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VALVE GEAR.

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Fig. 1.

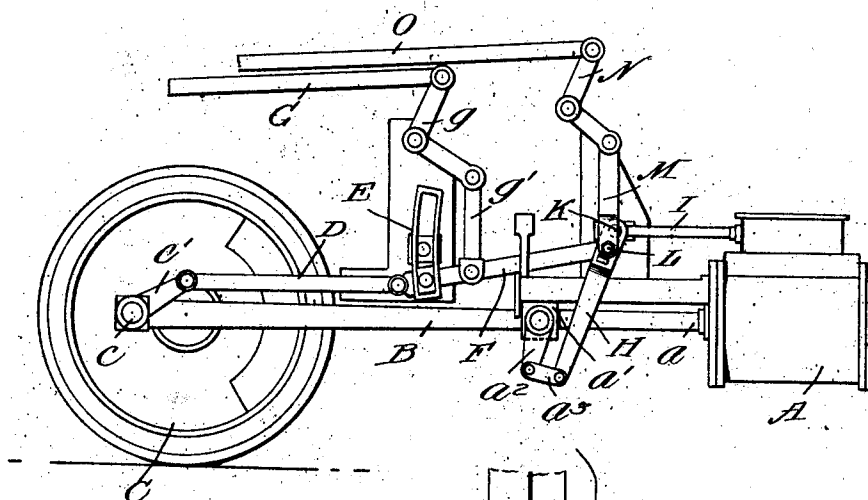


Fig. 4.

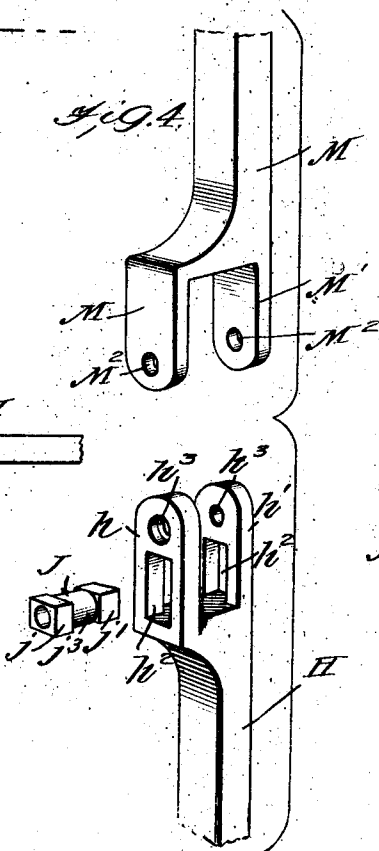
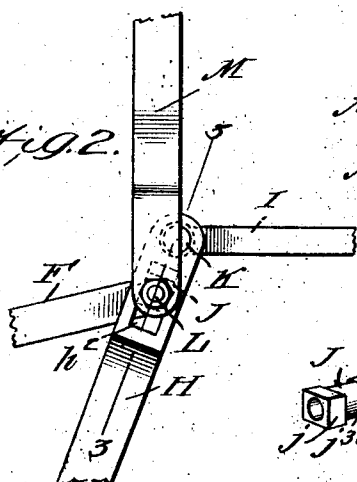


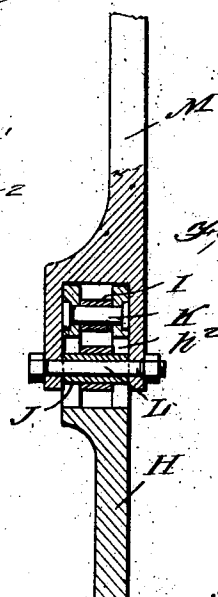
Fig. 2.



WITNESSES

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Fig. 3.



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VALVE-GEAR.

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To all whom it may concern:

Be it known that we, ERNEST L. ROBERTSON, IRVIN L. MILLER, and HARRY E. STURDYVIN, citizens of the United States, and residents of Greenville, in the county of Greenville and State of South Carolina, have invented a new and Improved Valve-Gear, of which the following is a specification.

Our present invention relates to valve gears of that type in which the valve rod receives its motion from the usual link mechanism and return crank, through the medium of a lap and lead lever having a link and hanger connection with the cross-head of the piston-rod.

