L. BECKER.
Car-Brake.

No. 213,378. Patented Mar. 18, 1879.

FIG. 1.

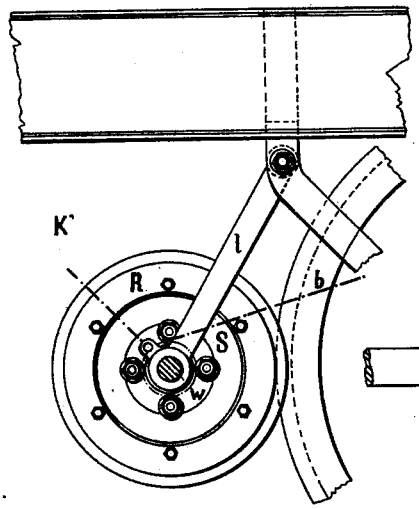


FIG. 2.

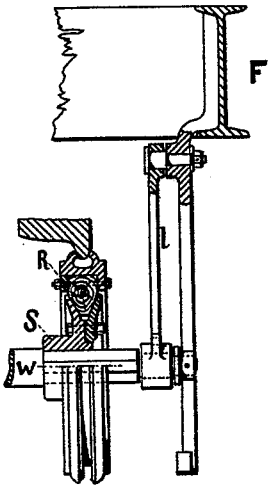


FIG. 3.

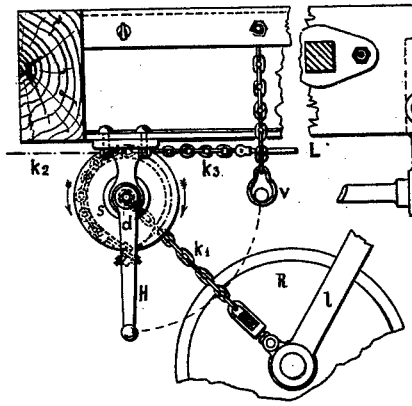


FIG. 4.

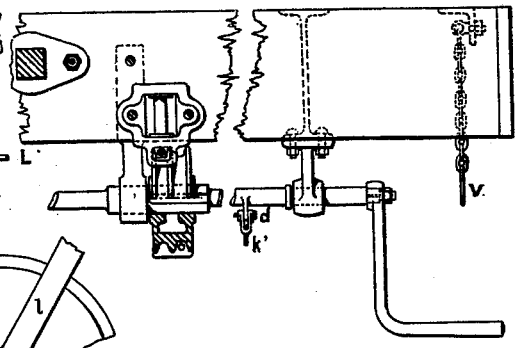


FIG. 5.

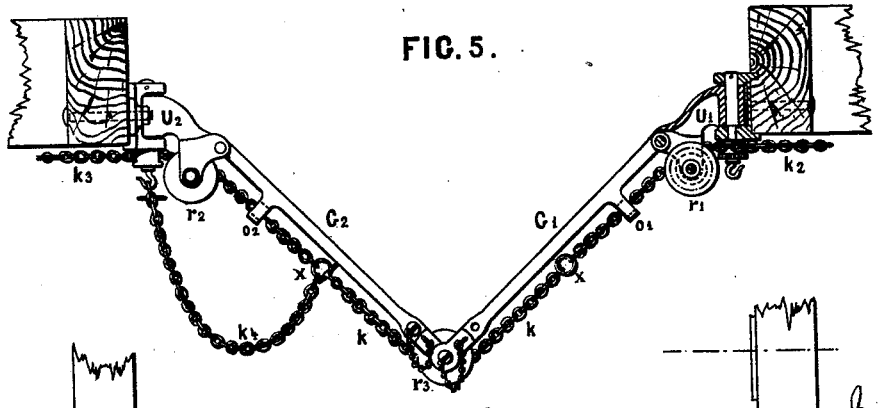
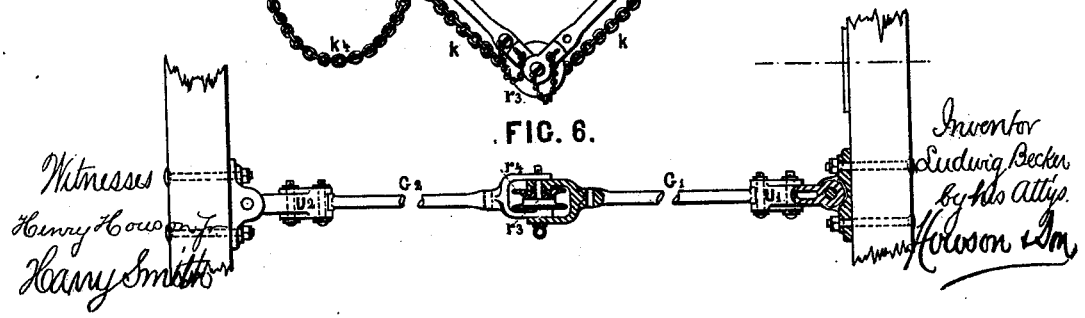


FIG. 6.



