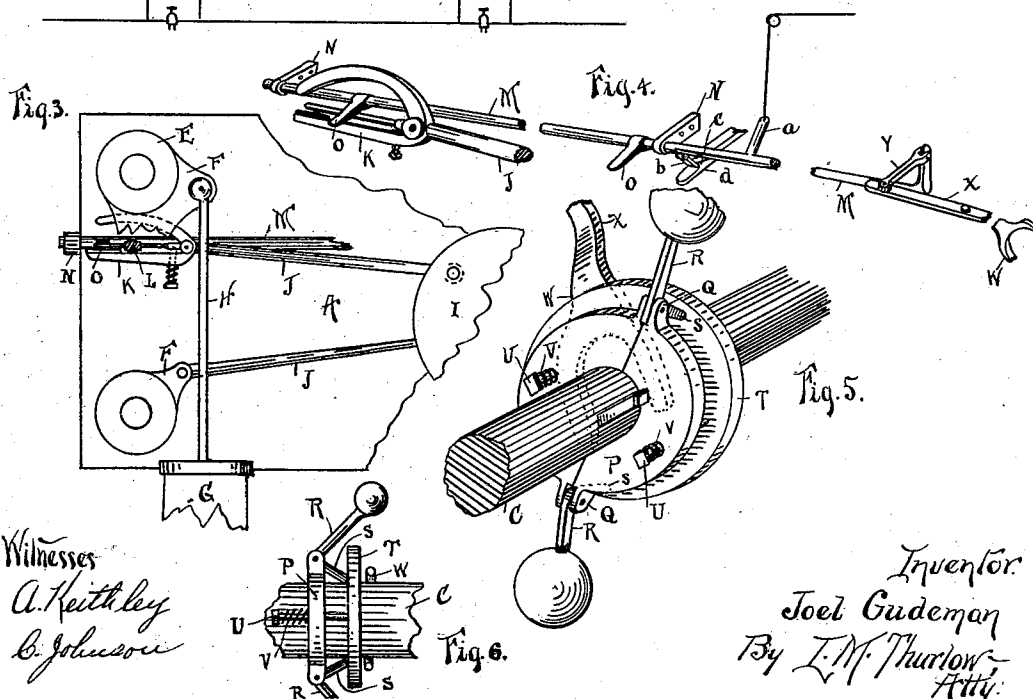
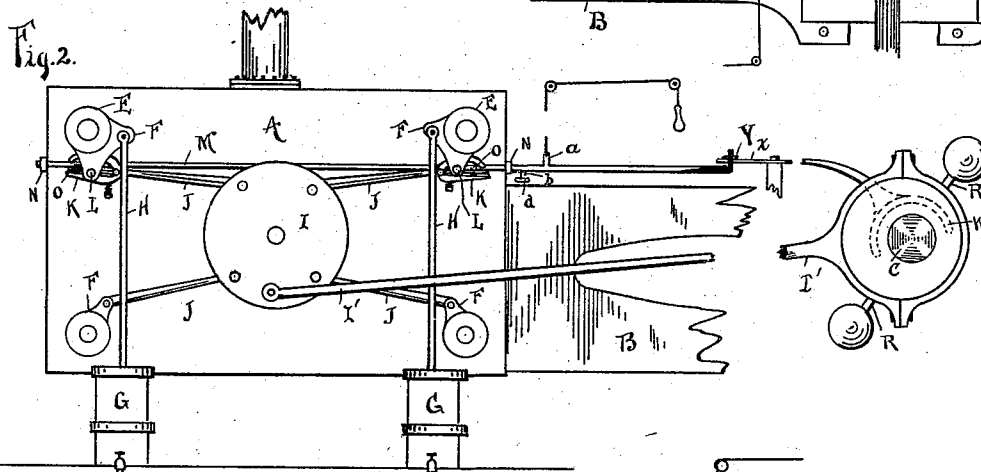
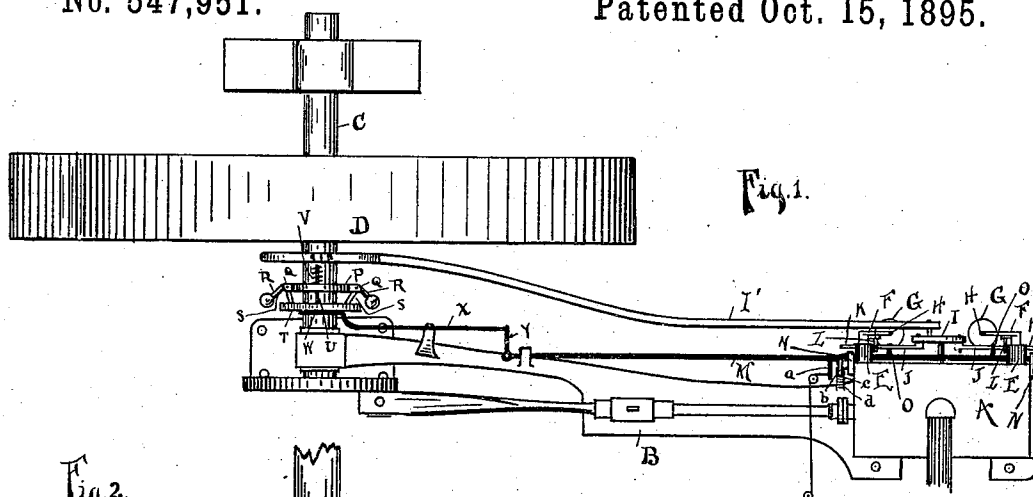