In the usual gear of this type the lead remains the same at all points of the cut-off, and this fact has given rise to a great disadvantage which our present invention aims to obviate.

Our object is therefore to provide means by which the lap and lead can be changed automatically or mechanically while the engine is in motion and whereby the engineer can adjust the lead without affecting the reversing connections.

It is our further object to provide means such as above outlined, which will be simple and inexpensive and require minimum change of the present type of valve gear, now in use.

With these and other objects which, with the advantages arising therefrom, will be hereinafter fully set forth, our invention resides in the construction which will be now described and which is shown in the accompanying drawing, forming a part of the specification and including several figures, of which,

Figure 1 is a diagrammatic elevation illustrating a valve gear constructed in accordance with our invention; Fig. 2 is a detail view in elevation, and on an enlarged scale, of the connected ends of the lap and lead lever, its adjusting member and the radius and valve rods; Fig. 3 is a sectional view taken through such connection along the line 3—3 of Fig. 2; and Fig. 4 is a perspective view of the connecting ends of the lap and lead lever and its adjusting member and the adjustable pivot sleeve, in detached relation.

Referring now to these figures, A represents the usual piston cylinder carried by a

locomotive, and the piston rod a of which is provided with a cross-head a' at its point of connection with the crank shaft B extending rearwardly into connection with the crank c of the driving wheel C. The crank c also carries the return crank c' which is pivotally connected, by a rod D, to the link E, the latter movably supporting the rear end of the radius rod F. The radius rod is supported in selected position by the reversing shaft G, through the medium of lever g and hanger g' . The cross head a' carries a hanger a^2 to the end of which is pivotally connected the short link a^3 , the latter being in turn pivotally connected to the lower end of the lap and lead lever H, to the upper end of which is pivotally connected the valve rod I, and at a point intermediate the ends of which lap and lead lever is pivotally connected the forward end of the radius rod F.

In accordance with our invention, we bifurcate the upper end of the lap and lead lever H to form side portions h and h' , which side portions are provided with slotted openings h^2 extending longitudinally of the lever. Through these slotted openings h^2 , there projects a pivot sleeve J, the ends j and j' being square and disposed within the openings h^2 and the intermediate portion j^3 thereof being cylindrical and extending in the space between the side portions h and h' of the lever for the purpose of forming a fulcrum for the forward end of the radius rod F.

As shown particularly in Figs. 3 and 4, the extremities of the side portions h and h' of the lever H are transversely apertured at h^3 to receive a pivot bolt K forming a fulcrum for the rear end of the valve rod I. As also shown particularly in these figures, a pivot bolt L is extended through the sleeve J and its extremities are adapted to project through the openings m^2 in the side portions m and m' of the forked lower end of the adjacent hanger M which is connected, through the lever N, with a lap and lead adjusting shaft O which, as shown in Fig. 1, is entirely independent of the reversing shaft G and its connections.

Thus from the construction described, it will be readily apparent that by manipulation of the lap and lead adjusting shaft O the engineer, can at all times, control the position of the pivot of the forward end of

the radius rod F toward and away from the pivot of the rear end of the valve rod I, whereby to regulate the lap and lead as desired.

5 It will be further noticeable that the construction described is such that minimum change of the valve gear of the present type now in use is required in order to permit the addition of the parts forming our present invention, and for this reason we are
10 enabled to install our invention with despatch and moderate expense.

We claim:—

15 In a link valve gear embodying a radius rod, a reversing shaft connected to said rod, and a valve rod, a cross head actuated lap and lead lever having one end bifurcated and slotted, a sleeve having squared ends disposed in the slots and having an intermediate cylindrical portion arranged in the
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bifurcation and upon which the adjacent end of the radius rod is journaled, the adjacent end of the valve rod being pivoted within the extremity of the bifurcated end of said lever, a bolt extending through the 25 said sleeve and projecting beyond the ends thereof, an adjusting hanger having connection with the said ends of said bolt, and an independent adjusting shaft having connection with said hanger whereby the pivot 30 of the radius rod may be manually adjusted toward and away from the valve rod pivot independently of the reversing shaft.

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