

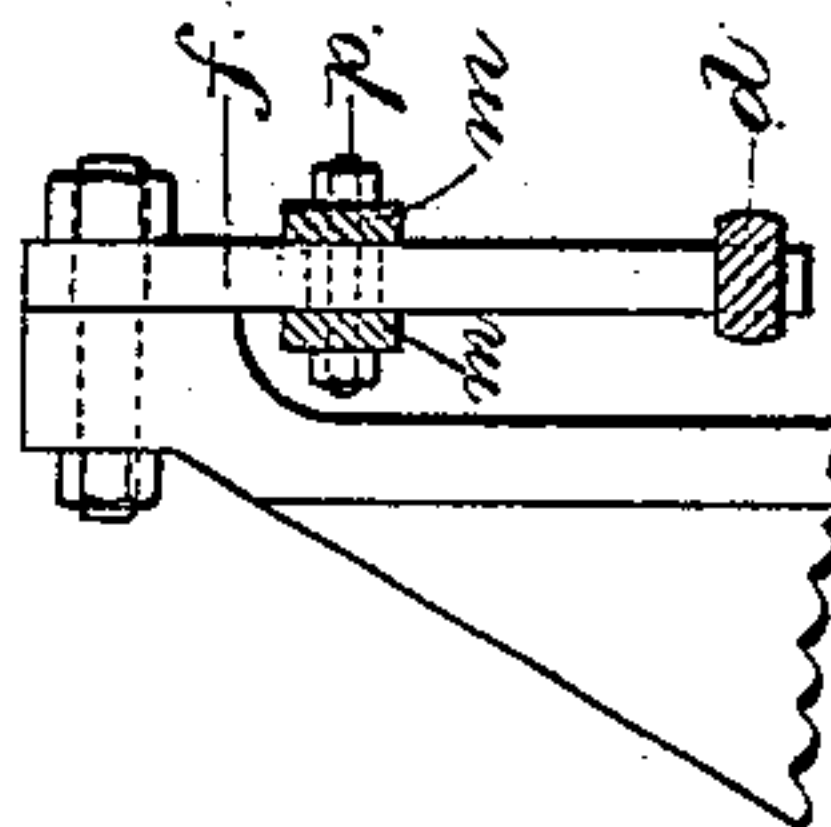
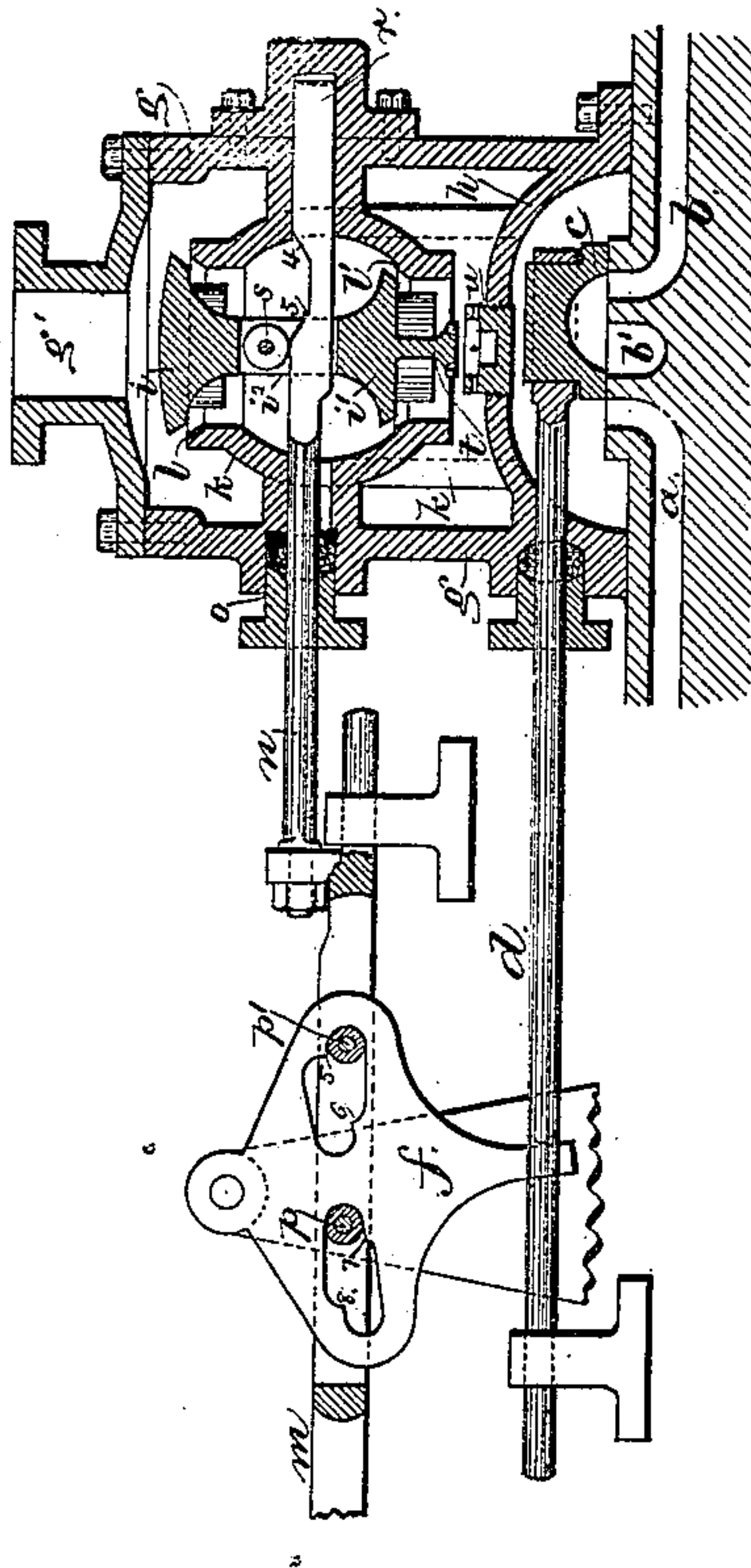
