(No Model.) 2 Sheets—Sheet 1.

W. B. TURNER.

CAR BRAKE.

No. 336,026. Patented Feb. 9, 1886.

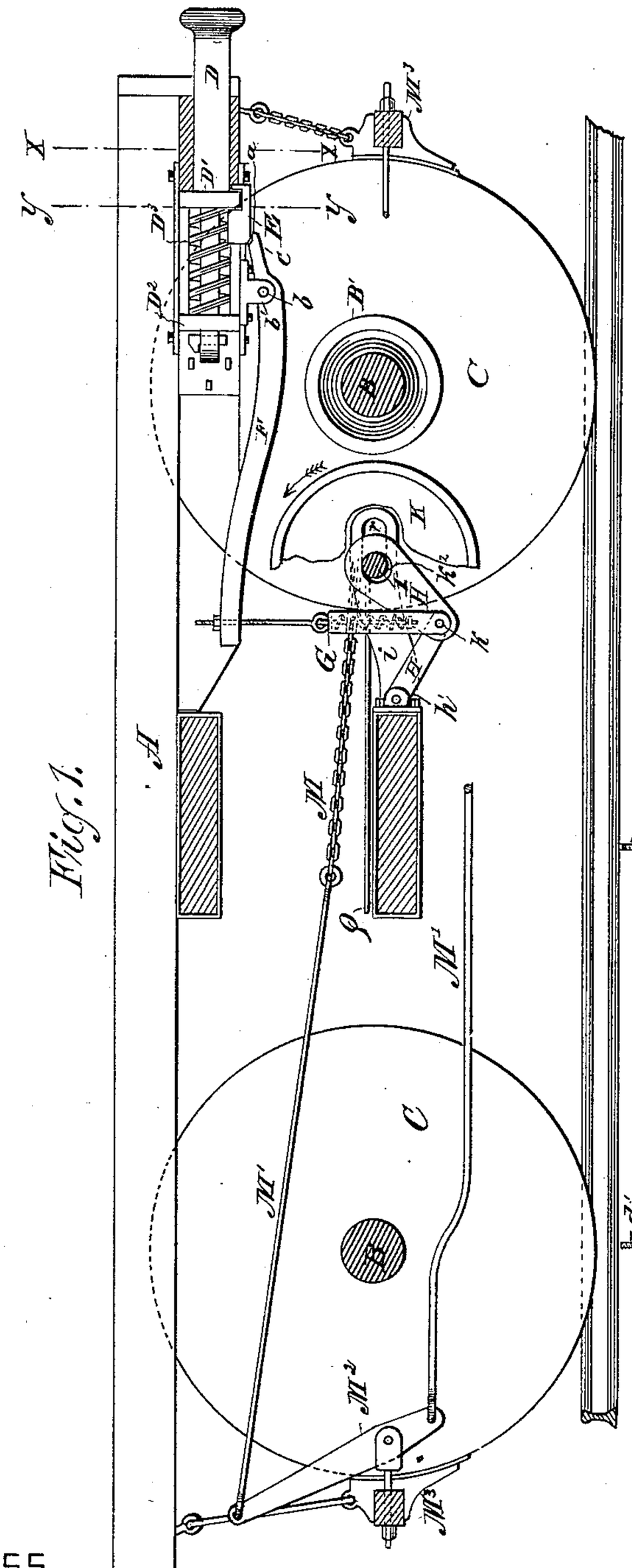

Fig. 1.

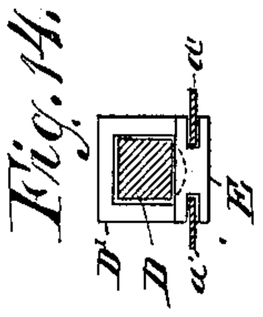

Fig. 14.

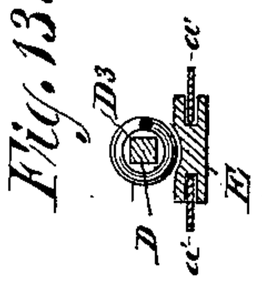

Fig. 13.

