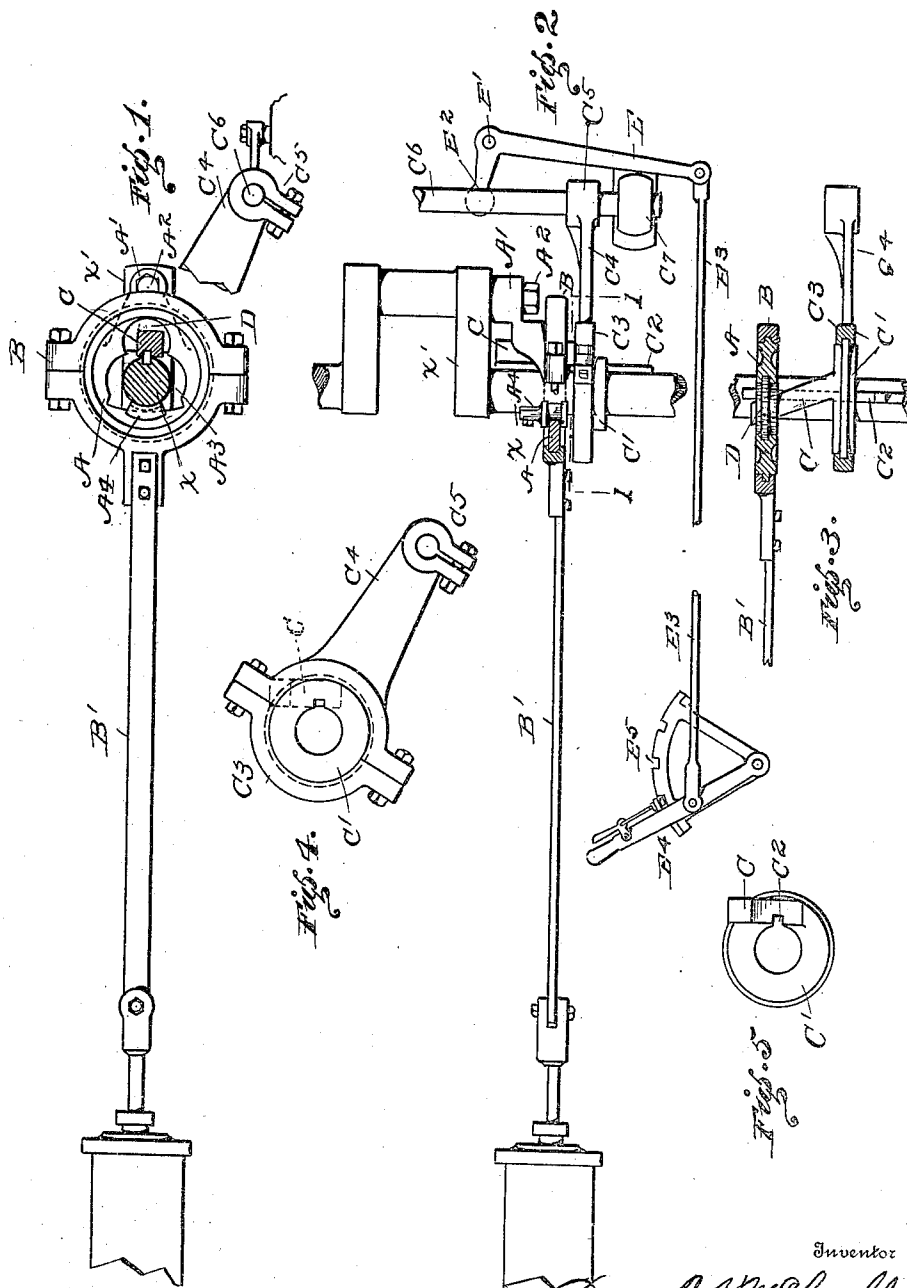


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 REVERSING GEAR.
 APPLICATION FILED OCT. 28, 1908.

957,362.

Patented May 10, 1910.



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REVERSING-GEAR.

957,362.

Specification of Letters Patent.

Patented May 10, 1910.

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To all whom it may concern:

Be it known that I, DENNIS W. McLAUGHLIN, a citizen of the United States, and residing at 2716 Grove street, in the city of Berkeley, county of Alameda, and State of California, have invented certain new and useful Improvements in Reversing-Gears for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in reversing gears for steam engines.

The object accomplished is the production of a simple, efficient and positive mechanism adapted to vary the cutoff of the steam to the actuating cylinder, with respect to the stroke of the crank shaft.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the drawings: Figure 1 is a sectional view on the line 1—1, Fig. 2. Fig. 2 is a plan view of the same parts being shown in section. Fig. 3 is a plan view detail of the eccentric mechanism, parts being in section, illustrating the operation of the inclined plane. Fig. 4 is a side elevation in detail of the shifting member of the variable cutoff mechanism. Fig. 5 is a front elevation in detail of the sliding block of the incline plane of the variable cutoff mechanism.

