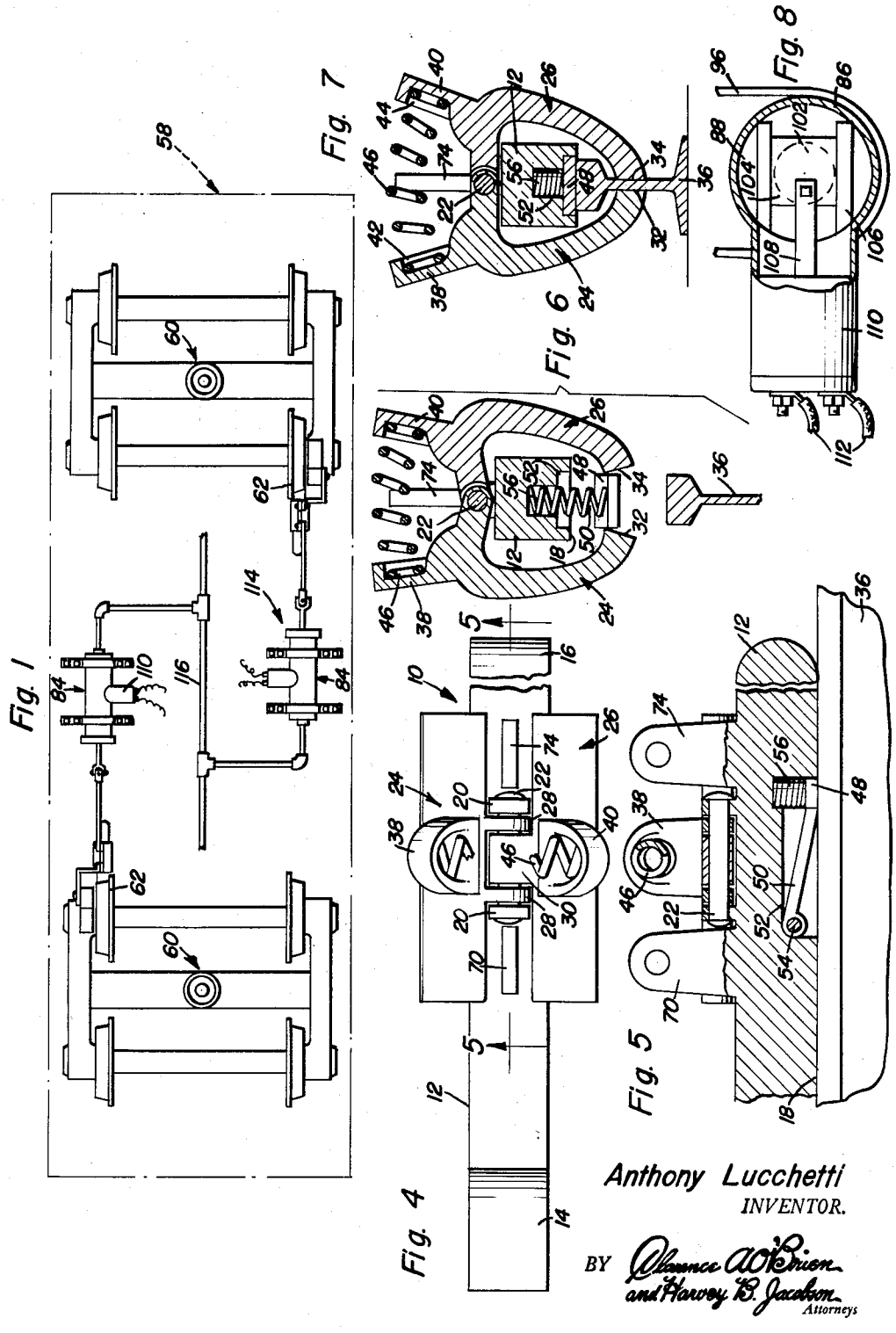
June 5, 1956 A. LUCCHETTI 2,748,895

EMERGENCY RAILROAD BRAKE

Filed Nov. 4, 1952 3 Sheets-Sheet 1



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EMERGENCY