

H. O. LAWRENCE.

VALVE GEAR.

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951,536.

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Fig. 1.

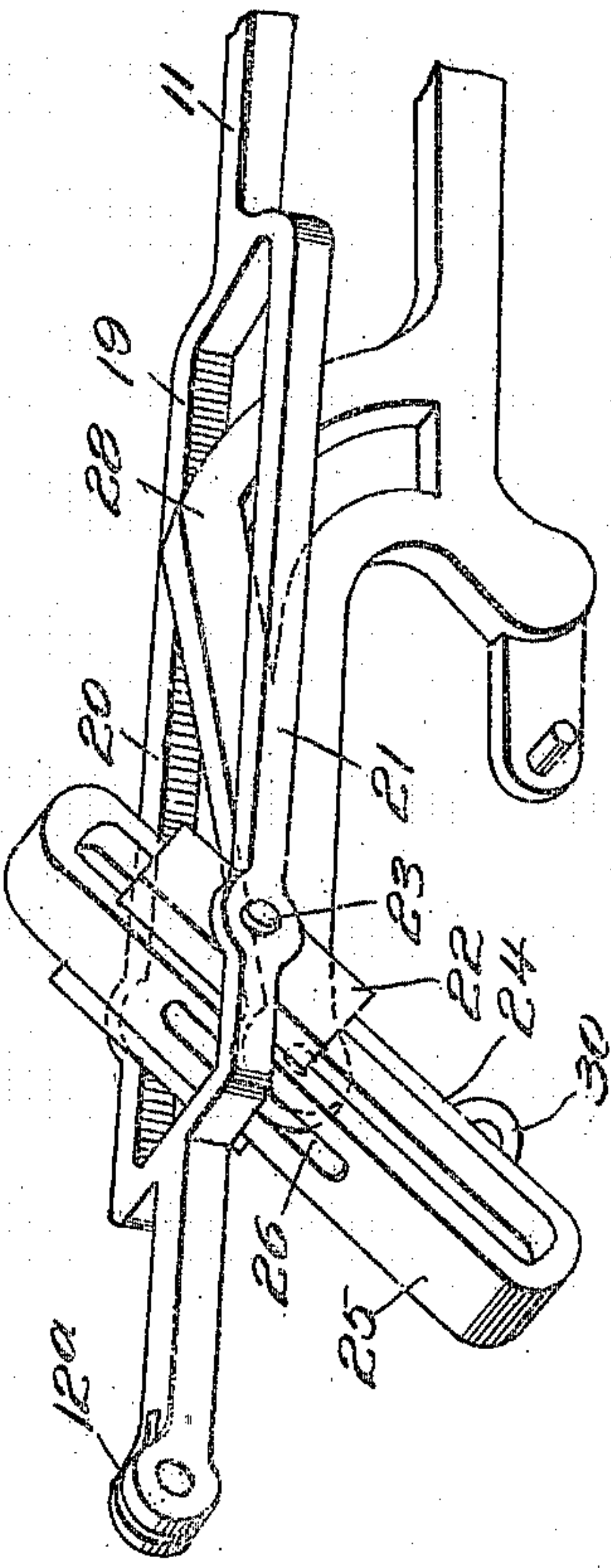
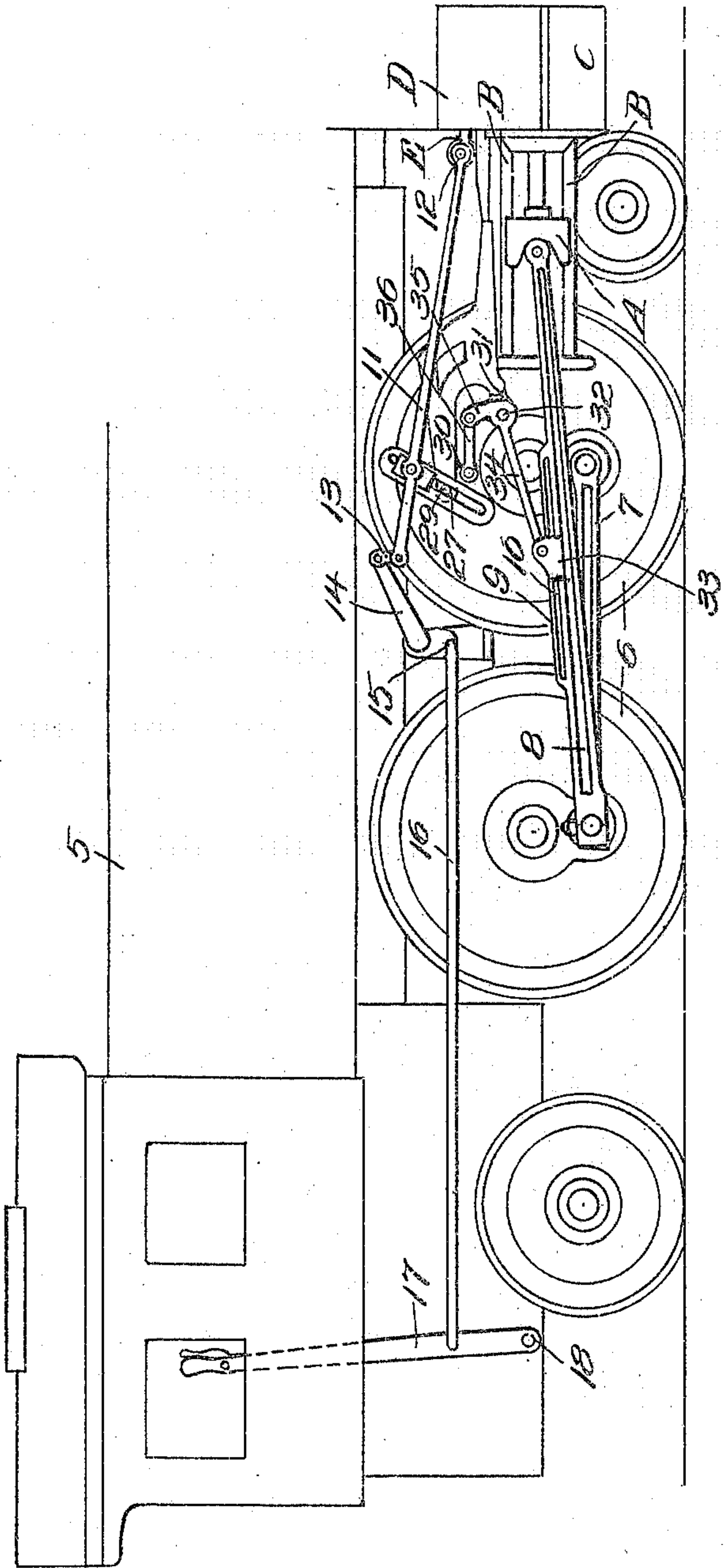


