(No Model.)

3 Sheets—Sheet 1.

W. B. TURNER & C. BEARD.

AUTOMATIC CAR BRAKE.

No. 314,983. Patented Mar. 31, 1885.

Fig. 4.

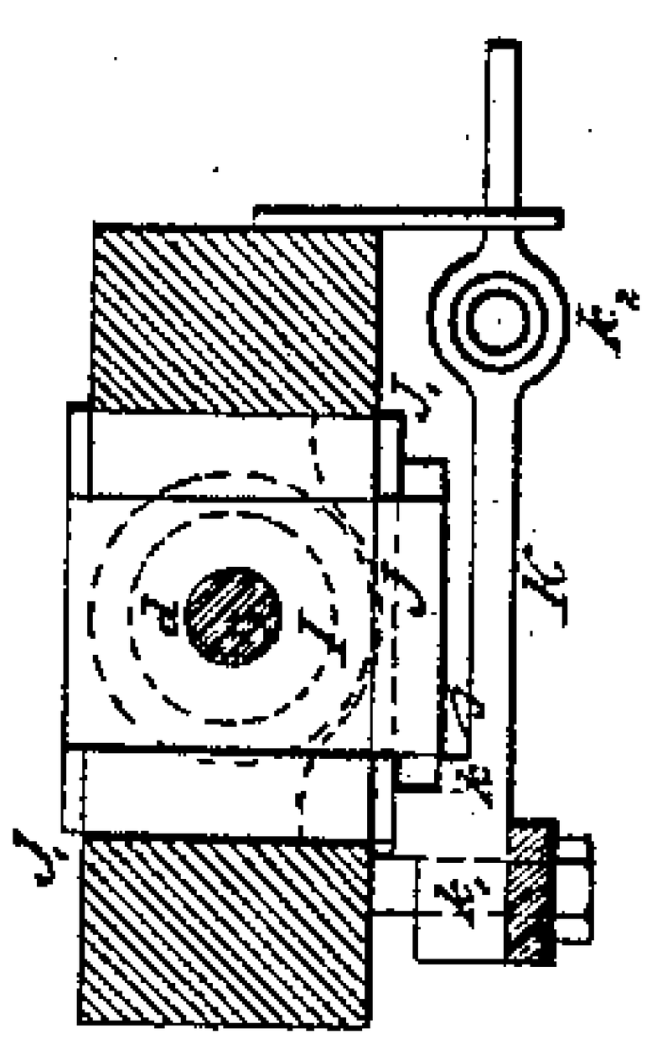


Fig. 8.

