No. 877,079. PATENTED JAN. 21, 1908.

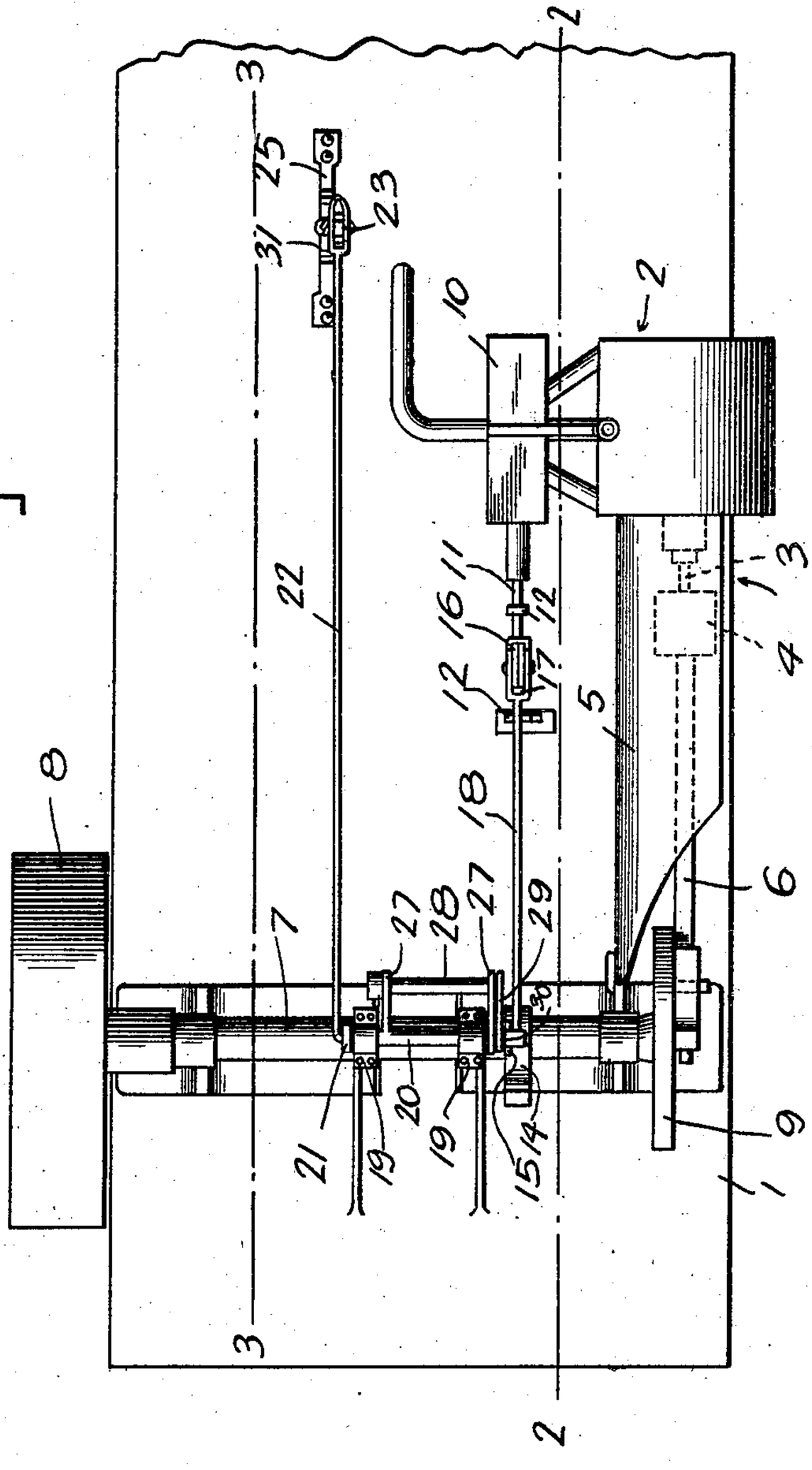
H. M. HENDRICKSON.

GEARING FOR STEAM ENGINES.

APPLICATION FILED MAY 28, 1907.

3 SHEETS—SHEET 1.

Fig-1.



2

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3 SHEETS—SHEET 2.

Fig. 2.

