(No Model.) 2 Sheets—Sheet 1.

D. TORREY.

AUTOMATIC CAR BRAKE.

No. 258,615. Patented May 30, 1882.

Fig. 1.

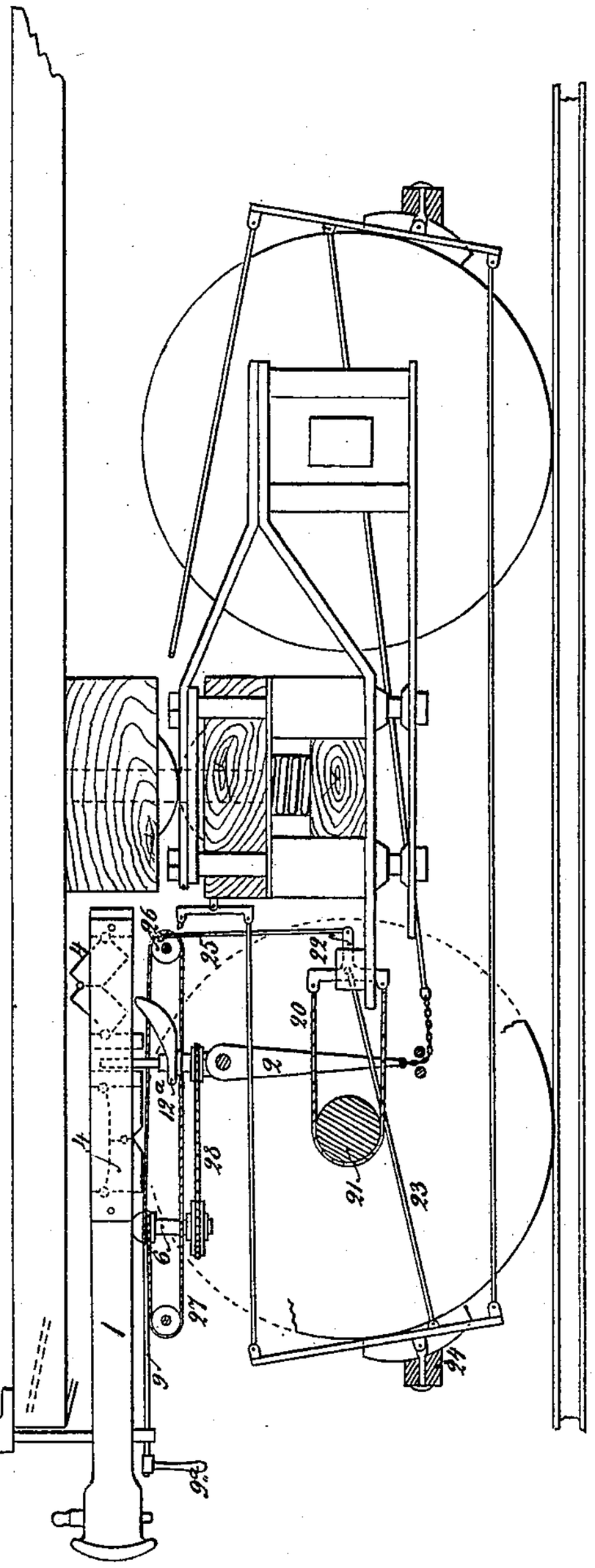


Fig. 1a.

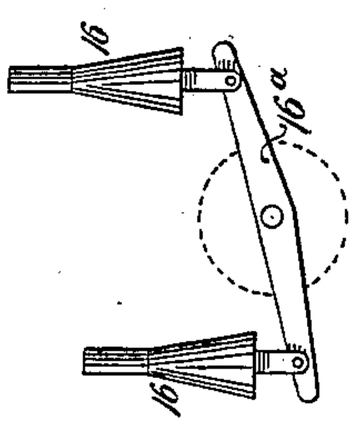
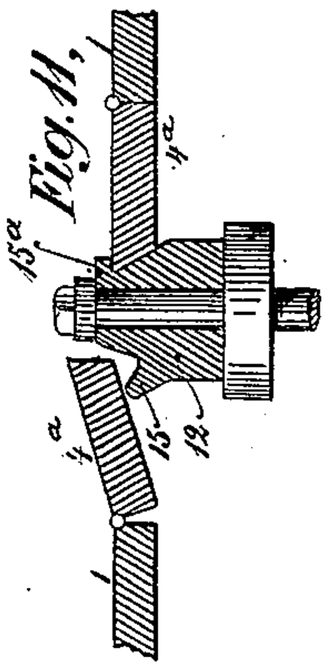


Fig. 1b.



