 and passes the fluid under pressure through pipeline 108 to a manually operated selector valve 110, pipeline 108 being provided with a relief valve 112 for safety purposes. The selector valve 110 is manually operated to indicate release or apply. That is, by means of manipulating the selector valve 110, the high pressure fluid from the pump may be directed through a pipeline 114 to the apply connection 54 of the cylinder assembly 10, or the return fluid may be directed through pipeline 114 from connection 54 through pipeline 116 back to the reservoir 104. When the selector valve 110 is in its last named position, high pressure fluid from the pump is directed through a pipeline 118 to the release connection 64 of the cylinder assembly. It will be appreciated that a plurality of cylinder assemblies can be supplied from one pump and reservoir by means of adding connections 120 and 122 in the apply and release lines, respectively.

Referring next to FIGS. 5-8, a railway car, indicated generally at 124, includes a truck frame 126, and a trunnion bracket 128 mounted on the truck frame. The cylinder assembly 10 is mounted on the trunnion bracket. A truck brake lever 130 is centrally pivotally mounted on the truck frame 126, as at 132, and one end thereof is attached to the cylinder assembly, as at 134. The other end of the truck brake lever 130 is attached to a braking mechanism 136, as at 138. This installation is particularly useful in transit car operation.

Referring next to FIGS. 9-11, a railway car, indicated generally at 140, includes a truck frame 142 upon which the cylinder assembly 10 is mounted, as at 144. A cylinder lever 146 is medially pivotally mounted on the truck frame, as at 148, and has one end pivotally connected to the cylinder assembly, as at 150. A connecting link 152 is medially pivotally mounted on said truck frame 142, as at 154. A double clevis 156 serves to connect the cylinder lever 146 to the connecting link 152. An air cylinder 158 is mounted on said truck frame and a truck lever 160 is medially pivotally mounted on the truck frame, as at 162. The connecting link 152 and one end of the truck lever are pivotally attached to said air cylinder assembly, as at 164. A braking mechanism 166 is connected to the other end of said truck lever 160, as at 168. This installation is particularly useful with lightweight passenger or rapid transit cars.

In the embodiment of the invention illustrated in FIGS. 12-16, a railway car, indicated generally at 170, comprises a bolster 172, FIG. 12, a first braking mechanism, indicated generally at 174, which includes a brake beam assembly 176 and brake shoes 178, FIG. 13. A first lever 180 is connected to said brake beam assembly, as at 182. As best seen in FIG. 12, one end of the first lever is pivotally connected to one end of a connecting rod 184, as at 186, and the other end of the connecting rod is pivotally connected to the bolster 172, as at 188, thereby allowing vertical motion of the bolster with respect to the first lever 180. A second braking mechanism, indicated generally at 190, includes a brake beam assembly 192 and brake shoes 194, FIG. 13. A second lever 196 is connected to the brake beam assembly, as at 198, FIG. 12. One end of the second lever is pivotally connected to one end of a connecting rod 200, as at 202, and the other end of the connecting rod is pivotally connected to the bolster 172, as at 204, thereby allowing vertical movement of the bolster with respect to the second lever 196. The cylinder assembly 10 is interposed between the first lever 180 and the second lever 196. That is, the cylinder assembly is provided with a jaw 15 at one end and a jaw 24' at the other end thereof. That is, the jaw 15 is pivotally connected to the second lever 196, as at 206, and the jaw 24' has an elongated slot 208 which receives a pin 210 extending from the first lever 180. The slot 208 serves to allow the brake beams to be moved with respect to each other by the automatic air actuator braking system employed for normal operation without continuously extending and retracting the piston of the cylinder assembly 10.

In operation, when hydraulic fluid is supplied to the apply connection of the cylinder assembly 10, the two jaws spread apart, thereby urging the brake beam assemblies 176 and 192 outwardly to apply the brakes. When hydraulic fluid is supplied to the release connection of the cylinder assembly 10, the two jaws are allowed to return toward each other, thereby allowing the brake beam assemblies 176 and 192 to move toward each other and release the brakes. As best seen in FIG. 15, the emergency or hand brake system operates in conjunction with the automatic air actuated braking system which is employed for normal train operation and which comprises a first air cylinder 212 and piston assembly 214, and a second air cylinder 216 and piston assembly 218 interposed between the two brake beam assemblies 176 and 192. For purposes of applying the brakes the air cylinder and piston assemblies are expanded, and for releasing the brakes they are retracted.