RAILROAD BRAKE

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Fig. 2

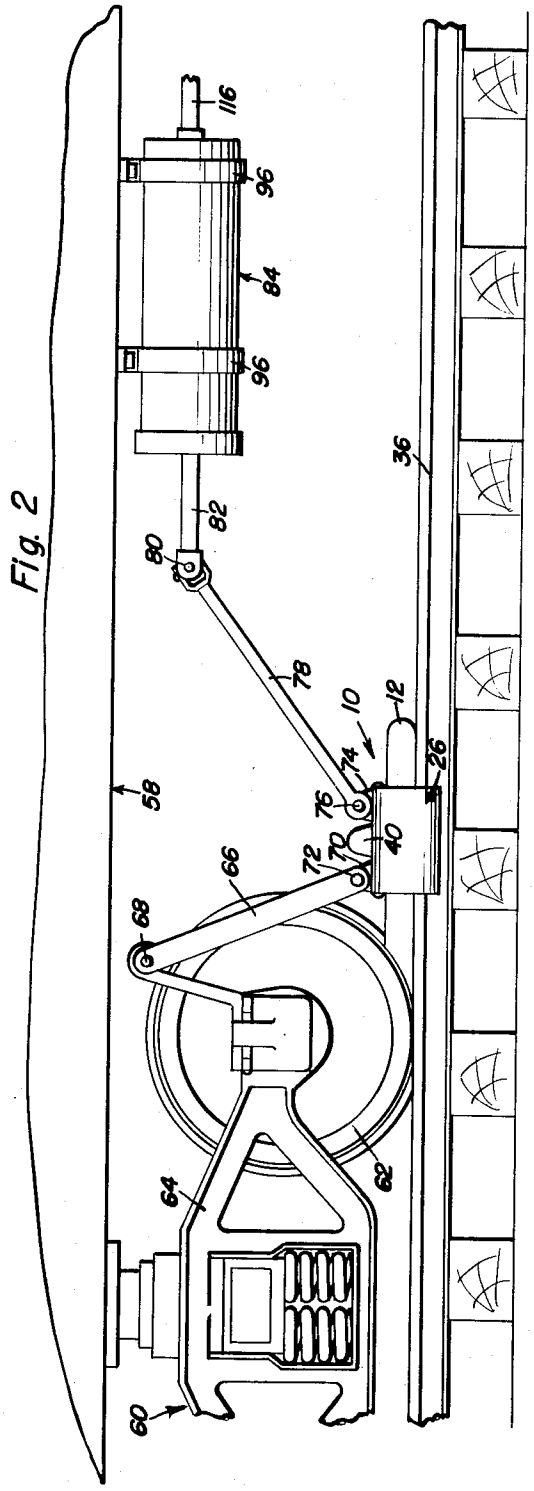
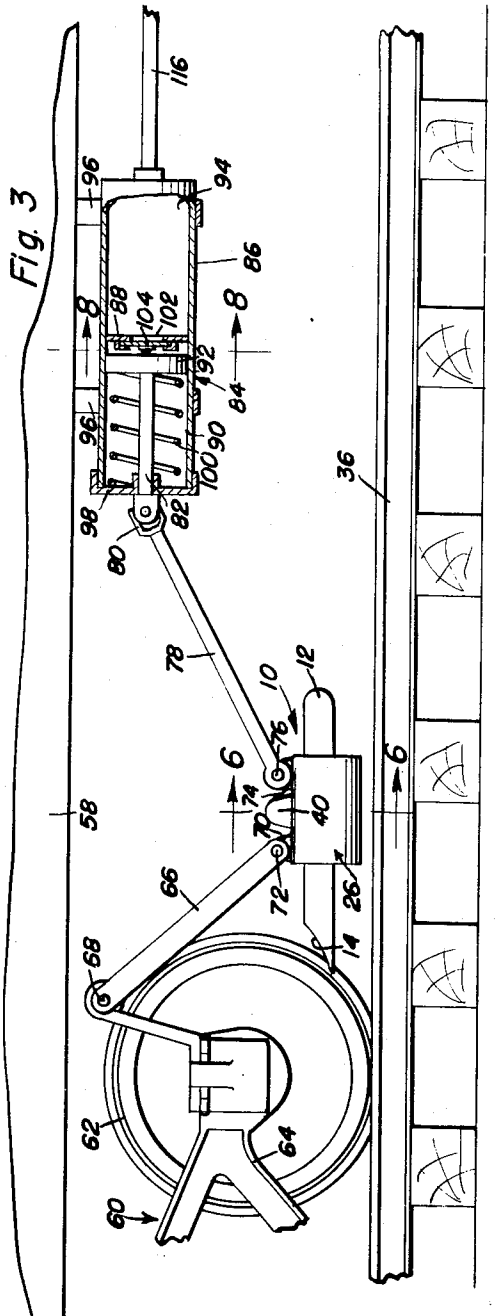


