

No. 703,936.

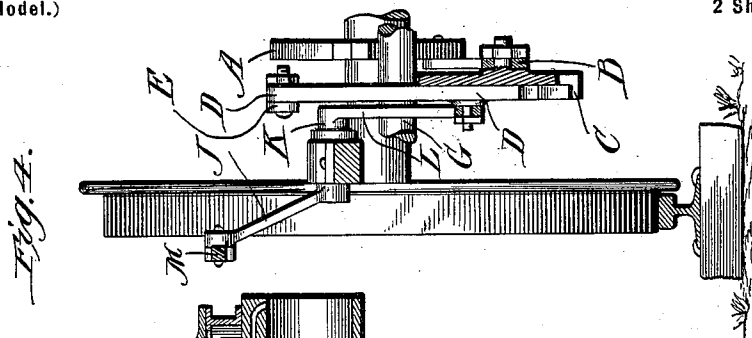
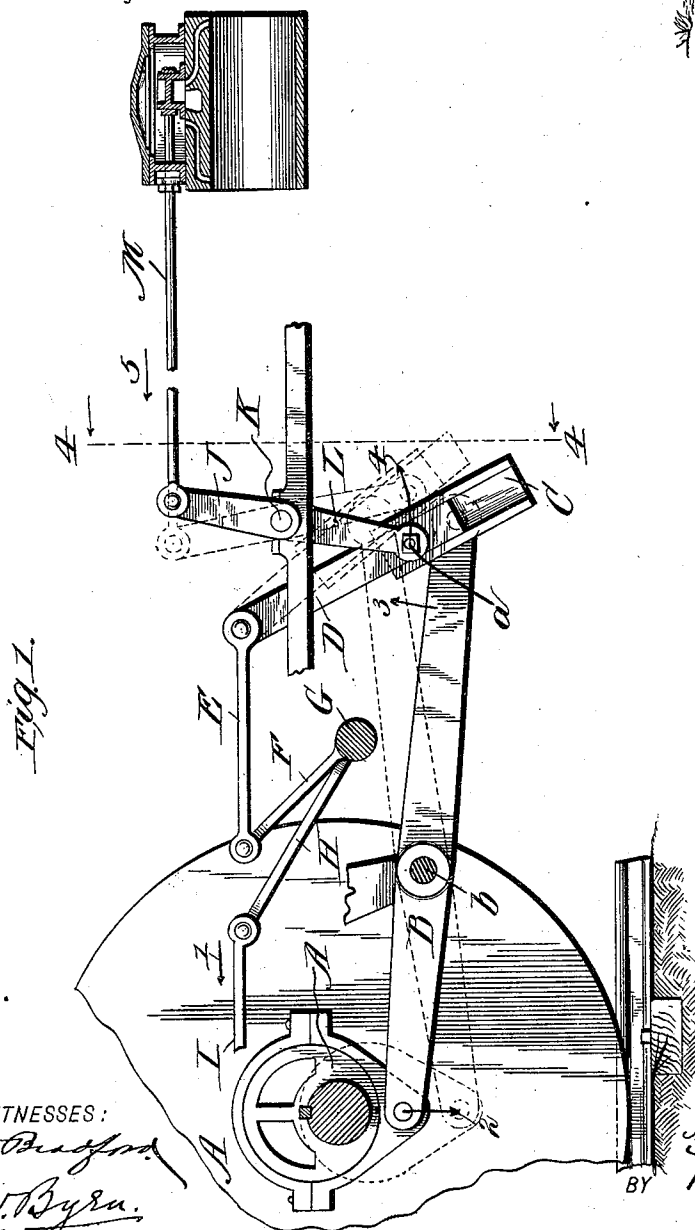
Patented July 1, 1902.

A. B. LEFTWICH.
REVERSING VALVE GEAR.

(Application filed Mar. 4, 1902.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

Edw. W. Byrns.