As best seen in FIG. 16, for certain installations, when extra large or heavily loaded railway cars are employed, four trucks are used at each end of the car. In this installation four cylinder assemblies 10 and 10' are used which are supplied by one pumping unit in a manner which was described more fully hereinbefore in connection with FIG. 2.

It will thus be seen that the present invention does indeed provide an improved railway car braking system which is superior in simplicity, economy and efficiency as compared to prior art systems.

Although certain particular embodiments of the invention are herein described for purposes of explanation, various

modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains.

We claim:

1. In a railway car having a frame member, a cylinder assembly mounted on said frame member, a braking system, lever means connecting said cylinder assembly to said braking system, said cylinder assembly comprising a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means comprising a nut portion carried by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate from each other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

2. Apparatus according to claim 1 further comprising means for selectively controlling the fluid flow into and out of said cylinder cavities which include a reservoir, a pump, a selector valve, means for interconnecting said reservoir, pump, selector valve and cylinder head in fluid flow communication so that actuation of said selector valve in one direction causes high pressure fluid to separate said cylinder and said piston for applying a braking force, and actuation of said selector valve in the opposite direction disengages said clutch means.

3. Apparatus according to claim 1 further comprising means for selectively controlling the fluid flow into and out of said cylinder cavities which include a reservoir, a pump, means for interconnecting said reservoir, pump, and cylinder head in fluid flow communication so that rotation of said pump in one direction causes high pressure fluid to separate said cylinder and said piston for applying a braking force, and rotation of said pump in the opposite direction disengages said clutch means.

4. Apparatus according to claim 1 further comprising means for selectively controlling the fluid flow into and out of said cylinder cavities including a reservoir, rotary pump means for developing pressure on one side of the pump when rotated in one direction and for developing pressure on the other side of the pump when rotated in the opposite direction, a first pipeline leading from said reservoir to one side of said pump means, a second pipeline leading from said reservoir to the other side of said pump means, a third pipeline leading from said first pipe line to the release connection of said cylinder assembly, a fourth pipeline leading from said second pipeline to the apply connection of said cylinder assembly, a first check valve mounted in said third pipe line to prevent flow from said release connection, a first pilot line extending from said fourth line to release said first check valve, a second check valve mounted in said fourth line to prevent flow from said apply connection, a second pilot line extending from said third line to release said second check valve, a third check valve mounted in said second line to prevent flow towards said reservoir, a third pilot line extending from said first line to release said third check valve.

5. Apparatus according to claim 1 further comprising manual unlocking means including a release pin mounted adjacent said release piston, and mechanical means for urging said release pin to engage and move said release piston for urging said clutch member to disengage said seat.

6. In a railway car having a truck frame, a trunnion bracket mounted on said truck frame, a cylinder assembly mounted on said trunnion bracket, a truck brake lever centrally pivotally mounted on said truck frame, a braking mechanism, one end of said truck brake lever being attached to said cylinder assembly and the other end of said truck brake lever being attached to said braking mechanism, said cylinder assembly comprising a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means comprising a nut portion carried by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate one from the other, and said cylinder having a release connection and a cavity adjacent said release piston means for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

7. In a railway car having a frame member, a cylinder assembly mounted on a said frame member, a cylinder lever medially pivotally mounted on said frame member, one end of said cylinder lever being connected to said cylinder assembly, a connecting link medially pivotally mounted on said frame member, a double clevis connecting said cylinder lever to said connecting link, a brake mechanism connected to the other end of said connecting link, said cylinder assembly comprising a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means comprising a nut portion carried by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate one from the other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

