

(No Model.)

E. HARTUNG.

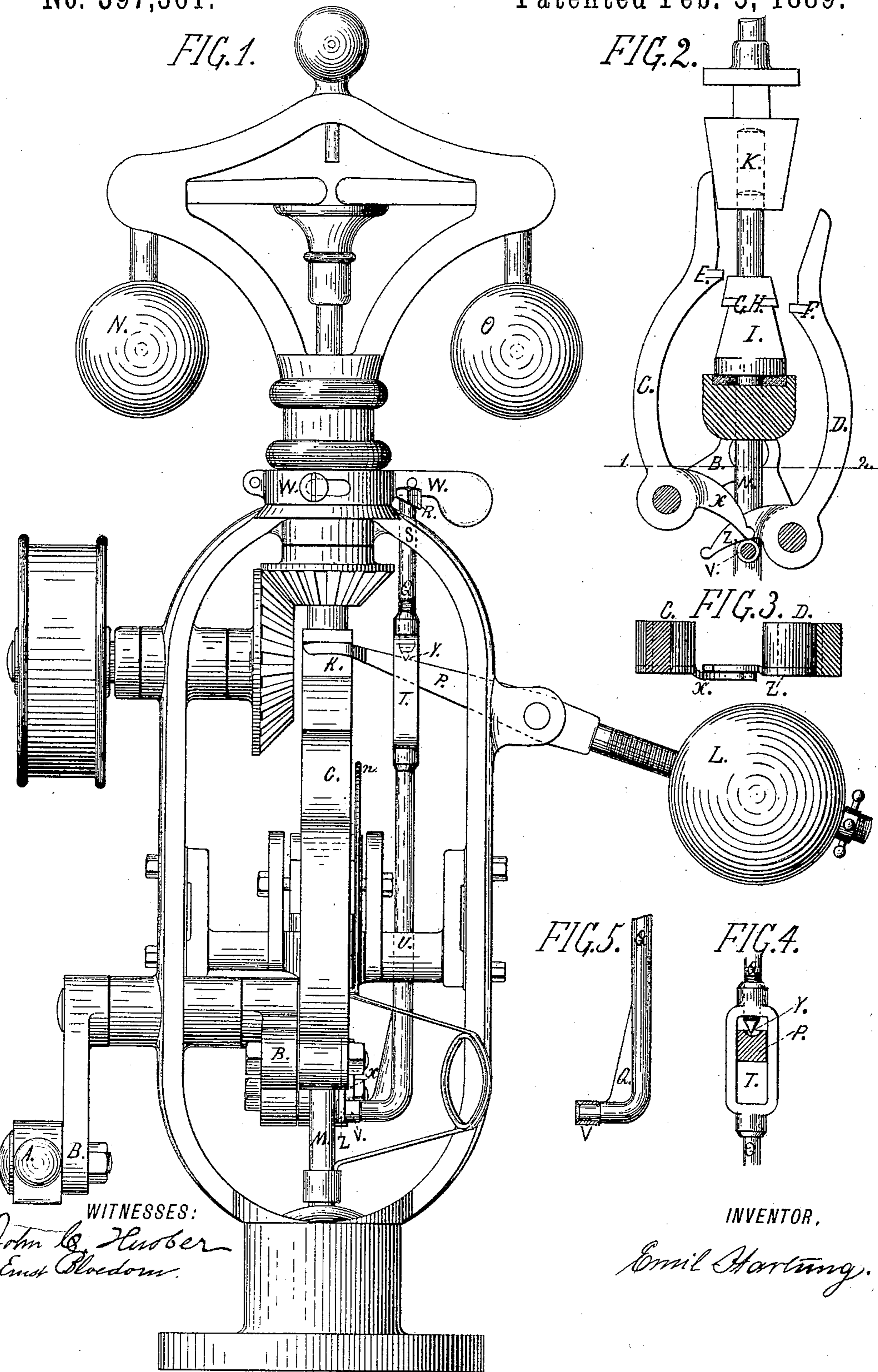
CUT-OFF AND GOVERNOR.

No. 397,361.

Patented Feb. 5, 1889.

FIG. 1.

FIG. 2.



WITNESSES:

*John G. Huber*  
*Emil Bloedorn.*

INVENTOR,

*Emil Hartung.*

# UNITED STATES PATENT OFFICE.

EMIL HARTUNG, OF DENVER, COLORADO.

## CUT-OFF AND GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 397,361, dated February 5, 1889.

Application filed June 26, 1888. Serial No. 278,233. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL HARTUNG, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented a new and useful Improvement in Combined Cut-Offs and Governors, more especially the Tremper combined cut-off and governor, of which the following is a specification.

