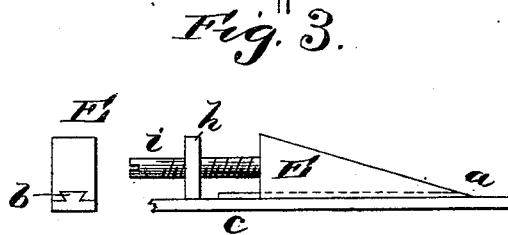
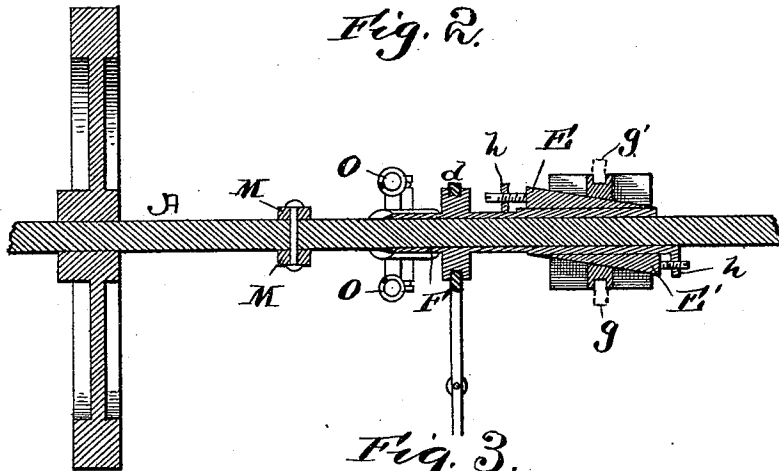
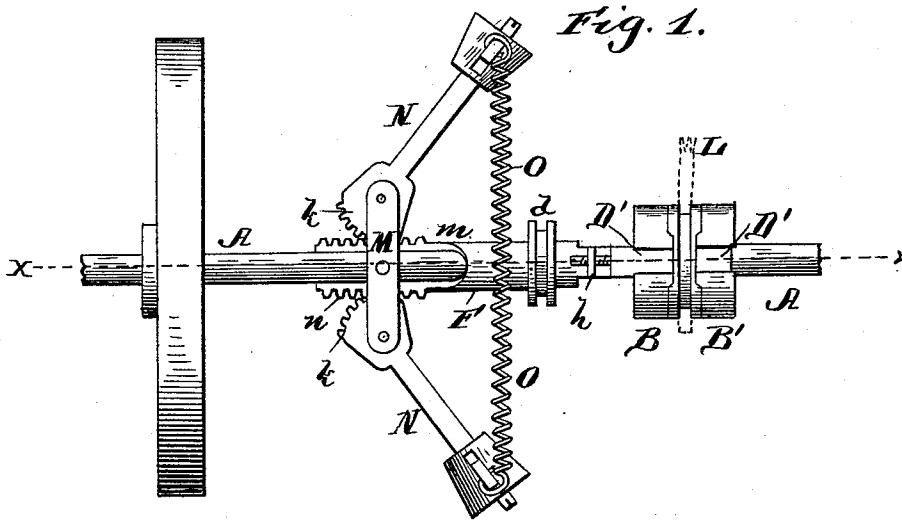


(No Model.)

S. T. BRUCE.
VALVE GEAR FOR ENGINES.

No. 460,628.

Patented Oct. 6, 1891.



Witnesses:
J. B. McGirr.
N. Z. Brubaker

Inventor:
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By his Attorneys,
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UNITED STATES PATENT OFFICE.

SIDNEY THOMAS BRUCE, OF MARSHALL, MISSOURI.

VALVE-GEAR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 460,628, dated October 6, 1891.

Application filed February 18, 1891. Serial No. 381,911. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY THOMAS BRUCE, a citizen of the United States, and a resident of Marshall, in the county of Saline and State of Missouri, have invented certain new and useful Improvements in Valve-Gears for Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In a separate application filed by me of even date herewith, Serial No. 381,910, I have illustrated and described an improvement in automatic cut-offs and reverse mechanism for steam-engines; and the present invention relates to an improvement in reversing mechanism, and more particularly to the construction of the eccentric.

The object of this invention is to simplify the reversing mechanism for steam-engines, increase the efficiency thereof, and compensate for the wear upon the moving parts of each reversing mechanism.

With these and other ends in view the invention consists in the combination, with a shaft of an engine, of a slidable sleeve carried by said shaft, so as to revolve therewith, said sleeve being provided on opposite sides with reversely-inclined wedges which are movable with said sleeve, a shifting eccentric fitted loosely on said shaft and adapted to be moved or adjusted by the wedges to cause it to lie on either side of the shaft and eccentric to the axis thereof, and means for confining the shifting eccentric against sidewise displacement on the shaft.