Fig. 3



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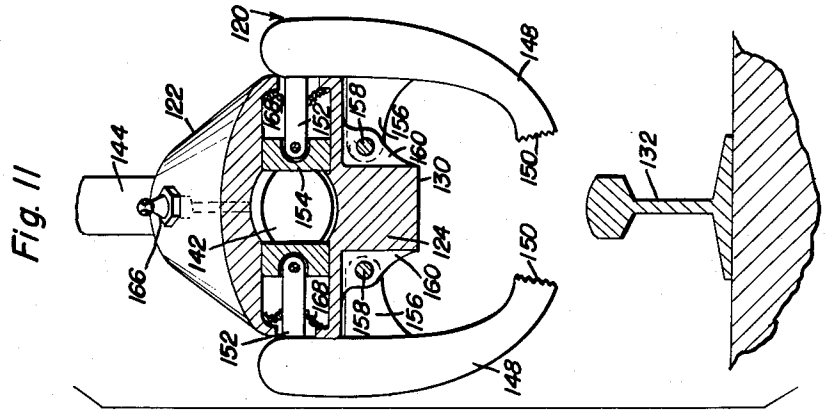


Fig. 11

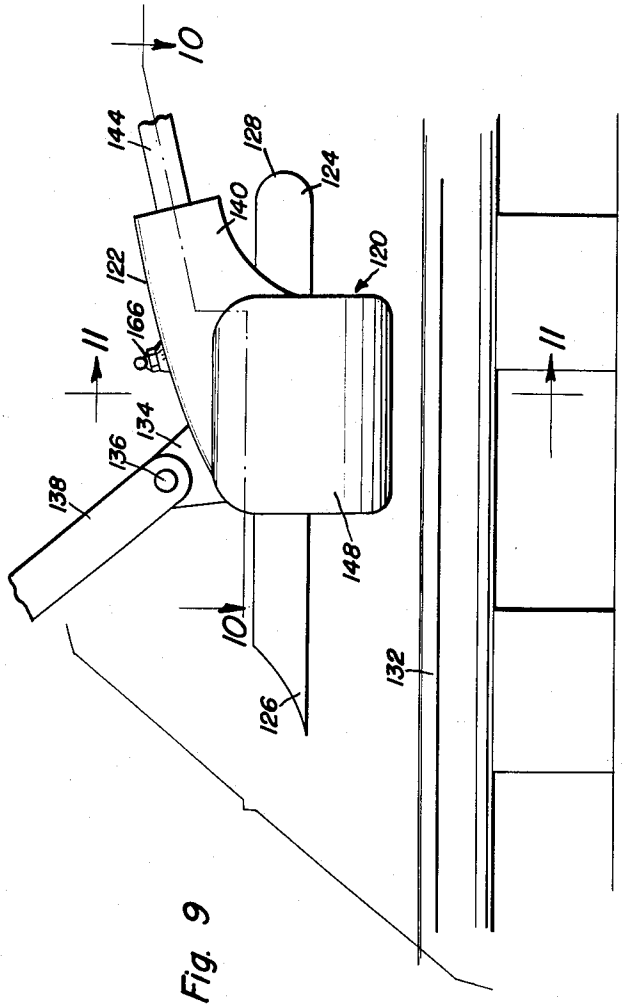


Fig. 9

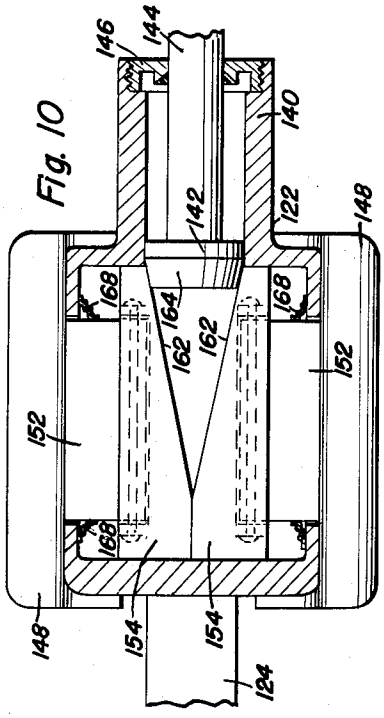


Fig. 10

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EMERGENCY RAILROAD BRAKE

Anthony Lucchetti, Point Pleasant, N. J.

Application November 4, 1952, Serial No. 318,686

4 Claims. (Cl. 188—36)

This invention relates in general to brake constructions, and more specifically to an emergency brake for railroad vehicles and the like.

During the recent years there have been numerous railroad wrecks with the loss of many lives due to the telescoping of cars one on the other. One of the principal causes of these wrecks appears to be the insufficiency of the brakes now being provided on railroad trains. Due to the inability of a train to stop in a relatively short space, there is oftentimes insufficient time for the engineer of a railroad train to halt the same with existing brakes. Therefore, it is desirable that there be provided suitable brakes for railway vehicles whereby the same may be stopped in a minimum of space so as to greatly decrease the number of wrecks and the loss of lives resulting therefrom.

The primary object of this invention is to provide an improved emergency brake for railway vehicles which is adapted to frictionally engage a rail on which the vehicle is running to effectively stop the same within a much shorter space than possible with ordinary types of brakes.

Another object of this invention is to provide an improved emergency brake means for railway vehicles, said emergency brake means including means for effectively gripping rails to prevent the raising of wheels of a railway vehicle therefrom thereby eliminating derailment of railway vehicles during wrecks.

Another object of this invention is to provide an improved emergency brake which is of a relatively simple construction and which is formed of readily attainable material whereby the same is economically feasible.

Another object of this invention is to provide an improved emergency brake which is operated by a compressed fluid, said brake including a fluid supply which is instantaneously available whereby the time required for actuation of the emergency brake is greatly reduced.

Another object of this invention is to provide an improved emergency brake for railway vehicles, said emergency brake being of such design and construction whereby the same may be attached to conventional railway cars now in existence without the requirement of expensive adaptations.

