(No Model.)

G. W. ANDERSON.

CUT-OFF AND REVERSING GEAR.

No. 301,948. Patented July 15, 1884.

Fig. 1.

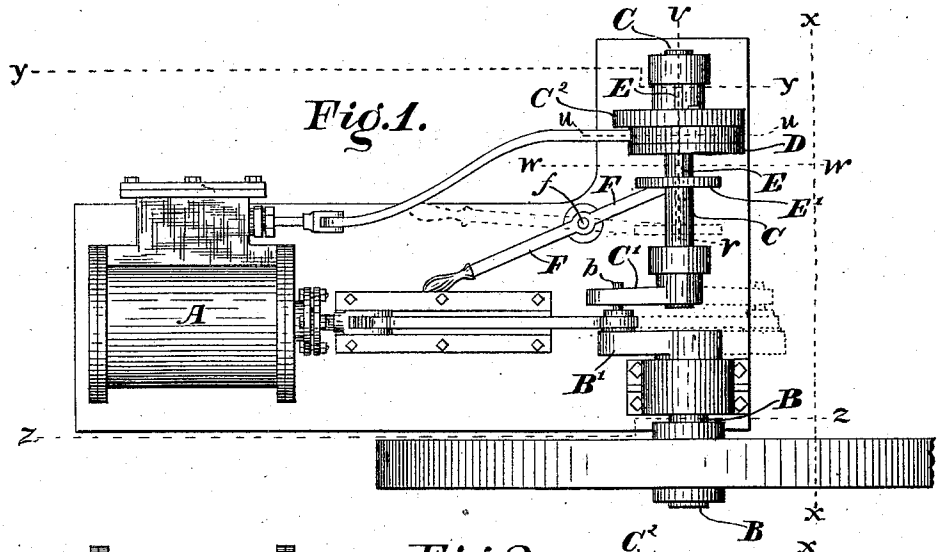


Fig. 2.

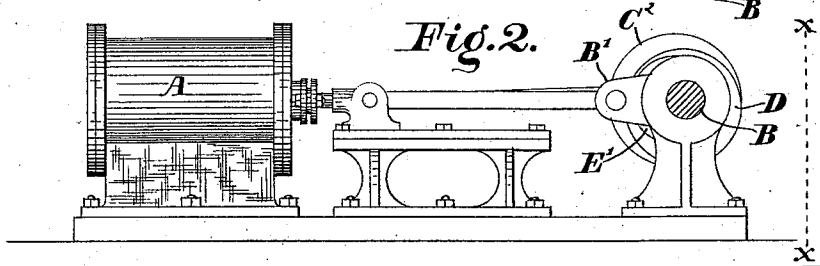


Fig. 3.

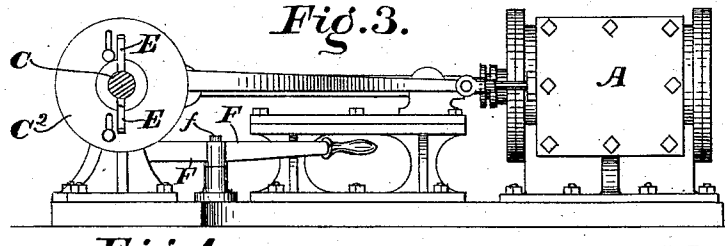


Fig. 7.

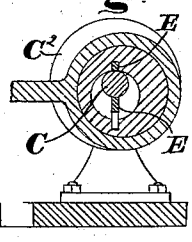


Fig. 4.

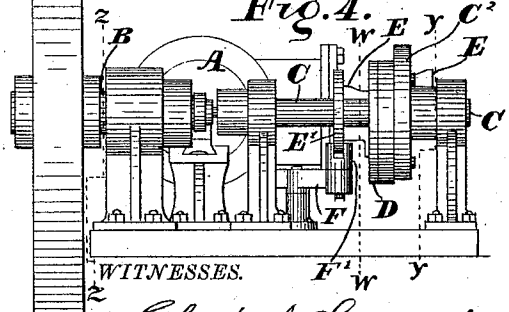


Fig. 5.

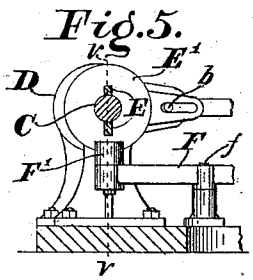
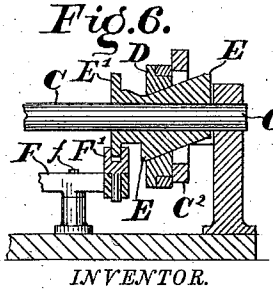


Fig. 6.



WITNESSES.

Chas. N. Leonard.

Chas. L. Thurber.

INVENTOR.

George W. Anderson,

PER

C. Bradford.

ATTORNEY.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. ANDERSON, OF WESTPORT, INDIANA.

CUT-OFF AND REVERSING GEAR.

SPECIFICATION forming part of Letters Patent No. 301,948, dated July 15, 1884.

