

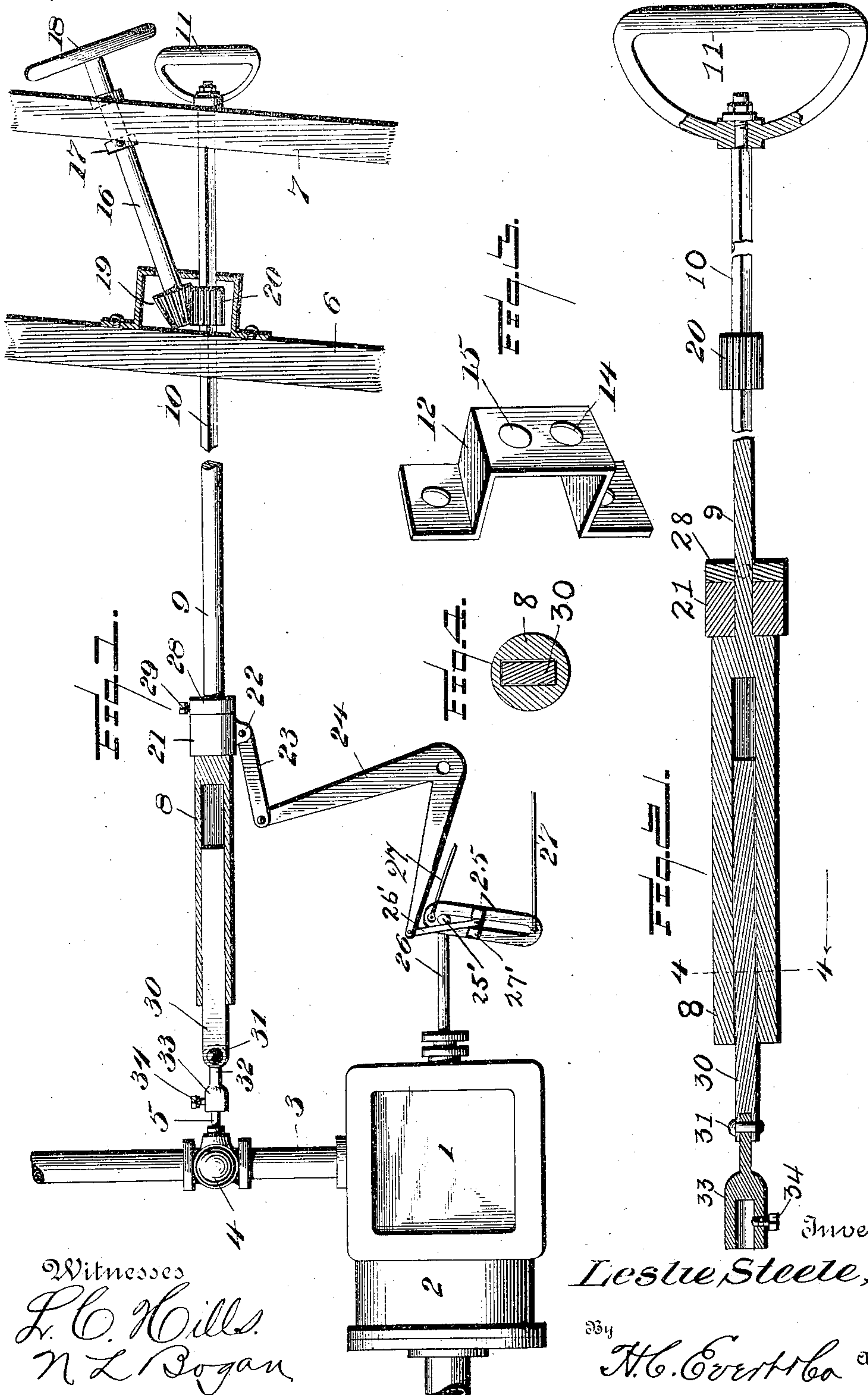
No. 659,458.

Patented Oct. 9, 1900.

L. STEELE.  
VALVE GEAR.

(Application filed Aug. 18, 1899.)

(No Model.)



Witnesses  
L. C. Mills.  
N. L. Bogan

Inventor:  
Lester Steele,  
By N. C. Everett & Co. Attorneys



# UNITED STATES PATENT OFFICE.

LESLIE STEELE, OF WASHINGTON, PENNSYLVANIA.

## VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 659,458, dated October 9, 1900.

Application filed August 18, 1899. Serial No. 727,676. (No model.)

*To all whom it may concern:*

Be it known that I, LESLIE STEELE, a citizen of the United States of America, residing at Washington, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Valve-Gear, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in valve-gear, and has for its object to provide an improvement in gearing of this type whereby the motion of the engine may be controlled at the will of the engineer.

15 The invention is particularly adapted to be employed in connection with engines employed for drilling oil and gas wells and the like and aims to provide means whereby the engineer may readily control the engine when located a considerable distance therefrom.

20 In drilling oil and gas wells the engine employed is usually for the sake of safety located at a considerable distance from the derrick in which the drilling-tools are suspended and it is desirable that the engineer or operator when in the derrick may have a convenient means at hand whereby the engine may be controlled, and to provide such

25 a means which will be simple in construction, strong, durable, and effectual in its operation is the primary object of my invention. Briefly described, my invention consists of an operating-rod which is mounted to rotate and reciprocate longitudinally. This operating-rod is connected at its one end to the inlet-valve of the steam-chest and controls said valve by its rotary movement. It is also connected with the valve-stem of the valve

30 which admits and exhausts steam to each end of the cylinder, which it controls by its longitudinal movement, and the particular construction by which this is attained, together with the various details entering into the invention, will be hereinafter more specifically described and then particularly pointed out in the appended claims.