A further object of this invention is to provide an improved emergency brake for railway vehicles which, when actuated, frictionally engage the head of a rail, engages a peripheral rail engaging surface of an associated wheel for preventing rotation of the same, and effectively grips a web of a rail to both resist movement of a railway vehicle to which it is attached and vertical movement of the same with respect to the rail.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specifications, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a bottom plan view of a railroad car and shows the relationship of emergency brake conforming to the spirit of this invention attached thereto;

Figure 2 is an enlarged fragmentary side elevational view of the railroad car of Figure 1 and shows an emergency brake in braking position with respect to one wheel of the car and a rail on which the same is supported and guided;

Figure 3 is an enlarged fragmentary side elevational view similar to Figure 2 and shows the emergency brake in its operative position, a portion of a fluid cylinder for actuating the emergency brake being broken away and shown in section in order to clearly illustrate the working parts thereof;

Figure 4 is a top plan view of wheel and rail engaging portions of the emergency brake, an actuating spring thereof being omitted in order to clearly illustrate the manner in which jaws are pivotally connected to a brake element;

Figure 5 is a fragmentary vertical sectional view taken taken substantially upon the plane indicated by the section line 5—5 of Figure 4 and shows the relationship of elements of the brake when the same are engaged with the rail;

Figure 6 is an enlarged fragmentary vertical sectional view taken substantially on the plane indicated by the section line 6—6 of Figure 3 and shows the relationship of the rail engaging portions of the emergency brake prior to engagement thereof with a rail;

Figure 7 is a vertical sectional view similar to Figure 6 and shows the rail engaging portion of the brake after the same is engaged with a rail;

Figure 8 is an enlarged fragmentary transverse vertical sectional view taken substantially upon the plane indicated by the section line 8—8 of Figure 3 and shows control means for the actuation of the emergency brake;

Figure 9 is an enlarged side elevational view of a modified form of brake assembly;

Figure 10 is a fragmentary sectional view taken substantially upon the plane indicated by the section line 10—10 of Figure 9 and shows the internal construction of the brake assembly; and

Figure 11 is an enlarged transverse vertical sectional view taken substantially upon the plane indicated by the section line 11—11 of Figure 9 and shows the relationship of the various elements of the brake assembly.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views of the drawings.