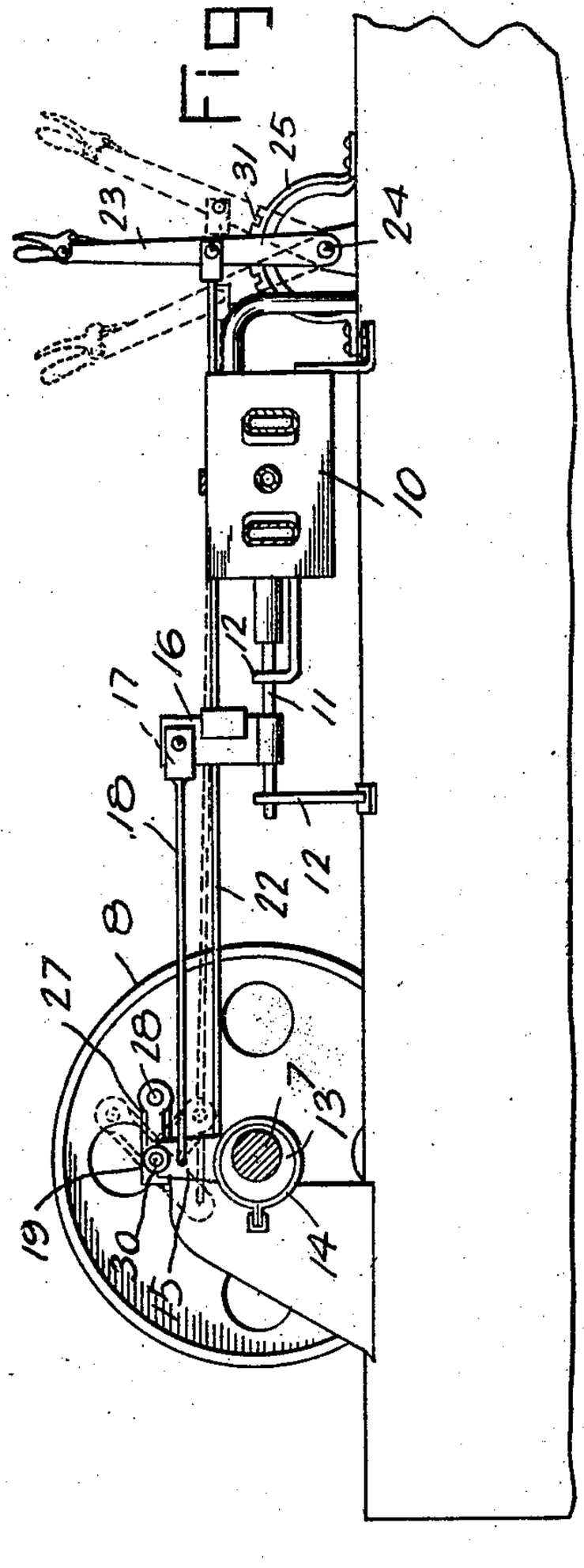
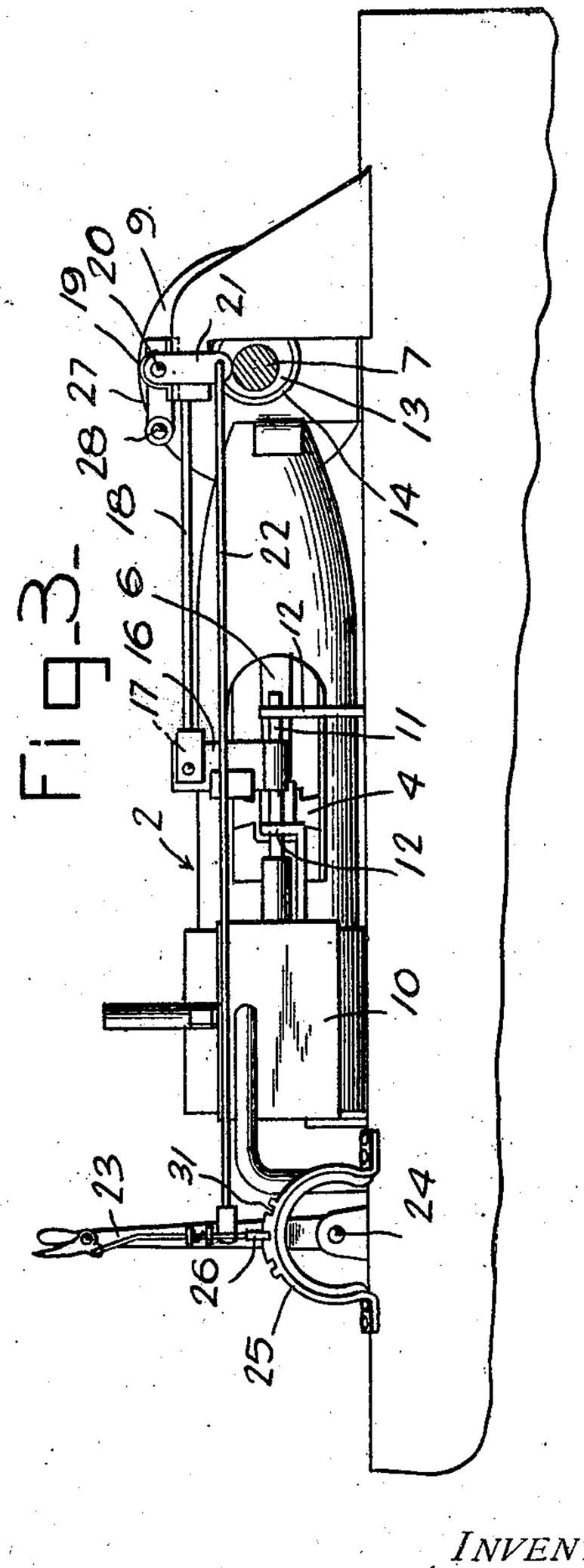


