

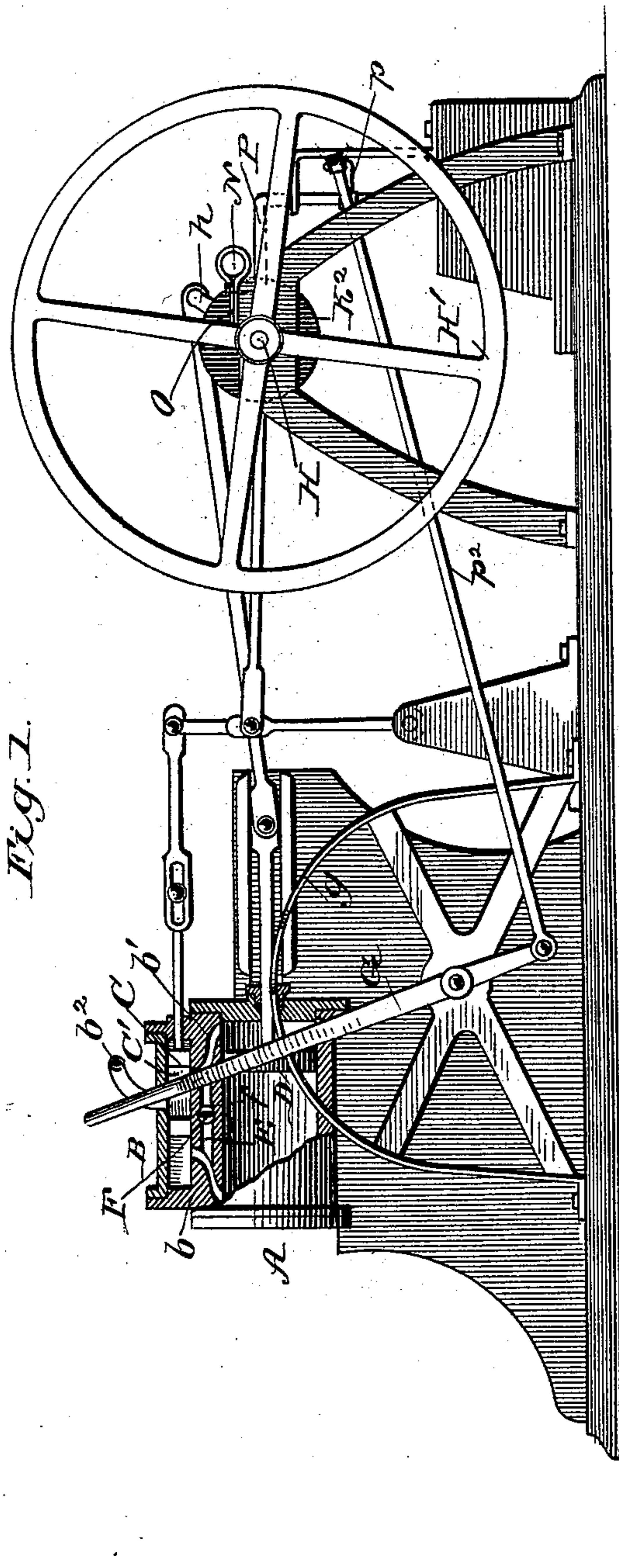
(No Model.)

2 Sheets—Sheet 1.

J. J. MOORE.
VALVE OPERATING MECHANISM.

No. 517,807.

Patented Apr. 3, 1894.



WITNESSES:

Jos. A. Ryan
R. B. Swipin.