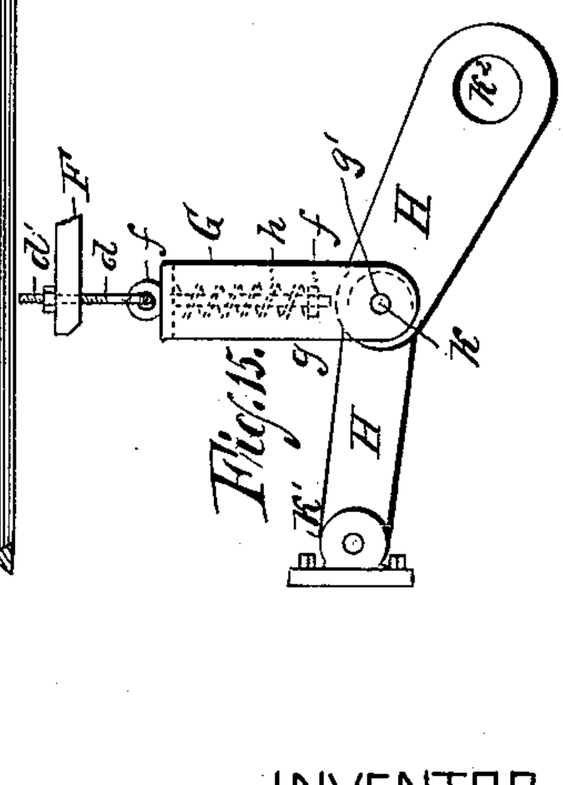

Fig. 16.

Fig. 15.

WITNESSES

C. W. Benjamin

Hamilton Ruddick

INVENTOR

William B. Turner,

by Isaac L. Stover.

his attorney.

(No Model.) 2 Sheets—Sheet 2.

W. B. TURNER.

CAR BRAKE.

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fig. 2.