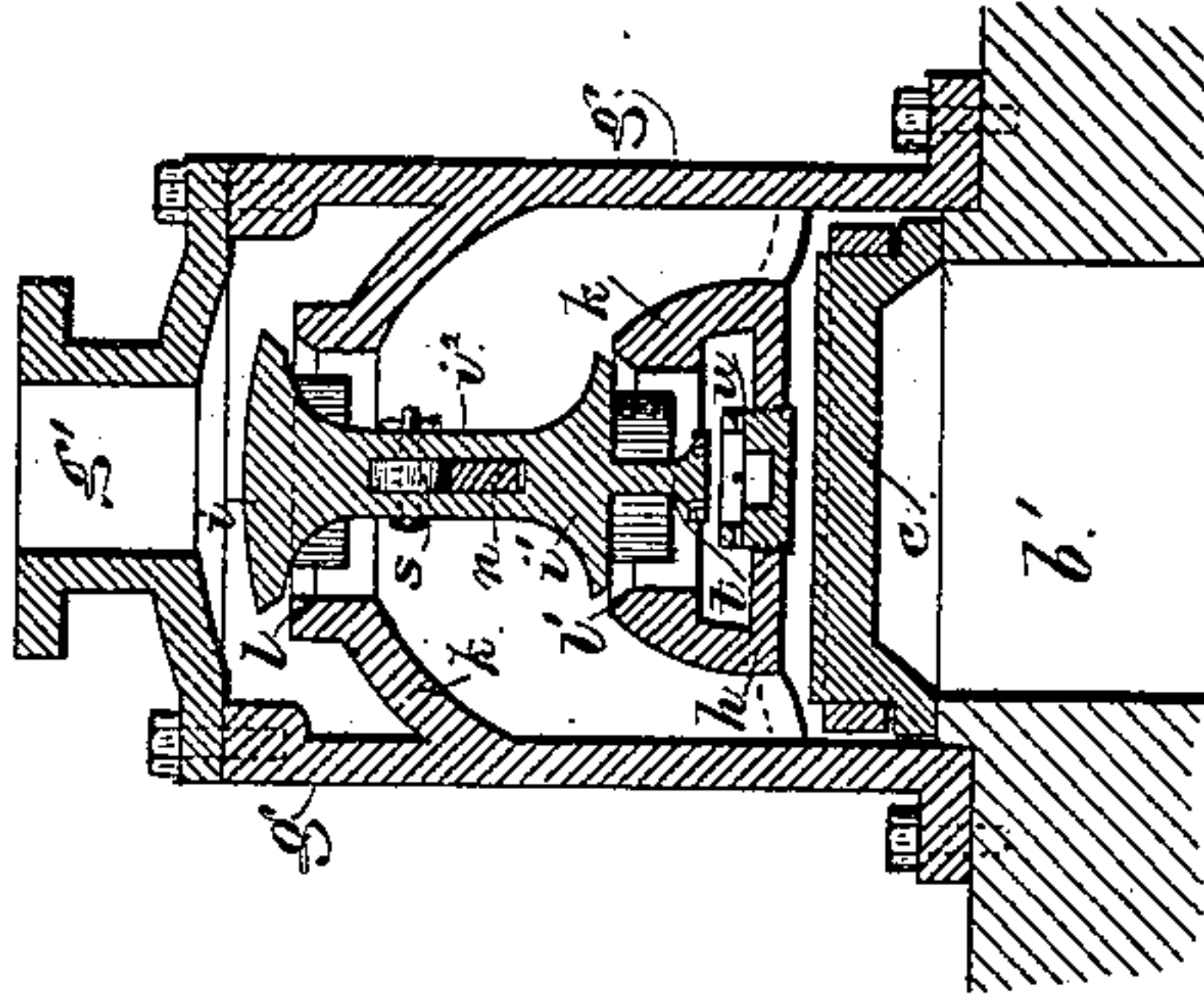
(No Model.)