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By his Attorneys Knight Bros.

(No Model.) 2 Sheets—Sheet 2.

D. TORREY.

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Fig. 6,

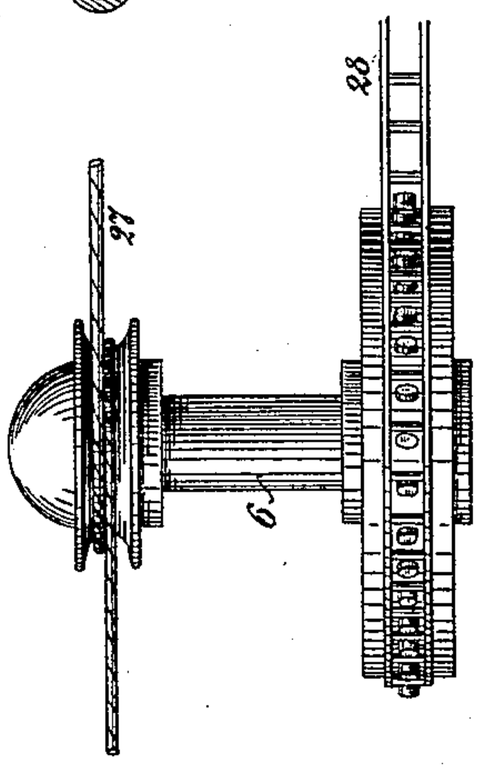


Fig. 8,

Fig. 7,

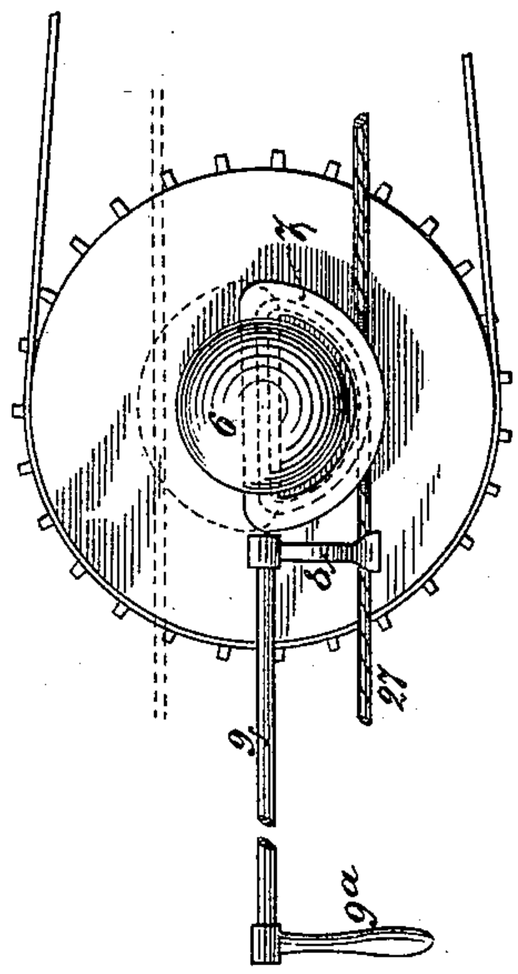


Fig. 9a,

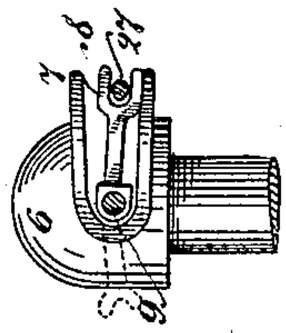


Fig. 9,

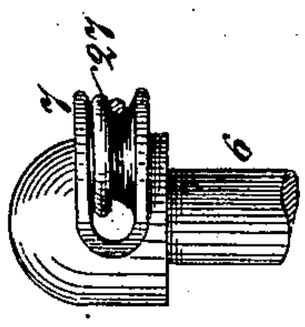


Fig. 2,

