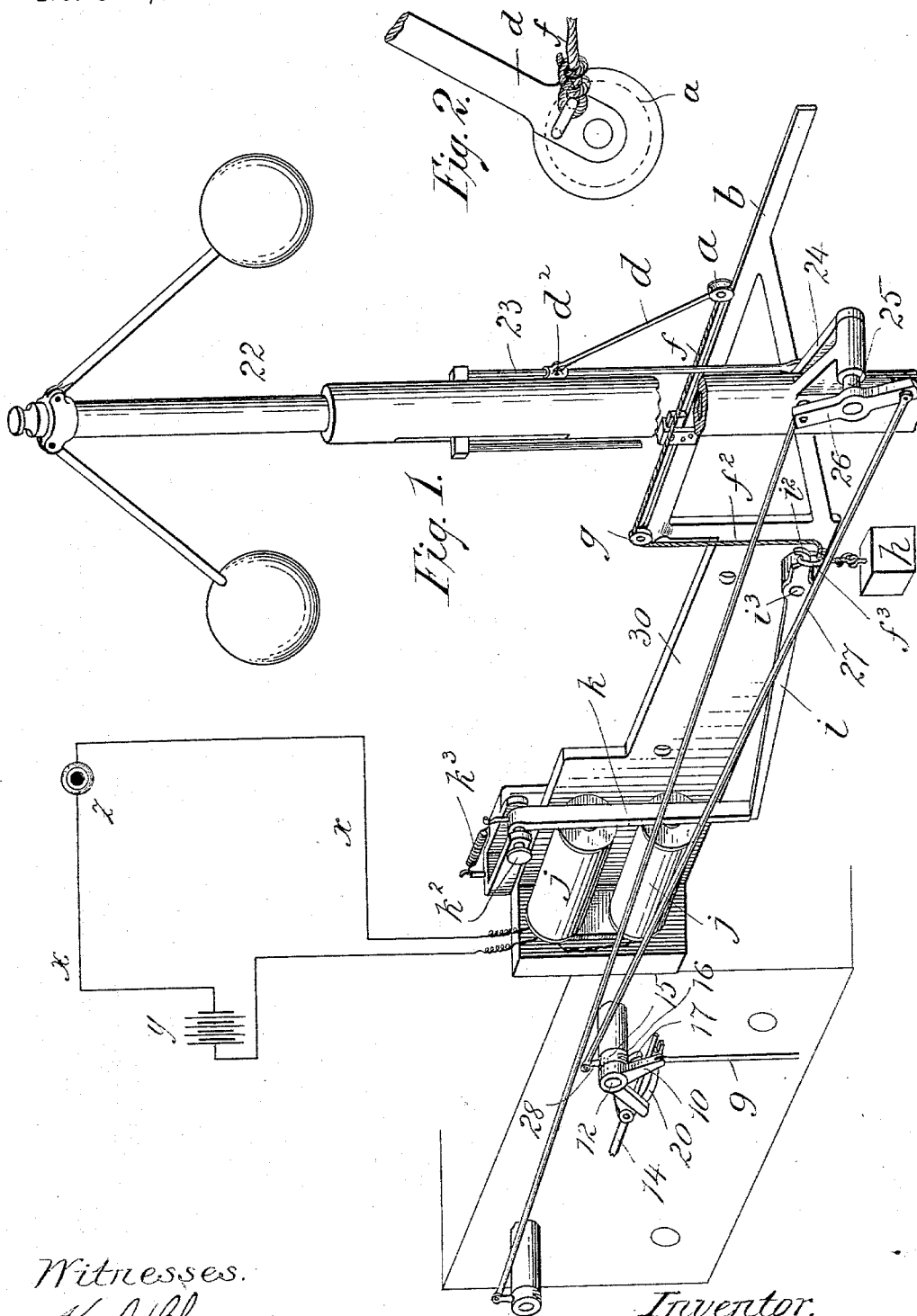


(No Model.)

L. ST. PETER.
ELECTRIC STOP MOTION FOR ENGINES.

No. 548,589.

Patented Oct. 22, 1895.



Witnesses.
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UNITED STATES PATENT OFFICE.

LOUIS ST. PETER, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO JOHN D. MILLEA AND THOMAS D. MILLEA, OF SAME PLACE.

ELECTRIC STOP-MOTION FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 548,589, dated October 22, 1895.

Application filed March 1, 1895. Serial No. 540,211. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ST. PETER, a subject of the Queen of Great Britain, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Electric Stop-Motions for Steam-Engines, of which the following is a specification.

This invention relates to improvements in that class of electrical stop-motions for engines which comprise means for causing the stopping of the engine by pressing a button or otherwise closing a circuit at any point which may be distant from the engine.

The object of this invention is to devise stop-motion devices which shall be applicable to a large variety of valve mechanisms as found in different engines, and which shall be of the utmost simplicity and compactness and susceptible of inexpensive production.

The invention consists in constructions and arrangements of parts for combination with ordinary valve-operating mechanisms of steam-engines, all as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying drawings, Figure 1 is a perspective representation of a portion of the ordinary valve mechanism and governor of the common Corliss engine with the present improved stop-motion so combined therewith that the regulating action of the governor upon the valve mechanism will not be affected by the applied stop-motion, and so that upon occasion the stop-motion will operate to absolutely and instantaneously stop the engine when operated by the push-button to close the circuit. Fig. 2 is an enlarged view showing the manner of connection between parts hereinafter referred to.

The ordinary valve and governor mechanisms, as shown, will be briefly pointed out as identified by numerals of reference, and the parts constituting the stop-motion will be referred to by letters of reference.

