

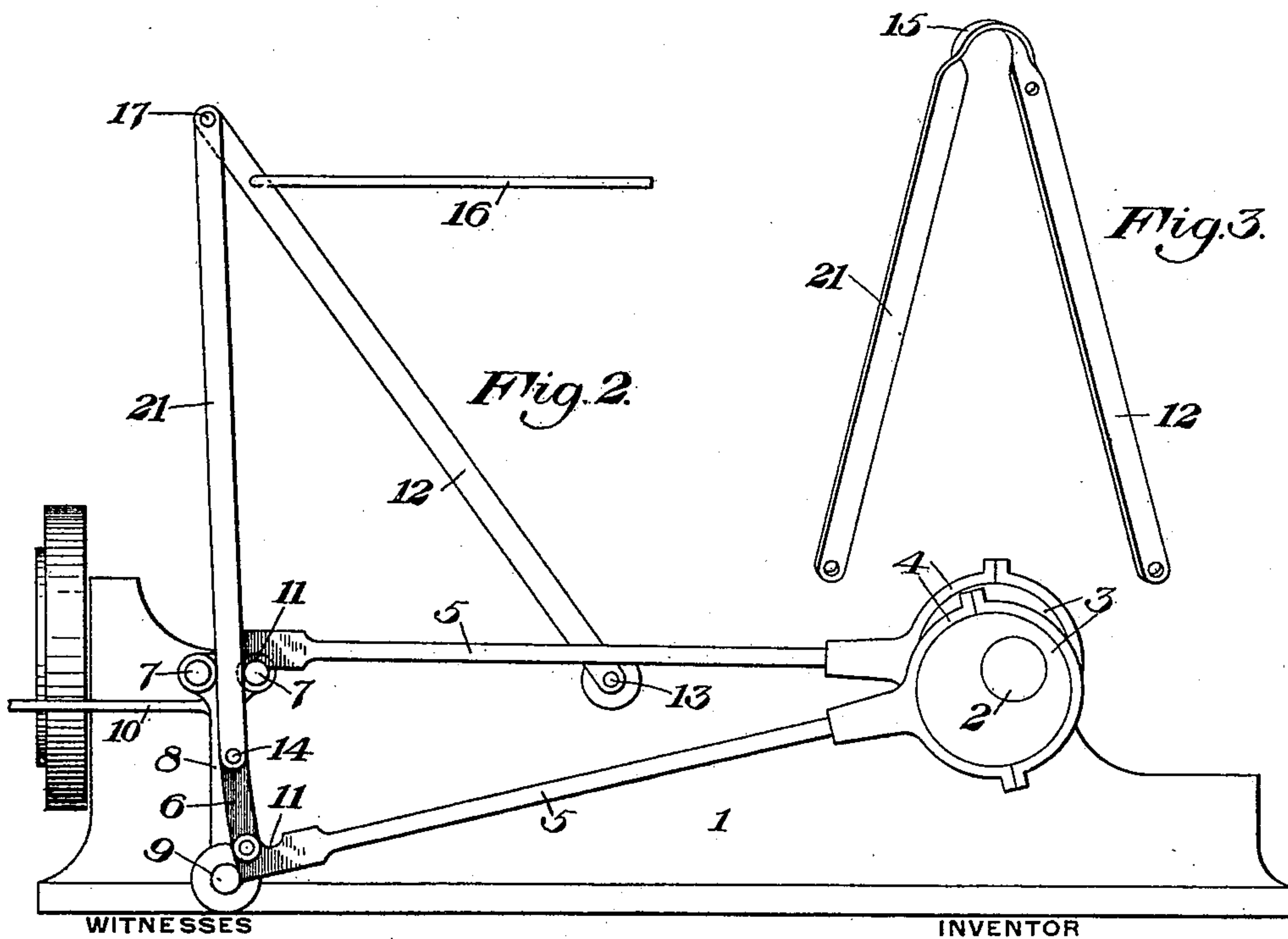
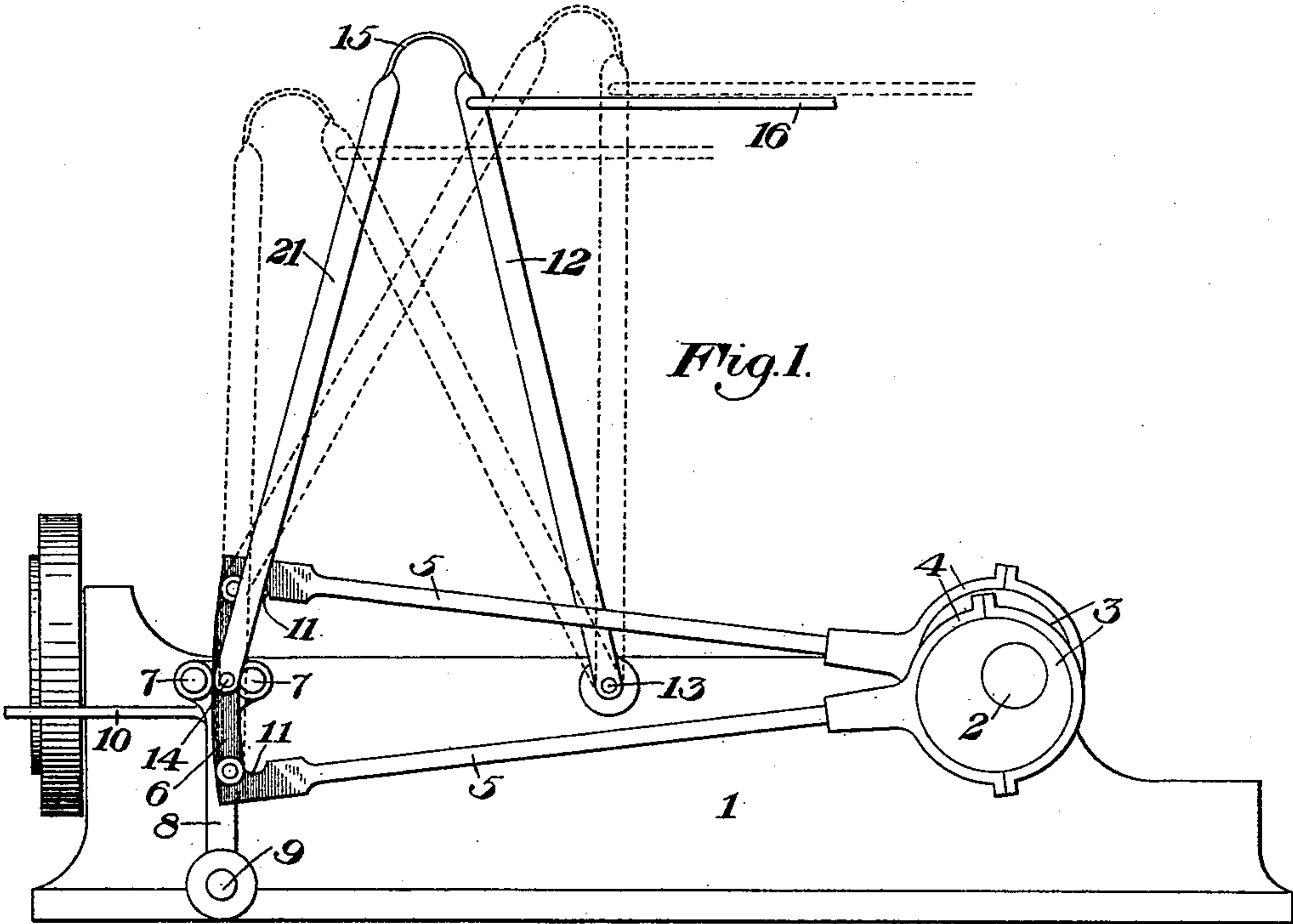
No. 640,689.

