

No. 649,407.

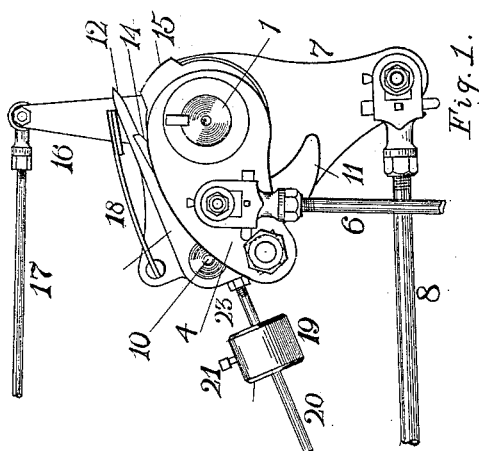
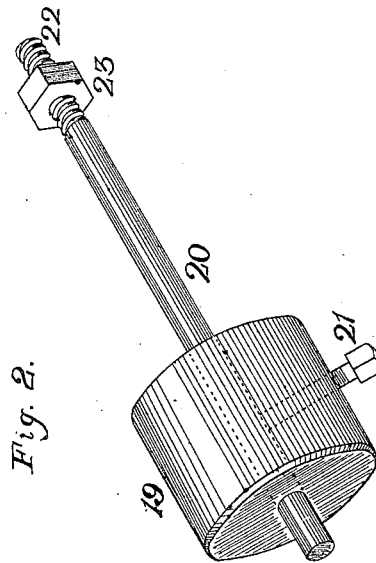
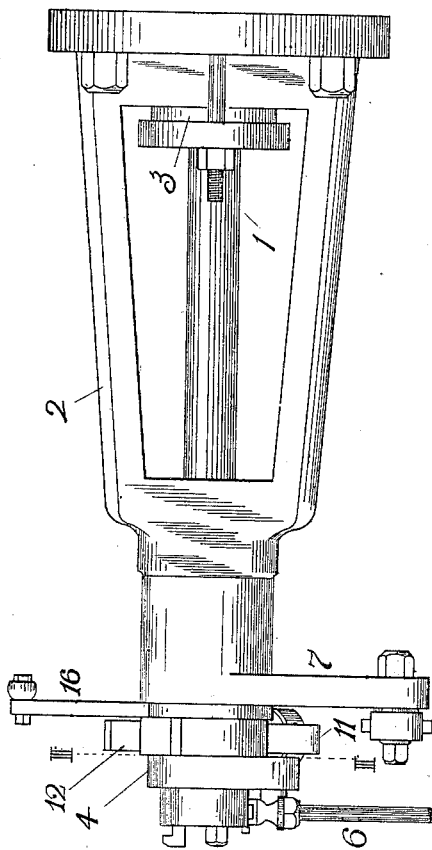
Patented May 8, 1900.

L. H. HART.

SAFETY STOP FOR STEAM ENGINES.

(Application filed Dec. 11, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

LOUIS H. HART, OF KANSAS CITY, KANSAS, ASSIGNOR OF ONE-HALF TO
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SAFETY-STOP FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 649,407, dated May 8, 1900.

Application filed December 11, 1899. Serial No. 739,866. (No model.)

To all whom it may concern:

Be it known that I, LOUIS H. HART, a citizen of the United States, residing in Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Safety-Stops for Steam-Engines, of which the following is a specification.

My invention relates to an improvement in automatic cut-off-valve mechanism for steam-engines, particularly in connection with the valve-gear generally known as the "Corliss" type, and has for its object to provide means for automatically checking the speed of the engine in case of the failure of the ordinary governor mechanism to act or to act effectively from any cause, such as the sudden release of the load, breaking or slipping off of the governor-belt, &c.

In the accompanying drawings, Figure 1 is a front elevation of an automatic cut-off-valve mechanism of the type referred to with my improvement applied thereto. Fig. 2 is an end view taken from the right-hand side of the parts shown in Fig. 1, also showing the bracket by which the valve-stem and its actuating mechanism, including my improvement, are supported on the cylinder. Fig. 3 is a view similar to Fig. 1, but with the valve-crank and dash-pot rod removed and partly in vertical section on the line III III of Fig. 2. Fig. 4 is a view of my improved safety-latch weight detached.

The drawings illustrate the application of my device to one of the two admission-valves of a Corliss engine, the valve shown being the one at the head end of the cylinder, it being understood that similar mechanism is employed with the position of the parts reversed for controlling the admission-valve at the crank end of the cylinder.