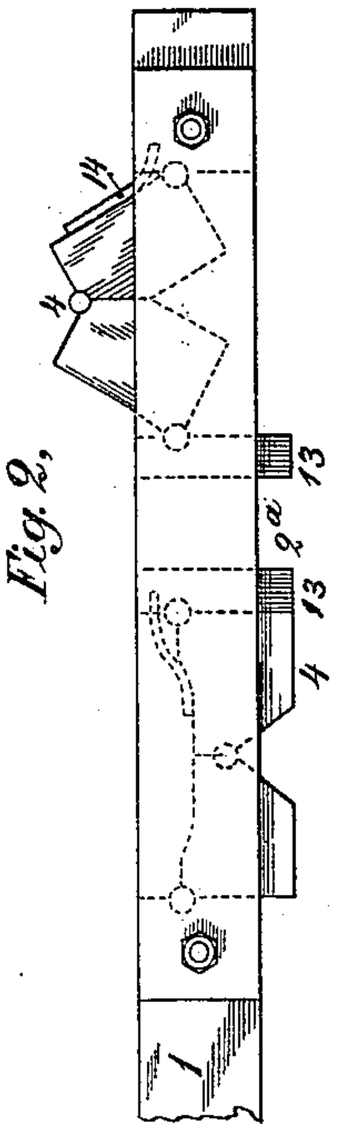


Fig. 3,

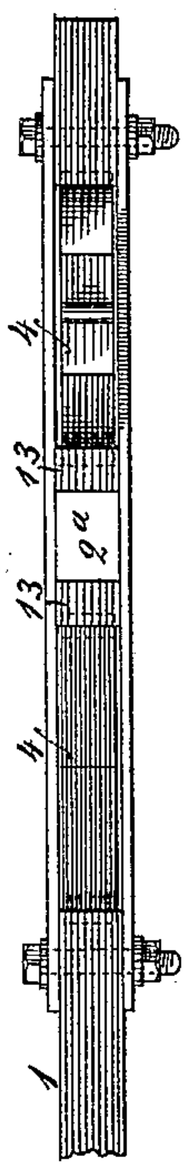


Fig. 5,

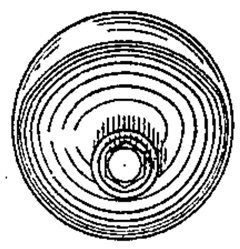


Fig. 10,

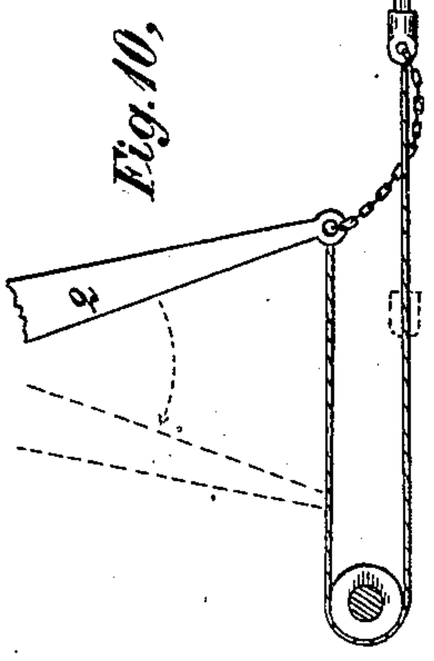
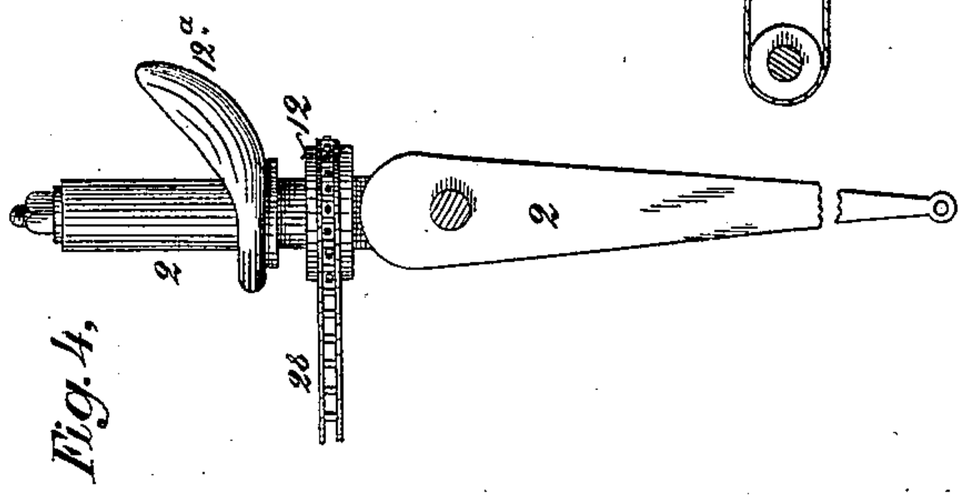


Fig. 4,



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Ernest Ashagen

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UNITED STATES PATENT OFFICE.

