(No Model.) 2 Sheets—Sheet 1.

H. A. WAHLERT.

LOCOMOTIVE BRAKE.

No. 347,017. Patented Aug. 10, 1886.

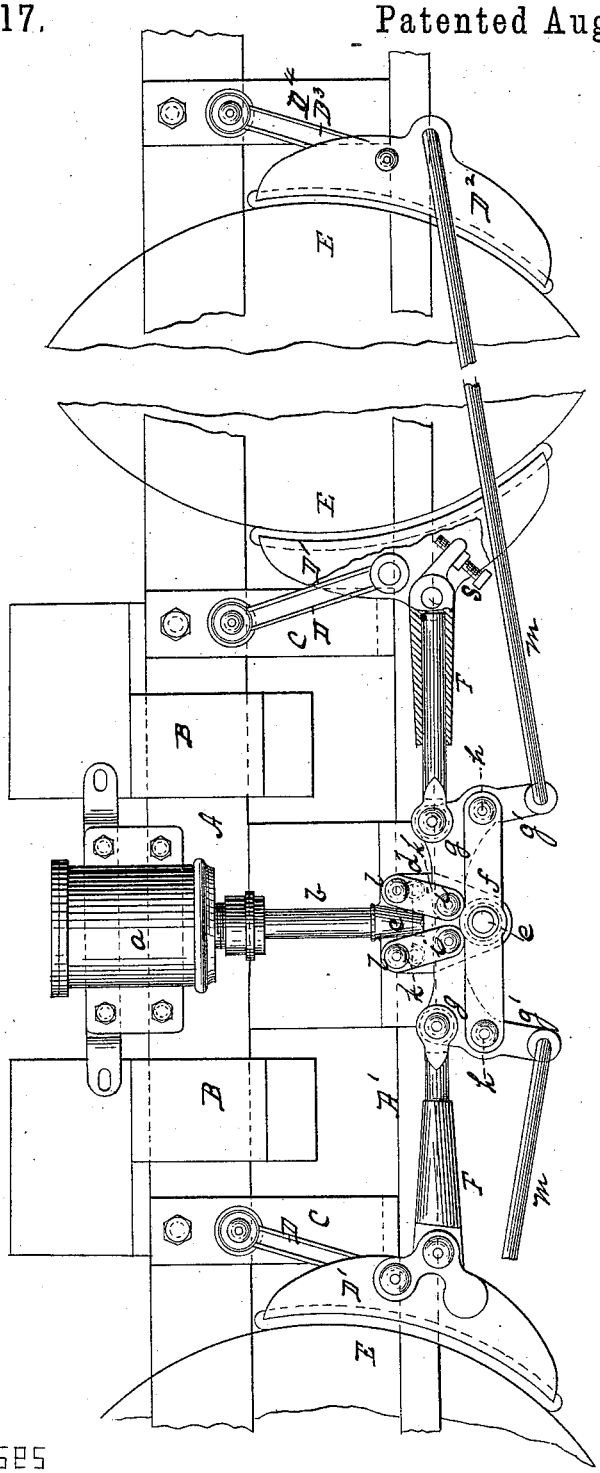

Fig. 1.

Witnesses

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F. P. Metzger

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by F. W. Ritter Jr. Atty

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

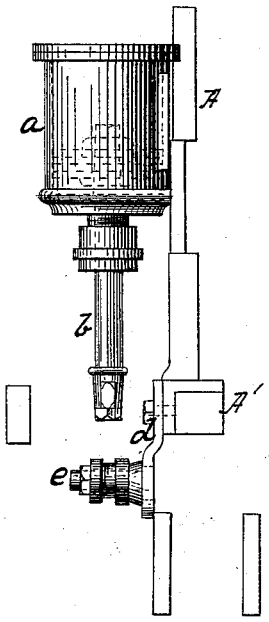
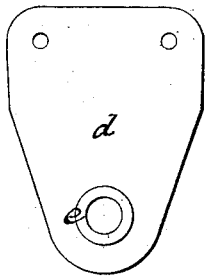


Fig. 3.



