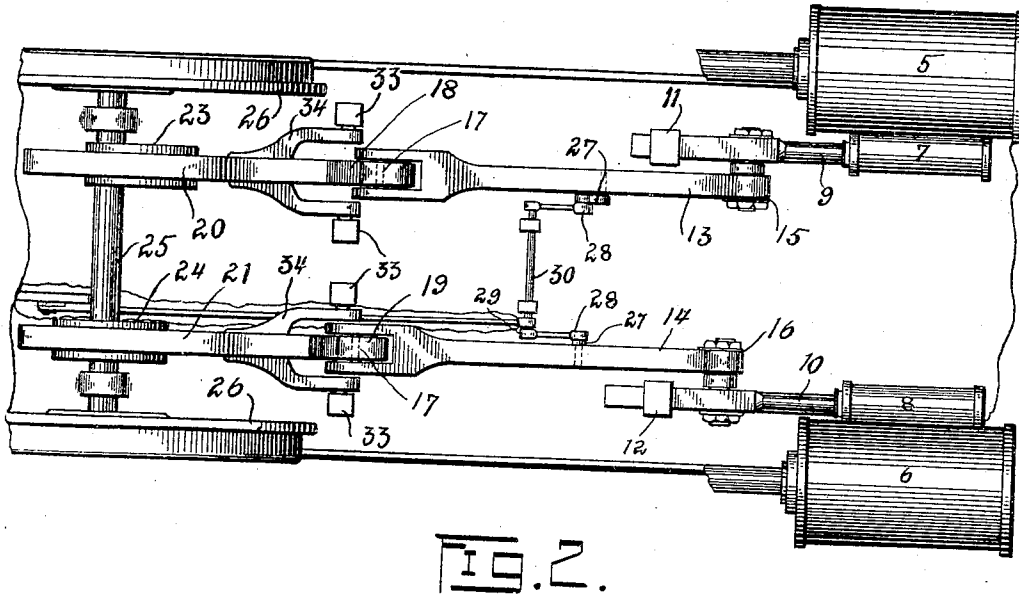
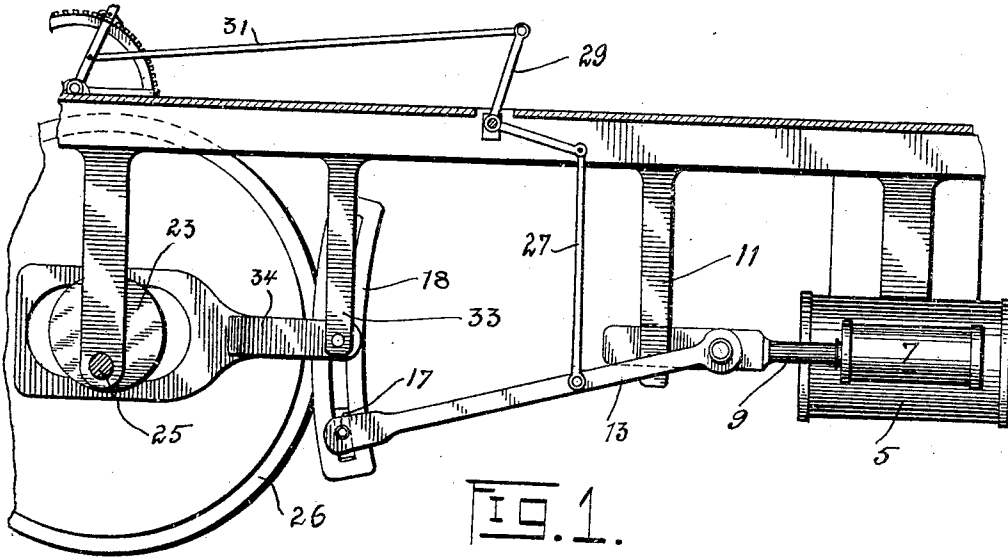


G. J. CLARK.
VALVE AND REVERSE GEARING FOR STEAM ENGINES.
APPLICATION FILED AUG. 11, 1909.

946,110.

Patented Jan. 11, 1910.



Witnesses

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UNITED STATES PATENT OFFICE.

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VALVE AND REVERSE GEARING FOR STEAM-ENGINES.

946,110.

Specification of Letters Patent.

Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, GEORGE J. CLARK, a citizen of the United States of America, residing at Defiance, in the county of Defiance and State of Ohio, have invented certain new and useful Improvements in Valve and Reverse Gearing for Steam-Engines, of which the following is a specification.

This invention relates to an improved valve and reverse gearing for steam engines. This improved valve gearing is particularly adapted for use upon locomotives though it may be employed upon any form of steam engine.

The object of the invention is the provision of a structure of the character described so arranged that the position of the valves may be shifted without imparting bodily movement to the yoke hereinafter described.

A further object of the invention is the provision of an eccentric mechanism for imparting a rocking movement to the yoke hereinafter described, said eccentric mechanism being so constructed as to operate with a minimum of friction.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawing, Figure 1 is a side elevation of a valve and reverse gear constructed in accordance with the invention, and, Fig. 2 is an underside view illustrating the improved valve and reverse gearing applied to the cylinders of a locomotive.