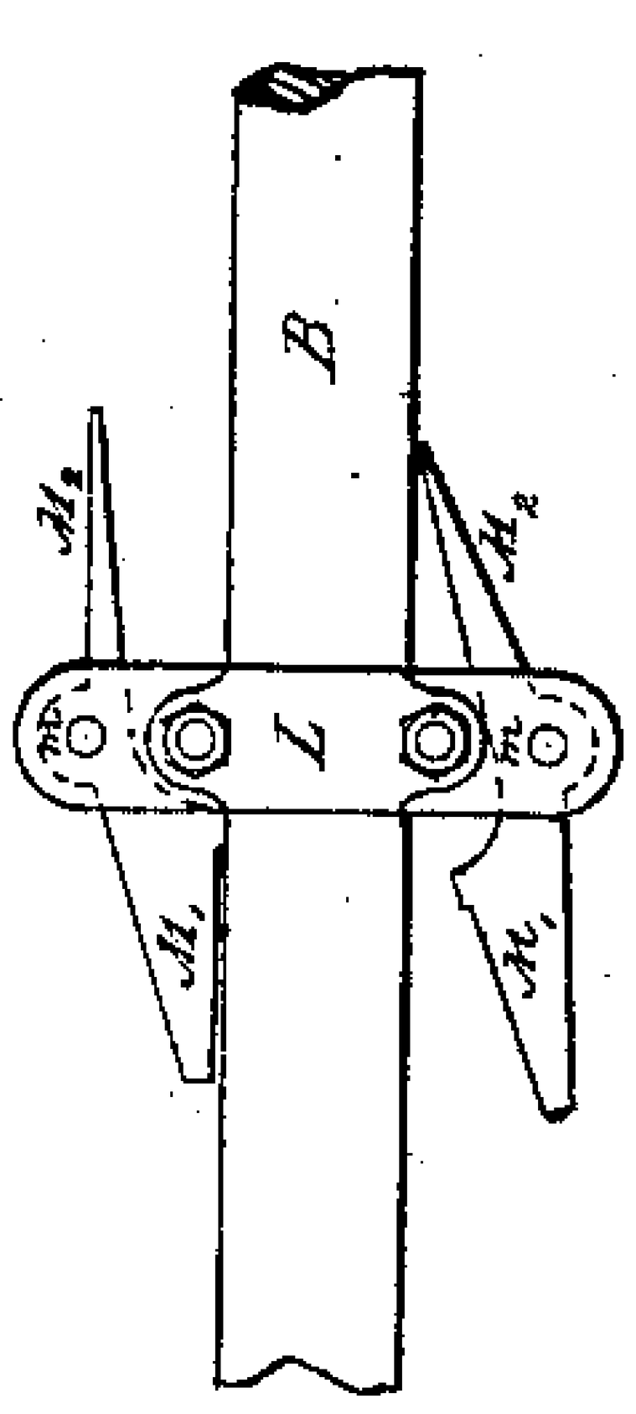
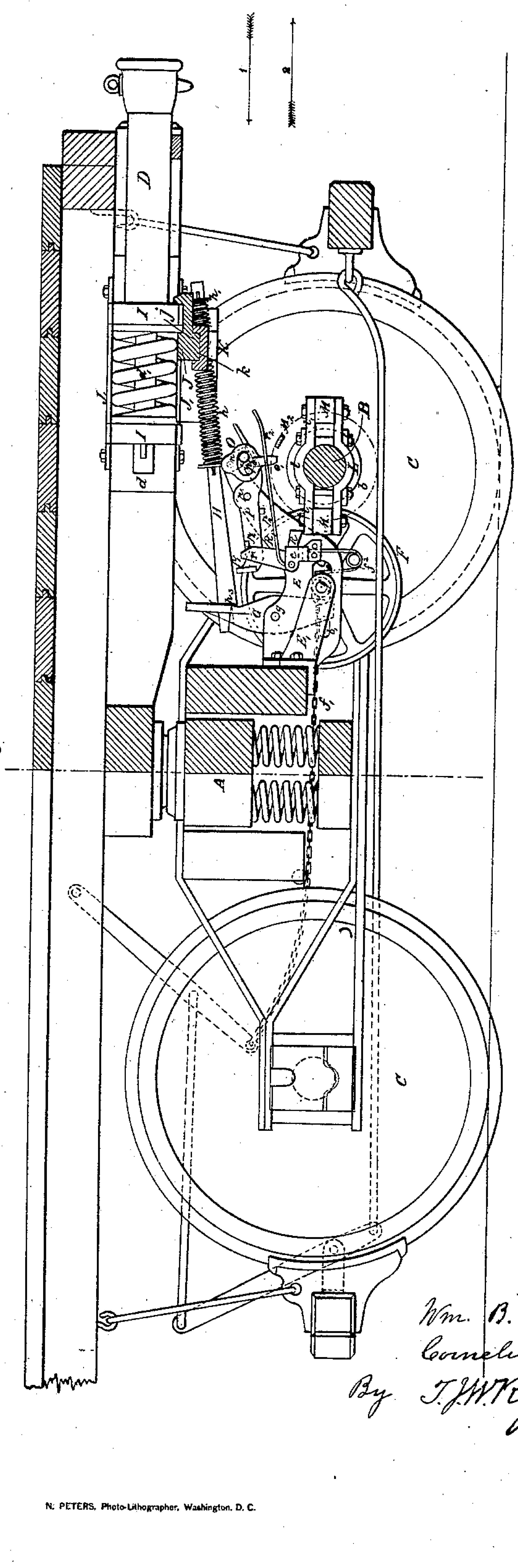


Fig. 1.