DOLPHUS TORREY, OF NEW YORK, N. Y.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 258,615, dated May 30, 1882.

Application filed October 18, 1881. (No model.)

To all whom it may concern:

Be it known that I, DOLPHUS TORREY, a citizen of the United States, residing in the city, county, and State of New York, have invented Improvements in Automatic Car-Brakes, of which the following is specification.

The invention relates to mechanism to effect the application of the brakes of a railroad-car by means of the draw-bar.

The subject of the invention is a double-acting draw-bar brake. By a "double-acting draw-bar" brake is meant one which, being properly set, causes the application of the brakes by either drawing out or pushing in the draw-bar, according to which way the cars are moving. My double-acting draw-bar brake apparatus includes means for direction adjustment, in addition to the automatic appliances which effect the application of the brakes by a check derived from the engine while moving in either direction. By "direction" adjustment is meant the adjustment of the apparatus to the direction in which the car is to be pulled, after which the automatic adjustment will meet all conditions of service. The direction adjustment is required because the brake-operating draw-bar is actuated by the engine when the engine is attached thereto—that is to say, when said brake-operating draw-bar is at the front end of the car—and by the cars behind when the engine is attached to the other draw-bar and the brake-operating draw-bar is in the rear. In the one case movement of the draw-bar only in a direction opposite that in which the car is moving will apply the brakes, while in the other case this condition of application is reversed. By "automatic" adjustment is meant the automatic changing of the adjustments of the mechanism so that the brakes will be applied whenever the movement of the train in either pulling or backing is resisted by the engine.

The object of my invention is to simplify the mechanism by which the desired results can be attained, and to do so with devices little liable to get out of order. The purpose which I accomplish is the automatic application of the brakes whenever the motion of the car at any rate of speed is opposed by the application of resistance by the draw-bar, including both the forward and the backward movements of the car; also, the adaptation of the apparatus to the changed conditions which are presented by changes in the direction of train movement.

To these ends my invention consists in a double-acting draw-bar brake having toggles or blocks for making and breaking the connection between the draw-bars and brake-lever. These toggles or blocks are to be in duplicate, and may be placed so as to act on opposite sides of the lever; also, in an automatic adjusting device actuated by the definite movement of some part of the brake mechanism (as the swinging of the brake beams or levers) whenever the brakes are applied, and operated by a change in the direction of wheel on axle rotation; also, in a device for direction adjustment by which the double-acting automatic brake apparatus is adapted to operate when the car is pulled either end forward.

In order that the invention may be fully understood, I will describe it with reference to the accompanying drawings, which illustrate several modifications under which it may be embodied.

Figure 1 is a vertical longitudinal section of one end of a railway-car with the invention applied. Figs. 2 and 3 are respectively a side view and a plan on a larger scale, showing the draw-bar (or it may be a supplemental draw-bar operated thereby) formed with a slot or recess to receive blocks or toggles employed to determine the direction of draw-bar movement which shall apply the brakes, one of said toggles being shown set for effective action and the other unset or retracted. Fig. 4 is an elevation of the brake-lever, showing a rotatory eccentric cam at the head thereof for tripping either of the toggles or blocks while leaving the other in effective position, this adjustment being effected automatically, as hereinafter described, so as to render the brakes effective when the car is either moving forward or backing. Fig. 5 is a plan of the same, showing the eccentricity of the tripping-cam. Fig. 6 is an elevation of a transmitting-shaft carrying chain-

pulleys and employed for rotating the oblique tripping-cam by a reversal of wheel-rotation, as hereinafter described. Fig. 7 is a plan of the said transmitting-shaft and its accessories, showing the direction-adjusting devices to adapt the double-acting brake apparatus to operate with the car pulled either end forward. Fig. 8 is a detailed section on the line 8 8, Fig. 6, of a pivoted yoke, carrying the transmitting rope or chain and permitting it to be placed on one or the other side of the transmitting-shaft for the purpose of direction adjustment, as hereinafter explained. Fig. 9 is an elevation of the direction-adjustment device. Fig. 9ª is a view of the same parts, with the addition of the reversing arm and lever hereinafter described. Fig. 10 is an elevation showing the connection of the brake-lever with a chain extending from the brake-rod around a pulley and back to the rod, so that the movement of the lever in either direction will draw on the brake-rod. Fig. 11 is a detailed elevation, illustrating the use of hinged blocks instead of the toggles before shown for transmitting movement from the draw-bar to the brake-lever, and a modification in the tripping-cam adapted to the said blocks. Fig. 12 is a plan of another modification in the tripping device.

