(No Model.) 2 Sheets—Sheet 1.

P. EVERITT & D. H. W. J. O'N. NEALE.

BRAKE.

No. 374,786. Patented Dec. 13, 1887.

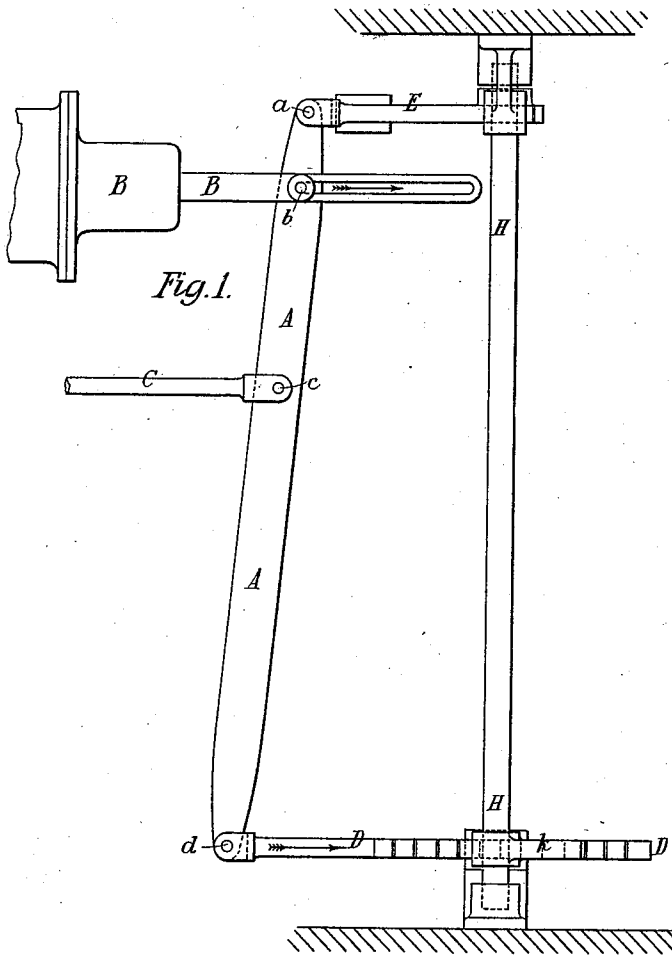


Fig. 1.

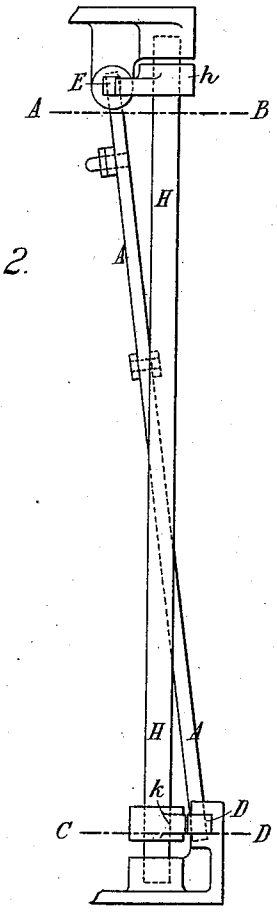


Fig. 2.

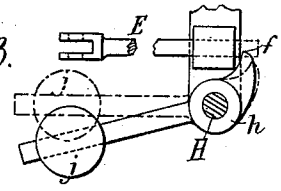


Fig. 3.

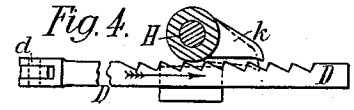


Fig. 4.

Witnesses
Will T. Norton
Thos. Belt

Inventors
Percival Everitt
D. H. W. J. O'Neale Neale
By their Attorneys
John J. Haasler & Son