Patented Jan. 2, 1900.

J. W. McKEE.
LINK REVERSING GEAR.

(Application filed Sept. 14, 1895.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JAMES W. MCKEE, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO THE LEVER ENGINE COMPANY.

LINK REVERSING-GEAR.

SPECIFICATION forming part of Letters Patent No. 640,689, dated January 2, 1900.

Application filed September 14, 1895. Serial No. 562,493. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. MCKEE, of Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Link Reversing-Gears for Steam-Engines, of which the following is a full, clear, and exact description.

My improvement is especially adapted for use on oil-well engines, which are usually run at a high rate of speed, resulting in great vibration of the frame and bed of the engine and rendering it difficult to control the operation of the engine as to stopping and reversing in cases where the engineer is necessarily stationed at a considerable distance from his engine.

My invention has reference to the employment, in connection with the reversing-link, of a reversing-lever which combines simplicity of construction and efficiency of action and by its peculiar construction serves to take up the objectionable vibration of the reversing-link, which in such engines of ordinary construction is injurious to the sliding valve and interferes with the control of the engine.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a portion of the engine-frame, showing the eccentrics by which the steam-valve is reciprocated, the reversing-link, and my improved device for operating the same. Fig. 2 is also a side elevation and shows a modified construction of the reversing-lever. Fig. 3 is a representation of the reversing-lever, constructed as shown in Fig. 1, detached from the engine.

In the several figures like symbols refer to the same parts.