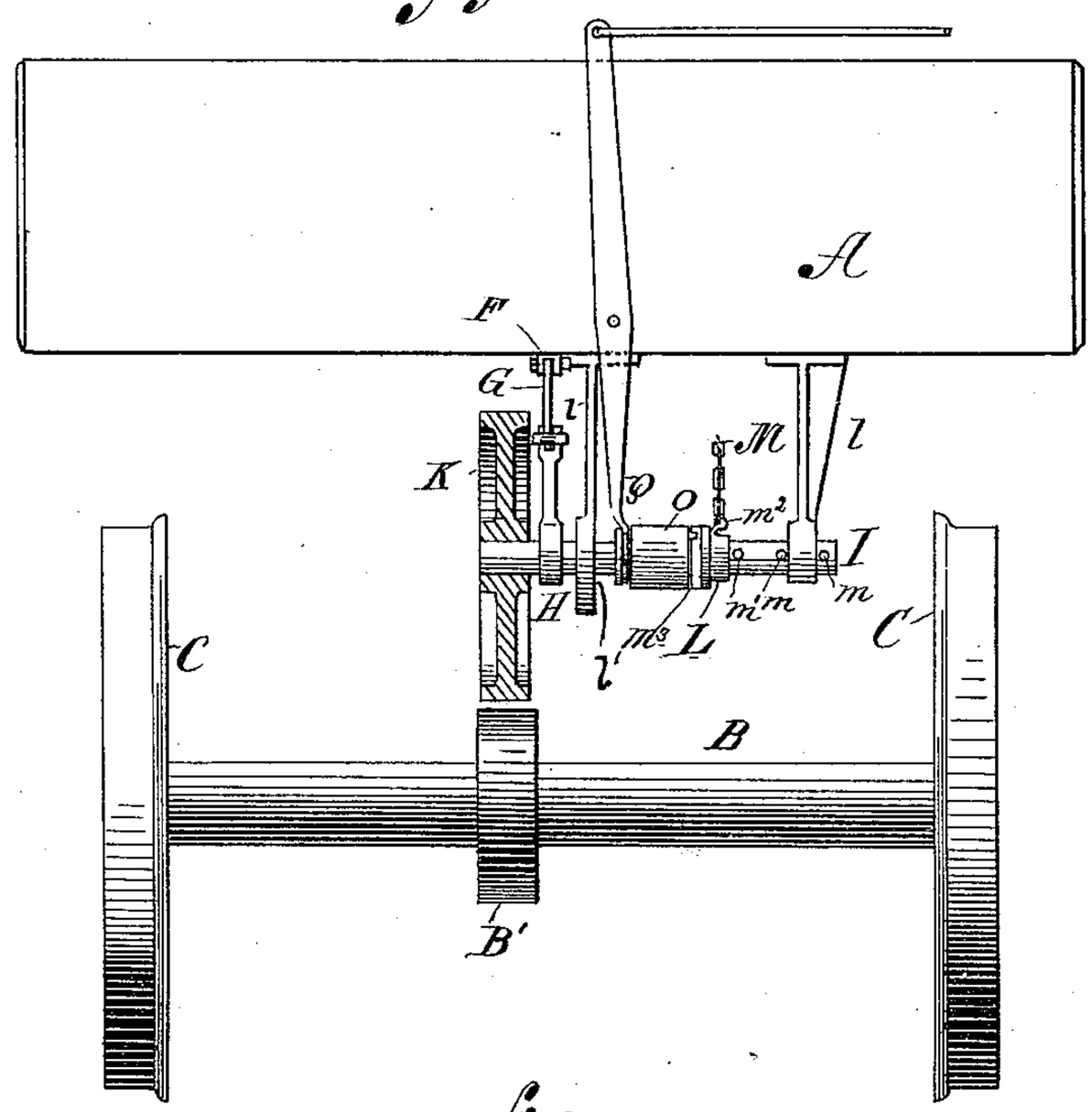


fig. 12.

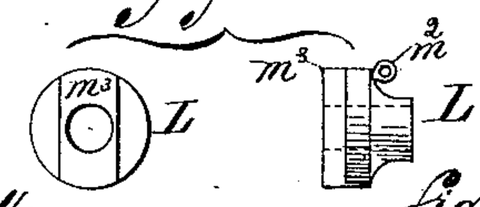


fig. 11.

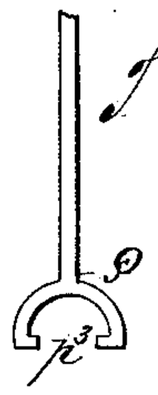


fig. 3.

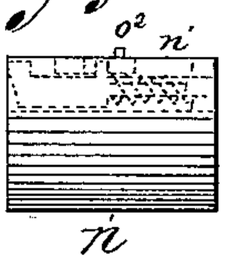


fig. 4.

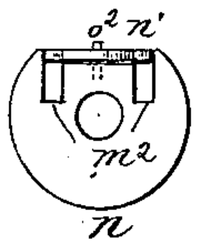


fig. 9.

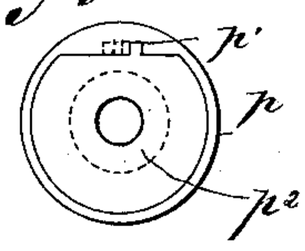


fig. 5.

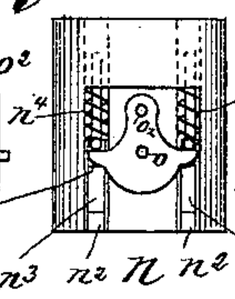


fig. 7.

fig. 8.

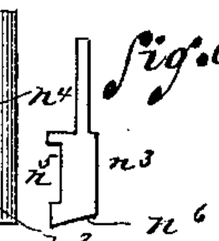


fig. 10.