N. PETERS, Photo-Lithographer, Washington, D. C.

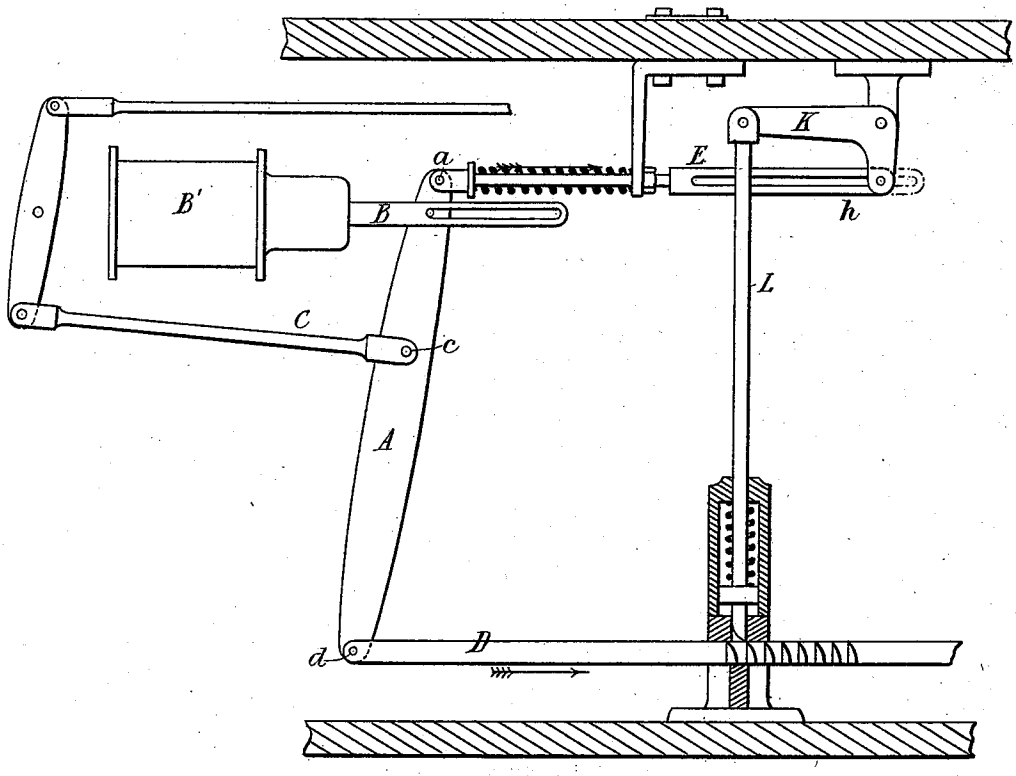
(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.



Witnesses
Will. Norton
Chas. Betts

Inventor
Percival Everitt
and D. H. W. J. O'Neale Neale
By their Attorneys
John J. Hassler & Son

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PERCIVAL EVERITT, OF LONDON, ENGLAND, AND DEODATUS H. W. J. O'NEALE NEALE, OF NEW YORK, N. Y.

BRAKE.

SPECIFICATION forming part of Letters Patent No. 374,786, dated December 13, 1887.

Application filed August 5, 1887. Serial No. 246,217. (No model.)

To all whom it may concern:

Be it known that we, PERCIVAL EVERITT, a subject of the Queen of Great Britain, and a resident of London, England, and DEODATUS H. W. J. O'NEALE NEALE, also a subject of the Queen of England, and a resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Brakes; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to an apparatus which is applicable to any ordinary hand, steam, or air brake, and it is of such a nature that until the brake-shoes or their equivalents—such as brake-blocks, straps, or rubbing pieces—come in contact with the wheels or other objects whose motion is to be arrested, the source of power acts with a quick leverage—that is to say, a small movement of the brake-cylinder piston, hand-wheel, or other source of power for applying the brakes causes a considerable and quick movement of the brake-blocks or their equivalents; but when, however, these are thus brought into contact with the wheels, which offer an increased resistance to the further movement of the brake-shoes, the fulcrum of the brake-lever, and consequently its leverage, is changed, so that a considerable movement of the brake-piston or other source of power produces only a small movement of the brake-blocks or their equivalents, which are pressed against the wheels or other objects whose motion is to be arrested. During that period when only the friction of the connecting-levers and parts has to be overcome, the brake-leverage gains speed rather than power; but when the brake-shoes or their equivalents come in contact with the wheels, which offer increased resistance to the further movement of the brake-shoes, this increased resistance shifts or causes a change in the fulcrum of the brake-lever in such a manner that the brake-leverage then gains power rather than speed, so that a small amount of power applied by the brake-piston or other original source of power exerts a considerable amount of pressure on the brake-blocks or their mechanical equivalents.

In the drawings, Figure 1 is a plan view of an apparatus embodying our invention; Fig. 2, an end view; Fig. 3, a section through the line A B of Fig. 2, and Fig. 4 a section through the line C D of Fig. 2. Fig. 5 illustrates in plan view the same invention with a few variations.

Referring to Fig. 1, A is a brake-lever, which works on no fixed fulcrum, and it is connected at *c* with pull-rod C, leading to the brake-blocks.

B is the piston-rod of the brake-cylinder B′, and it is coupled to the brake-lever at *b*.

H is a shaft carried by brackets on the car-sills S, and having the counterbalanced lever *h* and the pawl *k*, as shown in Figs. 3 and 4, both keyed onto the shaft H.

E is a rod, pivoted to the lever A at *a*, Fig. 1, the end of which butts against the end of the lever *h* at *f*, as shown in Fig. 3.

