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Patented Dec. 3, 1901.

D. E. BROCKETT.  
AUTOMATIC CAR BRAKE AND SPEED REGULATOR.

(Application filed Apr. 3, 1901.)

(No Model.)

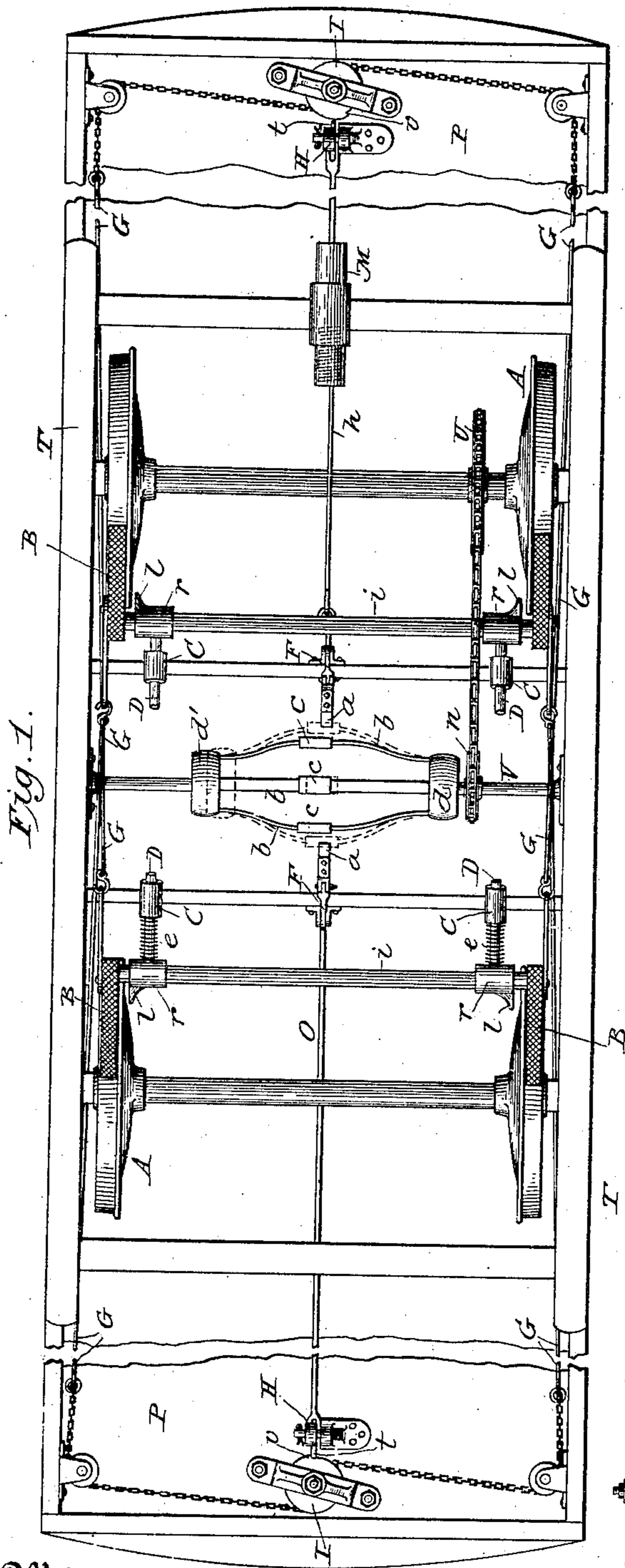


Fig. 1.