The draw-bar 1 is extended directly or indirectly by means of connected bars back under the car, so as to have such length as to permit the attachment of the parts of the apparatus as are required, or a supplemental bar is attached to the draw-bar through the medium of a lever or equivalent device. This extended piece is made rigid, and with a long slot through it, (see Fig. 3;) or in place of the slot it may have a long recess or depression in it. Within this slot or depression are placed, preferably at each end of it, toggle-joints 4, of the shape shown, and made so that in the set position the central joint is below the horizontal line, securing an increasing firmness of position with any increase of pressure applied by the draw-bar. These toggles are hinged to the draw-bar, preferably at the ends of the slots, and at the ends approaching each other are hinged to sliding blocks 13. This construction effects the shifting of these sliding blocks toward the ends of the slot to which a toggle is attached whenever the joint of the toggle is raised. The shorter end of the brake-lever 2 is placed at 2ª, between these sliding blocks, but disconnected from them. If the draw-bar is moved in either direction, with one toggle raised and the other one set, the effect is to compel the swinging of the brake-lever before the advancing movement of the set toggle, and thereby apply the brakes. The longer arm of the brake-lever is attached to the brake-rod in any one of the ways common to effect an application of the brakes by the swinging of the lever in either direction, two of which ways are shown in Figs. 1 and 10.

As the requirements of the apparatus are that the movement of the draw-bar in either direction from its position of rest shall apply the brakes according to the adjustment of the blocks or toggles to the positions of set or relaxation, it is only necessary to have a device to control the position of the blocks or toggles in accordance with the direction of wheel-rotation to accomplish the purpose of the apparatus. One method of applying to this use a change in direction of wheel-rotation consists in the employment of a friction belt or chain, 20, passing over the axle 21, and connected with a lever, 22, that will operate to rotate a shifting device. The application of such belt to the axle should depend upon the application of the brakes, and is accomplished by having a rod, 23, projecting from the brake-beam 24 or its lever, utilizing the swinging motion of the beams. This swinging of the beam toward the axle effects a tightening of the friction belt or chain 20. Such belt or chain, being carried by the rotation of the axle 21, swings the lever 22, causing the said lever or a pulley used in lieu thereof to move a pitman, 25, rotating a pulley, 26, thereby shifting the chain 27, which will rotate the transmitting-shaft 6, which imparts movement to the transmitting-chain 28, thereby rotating the drum 12, with the tripping-cam 12ª, and unsetting one or other of the blocks or toggles. This movement, which will always follow the application of the brakes, if not yet effected by a previous application, shifts in a longitudinal direction the chain or wire cord 27, connected with the transmitting-shaft 6. The shifting-tie 27 may be either a chain or a wire rope. I have shown a rope, but may use a chain on account of its superior flexibility. The longitudinal movement of this chain is in a definite direction for each direction of wheel-rotation. The connected movements of these shafts are such that with the friction band or chain 20 at one limit of its permitted movements the tripping-cam 12ª is positioned so that a particular part of it is presented to each toggle, and that by a shifting of the chain 20 the faces of the cam are reversed in their presentation to the toggles.

The tripping-cam 12ª, carried by the cylinder or drum 12 on the arm of the brake-lever, is in the form of an inclined collar or rim, the edge of which rises so as to bend the toggle or raise the block toward which it is presented from a set condition, the rim on the opposite side being depressed, so as to not operate on the toggle or block. The mode of action is that one of the toggles or blocks is always unset while the other is set. The rotation of the drum shifting the cam, the pressure of the inclined edge of said cam against the toggle or block previously set will lift it and render it unset, while the other toggle will fall into a set condition, aided thereto by a spring, 14.

The shaft 6, to which the setting and transmitting chains 27 28 are attached, is made with a hole through it near its projecting end. Through this hole passes the pivot of a yoke,

7, which can be swung over the end of the shaft from one side to the other. This yoke carries the shifting-chain 27, and by its change from one side to the other of the shaft the chain is caused to rotate the shaft in reversed direction by its movement in the same direction. This shifting of the yoke is effected by a shaft, 9, extending from, say, the end of the car to near the yoke, having a V-shaped arm, 8, embracing the chain 27 near the yoke 7, and a handle, 9^a, at the end of the car. The shifting-chain 27 is attached to the shaft 6 at a point elevated above the line of pulleys over which it passes, which causes a stress at the point of application to the shaft and yoke, holding the yoke firmly away from the end of the shaft and preventing any accidental shifting of the yoke over the end of said shaft.