In detail the construction consists of the eccentric A, having the offset bracket arm A¹, pivoted on the stud A², on the arm of the crank X¹. In engines having a disk crank with a bearing between the disk and the eccentric it is necessary to fix an arm on the engine shaft to provide a pivot for the eccentric in lieu of the crank arm. The eccentric has the elongated hole A³, to allow free clearance for the engine shaft X. By this construction the eccentric is given a variable eccentricity with relation to the axis of the engine shaft. The pivot permits adjustment to vary the time in which the eccentric passes a given point in the engine cycle. The action of the eccentric is transmitted to the cutoff valve stem through the connecting rod B¹, connected to the band B, encircling the periphery of the eccentric member. As illustrated in Fig. 1, the position of the eccentric center represents the

median position between the "ahead" and "reverse" directions of the engine shaft. It is desirable to vary the cutoff at times so that the steam supply to the actuating cylinder may be cut off before the completion of the piston travel to enable the steam to expand within the cylinder, a great saving in steam consumption being thus secured. The eccentric center of the eccentric member is held in a variable fixed relation to the axis of the engine shaft by the inclined plane C, extending at a suitable angle across the line of the engine shaft. The inclined plane consists of a square member, forming an integral part of, or fixed on a concentric collar C¹, feathered at C², to the engine shaft, and slidable thereon. Collar C¹ is encircled by the band C³, formed in the head of the bracket C⁴, fixed at C⁵, to the slidable shaft C⁶, mounted at C⁷, in the engine frame.

The inclined plane extends through the body of the eccentric at a point in a line between the center of eccentricity and the pivotal point. The eccentric and the inclined plane revolve in unison about the engine shaft. The lateral travel of the inclined plane across the line of the engine shaft swings the eccentric member in an arc from its pivot, increasing or decreasing the throw of the eccentric in accordance with the direction of the travel of the inclined plane. The inclined plane traveling in a line parallel with the axis of the engine shaft; and the eccentric member swinging in an arc across said axis, a planetary oscillation is set up at the junction of contact between the eccentric member and the inclined plane. To give a constant and positive contact between the eccentric member and the inclined plane, the oscillating block D, is supported in the body of the eccentric member concentric with the center of the inclined plane. This oscillating block absorbs all the twisting action due to the variations in the lines of action between the inclined plane and the eccentric member; and avoids the necessity of forming the incline plane to meet such variations; resulting in a far superior action, and economy in construction and maintenance. The guide A⁴, fixed to the engine shaft opposite the oscillating block, engages the edge of the eccentric and prevents any lateral movement of the same during the shifting of the in-

clined plane, preventing any binding of the inclined plane within the oscillating block.

The slidable shaft C⁶, is operated by the bell crank E, pivoted at E¹, to the engine frame; the round head E² extends into a slot in the shaft. The bell crank is operated by the connecting rod E³, connected to the usual graduated quadrant, or straight pull E⁴, with registering variation notches E⁵. To reverse the engine the bell crank is thrown from one extremity of quadrant E⁵ to the other, the variations in cut-off being the points between the extreme limits of the movement of lever E⁴. By this construction the lost motion in the reversing gear is reduced to the minimum, and prompt and responsive action of the reversing mechanism is assured. Multiplicity of parts is avoided, and all spiral or torsional strains are eliminated, and friction is reduced to the minimum.

Having thus described this invention what is claimed and desired to secure by Letters Patent is:

1. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft and adapted to be connected with a cut off valve, an oscillating block mounted in said eccentric, and an inclined plane slidably mounted on the engine shaft and extending through said block.

2. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft and adapted to be connected with a cut off valve, an oscillating block mounted in said eccentric, a disk mounted on said shaft and provided with a laterally extended inclined plane engaging said block, and means for shifting said disk on said shaft.

3. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft and adapted to be connected with the cut-off valve, means for pivotally supporting said eccentric to

one side of the axis of said shaft, a disk mounted on said shaft and provided with a laterally extended inclined plane engaging said eccentric, and means for shifting said disk on said shaft.

4. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft and adapted to be connected with a cut-off valve, means for pivotally supporting said eccentric to one side of the axis of said shaft, an oscillating block mounted in said eccentric, and an inclined plane slidably mounted on the engine shaft and extending through said block.

5. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft and adapted to be connected with a cut-off valve, an oscillating block mounted in said eccentric, means for pivotally supporting said eccentric to one side of the axis of said shaft, a disk mounted on said shaft and provided with a laterally extended inclined plane engaging said block, and means for shifting said disk on said shaft.

6. In a reversing gear for steam engines, the combination with an engine shaft, of an eccentric encircling said shaft, means for pivotally supporting said eccentric to one side of the axis of said shaft, an oscillating block mounted in said eccentric, a band encircling said eccentric and adapted to be connected with the cut off stem, a slidable collar feathered on said shaft and provided with an inclined member engaging said block, a band encircling said collar, and means connected to said band for imparting a sliding movement to said collar.

In testimony whereof, I have hereunto set my hand this 28th day of September 1908.

DENNIS W. McLAUGHLIN.

Witnesses:

BALDWIN VALE,
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