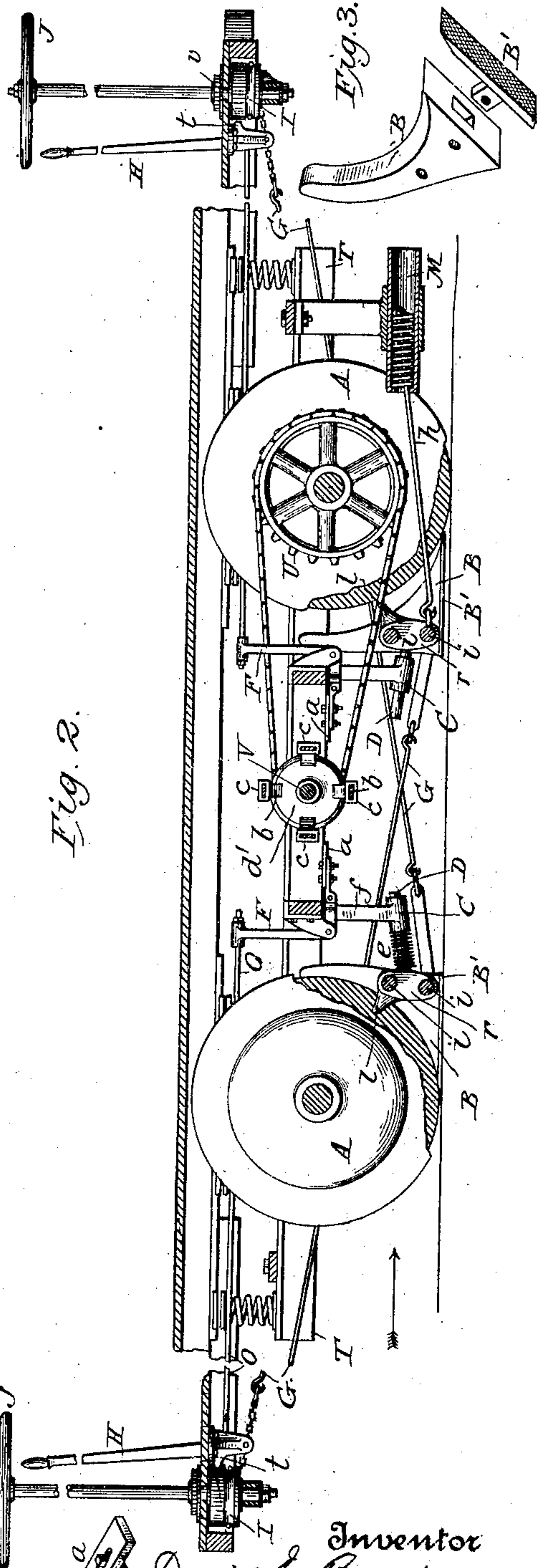
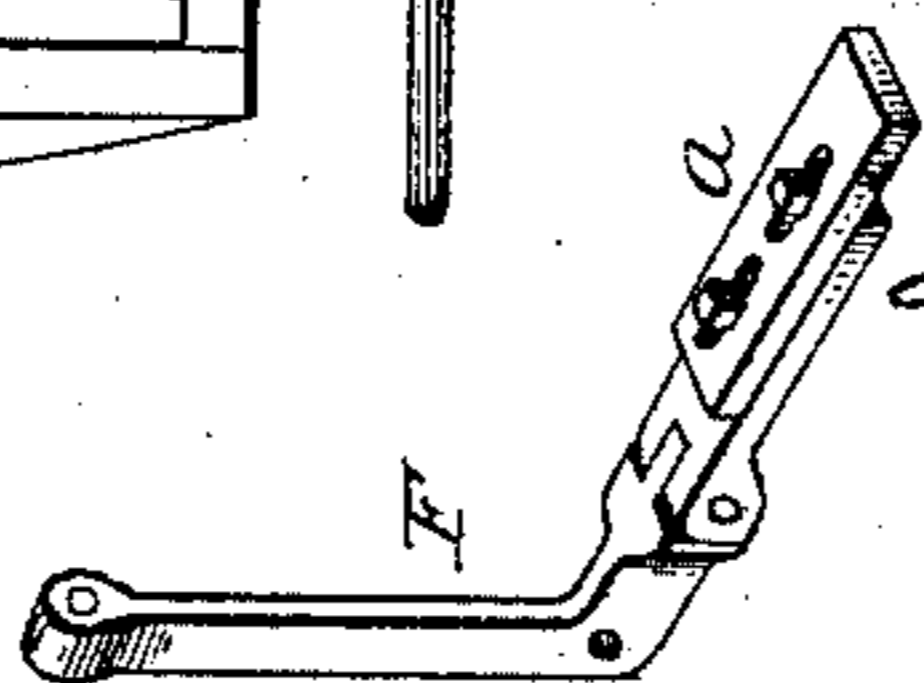


Fig. 2.