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(No Model.)

3 Sheets—Sheet 2.

W. B. TURNER & C. BEARD.

AUTOMATIC CAR BRAKE.

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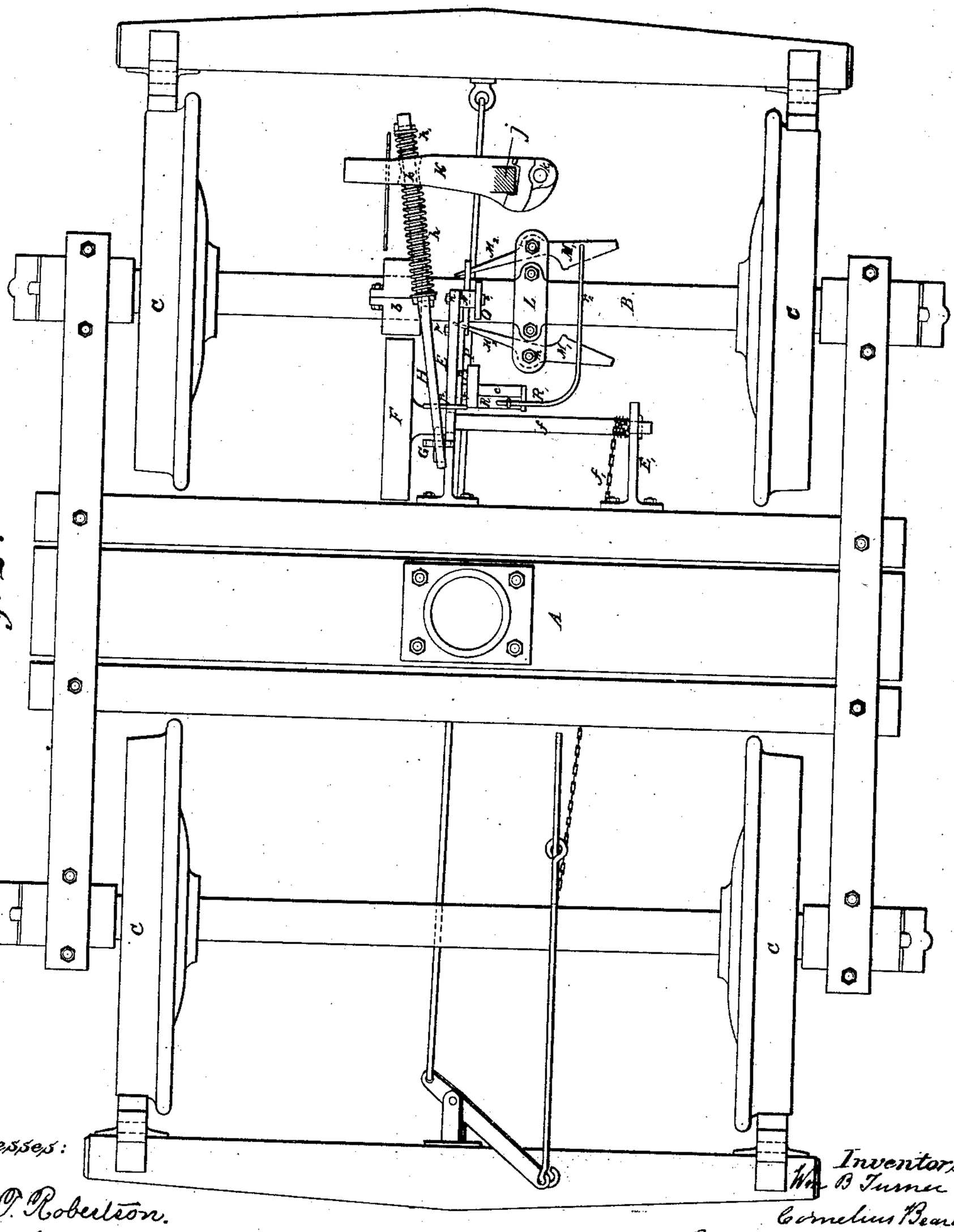

Fig. 2.

