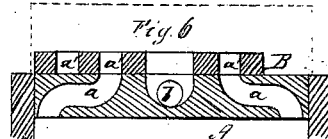
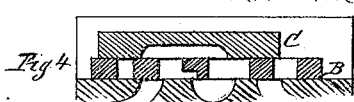
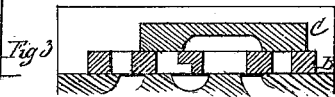
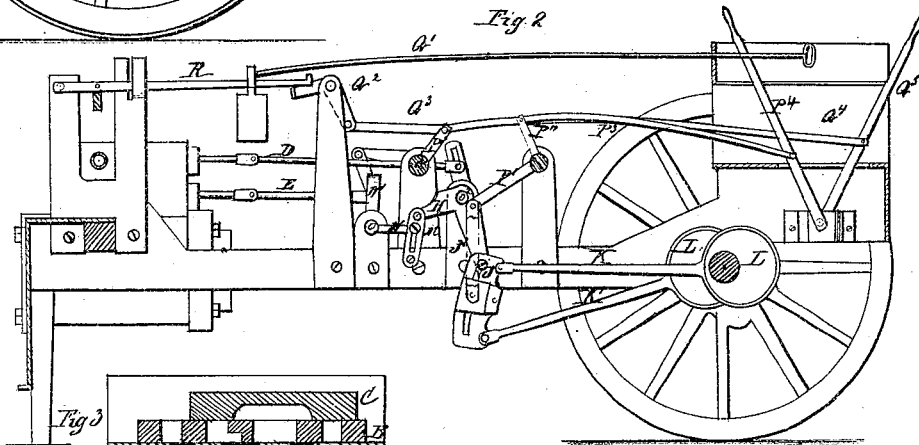
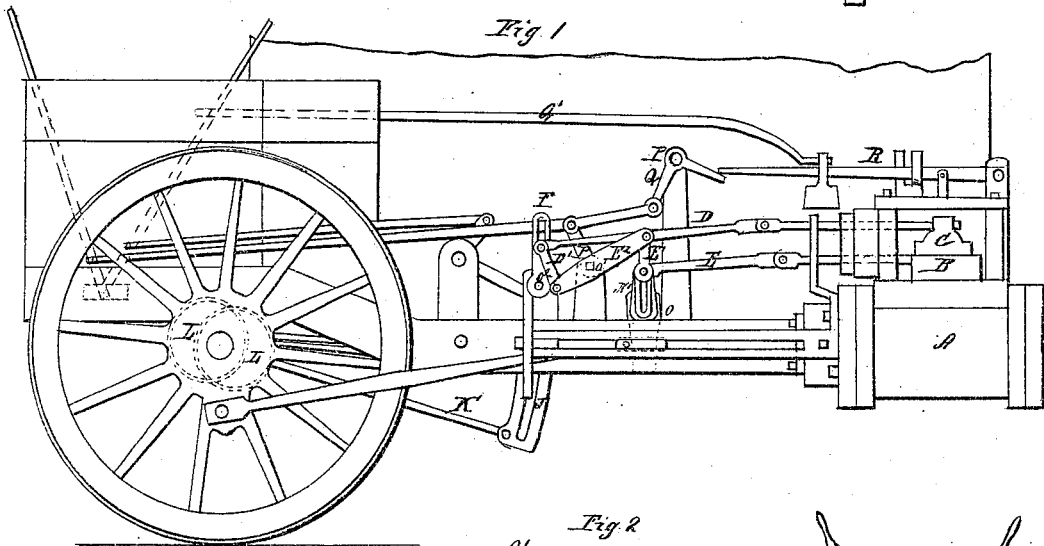
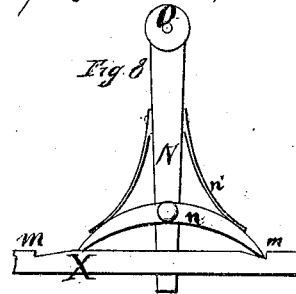
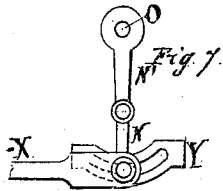


C. Lewis,

Locomotive.

No. 107,511.

Patented Sept. 20, 1870.



Witnesses
H. J. Smith
A. H. Tamm

Clark Lewis Inventor
by Munroe & Co.
His Attorneys.

United States Patent Office.

CLARK LEWIS, OF CASSVILLE, NEW YORK.

Letters Patent No. 107,511, dated September 20, 1870.

IMPROVEMENT IN LOCOMOTIVE ATTACHMENTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, CLARK LEWIS, of Cassville, in the county of Oneida and State of New York, have invented a new and improved Locomotive Attachment; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification.

My invention relates to steam-valves and valve-gear for locomotive-engines; and

The object is to hold back, break up, or entirely stop a train of cars by steam.

It consists in certain improvements, which will first be described in connection with all that is necessary to a full understanding thereof, and then be clearly specified in the summary or claim.