Witnesses
Henry Howson Jr.
Harry Smith

Inventor
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By his attys.
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UNITED STATES PATENT OFFICE.

LUDWIG BECKER, OF VIENNA, AUSTRIA.

IMPROVEMENT IN CAR-BRAKES.

Specification forming part of Letters Patent No. **213,378**, dated March 18, 1879; application filed November 18, 1878.

To all whom it may concern:

Be it known that I, LUDWIG BECKER, of Vienna, Empire of Austria, have invented a certain new and useful Improvement in Railway-Car Brakes, of which the following is a specification:

This invention relates to apparatus for retarding the speed of or stopping railway-trains by making use of the *vis viva* of the rolling stock in motion for automatically bringing the brake apparatus into action, and to improved means for conveying power produced at any particular part of the railway-train to other parts of the train, in order to there act either on the brake apparatus directly, or indirectly on the rest of the chain or other device for transmitting power.

A rocking shaft arranged beneath the frame of the carriage or other rolling stock carries opposite the tires of a pair of the running wheels a pair of disks. On each of these disks a loose ring is fitted, which, when the said rocking shaft is brought near the wheel, touches either the bearing-surface or the flange of the said wheel, so that when the wheels rotate their friction causes the rotation of the said loose rings, and consequently, also, of the disks, with their shaft. On the said shaft the end of a chain or rope is fixed, the other end of which communicates with the brake apparatus. When the said loose ring is arranged to run on the flange instead of on the bearing-surface of the wheel, it is formed on its circumference with a groove corresponding to the form of the flange, so as to insure sufficient contact.

The action of the apparatus is as follows: When the friction-ring on the rocking shaft comes into contact with the wheel, the said friction-ring rotates and communicates its motion to the disk and shaft, thereby causing a chain to be wound up and the brake-blocks to be drawn against the wheels; but an essential peculiarity of the present apparatus is that, although the action of the brakes is a complete one, the wheels are not caused to stand still or to skid, as is the case with other continuous brakes. This advantage of the present construction is attained on account of the chain not being wound up by the direct action of the said friction-ring, but by the disk fastened on the shaft, so that the said disk and shaft will rotate until the brakes have been properly drawn against the wheels, but will then remain at rest, while the friction-ring will rotate along as long as the wheel in contact with it revolves.

In order to be able to make use of the strain produced by the said chain or other similar device at other parts of the train for the purpose of putting on other brakes in the train, a special guiding arrangement is used. This guiding arrangement consists, essentially, of jointed links fitted to the ends of the carriage or other rolling stock, and which can be connected to similar jointed links on the other carriage firmly, and so that, while the joints remain movable at their ends, they can follow these approaching and receding motions of the two coupled carriages. At suitable points of the jointed links guide-rollers are fitted, over which a part of the draw-chain arranged throughout the train passes, so that the said chain, while remaining suitably stretched, can conform to the different positions of the carriage without altering its length, and therefore without being tightened or slackened by the motion of the carriages.

The construction of the friction-gear is indicated in Figures 1 and 2. It serves to press the brake-blocks against the tires either directly or by means of the brake-levers. A rocking shaft, W, carries a fast disk or sheave, S, on which a friction clip or ring, R, is fitted loosely and turns freely. The shaft W is held by two movable arms, *l*, hanging under the carriage-framing, and it can thereby be moved away from or toward one of the pair of wheels of the carriage.

The friction-ring R is set opposite to the tire of the wheel, and is made with a cylindrical or a grooved periphery, according as it is intended to press either against the bearing-surface or against the flange of the tire. In the latter case the groove in the friction-ring is made of such a shape as to gripe the flange, even in case the gear should chance to be slightly displaced to one side.

The action of this apparatus is as follows—that is to say: On the shaft being lowered,

the friction-ring R comes in contact with the wheel, and is thereby caused to revolve, transmitting its motion to the fixed sheave S and the shaft. It thereby winds the brake-chain *b* onto the said shaft and applies the blocks to the wheels, as described farther on.