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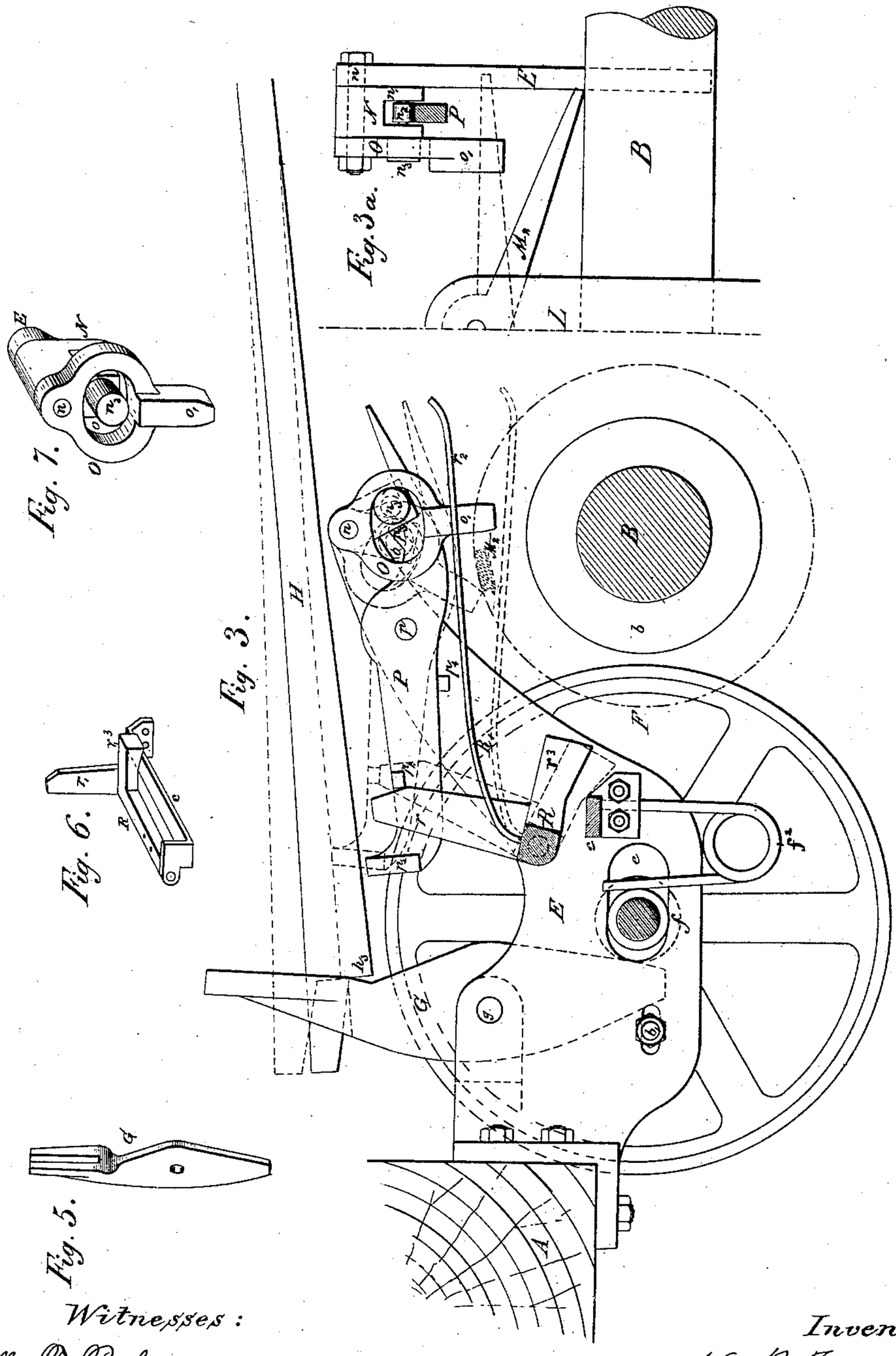
(No Model.)

