

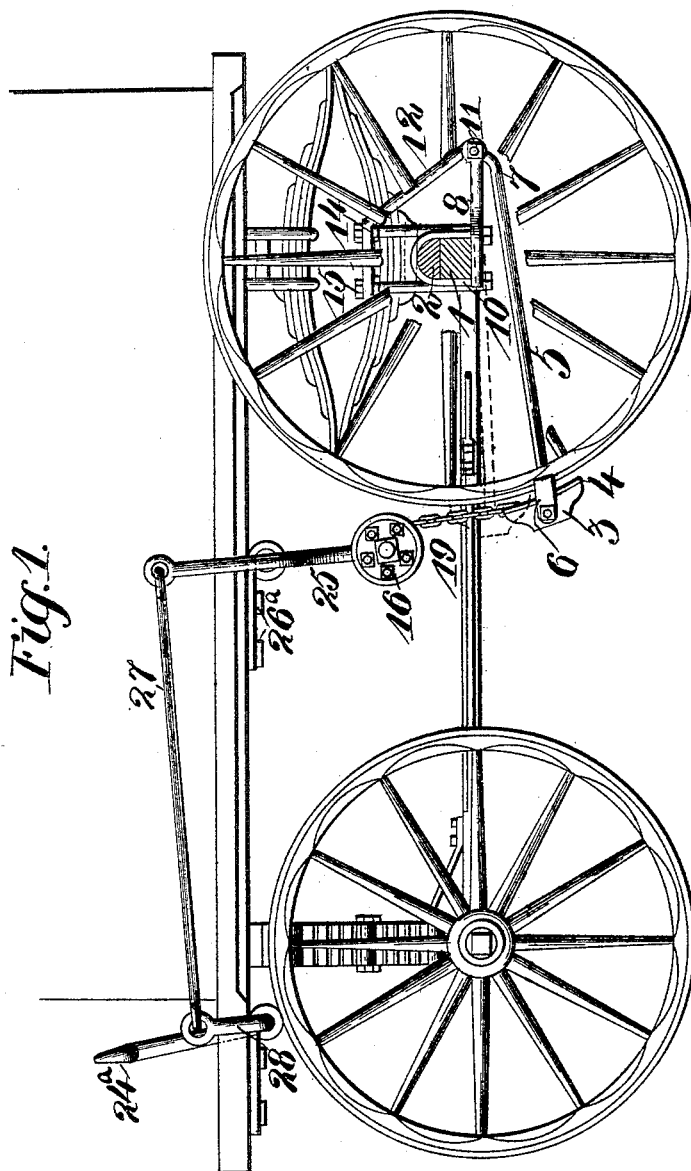
(No Model.)

2 Sheets—Sheet 1.

J. F. DUGAN.  
VEHICLE BRAKE.

No. 459,272.

Patented Sept. 8, 1891.



Witnesses

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Inventor

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*By his Attorney & Higdon & Higdon*