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

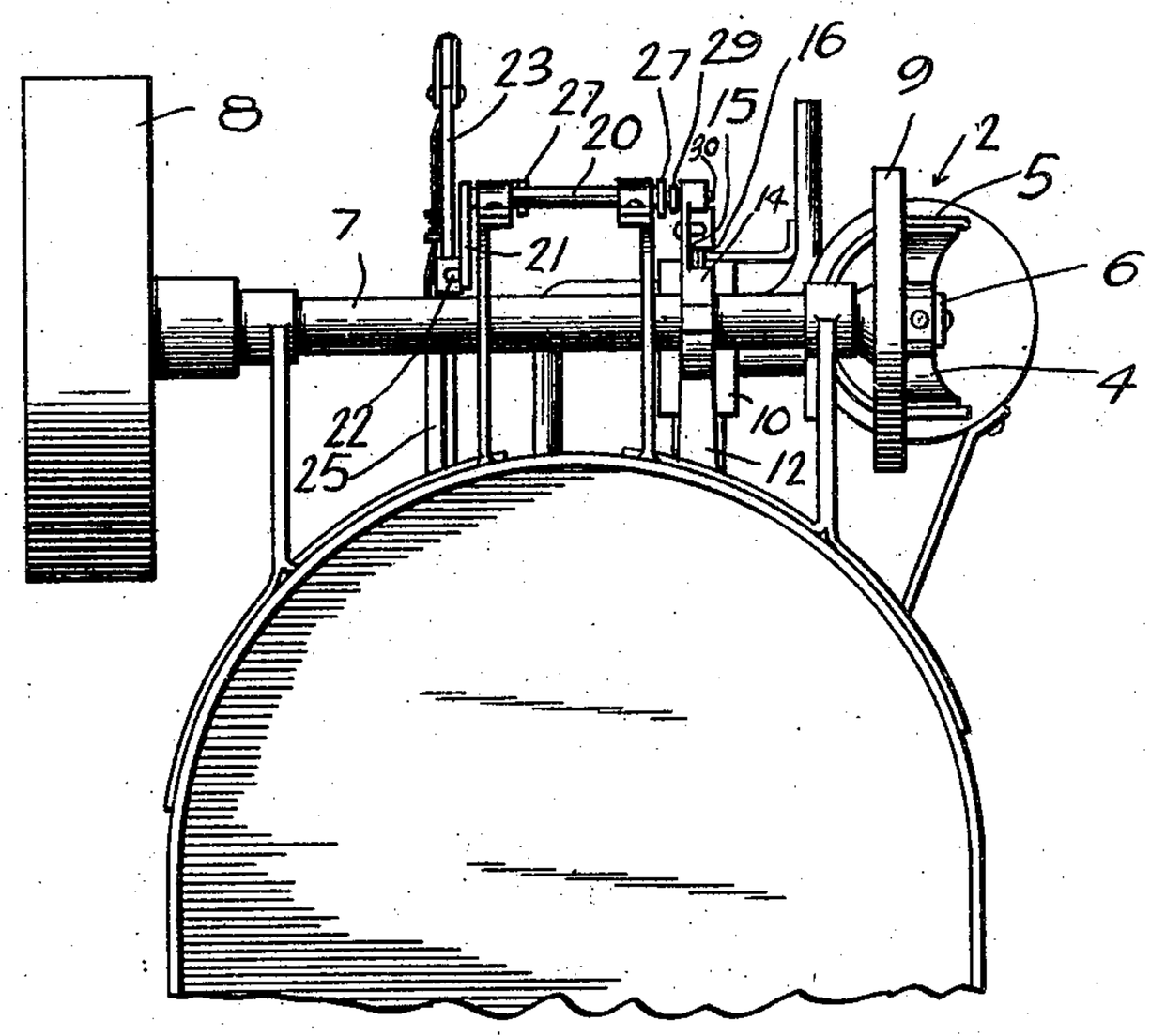
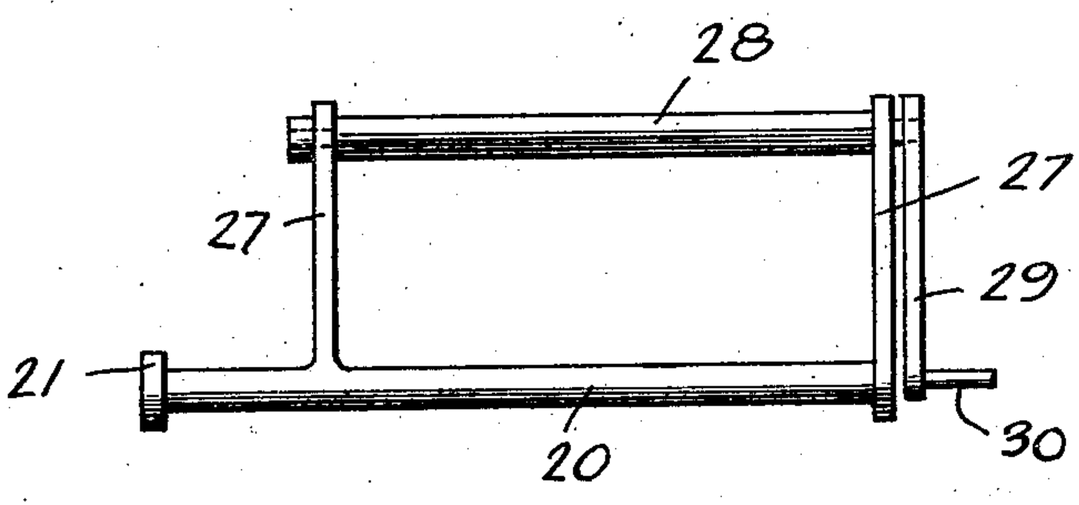


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY M. HENDRICKSON, OF GRANVILLE, NORTH DAKOTA.

GEARING FOR STEAM-ENGINES.

No. 877,079. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed May 28, 1907. Serial No. 376,159.

To all whom it may concern:

Be it known that I, HENRY M. HENDRICKSON, a citizen of the United States, residing at Granville, in the county of McHenry, State of North Dakota,, have invented certain new and useful Improvements in Gearing for Steam-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.

This invention relates to new and useful improvements in steam engines and more particularly it has reference to the valve gearing thereof, the primary object being to provide novel means for setting the adjustable elements of such gearing in position to reverse or stop the movement of the engine.

