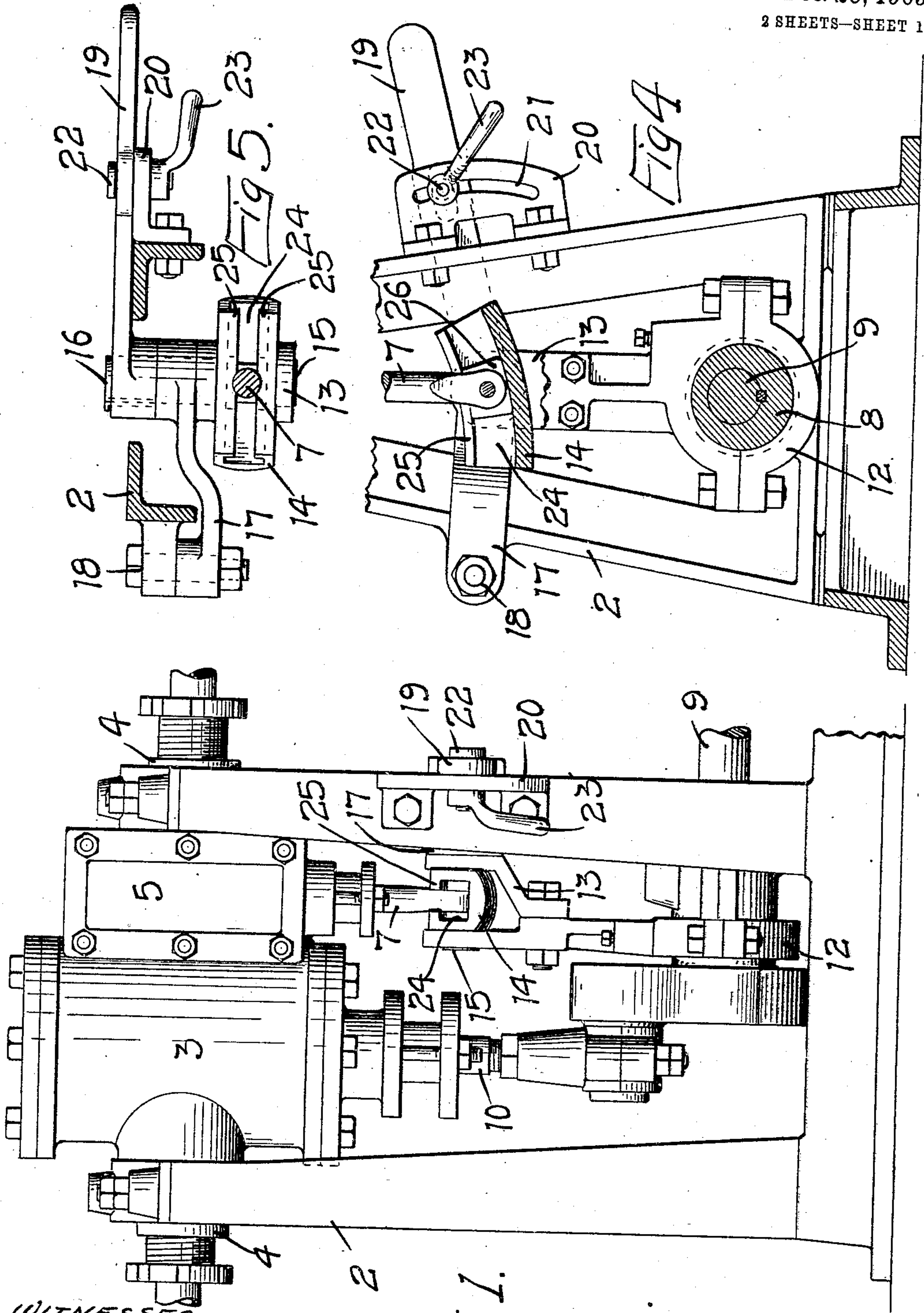


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VALVE GEAR FOR STEAM ENGINES.  
APPLICATION FILED MAR. 5, 1909.

944,724.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.



WITNESSES  
*W. M. Evered*  
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Fig 1.