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Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC CAR-BRAKE AND SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 687,975, dated December 3, 1901.

Application filed April 3, 1901. Serial No. 54,213. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID E. BROCKETT, a citizen of the United States, residing at Wells-  
ville, in the county of Columbiana and State  
5 of Ohio, have invented certain new and use-  
ful Improvements in Automatic Car-Brakes  
and Speed-Regulators, of which the follow-  
ing is a specification.

My present invention relates to cars; and  
10 the invention consists in devices for auto-  
matically applying the brakes to the wheels  
of the car and to the rails of the track simul-  
taneously whenever the speed of the car ex-  
ceeds a given rate.

15 It further consists in a peculiar construc-  
tion of the brake-shoe and in means for ad-  
justing the device which releases the auto-  
matic brake, whereby the speed of the car  
may be regulated as desired, together with  
20 various details hereinafter described.

Figure 1 is a bottom plan view of a car hav-  
ing my invention applied. Fig. 2 is a longi-  
tudinal vertical section of the same; Fig. 3, a  
perspective view of the brake-shoe, and Fig.  
25 4 a perspective view of the brake-releasing  
lever and its adjustable arm.

The object of this invention is to provide  
means by which the brake will be automatic-  
ally applied to the wheels of the car and also  
30 to the rails of the track whenever the speed  
of the car shall exceed a given rate and by  
which also the brake can be released by hand  
and automatically applied at any time desired  
regardless of the speed of the car.

35 Another object is to notify the motorman  
or person in charge of the car whenever the  
speed of the same exceeds a prescribed rate  
and also to provide for adjusting the device  
for running the car at different rates of speed.

40 Since the introduction of electricity as a  
motive power for street-cars many serious  
accidents have occurred, and especially on  
steep grades, owing to the inability of the  
person in charge to stop the cars by means of  
45 the hand-brakes in common use, it frequently  
happening that before the brakes are applied  
the speed has become such that the brake ap-  
plied to the wheels in the ordinary way has  
little or no effect, and especially so if, as often  
50 occurs, the operator happens to be absent  
from the brake-wheel at the instant. It has  
also been found necessary for the safety of

the public for the authorities to prescribe or  
fix a rate of speed which shall not be exceed-  
ed; but as cars have been heretofore con- 55  
structed no means have been provided by  
which the motorman or person in charge can  
determine when the prescribed rate of speed  
is exceeded. To obviate or remedy these dif-  
ficulties, I construct the parts as follows: 60

In the accompanying drawings, T repre-  
sents a rigid frame on which is mounted the  
platform or body P of the car, with springs  
interposed. The frame T is mounted on  
wheels A in the usual manner. I make the 65  
brake-shoe B of the peculiar form shown in  
Figs. 2 and 3, its face being curved, so as to  
fit the wheel, with its lower point made wedge  
shape to slide under the wheel and between  
it and the rail, its vertical arm or portion be- 70  
ing extended above the center of the wheel to  
prevent the latter from riding up on it too far.  
As shown in Fig. 2, this brake-shoe is com-  
posed of two parts, the lower part B' being  
composed of chilled iron and having its un- 75  
der face, which comes in contact with the  
track-rail, roughened, so as to cause it when  
applied to take a better hold on the rail.  
When worn, this part B' can readily be re-  
placed by a new one, it being detachable, as 80  
shown. A pair of these brake-shoes are rig-  
idly connected to a frame, which in this case  
is shown as composed of two strong bars *i i*,  
connected by hubs *r* near each end, but  
which may be constructed in any suitable 85  
manner. To this frame two arms D are rig-  
idly secured, they being inclined upward, as  
shown in Fig. 2. These arms are supported  
in tubular bearings C, in which they can  
freely slide, these bearings C being held rig- 90  
idly in position by brackets or pendants *f*,  
secured to a cross-bar of the car-frame, or in  
any suitable manner. A spiral spring *e* is  
applied to each of these arms D between the  
bearings or boxes C and the brake-shoe frame, 95  
so that when released, as hereinafter ex-  
plained, the shoe B will be thrown forward  
against the wheel and the rail, the inclina-  
tion of the arms D and boxes C being such  
as to impart to the shoes simultaneously both 100  
a forward and a downward movement, there-  
by causing them to impinge upon both the  
wheels and the rails at the same time.