3 Sheets—Sheet 3.

W. B. TURNER & C. BEARD.

AUTOMATIC CAR BRAKE.

No. 314,983. Patented Mar. 31, 1885.



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UNITED STATES PATENT OFFICE.

WILLIAM B. TURNER AND CORNELIUS BEARD, OF NEW YORK, N. Y.

AUTOMATIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 314,983, dated March 31, 1885.

Application filed April 23, 1884. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. TURNER and CORNELIUS BEARD, citizens of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Automatic Car-Brakes, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates more particularly to that class of car-brakes represented by the Patent No. 278,835, where the brake is operated by the movement of the draw-bar, and is designed to overcome certain difficulties which we have found in said class of car-brakes, for which reason we employ several new and useful devices heretofore unknown in automatic brakes, all of which will be hereinafter described and explained, together with their functions.

In the accompanying drawings, Figure 1 represents a side elevation, partly in section, of a truck, a draw-bar, and part of the frame of a car provided with our improvement. Fig. 2 is a plan of the truck, showing the parts attached thereto. Fig. 3 is an enlarged elevation showing some of the parts in two positions. Fig. 3ª is a front elevation of tripping device, showing point of weighted lever in two positions. Fig. 4 is a front elevation of one of the follower-plates and attachments thereto. Fig. 5 is a perspective of the lever used for moving the friction-wheel into position. Fig. 6 is a perspective of a dog and its supporting-bracket. Fig. 7 is a perspective detail of a hanger, &c., shown in elevation in Fig. 3ª. Fig. 8 is a front elevation of a pair of weighted levers as they appear when one lever is above and the other below the axle and the car is at rest or going with a slow speed.

Referring to the drawings, in which similar letters of reference indicate like parts in all the figures, A designates the car-truck; B, one of the car-axles having a rigid friction-collar, *b*, secured thereon in any convenient manner, and the wheel C, also rigidly secured on the axle, as usual.

D is the draw-bar, having the ordinary shank, *d*, and spring *d'*, which parts are of any ordinary and approved construction.

Rigidly secured to the frame of the truck A are the brackets E and E', the former of which has an elongated bearing, *e*, for the shaft *f* of the friction-wheel F, which shaft is also provided with loose bearings in the bracket E', and upon which the brake-chain *f'*, which connects with the brake mechanism, is wound when the wheel F is held forcibly in contact with the collar *b* of the axle, and the car is moving. At f^2 is shown a spring, which, by pressing against the axle *f*, will normally hold the friction-wheel F away from the friction-collar *b*.

Pivoted to the bracket E at *g* is a vertical lever, G, forked at its upper end, in which loosely operates a push-bar, H, and the lower end of which lever bears against the shaft *f*, and adjustable bolt, *b'*, in a slot in the bracket E, serving to limit its motion in the opposite direction.

The shank *d* of the draw-bar D passes through a follower, I, the shoulder formed between the body and shank of said draw-bar abutting against said follower I, the lower edge of which is embraced by the moving plate J. This plate J slides upon guides J', secured upon the under side of the car-frame, and a downwardly-projecting lug, *j*, upon said plate J operates in a recess, *k*, of an oscillating lever, K, pivoted to the lower surface of the car-frame at *k'*. This plate J may, however, be dispensed with by making a lug of the proper size upon the bottom of the follower I.

The push-bar H operates loosely through a perforation, k^2, in the lever K, and carries upon one side of said lever a spring, *h*, and upon the other side a spring, *h'*, the lever K being held between the two springs. The push-bar H has a lug, h^3, which bears against the forward face of the lever G, except when said push-bar is elevated to throw the brake mechanism out of operation by means which will shortly be described.

