(No Model.)

2 Sheets—Sheet 1.

E. SWARTZ & D. S. BEEMER

VEHICLE BRAKE.

No. 482,027. Patented Sept. 6, 1892.

Fig. 1.

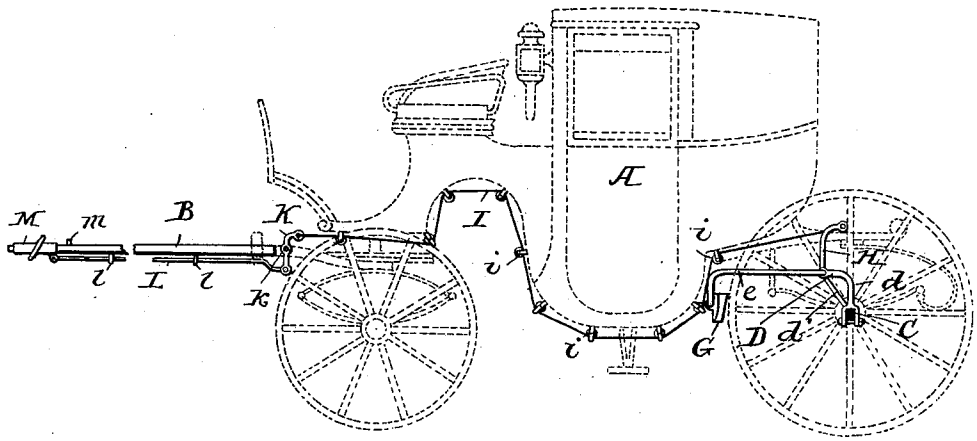
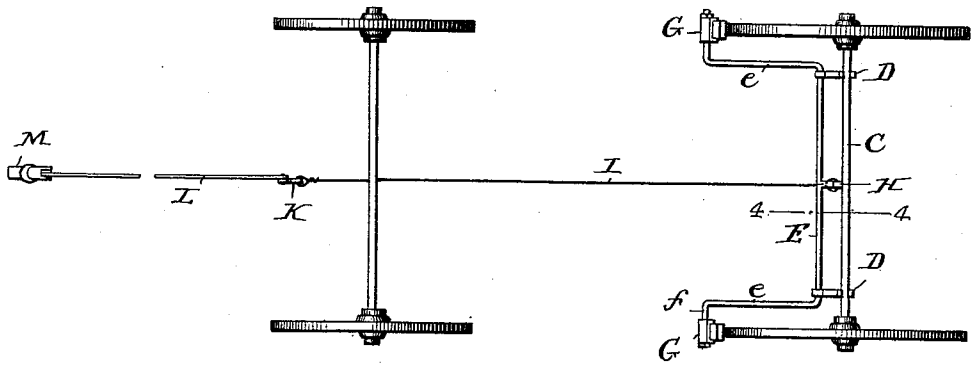


Fig. 2.



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Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

E. SWARTZ & D. S. BEEMER.

VEHICLE BRAKE.

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Fig. 3.

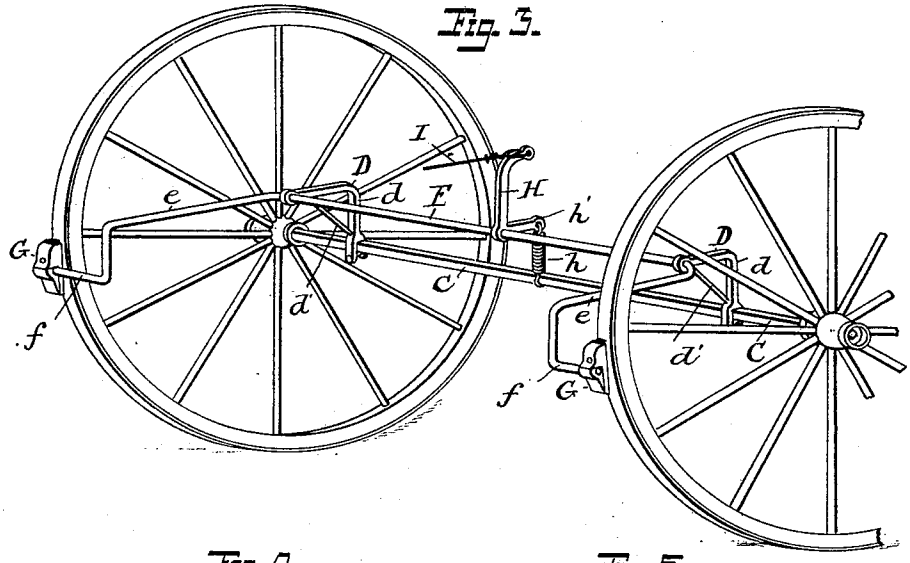


Fig. 4.