Without departing from the substance of this invention, the friction-ring may be so arranged that it can be driven from its inner instead of outer surface by the carriage-axle. For this purpose it may have a loose sheave or drum adjustable to its outer circumference instead of on its inner side, to which sheave or pulley the chain communicating with the brake-blocks is attached. In this case the axis of the friction-ring is in the line of the carriage-axle, on which a conical sheave is fixed, and against which the said friction-ring can be pushed when the brakes are to be applied. The said friction-ring will then be caused to rotate, and draw with it the loose sheave or drum, which will wind up the brake-chain. When the brakes are off the said friction-ring will be pushed on one side, and be out of contact with the friction-cone fixed on the carriage-axle.

The construction of the controlling or intermediate gear is shown in Figs. 3 and 4. It serves to bring the friction-ring into or out of contact with the periphery of the wheel, and hence to put on or take off the brake. It comprises a spindle or shaft arranged under the carriage, carrying a pulley, *s*, with two grooves, and fitted with a crank-handle, H, at each end at the sides of the carriage. A short arm, *d*, on the shaft is connected by a chain, k^1, to the brake mechanism, and from the connecting-rod L a second length of the chain, k^3, passes round the pulley in one direction, and another, k^2, in the contrary direction, both being fixed to the pulley. By drawing the connecting-rod L in one or the other direction the pulleys are caused to turn. The chain k^1 is thereby wound on or off, and the friction-ring and sheave put on or taken off. Similarly the slackening of the connecting-rod will tighten or slacken the brake mechanism.

The crank-handle H is set in such manner as to be downward when the brake touches the wheel, and when the crank is turned upward and held in that position by a suitable arrangement—as, for instance, the chain and shackle *v* (shown in Figs. 3 and 4)—the brake mechanism is slackened off. This crank-handle H, however, should only be hung in the shackle *v* when the carriage does not form part of a train, as it is intended for shunting purposes only.

In order to connect the different brake-controlling parts of a train in such a manner that all or several of the brakes can be set in action simultaneously, and from a single point, a continuous transmission is necessary. This should, by preference, be adapted under each carriage, and be set in motion by some convenient mechanical or hydraulic gear. The guide-links shown in Figs. 5 and 6 are arranged to carry this mechanical transmission when adapted between each pair of carriages.

The link G^1, hinged on each end of a carriage, carries at one end a solid guide-roller, and on the other end a roller with only one side cheek. This end is so formed that it may be coupled up with the next link. The two halves then form together a whole roller, $r^3\,r^4$, and the two links $G^1\,G^2$ constitute one coupling, which is movable at each end, where the links are hinged on the carriages, and in the middle, while it can accommodate itself to the different relative positions of the carriages.

In order to render the transmission-links capable of accommodating themselves to the lateral changes of position of the carriages, these links are connected to cast-iron hinges $u^1\,u^2$, which can swing on a pin resting in a bracket on the carriage. A chain, *k*, passed over the rollers held in links is thus enabled to adjust itself to the different positions and distances apart of the carriages without said chain being tightened up or slackened.

In order to set up the continuous connection throughout the train of which the guiding-links $G^1\,G^2$ between the carriages constitute the carriers, the chains *k*, running over the rollers $r^1\,r^2$, and connected to the controlling-gear, are hooked up at *x*, as shown in Fig. 5. The remaining length of chain k^4 is hung up at U^2 in reserve. The eyes $o^1\,o^2$ serve as checks to prevent the parts at which the chains are hooked together from running off the rollers.

Each carriage provided with a brake on this principle must, on being sundered from the train, have the crank-handle H fastened up in the retaining-shackle *v*, thereby slackening the brake.

If it be necessary to put on the brakes during shunting all that is required is to draw the shackle *v* off the crank, and the friction-sheaves will come into action. This can be done without danger, and from the side of the carriage, even when it is running at a high speed, thereby greatly facilitating the shunting work.

I claim as my invention—

1. In a car-brake, the combination of the shaft W, on which the brake-chain is to be wound, and the pivoted arms *l*, which carry the shaft, with a disk or sheave, S, secured thereto, and with the friction-ring R, all substantially as described.

2. The combination of a series of pivoted arms carrying the friction-wheels and brake-shafts for the several cars with the pulleys *s*, chains k^1 and k^3, and connecting-rods L, as described.

3. The combination of the pivoted arms carrying a friction-wheel and brake-shaft with the chain k^1, pulley *s*, handle H, and shackle *v*, as set forth.

4. The combination of the chain *k*, pivoted links $G^1\,G^2$, carrying a pulley at the point

where they are hinged together, and provided with eyes o^1 o^2, as and for the purpose set forth.

5. The combination of the pivoted links G^1 G^2 with the pulley r^3 r^4 made in two parts, substantially in the manner described.

In witness that I claim the foregoing I have hereunto set my hand this 18th day of July, 1878.

L. BECKER.

Witnesses:
H. SKANDER, *Engineer.*
D. ERMÉNYI.