The operation of this part of the invention is as follows: The car being in motion in the direction of arrow No. 2, and the engine "slowed," the momentum of the car acting through the draw-bar forces said draw-bar back, and carries the follower I with it. This action forces the plate J rearward on its guides J' until the lug *j* operates to swing the oscil-

lating lever on its pivot k' and acts against the spring h on the push-bar H, forcing said push-bar longitudinally rearward. This action through the lever G forces the shaft f forward, and consequently brings the friction-wheel F into contact with the axle-collar b, which causes the friction-wheel to revolve and wind up the brake-chain f' on its shaft and apply the brakes. The brakes thus applied will remain in action as long as the pressure on the draw-bar is maintained. If the car starts again in the same direction, the pressure on the lever G will be taken off, the spring f^2 acting on the axle f will push the wheel F from the collar b, the axle will unwind the chain f', and thus the brake will be released, and all the parts resume their normal position.

It will be seen that the lever K is pivoted eccentrically, or at one side of the center of one of its ends, which allows of the lug j passing out of the recess k of the lever K, and thus the draw-bar may continue its inward motion without producing any further effect upon the push-bar and its connections.

L designates a pair of clamps of such form that when the curved portions l embrace the axle B the arms l' will be far enough apart to allow the free action of a pair of weighted levers, M, which are pivoted between the ends of said clamps by pivot m. These weighted levers M are composed of two essential portions, which, for convenience, and to indicate their manner of working, I will denominate "lifters" M′, and "pushers" M^2, and are so constructed and arranged that when the axle is revolving at a predetermined rate of speed the lifters M^2 are thrown outward by centrifugal force, as shown in Fig. 2, but when traveling slowly they rise and fall as the axle revolves, according to the position they happen to be in—viz., above or below the axle.

Pivoted at n upon the bracket E is a bifurcated hanger, N, in the jaws n' of which is pivoted a roller, n^2. A stud, n^3, upon the side of this hanger N operates loosely in an elongated aperture, o, formed in the hanger O, having upon its lower portions a downwardly-projecting lug, o', which lug o' lies in the path of the pushers M^2 of the weighted levers M.

Pivoted to the bracket E at p is a lever, P, carrying upon its heavier end a cross-arm, p', which lies under the push-bar H near the lug h^3, having upon one of its sides a stud, p^2, and upon the inner edge of its lighter arm a cam, p^3. A stud, p^4, on the side of the bracket E, supports the heavier end of the lever P. This lighter arm sets loosely within the jaws n' of the hanger N, and the cam p^3 lies in the path of the roller n^2 when the hanger N is oscillated. In its normal position this lever P, when the brake is operative, has its cross-head p' out of contact with the push-bar, and its cam is to one or the other side of the roller n^2, according to the direction in which the car has last been moved.

Attached to the side of the bracket E is a side bracket, c, between the end of which and said bracket E is provided a rocking bar, R, carrying a dog, r, the top or upper end of which passes under the stud p^2, for a purpose hereinafter set forth. This rock-shaft carries an arm, R′, which extends for a short distance parallel with the rock-bar R, and is then bent at right angles, forming an arm, r^2, which extends over the axle, so as to be in the path of the lifters M^2 when they are thrown out by centrifugal force. The weight of this arm R′ r^2 tends to keep the dog r in contact with the stud p^2, and to carry the dog r under it when the lever p is raised, as shown in dotted lines in Fig. 3; but to make this movement of the dog r more sure I attach to the bar R a weighted arm, r^3. In lieu of the bracket c, I may extend the rock-bar R lengthwise, so as to have a bearing in an extension of the bracket E′, in which case the arm r^2 may pass directly into the rock-bar R, and then the arm R′ will not be required, making the arm r^2 an equivalent for the arm R′ r^2. If the side bracket, c, is used, it may form a means of attaching the spring f^2, which can be clamped between said bracket and bracket E.

