

No. 669,324.

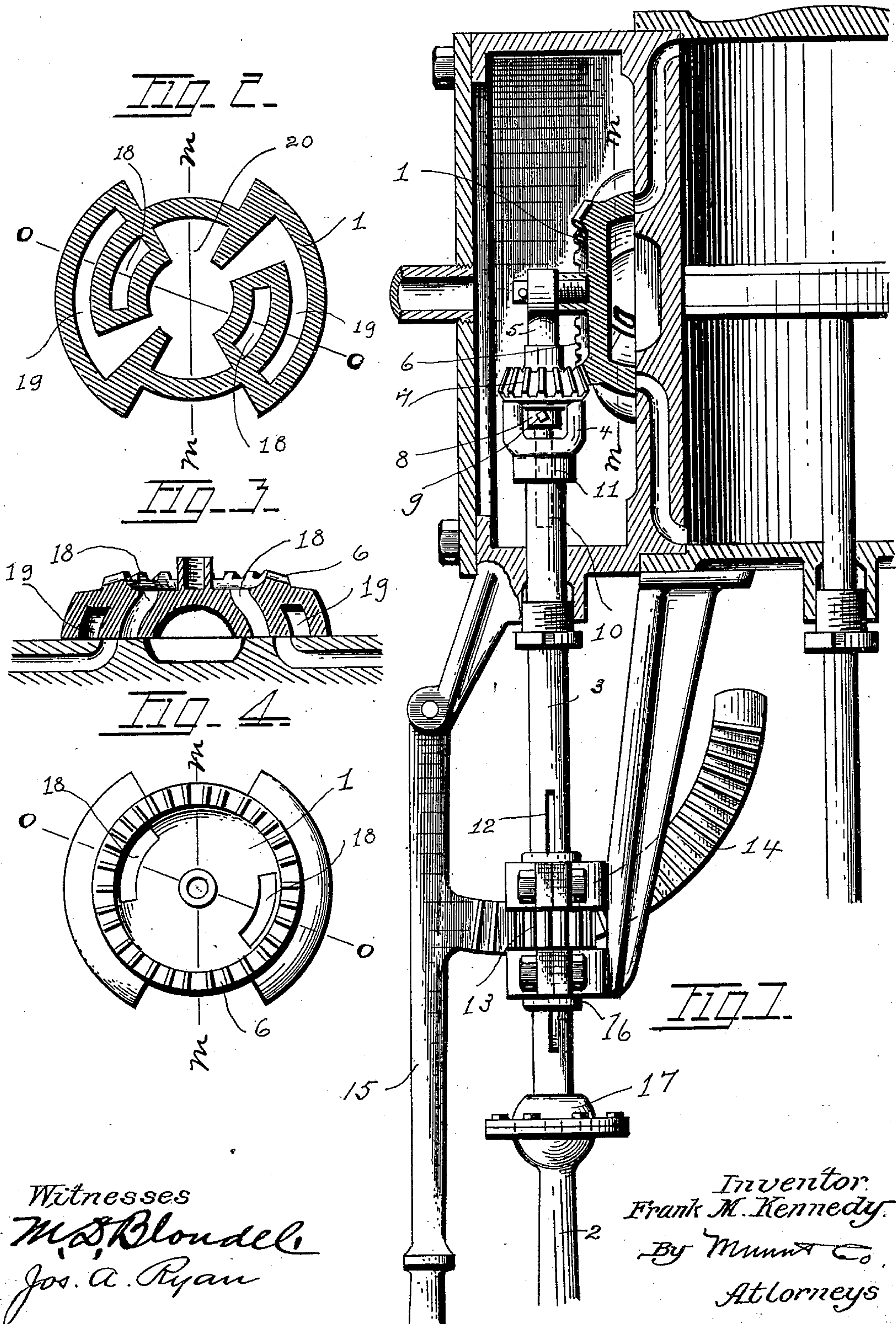
Patented Mar. 5, 1901.

F. M. KENNEDY.

VALVE GEARING AND REVERSIBLE VALVE.

(Application filed July 25, 1900.)

(No Model.)



Witnesses  
*M. S. Bloude*  
*Jos. A. Ryan*

Inventor  
*Frank M. Kennedy*  
By *Munn & Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

FRANK M. KENNEDY, OF CLARENDON, ARKANSAS, ASSIGNOR TO JANE W. STONE, OF BROOKLYN, NEW YORK.

## VALVE-GEARING AND REVERSIBLE VALVE.

SPECIFICATION forming part of Letters Patent No. 669,324, dated March 5, 1901.

Application filed July 25, 1900. Serial No. 24,791. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK M. KENNEDY, of Clarendon, county of Monroe, and State of Arkansas, have invented certain new and useful  
5 Improvements in Valve-Gearing and Reversible Valves; 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  
10 make and use the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form part of this specification.

My invention relates to a valve mechanism  
15 and reversible valve for steam-engines, and has for its object to provide a reversible valve that shall be suitable for employment in the oil regions, where simplicity of construction, ease of operation, and minimum expense in  
20 the manufacture thereof are the essential features to be considered.

In carrying out my invention I employ a slide-valve of novel construction capable of being revolved upon its axis by a lever under  
25 the control of the operator.

