

(No Model.)

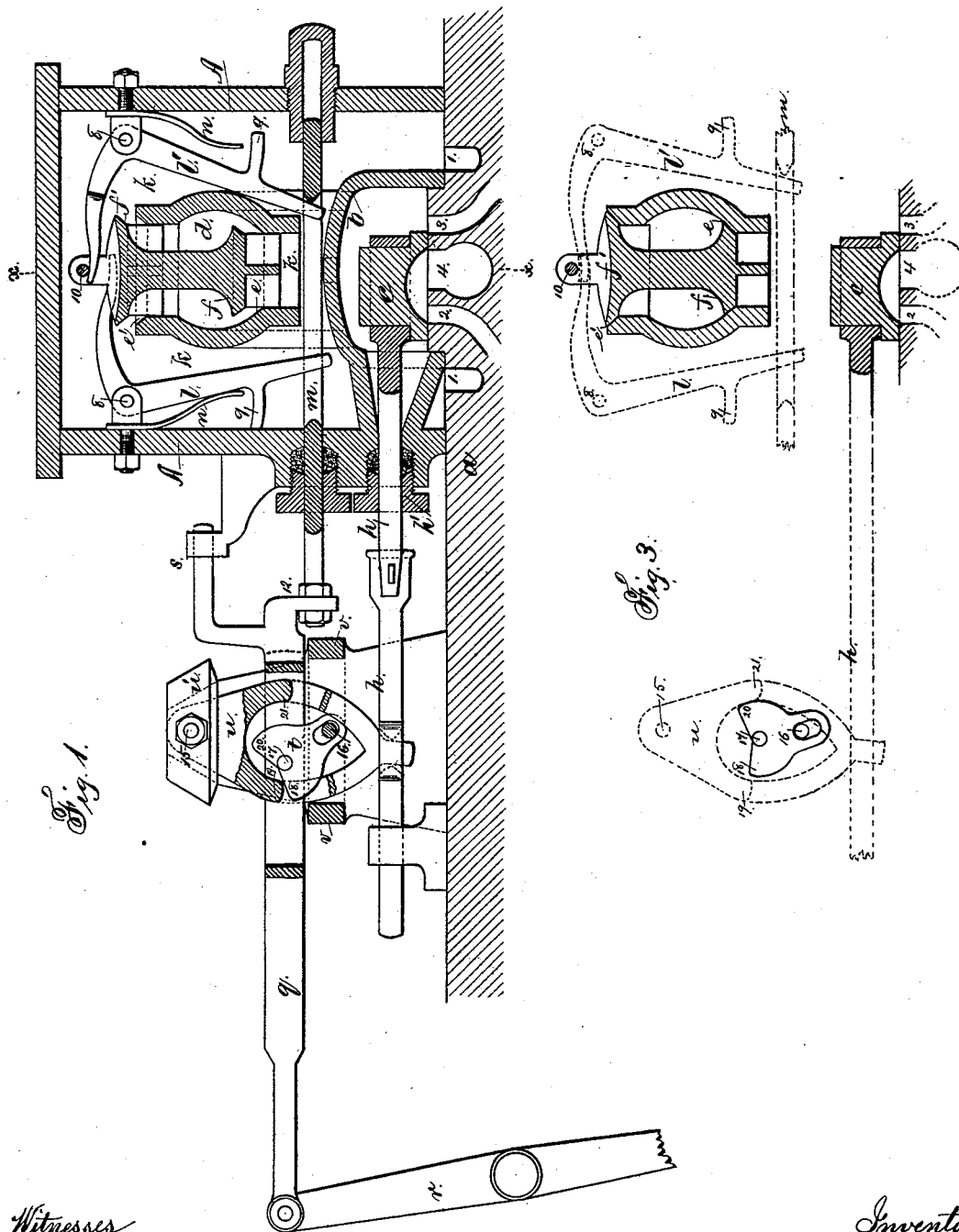
2 Sheets—Sheet 1.

M. N. CUMMISKEY.

CUT OFF VALVE.

No. 262,649.