8. In a railway car having a truck frame, a cylinder assembly mounted on said truck frame, a cylinder lever medially pivotally mounted on said truck frame, one end of said cylinder lever being connected to said cylinder assembly, a connecting link medially, pivotally mounted on said frame member, a double clevis connecting said cylinder lever to said connecting link, an air cylinder assembly mounted on said truck frame, a truck lever, the other end of said connecting link and one end of said truck lever being pivotally attached to said air cylinder assembly, said truck lever being medially, pivotally mounted on said truck frame, braking means mounted on the other end of said truck lever, said cylinder assembly comprising a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means com-

prising a nut portion carries by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate one from the other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

9. In a railway car, a bolster, a first lever, a first braking mechanism attached to the central portion of said first lever, a first fulcrum member mounted on said bolster, a first connecting rod having one end attached to said bolster and the other end attached to one end of said first lever, a second lever, a second braking mechanism attached to the central portion of said second lever, a second fulcrum member mounted on said bolster, a second connecting rod having one end attached to said bolster and the other end attached to one end of said second lever, a cylinder assembly having one end connected to the other end of said first lever and having the other end connected to the other end of said second lever, said cylinder assembly including a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means comprising a nut portion carried by said piston and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for a said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an application connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate one from the other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to engage said seat, and return spring means for urging the piston and the cylinder head toward each other.

10. In a railway car, a bolster, a first lever, a first braking mechanism attached to the central portion of a said first lever, a first fulcrum member mounted on said bolster, a first connecting rod having one end attached to said bolster and the other end attached to one end of said first lever, a second lever, a second braking mechanism attached to the central portion of said second lever, a second fulcrum member mounted on said bolster, a second connecting rod having one end attached to said bolster and the other end attached to one end of a said second lever, a cylinder assembly, a jaw member mounted on one end of said cylinder assembly, said jaw member having an elongated slot therein, pin means for mounting the other end of one of said levers in said slot in said jaw member and the other end of the other of said levers being attached to the other end of said cylinder assembly, said cylinder assembly including a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavi-

ty and connected to said piston, said mechanical locking means comprising a nut portion carried by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder assembly having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate one from the other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

11. Apparatus according to claim 10 further comprising means for selectively controlling the fluid flow into and out of said cylinder cavity including a reservoir, rotary pump means for developing pressure on one side of the pump when rotated in one direction and for developing pressure on the other side of the pump when rotated in the opposite direction, a first pipeline leading from said reservoir to one side of said pump means, a second pipeline leading from said reservoir to the other side of said pump means, a third pipeline leading from said first pipeline to the release connection of said cylinder assembly, a fourth pipeline leading from said second pipeline to the apply connection of said cylinder assembly, a first check valve mounted in said third pipeline to prevent flow from said release connection, a first pilot line extending from said fourth line to release said first check valve, a second check valve mounted in said fourth line to prevent flow from said apply connection, a second pilot line extending from said third line to release said second check valve, a third check valve mounted in said second line to prevent flow toward said reservoir, a third pilot line extending from said first line to release said third check valve.

12. In a railway car having a frame member, a cylinder assembly mounted on said frame member, an automatic air actuated braking system, lever means connecting said cylinder assembly to said braking system, said cylinder assembly comprising a cylinder, a cylinder head, a piston mounted within said cylinder, said piston having an internal cavity, mechanical locking means disposed in said cavity and connected to said piston, said mechanical locking means including a nut portion carried by said piston, and a screw which passes through said nut portion, clutch means mounted on said locking means for selectively connecting said mechanical locking means to said cylinder in operative relationship, said clutch means including a clutch member which is fixedly mounted on the end of said screw adjacent said cylinder head, said cylinder head having a mating seat for said clutch member, spring means for urging said clutch member to engage said seat, a fluid actuated release piston for urging said clutch member to disengage said seat, said cylinder having an apply connection and a cavity for receiving high pressure fluid for urging said piston and cylinder head to separate from each other, and said cylinder having a release connection and a cavity adjacent said release piston for receiving high pressure fluid for urging said clutch member to disengage said seat, and return spring means for urging the piston and the cylinder head toward each other.

13. Apparatus according to claim 12 further comprising manual unlocking means including a release pin mounted in said cylinder head adjacent said release piston, screw means for urging said release pin to engage and move said release piston for urging said clutch member to disengage said seat.