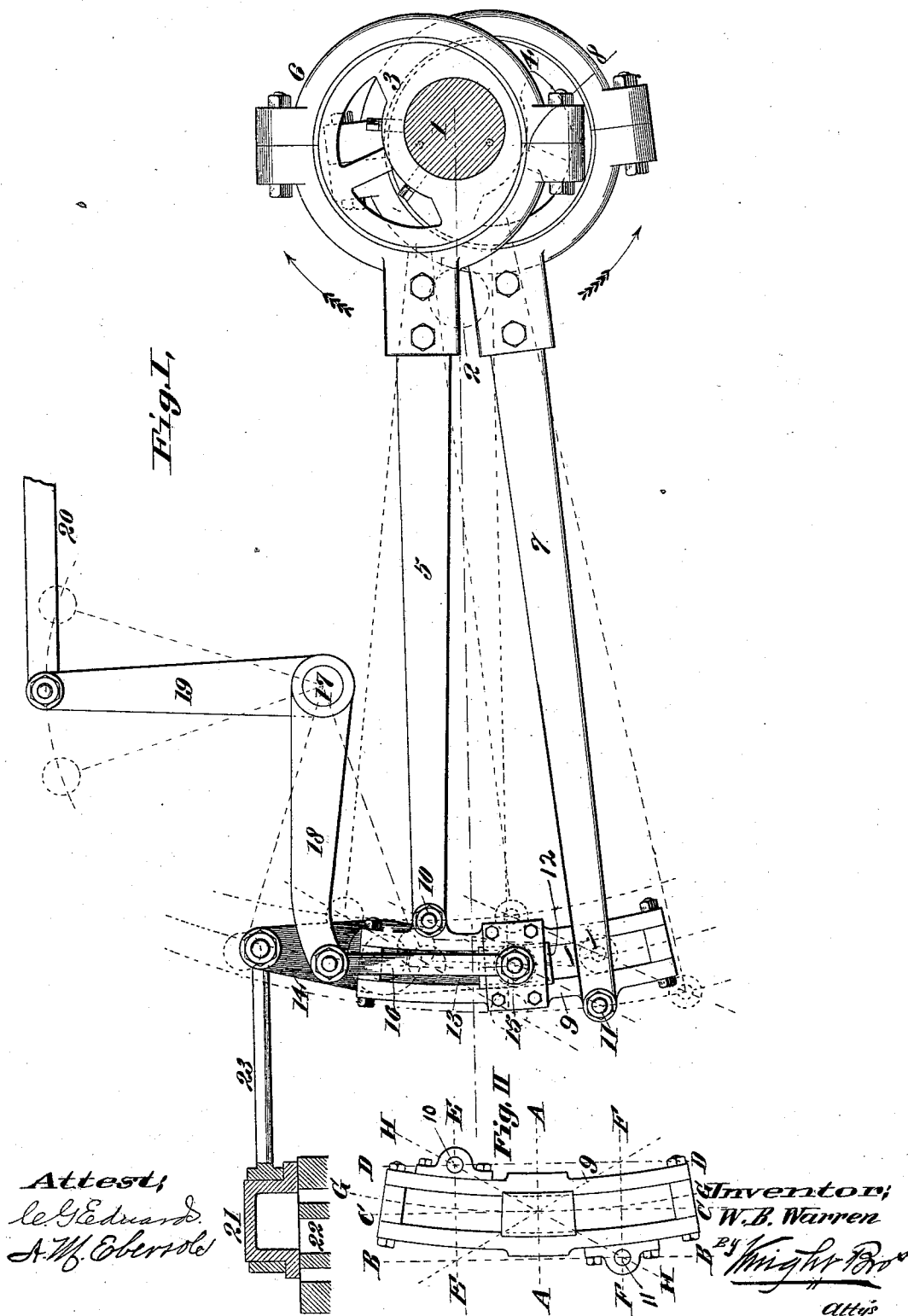


(No Model.)

W. B. WARREN.
SHIFTING LINK MOTION FOR LOCOMOTIVES.

No. 521,398.

Patented June 12, 1894.



UNITED STATES PATENT OFFICE.

WILLIAM B. WARREN, OF PEORIA, ILLINOIS.

SHIFTING LINK-MOTION FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 521,398, dated June 12, 1894.