Referring now to the drawings in detail, it will be seen that there is best illustrated in Figures 3 through 6, inclusive, a brake assembly which is referred to in general by the reference numeral 10. The brake assembly 10 includes an elongated generally rectangular rail engaging element 12 which is adapted to be supported and actuated in a manner to be described in more detail hereinafter. The rail engaging element 12 has an arcuate end portion 14 which is engageable with a rail engaging face of a railway car wheel to form a brake shoe therefor. The other end of the rail engaging element 12 is rounded as at 16 to prevent the accidental jamming of the same. It will be understood that the bottom surface 18 is adapted to frictionally engage the head of a rail to provide a braking action.

Extending upwardly from the upper side of the rail engaging element 12 is a pair of transversely extending spaced parallel ears 20. The ears 20 are provided with aligned bores in which is dispoesd a longitudinally extending pivot pin 22.

Pivotally mounted on the pivot pin 22 is a pair of rail engaging jaw members 24 and 26. The rail engaging jaw member 24 is provided with a pair of longitudinally spaced ears 28 which form hinge elements. The ears 28

have passed therethrough a pivot pin **22** and are positioned closely adjacent the opposed faces of the ears **20**. The rail engageable jaw member **26** is provided with an enlarged centrally located ear **30** which is also pivotally mounted on the pivot pin **22**. The ear **30** is disposed between the ears **28** and the jaw members **24** and **26** are in transverse alignment.

Referring now to Figure 7 in particular, it will be seen that the jaw members **24** and **26** have opposed clamp faces **32** and **34**, respectively, which are adapted to engage a web of a rail and firmly clamp the same. If desired, the faces **32** and **34** may be serrated to resist sliding of the same with respect to the web or a rail.

In order that the clamp faces **32** and **34** may be urged into clamping engagement with the web of a rail, such as a rail **36**, the jaw members **24** and **26** are provided with upwardly extending, centrally located enlarged ears **38** and **40**, respectively. Extending between the ears **38** and **40** and positioned within opposed recesses **42** and **44**, respectively, therein is a rigid spring **46**. While the means for urging the clamp faces **32** and **34** into clamping relation with the web of the rail **36** has been illustrated and described as being a spring, it will be understood that the same may be in the form of double springs, fluid cylinders, or mechanically actuated means for spreading apart the ears **38** and **40**.

Referring now to Figure 6 in particular, it will be seen that the clamp faces **32** and **34** are retained in spaced relation prior to the engagement of the same below the head of the rail **36**. In order that the clamp faces **32** and **34** may be retained in spaced relation, there is disposed therebetween a longitudinally extending stop member **48**. The stop member **48** is carried at the lower end of a supporting arm **50** pivotally connected to the rail engaging element **12**.

As is best illustrated in Figure 5, the support arm **50** is disposed within an elongated longitudinally extending recess **52** in the bottom portion of the rail engaging element **12**. The inner and upper end of the supporting arm **50** is mounted on a transversely extending pivot pin **54** carried by the rail engaging element **12**.

In order that the stop member **48** may be disposed between the clamp faces **32** and **34**, the rail engaging element **12** is provided with a downwardly extending spring **56** which engages the upper surface of the stop member **48** and urges the same downwardly.

When the brake assembly **10** is lowered into a rail engaging position, the head of the rail **36** engages the stop member **48** and urges the same upwardly against the compression of the spring **56**. The clamp faces **34** then engage the sides of the head of the rail **36**. Further downward movement of the brake assembly **10** results in the upward pivoting of the stop member **48** until the same is disposed within the recess **52** and the lower surface thereof is flush with the lower surface **18** of the rail engaging element **12**. At this time the clamp faces **32** and **34** have moved downwardly into engagement with the web of the rail **36** in the manner illustrated in Figure 7. Upward movement of the brake assembly **10** is then prevented by engagement of the lower ends of the jaw members **24** and **26** beneath the head of the rail **36**.

