No. 706,824. Patented Aug. 12, 1902.

W. F. HITCHCOCK.

BRAKE FOR VEHICLES.

(Application filed Mar. 10, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

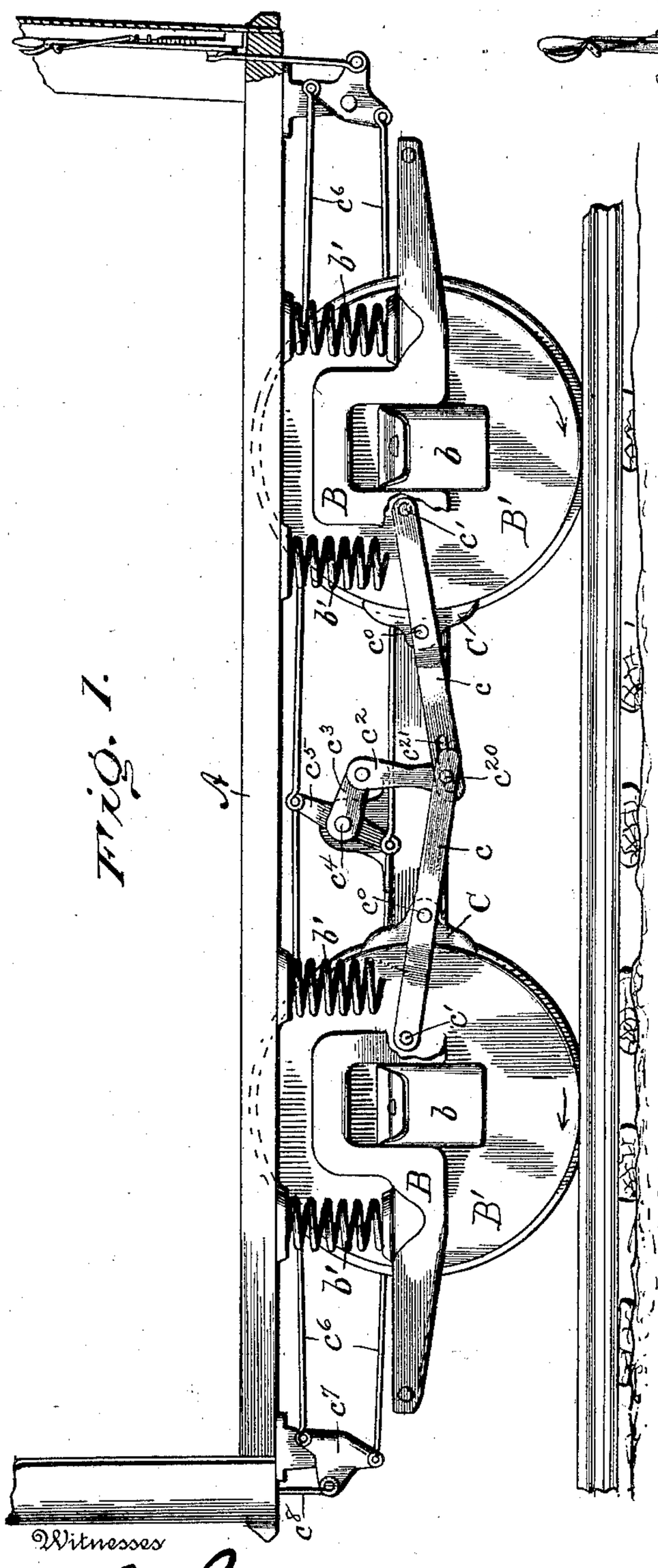

Fig. 2.