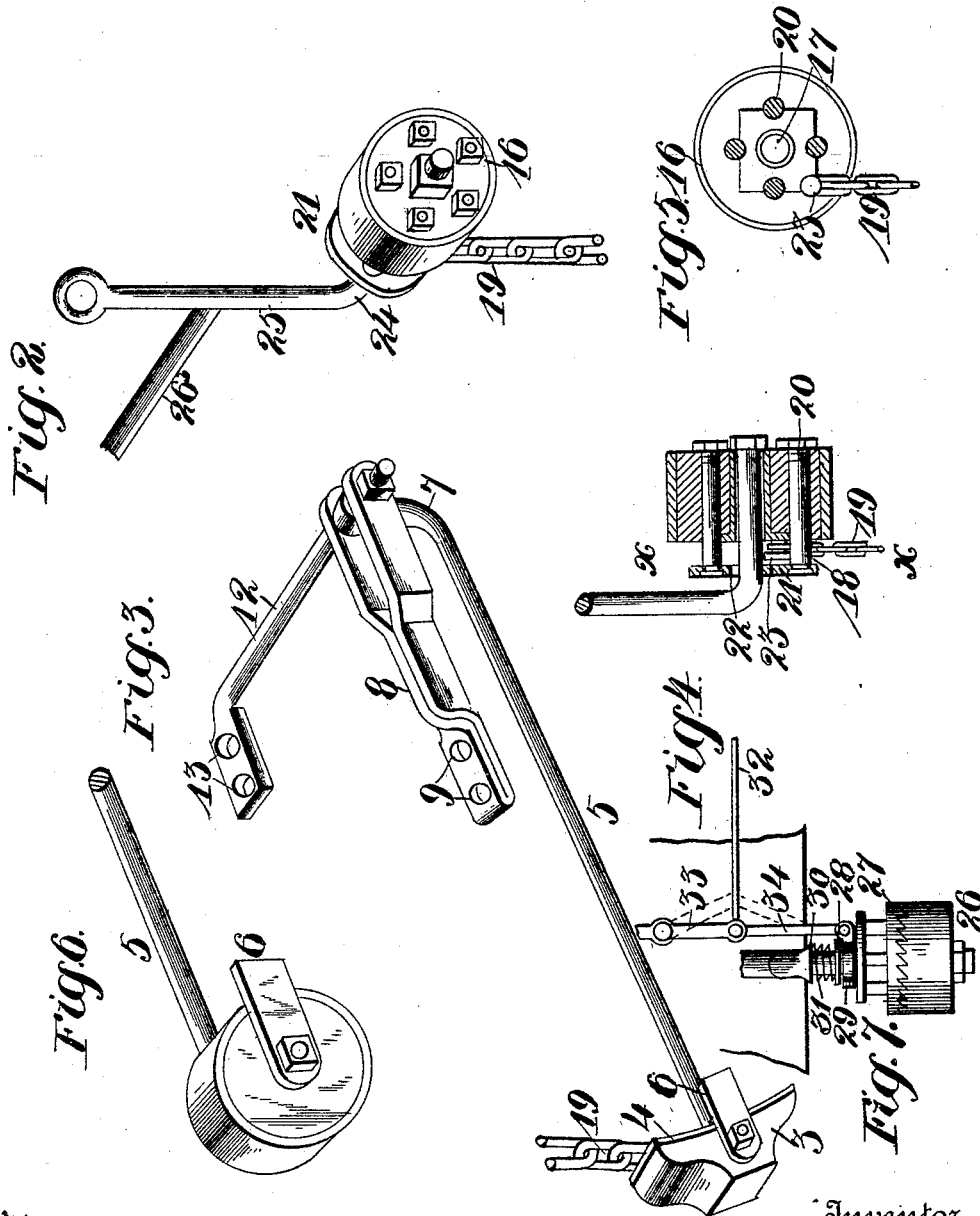
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Edward E. Longman.

Inventor  
James F. Dugan.

By his Attorneys, Higdon & Higdon

# UNITED STATES PATENT OFFICE.

JAMES FRANK. DUGAN, OF ST. LOUIS, MISSOURI.

## VEHICLE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 459,272, dated September 8, 1891.

Application filed April 7, 1891. Serial No. 387,962. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES FRANK. DUGAN, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Vehicle-Brakes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in vehicle-brakes; and it consists in the novel arrangement and combination of parts, as will be more fully hereinafter described, and designated in the claims.

In the drawings, Figure 1 is a side elevation of a vehicle, such as an ordinary spring-wagon, showing my invention applied to the same. Fig. 2 is a perspective view of a friction-wheel which I employ in carrying out my invention with its attachments. Fig. 3 is a perspective view of a brake-shoe, brake-shoe rod, and arms for securing said brake-shoe rod to the vehicle. Fig. 4 is a diametrical section of the friction-wheel. Fig. 5 is a transverse section taken on the line *x x* of Fig. 4, and Fig. 6 is a perspective view of a modification of a brake-shoe which I may employ in carrying out my invention. Fig. 7 is a bottom plan view of a further modification of a friction-wheel.

The object of my invention is to construct a brake for vehicles so that when the same is functionally operated the resultant of the forces arising from such functional operation will be brought to bear in a vertical direction on the springs (if the said device is applied to a spring-wagon.) Even in the advanced state of the art to which my invention belongs there is no brake to my knowledge wherein the result of the forces is applied as above stated. The tendency of the various constructions of brakes, from my personal observation, has been to twist and injure the springs. From the construction, as will be more fully hereinafter described, it can be readily perceived that my invention is equally applicable to any vehicle, and also the same may be applied to street or railway cars and may be used in connection with air-brakes. It can also be used in various mechanisms to restrain the motion of a rotating wheel.

While my invention is especially designed to the various uses as above stated, I will

only describe in this connection its application to ordinary spring-wagons.

Referring to the drawings, 1 indicates the rear axle of the wagon. Said axle is of the ordinary construction and having a wooden portion 2. The construction of this class of axles is well understood and requires no minute description or elucidation.

3 indicates a brake-shoe of ordinary construction, the same being provided with a contact-plate 4 of leather, rubber, or any metallic substance. Said brake-shoe is mounted in any suitable and mechanical manner on a brake-shoe rod 5.

In place of using a brake-shoe of the construction as shown in Figs. 1 and 3, I may use in lieu thereof a brake-shoe as shown in Fig. 4. By referring to said figure it can be perceived that the brake-shoe that I may employ is circular in form, and the same may be rigidly or revolubly mounted on the brake-shoe rod 5 in any suitable and mechanical manner.