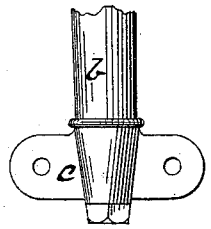
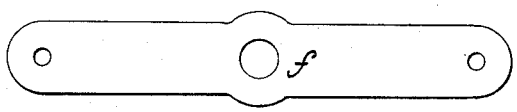


Fig. 4.



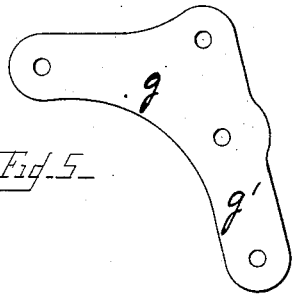


Fig. 5.

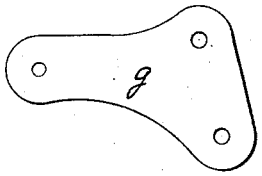


Fig. 6.

Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY A. WAHLERT, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE AMERICAN BRAKE COMPANY, OF SAME PLACE.

LOCOMOTIVE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 347,017, dated August 10, 1886.

Application filed January 20, 1886. Serial No. 189,191. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WAHLERT, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Locomotive-Brakes; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation of devices embodying my invention. Fig. 2 is a front view showing the cylinder and the edge of the face-plate. Figs. 3, 4, and 5 are detail views. Fig. 6 is a view of a modification of the elbow-lever shown in Fig. 5, which is used when outside shoes are not desired.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of locomotive-brakes, and has for its objects to provide a system of brake-levers which can be used for applying brakes between the drivers only, or for both inside and outside brakes, as may be desired, and is especially adapted for use where neither the horizontal cylinder nor any of the present toggle-lever systems can be applied.

In order to be acceptable, locomotive-brakes must be such as to be readily attached to locomotives as at present constructed. While those heretofore devised are generally applicable to the most common forms of locomotive construction, it frequently happens that certain locomotives are too wide coupled to permit the effective use of any of the present forms of brake, except that wherein a horizontal cylinder is used, and yet there are obstructions on the frame, on the engine, or in the location of the frame, which prevent the application of the horizontal-cylinder brakes, which obstructions cannot be removed or avoided, and which compel the use of a vertical cylinder for actuating the brake.

The conditions necessary to avoid the objections specified are, first, that the toggle system should have unusual span or reach; second, should be symmetrical; third, should operate without loss of power; fourth, should be of a character which will adapt itself automatically, so as not to beceme rigid when one of the drivers sags, and, finally, can be actuated by a vertical piston—that is to say, the fulcrums or fixed points of the toggle system must be sufficiently near, as well as in such relation to the path of the piston-rod as to prevent racking or strain of the piston and cylinder, and to prevent loss of power in applying the brakes.

To obtain the ends desired, I have combined with a fulcrum-bar pivoted on the face-plate two bell-crank or elbow levers, each of which has one arm pivoted on the fulcrum-bar and its other linked to the piston, so that the points where the power is applied are adjacent to the path of the piston, and the power is applied in two directions in the same plane at right angles to the piston, whereby the piston-rod is relieved of any racking or strain, and at the same time there is no chance for the brake-lever system to become locked or rigid in its application of the power to the brakes, as would occur if segmental bell-cranks pivoted at the angle were employed.

There are other novel features of minor importance, which will hereinafter more fully appear.

I will now proceed to describe my invention more specifically, so that others skilled in the art to which it appertains may apply the same.

In the drawings, A A′ indicate the frame-bars of a locomotive; B, the expansion-plates; C, channel-plates; D, the hangers for suspending the brake-heads D′; E, the driving-wheels; F, the push-bar, all of which may be as shown, or of any approved construction, as the same form no part of the present invention.