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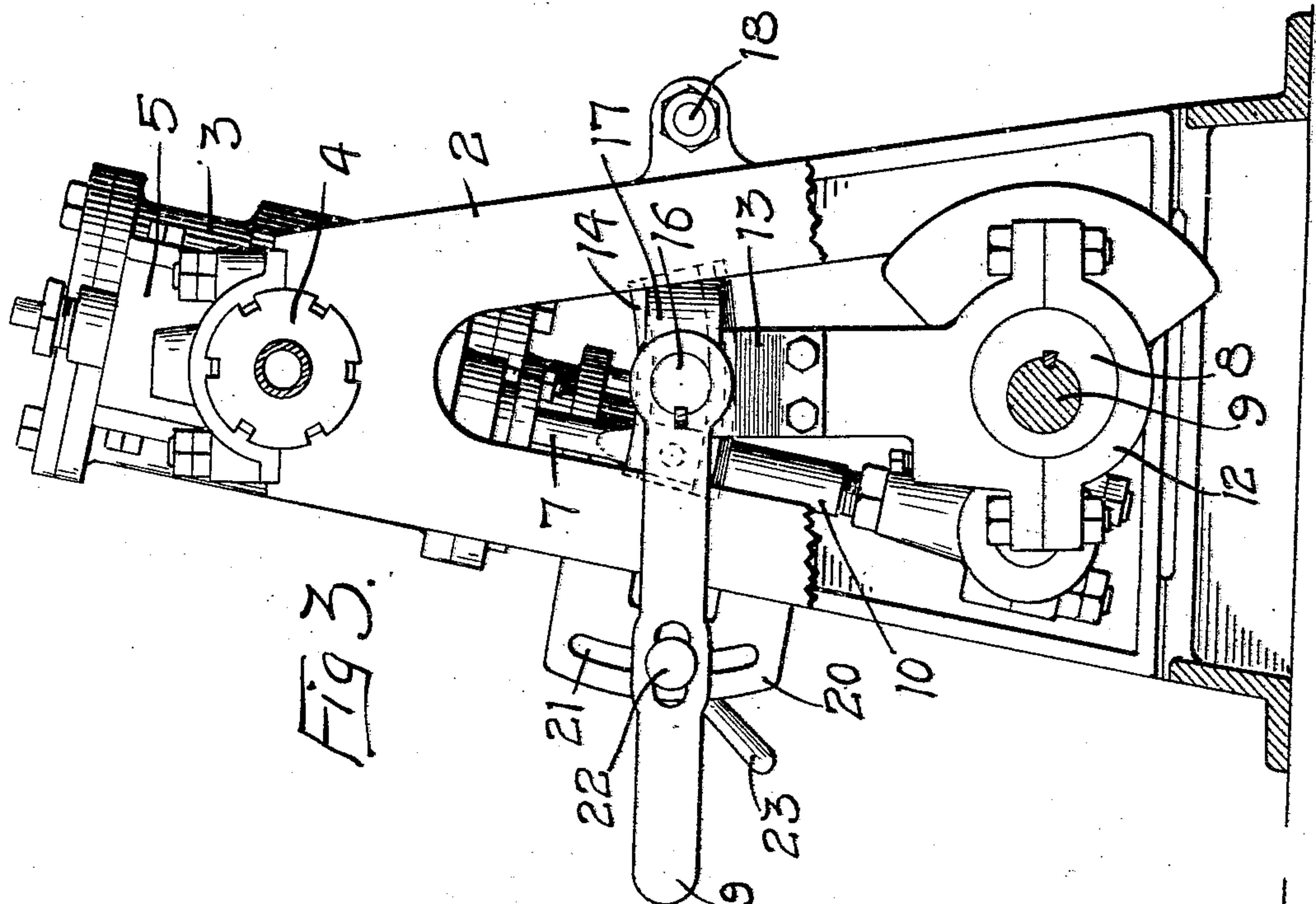


Fig. 3.