In the modified construction shown in Fig. 11, instead of toggles, hinged arms 4^a are employed, attached one at each end of the slot in the draw-bar 1, as described with reference to the toggles. The inner ends of these arms are formed to fit against the surface of the drum 12, which is formed with an upward slope or bevel, and has on one side, at the top, a lug, 15^a, which prevents the slipping upward of the end of the arm when the pressure of the draw-bar is applied, but which does not prevent the rotation of the drum, which, by shifting the position of the lug, releases the engagement of the arm against the lever. On the side of the drum opposite the lug, as described, is a collar or rim, 15, which, as in the case of the cam 12^a, before described, acts to lift from contact the arm of the hinged block opposite the one held in engagement.

Instead of either of the devices described for setting and unsetting the toggles, sliding conical cams 16, Fig. 12, may be used, connected to opposite ends of a lever, 16^a, pivoted in its center, so that when one cam is pushed in the other will be withdrawn. This lever is attached to the transmitting-chain 28, or may be carried by the drum 12, so as to be operated by the rotation of the axle, as before described, so that any change of direction in wheel-rotation will place a designated cam under the proper toggle or hinged block.

The operation of the mechanism is as follows: The car is assumed to be in front of the observer, with the mechanism attached to the draw-bar at the left end of the car in a condition of rest, the toggle between the draw-head and lever being set, while the other one is unset. The engine, being attached to the left end of the car, pulls out, extending the draw-bar, which, owing to the condition of the rear toggle, applies no stress to the brake-lever. The engine slows, compressing the draw-bar, which pushes the front toggle against the brake-lever, and thereby puts on the brakes. If this action is continued until the car is stopped and moves backward, the change in the direction of wheel-rotation will shift the chain 27, and by means of the shaft 6 and transmitting-chain 28 will rotate the cam-drum 12 on the top or end of the brake-lever 2, thereby bringing the cam 12^a from under the rear toggle to a position below the front toggle, unsetting it, while at the same time the rear toggle falls into a set position. Under these conditions the brakes come off, the draw-bar being inoperative on the lever, leaving the car free from the brakes for backing motion. Should the engine now be slowed, the momentum of the car will cause an extension of the draw-bar, thereby bringing the rear toggle to act upon the brake-lever and apply the brakes. If this extension of the draw-bar be continued until the motion of the car is reversed, the consequent change of direction of wheel-rotation will shift the chain 27, rotate the shaft 6 and the cam-drum, and unset the rear toggle, setting the front one, putting the apparatus in the condition first described. If the engine be attached to the right end of the car, the direction of wheel-rotation will be the reverse of what has been described for like movements of the draw-bar. To obviate this difficulty the attendant employed turns the handle 10 on the shaft 9 and shifts the yoke 7 to the opposite side of the shaft 6, whereby the shaft is rotated in a direction opposite that which a like movement of the transmitting-chain would have effected before, and the whole mechanism is as fully adapted as before to effect the application of the brakes either in going ahead or backing.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a double-acting draw-bar brake apparatus, the combination, with the draw-bar and brake-lever, of duplicated blocks or toggles, arranged for alternative use to transmit motion from the draw-bar to the brake-lever in one or the other direction.

2. In an automatic draw-bar brake apparatus, the combination, with the draw-bar and brake-lever, of duplicated blocks or toggles for transmitting motion from the former to the latter in one or the other direction, and a reversible tripping device for unsetting one or the other of said transmitting-blocks or toggles.

3. The combination, with the draw-bar, the brake-lever, and a transmitting device for communicating motion from one to the other, of a cam-drum, mounted on the brake-lever and carrying a tripping device for unsetting the transmitting device, substantially as described.

4. The combination, with the draw-bar, the brake-lever, and one or more blocks or toggles for transmitting motion from the draw-bar to the brake-lever, of the cam-drum and the oblique cam or eccentric carried thereby, for tripping the transmitting-block or toggle, substantially as decribed.

5. The automatic adjustment device 20 22, placed in active position by the movement of the brake-beam and actuated by the rotation of the axle, substantially as described.

6. The reversible yoke, in combination with the transmitting-shaft and chain or cord, for setting said chain or cord on either side of the shaft for direction adjustment, as explained.

7. The combination of the draw-bar or transmitting-bar connected therewith, the brake-lever, one or more interposed blocks or toggles, the cam-drum, and the transmitting chain or cord actuating said cam-drum for automatic adjustment, substantially as described.

DOLPHUS TORREY.

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