INVENTOR
Jacob J. Moore

BY *Munn & Co.*

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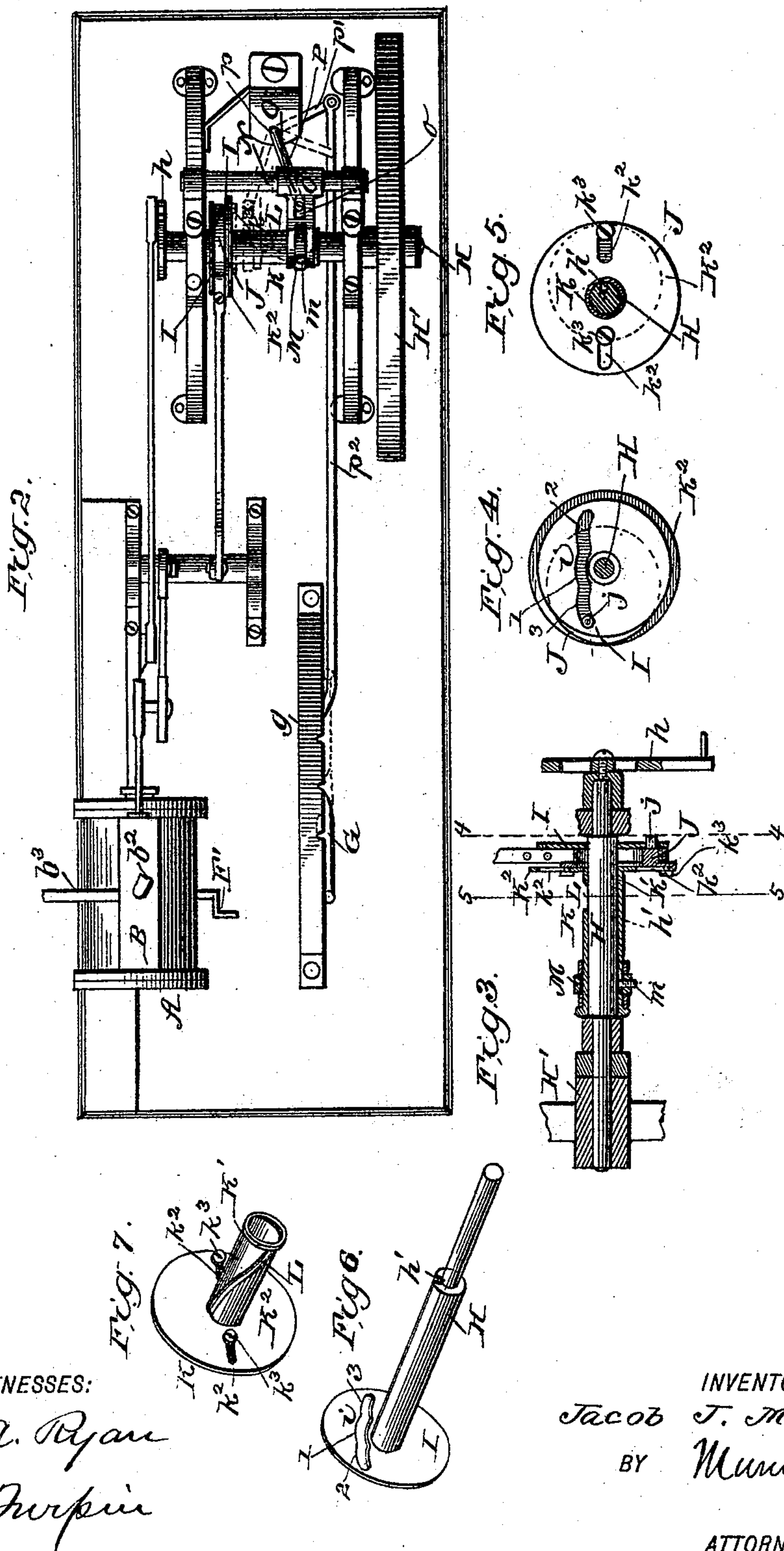
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UNITED STATES PATENT OFFICE.

JACOB J. MOORE, OF CHAMBERSBURG, ASSIGNOR OF ONE-HALF TO C. EMIL RÖNNE, OF PHILADELPHIA, PENNSYLVANIA.