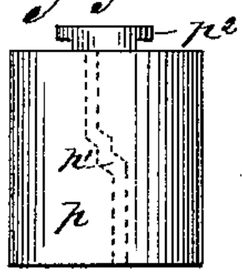
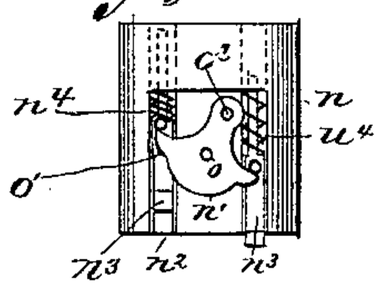


fig. 6.



Witnesses

C. W. Benjamin

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Inventor

William B. Turner,

by Isaac L. Stover,

his attorney.

UNITED STATES PATENT OFFICE.

WILLIAM B. TURNER, OF NEW YORK, N. Y., ASSIGNOR TO THE TURNER BEARD AUTOMATIC BRAKE COMPANY, OF SAME PLACE.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 336,026, dated February 9, 1886.

Application filed October 10, 1885. Serial No. 180,351. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. TURNER, a citizen of the United States of North America, and a resident of the city, county, and State of New York, have invented a new and useful Improvement in Car-Brakes, of which the following is a specification.

This invention relates to that class of car-brakes in which the brake mechanism is put in operative position by the inward movement of the draw-bar, and in which the power to apply the brake is derived from a friction-collar placed upon one of the car-axles and arranged to operate certain mechanism specially designed for the purposes of utilizing the rotary movement of the axle and the momentum of the car for applying the brake; and it embraces also a novel shifting device, by means of which the brake is rendered operative, in whichever direction the car may be pulled, all of which will be hereinafter fully set forth.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of a car-truck, showing my improved device in place, with parts broken away to exhibit other parts. Fig. 2 is a plan, partly in section, of certain parts of my improved brake in position on a car. Fig. 3 is an enlarged side elevation of the block portion of the brake-shifting device, showing a bolt and spring in dotted lines. Fig. 4 shows an enlarged end elevation of the same with bolts and spring removed. Fig. 5 is an enlarged plan of the same with both bolts drawn inward. Fig. 6 is an enlarged plan of the shifting-device block, showing one bolt thrown out. Fig. 7 is an enlarged side elevation of the double bell-crank of the shifting device. Fig. 8 is an enlarged side elevation of a bolt of the shifting device. Fig. 9 is an enlarged end elevation of the shifting-device shell. Fig. 10 is an enlarged plan of the same. Fig. 11 is an elevation of the forked shifting-lever. Fig. 12 gives an enlarged side elevation and an enlarged face view of the loose brake-chain sleeve. Fig. 13 is a sectional elevation on line *y y*, Fig. 1. Fig. 14 is a sectional elevation on line *x x*, Fig. 1. Fig. 15 is an enlarged side elevation, showing in position the device connecting the transmitting-lever with the toggle-lever of the brake. Fig. 16 is an enlarged front elevation of the same.

In the drawings, A represents a car-frame; B, car-axles; B′, a collar rigidly fixed on the forward axle, and C car-wheels.

D represents an ordinary draw-bar, and D′ D^2, respectively, the usual follower-plates, and D^3 the usual spring about the draw-bar shank. The front follower-plate, D′, is adapted to be moved rearward by the compression of the draw-bar, and forward to the position shown in Fig. 1 by the action of the spring D^3.

Secured loosely to the lower edge of the front follower-plate, D′, is an attachment, E, consisting of a heavy plate of metal having its lower rear edge beveled, as shown at *a*. This follower-plate attachment E slides on the guides *a′*, that are secured to the car-frame and support the draw-bar and draw-bar springs, and is moved by and with the follower-plate D′, and serves to transmit the motion of the latter to the brake mechanism through a transmitting-lever, F, which is pivoted at *b* to a lug, *b′*, on the car-frame. Said attachment E, instead of being a separate piece, may, if desired, be made an integral part of the front follower-plate, D′. The forward arm of this lever F has its upper face beveled or inclined, as shown at *c*, to oppose the bevel or inclined plane *a* of the attachment E, (if desired, a roller may be fitted in the beveled end of the lever or of the attachment to bear on the opposite bevel, and thus reduce the friction,) and its rear arm, extending with a slight upward curve considerably to the rearward of the front axle, carries suspended from it the connecting device G, which connects the said transmitting-lever F with the toggle-lever H, through or by means of whose direct action the friction-wheel is brought into contact with the axle-collar for the purpose of applying the brake.

