

(No Model.)

2 Sheets—Sheet 1.

T. L. RICHARDSON.  
AIR BRAKE ATTACHMENT.

No. 513,145.

Patented Jan. 23, 1894.

Fig. 1.

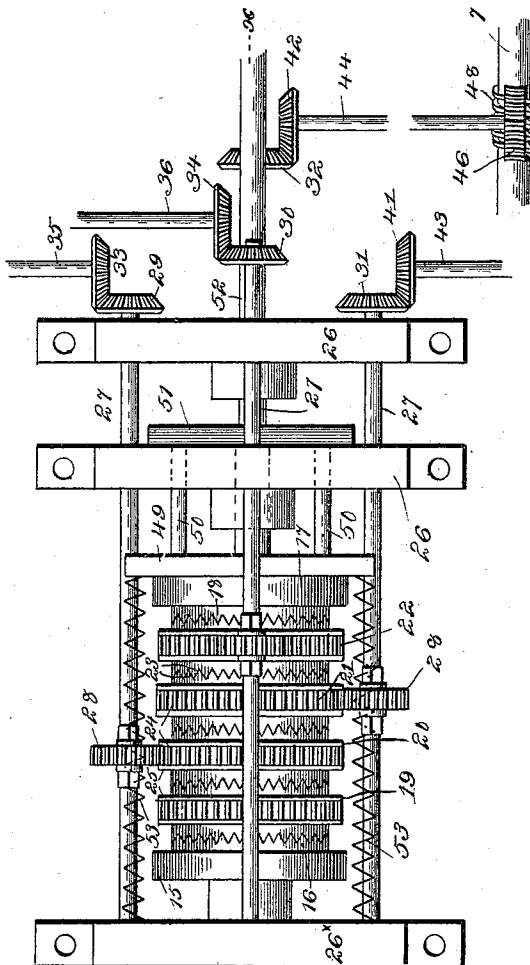
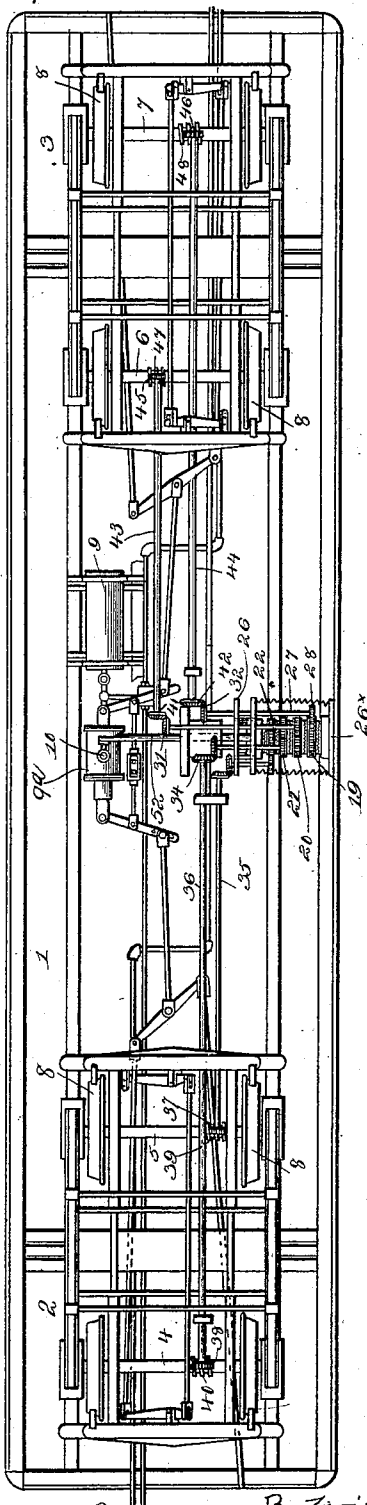


Fig. 2.

Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

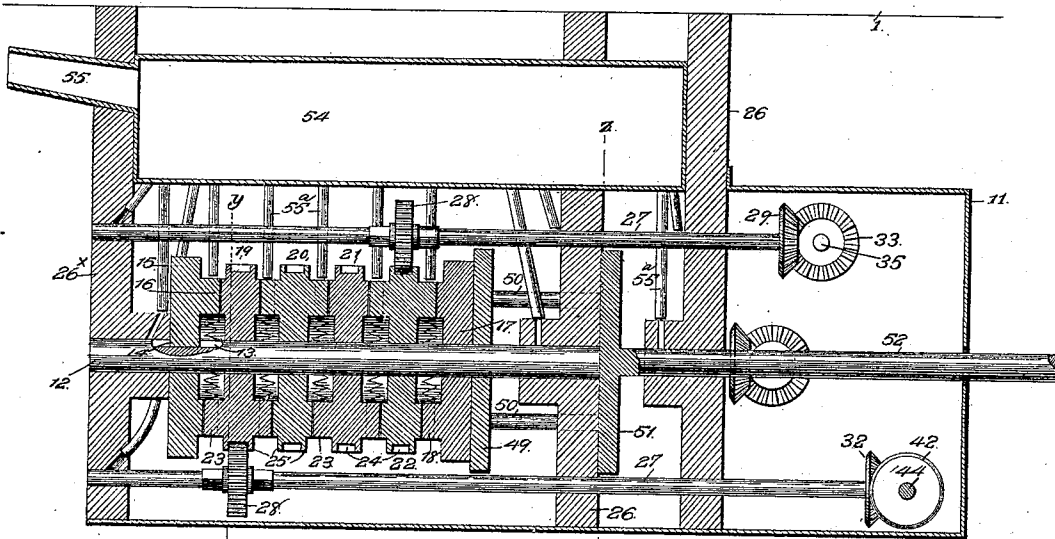


Fig. 4.

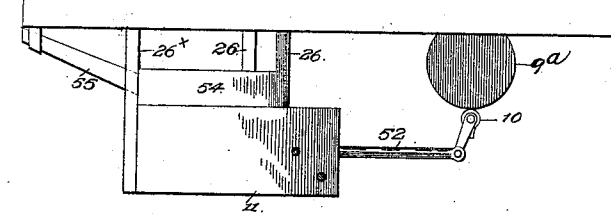


Fig. 5.

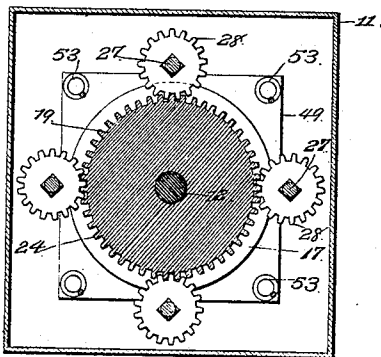
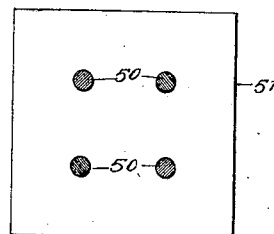


Fig. 6.



Witnesses

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# UNITED STATES PATENT OFFICE.

THOMAS L. RICHARDSON, OF HOISINGTON, KANSAS.

## AIR-BRAKE ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 513,145, dated January 23, 1894.

Application filed May 23, 1892. Serial No. 434,015. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS L. RICHARDSON, a citizen of the United States, residing at Hoisington, in the county of Barton and State of Kansas, have invented a new and useful Air-Brake Attachment, of which the following is a specification.

This invention relates to certain new and useful improvements in brake attachments, and consists of the construction and arrangement of the parts thereof, as will be more fully hereinafter described and claimed.

The object of this invention is to avoid causing what is known as "flat wheel" and it operates to release the air from the brake cylinder of ordinary air-brakes, when the mechanism shall have been placed in suitable position, the construction of the several parts being such that the operation thereof is automatic.

In the drawings:—Figure 1 is a bottom plan view of the car with the ordinary form of air-brake mechanism in connection therewith, and the improved attachment applied thereto. Fig. 2 is a top plan view of a part of the attachment disconnected from the car. Fig. 3 is a sectional view on the line  $x-x$ , of Fig. 2. Fig. 4 is a side elevation on a reduced scale of a portion of the car and the attachment in position thereunder. Fig. 5 is a transverse vertical section on the line  $y-y$ , Fig. 3. Fig. 6 is a similar section on the line  $z-z$ , Fig. 3.

Similar numerals of reference are employed to indicate corresponding parts in the several figures.

Referring to the drawings, the numeral 1 designates a car of any preferred form of construction having trucks 2 and 3, each of which is provided with a pair of axles 4, 5, and 6, 7, having wheels 8, of ordinary form of construction, and connected to said trucks and the wheels as set forth, is mounted an ordinary air-brake mechanism comprising the usual brake-cylinder 9 and provided with a suitable form of auxiliary reservoir 9. The brake-cylinder is of the ordinary construction, with the exception that it is provided with a release-valve 10 at one side.

