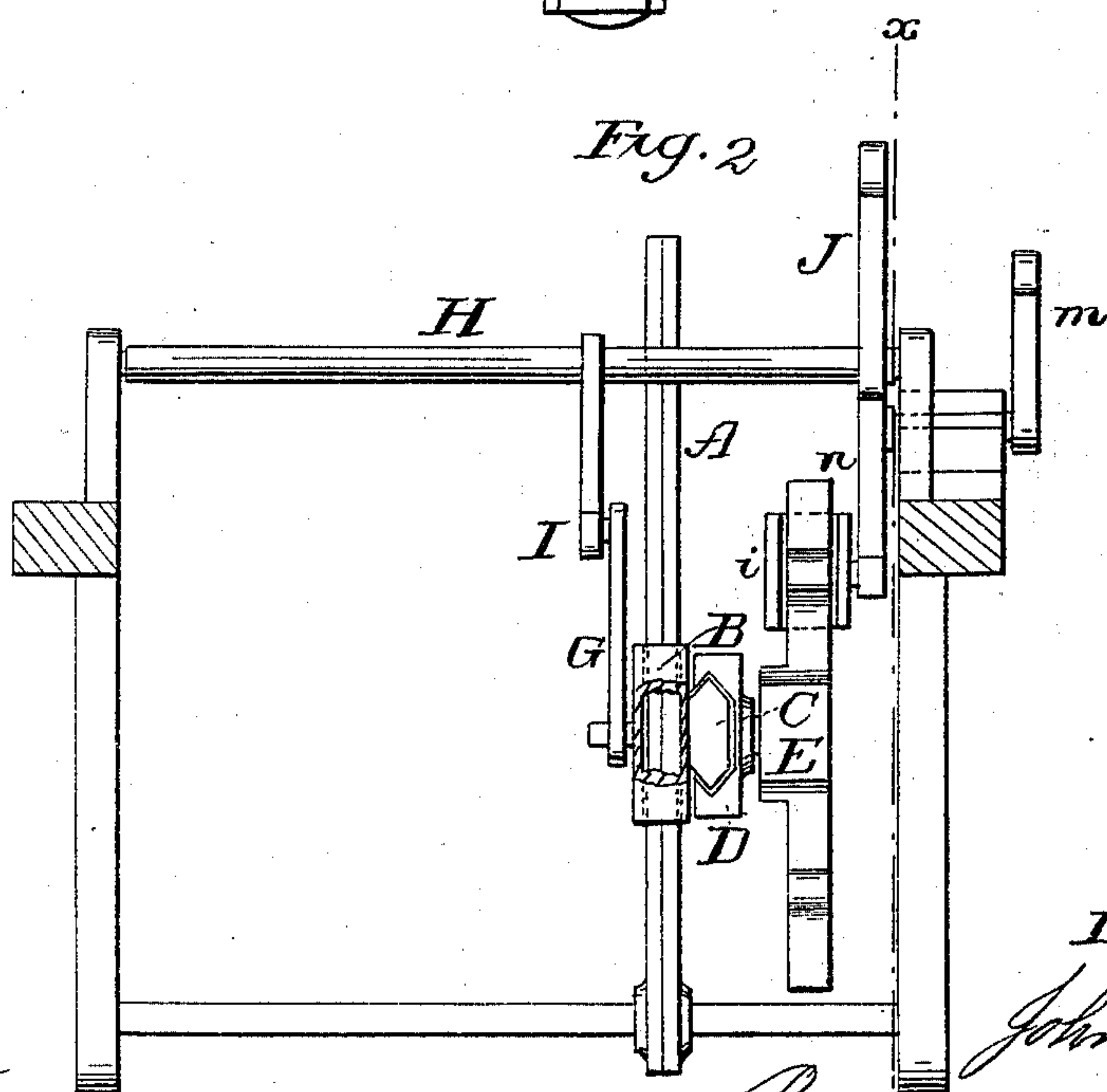
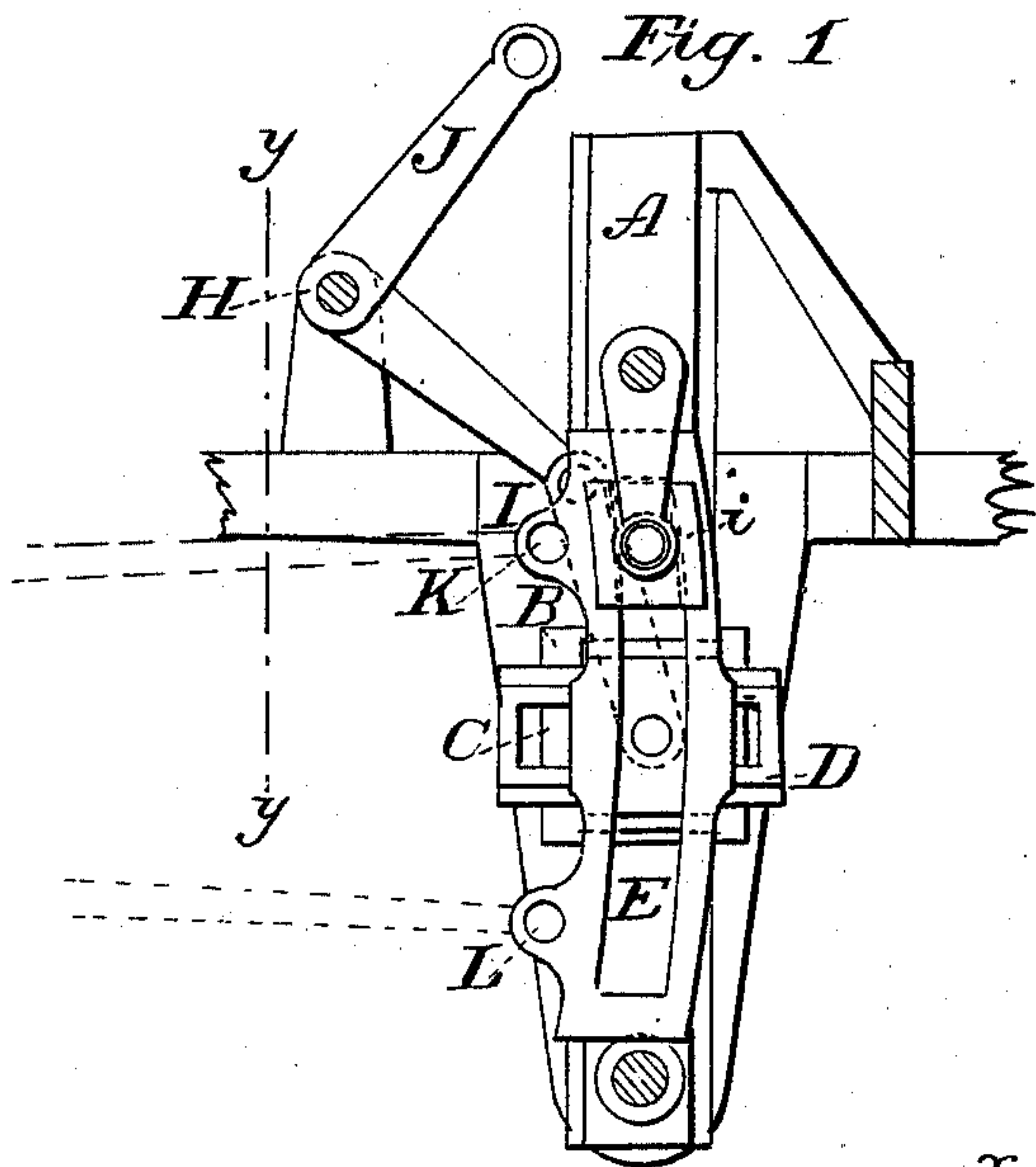