6 indicates a plate, which is secured to the exterior lateral surface of brake-shoe 3 and projects rearwardly over the exterior lateral surface of the wheel. The function of said plate is to keep and prevent said brake-shoe from slipping off of the wheel. I also desire to use this plate in connection with the modification of the brake-shoe which I have just described. The brake-shoe rod 5 has an upturned terminal portion 7, and said portion is provided with a perforation.

8 indicates a bifurcated arm. One end of the same is provided with perforations 9, through which the ends of clip 10 are adapted to be inserted. It may be observed that clip 10 is one of the clips that clamps the wooden portion 2 on the metallic portion 1 of the axle, and said clip also secures the bifurcated arm 8 to the lower exterior surface of axle 1 in the manner as heretofore stated. The upturned portion 7 of the brake-shoe rod 5 is pivoted in an interposed position between the bifurcations of arm 8 by means of a bolt 11 or any other suitable means.

12 indicates a supporting and bracing arm, one end of which is provided with perforations 13, and the other end of same is provided with a perforation through which bolt 11 is adapted to pass. It can be readily perceived

that bolt 11 secures brake-shoe rod 5, arm 8, and arm 12 in a pivotal connection. The upper end of arm 12, when the same is in its normal position, is superposed on a plate 5 which extends transversely across the lower half of the spring. Said plate is clamped over the lower half of the spring by means of clips 14, and the outer of said clips pass through perforations formed in said plate 10 and also through perforations 13, formed in arm 12.

15 indicates nuts which are adapted to be screwed on the end of clips 14.

I do not wish to limit myself to the manner 15 just described for securing the brake-shoe rod to the vehicle, as many other mechanical means are equally applicable, depending, of course, on the mechanical ingenuity of the manufacturer.

20 It can be readily perceived from the construction as hereinbefore described that the brake-shoe rod 5 is pivoted eccentrically relative to the center of the wheel to which the brake-shoe carried by said rod is adapted to 25 be applied.

In the specification as herein shown and described, referring to Fig. 1, it can be perceived that the brake-shoe rod 5 is pivoted eccentrically relative to the wheel in the rear of 30 the axle and a little below or about on a line with the horizontal plane of the lower exterior surface of the metallic portion of axle 1. The brake-shoe rod 5, however, could be pivoted in front of the rear axle and the brake-shoe 3 could be applied from the rear.

I do not wish to limit myself to any specific position relative to the axle, whether in the rear, in front, or on the top or bottom of same; but it is highly essential, according to 40 the principle of applied mechanics, that the brake-shoe rod 5 should be pivoted eccentrically relative to the axial center of the wheel to which the brake-shoe is adapted to be applied.

45 By the brake-shoe rod 5 being pivoted eccentrically, as hereinbefore stated, referring to Fig. 1 and confining myself for illustration only to the construction therein shown, it can be readily perceived that when the brake-shoe 3 is elevated by any mechanical means 50 it will strike and come in direct contact with the tire of the wheel, as shown in dotted lines in said figure.

Having given an explicit description of the 55 brake-shoe 3, the rod 5 for carrying the same, and the manner in which said rod is pivotally secured to the vehicle, I will now describe the mechanism by which said brake-shoe rod 5 is operated and causes the brake-shoe to 60 be brought in contact with the wheel. Mechanical ingenuity no doubt may suggest many different ways of operating the brake-shoe—that is, bringing the same in contact with the tire of the wheel. In this connection 65 I will only describe one manner, to-wit: 16 indicates a friction-wheel, the same being lined on its exterior peripheral surface with rub-

ber, leather, or any desired substance of high abrasive effect. Said wheel is provided with a central perforation 17, same being lined 70 with any suitable metallic substance for bearing purposes. The inner lateral surface of said friction-wheel 16, or rather the entire wheel, has secured to it a reel 18, over which a chain 19 is adapted to be wound. Said reel 75 consists of four or any suitable number of bolts 20, which pass through suitable perforations formed in said wheel, and also through a plate 21. Plate 21 is provided with a perforation 22, and said plate stands apart from 80 the inner lateral surface of wheel 16, as shown in Fig. 4, so that the chain 19 may be wound in between said plate and said wheel. I do not wish to limit myself, however, to this specific construction of a reel for winding up 85 the chain which operates the brake-shoe. One end of chain 19 is secured to wheel 16 by means of a bolt 23, and the other end of said chain is secured in any suitable and mechanical manner to the brake-shoe rod 5 or to 90 the brake-shoe 3 itself.