Application filed March 30, 1894. Serial No. 505,872. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. WARREN, of Peoria, in the county of Peoria and State of Illinois, have invented a certain new and useful Improvement in Shifting Link-Motions for Locomotives, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in link motions for moving the main valve of locomotives; and my invention consists in features of novelty hereinafter fully described and pointed out in the claims.

Figure I is a side view, illustrative of my invention; and Fig. II is a side view of the skeleton shifting link.

Referring to the drawings, 1 represents the main driving shaft, and 2 the crank pin.

3 represents the forward motion eccentric on the shaft 1, and 4 the backward motion eccentric, which is also on the shaft 1.

5 represents the rod of eccentric 3, which is connected to the eccentric by a strap 6, and 7 represents the rod of the eccentric 4, which is connected to the eccentric by means of a strap 8.

9 represents the skeleton link, with which the rod 5 is connected at 10, and with which the rod 7 is connected at 11.

12 represents the link block, 13 the lower rocker arm, 14 the upper rocker arm, 15 the saddle pin, 16 the link lifting hanger, 17 the tumbling shaft, 18 the tumbling shaft lifting arm, 19 the tumbling shaft vertical arm, 20 the operating rod, which extends to within reach of the engineer, 21 the main valve, 22 the main valve seat, and 23 the stem of the main valve. These parts, in themselves, are all old, and require no specific explanation of their operation.

My invention resides in the manner in which the outer ends of the eccentric rods are connected to the skeleton link, with relation to the saddle pin 15, whereby a more perfect working of the parts is attained. To accomplish this object, I first establish a center line A, (Fig. II,) from which lines B, B, C, C, and D, D, are laid off perpendicular and at right angles to the center line, and these lines are equidistant apart on the center line. I then mark off lines E, E, and F, F, parallel with

the center line, and equal distances from the center line. I next locate the center of the saddle pin 15, (which is the center of suspension and axis for link 16,) where the center line and the center arc line G, G, intersect with the center line C, C. I then locate the coupling pin hole 10 at the intersection of the lines E, E, and D, D, and locate the coupling pin hole 11 at the intersection of the lines B, B, and F, F, and I thus have the coupling pin holes located at different distances from the main shaft and each located on a different side of the center arc G, G, and they are located at equal distances, in a perpendicular measurement from the center of the saddle pin 15, and are likewise located at equal distances in a horizontal measurement from the center of the saddle pin, thereby forming a straight line H, H, through the center of the saddle pin, the coupling pin hole 10, and the coupling pin hole 11, so that the point of connection between the eccentric rods 5 and 7, with the link 9, each travel an equal distance to or from the central line of motion at movement of the link either along the center line of motion or rotation on its center of saddle pin 15. I thus equalize and proportion to better advantage, the angularity of the eccentric rods, thereby producing more correct and equal cut off and exhaust of the openings in the main valve at all points of the stroke of the engine, and this is done without sacrificing the lead or admission openings of the main valve. By this arrangement also, I am better able to locate the center of the saddle pin on the center arc G, G, of the link 9, thus reducing the slip of the link on its block, and reducing the strain and wear of all parts of the link motion and doing away with the customary way of equalizing the main valve cut off, and exhaust openings, which was done by locating the center of saddle pin 15 back of the center of arc G, G, and link 9, which caused slipping of the link on the block 12, resulting in wear and strain on the link motion. These advantages are attained without complication, or without the use of more parts than usually employed in link motions, and the improvement can be applied to all shifting link motions in use, and at a small cost.

It is evident that I can change the location

of the holes 10 and 11, in a horizontal direction, the required amount, to correct and proportion any point of cut off and exhaust openings of the main valve, and still retain the center line of the saddle pin on the intersection of the lines, as explained.

I claim as my invention—

1. In a link motion for locomotives, the link 9 having the points of connection between the link and the eccentric rods on opposite sides of the link and at equal distances from the saddle pin, and having these points of connection so disposed with relation to the saddle pin that a straight line drawn from one connection to the other will pass through the

saddle pin; substantially as and for the purpose set forth.

2. In a link motion for locomotives, the link 9 having the points of connection between it and the eccentric rods at unequal distances from the center of the main shaft, and on opposite sides of the saddle-pin, with the center of the saddle-pin at the intersection of a line drawn centrally through the link in a longitudinal direction, and a line formed in the arc of a circle in which the saddle-pin moves.

WILLIAM B. WARREN.

In presence of—

W. L. VERMILLION,
R. S. COPPACK.