Patented Aug. 15, 1882.



Witnesses
Harold Terrell
Chas. H. Smith

Inventor
per Michael N. Cumiskey
Lemuel W. Terrell
att

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Fig. 2.

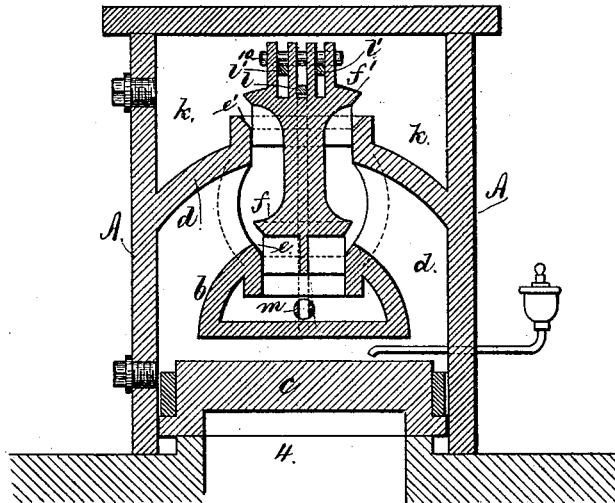
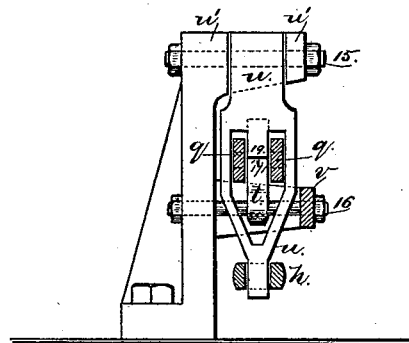


Fig. 4.



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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. 262,649, dated August 15, 1882.

Application filed February 13, 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.

I make use of a slide-valve that moves in a chest from which the steam is excluded during the principal portion of the movement, so that it moves with but little friction or wear, and I combine therewith a balanced inlet and cut-off valve and mechanism for operating the same, whereby the steam is allowed to pass to the slide-valve just as the port to the cylinder is opened, and then the supply of steam is cut off before the steam-port is closed.

This improvement is especially adapted to locomotive-engines; but it may be used with any kind of steam-engine.

In the drawings, Figure 1 is a longitudinal section of the valve, valve-chest, and elevation of the actuating mechanism. Fig. 2 is a cross-section at $x x$, and Fig. 3 is a diagram illustrating the movements, and Fig. 4 is a side elevation of the pendulous lever and rocker.

1 1 represent steam-ports in the metal a of the steam-cylinder; 2 and 3, the ports leading to the ends of the cylinder, and 4 the exhaust-port. It is to be understood that the ports 1 1 are connected to the boiler in the usual manner, and that live steam passes through them constantly into the steam-chest.

A is a steam-chest upon the steam-cylinder, and within the same is an inner compound valve-chest made with a hood, b , over the slide valve c , from the ends of which extends up the closed passage d to the openings and seats $e e'$ for the balanced valves $f f'$. The steam passes freely through the ports 1 1, and constantly fills the portions k of the steam-chest; but the steam cannot pass into the passages d or hood b until the balanced valves $f f'$ are raised. Hence there will be little or no pressure upon the slide-valve, except when steam is admitted, as hereinafter provided.

There is a valve-rod, h , to the slide-valve c . The same passes through the stuffing-box or gland h' , and there are bent levers $l l'$ for raising the balanced valves $f f'$, said levers $l l'$ moving upon fulcrum-joints 8 and having stops 9 upon their rear portions to limit their move-

ments by striking against the inner surface of the steam-chest, and there are buffer-springs n to prevent too great concussion. The stem of the valves $f f'$ is slotted to receive the end of the lever l and the forked ends of the lever l' , and these pass below the pin 10.

I have referred to the valves $f f'$ as balanced. They are as nearly balanced as consistent with a proper closing action—that is to say, the valve f is slightly smaller than the valve f' , so that said valve f may pass through the seat e' of the valve f' , and so that the pressure upon the top of f' , being slightly more than on the bottom of f , may insure the proper resting of the valves on their seats when not raised by the lever l or l' , and said valves drop by gravity as soon as the rod m , which operates said levers, releases its action on either lever.