The operation of this part of the apparatus is as follows: When the car, on the reversal of direction, is moving as indicated by arrow 1, Fig. 1, and the axle has revolved sufficiently to bring one of the weighted levers on top, the lifter will fall by its own gravity until it rests on the axle, thus the pusher M^2 of said lever being in the path of the lug strikes the lug o' of the hanger O and oscillates such hanger upon its pivot n. The stud n^3 of the hanger N being engaged in the aperture o, said hanger O is oscillated in the same direction, and this action brings the cam p^3 of the lever P and the roller n^2 into such contact that the gravity of the weighted end of the lever P is overcome, and the cross-arm p' is brought into such forcible contact with the push-bar H that the tooth h^3 is disengaged from the lever G, thus throwing the brake mechanism out of connection with the draw-bar. Simultaneously with the operation of disconnecting the push-bar H and lever G, as has just been described, the stud p^2 releases the dog r, and the gravity of the arm R′ r^2 and weighted arm r^3 forces the said dog to oscillate until its top falls under the said stud, thus holding the push-bar out of action and rendering the brake inoperative until the predetermined rate of speed has been reached, which again puts the brake in an operative condition in the following manner: When started up and the predetermined rate of speed is attained, the centrifugal force due to the more rapid revolutions of the axle B throws the lifters M′ outward, which, coming in contact with the arm R′ of the dog R, causes the said dog to move backward until it passes from under the stud p^2, and the lever P falls into normal position to allow the tooth h^3 of the push-bar H to fall into engagement with the lever G, and thus put the brake mechanism again into operative position. The rate of speed at which this

operation of throwing the brake mechanism again into operation occurs may be predetermined by making the lifters of the proper weight, according to the speed desired, or they may be made so as to be adjusted at will by weighting them more or less.

By our peculiar construction and arrangement it will be observed that when the car is going in a forward direction, and the predetermined rate of speed has been attained, that it makes no difference whether or not the speed is lessened below the predetermined rate, so far as the operation of the brake is concerned, as it will still be in an operative condition until a change in the direction of travel is made, no matter whether the train is going fast or slow, so that, in case of there being a probability of running into a train, the brakes may be kept in operation until the train has been reversed, whereas in an apparatus which depends solely on speed for its action the brakes are in an inoperative condition at all times when the speed is below the predetermined rate. This feature we consider very important, and it is evident that it may be the means of saving many disastrous collisions.

It will be observed that the same system of devices which serves to throw and hold the brake mechanism out of operation also serves to throw the same into operation when the desired rate of speed is reached, and that there is no friction upon the running-gear until the brake is thrown into engagement.

Each of the weighted levers M has a double function. By its centrifugal force the lifter operates the dog R to throw the parts into operation, and by its gravity when on top of the axle B it serves to throw the pusher M^2 in the path of the lug *o'* of the lever O to throw the brake mechanism again out of operation on change of direction.

It will thus be seen that a single weighted lever would be sufficient to perform the necessary functions, but we have shown two as most convenient, all things considered, but do not limit ourselves to this number, as more or less than two may be used, if found desirable to meet special constructions of brake apparatus. It is evident that the same effect will be produced if the weighted levers are attached to a separate shaft and driven by the axle.

As the weighted levers and their connections render the brake inoperative every time the car is backed up, and keep it inoperative until the predetermined rate of speed—say eight miles per hour—is attained, it precludes the brake action in yards, provided the predetermined rate of speed is not reached.

We desire it to be especially understood that after the brake has been started out on the road and the predetermined rate of speed reached that speed and centrifugal force ceases to have anything to do with its action, other than to obviate wearing of parts, as the brake then becomes operative at all rates of speed, and cannot be rendered inoperative until a change of direction is made, and this we consider the main and distinguishing feature of our improvement.

What we claim as new is—

1. In a car-brake, the combination, with a tripping device constructed to automatically throw the brake out of operation on a change of direction, of a device adapted to hold it in an inoperative condition until a predetermined rate of speed has been attained, substantially as described.