VALVE-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 517,807, dated April 3, 1894.

Application filed June 30, 1893. Serial No. 479,273. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. MOORE, residing at Chambersburg, in the county of Franklin and State of Pennsylvania, have invented
5 a new and useful Improvement in Valve-Operating Mechanism, of which the following is a specification.

My invention is an improvement in valve operating mechanism and seeks among other
10 improvements to provide novel means whereby the engine may be reversed or throttled by the use of a single lever and eccentric and the invention consists in the special constructions and combinations of parts as will be
15 hereinafter described and pointed out in the claims.

In the drawings, Figure 1 is a side elevation, parts being broken away and others shown in section, and Fig. 2 is a top plan
20 view of an engine embodying my improvements. Fig. 3 is an enlarged plan view of the shafts and parts immediately connected therewith the adjustment of the eccentric and the parts which adjust it being indicated in dotted lines. Fig. 4 is a sectional view longitudinally through the key way of the shaft. Fig.
25 5 is a cross section drawn through the inwardly projecting pin or stud of the sliding collar. Fig. 6 is a detail view of the shaft. Fig. 7 is a detail view of the eccentric carrier.

The cylinder A may in general respects be of ordinary construction and has the valve chest B and the ports *b b'* leading from said chest into the cylinder. The chest B also has
35 the steam inlet port *b²*, and the exhaust port *b³*. The valve C operates in chest B and is formed with the open center *C'* and is arranged to take steam at the center or inside and to exhaust outside that is to say the valve
40 feeds steam from within its center *C'* to the cylinder and the exhaust passes outside the valve and out through the exhaust port. This valve it will be seen is not only adapted to supply steam alternately to the opposite inlet
45 ports but is also adapted to shut off steam from both said ports to provide for stopping the engine by the proper adjustment of the valve as will be readily understood. When the supply of steam is so cut off a suitable form of
50 relief may be employed to balance the steam on opposite sides of the piston D. This may

be accomplished by the construction shown in Fig. 1 including a port or channel E connecting the ports *b b'* and controlled by a valve F having a port *f* arranged to be turned
55 into and out of register with the channel E and also provided with a crank arm *F'* or other device suitably connected with the main lever so that when the latter is in position to adjust the eccentric to cut off the steam from
60 the cylinder the valve F will be set to open communication through the channel E between the opposite ends of the cylinder to balance the steam on opposite sides of the piston. The main lever G may be held in
65 either of its three positions by means of the rack *g* and when in its central position operates to set the eccentric concentric with the shaft when through the connection presently described the valve C will be set to close both
70 ports *b b'*. If the lever be thrown forward from its central position it will move and set the eccentric to operate port *b* to start the engine forward and a reverse movement of the lever or from the central position backward
75 will so admit steam as to reverse or run the engine backward. These results are effected by the constructions and operations which I will now describe. The shaft H, which may
80 be the axle of a locomotive is provided with the crank *h* and the wheel *H'*, which latter may in a locomotive be the drive wheel. The shaft also has a key way *h'* and is provided with the cam plate I which is rigid with
85 the shaft being either integral therewith or suitably fastened thereto. This plate I has a guide preferably a slot *i*, as shown and formed with the intermediate or central portion 1 and the opposite end portions 2 and 3.
90 The central portion 1 extends in the arc of a circle concentric with the shaft while the end portions extend concentrically thereto and oppositely or reversely to each other as described. The eccentric J has a pin or projection *j* entering and operating in the slot *i*
95 and when the said pin is in the central portion 1 of said slot *i* the eccentric J will be held concentric with the shaft while when said pin is in either of the end portions 2 or 3 of said slot the eccentric will be thrown in
100 one or the opposite direction to operate the valve through the connections shown to prop-

erly admit steam to run the engine forward or back as may be desired.