(No Model.)

J. GUDEMAN.
AUTOMATIC CUT-OFF FOR ENGINES.

No. 547,951.

Patented Oct. 15, 1895.



Witnesses
A. Keithley
B. Johnson

Inventor
Joel Gudeman
By L. M. Thurlow
Atty.

UNITED STATES PATENT OFFICE.

JOEL GUDEMAN, OF EUREKA, ILLINOIS.

AUTOMATIC CUT-OFF FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 547,951, dated October 15, 1895.

Application filed June 1, 1894. Serial No. 513,220. (No model.)

To all whom it may concern:

Be it known that I, JOEL GUDEMAN, a citizen of the United States, residing at Eureka, in the county of Woodford and State of Illinois, have invented certain new and useful Improvements in Automatic Cut-Offs for Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in automatic cut-offs for stationary engines.

The object of the invention is to provide an exceedingly simple, cheap, and effective device for stationary engines, and more particularly for use on Corliss engines, which will cut off the steam-supply to the cylinder in case the governor of the engine fails to work. It sometimes happens that the governor-belt becomes loose or the governor itself sticks and fails to act promptly with the changes of load. When the governor fails to work, the full head of steam enters the cylinder, causing the engine to "run away." This is liable to happen to any engine, of whatever make, and in order that the engine may be kept under perfect control the means hereinafter described are provided.

In the drawings presented herewith, Figure 1 represents a plan view of the engine, showing my device applied thereto. Fig. 2 is a side elevation of the cylinder and a portion of the operating-gear of an engine, showing application of the invention thereto. Fig. 3 is a detail view of one of the arms of the valve-operating parts, showing its connection with a dash-pot rod and showing the "crab-claw" or grip and its rod connected to a central reciprocating plate for operating the valves. Fig. 4 is a perspective view of a cut-off rod, showing its connection at one end with the crab-claw or grip. Fig. 5 is a perspective view of a governor secured to the main shaft of the engine for operating the cut-off rod. Fig. 6 is a plan view of Fig. 5, showing the governor mechanism.

In Figs. 1 and 3 A represents the cylinder of a Corliss engine. B represents the engine-framework, and C represents the main shaft carrying the usual drive-wheel D.

The valves are represented in Fig. 1 by E E,

while F F represent the arms connected therewith for the operation thereof. The usual dash-pots G are shown at the side of the cylinder and below it, from which rise the rods H, pivotally connected with the said arms F. A reciprocating plate I is pivoted to the cylinder, to which are pivoted four rods J, as shown, which extend to the several valve-arms F. The two upper arms F F are provided with a grip or claw K, which engages the pin L at the valve-arm F. The plate I is given its reciprocating movement by the eccentric-rod I'. 55 60 65

I have described thus far the construction usually adopted in Corliss engines. There are, however, some slightly-different constructions, with which the device hereinafter described will operate equally well. 70