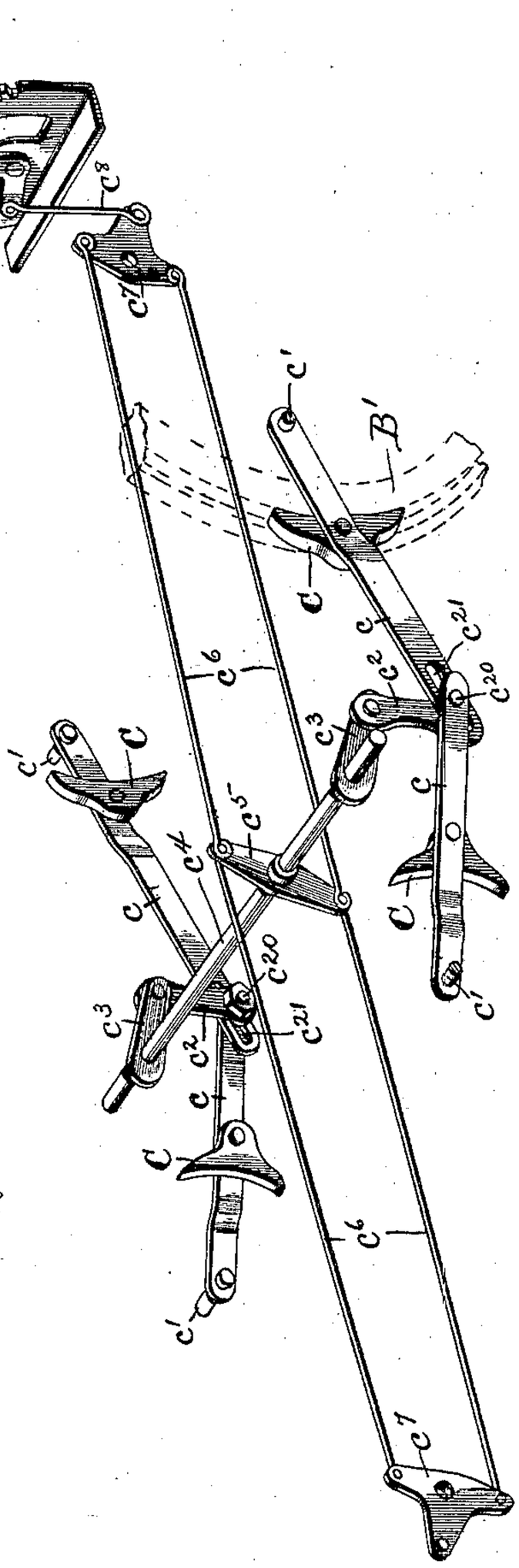

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Fig. 3.

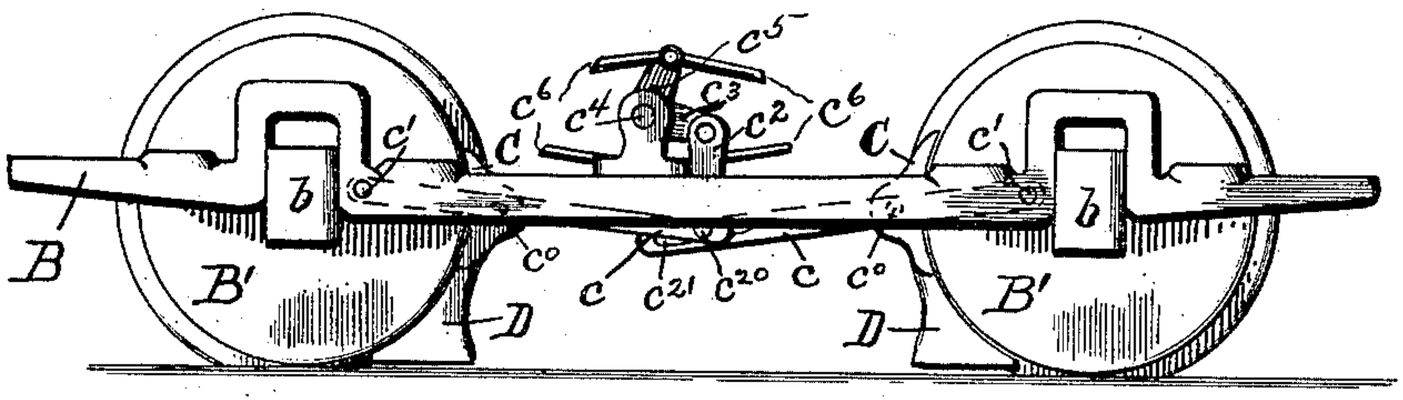


Fig. 4.

