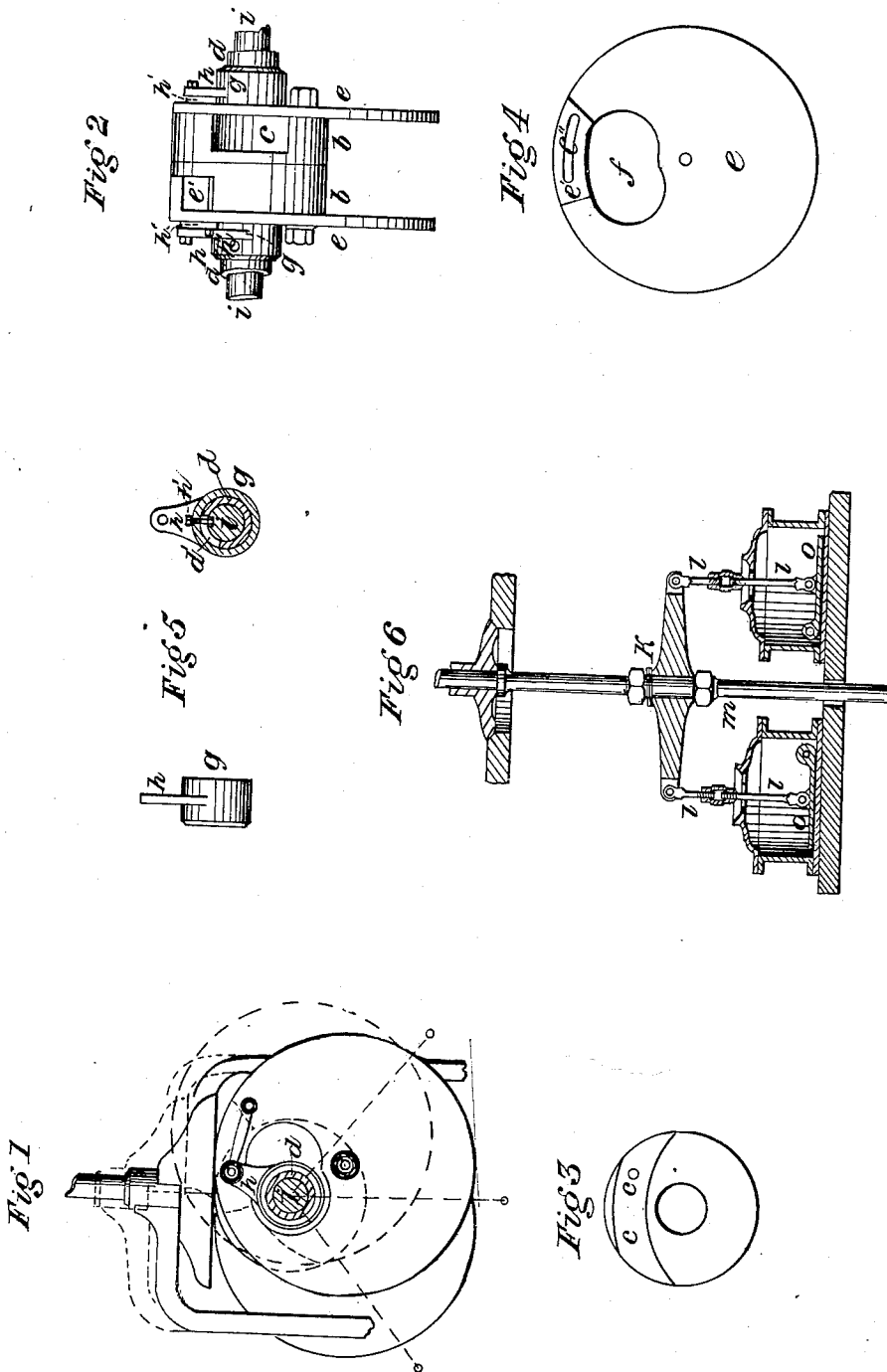


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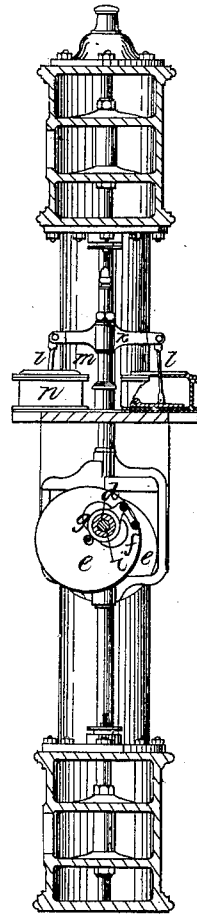
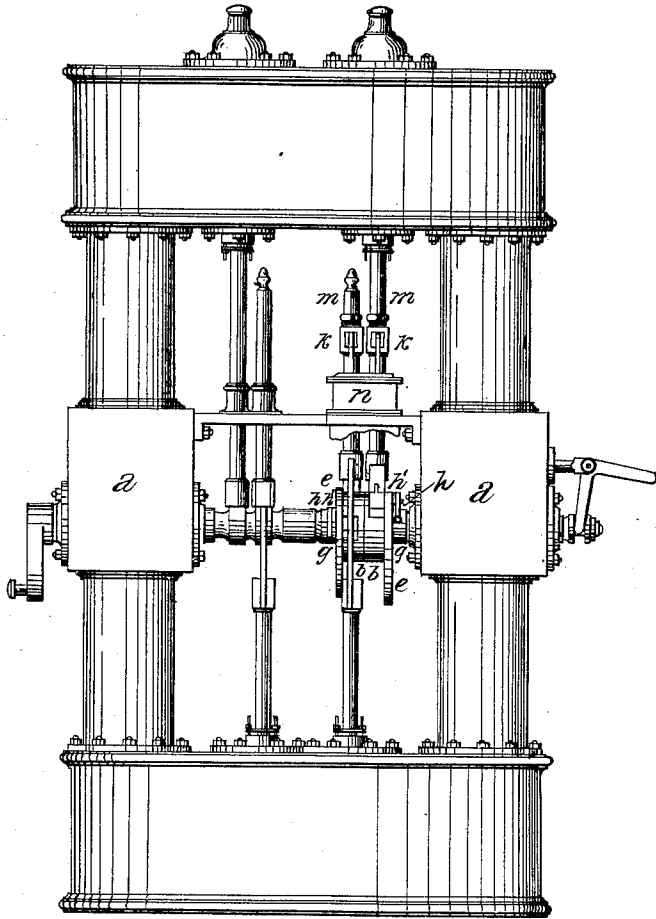


Inventor:  
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# UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, OF HARTFORD, CONNECTICUT.

## ADJUSTABLE CUT-OFF FOR STEAM-ENGINES.

Specification of Letters Patent No. 16,132, dated November 25, 1856.

*To all whom it may concern:*

Be it known that I, WM. WRIGHT, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Self-Adjusting Cut-Offs for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1, Plate I, is a front elevation; Fig. 2, is a side elevation of the side pipes showing the apparatus attached; Fig. 1, Plate II, is a section through the rock shaft, showing the position of cams, and toes of lifting rods; Fig. 2, front view of cams; Fig. 3, the cylindrical hub into which a projection upon the disks fits; Fig. 4, the disk which is attached to the cylindrical hub; Fig. 5, the carrier which connects the rod inside of the rock-shaft with the disk; Fig. 6, section of the apparatus for checking the descent of the drop valve.

My improvements are comprised in the apparatus for working the induction valves of a steam engine, so that they can be dropped at any point of the stroke, easily regulated and determined while the engine is in motion or at rest, and the further device of hinged flaps or valves, attached to the valve stems or lifting rods, to relieve the valve from striking its seat with a shock when falling to cut off.