An alternative or equivalent means of

drawing the shoes against the wheels and rails is shown in the right-hand portion of Figs. 1 and 2. This consists of a tube M, secured centrally to a cross-bar of the frame, in which there is a strong spiral spring connected by a rod *h* to the shoe-frame and which may be used alone or in connection with the other springs *e*, as circumstances may require. It is also obvious that flat springs may be arranged to press the shoes B into position, it being merely a matter of choice as to the mechanical details, the only requisite being that the brake-shoes shall be arranged to move in the proper direction to engage with both the wheel and the rail and that springs or equivalent means be used to so move them when released.

On each of the hubs *r* is a projection *l*, which rests near the inner face of each wheel, as shown in Fig. 1, the object of these being to prevent the wheels from moving sidewise far enough to throw the flange out of place when the wheels are raised by the shoe.

In order to hold the brake-shoes suspended clear of the rails and the wheels when not in use, there is attached to their rear side a rod G, at the opposite end of which is a short chain having its opposite end secured to and arranged to wind around a hub I on the lower end of the shaft of the brake-wheel J, located at the opposite end of the car, as shown in Figs. 1 and 2, (the rod being shown broken away in the figures to correspond with the platform, which is also shown broken away at each end.)

Adjacent to the shaft of the brake-wheel J a hand-lever H is pivoted, which has a projection *t* on it arranged to engage with a shoulder *v* on the hub I, (see Figs. 1 and 2,) and thereby lock the latter fast after it has been turned far enough to draw the brake-shoes away from the wheels and rails and hold them suspended, as represented in the right-hand part of Fig. 2. To release the brake-shoes from this raised and locked position, I provide a releasing device, which consists of a revolving shaft V, mounted in the frame T midway between the front and rear wheels, this shaft being rotated by a chain which passes around a sprocket-wheel U on one of the car-axles and a corresponding wheel *n* on the shaft, as shown more clearly in Fig. 1. On this shaft V, I mount what may be termed an "expanding striker," it consisting of a hub *d*, rigidly secured to the shaft, and a loose or sliding hub *d'*, the two hubs being connected by a series of spring bars or rods *b*, each of which is provided at its center with a weight *c*, as shown in Fig. 1. I then provide an elbow-lever F, Fig. 2, and pivot it by a suitable support in such a position that its horizontal or lower arm will stand opposite the center of the expanding striker, the vertical arm of the lever being connected by a rod or cord O to the hand-lever H, as shown more clearly in Fig. 2. In order to enable this to be arranged for different rates of speed,

I make the lower arm *a* of the elbow-lever F adjustable in length, as shown in Fig. 4, the part *a* being capable of being drawn out or shoved in and secured by bolts passing through slots therein or by any equivalent means.

To adjust the parts for use, the arm *a* will be so set as not to be hit by the expanding striker so long as the speed of the car does not exceed its normal or prescribed rate; but whenever the speed is increased to any material extent the more rapid rotation of the shaft V will cause the weights *c* to be thrown outward by centrifugal force, as indicated by the dotted lines, thereby causing them to hit and depress the arm *a*, which will draw back the vertical arm of the elbow-lever F and by means of rod O also draw back the hand or locking lever H, thereby unlocking the hub of hand-wheel J, when the springs operating on the brake-shoes will instantly force them into the braking position in contact with both the wheels and the rails.