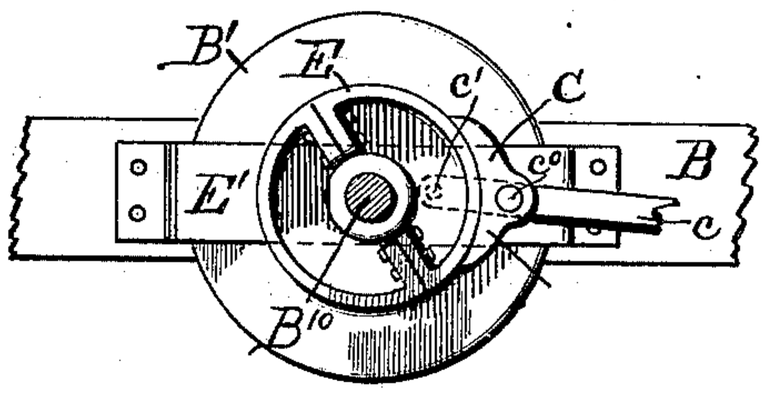
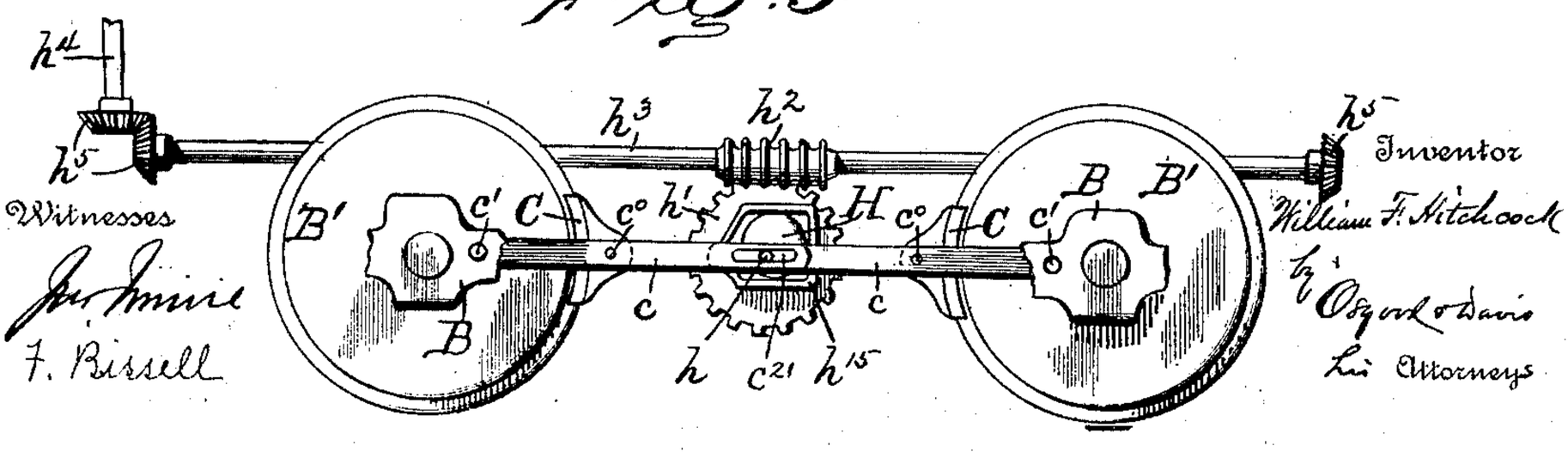


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM F. HITCHCOCK, OF ROCHESTER, NEW YORK.

BRAKE FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 706,824, dated August 12, 1902.

Application filed March 10, 1900. Serial No. 8,166. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. HITCHCOCK, a citizen of the United States, and a resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Brakes for Vehicles, of which the following is a specification.

This invention relates to brakes for vehicles, and is exemplified by its application to a four-wheeled car.

The object of the invention is to provide a brake that is easily and quickly set, that is powerful in operation, and is to an extent self-operating.

The invention consists in the apparatus hereinafter described and claimed.

In the drawings, Figure 1 is an elevation of a car floor and truck, showing this invention applied thereto, parts of the structure being broken away to exhibit the construction. Fig. 2 is a perspective view of the brake-shoes and their operating devices and shows a portion of a car-wheel in dotted lines. Figs. 3 to 5, inclusive, show modifications of this invention.