Referring now to Figures 2 and 3 in particular, it will be seen that there is illustrated a lower portion of a railroad car which is referred to in general by the reference numeral **58**. The railroad car **58** is provided with standard trucks which are referred to in general by the reference numeral **60** and include a plurality of rail engaging wheels **62**. Carried by a frame **64** of one of the trucks **60** is a first support arm **66** whose upper end is pivotally connected to the frame **64** by a horizontal pivot pin **68**. The lower end of the support arm **66** is pivotally connected to an upstanding ear **70** of the rail engaging member **12** by a second horizontal pivot pin **72**.

In longitudinally spaced relation to the ear **70** and in longitudinal alignment therewith is a second upstanding

ear **74** integral with the rail engaging member **12**. Pivotally connected to the second ear **74** by a horizontal pivot pin **76** is a lower end of a second support arm **78**. The upper end of the second support arm **78** is connected by a universal joint **80** to a horizontal plunger shaft **82**.

The horizontal plunger shaft **82** is an element of a fluid cylinder which is referred to in general by the reference numeral **84**. The fluid cylinder **84** includes an elongated cylindrical body **86** which is divided into two portions by a transverse bulkhead **88**. The portions include a cylinder **90** for a horizontally reciprocating piston **92** and a fluid supply chamber **94**.

It will be understood that the fluid cylinder **84** is mounted beneath the railway car **58** in alignment with the support arm **78**, as is best illustrated in Figure 1. The fluid cylinder **84** is mounted in a pair of depending brackets **96** carried by the supporting frame of the railway car **58**.

Referring once again to Figure 3 in particular, it will be seen that the piston **92** is mounted on an end of the plunger shaft **82** remote from the universal joint **80**. Surrounding the plunger shaft **82** and disposed between an end wall **98** of the fluid cylinder **84** and the piston **92** is a coil spring **100**. The coil spring urges the piston **92** toward the bulkhead **88** so as to retain the brake assembly **10** in an elevated position.

Referring now to Figure 8 in particular, it will be seen that the bulkhead **88** is provided with a centrally located, enlarged opening **102**, which when open communicates the fluid reservoir **94** with the interior of the cylinder **90**. Normally closing the opening **102** is a slide gate **104** which is mounted within suitable guideways **106**. The slide gate **104** has connected thereto one end of a plunger shaft **108** of an electromagnetic device **110**. The electromagnetic device **110** is connected by wires **112** to a suitable emergency brake actuating switch (not shown).

Referring now to Figures 2 and 3 in particular, it will be seen that when the gate **104** is moved to a position out of alignment with the opening **102**, compressed fluids from the fluid reservoir **94** will rush through the opening and into the cylinder **90**. The fluids will then urge the piston **92** toward the left, as viewed in Figure 3, with the resultant movement of the universal joint **80** to the left. This will result in the movement of the brake assembly **10** downwardly and to the left into engagement with the rail **36** and the wheel **62**. The engagement of the brake assembly **10** with the rail **36** will be identical to that described above, and the arcuate end portion **14** of the rail engaging member **12** will frictionally engage the wheel **62** in the same manner as the brake shoe.

Referring now to Figure 1 in particular, it will be seen that there is illustrated the underside of the railway car **58**. Associated with one wheel **62** of each truck **60** is an emergency brake, which is the subject of this invention, the emergency brake being referred to in general by the reference numeral **114**. It will be understood that the emergency brake **114** includes the fluid cylinder **84** and the brake assembly **10**, together with means linking the same together and supporting the same. The emergency brakes **114** are disposed on opposite sides of the railway car **58** in diagonal relation. In this manner a railway car may be effectively stopped and at the same time prevent tilting of the same. However, if it is found to be necessary additional emergency brakes **114** may be applied to other wheels of the railway car **58**.