By referring to Fig. 1 it can be readily perceived from the construction hereinbefore described that when the friction-wheel 16 is rotated the chain 19 will be wound around the 95 reel, and consequently will elevate the brake-shoe 3 and bring it in contact with the wheel, and consequently restrain the motion of the same. It can also be readily perceived that the wheel 16 is caused to rotate by being 100 brought in contact with the tire of the wheel of the vehicle, the friction between the same being sufficient to affect the rotation. The wheel 16 and its attached reel is revolvably mounted upon a crank portion 24 of a lever 105 25, and the lever 25 is rigidly secured to a transverse bar which passes across the lower surface of the bed of the vehicle, and is pivotally secured thereto by means of cleats 28. The upper arm of lever 25 is pivotally se- 110 cured to a rod 27, and the other end of said rod 27 is pivotally secured to a crank-lever 28, the same being provided with a foot-piece 24\* or a handle, and said crank-lever 28 is pivotally secured to the bottom of the vehicle-bed, preferably as shown in Fig. 1. It 115 can be readily perceived that when the crank-lever 28 is pushed forward by means of the hand or foot of the driver or operator the friction-wheel 16 will go in a rearwardly di- 120 rection and be brought in contact with the tire of the wagon-wheel. Of course, there being a frictional contact between said frictional wheel 16 and the tire of the wagon-wheel, the motion of the latter will rotate the former and 125 wind up the chain 19, and consequently bring the brake-shoe 3 in contact with the tire of the wheel, as hereinbefore stated. Of course when the force is removed from the crank-lever 28 the gravity of the brake-shoe rod 5 130 and the brake-shoe itself will cause the mechanism to assume its normal position, as shown in Fig. 1.

From the construction as hereinbefore set

forth the first power or force which tends to restrain the motion of the vehicle-wheel arises from the friction-wheel 16, which is brought in contact with the tire of the vehicle-wheel, and from the mechanical construction, as described, it can be readily perceived that the result of the said force will be in a vertical direction on the springs of the vehicle. Empirical knowledge on the part of the inventor has proven that the motion of the vehicle-wheels can be restrained almost instantly by the mechanism as hereinbefore described.

It may be observed in the construction as hereinbefore described that the brake-shoe 15 rod 5 is pivoted within the circumference of the wheel and eccentrically relative to the center of same, to which the brake-shoe is adapted to be applied.

In Fig. 7 I show a further modification of the friction-wheel—that is, I use two ratchet-wheels 26 and 27, the teeth of which are adapted to mesh and engage each other. Wheel 26 is revolvably mounted on crank portion 24, but has no lateral movement. The ratchet-wheel 27 is likewise mounted on said portion and is adjustable laterally to and from wheel 26. In other words, wheel 26 is adapted to rotate independently of the ratchet-wheel 27, which carries the reel for winding up chain 19. Wheel 27 is provided with a flange 28, and interposed between said flange and plate 21 is a collar 29, so constructed that the wheel 27 can move independently of the collar. Interposed between flange 28 and a shoulder 30, formed on the crank portion 24, is a spiral spring 31, which holds wheel 27 in engagement with wheel 26. The disengagement between said wheels is effected by means of a rod 32, adapted to be operated from any convenient part of the wagon. Said rod is connected to either of the hinged arms 33 or 34. Arm 34 is pivotally secured to collar 28, and arm 33 is likewise secured to the bottom of the vehicle-bed. Wheel 26 is so located that it is adapted to come in con-

tact with the tire of the wheel. When it is desired to slightly restrain the motion of the wheel, the ratchet-wheel 27, which operates the brake-shoe, is disengaged from wheel 26. This is advisable in light vehicles, and also in driving down a slightly-inclined hill or road or street.

I claim—

1. In a wagon-brake, the combination, with a brake-shoe, of a bar carrying the said brake and pivoted eccentrically in relation to the wheel to which the brake is to be applied, a friction-wheel carrying a reel and mounted above the said brake-shoe, and a flexible connection between the said reel and the brake-shoe, substantially as described.

2. In a wagon-brake, the combination, with a brake-shoe, of a bar carrying the said brake and pivoted eccentrically in relation to the wheel to which the brake is to be applied, a friction-wheel carrying a reel and mounted above the said brake-shoe, a chain having its upper end secured to the said reel and having its lower end secured to the said brake-shoe, and means whereby the said friction-wheel may be caused to bear at will upon the wheel to which the brake is to be applied.

3. In a vehicle-brake, a brake-shoe eccentrically mounted with respect to a vehicle-wheel, a device to operate said shoe mounted upon the vehicle and adapted to be brought into contact with the vehicle-wheel, said device consisting of a wheel proper, bolts passing therethrough, forming a reel, a plate secured to the inner ends thereof, a lining of abrasive material secured to the rim of said wheel, and a chain connecting the reel and shoe, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES FRANK. DUGAN.

Witnesses:

C. K. JONES,

E. F. KELLER.