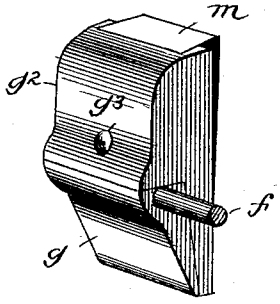


Fig. 5.

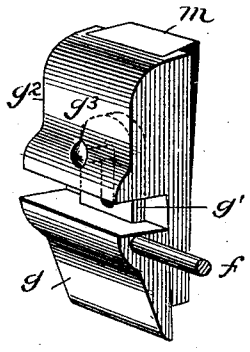


Fig. 6.

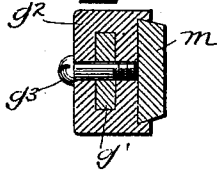
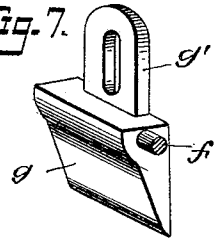


Fig. 7.



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UNITED STATES PATENT OFFICE.

ELI SWARTZ AND DANIEL S. BEEMER, OF SCRANTON, PENNSYLVANIA.

VEHICLE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 482,027, dated September 6, 1892.

Application filed January 20, 1892. Serial No. 418,627. (No model.)

To all whom it may concern:

Be it known that we, ELI SWARTZ and DANIEL S. BEEMER, citizens of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Vehicle-Brakes; of which the following is a specification.

Our invention relates to an improved automatic vehicle-brake; and it consists in a brake which is particularly adapted for use with cut-under carriages and other similar vehicles.

In the accompanying drawings, in which like reference signs refer to like parts throughout the several views, Figure 1 is a side elevation of a cut-under carriage in dotted outline, showing our improved brake attached. Fig. 2 is an under side plan view of the same, looking upward. Fig. 3 is a perspective view of the rear axle, showing the brake apparatus. Fig. 4 is a perspective view of one of the brake-shoes in its normal condition. Fig. 5 is a similar view showing the brake-shoe in the position which it takes when the vehicle is backing. Fig. 6 is a cross-section of the brake-shoe and block, and Fig. 7 is a perspective view of the fixed part.

Our improved brake belongs to that class usually termed "automatic," in which the pressure of the carriage or wagon upon the horses in going downhill, or, in other words, the backward pressure of the horses, is used to apply the brakes. Thus the brakes are always applied at the proper times and with a power proportionate to the grade of the hill.

Referring to the accompanying drawings, A designates the carriage-body, and B the pole.

Upon the rear axle C, near its ends, is fastened a pair of brackets D, each consisting of a bent rod *d*, which is fastened by a clip and bolt, as shown, or in some other suitable manner to the axle, and a straight brace-rod *d'*, extending between the ends of the rod *d*. The rods *d* extend upward and then forward from the axle, as shown in Fig. 1, and at their ends are provided with eyes. Through these eyes passes a brake-shaft E. At each end of said shaft is an arm *e* at right angles to the shaft and preferably formed integral therewith. The brakes proper G are carried by right-angled extensions *f* of the arms *e*.

From the middle of the brake-shaft E rises an arm or lever H, having an eye in its upper end for the attachment of a rope, chain, or cable I of suitable material. The lever H is rigidly connected to the brake-shaft either by being welded thereto or by a set-screw or equivalent clamping device.

The brakes proper each consists of a head formed in two parts and a removable shoe which bears against the wheel. The lower part *g* of the head is fixed upon the arm *f* of the brake-shaft. A tongue *g'*, which is preferably integral with the part *g*, extends upward into a corresponding slot or opening in the upper part g^2 of the head, and a screw, bolt, or pin g^3 is passed through the portion g^2 and the slot in the tongue *g'* to hold the two portions of the head together and prevent the tongue from being withdrawn. The brake-shoe *m*, which is preferably made of wood, is attached in any suitable manner to the back of the larger portion g^2 of the head. As shown, the shoe is dovetailed into the head.

A common defect in automatic brakes is that the shoe is made movable upon the head in such a way that the water or snow which gathers on the top is permitted to run down between the movable parts and freeze, thereby preventing them from operating properly and impairing the efficiency of the brake. In our improved brake it will be noticed that the connection between the two movable parts is entirely shielded from the action of snow and frost. It therefore operates successfully at all seasons and in all kinds of weather.