It will be noted that there is provided a fluid pressure line **116** which is connected to each of the fluid cylinders **84**. The fluid pressure line **116** is adapted to receive fluid under pressure either from pumps or in the form of steam from the boiler of a locomotive. It is intended that the fluid pressure line **116** be utilized to replenish the supply of compressed fluid within the fluid reservoir **94**. Also, during the actuation of the emergency brake **114** should there be a demand for additional fluid, the same may be supplied through the fluid supply line **16**.

While there has not been illustrated a switch means for controlling the electromagnetic devices **110** whereby the emergency brake **114** may be actuated, it will be understood that such switch will be connected to the emergency brake means for a train. Also, the switch may be connected to an emergency cord or other similar brake control means for a train. The exact manner in which the electromagnetic devices **10** are operated is not an essential feature of this invention and therefore has not been set forth in detail.

It will be understood that the emergency brakes **114** may be applied to railway cars now in existence and function either in combination with existing emergency brakes thereof or form the sole emergency brake means for a railway car. In either case, the engagement of the brake assemblies **10** with the wheels and rails is such that the braking action of a railway car is greatly increased so that cars of a train will stop substantially instantaneously and thereby prevent telescoping of cars during a wreck. Furthermore, the gripping action of the jaw members **24** and **26** on the rails prevents the upward movement of the railway cars and eliminates the possibility of derailment and overturning of the same.

In view of the foregoing, it will be seen that the provision of railway cars with the emergency brakes which are the subject of this invention will result in a railway car which may be quickly stopped and which will not overturn when the brakes are applied. Although passengers of a car will be slightly shaken up during the sudden stopping of the same, it will be seen that a resulting loss of lives in railway wrecks will be greatly diminished and travel on railroad trains will become much safer than at the present time.

Referring now to Figures 9, 10 and 11 in particular, it will be seen that there is illustrated a modified form of brake assembly which is referred to in general by the reference numeral **120**. The brake assembly **120** includes a hollow housing **122** whose lower portion is in the form of an elongated generally rectangular rail engaging portion **124**. The rail engaging portion **124** is substantially identical with the rail engaging element **12** and has an arcuate end portion **126** which is engageable with a rail engaging face of a railway car wheel to form a brake shoe therefor. The other end of the rail engaging portion **124** is rounded as at **128** to prevent the accidental jamming of the same. It will be understood that the rail engaging portion **124** has a bottom surface **130** which is adapted to frictionally engage the head of a rail **132** to provide a braking action.

The brake assembly **120** is normally suspended above the rail **132** adjacent one wheel of a railway car and is intended to be moved downwardly and to the left, as viewed in Figure 9, into its braking position. In order that the brake assembly **120** may be properly supported, the forward portion of the housing **122** is provided with an upstanding ear **134** to which is pivotally connected by a pivot pin **136** a first support arm **138**, the support arm **138** being identical with the support arm **66**.

Referring now to Figure 10 in particular, it will be seen that the housing **122** includes an upwardly and rearwardly sloping cylinder portion **140**. The cylinder portion **140** commuicates with the hollow interior of the housing **122** and has slidably mounted therein a piston **142**. The piston **142** is integral with a lower end of a shaft **144**. It is intended that the shaft **144** has its other end (not shown) connected by a universal joint to a horizontal plunger shaft similar to the horizontal plunger shaft **82**. In order that hydraulic fluid may be retained within the housing **122**, the outer end of the cylinder portion **140** is closed by a suitable packing gland **146** which surrounds the adjacent portion of the shaft **144**.

Carried at opposite sides of the housing **122** are downwardly and inwardly curved jaw members **148**. The jaw members **148** have opposed serrated clamp faces **150** which are adapted to clampingly engage the web of the rail **132** below the head thereof and function both as a braking means and to prevent upward movement of the brake assembly **120**.

It will be noted that integral with the upper portion of each of the jaw members **148** is an inwardly directed support portion **152** which passes through an adjacent side wall of the housing **122**. The inner end of the support portion **152** is pivotally connected by suitable fastening means to a plate **154** disposed within the housing **122**.

Referring now to Figure 11 in particular, it will be seen that the jaw members **148** are also supported by inwardly projecting ears **156** which are pivotally connected by pivot pins **158** to outwardly projecting ears **160** of the housing **122**. The ears **160** are carried by side portions of the rail engaging portion **124** of the housing and are disposed between adjacent ears **156** of their respective jaw members.