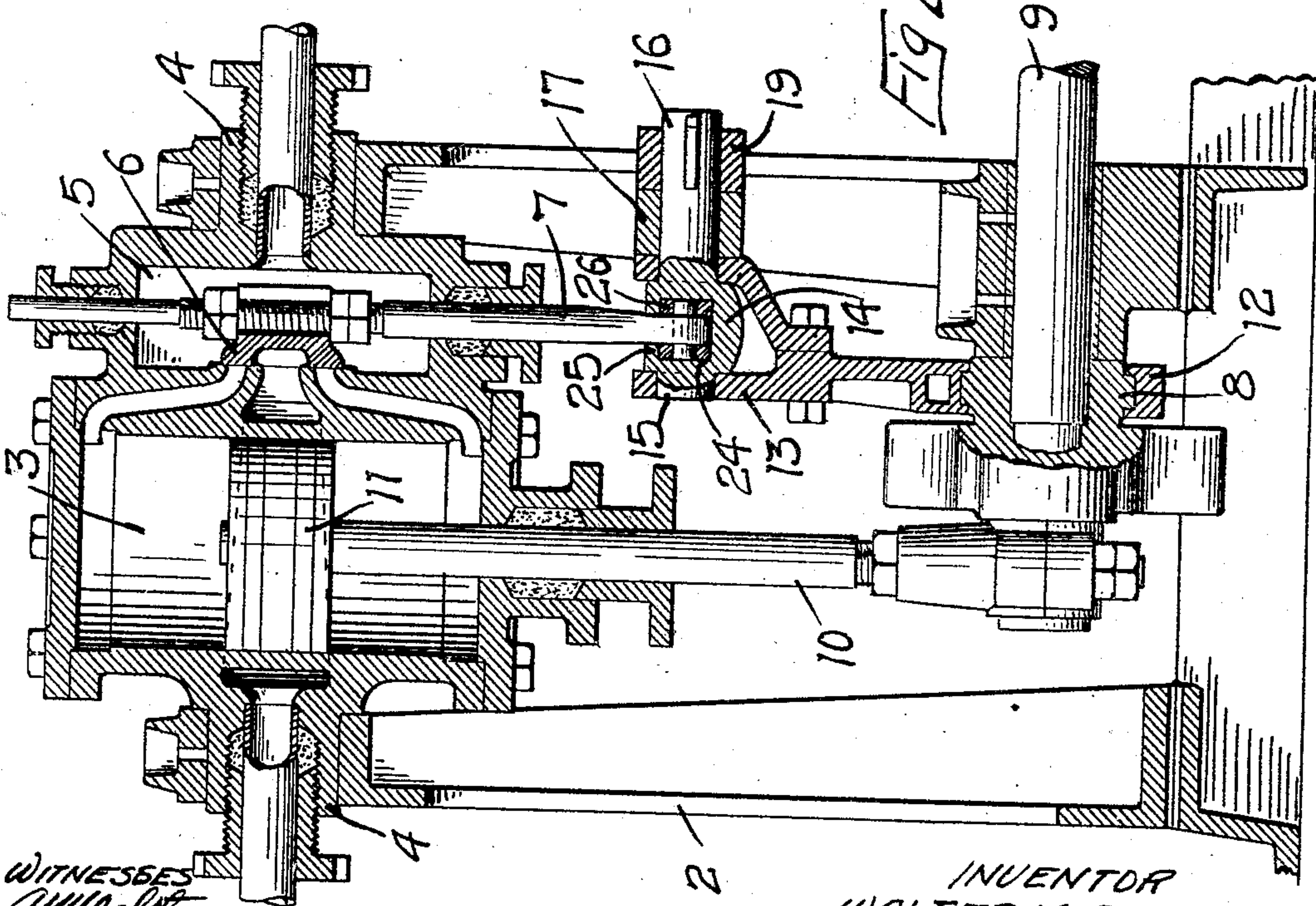


Fig. 2.

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# UNITED STATES PATENT OFFICE.

WALTER M. EVERED, OF DULUTH, MINNESOTA.

VALVE-GEAR FOR STEAM-ENGINES.

944,724.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed March 5, 1909. Serial No. 481,348.

*To all whom it may concern:*

Be it known that I, WALTER M. EVERED, of Duluth, St. Louis county, Minnesota, have invented certain new and useful Improvements in Valve-Gears for Steam-Engines, of which the following is a specification.

The object of my invention is to provide means interposed between the eccentric and the engine slide valve by means of which the cut off can be easily and accurately regulated and the reversal of the engine easily obtained.

A further object is to provide a valve-controlling mechanism adapted particularly for engines of the oscillating type.

A further object is to provide a valve gear mechanism of simple, economical construction and one which can be easily adjusted and not likely to get out of order.

My invention consists generally in various constructions and combinations all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of an oscillating engine with my invention applied thereto, Fig. 2 is a vertical, sectional view of the same, Fig. 3 is an end view, taken substantially at right angles to the section line of Fig. 2, Fig. 4 is a detail view, partially in section, illustrating the construction of the valve gear mechanism, Fig. 5 is a horizontal, sectional view, illustrating the manner of mounting the segmental block and its connection with the reversing lever.

In the drawing, 2 represents a frame whereon an engine cylinder 3 is supported by trunnions 4.

5 is a steam chest having a slide valve 6 and a valve stem 7.

8 is an eccentric, 9 a shaft, 10 a piston rod and 11 the piston operating within the cylinder 3.

12 is an eccentric strap inclosing the eccentric 8 and having a forked upper end 13.