The rod q receives motion either directly from the eccentric or from the rocker-arm r , and this rod q is fitted to slide at the end near the steam-chest in a support, s , and the rod m is connected to it by the nuts at 12. There is a slot in the rod m , into which the lower ends of the bent levers $l l'$ pass, and the length of said slot is such that the levers $l l'$ will only be moved and the valves opened during a certain interval at the ends of the movements of the rods q and m .

I provide a rocker, t , and pendulous lever u for giving motion to the valve-rod h . The pendulous lever u is upon a pivot-bolt, 15, projecting from the frame u' , and its lower end passes into a mortise in the valve-rod h . There is a pear-shaped opening in the pendulous lever, through which passes the pivot-bolt 16 of the rocker, and a bridge-piece, v , supports the outer end of this bolt. The rocker t is slotted for the pivot-bolt 16 to pass through, and there is a stud or trunnion, 17, on the rocker-rod q , passing through the rocker and serving to give to said rocker a movement upon the pivot-bolt 16. This rocker somewhat resembles a triangle, and the cam part 18 acts against the part 19 of the pendulous lever to move it and the valve-rod h and valve c in one direction, and the cam part 20 of t acts against the part 21 of the pendulous lever u to move it and the valve in the other direction. The cams of the rocker and the parts of the pendulous lever

are so shaped that the rocker *t* moves the pendulous lever and valve either one way or the other before the rod *m* commences to act upon the levers *l* or *l'*. Hence the valve *c* is moved, 5 before steam is admitted to it; and hence there will be but little friction or wear of the valve on its seat.

By reference to Fig. 1 it will be seen that the cam 18 of the rocker swings clear of the 10 part 19 of the pendulous lever at the time, or nearly so, that the rod *m* acts on the lever *l* and lifts the valves *f f'* to supply steam, and that the rocker swings to its extreme movement and back again until the cam 20 comes 15 into contact with 21 before the valve *c* commences to move. The exhaust will hence remain open on one side and the steam-port on the other side until after the valves *f f'* have been closed by the movement of the rod *m*. 20 After the valve *c* has been moved, then the further movement of the rod *m* will open the valves *f f'* and admit steam to the other side of the piston.

The pendulous lever may be made as an open 25 frame, as shown, or the parts 19 21, against which the cams of the rocker act, may be projections or studs on the face of the lever.

The back end of the slotted rod *m* should be guided by a box on the valve-chest, as shown.

30 It is to be understood that the parts may be so proportioned or adjusted that the slide-valve is moved slightly in advance of the opening of the valves *f f'*, so as to allow the ex-

haust to commence before live steam is admitted on the other side of the piston. 35

I claim as my invention—

1. The combination, with the slide-valve *c* and mechanism for moving the same, of the balanced valves *f f'* and mechanism for opening the same at or about the time the valve *c* 40 has reached its extreme movement, substantially as set forth.

2. The steam-chest *A*, valve-seat *a*, and steam and eduction ports, in combination with the valve *c*, the hood *b* over said valve, the pas- 45 sages *d*, valve-seats *e e'*, and valves *f f'*, substantially as set forth.

3. The combination, with the valves *f f'*, of the bent levers *l l'*, slotted rod *m*, valve *c*, and valve-chest and steam ways and ports, sub- 50 stantially as set forth.

4. The combination, with the valves *f f'* and valve-seats *e e'*, of the levers *l l'*, connected to the valve-stem, the springs *n*, stops 9, and slot- 55 ted valve-rod *m*, substantially as set forth.

5. The rocker *t* and pendulous lever *u*, in combination with the valve and rod *h*, the rocker-rod *q*, the pivot-bolt 16, and the rod *m* and valves actuated therefrom, substantially 60 as set forth.

Signed by me this 7th day of February, A. D. 1882.

MICHAEL N. CUMMISKEY.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.