

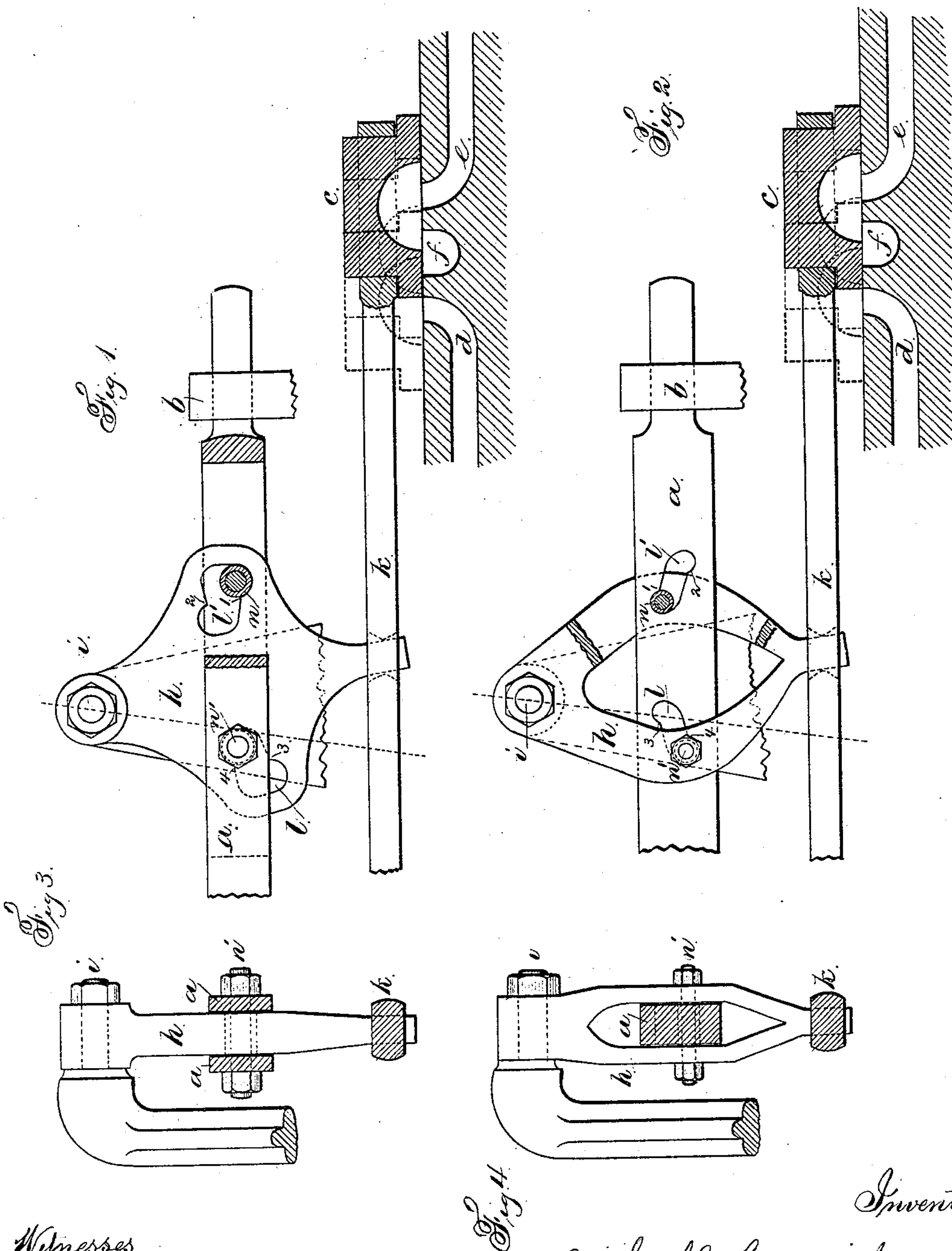
(No Model.)

M. N. CUMMISKEY.

VALVE GEAR.

No. 270,395.

Patented Jan. 9, 1883.



Witnesses
Harold Ferrell
Chas H Smith

Fig. 4.

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per
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UNITED STATES PATENT OFFICE.

MICHAEL N. CUMMISKEY, OF PATERSON, NEW JERSEY.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 270,395, dated January 9, 1883.

Application filed June 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL N. CUMMISKEY, of Paterson, in the county of Passaic and State of New Jersey, have invented an Improvement in Valve-Motions for Steam-Engines, of which the following is a specification.

This invention is for operating the valve by an eccentric-rod and accelerating the motion, and for cutting off the steam, so as to work the engine expansively.

Between the eccentric-rod and the valve-rod there is a rocker-lever pivoted at one end, connected at the other end to the valve-rod, and provided with studs, either with or without rollers upon them, and slot-connections to the eccentric-rod in such a manner that the eccentric-rod gives motion to the lever and valve-rod to admit steam, and then to close the steam-port and allow the valve to remain quiescent, or nearly so, and then to open the exhaust and to admit steam on the other side to move the piston the other way, and then to shut off the steam and allow the same to expand. The operations are repeated each movement of the eccentric-rod.