Application filed April 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ANDERSON, of the town of Westport, county of Decatur, and State of Indiana, have invented certain new and useful Improvements in Variable Cut-Off and Reversing Gear, of which the following is a specification.

My said invention consists in a certain combination and arrangement of devices whereby the cut-off of a steam-engine may be varied or the engine reversed, being in effect a substitute for the usual link, as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of an engine provided with my invention; Fig. 2, a side elevation of the same as seen from the dotted lines *z z;* Fig. 3, an elevation of the opposite side as seen from the dotted line *y y;* Fig. 4, an end elevation as seen from the dotted lines *x x;* Fig. 5, a vertical sectional view, as seen when looking toward the shifting-lever from the dotted lines *w w;* Fig. 6, a vertical sectional view on the dotted lines *v v*, and Fig. 7 a section through the eccentric on the dotted line *u u.*

In said drawings, the portions marked A represent the cylinder; B, the main or crank shaft; C, a separate shaft for operating the valves; D, the eccentric thereon; E, a wedge-shaped device upon which the eccentric is mounted, and by which it is operated; and F, a handle or lever for moving said wedge.

The cylinder A and shaft B are or may be similar to the corresponding portions of ordinary steam-operated machinery and operate in the usual manner. They are connected by the usual piston and connecting-rod, as shown.

The shaft C should run in the same direction, but not exactly in line with the shaft B, and is operated by a projecting end of the crank-pin *b*, as shown most plainly in Fig. 1. The crank on the shaft C is slotted, (see Fig. 5,) and thus both cranks and shafts are permitted to be driven by the same crank-pin, notwithstanding the difference in the position of said shafts. One position of the pin in the slot is indicated by dotted lines in Fig. 1, and the other by the full lines. This arrangement varies the speed of the shaft C, causing it to travel faster at certain portions of its revolutions than at others, and thus so operate the valve that it will cause the engine to take steam at each end alike without reference to the point of cut-off.

The eccentric D is only different from ordinary eccentrics in that it can be adjusted so that its periphery will occupy varying relations to the shaft on which it is mounted, and thus operate to drive the valve in such a way as to serve as a variable cut-off or to reverse the engine. This is accomplished by forming in the center of the eccentric a hole considerably larger than the shaft, and attaching said eccentric to a disk, C^2, which is rigidly mounted on said shaft by means of slots and pins, (see Fig. 3,) or other similar devices, which will permit it to slide across the face of the disk, as it is desired to adjust the same. The eccentric is mounted on the sliding wedges E, which are adapted to be moved back and forth, and thus vary the position of the eccentric, as will be presently described.

The wedge E, or, rather, the two wedges, are connected together by the ring or collar E′, which is adapted to slide along the shaft C, and thus move said wedges, which are located on opposite sides of said shaft along the same, thus varying the position of the eccentric thereon, and correspondingly changing the action of the valve. Said wedges are prevented from turning on the shaft C by means of slots in a collar on said shaft, or in the shaft itself, in which said wedges fit and move.

The lever F is mounted on the frame-work or bed-plate on which the engine is mounted, preferably on a pivot, *f*, as shown. On the end of this lever is a pivoted head, F′, in the upper end of which is a slot, into which the edge of the collar E′ enters. When the lever is swung from one of its positions to the other, (see respectively the full and dotted lines in Fig. 1,) it moves said collar, and with it the wedges E, along the shaft C, and thus so varies the eccentric as to reverse the motion of the valve and reverse the engine. A less motion of the lever operates to vary the points at which the valve shall cut off the steam, and serves as a "variable cut-off."

I am aware that two shafts set eccentrically,

one of said shafts being provided with an eccentric that can be adjusted only when the engine is at rest, is not broadly new, and hence I make no broad claim thereto; but,

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the drive shaft B, carrying a crank-arm, B′, having a rigid crank-pin, *b*, with the eccentric-shaft C, carrying crank-arm C′, having a slot adapted to receive crank-pin *b*, the eccentric D, the varying wedge E, the slotted pivoted head F′, and the pivoted lever F, all arranged and operated substantially as shown and specified.

2. The combination, with an engine-shaft, of a second shaft set eccentrically to the engine-shaft, a shifting eccentric movably secured on said eccentric-shaft, and devices whereby the eccentric can be shifted while the engine is in motion, substantially as set forth.

3. The combination of engine-shaft, second shaft situated eccentrically to the engine-shaft and coupled thereto, an eccentric movably held in position on the eccentric-shaft, and the lever, disk E′, and wedges E, whereby the eccentric can be shifted while the engine is in motion, substantially as set forth.

4. The combination, with the two shafts situated eccentrically to each other, one of said shafts being connected by a piston-rod to the engine, of a disk rigidly secured to the driven shaft, the eccentric movably secured to the said disk, the sliding wedges, and the lever for moving the wedges, the parts being constructed and combined to enable the eccentric to be shifted while the engine is in motion, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Westport, Indiana, this 9th day of April, A. D. 1883.

GEORGE W. ANDERSON. [L. S.]

In presence of—
WILLIAM HAUSE,
MILTON M. MEWHINNEY.