To the under portion adjacent to one side of the car is secured a box or casing 11, in which is mounted a shaft 12, having a groove

13 therein engaged by a feather 14, connected to a flanged circular head 15, having clutch teeth 16 projecting from the inner side or face thereof and surrounding the said shaft 12. At the opposite portion of the shaft 12, some distance from the head 15, is a head 17, which is keyed to said shaft and provided with clutch teeth 18, arranged in a manner similar to the clutch teeth 16, hereinbefore set forth.

Loosely surrounding the shaft 12 are a series of gears 19, 20, 21 and 22, which have bearing on the said shaft but are free to move longitudinally and formed with clutch teeth 23, extending from opposite sides of each and similar in construction and arrangement to the clutch teeth 16 and 18, connecting the heads 15 and 17. The teeth 24 are formed below the peripheral face or rim of each of the gears referred to and thereby flanges 25 are arranged on each side of the said teeth 24.

In the casing 11 are mounted heads or uprights 26, through which project a series of shafts 27, which are four in number, and at their inner portions carry pinions 28, which engage the teeth 24, of the gear wheels 19, 20, 21 and 22, at different points as shown in Fig. 5, and are of such width or thickness as to movably fit between the flanges 25 of the said gear-wheels. The pinions 28 are positioned in such manner relative to the gears 19, 20, 21 and 22, that they will not interfere with each other and are also arranged at such distances on the shafts 27 supporting the same, as to have proper engagement with the several gears. The number of the shafts 27 is same as the number of axles carried by the two trucks of the car, and on the ends of the said shafts 27 are keyed bevel pinions 29, 30, 31 and 32. The pinions 29 and 30 mesh with pinions of a similar construction as at 33 and 34, which are keyed to the ends of shafts 35 and 36, having worm wheels 37 and 38 on the ends thereof gearing respectively with worms 39 and 40, carried by the axles 4 and 5 of the truck 2. The beveled pinions 31 and 32 mesh with similar pinions 41 and 42, keyed to the ends of shafts 43 and 44, having worm wheels 45 and 46 on the opposite ends thereof, which engage with worms 47 and 48, respectively connected to the axles 6 and 7, of the truck 3. From this description it will be observed that

each of the gear-wheels 19, 20, 21 and 22, is connected with one of the axles of the trucks.

Within the casing or covering 11 is located a head 49, from which extend four rods 50, which movably extend through the adjacent head or upright 26, and are connected to another head 51, from which centrally extends a rod 52, which projects through and beyond the inner end of the casing 11, and is connected to the release valve 10, of the brake cylinder 9.

When the air is thrown on by the engineer to apply the air-brakes, as the consequence of the pressure exerted upon the brakes used, the wheels are locked against movement and often slide over the rails, thereby wearing away portions of the wheels and producing what is known as "flat-wheel." By means of the attachment herein set forth, this disadvantageous and injurious result of the use of the air-brakes is avoided. The gears 19, 20, 21 and 22, have the clutch teeth thereof normally in locked engagement with each other and with the clutch teeth 16 and 18, of the heads 15 and 17 and thereby they all move together with the shaft 12, and rotate in one direction, and at the same time are held in said engagement by four springs 53 secured to the head 49 and an upright 26<sup>x</sup>, said parts being on opposite sides of the gears and clutch teeth. These springs 53 are coiled and of sufficient tension to hold the parts with which they co-act, normally engaged. The motion is transmitted to the shaft 12 and the gears and heads supported thereby as set forth, by the pinions 28, which are longitudinally movable on their shafts 27, but which are engaged and moved by the peripheral flanges 25 of the gears 19, 20, 21 and 22, and said shafts 27 are rotated through the bevel gear connection on the ends thereof, and on the ends of shafts 35, 36, 43 and 44, running to the axles of the trucks and revolved by the worm wheels and worms hereinbefore set forth. Should one of the axles of the truck cease its movement, by virtue of the shoes clamping against the wheels thereon, the shaft in connection with said axle would cease to move, and the shaft 27 operated thereby would have its movement stopped as would also the gear in connection with the pinion 28 on the said shaft 27. This would cause the said gear to become separated or disengaged from the adjacently situated gears by the clutch teeth on said parts endeavoring to move away from each other, and thereby longitudinally spread the heads apart against the action of the coiled springs 53, which would slightly move the head or upright 51 through the medium of the rods 50, and actuate the rod 52 to open the release valve and relieve the brake cylinder 9<sup>a</sup> of some of the air contained therein. This would reduce the pressure on the brakes used, and permit the blocked wheel to revolve, when the gears would immediately assume their normal locked position as shown in Fig. 3,

and again permit a unitary revolution of the same until another wheel should become locked when the releasing operation would be repeated.