The bevel or inclined planes on the follower-plate attachment E and lever F may be of any desired inclination, so that the full action of said lever may be had by a quarter-inch movement of the draw-bar, or only by one-sixth of an inch movement thereof, though it is preferable that the brake should be applied by about a half-inch compression of the draw-bar. The vertical measure of the inclined

plane of the plate E or of the lever F will determine the limit of the upward throw of the inner end of the lever when the draw-bar is compressed.

The device G consists of an eyebolt, *d*, which is passed up through the rear end of the transmitting-lever F and is secured there, adjustably as to its vertical elevation, by a nut, *d'*; of an eyebolt, *f*, linked into the eye of the bolt *d* and hanging down therefrom and having a nut, *f'*, on its threaded end; of a clevis or yoke, *g*, fitted about the shank of the bolt *f*, and having its parallel depending legs perforated horizontally near their extremities, as shown at *g'*, and of a spring, *h*, coiled about the bolt *f*, with its upper end against the inner face of the head of the yoke *g* and its lower end bearing upon the nut *f'*. By turning up this nut *f*, when required, the tension of the spring *h* is increased, and it is thereby made to exert more power for holding the friction-wheel against the axle-collar, as hereinafter set forth, while the distance between the transmitting-lever F and the toggle-lever H is unchanged.

By turning the nut *d'* the distance between the levers F H may be increased or diminished, the device G practically lengthened or shortened, as may be desired, so that the angle of the toggle-lever H may be set or adjusted for a greater or lesser movement for effective operation, so that by this range of adjustment one pattern of the brake can be adapted to cars which vary in measurements between the forward axle and the timber to which the brake-frame pieces are to be secured. It is seen, then, that the said lever connecting device G is made adjustable, both as to spring-power and as to length, for better adaptation to the functions it is to perform.

The toggle-lever H, hinged at its elbow on a bolt, *k*, which passes transversely through the bolt-holes in the lower end of the yoke *g*, has one end pivoted, as shown, to a lug, *k'*, fastened on a car-timber, while the other end, provided with an eye, k^2, encircles the shaft I, which carries the friction-wheel K, firmly secured upon it. This shaft I has the end nearest the friction-wheel journaled in a slot, *l'*, formed in the free end of one of the frame-pieces *l*, which are securely fastened to a car-timber and project forward therefrom, as shown, while the other end of said shaft loosely fits in an eye in the free end of the other frame-piece *l*. Pins or stops *m* are inserted in the shaft I at either side of one of the frames *l*, and in contact therewith, to prevent lateral movement of said shaft. A loose sleeve, L, Fig. 12, set upon the shaft I, and prevented from moving laterally in one direction by a pin, *m'*, inserted in shaft I, has secured to it, or to an eyebolt, m^2, in it, one end of the brake-chain M, whose other end is secured to one of the brake-rods M', which, together with the brake-levers M^2 and brake-shoes M^3, are constructed in the usual manner, and therefore require no further description herein. This sleeve L has a straight-sided bar, m^3, projecting from its face for the bolts of the shifting device to take against, as hereinafter more fully explained.