Figures 1 and 2 represent, respectively, opposite side views of a locomotive, with my valves and operative mechanism attached.

Figures 3, 4, 5, and 6, are detail sectional views of the valves.

Figures 7 and 8 are modifications of a particular device hereinafter described.

A is the steam-cylinder;

C, the common slide-valve; and

B, the intermediate slide or attachment-valve.

Figs. 3 and 4 show these valves in section, supported upon one another and the cylinder, and also their relative positions after the forward and backward throw of the piston.

Fig. 5 shows attachment-valves, with inlets closed.

Fig. 6 shows the valves as applied to the face of the steam-cylinder, while dotted lines indicate steam-chest.

a represents the induction, and *b* the exhaust-ports of the cylinder, while *a'* are corresponding passages in the attachment-valve.

In fig. 6 this valve is drawn back to its utmost backward throw, when it will be perceived that it registers with the ports of the cylinder, and leaves both inlet and exhaust-passages open.

On the other hand, when, as in fig. 5, the furthest forward throw is given to this valve, it will not register with the cylinder, but will cut off the steam entirely, while the slide-valve C may continue to reciprocate.

D E represent jointed valve-rods.

D is pivoted to a strap, D', whose other end is pivoted to a vibrating lever, E².

E is pivoted to an arm, E¹, which is also pivoted to the other end of lever E².

Lever E² is fast upon the rocking shaft O¹, which has an arm, P, vibrated by the rod and hand-lever Q¹ Q².

The object of this mechanism is to raise and lower the ends of valve-rods, D E, to regulate the throw of the valves.

For this purpose the end of rod D slides in the slotted arm F, and the rod E in the slotted yoke-arm N'.

These arms give reciprocating motion to the valves, and are respectively fast upon the rock-shafts O O².

The hand device Q¹ Q² also serves, by means of angle-lever Q, to raise lever R, and thereby act upon the throttle-valve.

Thus it will be perceived that, by a single movement, the engineer can act upon both the slide-valves and throttle-valve.

The shaft O², which carries the top slide-valve, is operated by one arm of lever H, the link I, rods K K', and cams L L, on the driving-shaft.

The link I is adjustable by means of slot therein, strap J', arm P¹ P², rod P³, and hand-lever P⁴.

The attachment valve-shaft O is operated by means of arm N, slotted link M, and short arm of lever H.

The slotted link M, after each movement of the arm N, moves a space, the length of the slot, while the shaft is at rest. The purpose of this is to allow the attachment-valve B to stand still a certain length of time after each forward and backward movement.

Figs. 7 and 8 show modifications operated directly from the driving-shaft or crank-rod of the engine, which would obviously answer the same purpose as link M and its operative parts.

N, in fig. 7, is a rod jointed to pendent arm N'.

X may be a reciprocating crank-rod, pivoted, at the end of rod N, to an arc-slotted piece, Y, which forms a part, or is rigidly attached to, and reciprocates, the rod E of the attachment-valve.

X carries Y, on the forward movement, to the end of its throw, and thereby deposits the attachment-valve at its furthest point of travel; but when X returns, Y is left stationary, and is not carried back until the length of the slot has been traversed by X. This gives the desired pause of the valve in the same manner at each end.

In fig. 8 the arm N is not jointed, but continuous, and the rocking of the shaft is made to reciprocate the rod E, connected therewith, in any suitable manner.

N is provided with a double spring-pawl, *n n*, which is made to actuate the shaft by means of two notches, *m m*, on the reciprocating rod X.

X carries the arm to the limit of its throw, leaves it, travels back till notch *m* comes in contact with pawl *n*, and then takes it on the return movement. Thus the proper pause is given to the valve at each ultimate point of its travel.

Q' is a weighted adjustable rod, which slides on the lever Q to regulate the throttle-valve.

The mode of operation is as follows:

When the train is in motion the slide and attachment-valves move in opposite directions, and the steam is exhausted by bringing the inlet-ports of the cylinder into communication with the exhaust-port, the attachment-valve making a momentary stop at each end. This is seen in figs. 3 and 4 of drawing.

When, however, it is desired to stop the train entirely, or to retard its speed, the attachment-valve B is interposed so as to cut off steam from the cylinder altogether, or to admit it behind the piston, to exert a counter pressure.

Having thus described all that is necessary to an understanding of my invention,

What I esteem as new, and desire to protect by Letters Patent, is—

1. The attachment-valve B, interposed between

the top slide-valve C and the face of the cylinder A, as and for the purpose described.

2. The slotted link M, or its equivalent, arranged in the machine, as and for the purpose described.

3. The rock-shaft O', arranged and operated by any suitable mechanism, combined with the lever E', straps D' E', and slotted arms F N', to adjust simultaneously the throw of the two valve-rods.

4. The combination of a hand-lever and rod Q' Q', with the mechanism for adjusting the throw of the valves, and the mechanism for acting upon the throttle-valve, whereby the slide, attachment, and throttle-valves may be all simultaneously operated in the manner described.

CLARK LEWIS.

Witnesses:

H. H. BARNUM,
C. D. POTTER.