Referring to Fig. 1, A is the car-floor, and B is the truck-frame. The frame is continuous from one end to the other and is arched over the axle-boxes *b*. Between the frame and the car-floor are suitable devices for supporting the floor, such as the springs *b'*. The brake-shoes C, of which there is one for each car-wheel B', are carried by levers *c* and are pivoted thereto in any suitable manner. The levers are pivoted to the truck-frame B by pivots *c'*, forming stationary fulcrums for the levers *c*, and at such a distance from the place of contact between the brake-shoe and the wheel-rim that the circle of movement of the brake-shoe is eccentric to that of the wheel B' and intersects the circle of the wheel-rim at a small angle. In the present instance the distance from the pivot *c'* to the operating-face of the brake-shoe is less than the distance from the axis of the wheel to its rim. It is obvious that under these circumstances the shoe when in its normal position of non-contact with the wheel may be moved in either direction from said position and make contact therewith. The levers *c* extend from the pivot *c'* past the pivotal point of the brake-shoe thereon to a suitable point for operation of the lever. In Figs. 1 and 2 the ends of the two levers overlap each other, so as to be operated by a single operating mechanism, as follows: One of said levers is pivoted to a link c^2 by the pivot c^{20}, and the other of said levers has a slot c^{21}, spanning the pivot c^{20}, and thus it will be seen by movement of the link c^2 both levers are moved and both brake-shoes C are pressed against or removed from the wheel-rim. The link c^2 is hung from a rock-arm c^3, carried upon a rock-shaft c^4. Said rock-shaft c^4 in most cases will be suitable for operating the brake-shoes as to all the wheels of a four-wheeled vehicle. A convenient means of operating the rock-shaft is an arm c^5, rigidly connected at its middle to said rock-shaft, and rods c^6, connected to the ends of the arm c^5 and to two arms of a double bell-crank lever c^7, that is pivoted to the car-floor A. A link c^8 from the third arm of said bell-crank lever extends up through the car-floor to another bell-crank lever c^9, that is actuated by the power. In order to set the brake to different degrees of pressure and to hold it both in a braking and non-braking position, a notched quadrant c^{10} upon the car-floor and a dog c^{11} upon the lever c^9 are employed in a well-known manner.

In Fig. 1 the brakes are shown as set; but in their normal positions the pivot c^{20} is raised, thereby removing the brake-shoes from contact with the wheels.

The operation of the device is as follows: Upon throwing the lever c^9 the double bell-crank lever c^7 will rock and through the rods c^6 rock the arms c^3, depressing the link c^2 and the pivot c^{20}, thus setting the brake-shoe against the wheels. If the wheels are revolving in the direction shown by the arrows in Fig. 1, their friction against the brake-shoes will drag the brake-shoe on the left-hand wheel in Fig. 1 into closer contact with the wheel and will tend to raise the brake-shoe in contact with the right-hand wheel and to decrease the pressure of the brake-shoe against it. It is found in practice that the tendency under the circumstances just described to press the brake-shoe on the left-hand wheel into closer contact therewith is somewhat greater than the tendency to decrease the pressure of the brake-shoe against the right-hand

wheel. In order that this braking pressure should not be too great, the operating-lever c^9 can be locked in the proper notch of the quadrant c^{10} and held so as to give the degree of braking effect desired.

Various modifications may be made of this device—as, for instance, in Fig. 3 a track-shoe D is shown attached to each brake-shoe C, so that when the brake-shoe is set the track-shoe will be set also.

In Fig. 4 the brake-shoe C upon the lever *c* is shown as making contact with a split wheel or drum E upon the axle B^{10} of the wheel B'. In order to support the pivotal point *c'* of the lever *c*, an arched frame-piece E' is attached to the inside of the truck-frame B, so that the wheel B' is between the arched piece E' and the frame B, and the pivot *c'* of the lever C is set upon said arched piece. It will be noticed that the radius from the pivot *c'* to the pivot c^0 is, as in the former cases, shorter than that of the wheel.