The cable I passes over a series of small noiseless pulleys *i*, following the contour of the bottom of the carriage, and extends from the upper end of the lever H to the upper end of a lever K, which is pivoted near its middle at *k* between the hounds of the carriage. To the lower end of the lever K is pivoted a rod L, which extends along beneath the pole of the carriage and is held in place by suitable guides *l*, which are attached to the pole. The forward end of the rod L is connected to a sleeve or thimble M, which is free to slide upon the outer end of the pole. The stop *m* limits the rearward movement of the thimble M when the carriage is being backed, and a spring *h*, which connects an arm *h'* upon the shaft E with the rear axle, releases the brakes

and holds them normally away from the wheels. It will be evident that the spring *h* and stop *m* may be located at different parts of the brake mechanism and still perform the same functions.

The operation is as follows: When the carriage is going downhill, the horses in holding it back draw the sleeve M toward the carriage and by means of the rod L force the lower end of the lever K backward and the upper end of said lever forward. The cord or cable I is thus drawn forward, and with it the upper end of the lever H, which rotates the brake-shaft and causes the arms *e* to descend and apply the brakes to the wheels. By pivoting the brake-shaft upon arms which extend upward and forward from the axle the arms *e* are necessarily shorter than the radius of the wheel, and therefore as the arms descend the brakes are pressed against the wheels with great force. When the vehicle reaches the bottom of the hill, the brakes are raised and released by means of the spring *h*. When the carriage is backed, the brakes are thrown against the wheels as in going downhill; but in this instance the wheels revolve in the opposite direction and the friction upon the brake-shoes causes the parts g^2 to rise and the shoes rest lightly upon the wheel, so that the brake offers no resistance. By connecting the brake-shaft and the brake-levers to the axle instead of to the body of the carriage the brakes are always held in the same relation to the wheels and are not influenced by the movement of the carriage-body upon its springs. The cable which connects the forward lever with the rear or brake lever is flexible and therefore offers no resistance to the movement of the carriage-springs. In some instances it may not be convenient to attach the brackets D directly to the axle, in which cases they may be connected with the springs at or near the axle. It is, however, preferable to connect the brackets directly to the axle.

While our invention is particularly adapted for use with undercut vehicles, it will be evident that some of its elements and combinations of elements may be used with vehicles of other descriptions. We therefore do not limit ourselves to the precise construction and arrangement of parts shown.

What we claim, and desire to secure by Letters Patent, is—

1. The combination, with the axle, of the brackets fixed to the axle, the brake-shaft supported in the brackets above and in front of the axle, the brake-carrying arms upon the ends of the brake-shaft, and the lever extending upward from the shaft and connected to the brake-operating devices, substantially as described.

2. The combination, with the axle, of the brackets D, extending upward and forward, the brake-shaft E, mounted on the brackets and having arms *e* carrying the brakes, and a lever H for operating the shaft, substantially as described.

3. The combination of the axle, the brackets attached to the axle, the brake-shaft having arms *e* and lever H attached thereto, the brakes at the outer ends of the arms *e*, the arm *h'* upon the brake-shaft, and the spring *h*, connecting the arm *h'* with the axle, substantially as described.

4. The combination, with a cut-under vehicle, of the brackets connected with the rear axle, the brake-shaft provided with arms carrying the brakes and a lever, a cable extending from the upper end of said lever to a lever pivoted between the hounds, a rod connecting the latter lever with a sleeve upon the tongue of the vehicle, and guides for conducting the cable along the bottom of the vehicle, substantially as described.

5. The combination, with the axle, of the brackets fixed to the axle, the brake-shaft, the lever for operating the shaft, the arms at the outer ends of the shaft, and the two-part brake-heads, each having one part rigidly connected to the brake-shaft and the other part movable and provided with a shoe, substantially as described.

6. The combination, with the brake-shaft, of the two-part brake-head, the lower part of the brake-head being connected rigidly to the shaft and provided with an upwardly-extending slotted tongue and the upper part having a recess to receive said tongue, and a screw or pin arranged to pass through the slot in the tongue, whereby the two parts are movably held together, substantially as described.

7. The herein-described two-part brake-head, the lower part having an upwardly-extending slotted tongue and the upper part having a portion overlapping the lower part, the said overlapping portion being provided with a recess to receive the tongue, and a pin or bolt for retaining the tongue within the recess, substantially as described.

8. The combination, with the shaft E, having the arms *e f*, of the two-part brake-head, the lower part *g* being rigidly connected to the arms *f* and provided with the slotted tongue *g'* and the upper part g^2 overlapping the lower part and provided with a recess to receive the tongue, a pin or bolt g^3 to retain the tongue within the recess, and a shoe *m*, attached to the back of said upper portion, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ELI SWARTZ.
D. S. BEEMER.

Witnesses:
JAS. H. TORREY,
JNO. P. ALBRO.