2. The combination, with a car-brake operated by the inward motion of the draw-bar, of a push-bar connecting the draw-bar with the brake-operating mechanism, a tripping device, substantially as described, for automatically throwing said push-bar out of operative connection with said brake mechanism on a change of direction, and a device for holding the same in an inoperative condition until a predetermined rate of speed has been attained, substantially as described.

3. The combination, with a car-brake, of a tripping device provided with a lever constructed and arranged to throw the brake out of operative condition on change of direction, and cause the brake to resume its operative condition when the predetermined rate of speed has been attained, substantially as described.

4. The combination, with a car-brake, of a tripping device provided with a pivoted weighted lever having one end constructed to automatically break the connection between the brake and the draw-bar on change of direction, and through suitable mechanism hold the same in an inoperative position, and the other end to disengage said mechamism and allow the connection between the brake and draw-bar to resume its operative position, substantially as described.

5. The combination, with a brake mechanism, of a weighted lever revolving with the axle and operated by gravity and the centrifugal force created by the revolution of the axle adapted to throw the brake mechanism out of operation on change in direction, and a dog to hold it in that condition, substantially as described.

6. In a car, and in combination with a brake mechanism operated through the draw-bar, a lever operated by the axle to throw the brake-connection out of operation, a dog operated by gravity to hold said brake-connection out of operation, and a lever carried by the axle constructed to disengage said dog by the centrifugal action of its weighted end when a predetermined rate of speed is attained, substantially as set forth.

7. In combination with a brake mechanism substantially as described, weighted levers, as M, operated by the car-axle and connections, whereby the said brakes may be thrown and held out of operation by one end of said levers as the axle revolves slowly on change of direction and into operation by the opposite

end when a rate of speed sufficient to overcome the gravity of said weighted lever has been reached, substantially as set forth.

8. In combination with a car-brake, the weighted lever M, pivoted to the car-axle, a lever operated by one arm of said lever M to throw the brake mechanism out of operation on change of direction, and a lever, as R′, operated by the other arm of said lever M to release such mechanism and render the brake operative.

9. In combination with the brake mechanism and levers M, the lever P, having cam p^3 and stud p', the hangers N O, the roller n^2, and the dog r, having arm R′ r^2, as set forth.

10. In combination with the push-bar H, lever G, and brake mechanism, the lever P, dog r R′ r^2, the weighted levers M, and their operating connections, as and for the purposes set forth.

11. In a brake mechanism, and in combination with the push-bar H and draw-bar D, the pivoted lever K, having recess k and aperture k^2, the springs h h', and connections, as I J, as set forth.

12. The moving plate J, sliding on guides J′, and having lug j, combined with the oscillating lever K, having recess k and connections with the brake mechanism and the draw-bar, as set forth.

13. The oscillating lever K, having recess k and aperture k^2, the springs h h', and push-bar H, having tooth h^3, combined with the lever G, having its upper end forked, and the shaft f, brake mechanism, and connections with the draw-bar, as set forth.

14. In combination with the push-bar and brake mechanism, the lever P, having cam p^3, the lever M, having arm M², the hanger O, and roller n^2, as and for the purposes set forth.

15. In combination with the push-bar H and brake mechanism, the lever P, having cam p^3 and lug p^2, the levers M, the hanger O, and roller n^2, and the dog r, having arm R′ r^2, as set forth.

16. In combination with the lever M, the push-bar, and lever P, having cam p^3 and lug p^2, and the dog having arm R′ r^2, the hanger O, having roller n^2, pivoted in the jaws n', and having lug n^3, as set forth.

17. The combination, in a brake apparatus, of a pivoted lever, K, provided with a recess, k, and having its fulcrum on one side of a line drawn through the center of said recess, in combination with the sliding lug j, working in said recess and connected with and deriving its motion from the draw-bar, substantially as described.

In testimony whereof we affix our signatures, in presence of two witnesses, this 14th day of April, 1884.

WILLIAM B. TURNER.
CORNELIUS BEARD.

Witnesses:
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A. J. PRYER.