It will be noted that owing to the form and location of the expansion-plates B the distance between the drivers F is greatly increased over the general construction, while the position of the frame-bar A′ precludes the effective use of a horizontal cylinder. It is to meet such and similar constructions that my toggle system has been devised.

a indicates a vertical brake-cylinder arranged in the vertical central plane between the drivers E, properly secured to the frame A, and provided with the piston *b*, which terminates in or is provided with a cross-head, *c*.

On the bar A′ of the frame, in the same plane as the cylinder, is secured a face-plate or fulcrum-plate, *d*, having a fulcrum boss and bolt, *e*, on which is pivoted a fulcrum-bar, *f*.

g indicates bell-crank or elbow levers, each pivoted by one arm to the fulcrum-bar, as at *h*, and linked by the opposite arm, as at *i*, to the cross-head *c* by links or short levers *k*, pivoted on the cross-head, as at *l*. The bell-crank or elbow levers *g* are pivoted at their angles to the push-bars F of the brake-heads arranged between the drivers. If only outside brakes are used, the elbow lever may be of the form shown in Fig. 6; but if outside brake-shoes are desired the lower arm of the bell-crank or elbow lever is extended beyond the point *h*, where it is pivoted on the fulcrum-bar *f*, to form an arm or extension, *g′*, and said extension is connected by a pull-rod, *m*, with an outside shoe, D^2, suspended by its hanger D^3 from channel-plate D^4.

S indicates the screw in the toe of the push-bar for adjusting the brake-head.

The operation of the devices is as follows: Steam being admitted to the under side of the piston forces up the same, and the piston pulling on the links *k* and the arms of the bell-crank or elbow levers causes them to rock on the fulcrum-pivots *h* of the fulcrum-bar *f*, and thus forces the push-bars F, which are connected to the angles of the elbow-lever, apart or away from each other in the same plane, with uniform motion and equal power, thus applying the brake-shoes between the drivers at the same time the extension ends *g′* of the elbow-levers *g* move toward each other at uniform rates, and with equal power drawing on the pull-rods *m* and applying the outside shoes, if such are used.

Owing to the construction shown and described, there will be no liability of racking or straining the piston, as the power is applied from the center in both directions in one and the same plane, so that any shocks will be neutralized or converted into the axial line of the piston-rod, and as the fulcrum-bar can rock on its fulcrum *e*, and the elbow-levers have movable fulcrums at all points of connection, while the points *i e i* are closely grouped, it is evident that there is always a chance for compensating movement in the fulcrum, which will prevent the locking of the wheels by the brakes, and thus avoid flattening of the wheels.

Having thus described the nature, operation, and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a toggle system for actuating locomotive-brakes, the combination, with a pivoted fulcrum-bar, of two elbow-levers, each of said levers pivoted by one arm on the fulcrum-bar, and connected by the opposite arm to the piston or power rod, substantially as and for the purposes specified.

2. In a toggle system for actuating locomotive-brakes, the combination, with a pivoted fulcrum-bar, of two elbow-levers, each pivoted by one arm on the fulcrum-bar, and connected by the opposite arm to the piston or power rod, said arms provided with an extension-arm for connecting a pull-rod thereto, substantially as and for the purposes specified.

3. In a locomotive-brake, the combination of a vertical cylinder and piston, a fulcrum-bar having its fulcrum in the axial line of the piston, and elbow-levers movably connected with the fulcrum-bar and piston and the push-bars of the brakes, substantially as and for the purposes specified.

4. In a locomotive-brake, the combination of the piston-rod provided with a cross-head, a fulcrum-bar having its fulcrum in the axial line of the piston, elbow-levers pivoted by one arm on the fulcrum-bar, and links which connect the opposite arms of the elbow-levers to the cross-head of the piston, substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 2d day of January, 1886.

HENRY A. WAHLERT.

Witnesses:
GEORGE H. POOR,
E. B. LEIGH.