J. R. Fish,
Steam-Engine Valve-Gear.
N^o 68,724. Patented, Sep. 10, 1867.



Witnesses:

Geo. Inseck,
Wm. Greer

Inventor:

John R. Fish
Per ^{at} Wm. J. Allen

United States Patent Office.

JOHN R. FISH, OF FORT WAYNE, INDIANA.

Letters Patent No. 68,724, dated September 10, 1867.

IMPROVEMENT IN VALVE-GEAR FOR STEAM ENGINES.

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, JOHN R. FISH, of Fort Wayne, in the county of Allen, and State of Indiana, have invented a new and improved Valve-Motion; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved arrangement, whereby steam-valves which are controlled in their motion by a link, are made to operate uniformly under all circumstances during the revolution or stroke of the engine, and the invention consists principally in the arrangement of the link as will be hereinafter described.

Figure 1 represents a vertical section of the link and its attachments, showing sections of the eccentric-rods (in red) attached to the link, the section being through the line xx of fig. 2.

Figure 2 is a view of the arrangement from the line yy of fig. 1.

Similar letters of reference indicate like parts.

A is a guide which controls the vertical motion of the link. B is a sliding block which is fitted to the guide A, and which moves up and down on it. C is a guide which is attached to the block B, the line of motion which is controlled thereby being at a right angle with the line controlled by the guide A. D is a sliding block which is fitted to this guide, and which moves horizontally upon it. E is the link which is attached to the block D by the pivot seen at a , upon which pivot the link oscillates. The eccentric-rods are attached to the link at the points marked K and L. When the link is raised or lowered for the purpose of cutting off steam or reversing the motion of the engine, it moves, by its connection with the block B on the guide A, always on the same vertical line, the point of its suspension being on the block B. When the link is moved by its eccentric-rods, its motion is always on the same horizontal plane, because it is confined by block D to the guide C; in other words it does not "lift." As heretofore used the hanger G supported the link, and was the radius of an arc whose centre was at I, a centre which changed its position at every point of cutting off steam rendering thereby the motion of the valve necessarily unequal at the different points of working steam, the link moving in this arc. As the link must always move on a vertical or horizontal line, all lifting by the eccentric-rods is prevented, and consequently the motion of the valve is rendered uniform. H is a rock-shaft to which the reversing-rod is attached by the arm J. m is the arm to which the valve-rod is attached, and i represents the sliding block within the link, by the position of which the throw of the valve is regulated. n is the arm which is attached to the sliding block i , and to the shaft of the arm m .

The improvement herein shown and described will be at once understood and appreciated by those who are acquainted with the locomotive or other engines where the motion of the valve is controlled by the link, and it will be seen that the link can be made of any desired length, thereby increasing the delicacy of the motion.

What I claim as new, and desire to secure by Letters Patent, is—

1. The guide A placed in an upright position, and perpendicular to the line of motion from the driving-shaft, upon which guide the link is raised and lowered, substantially as shown and described.
2. I claim the combination and arrangement of the guide A, horizontal guide C, and blocks B D, substantially as described for the purpose specified.

JOHN R. FISH.

Witnesses:

H. C. HARTMAN,
GEO. S. HARTMAN.