14 is a segmental block having trunnions 15 and 16 in the forked end 13, the trunnion 16 being extended to form a bearing for a hanger 17 that is pivoted at 18 on the frame and also form a bearing for a reversing lever 19 that is secured to the end of said trunnion and is capable of vertical oscillation, being locked in its different adjust-

ments by means of a bracket 20 having a curved slot 21 and a bolt 22 passing through said lever and slot and provided with a locking handle 23. The block 14 has a grooved guide way 24 therein, provided with flanges 25 and adapted to receive a segmental slide 26 that is arranged to move back and forth in the guideway 24 and has a pivotal connection with the valve stem 7. This slide block is made to conform to the curve of the guideway 24 and is capable of moving back and forth therein to obtain the desired stroke of the engine valve. The operation of the eccentric 8 will move the valve to close the steam port or open the port a given distance. The throw line of the eccentric is placed opposite the crank pin for the D. type of slide valve shown herein. The opposite position would be adopted for a B. type of valve. The object of placing the throw line in this position is to locate it properly for opening the steam port at the beginning of the stroke at either end of the cylinder, when the crank is moving in one direction or when the engine is reversing. For an engine built to operate in one direction only, the eccentric throw line would be moved forward or backward according to the direction of the movement of the crank and the lap of the valve. The hanger, pivoted at one end on the engine frame, acts as a guide for the segmental slide in its line of motion. I do not wish however, to confine myself to the use of this hanger for guiding the slide, as any other suitable guide way or bracket, mounted on the frame, might be employed.

The segmental block 14 has its groove made with a suitable radius and length, according to the desired travel of the valve and is capable of being tilted up or down to increase or decrease the throw of the valve, the adjustment being obtained by the movement of the lever 19. A sliding block 26 operates between the bottom of the groove and the double flanges formed thereon and controls the movement of the steam valve. The segmental groove in the block 14 acts as a guide and pathway for the slide block 26 and the position of the arc of this guideway 24 determines the degree of movement of the valve and also makes it possible to operate the engine in either direction. The reversing lever controls the arc of travel of the block 26, increasing it when the lever



is moved away from the center of the slot 21 and decreasing its movement when the lever is adjusted near the center of said slot.

The operation of the mechanism is as follows:—With the valve gear in the position shown in Fig. 4, with the reverse lever near the top of the slot, the engine on the center, the piston at the top of the stroke and the eccentric on the bottom, as the crank 10 passes the center from right to left, it will cause the cylinder to oscillate on its trunnion and at the same time bring the lower end of the valve stem and block 26 away from the center of the guideway in the segmental block 14, the arc of which having 15 been set for full port opening by reverse lever will cause the valve stem to be drawn out of the steam chest sufficiently to open the steam port. When the crank passes the 20 quarter and the piston is finishing its stroke in the cylinder, the latter will swing to its former position and push the valve stem into the steam chest and at the same time, the eccentric 8 will move the segmental 25 block 14 in the same direction, causing the steam port to close, closing also the port for exhaust and releasing the steam and adjusting the valve in position for a return stroke. To reverse the engine, lever 19 is adjusted 30 in the opposite end of the slot 21 and for shortening the travel of the valve or reducing the size of the port opening, merely adjust the valve toward the center of the slot 21, which will cause the earlier closing of the 35 steam port and the shutting off of steam to the cylinder and permit the piston to finish its stroke by the expansive power of the steam.

This apparatus may be applied to an en-

gine of the horizontal type as well as to the 40 one shown herein.

I claim as my invention:

1. The combination, with an upright 45 frame, of an oscillating cylinder mounted therein and having a steam chest, a slide valve for said chest, a stem for said valve, an eccentric and strap therefor, a segmental block having a curved guide way therein 50 mounted on said strap, a hanger pivoted in said frame and having a bearing for said block, a lever pivoted in said frame and operatively connected with said segmental block to oscillate the same, a slide block fit- 55 ting within the guide way in said segmental block and pivotally mounted on said valve stem, substantially as described.

2. The combination, with an upright 60 frame, of an oscillating cylinder journaled therein and having a steam chest and slide valve therefor and a stem for said valve, an eccentric and strap therefor having a forked 65 upper end, a segmental block having trunnions journaled in the forked end of said strap, said segmental block having a curved guide way therein, a hanger pivoted on said 70 frame and journaled on one of said trunnions, a reversing lever also pivoted on said frame and also journaled on one of said trunnions and adapted to move vertically to tilt said segmental block, a slide block fit- 75 ting within said guide way and pivotally connected with said valve stem.

In witness whereof, I have hereunto set my hand this 26th day of February 1909.

WALTER M. EVERED

Witnesses:

WILLIAM GITTY,  
PERCY N. DENNIS.