The shifting device or clutch O is designed for holding the loose sleeve L firmly on the shaft I and preventing it from revolving in one direction or the other, as the case may be, so as to apply the brake, while allowing it to revolve in the opposite direction without applying the brakes. This clutch O, Figs. 3, 4, 5, 6, consists of a cylindrical block, *n*, flattened on one face, as shown at *n'*, and having running lengthwise the parallel grooves n^2 containing bolts n^3, Figs. 5, 7, 8, 9, about whose shanks are spiral springs n^4. These bolts n^3 are recessed or cut away on their upper edges, as shown at n^5, for the engagement therein of the double bell-crank arms, as hereinafter set forth. Centrally secured on the face of this block by a pivot, *o*, is a double bell-crank, *o'*, whose opposite arms rest in the bolt-recesses n^5, and which has a stud, o^2, projecting upward for engagement in the cam-groove *p'*, formed in the flat portion of the inner face of the shell *p*, Figs. 9, 10, which incloses the block *n*. A flanged hub, p^2, on the shell *p* serves for the engagement therewith of the prongs p^3 of the forked lever Q, which is designed for moving said shell back and forth at will for the purpose of throwing out one or the other of the bolts n^3, as the case may be, for engagement against a side of the bar m^3 of the loose sleeve L. The lever Q is pivoted to a car-timber, as shown in Fig. 2, and may have a rod secured to its upper end, for convenience of operating it, and may be held fixed in desired position in any convenient way. When the block *n* and shell *p* are in their normal position, or fixed centrally to each other, the bell-crank stud o^2 is in the center of the cam-groove *p'* and both bolts n^3 are withdrawn inside the face or end of the block; but when the shell *p* is moved either way from its center by the lever Q the bell-crank *o'* is thereby caused to turn on its pivot, thus causing one or the other of the bolts n^3 to be drawn inward and the other to be thrust outward by its spring, as shown in Figs. 2 and 6, to engage with the bar on the face of the loose sleeve L and carry said sleeve around with it, thereby causing the chain to be wound around the shaft I and the brake to be set. It will be seen that the sides of the bolts n^3 which are designed to engage with the bar of the sleeve L are beveled, as shown at n^6, so that when one of the said bolts is in such engagement or contact it bolts said sleeve as the shaft I turns in one direction, but does not hold the sleeve when the said shaft turns in the opposite direction, for then the opposite side of the sleeve-bar comes in contact with the bevel on the end of the bolt and pushes the latter back within the clutch-shell, so that the train can be backed up without setting the brakes. Hence it will be seen that when the clutch or shifting mechanism is on its center or normal position the brake

is inoperative and that it must be changed by hand (by moving the lever Q) to adjust the brake in operative position to suit the direction in which the car is to be pulled. The train being run in the direction of the arrow, Fig. 1, if the engineer wishes to stop the train, he applies a brake to his engine, which has the effect of slowing it. The cars will consequently close up, and, as the engine resists their forward motion, will by their momentum push in their draw-bars and bring the brake into operation, as follows: As the draw-bar moves inward it moves with it the follower-plate attachment E, whose inward plane is in contact with that of the transmitting-lever F, with the effect of depressing the forward end and elevating the rear end of said lever. The upward movement of the rear end of the lever F, transmitted through the lever-connecting device G, pulls up the elbow of the toggle-lever H, with the effect of straightening out the same and thereby forcing the periphery of the friction-wheel K into contact with the axle-collar B′; then, the car being in motion, the revolving motion of the car-axle is transmitted through the axle-collar to the said wheel and thence to the shaft I and clutch O, and the said clutch being properly engaged with the loose sleeve L, the latter also revolves and causes the brake-chain attached to it to be wound about the shaft I, with the effect of applying the brake.

It will be seen that as the power for applying the brake acts through the spring *h*, the tension of said spring, which may be adjusted or regulated as before said, will determine the power with which the wheel K is forced in contact with the axle-collar B′. When the car is pulled forward again and the draw-bar pulled out, the reaction of the spring *h* and the elasticity of the brake-beams throw the brake off and the mechanism thereof into the normal operative condition.

If the engine is attached to the opposite end of the train for the purpose of pulling it in that direction, it is necessary that the shifting device be adjusted to make the brake operative in said direction. To do this the handle of the lever Q must be moved, to the opposite angle, which action will slide the clutch-shell to its other extreme on the clutch-block, and as the shell is so moved, the stud o^2 of the bell-crank being engaged in the cam-groove p' of the clutch-shell, the said crank *o* is thereby caused to turn on its pivot to its opposite angle, thus pulling in the bolt n^3, which is now out, and allowing the other bolt, n^3, to be pushed by its spring out, in readiness to engage with the other square edge of the bar on the face of the loose sleeve L, thus making the brake operative in this direction, as above set forth.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a car-brake, the combination, with the draw-bar and front follower-plate, of the follower-plate attachment E and transmitting-lever F, having oppositely-inclined planes or bevels on their contiguous ends, substantially as herein shown and described, said attachment and lever being arranged to transmit the inward movement of the draw-bar to the brake mechanism, as set forth.