D is a toothed rack, also pivoted to the lever A at *d*, free to travel in the direction of the arrow and sliding in a bracket beneath the pawl *k*, as in Fig. 4.

The action is as follows: When the power is first applied by means of the piston-rod B, the power required to raise the balance-weight *j*, Fig. 3, by means of the rod E pressing against the point *f*, is greater than that necessary to overcome the friction of the connecting levers and parts, and to bring the brake-blocks to the wheels. Therefore the point *a*, Fig. 1, during this portion of the motion acts as a fulcrum, and the rack D travels in the direction of the arrow until the pull-rod C has traveled sufficiently to bring the brake-blocks in contact with the wheels. It will be seen that during this movement the brake is acting with a quick leverage—that is to say, a small movement of the brake-cylinder piston-rod B causes a considerable movement of the brake-shoes. When, however, the blocks come in contact with the wheels, the motion of the point *c* is arrested, and it for the moment becomes the fulcrum of lever A. This additional resistance at *c* causes the pressure at the point *a* to increase until the rod E begins to move forward in the direction of the arrow, (the rack D at

the same time taking the reverse action,) thereby tipping the lever *h*, Fig. 3, which then assumes position shown in dotted lines; but at the same time the pawl *k*, being keyed to the same shaft H, assumes the position shown in dotted lines, as in Fig. 4, and engages with the rack D. The backward travel of the rack D being now arrested, and this being held fast by the pawl *k*, the fulcrum of the lever A instantly changes from the point *c* to the point *d*. Therefore the brake will now act with increased or slow leverage—that is to say, any movement of the piston-rod B creates a less movement of the brake shoes or blocks.

In Fig. 5 the same principle is applied and the same kind of changing leverage takes place. Some of the details, however, are different, namely: the rod E in moving forward compresses a spring, *e'*, thereon, and actuates a bell-crank, K, instead of a pawl, *k;* and this bell-crank, when it has assumed the position shown in dotted lines causes the rod L to enter one of the holes or notches in bar D to lock it fast, as already described. The lever A is then held at *d*, and the fulcrum of lever A is now transferred, as before, to this point *d*, and the action is the same as above stated with regard to Fig. 1. It will be noticed that during the action of lever A three different points successively become its fulcrum—namely, *a*, *c*, and *d*—and that neither of these is a permanently fixed one. All are shifting and movable, to accomplish the objects previously stated, and the action is quick but less powerful at first, but slow and more powerful at the finish, when it is needed.

By this invention a much smaller brake-cylinder than usual may be used, thus diminishing cost and occupying less space.

We claim—

1. In combination with the brake-lever A, rod B, and pull-rod C, the rod E, pivoted at one of the ends of lever A, rack D, pivoted at its other extremity, and intermediate cross-connections between rod E and the rack, whereby the endwise shifting of rod E serves to lock the rack and to transfer the fulcrum of the brake-lever from one extremity to the other, and to change from a quick to a more powerful action when the brake-shoes come into contact with the wheels or objects whose motion is to be arrested.

2. In a brake, a lever actuated by its prime motor or power applied near one of its ends, combined with a rod and levers leading to the brake-shoes, a slide-rod pivoted or attached to such end, a device for locking and unlocking the said slide-rod and pivoted at its other extremity, and a cross-connection between the slide-rod and such locking device, whereby the fulcrum of the lever shall at the first be at one end of the brake-lever to give a quick action, and afterward, when the brake-shoes, blocks, or equivalents come in contact with the wheels or objects whose motion is to be arrested at the other end, to give a more powerful action at the finish.

3. In combination, the brake-lever A, its operating-rod B, pull-rod C, pivoted rod E, pivoted rack-bar D, shaft H, and its counter-balanced lever *h* and pawl *k*, these parts operating, as set forth, to cause at first a quick movement of the brake-blocks or their described equivalents by a small movement at the source of power and then a more powerful movement when the brakes are brought into operative action on the wheels.

4. In a brake, a lever having changeable fulcra, and connected at one extremity to a locking device and at its other extremity to a shifting device, and at a point intermediate the extremities to an operating-rod and to the brake-connections, and whereby the act of bringing the brake-shoes or their equivalents in contact with the wheels or objects whose motion is to be arrested causes the change in the leverage from a quick action at first to a more powerful action at the finish.

Signed at New York city, in the county of New York and State of New York, this 13th day of June, A. D. 1887.

PERCIVAL EVERITT.
DEODATUS H. W. J. O'NEALE NEALE.

Witnesses to the signature of Percival Everitt:

JENS JENSEN,
JOSHUA ROSE.

Witnesses to the signature of D. H. W. J. O'Neale Neale:

T. C. JENKS,
TYRRELL COOKE.