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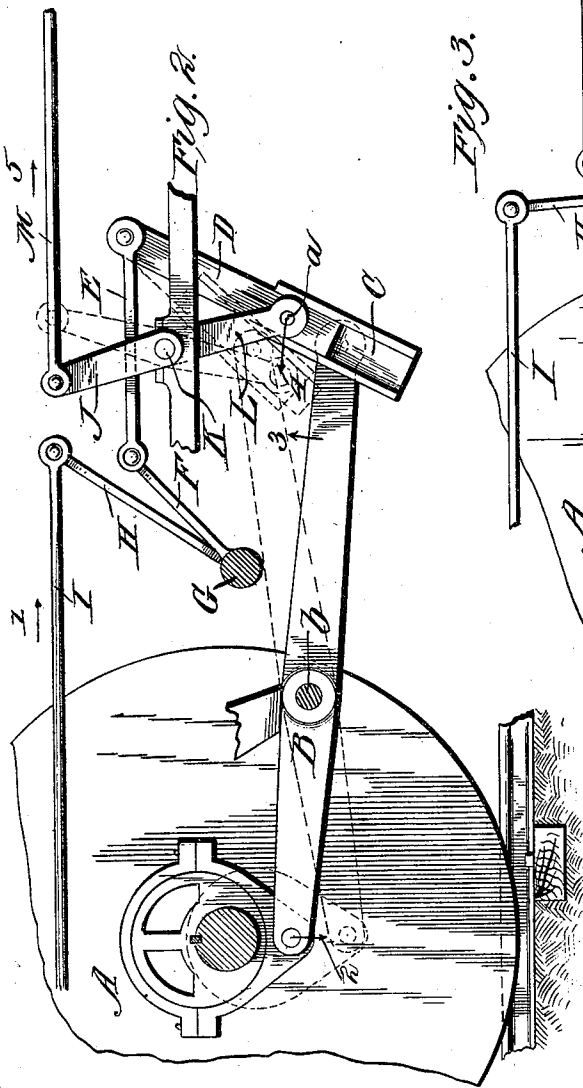
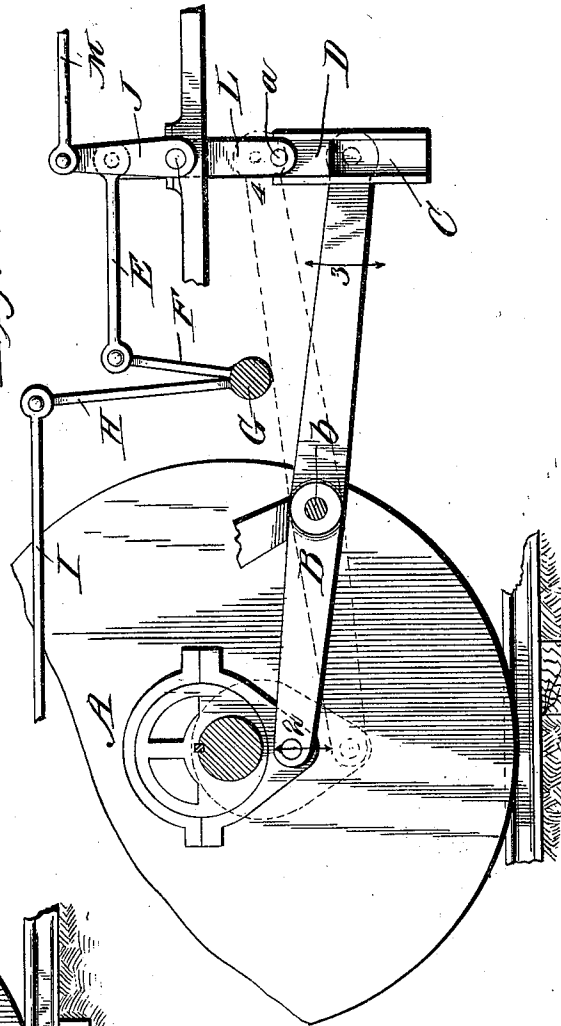
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ANDREW B. LEFTWICH, OF PUEBLO, COLORADO, ASSIGNOR OF ONE-HALF
TO EMMETT E. SCANTLIN, OF PUEBLO, COLORADO.

REVERSING VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 703,936, dated July 1, 1902.

Application filed March 4, 1902. Serial No. 96,607. (No model.)

To all whom it may concern:

Be it known that I, ANDREW B. LEFTWICH, of Pueblo, in the county of Pueblo and State of Colorado, have invented a new and useful
5 Improvement in Reversing Valve-Gears, of which the following is a specification.

My invention is in the nature of an improved reversing valve-gear designed to take the place of the ordinary Stephenson link-motion for locomotives, but applicable also to
10 all sorts of reciprocating steam-engines.

In the ordinary link-motion two eccentrics on the axle are required for each valve, one eccentric being connected to one end of the
15 curved, slotted, and adjustable link and the other eccentric to the other end of said link by means of eccentric-rods. In my invention only a single eccentric is employed for each valve and a simple construction of reversing-gear is provided, which is susceptible of the two positions necessary to reverse the
20 valve and a middle position, which has no influence on the valve, as well as various intermediate positions, which give a greater or less throw to the valve, as may be desired.