2. In a car-brake, as a means for bringing the friction-wheel in contact with the axle-collar, the combination, with the lever F, arranged to transmit the inward motion of the draw-bar, and the toggle-lever H, of a device, G, connecting said levers and adapted to be adjustable as to length and spring-power, as and for the purposes set forth.

3. In a car-brake wherein the power to apply the brake is derived from a collar fixed on a car-axle, the combination, with the shaft I, of the follower-plate attachment E, transmitting-lever F, lever-connecting device G, and toggle-lever H, arranged in relation with each other and with the draw-bar D and friction-wheel K, to force the said friction-wheel in contact with the axle-collar, for the purpose of applying the brake.

4. In a car-brake of the character substantially as herein described, as a means for transmitting vertical motion from the transmitting-lever F to the toggle-lever H, a lever-connecting device, G, adapted to be adjusted as to length and spring-tension, as set forth.

5. In a car-brake, the combination, with the toggle-levers H and lever F, of the lever-connecting device G, consisting of the eye-bolts *d* and *f*, connected by their eyes, nuts *d′* *f′* on the ends of said bolts opposite their eyes, yoke *g*, and spring *h*, all constructed, arranged, and operating substantially as and for the purposes specified.

6. In a car-brake of the character substantially as herein specified, the combination, with a shaft and a loose sleeve thereon for winding up the brake-chain for applying the brake, of a lever-operated clutch, O, constructed substantially as herein shown and described, consisting of a cylindrical block, *n*, flattened on one face and having two parallel grooves, n^2, recessed beveled bolts n^3, springs n^4, and double bell-crank *o′*, provided with stud o^2, and of a cylindrical shell, *p*, inclosing said block, and provided with a cam-groove, *p′*, for reception of the bell-crank stud, and also with a flanged hub, p^2, for reception of the moving lever, said block being fixed on the shaft aforesaid, and said shell being movable on said block by said lever, all arranged to operate substantially as set forth.

7. In a car-brake wherein the power to apply the brake is derived from a collar fixed on a car-axle and transmitted to a friction-wheel and shaft, a lever-operated reversible clutch, O, and loose sleeve L, set on the friction-wheel shaft, said clutch being distinct from said loose sleeve and adapted and arranged to hold or release said sleeve for the purpose of applying or throwing off the brake, as set forth.

8. In a car-brake, the combination, with the friction-wheel shaft I and brake-chain M, of

a loose sleeve, L, set on said shaft and provided with face-bar m^3, and of a lever-operated clutch, O, provided with two spring-actuated bolts, n^3, which are adapted to engage, one at a time, against opposite sides of said bar, and to hold the said sleeve fast for winding up the chain when the shaft is turning in one direction, while permitting said sleeve to be loose when the shaft turns in the opposite direction, as set forth.

9. In a car-brake of the character substantially as herein specified, the combination, with a loose sleeve on the friction-wheel shaft, of a clutch, O, provided with two beveled bolts, n^3, adapted and arranged to be alternately projected to engage the said sleeve.

10. In a car-brake of the character substantially as herein specified, the combination, with a loose sleeve on the friction-wheel shaft, of a single clutch fast on the shaft, arranged in relation to the said sleeve to hold it fast, in whichever direction the car is pulled, and to let it run loose when the car is backed, as set forth.

11. In a car-brake of the character substantially as herein specified, the combination, with a loose sleeve connected with the brake-chain and held from sidewise motion, of a fixed clutch provided with reversible teeth to connect with the loose sleeve, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 11th day of August, 1885.

WM. B. TURNER.

Witnesses:
JACOB J. STORER,
WM. E. STILLINGS.