1 designates the rotatable valve-stem; 2, the bracket in which the valve-stem and its actuating mechanism are supported on the cylinder, (not shown); 3, the stuffing-box through which said valve-stem passes into the steam-chest; 4, the crank by which the valve-stem is rotated, provided on its inner face with the usual latch-block 5; 6, the rod secured to crank 4 and leading to the dash-pot, (not shown,) and 7 the main crank, rotatably mounted on an ex-

tension of bracket 2 and actuated by the rod 8, leading to the oscillating wrist-plate, (not shown,) which crank 7 carries the latch-link 9, pivoted thereto at 10. Said latch-link 9 is provided, as usual, with the two arms 11 12, one of which, 11, extends downward and has the recess 13 to engage the block 5, and the other, 12, extending upward and contacting through a bearing-plate 14 with the edge of the cam 15. Said cam 15 is rotatably mounted on the extension of bracket 2 and has an extending arm 16, to which is pivoted a rod 17, leading to the governor. (Not shown.) A spring 18, mounted on crank 7, presses against the arm 12 of the latch-link 9, thus throwing the other arm, 11, toward the latch-block 5 on crank 4, so that normally the recess 13 in said arm 11 will engage the block.

The operation of the parts is well known, the oscillation of crank 7 in one direction (to the left in Figs. 1 and 3) carrying with it latch-link 9, which engages block 5, lifting valve-crank 4 and rotating the valve-stem, thus effecting the admission of steam to the cylinder, the cut-off being effected by the contact of cam 15 with arm 12 of the latch, tripping the same and releasing block 5, after which the valve is immediately closed by the action of the dash-pot.

The duration of the period of admission is controlled by the governor, an increase of speed moving cam 15 nearer to the latch and hastening the cut-off and a decrease of speed moving said cam farther away from the latch and delaying the cut-off.

The mechanism thus far described has been found sufficient for the ordinary operation of an engine provided therewith; but emergencies arise and are always liable to occur in which ordinary governor action cannot be depended on to effect the cut-off, such as a great or sudden diminution or total release of the load, the slipping off of the governor-belt or other accident, in which case the engine "runs away" and is liable to be seriously injured before the throttle can be closed. My device provides means for effecting the cut-off without any governor action in case of any undue increase of speed and shortening the admission period or keeping the valve wholly closed until speed is reduced to normal.

Fig. 4 shows my device detached. It consists of a weight 19, slidably mounted on a rod 20, with a set-screw 21 to secure the weight in any desired position on the rod, and said rod is provided at one end with a thread 22 and locking-nut 23. I secure this device to the heel of the latch-link by screwing the end of rod 20 into the same at a point near to and below pivot 10, as shown in Fig. 3. The natural tendency of the weight thus applied is to rotate arm 11 of the latch-link away from block 5; but this is prevented normally by the stress of spring 18 pushing the said arm in the opposite direction or toward the block; but should the speed of the engine be unduly increased from any cause the throws of crank 7 will set the latch-link 9 and weight 19 in oscillation on pivot 10, the weight moving upward and downward in a vertical plane and making its downward throws with increased momentum, overcoming the stress of spring 18, so that arm 11 will be moved away from block 5, and the recess 13 in the upward movement of the arm will not engage said block, so that the valve will not be opened until speed is reduced to normal. The action of weight 19 may be varied by its adjustment on rod 20, an increase in its distance from the latch increasing the momentum of its vibrations and its tendency to prevent the latch from engaging the block.

I have shown in the drawings my device attached to the latch-link at the proper point in a link having the form and adjustment shown; but inasmuch as there is considerable variation in the form and adjustment of such

links in valve-gears of different makes I would state that I do not limit my invention to the device mounted precisely as shown, but desire to cover any method of mounting the device on the link so as to operate in substantially the same way.

I claim as my invention and desire to secure by Letters Patent—

1. In an automatic cut-off-valve gear of the type described the combination of the main crank oscillated by a rod from the wrist-plate, a latch-link pivoted on said crank and having a recess a valve-crank fixed on the valve-stem, a latch-block carried by said valve-crank, a spring mounted on the main crank and bearing against the link and normally pressing said recess into engagement with the block and a latch-weight mounted on the link and adapted to oscillate in a vertical plane and prevent the engagement of the link and block when the speed of the engine is excessive, substantially as set forth.

2. In an automatic cut-off-valve gear of the type described a safety-governor consisting of a rod, secured to the pivoted latch-link, and a weight adjustably mounted on said rod and adapted to oscillate in a vertical plane and prevent the engagement of the latch-link and latch-block when the speed of the engine is excessive, substantially as set forth.

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

LOUIS H. HART.

Witnesses:

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M. L. LANGE.