As well known in this and other types of engines, there are one or more valves alternately opened.

9 represents one of the valve-operating rods, which is hung to an arm 10, mounted to rock on the shaft or stud 12. The part 14 has, during the running of the engine, a regular re-

ciprocatory movement and engages in each of its strokes a part which causes the rocking of the arm 10 to properly and in good time effect the lifting of the valve-operating rod 9. The periodicity or extent in duration of the lifting of the said valve-operating rod 9 is controlled by the governor, which acts upon the oscillating collar 15, which is provided with a cam 16, that so acts against the upper jaw 17 of the two-jawed part 20 that by reason of the degree of oscillation of the part 15 and the swinging of the part 20 the duration of the engagement by the grab-hook may be longer or shorter, and in fact when the part 15 is sufficiently far oscillated the part 20 will be so far swung that there will be no effect to rock the arm 10.

The governor 22 in rising through the rod 23 upwardly swings the crank-arm 24 of the rocker shaft or stud 25, on which is the lever 26, and to one arm of this lever the connecting-rod 27 is by its one end secured, while its other extremity is connected to a radial projection 28 of the oscillating part 15, which carries the cam 16. All of these devices are very common and well known as well, also, as their mode of operation, and it is understood, of course, that during the ordinary running of the engine the degree of oscillation of the part 15 as occasioned through the mechanism mentioned by the raising or lowering of the governor-balls is slight, although in this class of engines, as well known, should the governor-balls be so far raised beyond their normal limits of movement the oscillation of the part 15 will be so great as to cause on each reciprocatory movement of the parts 14 and 20 no engagement and tripping of the grab-hook, and consequently no lifting of the valve-operating rod 9, whereupon no steam would be admitted to the cylinder. It will be stated, preliminarily, that the action of this stop-motion is such that upon its operation it so elevates the rod 23 as to effect the required oscillation of the part 15 to prevent the engine from taking steam, and the devices operating to this end will be now described in detail.

a represents a roller which is adapted to run on the horizontal track or bar b, which may be a part of the framing 30 of the engine. This roller is journaled in the lower end of

the rod d , which at d^2 is pivoted to the aforesaid vertical rod 23, which is an adjunct of the governor.

A cord or other flexible connection f is connected to the rod d near the roller a or the part to which it is journaled, thence passing around the sheave g , its depending portion f^2 being provided with the weight h , of considerable preponderance over the force required to raise the governor-balls. This depending portion of the flexible connection has the eye f^3 , which is adapted to be hung upon the hooked arm i^2 of the lever i , which is pivoted at i^3 .

j represents an electromagnet, for which k is the armature, pivotally mounted at k^2 , and so poised, as preferably insured by the application of the spring k^3 , that the armature normally stands well away from the end of the electromagnet and serves as a trigger to restrain the lever i in its position, (indicated in the drawings,) in which it supports the weight h .

It will be here noted that when the weight h is hung upon the hooked arm i^2 of the said armature-restrained lever the cord connection f and f^2 between the eye f^3 and the roller a is sufficiently slack to permit the slight vibratory movements of the roller as occasioned during the ordinary action of the governor by reason of the said roller being linked to the said rod 23.

The electromagnet is comprised in an open circuit constituted by the wires xx , which also comprise a battery or other generator y and a circuit-closing device (indicated at z) in the form of an ordinary push-button.

The operation of this electrical stop-motion is evident on an inspection of the drawings, although it will be stated as follows: Assuming a person in a place distant from the engine-room—as, for instance, on an upper floor in the factory—desires to instantly stop the engine because of some accident, as, perhaps, on the occasion of an operative becoming caught in the machinery. Upon simply pressing the button at z closing the circuit and energizing the electromagnet the armature k is drawn to the electromagnet and out of its restraining position for the lever i , which then so swings as to leave the cord f fully subject to the entire draft action of the weight h , which causes the rod d to force the rod 23 so far vertically as to, through parts 24, 25, 26,

and 27, so far oscillate the part 15 as to prevent the further taking of the grab-hook upon the reciprocatory movements of the part 14, in which event, of course, the valve-operating rod 9 (or as the engine is usually equipped, the two of such rods) will not be elevated, and by reason of the cessation of the passage of steam to the cylinder or cylinders of the engine the latter will stop. In practice the absolute stopping of the engine is effected in from ten to twenty seconds.

The electromagnet is axially horizontal while the armature is vertically hung, so as to receive and resist endwise the stress of the lever as established by the weight. Hence this arrangement conduces to simplicity and desired lightness of construction without dispensing in any measure with the required strength.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric stop motion for engines, the combination with the track-bar, b , and a reciprocatory part, as 23, of the governor mechanism, of the rod, d , pivoted to the said reciprocatory part and having the roller to move in said track-bar, the sheave, g , the lever, i , the weighted cord, f , connected to the said rod, d , and having a guiding engagement with the sheave and having in its depending portion the eye, f , and provided at its portion therebelow with the weight, h , the electromagnet having its armature adapted for a restraining engagement with said lever, i , and electric apparatus for duly energizing the said electro-magnet, substantially as described.

2. In an electrical stop motion for engines, the combination with a valve operating device of the engine, of an electro-magnet and armature, electric conductors for forming a circuit, means for closing the circuit, a lever to act on the valve-operating device and engaged by the armature of the electro-magnet, all so that on the closing of the circuit and energizing of the magnet the armature is withdrawn from its lever-engaging position leaving the lever free to be swung, substantially as described.

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Witnesses:

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