The invention further consists in the peculiar construction and arrangement of parts, as will be hereinafter described and claimed.

To enable others to understand the invention, I have illustrated the same in the accompanying drawings, in which—

Figure 1 is a plan view of the shaft of an engine having my improvements applied thereto. Fig. 2 is a longitudinal sectional view on line *xx* of Fig. 1. Fig. 3 is a detail view of the devices for compensating for wear on the movable wedges and shifting eccentric.

Like letters of reference denote correspond-

ing parts in the figures of the drawings, referring to which—

A designates the main shaft of an engine, and on this shaft A, near one end thereof, are secured two disks or plates B B', which are separated at some distance to receive a shifting eccentric C. The disks B B' are further provided on opposite sides of the shaft with passages D D', in which are fitted oppositely-inclined wedges E E'. These wedges are each provided on one face with a longitudinal groove or recess *a*, in which is fitted a rib *b*, formed integral with an arm *c* of a sliding sleeve F, which sleeve is fitted on the shaft and is capable of being moved longitudinally thereon by means of a forked reversing-lever of the ordinary construction, which lever fits in an annular *d* in the sleeve F.

The shifting eccentric is provided with an annular groove *g*, in which is fitted a yoke *g'*. To this yoke is attached one end of a rod L, the other end of which connects with the valve of the engine.

The bars *c c* of the sleeve F are provided in rear of the wedges E E' with lugs *h*, provided near their outer ends with threaded apertures, in which are fitted short threaded bolts *i*, the inner end of which bolts bear against the rear face of the wedges.

To the end of the sliding sleeve opposite to that to which the wedges are secured are attached longitudinal bars *m*, which extend rearwardly in line with the sleeve F and on opposite sides of the shaft A. These bars *m* are provided near their free ends with a series of teeth *n*, with which meshes a series of teeth *k*, formed on one side of the hub of the levers *n*. These levers are provided with weights, which are attached to the outer ends thereof, and the levers are pivoted between the ends of parallel plates M, which are centrally secured to the shaft A. The weights at the outer ends of the levers N are connected together by coiled springs D.

The operation of my invention may be briefly stated as follows: The reversing mechanism rotates with the shaft A, and the valve is reciprocated by means of the construction intermediate of the eccentric and the valve. When it is desired to reverse the movement

of the engine, the sleeve F is moved longitudinally on the shaft A by means of the shifting or reversing lever, so as to reverse the position of the wedges E E' with relation to the shifting eccentric C.

Should either of the wedges become worn or ineffective in operation, it can be adjusted sufficiently in the rib or flange b by means of the bolt i to take up the wear.

If the speed of the engine exceeds a certain limit, the governor-weights are forced away from each other by centrifugal force until the levers adjust the two wedges within the eccentric C to cause the shifting eccentric to assume a position more or less concentric with the shaft and adjust the valve to allow more or less steam to pass into the engine-cylinder.

Although I have shown and described the reversing mechanism as carried by the main shaft of an engine, it is obvious that the same can be applied with equally good results to any other shaft connected with and rotating with the same rate of speed as the main shaft.

I am aware that changes in the form and proportion of parts can be made without departing from the spirit or sacrificing the advantages of my invention.

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

1. The combination, with a rotary shaft, of a rotary sleeve fitted on said shaft and pro-

vided on opposite sides with longitudinal ribs, oppositely-inclined wedges having longitudinal grooves or recesses which receive the ribs on the rotary sleeve, the spaced disks rigidly fixed to the rotary shaft and provided with the transverse passages, the shifting eccentric, and means for manually moving the sleeve and the attached wedges longitudinally on the rotary shaft, substantially as shown and described, for the purpose specified.

2. The combination, with a rotary shaft, of a rotatable sleeve fitted on said shaft and having an annular groove near one end and the longitudinal ribs or flanges arranged on opposite sides of said sleeve and shaft, the oppositely-inclined wedges fitted on said ribs, the fixed lugs secured at opposite ends of the ribs, the shifting eccentric ring confined between suitable guides on the shaft, the adjusting screw-bolts working in the lugs on the rotatable sleeve and engaging the ends of the wedges, and a forked reversing-lever fitted in the annular groove of the rotatable sleeve, substantially as shown and described, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

SIDNEY THOMAS BRUCE.

Witnesses:

J. B. STARKE,
MARSH FIELD.