In the drawings, Figure 1 is a section of the valve and valve-seat and elevation of the lever and rods, the eccentric-rod being partly in section. Fig. 2 is a similar view with a transposition of the slots and rollers. Fig. 3 is a view edgewise of the rocker-lever, Fig. 1; and Fig. 4 is a similar view of the rocker-lever, Fig. 2.

The eccentric-rod *a* is guided in suitable bearings, *b*, and it is moved endwise back and forth by the eccentric and any suitable connection thereto not shown in the drawings. The valve *c* is of usual form—such as a *D* slide-valve—and the ports *d* and *e* and exhaust *f* are of usual character, the valve being adapted to covering the steam-ports alternately while the exhaust remains open.

The rocker-lever *h* is sustained by a fixed pivot at *i*, and its lower end passes into a mortise in the valve-rod *k*, or is otherwise connected therewith, and this lever *h* is either made in two parts, as seen in Fig. 4, with the eccentric-rod *a* passing through it, or else the eccentric-rod is mortised or made in two parts, with the lever *h* passing through it, as seen in Fig. 3, these differences in construction being immaterial. The connections between the eccentric-rod *a* and the lever *h* are by studs or

pins in slots, and there are by preference rollers on these studs, and the slots may be in the eccentric-rod *a*, as seen in Fig. 2, and the studs on the lever *h*; or the slots may be in the lever *h* and the studs be upon the eccentric-rod *a*, as seen in Fig. 1.

I will describe the devices shown in Figs. 1 and 3. The slots *l l'* are approximately of an *S* form, and the curved recesses near the ends form nearly half-circles for the reception of the studs or rollers *n*, that are of the same radius as the recesses. There are therefore cam-shaped projections at 1 2 3 4 at the respective slots.

Presuming, now, that the eccentric-rod *a* has reached the end of its motion to the right, the steam-port *d* is uncovered, the exhaust open by *e f*, as shown by full lines. The eccentric-rod *a* now commences to move to the left, and the studs or rollers *n n'* are in contact with the projections 1 and 4, so that the lever *h*, valve-rod *k*, and valve *c* are moved, and this motion continues until the steam-port *d* is covered by the valve, as shown by light dotted lines. The parts are made so that at this moment the studs *n n'* separate from the projections 1 and 4, allowing the valve to remain quiescent, or nearly so, as the rollers move along through the middle portions of the slots, and then said studs or rollers *n n'* again press against and move the lever *h* and valve by coming into contact with the lever at the ends of the slots, and the motion of the valve is completed to the position shown by heavy dotted lines, the port *e* being opened for the steam and the port *d* to the exhaust. If the slots are slightly inclined, as shown, the valve will be moving quite slowly after the steam has been cut off; but if the slots are shaped so as to be parallel with the line of motion after the rollers pass the projections 1 4 or 2 3 the valve will remain stationary during the movements of the rollers or studs in the slots. As the lever swings in the arc of a circle and the eccentric-rod moves in a straight line, the studs or rollers *n n'* will at the end of the stroke to the left be in the half-circle recesses adjacent to the projections 2 and 3, so that when the eccentric-rod commences to move to the right the rollers *n n'*, acting against 2 and 3, will move the lever and valve-rod and valve to the right, covering up the port *e* to allow the steam

to work expansively, but allowing the exhaust to remain open, and then moving the valve the remainder of the stroke to admit steam into *d*, as before. It is to be understood that
5 the eccentric is to be placed so as to give the necessary lead to admit steam as the engine turns the center in any of the usual ways.

The operation of the parts shown in Figs. 2 and 4 is the same as before described, except that, the studs or rollers being upon the lever and passing through the S-shaped slots in the eccentric-rod *a*, the projections are transposed in position, the parts 1 and 3 on the slot-
10 ted bar *a*, Fig. 2, being above the studs *n n'*, instead of below, as in Fig. 1, and the parts 2 and 4 below, in Fig. 2, instead of being above, as in Fig. 1. The operations of the parts will be easily followed, because as the slots in the
15 bar *a* move to the left over the studs *n n'* the latter swing and separate from 1 and 4, and in moving to the extreme left the studs *n n'* will swing into the curved ends of the slots and be acted upon by the parts 2 and 3 as the eccentric-rod commences to move the other way.
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The slots in Fig. 2 are shaped so as to cut 25 off the steam at a different point in the stroke of the piston from that represented in Fig. 1.

I claim as my invention—

The combination, with the valve and valve-rod, of a rod receiving its motion from an eccentric, and a rocking lever upon a fixed pivot
30 intervening between the eccentric and valve-rods, and studs passing into S-shaped slots to connect the eccentric-rod to the pendulous lever, and give to the pendulous lever and to the
35 valve the movements specified for supplying and then cutting off the steam and allowing the engine to work expansively, substantially as set forth.

Signed by me this 2d day of June, A. D. 1882.

M. N. CUMMISKEY.

Witnesses:

WILLIAM G. MOTT,
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