To lubricate the mechanism set forth, an oil tank or box 54 is mounted over the casing 11, and has a spout or feeder 55 extending from the upper portion thereof, at an upper angle of inclination, to one side of the car, and in convenient position to be supplied with a suitable lubricant. From the bottom of the said box or tank extends a series of pipes 55<sup>a</sup>, which run to the several journals of the mechanism located below the same with a beneficial result, and as will be readily understood by those skilled in the art.

The advantages and utility of a device of the character set forth will be readily apparent to those skilled in the art to which the same appertains, and it is obviously apparent that many minor changes in the construction and arrangement of the several parts might be made and substituted for those shown and described without in the least departing from the nature or spirit of the invention.

Having thus described the invention, what is claimed as new is—

1. In a device of the class set forth, the combination of the brake mechanism, the trucks, axles, and wheels, a clutch comprising a series of gears having clutch-teeth at their sides yieldingly maintained in engagement, heads at the ends of the clutch, shafts operated by the axles, gears on the shafts and engaging the clutch-gears, said shafts being connected with the heads, springs for normally drawing the heads together, a brake-cylinder, and connections between said heads and the release-valve thereof, substantially as specified.

2. In a device of the character set forth, the combination of the brake mechanism, trucks having axles therein, shafts attached to the brake mechanism and having gears thereon operated by said axles, clutch mechanism in connection with said shafts, and a rod extending from said clutch mechanism to a release valve of the brake cylinder, substantially as described.

3. In a device of the character set forth, the combination of the air-brake mechanism, the trucks carrying axles having worms thereon, shafts having worm wheels engaging said axles, other shafts connected to the aforesaid shafts and carrying pinions, a series of gear wheels having clutch teeth and adapted to engage each other, heads adjacent to said gear wheels, and a rod attached to one of said heads and extending to a release valve of the brake-cylinder of said air-brake mechanism, substantially as described.

4. In a device of the character set forth, the combination with the air-brake mechanism and the axles of the trucks, of a series of gear wheels having clutch teeth, shafts connecting said axles and gear wheels, and longitudinally movable pinions carried by said shaft, said

clutch mechanism being in connection with a release valve of the brake-cylinder, substantially as described.

5. In a device of the character set forth, the combination with the air brake mechanism and the axles of the trucks, of a series of gear wheels having clutch teeth, springs normally holding said gear wheels in engagement with each other, a series of shafts individually connecting said gear wheels with the axles of the trucks, pinions on said shafts, and a rod extending from said gear wheels to a release valve of the brake-cylinder, substantially as described.

6. In a device of the character set forth, the combination with the brake mechanism and the wheel axles, of clutch gears having flanged peripheries with teeth between said flanges, a series of shafts connecting said gears with the wheel axles, pinions movably mounted on a portion of said shafts and engaging the said gears between the flanges thereof, and a rod in engagement and extending from the said clutch gear to a release valve of the brake cylinder, substantially as described.

7. In a device of the character set forth, the combination of the brake mechanism, the wheel axles having worms thereon, a se-

ries of longitudinally extending shafts with worm wheels on the outer ends thereof engaging said worms of the axles, bevel pinions on the inner ends of said shafts, a series of shafts at right angles to the aforesaid shafts having engaging bevel pinions, pinions longitudinally movable on said series of shafts at right angles to the aforesaid shafts, a series of gear wheels having flanged peripheries, with teeth between the flanges thereof, and clutch teeth extending from opposite sides of the same, oppositely situated heads having similarly arranged clutch teeth extending from the inner opposing sides of the same, springs normally holding said parts in engagement, a head carrying a series of rods attached at their inner ends to another head, a rod centrally extending from the last named head, and a brake cylinder having a release valve with which said rod is connected, substantially as described.

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

T. L. RICHARDSON.

Witnesses:

JNO. H. SIGGERS,  
HORACE G. PIERSON.