Referring once again to Figure 10 in particular, it will be seen that the plates **154** have tapered inner edges **162** which are engaged with a conical forward portion **164** of the piston **142**. It will be also noted that the plates **154**, although they are slidably mounted within the housing **122**, form the walls of an extension of the cylinder **140**.

When the brake assembly **120** is actuated by downward and forward movement of the shaft **144** due to urgence of a fluid cylinder (not shown) such as the fluid cylinder **84**, the brake assembly **120** will move downwardly and forwardly until the rail engaging portion **124** engages the head of the rail **132**. Further downward and forward movement of the shaft **144** will result in the pumping of hydraulic fluid, which is disposed within the housing **122**, to urge the plates **162** outwardly. Outward movement of the plates **162** will result in the inward movement of the clamping faces **150** of the jaw members **148** and the clamping of the web of the rail **132**.

In the event that the pressure of the hydraulic fluid is insufficient to urge the plates **154** outwardly, the conical forward portion of the piston **142** will move into engagement with the edges **162** of the plates **154** and through a camming action will urge the same outwardly.

In order that hydraulic fluid may be conveniently placed into the housing **122**, the upper portion thereof is provided with a suitable fitting **166**. Also, inasmuch as the support portions **152** pass through the walls of the housing **122**, that portion of the housing is provided with suitable sealing means **168** which engage the support portions **152** and prevent escape of hydraulic fluid.

The operation of this device will be understood from the foregoing description of the details thereof, taken in connection with the above recited objects and drawings. Further description would appear to be unnecessary.

Minor modifications of the device, varying in minor details from the embodiment of the device illustrated and described here, may be resorted to without departure from the spirit and scope of this invention, as defined in the appended claims.

Having described the invention, what is claimed as new is:

1. In an emergency brake for railway vehicles, a brake assembly comprising a housing having an elongated rail engageable portion adapted to overlie and frictionally engage a rail, jaw members pivotally carried by said housing for clampingly engaging a web of a rail, actuating means carried by said housing urging said jaw members into a rail clamping position, said actuating means including a supporting shaft for the brake assembly, and a piston connected to said jaw members and connected to said supporting shaft for actuation thereby, said housing being provided with a wheel engaging portion, said wheel engaging portion forming a friction brake for a wheel and limiting movement of said housing with said supporting shaft to insure movement of said piston relative to said housing to actuate said jaw members.

2. In an emergency brake for railway vehicles, a brake assembly comprising a housing having an elongated rail engageable portion adapted to overlie and frictionally en-

gage a rail, jaw members pivotally carried by said housing for clampingly engaging a web of a rail, actuating means carried by said housing urging said jaw members into a rail clamping position, said actuating means including hydraulic primary means for positioning said brake assembly and secondary wedge means for urging said jaw members into rail engaging positions, a conical piston movable with said housing, said piston forming a part of both said hydraulic primary means and said secondary wedge means.

3. In an emergency brake for railway vehicles, a brake assembly comprising a housing having an elongated rail engageable portion adapted to overlie and frictionally engage a rail, jaw members pivotally carried by said housing for clampingly engaging a web of a rail, a first support arm, means pivotally connecting said housing to said support arm, a second support arm connected to said housing for relative sliding movement, wedge members mounted in said housing and connected to said jaw members, a piston carried by said second support arms engaged between said wedge members, and means for moving said second support arms to shift said rail engageable portion into a rail engaging position and to move said piston further between said wedge members to set said jaw members.

4. In an emergency brake for railway vehicles, a brake assembly comprising a housing having an elongated rail engageable portion adapted to overlie and frictionally engage a rail, jaw members pivotally carried by said housing for clampingly engaging a web of a rail, a first support arm, means pivotally connecting said housing to said support arm, a second support arm connected to said housing for relative sliding movement, wedge members mounted in said housing and connected to said jaw members, a piston carried by said second support arms engaged between said wedge members, and means for moving said second support arms to shift said rail engageable portion into a rail engaging position and to move said piston further between said wedge members to set said jaw members, said rail engageable portion having a wheel engageable part to limit movement of said housing by said second arm.

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