In Fig. 5 the same levers *c*, brake-shoes C, and pivots c^0 and *c'* are shown as in Figs. 1 and 2; but the operating mechanism is somewhat different. A cross-shaft H carries a crank-pin *h*, that operates in slots c^{21} in the overlapping ends of the levers *c*, so that revolution of the shaft H oscillates the levers *c* and sets the brakes, as in the case of the mechanism shown in Figs. 1 and 2. The shaft H may be operated by a wheel *h'* upon said shaft, which is operated by a worm h^2 upon a shaft h^3, running lengthwise of the car. Brake-staffs h^4, operated by cranks, (not shown,) communicate rotary motion to the shaft h^3 by bevel gear-wheels h^5, so that the brakes may be set and released as desired.

What I claim is—

1. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, a lever pivotally connected to each brake-shoe and to a portion of the vehicle at such a point that said lever moves said brake-shoe in a path intersecting the circle of the rim of the wheel at a small angle thereto, and means for operating said two levers.

2. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, a lever pivotally connected to each brake-shoe and to a portion of the vehicle at such a point that said lever moves said brake-shoe in an arc of a circle intersecting the circle of the rim of the wheel and at a small angle thereto, and means for operating said two levers.

3. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, and a lever pivotally connected to each brake-shoe and to a stationary point on the vehicle adjacent to the wheel-axle and having a movement of said brake-shoe eccentric to the wheel and in an arc intersecting the circle of the rim at a small angle, and means for operating said two levers.

4. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, and a lever pivotally connected to each brake-shoe and to a stationary point on the vehicle adjacent to the wheel-axle and having a radius for movement of said brake-shoe less than the radius of the wheel, and means for operating said two levers.

5. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, two levers, one for each brake-shoe pivotally connected thereto and to a stationary point on the vehicle and having an arc of movement of the brake-shoe eccentric to the circle of the rim of the wheel and intersecting the circle of the rim thereof at a small angle, said levers being connected for simultaneous operation at all times and a single means for operating both levers.

6. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, two levers, one for each brake-shoe pivotally connected thereto and to a stationary point on the vehicle and having an arc of movement of the brake-shoe eccentric to the circle of the rim of the wheel and intersecting the circle of the rim thereof at a small angle, said levers being connected for simultaneous operation at all times, a rock-shaft having an arm thereon, means for connecting said arm to the free ends of both levers, and means for operating said rock-shaft.

7. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, two levers, one for each brake-shoe pivotally connected thereto and to a stationary point on the vehicle and having an arc of movement of the brake-shoe eccentric to the circle of the wheel and intersecting the circle of the rim thereof at a small angle, the free ends of said two levers being overlapped and being pivotally connected, and a single means for operating the common pivot of both levers.

8. In a vehicle-brake, a pair of wheels, a pair of brake-shoes for acting upon the oppositely-moving sides of said two wheels, two levers, one for each brake-shoe pivotally connected thereto and to a stationary point on the vehicle and having an arc of movement of the brake-shoe eccentric to the circle of the wheel and intersecting the circle of the rim thereof at a small angle, the free ends of said two levers being overlapped and pivotally connected, a rock-shaft having an arm thereon, means for connecting said arm to the common pivot of both levers, and means for operating said rock-shaft.

9. In a vehicle-brake, a wheel B', a brake-shoe C for acting upon the rim of said wheel, a lever *c* having said brake-shoe pivoted thereto, said lever being pivoted to a portion of the vehicle at such a point as to move the brake-shoe in an arc of a circle intersecting

the circle of the rim of each wheel at a small angle thereto, a link c^2 pivotally connected to the free end of said lever, a rock-shaft c^4, a rock-arm c^3 upon said rock-shaft and carrying the link c^2, an arm c^5 upon said rock-shaft, one or more rods c^6 for operating said arm c^5, a T-lever c^7 for operating said rod or rods, and means for operating said T-lever.

10. In a vehicle-brake, a pair of wheels B′, a pair of brake-shoes C for acting upon the rim of said wheels, a pair of levers c having said brake-shoes pivoted thereto, said levers being pivoted to portions of the vehicle at such points as to move the brake-shoes in arcs of circles intersecting the circles of the rims of the wheels at small angles thereto, and a link c^2 pivotally connected to the free ends of said levers, a rock-shaft c^4, a rock-arm c^3 upon said rock-shaft and carrying the link c^2, an arm c^5 upon said rock-shaft, rods c^6 for operating said arm c^5, a T-lever c^7 for operating said rods, and means for operating said T-lever.

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