10 The object of my improvement is to stop the engine or keep it under control and not let it speed up to a speed which frequently causes destruction and loss of lives and property when the belt driving the governor breaks or  
15 slips or the governor does not work from any other reason. This object I attain by the mechanism illustrated in the accompanying drawings, in which—

20 Figure 1 is a side view of the "Tremper combined cut-off and governor" with my improvement attached to it. Fig. 2 is a part of said governor, showing the lifters with thumbs, also the lifting-block and cone in correct position to stop the engine. Fig. 3 is a section  
25 of Fig. 2 on line 1 and 2. Figs. 4 and 5 are details of the thumb-rod.

Similar letters refer to similar parts throughout the several figures.

30 The operation of the Tremper combined cut-off and governor is as follows: The rock-rod A, being attached to the slide-valve rod, imparts a rocking movement to the bell-crank B, which moves the lifters C and D upward and downward alternately a given distance.  
35 The hardened-steel plates E and F, fitted into the lifters, project so far as to engage with the corresponding plates, G and H, in the lifting-block I. When the cone K is raised to its full height by the governor-ball L, the lifters  
40 will carry the lifting-block upward, opening the cut-off valve, which is fastened to the stem M, and as the steel plates (either E and G or H and F) under these circumstances remain in contact the cut-off valve remains open until  
45 it is closed by the lifter on its downward movement. It is then reopened by the lifter on the opposite side, which represents the return-stroke of the piston. In this condition the engine is taking steam full stroke. If a  
50 less amount of steam is sufficient to maintain the speed of the engine, the cone K is moved downward by the operation of the governor-

balls N and O, and the lifter, sliding outward as it moves upward, is disengaged from the lifting-block I, and the cut-off valve on the  
55 stem M is allowed to drop instantly into its seat, cutting off the passage of steam into the cylinder. In this condition the engine is working steam expansion.

60 The operation of my improvement is as follows: Before stopping the machine the ring W is swung over the head R on rod Q, in order to have the engine in readiness for starting. This position will enable lifters to operate cut-off valve, when engine is started, as  
65 before described. When the engine is at rest, the thumb-rod Q is kept down in its lowest position by the ring W being swung over head R, which then rests on governor-frame S. In this position the small roller V, which is fast-  
70 ened to the lower end of rod Q, as shown in Fig. 5, is kept far enough below the two thumbs X and Z (parts of lifters C and D, as shown in Fig. 2) to enable the lifters C and D to engage with the steel plates G and H on beater I.  
75 Under these circumstances when starting engine the lifters will raise the cut-off valve and allow the steam to pass into the cylinder of the engine and the engine will be running. When up to full speed, the ring W is swung  
80 off head R, and as the lever P has swung downward in the slot T of rod Q, as shown in Fig. 4, rod Q will be kept down by its own weight. Now if anything happens either to  
85 the governor or the belting, the governor-balls O and N coming to rest, raising cone K, lever P must swing upward, raising at the same time thumb-rod Q, (in point Y.) The small roller V, fastened to lower end of rod Q, en-  
90 engages at once with thumbs X and Z, as shown in Fig. 2, which serve as levers to throw out the lifters and in turn keep the lifters C and D far enough from beater I to prevent the steel plates E and F from engaging with G and H; consequently the cut-off valve must  
95 remain on its seat, no steam can pass into the cylinder, and the engine stops. Rod Q is adjusted to the requisite length by screwing its head-piece the proper distance into slot-piece T.

100 Having fully described my invention, I desire to claim and secure by Letters Patent the following:

1. The combination, with the alternately-

moving lifters C and D and lifting-block I, of levers or thumbs connected with said lifters and means automatically brought into play on derangement of governor or belting to act  
5 on said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem carrying the beater, substantially as and for the purposes set forth.

2. The combination, with the alternately-  
10 moving lifters C and D and lifting-block I, of levers or thumbs X and Z, connected with said lifters, a reciprocating rod constructed to engage with said levers or thumbs, and means for automatically moving said rod on derange-  
15 ment of governor or belting to engage with said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem carrying the beater, substantially as and for the purposes set forth.

20 3. The combination, with the alternately-moving lifters C and D and lifting-block I, of levers or thumbs X and Z, connected with said lifters, a reciprocating rod constructed to engage with said levers or thumbs, means for  
25 holding said rod out of engagement with said levers or thumbs, and means for automatically

moving said rod on derangement of governor or belting to engage with said levers to throw the lifters away from the beater, so as not to engage therewith in the movement of the stem  
30 carrying the beater, substantially as and for the purposes set forth.

4. The combination, with the beater I, lift-  
ers C D, and lever P, of the levers or thumbs X and Z, connected with said lifters, a rod  
35 constructed to engage with said levers or thumbs, when moved in line therewith, to throw said lifters out of line with said beater, and adapted to have said lever P engaged with  
40 it to bring it to bear against said thumbs, and a locking device, W, to hold said rod out of engagement with said thumbs while the engine is being started, said rod being free to  
45 be moved by said lever P after the engine is started, whereby the engine may be automatically stopped should the necessity therefor arise, substantially as set forth.

EMIL HARTUNG.

Witnesses:

JOHN C. THROBER,  
ERNST BLOEDORN.