The construction and arrangement of the parts are as follows; (*a, a,*) are the side pipes connecting with the valve chambers in the ordinary way; the valve chambers are also of the usual form and arrangement. The toes connected with the induction, or cut-off valves rest upon short cylindrical hubs, concentric with and secured to the rock shaft; these hubs, lettered (*b,*) in the drawings, have a curved channel cut into them on one side of the shaft so that an opening is made in their periphery, the curve of the channel is the arc of a circle eccentric to the rock-shaft; this channel is lettered (*c,*) and is clearly shown in Figs. 2 and 3. Plate II: The two cylinders or hubs are firmly fixed to the rock shaft (*d,*) and move with it; two plates or disks (*e,*) are so attached to the hubs (*b,*) that they can turn upon the centers with which the channels (*c,*) are described; on the inner faces of the disks (*e,*) there is a projection or boss (*e'*) and an enlarged opening (*f,*)

is made in the disks which allows them to vibrate over the rock shaft; when the disks are attached to the hubs (*b,*) the bosses (*e'*) by projecting from the periphery of the hubs form the cams and it will be seen that the farther the bosses project when the rock shaft turns, the higher and longer will the cams so formed lift the toes resting upon them; the amount of projection of the bosses (*e,*) is regulated by the following arrangement; upon the rock-shaft (*d,*) are two carriers (*g,*) with projecting arms (*h,*) which are connected to the disks (*e,*) by the links (*h'*), and are also connected by the pins (*h''*) to a rod (*i,*) inside of the rock shaft which is made hollow to receive it, so that by means of the rod (*i,*) and the carriers (*g,*) a communication is made between the two disks (*e,*) and when one of these disks is moved, motion is transferred to the other; in the rod (*i,*) are two spiral grooves (*i'*) (see Fig. 2,) inclined in opposite directions; into these grooves the pins (*h''*) in the carriers project, so that by moving the rod (*i,*) in the direction of its length, the disks (*e,*) connected with their respective carriers are caused to turn on their centers in opposite directions, thus changing the position of the bosses (*e'*) in relation to each other: a pin (*e'*) (see Fig. 3,) is fixed at the bottom of the channel (*c,*) in the hubs (*b,*), which pin enters a groove (*e''*) (see Fig. 4) in the boss on the disks (*e,*) and serves to limit the motion of the disks on their centers, so that if the positions of the disks be such that the ends of the bosses (*e,*) do not project from the periphery of the hubs (*b,*), no motion of the disks upon their centers can take place, the two pins (*e'*) being in contact with the ends of their respective grooves (*e''*); and any amount of projection of one of the bosses (*e,*) will when the disk is pushed back produce a corresponding projection of the other boss: the toe upon the valve stem is so placed that the back end of it is directly above the center of the hub (*b,*) so that when the rock shaft turns so as to bring the end of one projecting boss behind the back end of the toe, the toe will fall, and upon the return motion of the rock-shaft, the projecting boss (*e'*) coming in contact with the back of the toe, the disk (*e,*) will be pushed back thus causing a projection of the boss upon the other disk, by which means the corresponding toe will be lifted, the drawing out

and pushing in of the rod (*i*) may be accomplished by an attachment to the regulator which will render it self acting.

To relieve the blow upon the valve seat, occasioned by the falling valve, I employ the following device, shown in Fig. 6, Plate II: the valve stem or lifting rod (*m*), passes through a cross-head (*k*); a nut above and below the said cross-head determining its position thereon; between the upper nut and the cross-head there is a short spiral or other proper spring, simply to relieve the shock; to each end of the cross-head (*k*), rods (*l*) are jointed, that pass loosely through the cover of a square or other formed bore (*n*); on each of these rods (*l*), there is an adjusting screw, of ordinary form to determine exactly the length of the rods; each of the above named rods (*l*) is jointed to a hinged flap (*o*), which is a plain flat plate of metal jointed by one edge to the bottom of the box (*n*); beneath the flap (*o*), there is some incepting medium like india rubber or its equivalent; the effect

is to check the descent of the valve as it reaches its seat and prevent the blow thereupon.

I find this a simple cheap and efficient apparatus, not so liable to get out of order as other valve checks with which I am acquainted, and can be made with little cost compared with others.

Having thus fully described my improvements in the self-adjusting cut off, what I claim and desire to secure by Letters Patent, is—

1. The construction and arrangement of the adjustable cut off, consisting of the cylindrical hubs, disks, and their adjustments substantially as above specified.
2. I also claim the flap valve-checks, constructed and combined with the drop valve, as herein described.

WM. WRIGHT.

In presence of—

HENRY L. RIDER,

CHAS. B. RICHARDS.