M. N. CUMMISKEY.

CUT-OFF VALVE.

No. 270,396.

Patented Jan. 9, 1883.



Witnesses  
Harold Terrell  
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Inventor  
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# UNITED STATES PATENT OFFICE.

MICHAEL N. CUMMISKEY, OF PATERSON, NEW JERSEY.

## CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 270,396, dated January 9, 1883.

Application filed June 12, 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 Cut-off Valves for Steam-Engines, of which the following is a specification.

My present invention is an improvement upon or modification of that for which I made application for a patent February 13, 1882.

10 In my present invention the balanced valves are operated by inclines upon the rod that is moved by the eccentric. These valves admit steam to the ordinary steam-valve, and there is a rocking lever between the eccentric-rod 15 and the valve-rod, the same having slots with shoulders of peculiar construction, that give motion to the valve at the time the eccentric-rod is approaching the terminals of its reciprocation.

20 In the drawings, Figure 1 is a longitudinal section of the steam-chest and valves. Fig. 2 is a transverse section, and Fig. 3 represents the rocker-lever with the eccentric-rod in section.

25 The steam-ports *a b* lead to the cylinder of the engine. The port *b'* is the exhaust. The valve *c* is adapted to these ports, and it is operated by the valve-rod *d* and rocker-lever *f*, hereinafter described.

30 Above the valve *c* there is a compound steam-chest, the exterior casing, *g*, having a pipe, *g'*, through which steam passes into such case, and there is an arch, *h*, over the valve *c*, and a chamber above it, formed by a curved pipe, *k*, opening at the ends through the arch *h*, and 35 there are valve-seats *l l'* in the pipe *k* for the balanced valves *i i'*. These valves are nearly the same size, the upper valve-seat and valve being sufficiently large for the lower valve to pass through the upper valve-seat as it is 40 placed in position.

When the valves *i i'* are raised off their seats the steam passes down through the valve-seat *l* and up through the valve-seat *l'*, and by the 45 curved passage through the pipe *k* to the chamber below the arch *h*, in which is the valve *c*.

The rod *m* receives its motion from an eccentric in any usual manner, and to it is connected the valve-lifter *n* in the form of a rod, passing 50 through a gland at *o* and flattened where it goes through a mortise in the spindle *i<sup>2</sup>*, that connects the valves *i i'*. There are guideways at *r*,

in which the valve-lifter *n* slides and by which it is supported, and there is a roller, *s*, in the spindle *i<sup>2</sup>* to lessen friction. The valve-lifter 55 has a cam-face in its upper edge, the same being composed of two inclines, 4 and 5, that operate near the ends of the movement of the eccentric-rod.