It consists in the peculiar construction and arrangement of the various parts of the device, which I will now proceed to describe, reference being had to the accompanying
25 drawings, in which—

Figure 1 is a side elevation of my invention shown applied to so much of a locomotive as is necessary to illustrate its operation. Fig. 2 is a view of a portion of the same parts,
30 showing the position assumed in reversing the engine. Fig. 3 is another view of these parts, showing the position in which the valve-gear has no influence on the valve. Fig. 4 is a sectional view on the line 4 4 of Fig. 1 on
35 the near side of the locomotive.

In the drawings, A represents the single eccentric on the axle.

B is a lever fulcrumed at *b* and connected at one end to the eccentric and at the other to
40 a vibrating shoe C. The connection of the lever B to the shoe C is a pivotal one by means of a wrist-pin, which permits the shoe C to turn or oscillate about its point of connection with the said lever. The shoe C is formed
45 with a longitudinal groove in one side of it, in which is retained, so as to reciprocate freely,

a reversing-slide D. The top of the slide is jointed to a short rod E, and this rod in turn is jointed to an arm F on a rock-shaft G, which
50 rock-shaft is by arm H connected to a long rod I under the control of the engineer.

The reversing-slide D is loosely jointed at *a* near its lower end to an arm L, depending from a short rock-shaft K, (see Fig. 4,) and this
55 rock-shaft has another rigid arm J, that connects with the valve-rod M and gives it the necessary motion. The rock-shaft K may be a short one, and an independent one may be used on each side of the locomotive, or said
60 rock-shaft may extend beneath the locomotive and be in common to both valves, if desired.

The operation of my invention is as follows: Referring first to Fig. 1, in which the engineer has pulled the rod I into the position
65 shown by arrow 1, it will be seen that the shoe C and reversing-slide D will incline to the rear at the top. Now when the eccentric A, acting on the lever B, forces it down at the arrow 2 and up at the arrow 3 the slide
70 C, turning on its joint and rising at the same time over slide D, throws the point *a* to the right in the direction of arrow 4 and pulls the valve-rod M in the direction of arrow 5. If, however, the engineer sets the rod I in
75 the position shown in Fig. 2, then the inclination of shoe C and slide D is reversed, and the same action of eccentric A, causing the lever B to move, as indicated by arrows 2 and 3, will cause the point *a* to move to the left,
80 as indicated by arrow 4, which throws the valve-rod M in the direction of arrow 5, which is the reverse of that shown in Fig. 1. If the engineer's rod I be adjusted to a half-way position, as in Fig. 3, then the oscillation of the
85 shoe C in a short arc is practically vertical, in which direction the shoe simply moves up and down on slide D without rocking the shaft K or moving the valve-rod M. It will
90 be seen that the shoe and slide may be adjusted to any degree on either side of this position to give any degree of throw to the valve for either a forward or backward direction.

Having thus described my invention, what
95 I claim as new, and desire to secure by Letters Patent, is—

1. A reversing-gear, comprising a reversing-slide, a guide-shoe embracing the same, a rocking arm pivoted to the reversing-slide and connected with the valve-rod, a lever
5 jointed to the shoe and adapted to oscillate it, and means for reversing the inclination of the shoe and slide substantially as described.
2. A reversing-gear, comprising a reversing-slide, a guide-shoe embracing the same,
10 a rocking arm pivoted to the reversing-slide and connected to the valve-rod, a lever jointed to the shoe and adapted to oscillate it, an eccentric for oscillating the lever, and means for reversing the inclination of the shoe and
15 slide substantially as described.
3. A reversing-gear, comprising a reversing-slide, a guide-shoe embracing the slide, a rocking arm pivoted to the reversing-slide and connected to the valve-rod, a lever joint-
20 ed to the shoe and adapted to oscillate it, a connecting-rod jointed to the top of the reversing-slide, and means for adjusting the same to reverse the inclination of said slide and shoe substantially as described.
- 25 4. A reversing-gear comprising a reversing-slide, a guide-shoe embracing the slide, a rock-shaft with one arm extending down to and jointed to the slide and another arm extending upwardly and connected to the valve-rod, a lever fulcrumed in the middle and
30 jointed at one end to the shoe, an eccentric connected to the opposite end of said lever, a rod connected to the top of the reversing-slide, and a rock-shaft with an arm jointed to said connecting-rod and provided with op-
35 erating mechanism under the control of the engineer substantially as described.
5. A reversing-gear, comprising a guide and a rectilinear slide moving therein, a supporting device for the guide pivoted thereto
40 and arranged to vibrate the same over the slide, means for reversing the inclination of the guide and slide and an arm jointed to the slide and connected to the valve-rod substantially as described.

ANDREW B. LEFTWICH.

Witnesses:

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