Like numerals designate corresponding parts in both of the figures of the drawing.

Referring to the drawing, the numerals 5 and 6 designate a pair of locomotive cylinders having the usual valve chests 7 and 8, the valves of which are operated by the usual valve stems 9 and 10. The outer ends of these valve stems are slidably mounted in bearings 11 and 12. Swinging links 13 and 14 are pivotally connected at 15 and 16 to the valve stems 10. At their opposite ends these swinging links are connected to bearing blocks 17, said bearing blocks being slidably mounted in rocking yokes 18 and 19. The rocking yokes are rigidly formed with rearwardly extending eccentric straps 20 and 21, said straps having elongated openings 22 formed therein and said straps embracing the eccentrics 23 and 24. These eccentrics are fixedly mounted upon one of

the driving axles 25, said axles carrying the driving wheel indicated at 26. The swinging links 13 are connected by levers 27 with the arms 28 of bell crank levers, the opposite arms 29 of said bell crank levers being connected by a tie rod 30. This tie rod is in turn connected by a rod 31 with the usual reverse lever 32 of the locomotive.

With the parts in the position illustrated in Fig. 1, it is apparent that the rotation of the driving axle 25 will impart rotation to the eccentrics and they in turn will impart an up and down movement to the straps 20 and 21. These straps are pivotally mounted in bearings 33 through the medium of arms 34, said arms being rigid with the straps 20 and 21. It will therefore be seen that a rocking movement is imparted to the yoke 18 but that there is no back and forth bodily movement of said yoke as is the case in the present type of locomotive valve gearing. Through the medium of the links 13, the movement of the yokes 18 and 19 is transmitted to the valve stems 9 and 10 to cause them to shift the valves in the usual manner.

When it is desired to reverse the locomotive, the links are lifted through the medium of the connections described between them and the reverse lever. The movement of the reverse lever, it will be understood, causes the bearing blocks 17 to travel to the upper portions of the yokes 18 and 19, and consequently reverses the movement of the valves. By providing straps 20 and 21, having the elongated openings therein, for engagement with the eccentrics, the yokes may be mounted for rocking movement as described without having a back and forth movement imparted to them. Furthermore, the eccentrics are engaged by the straps at only two points instead of entirely around the periphery of said eccentrics. It is therefore unnecessary to provide a closely machined fit between these members. The yokes being mounted in bearings upon both sides thereof, hang true and even, rendering it possible to shift the links 13 with a minimum of effort. With the present form of locomotive reverse gearing, it is necessary for the engineer to bodily lift the yokes corresponding to the connections 18 and 19. Since these yokes are very heavy, the effort required to shift them is great.

From the foregoing description, it will

be seen that the present invention comprises a reverse and valve gearing of comparatively few parts, one having but very few joints that may become loose, and one that is very easy to operate. While the elements shown and described are well adapted to serve the purposes for which they are intended, however, it is to be understood that the invention is not limited to the precise construction set forth, but includes within its purview such changes as may be made within the scope of the appended claims:

Having described my invention, what I claim is:

1. The combination with an engine and its rotative shaft, of an eccentric carried thereby, a strap having an elongated opening formed therein in which said eccentric moves, a yoke integral with said strap, bearings upon each side of said yoke, the central portion of said yoke being pivotally mounted in said bearings and the integral strap extending rearwardly from the central portion of the yoke, a bearing block slidably disposed within said yoke, a slidable valve stem, and a swinging link, one end of said link being pivotally connected to the valve stem and the other end of said link being pivotally connected to the bearing block.
2. In a device of the character described, the combination with a slidably mounted valve stem, of a swinging link, a centrally pivoted yoke, a bearing block slidably mounted therein with which said swinging link engages, and means for imparting a rocking movement to said pivoted yoke, said means comprising an eccentric and a strap

engaged therewith, said strap being rigidly connected to said yoke, and said strap having an elongated opening formed therein for the reception of the eccentric.

3. In a device of the character described, the combination with a slidably mounted valve stem, of a swinging link, a centrally pivoted yoke, a bearing block slidably mounted therein with which said swinging link engages, means for imparting a rocking movement to said pivoted yoke, said means comprising an eccentric and a strap engaged therewith, said strap being rigidly connected to said yoke, and said strap having an elongated opening formed therein for the reception of the eccentric, and means for shifting the link and its bearing block from one extremity of the yoke to the other.

4. In a device of the character described, the combination of a slidably mounted valve stem, with a swinging link pivotally connected thereto, a yoke, bearings mounted upon each side of said yoke in which said yoke is pivotally mounted for rocking movement, a bearing block slidably mounted in said yoke and with which the swinging link is pivotally engaged, a strap rigidly connected to said yoke and having an elongated opening formed therein, and an eccentric embraced by said strap.

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

GEORGE J. CLARK.

Witnesses:

CHARLES POLLOCK,
HERBERT CURTLAND.