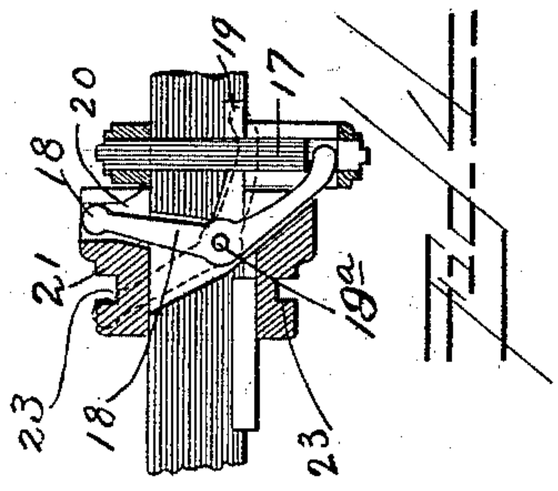
(No Model.) 2 Sheets—Sheet 1.

A. F. DUMKE.

VALVE GEAR FOR STEAM ENGINES.

No. 497,171. Patented May 9, 1893.



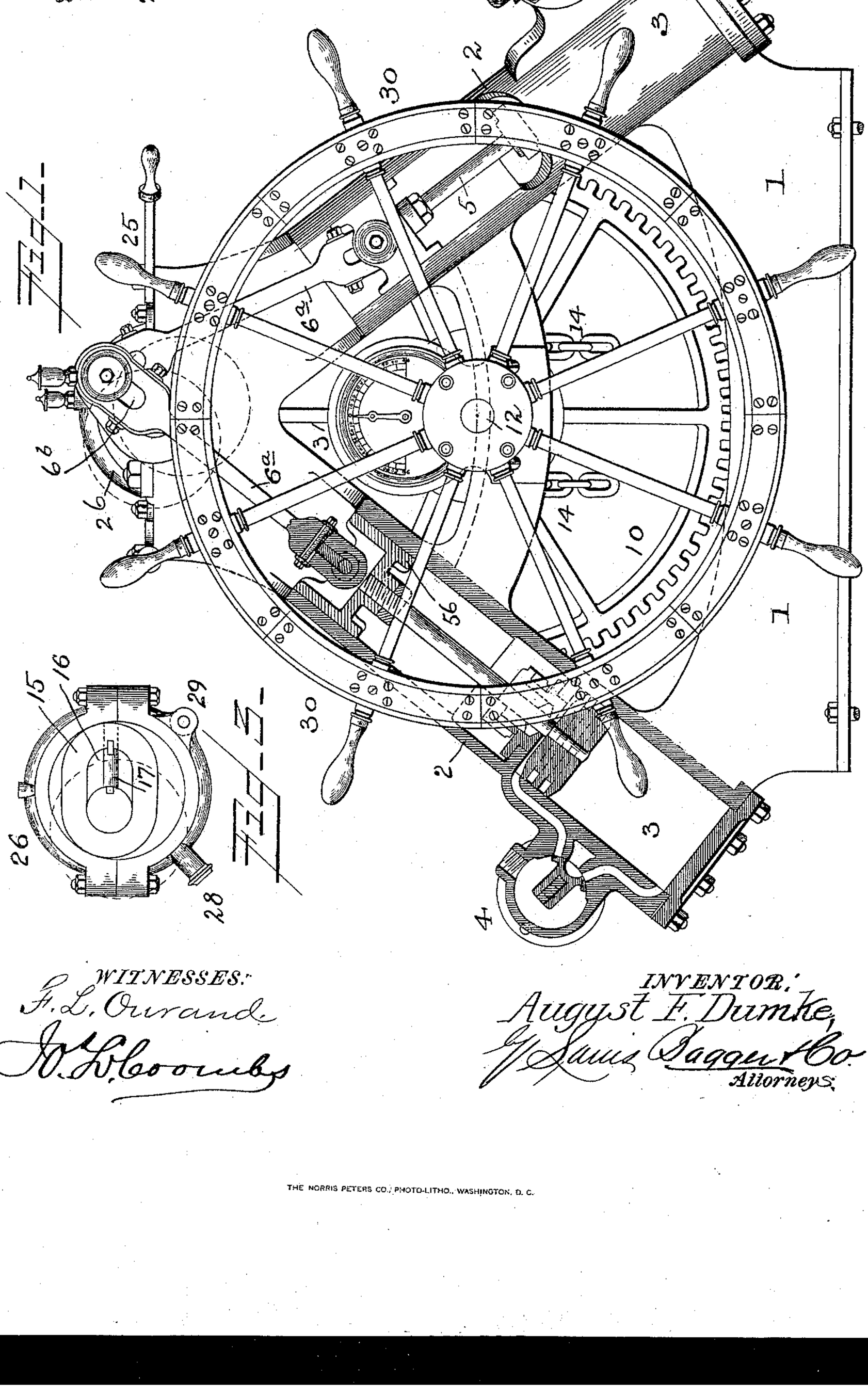


FIG. 1.