The details of construction will appear in the course of the following description in which reference is had to the accompanying drawings forming a part of this specification, like characters of reference designating similar parts throughout the several views wherein:

Figure 1 is a plan view of an engine equipped with a valve gearing constructed in accordance with the present invention. Fig. 2 is a section on the line 2—2 of Fig. 1, the elements of the valve gearing being shown in elevation. Fig. 3 is a section on the line 3—3 of Fig. 1 showing more particularly the connections between the controlling lever and the adjustable elements of the gearing. Fig. 4 is a rear end elevation of the gearing and its adjuncts. Fig. 5 is a detailed view of a rocking lever constituting the adjustable elements together with the connections carried thereby.

Referring specifically to the accompanying drawings, 1 designates the boiler, 2 the cylinder, 3 the piston rod, 4 the cross head, 5 the guide, 6 the pitman, 7 the power shaft, 8 the fly wheel, and 9 the disk on said shaft having eccentric connection with the pitman 6. The cylinder 2 has attached thereto the usual steam chest 10 in which works a slide valve, the latter being operated by a valve rod 11 which is slidable in supporting brackets 12. The shaft 7 is constructed with an eccentric 13 about which is engaged an eccentric strap 14 including the vertically extending arm 15. The valve rod 11 is constructed with an arm 16 and the latter has pivotal connection with the bifurcated end 17 of a link 18, the latter being in turn pivoted between the ends of the arm 15. Forward of the shaft 7 are alined bracket bearings 19 which support a rock shaft 20, the latter projecting on each side of said bracket bearings and being formed at one end with a depending arm 21, which, at its lower end has pivotal connection with a link 22, the latter being in turn pivoted to a controlling lever 23 above the pivot 24 of said lever. The lever 23 works about a rack quadrant 25 and is provided with a trigger operated pawl for engagement with the teeth of said quadrant. The shaft 20 includes parallel rearwardly projecting arms 27 which are constructed at their outer ends to afford bearings for a rock shaft 28 which at one end is formed with a forwardly extending arm 29, the arm 29 being pivoted at its end as at 30, to the upper end of the arm 15.

The quadrant 25 is constructed with three notches 31 and the parts are so proportioned that when the lever 23 has its pawl engaged in the central notch, said lever will be in a perpendicular position and the arms 27 in a perfectly horizontal position, in which case, movement of the link 18 from the arm 15 will be so slight that there is practically no movement of the valve rod 11 and consequently, no operation of the engine. When the lever 23 is swung to either one of the end notches 31, the arms 27 will be moved on either side of a horizontal plane as indicated more particularly by the dotted lines in Fig. 2. In such movement of the arms 27, the relation of the pivotal centers of the arm 29 and link 18 is reversed, whereby movement of the valve rod 11, will be reversed by means of the connections described.

The valve gearing embodied in the present invention is simple in construction, inexpensive to manufacture and practical and efficient in use.

From the foregoing description it will be seen that simple and efficient means are provided for accomplishing the objects of the invention, but while the elements herein shown and described are well adapted to serve the functions set forth, it is obvious that various minor changes may be made in the proportions, shape and arrangement of the several parts, without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. The combination with the power shaft and the valve rod, of a steam engine of an

eccentric on said power shaft, an eccentric strap surrounding the same and provided with a vertical arm, a post carried by said valve rod, a link having pivotal connection with said arm and said post, a rock shaft supported in stationary bearings and parallel to said power shaft, a depending arm carried by said rock shaft, a controlling lever, a link having pivotal connection with said depending arm, and said controlling lever, rearwardly projecting arms carried by said rock shaft, a second rock shaft journaled in the ends of said rearwardly projecting arms, a forwardly projecting arm carried by said second rock shaft and having pivotal connection with said eccentric strap arm.

2. The combination with the power shaft and the valve rod, of a steam engine, of an eccentric on said power shaft, an eccentric strap surrounding the same and provided with a vertical arm, a post carried by said valve rod, a link having pivotal connection with said arm and said post, rearwardly projecting arms mounted for pivotal movement, manually operated means for moving said arms pivotally, a rock shaft journaled in the ends of said rearwardly projecting arms, and a forwardly projecting arm carried by said rock shaft and pivoted at its end to said eccentric strap arm.

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

HENRY M. HENDRICKSON.

Witnesses:

G. N. LIVDAHL,

J. F. OAKER.