The brake-shoes are so placed as to bear against the front side of the wheel as the car is moving, so that as the car moves forward and the brake-shoes are applied or released the wheels will tend to ride up on the point of the shoe, as shown in the left-hand part of Fig. 2, thereby forcing the shoe down upon the rail, and if the speed or momentum of the car be sufficient the wheel will ride up on the shoe sufficient to lift the wheel clear of the rail, when the weight of the car bearing on the shoes will cause them to take such a hold on the rail as will stop the car almost instantly.

As shown, the one expanding striker is arranged to release the brake for one pair of wheels when the car is moving in one direction and for the other pair when moving in the opposite direction, the pivoted arm *a* of the elbow-lever F being turned up out of the way of the striker when the brake with which said lever is connected is not designed to operate. It will therefore be seen that one pair of the brake-shoes will be used when the car is moving in one direction and the other pair when the car is moving in the opposite direction, it only being necessary to lower the pivoted arm *a* on one side of the striker and raise the one on the opposite side, according as the car is to run in the one or the other direction.

It is obvious that by placing brake-shoes on both sides of the wheels and connecting them properly with their respective hand-wheels the brakes may be applied to both sets of wheels at once, whichever way the car may move; but as that would be a mere duplication of what is shown and as the principle and mode of operation of the brakes are fully shown in the present drawings I have not thought it best to complicate the drawings by adding the duplicate sets.

It is obvious that the brakes can be released by hand at any time by merely drawing back the hand-lever H, and thus they are adapted

for use when the car is moving at its normal or prescribed rate the same as the ordinary hand-brake, but with greater efficiency.

It will of course be understood that means 5 will be used for raising and lowering the pivoted arms *a* when necessary and for holding the one raised out of the way of the striker until ready to be thrown into use again. This may be done by rods and levers or by cords 10 and pulleys suitably arranged, and being within the knowledge of an ordinary mechanic I have not thought it necessary to show it. This expanding striker can be used to notify the motorman or operator whenever the pre- 15 scribed speed is being exceeded or about to be, and that, too, whether this style of brake be used or not. All that is necessary for that purpose is to connect the elbow-lever with a bell or other indicator located where it can 20 be heard or seen by the motorman, and by properly adjusting the arm *a* it may be set for any rate of speed desired. The instant the prescribed rate of speed is exceeded the motorman or operator will thus be notified 25 and can regulate the speed accordingly, or if used in connection with the brakes the latter will be automatically thrown into operation and the car stopped whenever the proper rate of speed is exceeded.

30 It is obvious that other forms of expanding device may be substituted for that shown and be made to produce the same results, and hence I do not limit myself to that construction, but prefer it as being very simple and 35 not liable to get out of order.

Having thus fully described my invention and its mode of operation, what I claim is—

1. In combination with a car, brake-shoes 40 supported by guide arms or rods, mounted and arranged to slide in rigid bearings set at an angle that will cause the brake-shoes to simultaneously be brought in contact with the rails and the car-wheels when released, means sub-

stantially such as shown for holding the brake-shoes suspended, springs for forcing them 45 into operation when released, and an expanding striker for releasing the same, all constructed and arranged to operate substantially as shown and described.

2. The combination in a car, of an expand- 50 ing striker arranged to be rotated by the axle of the car, and an elbow-lever arranged to be operated by the striker when expanded, said lever having the arm on which the striker operates jointed, so that it can be thrown into 55 and out of the path of the rotating striker at will, substantially as shown and described.

3. In combination with an expanding striker arranged to be rotated by the axle of a car, an elbow-lever arranged to be operated by 60 the striker when expanded, said lever having its arm upon which the striker operates made adjustable in length, whereby it can be set or adjusted to be operated at different rates of speed of the car, substantially as and for the 65 purposes herein set forth.

4. In combination with the wheels of a car, brake-shoes with springs for forcing the brake-shoes against the wheels and rails, a hand-wheel connected to said shoes to draw them 70 away from the wheels and rails, a lever *H* arranged to dog or lock said hand-wheel, an elbow-lever connected to said hand-lever, and an expansible revolving striker arranged to operate the elbow-lever and thereby release 75 the hand-wheel and permit the brake to operate, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of 80 two subscribing witnesses.

DAVID E. BROCKETT.

Witnesses:

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W. C. DODGE.