Fig. 2.

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VALVE-GEAR.

951,536.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY O. LAWRENCE, a citizen of the United States, residing at 3303 Morgan street, St. Louis, State of Missouri, have invented new and useful Improvements in Valve-Gears, of which the following is a specification.

This invention relates to valve gears especially adapted for use in connection with locomotives and has for an object to provide a simple gear for changing the motion of the locomotive without the use of eccentrics commonly used heretofore and to obviate the use of other various objectionable features, and to so arrange the operative parts of the present invention that they may be accessible at all times to enable the operator to remove worn or broken parts in a simple and convenient manner.

A further object of this invention is to provide a gear that can be conveniently applied to locomotives without changing the same, and to provide means so that the valve operating mechanism may be controlled directly from the main rod.

Other objects and advantages will be apparent as the nature of the invention is better disclosed, and it will be understood that changes within the scope of the claims, may be resorted to without departing from the spirit of the invention.

In the drawings, forming a portion of this specification, and in which like characters of reference indicate similar parts in the several views, Figure 1 is a side view of a portion of a locomotive showing the application of the valve gear thereto. Fig. 2 is a detail perspective view.

Referring now more particularly to the drawings, there is shown a locomotive 5 having the usual drive wheel 6 provided with the ordinary side rods 7, and a main rod 8. The main rod has formed upon its upper surface midway between its ends an enlargement 9 in which is formed a longitudinally extending guide slot 10 for a purpose to be hereinafter more fully set forth. The said main rod 8 is connected in the ordinary manner to the cross head A of the locomotive slidable in the usual guides B.

A piston cylinder C is shown, and has mounted upon the top thereof the usual form of steam chest D in which is mounted a slide valve of ordinary construction adapt-

ed to be operated in a manner to be hereinafter described to change the motion of the locomotive, and as shown, the valve is provided with a stem E. A radius rod 11 is loosely connected as indicated at 12 to the stem E, and at the rear end the said rod is forked as indicated at 12^a, and between the arms of the said fork is mounted a reverse lift bar 13 which is loosely connected at its upper end to a reverse arm 14. The reverse arm is connected as shown at 15 to a reverse reach rod 16, and at its extreme rear end the said reach rod is connected to an operating lever 17 pivotally mounted as shown at 18 at a suitable point upon the locomotive. The operating lever extends within the cab of the locomotive in order that said lever may be conveniently manipulated by the engineer when it is desired to operate the valve gear. The radius rod at a point between the ends thereof is of substantially yoke form as shown at 19, and thus forms parallel spaced arms 20 and 21 provided with guide elements 22 pivoted to the arms of the yoke as shown at 23. The said guide elements are slidably engaged with ribs 24 upon the sides of a solid rocker 25. The rocker 25 has formed therein a slot 26 which receives the rear end 27 of a frame 28 mounted upon one of the cross head guides B. The said rear end 27 of the frame 28 receives a pivot pin 29 mounted in the walls of the slot 26. The bar 25 is provided with a forwardly projecting ear 30, and the frame 28 is provided with a rearwardly projecting ear 31 which has mounted thereon a horizontally disposed pin 32.

A motion block 33 is slidably mounted in the guide slot 10 and has connected thereto the rear end of a rocker 34. The rocker 34 is pivoted at its forward end on the pin 32, and as shown, the said rocker is provided with an upstanding portion 35 to which is pivoted the forward end of a connecting rod 36. The rear end of the rod 36 is pivoted to the ear 30 upon the rocker 25.

From the construction of valve gear as herein set forth, it will be seen that the same may be applied to locomotives of the general type without changing the same as will be readily appreciated upon reference to Fig. 1 of the drawings wherein is shown a well known form of locomotive. In the operation of the engine it will be seen that mo-

tion imparted to the main rod will transmit a sliding motion to the block 33 thus rocking the upstanding portion 35 of the rocker 34. The just described motion of the upstanding portion 35 thus rocks or oscillates the rocker 25, and by means of the radius rod 11 which is attached to blocks slidably mounted on the said rocker 25, it will be seen that motion is imparted to the slide valve. It is, of course, obvious that the lever 17 may be operated to change the position of the rocker 25 in order that the motion of the valve may be changed to consequently change the movement of the locomotive.

Having thus fully described the invention, what is claimed as new, is:—

1. The combination of a rocker bar, a radius valve operating rod connected with the rocker bar, the main rod, an oscillating bar, a slidable connection between the oscillating bar and the main rod, and a link connecting said oscillating bar and the rocker bar, said link extending rearwardly

from the connection with the oscillating bar and connected to the rocker bar eccentric to the pivot of the rocker bar.

2. The combination of a rocker bar, a radius valve operating rod, a slidable connection between said radius rod and the rocker bar, situated between the ends of the radius rod, means connected to one end of the radius rod to rock the same at will to shift said slidable connection, a main rod, an oscillating bar slidably connected with said main rod, and connections between said oscillating bar and said rocker bar eccentric to the pivot of the rocker bar, and the rocker bar being in rear of the pivot of the oscillating bar.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY O. LAWRENCE.

Witnesses:

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