To adjust the eccentric it is only necessary to turn it relatively to the shaft and the cam plate fixed to said shaft. To do this I employ an eccentric support or carrier K consisting of a sleeve K' embracing the shaft and a disk K² at the end of said sleeve. The said disk K² is provided with diametrically opposite radial slots k² and the eccentric is held to the disk K² by screws or bolts k³ passed through the slots k² so the eccentric can be adjusted to either side of the center of the shaft by turning its support or carrier to cause its pin to adjust into either of the portions 2 or 3 of the cam slot. The sleeve K' is provided with a spiral slot L which is entered by a pin m on a sliding collar M. This collar M is also keyed to the shaft preferably by extending its pin m to enter the key way therein so that the collar M may be moved longitudinally along but will be held from turning on the shaft, hence as the said collar is moved toward one or the other end of the sleeve K' from the center thereof it will tend to turn such sleeve either in one or the other direction and operate by the end disk K² and the cam disk before described to adjust the eccentric to one or the other side of the center of the shaft to operate as before described.

While the collar M may be operated in various ways I prefer the construction shown which includes a guide rod N fixed parallel to the shaft, a shifter O sliding at one end longitudinally upon the rod N slotted at o between its ends and having its other end forked to embrace or engage the sliding collar and a rock shaft P having a crank p operating in the slot o of the shifter and a crank p' connected by pitman p² with the operating lever.

The operation will be readily understood from the foregoing. When the lever is adjusted to its central position the eccentric will be adjusted to set the valve to shut off steam. Then if the lever be moved either forward or back it will so throw the eccentric as to move the valve to open the port to admit steam to one or the other side of the piston to properly move it to drive the engine forward or back as the case may be.

Manifestly in locomotives there will need to be duplicate eccentrics one for each side.

Having thus described my invention, what I claim is—

1. The combination of the shaft, having the plate provided with the guide, the eccentric having a pin or projection engaging said guide, the eccentric carrier to which the eccentric is movably fixed, such carrier having

a sleeve embracing the shaft and provided with a spiral groove, the sliding collar having a pin entering said spiral groove and keyed to the shaft and devices for sliding said collar, all substantially as set forth.

2. In an engine, the combination of the shaft, the eccentric support or carrier having a sleeve provided with a spiral groove and having a plate or disk, the eccentric held to and movable radially on the disk, the shaft having a disk provided with a cam slot having a central portion concentric with the shaft and end portions eccentric thereto, the eccentric held movably to the disk of its carrier and the sliding collar fitted upon and having a pin entering the spiral groove of the eccentric carrier sleeve, all substantially as set forth.

3. In an apparatus substantially as described, the combination of the shaft having a disk provided with the cam slot formed with the concentric central portion 1 and the opposite eccentric end portions 2 and 3, the eccentric having a pin entering said cam slot and the eccentric support to which said eccentric is movably secured and devices for shifting said eccentric all substantially as set forth.

4. In an apparatus substantially as described, the combination with the shaft and its cam disk, the eccentric and its carrier, the latter having a sleeve embracing the shaft and provided with a spiral groove and the sliding collar embracing said sleeve and having a pin entering its spiral groove a guide rod parallel with the shaft a shifter sliding upon said rod and engaging the sliding collar and devices for operating said shifter all substantially as set forth.

5. The improvement in engines herein described comprising the shaft having a key way and provided with the disk having the cam slot formed with portions 1, 2 and 3, the eccentric having a pin entering said cam slot, the eccentric carrier having a disk to which said eccentric is movably connected and a sleeve embracing the shaft and provided with a spiral groove, the sliding collar having a pin entering the said spiral groove and projecting into the key way of the shaft, the guide rod parallel to the shaft the shifter sliding at one end on said rod and engaging at its other end with the sliding collar and the operating devices connected with said shifter, substantially as set forth.

JACOB J. MOORE.

Witnesses:

A. H. RITTER,
CHAS. F. MYERS.