The balanced valves are lifted by the incline 4 when the eccentric-rod is nearing the extreme movement to the left, and upon the eccentric-rod moving to the right the balanced valves are allowed to close and cut off the steam, the valve *c* is moved at the proper time 65 to reverse the connections of the exhaust and steam-ports during the time that there is but little pressure on the valve, and then the balanced valves *i i'* are raised again as the eccentric-rod approaches the termination of its 70 stroke to the right, the incline 5 acting upon the roller *s* and valve-stem to lift the valves *i i'*, and these are again lowered and closed shortly after the eccentric-rod has commenced its movement again to the left. 75

In order to prevent any concussion of the valves *i i'* upon their seats as they drop, I provide a stem, with a plunger, *t*, and a short cylinder at *u*, into which the plunger *t* passes. The steam and any water of condensation confined in this cylinder *u* form a cushion to check 80 the descent of the valves, and it is necessary to make holes through the plunger or its cylinder, or to make the plunger fit sufficiently loosely into the cylinder to prevent the confined 85 cushion holding the valve up.

I will now describe the peculiar device for connecting the eccentric-rod to the valve-rod *d*. The lever *f* may be in two parts, with the eccentric-rod *m* passing through it; but I prefer 90 and have shown the eccentric-rod in two parts, with the tumbler-lever between them.

In this tubular lever there are two slots having shoulders 5 6 7 8, and there are studs or pins passing through the eccentric-rod, as at 95 *p p'*, and these are preferably surrounded by rollers. As the eccentric-rod moves from right to left the studs *p p'* do not act upon the tumbler-lever until they come against the shoulders 6 and 8, and by contact with them the 100 lever *f*, the valve-rod *d*, and the valve *c* are moved so as to open the port *b* to the steam and the port *a* to the exhaust. The studs *p p'* now move along the remainder of the length



of the slots without acting on the valve *c*, and during this time the valves *i i'* are raised, as aforesaid. On the return movement of the eccentric-rod to the right the studs move  
5 along in their slots until they reach the shoulders 5 and 7, when they again give motion to the lever *f* and valve *c* and return it to the position shown by full lines. This lever, having slots with shoulders and the studs acting there-  
10 on, may be employed in other instances where a gradual reciprocating motion is employed to give a sudden movement, and then to allow a pause until an opposite movement is given on the return-stroke.

15 In an application bearing like date herewith I have shown a valve with valve-rod, eccentric-rod, and rocking-lever, having S-shaped slots adapted to moving the valve to admit steam, and then to cut off the steam so  
20 that the engine operates expansively. This does not form any part of this particular application, as in the present case I construct the parts in such a manner as to move the valve and allow it to remain fully open while  
25 the eccentric-rod continues to move to the end of its stroke and partially returns.

I claim as my invention—

30 1. The combination, with the valves *i i'* and their respective seats, of the valve-lifter *n*, having the inclines 4 and 5 and sliding endwise across the stem of the said valves *i i'*, substantially as set forth.

2. The combination, with the valve *c* and

means for actuating the same, of the valves *i i'*, their seats, the steam-passages, and the valve-  
35 lifter *n*, actuated by the eccentric-rod, and having the inclines 4 and 5 and the roller *s* upon the valve-stem, substantially as set forth.

3. The combination, with the valve and valve-rod, of the eccentric-rod, the tumbler-le-  
40 ver between the valve-rod and the eccentric-rod, and provided with the slots and shoulders, and the studs upon the eccentric-rod, substantially as set forth, whereby the valve is  
45 opened and allowed to remain open while the eccentric-rod completes its stroke and partially returns, as specified.

4. The combination, with the valves *i i'*, the valve-chest, steam-passages, and the valve *c*, of  
50 the valve-lifter *n*, eccentric-rod, slotted rocker-lever, valve-rod, and studs passing through the slots, substantially as set forth.

5. In combination with a pendulous lever and a rod actuated by the same, an eccentric-rod,  
55 and studs passing into slots with shoulders, substantially as specified, whereby the pendulous lever is moved by the eccentric-rod in the middle portions of its strokes, substantially as specified.

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

M. N. CUMMISKEY.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.