The operation of this portion of the engine may be understood from the following: The steam entering at the top of the cylinder is allowed to enter the cylinder proper through one of the upper valves E, which causes the engine to start and by its movement the eccentric and its rod I' moves the central plate I, which closes the valve through which steam has been taken and opens the opposite valve to take steam at the other end of the cylinder, and simultaneous with the opening and closing of these valves the lower valves E are opened and closed for exhaust. The claws K of the rods J raise the arms F alternately by engaging with the pins L thereof, and this raises the piston in the dash-pot and creates a vacuum therein, and at the proper moment the claw or catch K is automatically released and the dash-pot assumes its normal position instantly, closing the valves with which it is connected. Now, should the engine start to run away from any cause whatever the claws K, if held down, cannot engage the pins L of the arms F, and consequently the steam is not admitted to the cylinder, for the reason that the dash-pots hold the valve shut, and if the claw is held down the engine will cease to move. With this idea in view the following-described construction will be readily understood: A horizontal rod M is secured at bearings N at the side of the cylinder and carries two fingers O, whose extreme ends occupy a position just above the claws K. This rod M extends forward near to the shaft C of the 75 80 85 90 95 100

engine and is controlled by a governor secured to the said shaft C. This governor consists of ring P affixed to the shaft and provided with the ears Q, between which are pivotally held an arm R, carrying a weight at its outer end and having its pivoted end extended substantially at right angles to its length to form the short arm S. A ring T is placed upon the shaft near the ring P and is held by bolts U passing through the ring P and threaded into the said ring T and carrying a coiled spring V between the heads of the bolts and the said ring P. The short arm S bears continually against the plate T, the springs exerting a pull which keeps the said arms and plate in constant contact. A fork W of a lever X straddles the shaft and occupies a position near the plate T. This lever X is pivoted to a portion of the frame of the engine, and its free end is pivoted to a rod Y, which is in turn pivoted to the upturned end of the shaft M. An arm *a* is secured to the rod or shaft M, to which a cord may be attached and running over pulleys to any part of the building in which the engine is placed. A latch *b* is pivoted to the said shaft and is adapted to engage a lug *c* on a plate *d*, secured to the framework of the engine.

The operation of the device is as follows: When the engine runs above its usual speed, the governor-arms R are thrown outward by reason of the weights and the short arms S bear against the plate T and the said plate carries the fork and lever W outward, thus throwing the forward end of the said lever in the opposite direction by reason of the pivot and thus turning the shaft M in a direction to lower the fingers O upon the claws K, and the latch *b* engages the lug *c*, and the steam being shut off the engine stops and cannot be started until the throttle is closed and the fingers lifted. When the claws or catches are held down, they pass backward and forward under the fingers and without moving the valves. The purpose of the arm *a* and the cord attached thereto is to stop the engine from any part of the building.

I claim—

1. In an automatic cut-off for stationary engines having external valve gears, a governor mounted on the engine shaft, a rock-shaft journaled on the engine frame, a pair of fingers mounted on the said rock-shaft at right angles thereto to engage the valve operating mechanism substantially as and for the purposes set forth, the said governor being adapted to impart a partially revoluble movement to the said rock shaft when the speed of the engine passes above the normal.

2. In a detachable valve gear for engines, a device for releasing the same which consists in a rock-shaft M journaled on the engine and provided with the fingers O for preventing the valves being opened, said rock-shaft M having its forward free end turned upward at substantially right angles to its length, an arm or rod Y pivoted to said shaft M, a lever W pivoted to the engine frame and pivoted at one end to the said rod Y, a ring P affixed to the shaft C and carrying the weighted arms R by means of pivots, the pivoted ends of said arms being formed at right angles to the length thereof, a ring T loosely mounted on the shaft A, bolts U passing through the ring P and secured to the said ring T and the coil springs V surrounding the bolts for the purposes set forth and described.

3. In a detachable valve gear for engines, a device for releasing the same, the combination of a rock shaft M journaled on the engine and provided with the fingers O for preventing the valves being opened, said rock-shaft M having its forward free end turned upward at substantially right angles to its length, a latch *b* pivotally hung from the said shaft M, an arm *a* rigidly secured to the shaft, a rod Y pivoted at one end to the upturned end of the said shaft M, a lever X pivoted to the engine frame and pivoted at one end to the free end of the said rod Y, the forward end of said lever X terminating in a fork W for straddling the shaft of the engine, a ring P affixed to the said engine shaft, and carrying, by means of pivots, the weighted arms R, said pivoted ends being formed at right angles to the length of said arms, a ring T loosely mounted on the shaft, bolts U passing freely through the ring P and secured in the said ring T, and the coil springs V surrounding the said bolts and occupying a position between the heads thereof and the ring P substantially as herein set forth and described.

4. In an automatic cut off for engines, a governor mounted on the main driving shaft of the engine, a rock-shaft suitably journaled on the engine at right angles to the said driving shaft, said rock-shaft adapted to be operated or controlled by said governor and being also adapted to disengage the valve mechanism by the action of said governor substantially in the manner and for the purposes set forth.

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

JOEL GUDEMAN.

Witnesses:

C. JOHNSON,
A. KEITHLEY.