In the drawings, 1 represents the frame or bed of a steam-engine, in which is mounted the usual shaft 2, carrying two eccentrics 3, with eccentric-collars 4 and a connecting-rod 5 from each eccentric-collar to the reversing-link, and the reversing-link 6, all of which may be of the ordinary construction, the ends of the connecting-rods 5 being pivotally attached one to each end of the reversing-link 6. The link-block (that part of the reversing-link to which the outer extremity of the valve-rod 10 is attached) may

consist, as shown in Figs. 1 and 2, of a rocking arm 8, pivoted at one end 9 to the frame of the engine and furnished at the other extremity with pins 7 7, between which the link reciprocates, or, as links are sometimes constructed, the link-block, having the valve-rod attached to it, may be situated between two parallel sides of the link. Each of the eccentric-rods 5 has at its outer extremity a semi-circular notch 11, adjacent to the link and adapted to engage one of the pins 7 of the link-block 8 when the link is either raised or lowered to either extreme limit of movement in reversing the engine, so that when the link is lowered it rests on and is supported by the link-block, the arrangement in either case being, as is usual, such that the travel of the valve-rod and valve of the engine is reversed by raising or lowering the link and becomes substantially stationary when the link-block is in the position shown in Fig. 1, midway between the two extremities of the link.

The lever by which the reversing-link 6 is raised and lowered consists of two arms 12 and 21, connected together at their upper extremities by a pivot 17, as shown in Fig. 2, or by a leaf-spring 15 or flexible connection, as shown in Figs. 1 and 3. In the latter case, as shown in Fig. 3, the two arms 12 and 21 may be made of one piece of material, the part marked 15 in that figure being made flexible, so as to be capable of being bent to form a lever of inverted-V shape. One extremity of this flexible reversing-lever is attached to the reversing-link at any convenient point, and the other extremity is pivoted to some fixed point, preferably on the frame 1 of the engine, as at 13 in Figs. 1 and 2. An operating-rod 16 is attached to the flexible lever at either arm 12 or 21, as may be convenient, but at such point that by pulling or pushing on the rod the lever may be turned on its pivotal point 13, and thus raise or lower the link 6, and is extended to any desired point remote from the engine. The rod 16 is preferably made of light iron pipe, so as to have sufficient rigidity, without unnecessary weight, to enable the engineer to operate it at a distance from the engine.

The pivotal point of the arm 12 of the flexible lever is preferably located at such con-

venient distance from the lower extremity of the other arm 21 that when the rod 16 is pushed forward to lower the reversing-link 6 it will occupy a substantially vertical position, as shown in Fig. 2, and thus by its weight acting directly over the link insure its prompt action in lowering it, and thus reversing the engine. The position of the flexible lever when the link is half raised, so as to stop the engine, is shown by full lines and its position when the link is raised or lowered by dotted lines in Fig. 1.

It will be noticed that by the construction and arrangement of parts which I have devised and hereinbefore described the upper end of the link 6 rests within a notch 11 at the outer end of the upper eccentric-rod 5, while the excessive vibration which usually results from a close connection of those parts when the link is lowered is taken up by the flexible or yielding connection of the two arms of the lifting-lever, and thus the desired end is attained, and the excessive vibration which is so detrimental to the operation of the engine and injurious to the steam-valve is substantially prevented.

It is obvious that the position of the flexible lever might be reversed or inverted and in some cases be more convenient; but I prefer that which I have described, as more efficiently accomplishing the purpose of my invention.

By the term "flexible," as applied to the link-reversing lever in the specification and claims, I desire to be understood as including a lever with two arms either connected pivotally or by a spring or flexible part, whether integral with the arms or either of them or in separate pieces, but attached together.

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

1. The combination of a reversing-link, and a lifting-lever composed of two upwardly-extending arms, 12 and 21, flexibly connected at their upper ends, one of said arms being pivoted at its lower end to the engine bed or frame, and the other arm connected at its lower end to the link, and an operating-rod adapted to extend from the lever to a remote point.

2. The combination of a reversing-link, and a lifting-lever composed of two arms elastically connected at their upper ends, one of said arms being pivoted at its lower end to the engine bed or frame and the other arm connected at its lower end to the link, and an operating-rod adapted to extend from the lever to a remote point.

3. The combination of a link-block; a reversing-link, resting upon the link-block when the link is lowered; a lifting-lever, pivoted to the engine-bed and supported by its connection to the link; and a rod extending from the lifting-lever to a point remote from the engine-bed; and a flexible or yielding connection, to prevent the transmission of vibration from the link to the rod, substantially as described.

4. In combination with link reversing-gear for steam-engines, a flexible lever for raising and lowering the link, said lever being attached at one extremity to the reversing-link, and at the other extremity to a fixed pivotal point, and adapted to be operated by a rod extending to a point remote from the engine.

In testimony whereof I have hereunto set my hand.

JAMES W. MCKEE.

Witnesses:

W. T. MECKLIN,
A. M. CORNELIUS.