The invention therefore consists in the parts hereinafter shown, described, and claimed.

In the drawings, Figure 1 is a sectional elevation of an engine-cylinder and steam-chest,  
30 showing the valve in section on line *m m*, Figs. 2 and 4, and the mechanism for controlling the same. Fig. 2 is a cross-section of the valve on line *n n*, Fig. 1. Fig. 3 is a vertical section on line *o o*, Figs. 2 and 4. Fig. 4  
35 is a plan view of the valve, the connection therewith being removed to disclose the bevel-gear thereon, the valve-ports for the admission of steam to the cylinder also being shown.

1 designates my improved valve, to which  
40 a reciprocatory movement is imparted by means of an ordinary eccentric on the main shaft (not shown) through the medium of a connecting-rod 2, guide-rod 3, swivel connection 4, and hanger 5. Valve 1 is formed with  
45 a bevel-gear 6 on the outer side thereof, which meshes with a bevel-gear 7, forming the body portion of swivel 4, in which is loosely journaled the hanger 5, being held from withdrawal therefrom by a collar 8, secured thereon by a set-screw 9. The end portion 10 of  
50 the guide-rod 3 is screwed into the portion 11

of swivel 4, forming a rigid connection therewith.

12 designates a longitudinal slot in the guide-rod 3, which engages the key of a pin-  
55 ion 13 thereon, meshing with a segmental rack-bar 14, secured to hand-lever 15, whereby the revolution of guide-rod 3 will be effected when the hand-lever 15 is thrown, and  
60 at the same time permitting a free vertical movement of the guide-rod in its bearings 16. Guide-rod 3 and connecting-rod 2 are joined together by a ball connection 17.

The steam-ports are formed in the slide-valve by parallel metal rings connected in  
65 quarter-divisions by radial ribs, forming the steam-ports 18 and exhaust-ports 19. The steam-ports 18 are interposed between the exhaust-chamber and in the center of the valve and the exhaust-port near the periph-  
70 ery of the valve.

The operation of the valve is identical with the ordinary D slide-valve, actuated reciprocally by an eccentric secured to the engine-  
75 shaft.

In operating the hand-lever either to the right or left the rack-bar will engage the pin-  
ion secured upon the valve-rod and rotate the valve from its operative position and trans-  
pose the steam and exhaust ports of the valve  
80 to coincide with the steam and exhaust ports of the cylinder, admitting steam for either motion.

It will be seen from the foregoing that a reverse movement can be given to an engine  
85 instantaneously and that I can also by means of the rotative movement of the slide-valve throttle the admission of steam into the cylinder-ports, decreasing the area as desired, gaging and controlling the velocity.  
90

What I claim is—

1. In a steam-engine, a slide-valve mounted to rotate and provided with steam and exhaust ports, a valve-rod connected with said valve to reciprocate the same, the said valve-rod being  
95 mounted to turn, and a pinion secured on said valve-rod and engaging a gear on the valve for the purpose set forth.

2. In a steam-engine, a reversible mechanism comprising a slide-valve, mounted to turn  
100 on its axis and having a bevel-gear on the outer face thereof, a valve-rod mounted to



slide and to turn, a bevel-gear carried thereby and meshing with the bevel-gear on the valve, a hand-lever, provided with a rack, and a pinion secured to the valve-rod and engaged by said rack.

5

3. In a steam-engine, a reversible mechanism, comprising a throttling slide-valve mounted to turn and having ports adapted to act in conjunction with the ports of the cylinder, a slotted rod connected with said valve and mounted to slide and to turn, a pinion on said rod and provided with a key engaging said slot, and means for turning the pinion.

4. In a steam-engine, the combination with the steam-chest and the cylinder provided with steam and exhaust ports, of a slide-valve provided with steam and exhaust ports, the said valve being mounted to turn to reverse the engine, and a valve-rod for reciprocating the slide-valve and for turning the same, as set forth.

5. In a steam-engine, a slide-valve mounted to turn on its axis and provided with steam and exhaust ports adapted to act in conjunction with the ports of the cylinder, the ports of said valve being so arranged relatively to the cylinder-ports that the engine may be reversed by turning the valve.

6. In a steam-engine the combination with the steam-chest and cylinder of the slide-valve provided with steam and exhaust ports acting

in conjunction with the cylinder-ports, a hanger in which said valve is mounted to rotate, a reciprocating valve-rod having a section rotatably connected with said hanger, means for turning the said section of the valve-rod, and means for rotating the valve to reverse the engine when the said section of the valve-rod is turned, as set forth.

7. In a steam-engine, a slide-valve provided with steam and exhaust ports arranged to act in conjunction with the ports of the cylinder, the said valve being mounted to turn in either direction, and adapted, when turned, to reverse the engine, and means for turning the said valve.

8. In a steam-engine, a slide-valve provided with steam and exhaust ports adapted to act in conjunction with the ports of the cylinder, the said valve being mounted to turn on its axis to reverse the engine, a valve-rod for reciprocating the valve, the said valve-rod having a section mounted to turn, and means for turning the valve from the valve-rod.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses:

FRANK M. KENNEDY.

Witnesses:

WILLIAM WEBSTER,  
MAUD SCHUMACHER.