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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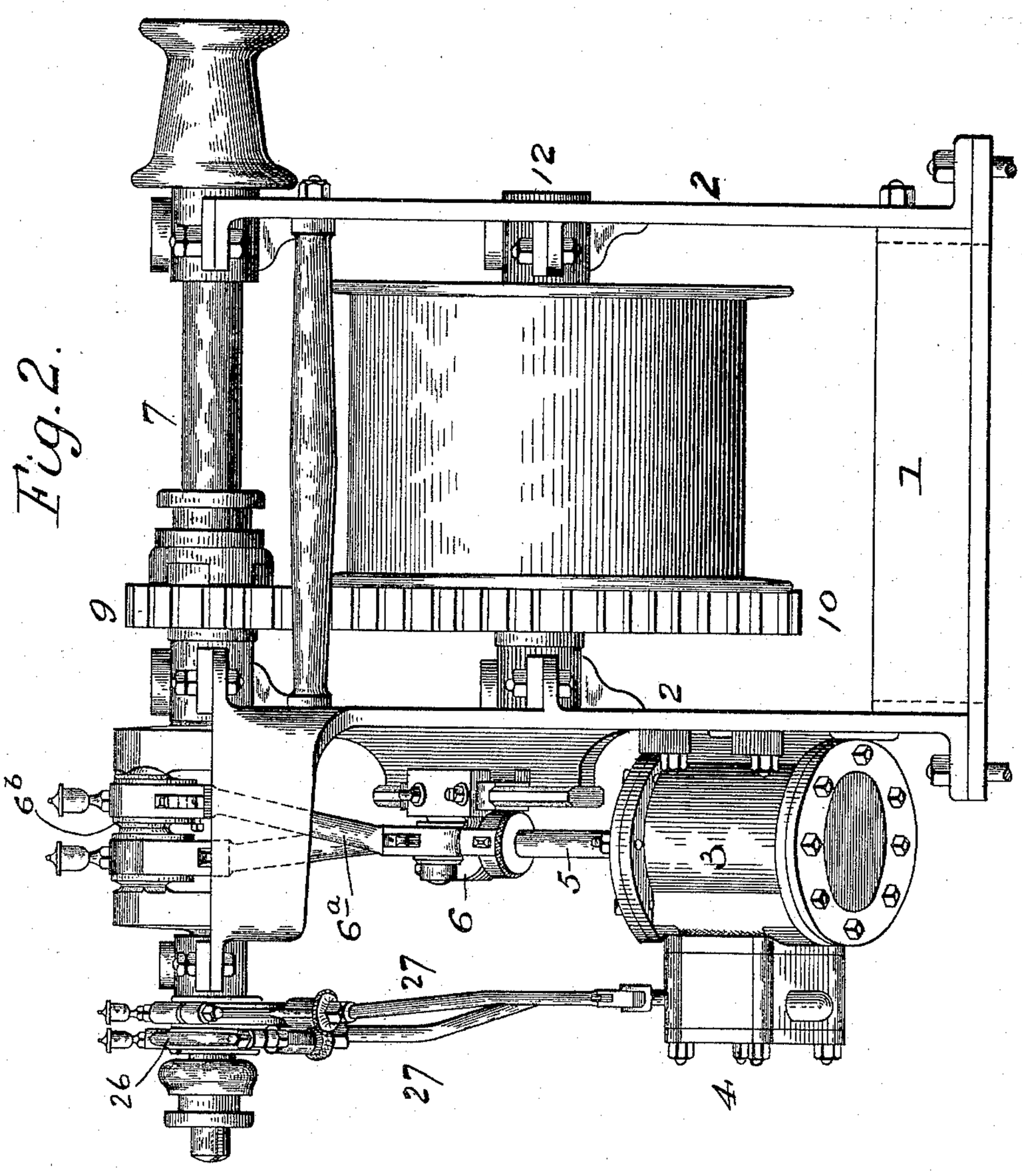
Fig. 2.



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UNITED STATES PATENT OFFICE.

AUGUST F. DUMKE, OF MILWAUKEE, WISCONSIN.

VALVE-GEAR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 497,171, dated May 9, 1893.

Application filed December 14, 1892. Serial No. 455,146. (No model.)

To all whom it may concern:

Be it known that I, AUGUST F. DUMKE, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Valve-Gear for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in valve gear for double cylinder steam engines in which the pistons of said cylinders are connected with a common driving shaft.