35 In describing the invention in detail reference will be had to the accompanying drawings, forming a part of this specification, and wherein like figures of reference will be used

to designate similar parts throughout the several views, in which—

Figure 1 is a side view of my improved valve-gear, partly in section and partly broken away, showing the same in position for controlling the engine. Fig. 2 is a longitudinal sectional view of the operating-rod. Fig. 3 is a perspective view of the bracket which forms a support for the operating-rod and rotating rod or shaft and incloses the operating cogs or gears which rotate the operating-rod. Fig. 4 is a transverse vertical sectional view of the operating-rod, taken on the line 4 4 of Fig. 2.

Referring to the drawings by reference-numerals, 1 indicates the steam-chest, 2 the cylinder, and 3 a steam-inlet pipe connected to the steam-chest and having interposed therein a throttle-valve 4, provided with the stem 5.

40 In Fig. 1 of the drawings I have shown a portion of the derrick or other device from where the engine is to be controlled, 6 and 7 indicating the two standards or supports in which the operating-rod is supported. This operating-rod consists of the barrel portion 8, having the round stem 9 of less diameter projecting from its closed end, with the portion of said stem that operates in the standards 6 and 7 squared, as shown at 10, and the operating-handle 11 suitably mounted on its free end, this handle being preferably mounted thereon so as to be easily gripped from different positions. To the face of the standard or support 6 is secured a bracket or keeper 12, having apertures 14 and 15 to receive the operating-rod and the rod or shaft which rotates the operating-rod. The aperture 14 is in alinement with the apertures in the standards 6 and 7, while the aperture 15 is located directly above the aperture 14 and has its walls at an incline to the walls of the aperture 14 to accommodate the inclination of the shaft 16, journaled in the standard or support 7 at a slight incline, and may be retained in its position by collars 17, secured to the shaft at either side of the standard. For operating the same it has mounted on its outer end a suitable hand-wheel 18 and carries on its inner end, within the bracket 12, a bevel-gear 19, which is adapted to mesh with the gear or cog 20, that is loosely mounted upon the squared portion of the operating-rod that is



within said keeper or bracket 12. The rounded stem 9 of this operating-rod has mounted thereon, adjacent to the closed end of the barrel 8, a sleeve 21, having lugs 22 on its under side, to which is pivotally connected the upper end of the link 23, the other end of said link being similarly connected to the upper end of a bell-crank lever 24, that is supported from any suitable point in close proximity to the engine. The other arm of this bell-crank is pivotally connected to a link 26', having its other end pivotally attached to a cross-head 27', carried by the link 25, which is slotted to receive either a pin 25', secured on the outer end of the stem 26 of the valve, which admits and exhausts steam to each end of the cylinder and extending at right angles to said stem, or this stem may have its outer or free end bent at right angles to engage in the slot of said link. This link 25 is connected by the rods 27 to the eccentric of the engine.

The collar or sleeve 21 is held in position upon the rounded portion 9 of the operating-rod by means of a collar 28, having a set-screw 29 to engage said stem and hold the collar or sleeve 21 in its position. The opening in the barrel portion 8 of this operating-rod is oblong in cross-section of the barrel and is adapted to receive the flat bar 30, having pivotally connected to its outer end by a pin or rivet 31 the stem 32 of a socket 33, which receives the stem 5 of the throttle-valve and is secured thereto by a set-screw 34.

The opening and closing of the throttle-valve 4 is controlled by rotating the operating-rod, which may be accomplished by means of the shaft 16 and hand-wheel 18 or when the handle 11 is rigidly mounted on the rod 10 by turning this handle 11. However, I prefer to rotatably mount this handle 11 on its rod, so the handle may be turned thereon to any convenient position, and as it would not be possible to rotate the rod 10 when this handle was so mounted I prefer to use the shaft 16, hand-wheel 18, bevel-gear 19, and cog 20 for imparting this rotary movement to the rod 10 to open or close the valve 4. When it is desired to open or close the valve which admits and exhausts the steam to each end of the cylinder, a longitudinal movement is imparted to the rod 10 by its handle 11 and the link 23, bell-crank 24, and link 25 thereby actuated to operate such valve to open or close the same according to the direction in which the rod 10 has been moved.

It will be observed that various changes may be made in the details of construction without departing from the general spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a valve-gear, the combination, with the steam-chest and its throttle-valve, of an operating-rod connected to the stem of the throttle-valve, connections between said rod and the valve which admits and exhausts steam to each end of the cylinder, a cog-wheel mounted on said operating-rod, and an operating-shaft having a bevel-gear to engage said cog on the operating-rod and impart a rotary movement thereto when the shaft is rotated, substantially as described.

2. In a valve-gear, the combination with the steam-chest and its throttle-valve, and the cylinder and its valve for admitting and exhausting steam to each end thereof; of a longitudinally-reciprocating and rotary-movable operating-rod connected to the stem of the throttle-valve and adapted to operate said valve by its rotary movement, connections between said operating-rod and the stem of the valve which admits and exhausts steam to each end of the cylinder, and means connected to said operating-rod for rotating the same, and separate means carried by the rod for longitudinally operating the same, substantially as described.

3. In a valve-gear, the combination, with the steam-chest and its throttle-valve, and the cylinder and its valve for admitting and exhausting steam to each end thereof; of a longitudinally-reciprocating and rotary-movable operating-rod connected to the stem of the throttle-valve and adapted to operate said valve by its rotary movement, a bell-crank and link connection between said operating-rod and the stem of the valve which admits and exhausts steam to each end of the cylinder, means engaging said operating-rod for imparting a rotary movement thereto, and means carried by said operating-rod for longitudinally operating the same, as and for the purpose described.

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

LESLIE STEELE.

Witnesses:

G. W. CHITTIS,  
J. A. LANE.