The invention is more particularly designed for use in connection with steering apparatus for vessels and hoisting machines, in which it is necessary to frequently and quickly reverse the engine, although it is applicable to other descriptions of engines.

The object of the invention is to provide an improved valve gear for such engines whereby only one eccentric is necessary to operate the valves of both cylinders, thereby considerably lessening the expense and cost of construction; also to provide improved means for shifting the eccentric to reverse the engine.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 represents an end view of a steam steering apparatus constructed in accordance with my invention. Fig. 2 is a side view of the same, when used as a hoisting machine. Figs. 3 and 4 are detail views of the eccentric and means for shifting the same.

The engine frame comprises a triangular shaped casting, the numeral 1 designating the base, and 2 the sides.

The numerals 3, 3, denote the steam cylinders which are bolted to said frame at an angle of about seventy-five degrees to the base thereof. These cylinders may be of any ordinary construction provided with steam chests 4, the usual pistons and piston rods 5, which latter are connected with crossheads 6, working in guides formed in the sides 2 of the frame. These crossheads are connected by pitmen 6^a with the crank 6^b. The steam chests in the present instance are provided with rotary valves which may be of any of the ordinary constructions.

In the apex of the triangular frame is journaled the driving shaft 7, provided with a crank, 1, with which the piston rods are connected. This shaft is provided with a pinion 9 meshing with a cog wheel 10, carried by a shaft 12, also journaled in said frame and having intermediate of its ends a sheave or sprocket wheel over which passes the chain 14, connected with the steering devices.

The numeral 15 designates the eccentric having an elongated slot 16, of a length equal to the throw or shift of the eccentric, and passing through an aperture in the shaft rectangular to the line of the engine crank, and through aligned diametrical apertures in the eccentric is a rod or bar 17 securely connected with the eccentric but capable of freely working in the aperture in the shaft. Near one end the rod 17 and the eccentric are provided with a slot with which engages one end of a two armed or angular lever 18, pivoted to the shaft by a pin 18^a and working in an angular recess 19, formed in the shaft. The other end or arm of this lever engages with a slot 20 in a horizontally movable sleeve 21, carried by said shaft. This clutch is provided with an annular groove 23 with which engages the bifurcated end of a two armed or angular shifting lever 25, pivoted to the engine frame.

The numeral 26 denotes the eccentric strap with which are connected the eccentric rods 27, one of said rods being screwed into a boss 28, while the other is pivoted to a lug 29, so as to prevent binding of the eccentric. These rods are connected at their opposite ends with the valve stems.

The numeral 30 designates an ordinary steering wheel secured to the steering shaft by which the steering apparatus may be worked by hand, in case of accident to the steam steering gear. When the invention however, is used with a hoisting or other engine, this wheel is entirely dispensed with.

The numeral 31 denotes a dial, and the numeral 32 a pointer for indicating the position of the rudder.

The crank on the driving shaft and the pis-

ton rods of the cylinders are so located and arranged with respect to each other, that one of said engines runs in advance of the other, so that there will be no dead center to overcome.

The operation is as follows: Steam is admitted to the cylinders through an ordinary steam supply pipe and throttle valve under control of the engineer as usual, causing the pistons and piston rods to be actuated and the driving shaft rotated through the medium of the pitmen and crank. By shifting the eccentric to the right or left by means of the shifting lever, the engine will be reversed, as will be well understood by those skilled in the art.

While I have illustrated the invention as employed in connection with a steering apparatus, it is obvious that it may be used with hoisting and other machines with equally good results. I may also use two eccentric straps, if found desirable. In this case the valve rod of one cylinder is connected with one strap, and the other valve rod with the other strap.

Having thus described my invention, what I claim is—

1. The combination with a steam engine having a pair of cylinders arranged at an angle to the driving shaft, and provided with the usual steam chests, valves, pistons and connections, of the cranked driving shaft having an angular recess and an aperture, the eccentric carried by said shaft having an oblong slot, the pin passing through said aperture and secured to the eccentric, and the angular lever pivoted in the recess in the shaft and having one end engaging with a slot in the eccentric, substantially as described.

2. The combination with a steam engine having a pair of cylinders arranged at an angle to the driving shaft and provided with the usual steam chests, valves, pistons, and connections, of the cranked driving shaft having an angular recess and an aperture, the eccentric carried by said shaft having an oblong slot, the pin passing through said aperture and secured to the eccentric, the angular lever pivoted in the recess in the shaft, having one end engaging with a slot in the eccentric, the horizontally movable sleeve having a slot with which the other end of the lever engages, and an annular groove and the angular shifting lever engaging with said groove, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

AUGUST F. DUMKE.

Witnesses:

CHAS. TRZEBIATOWSKI,

H. J. NICHOLSON.