A. GALE.

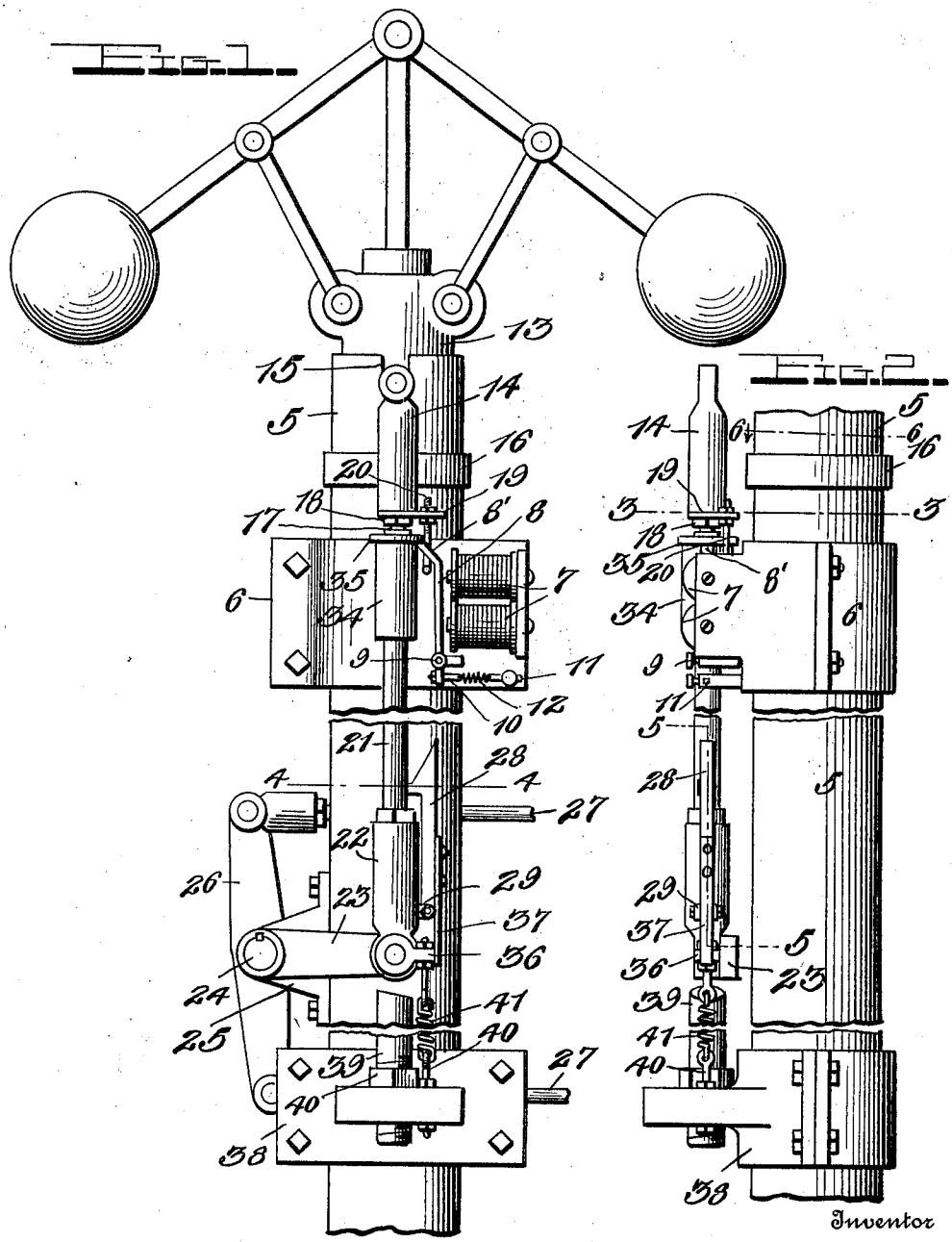
ENGINE STOP DEVICE.

APPLICATION FILED AUG. 23, 1911.

1,038,867.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

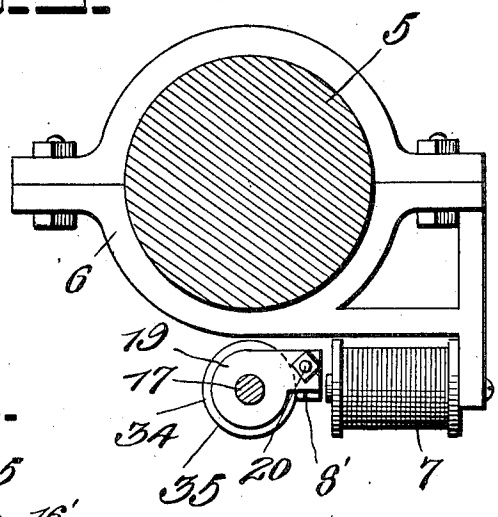


Fig. 6.

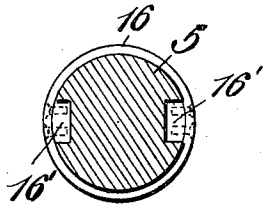


Fig. 5.

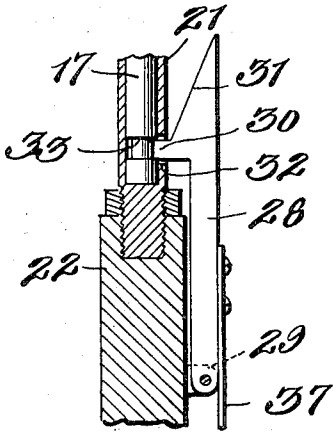
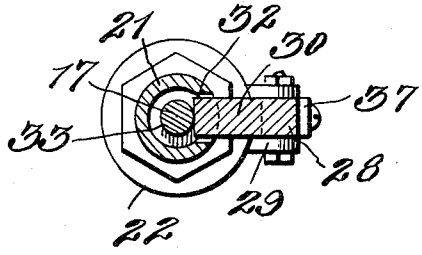


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANSON GALE, OF DECATUR, ILLINOIS.

ENGINE STOP DEVICE.

1,038,867. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed August 23, 1911. Serial No. 645,537.

To all whom it may concern:

Be it known that I, ANSON GALE, a citizen of the United States, residing at Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Engine Stop Devices, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in engine stop devices and more particularly to an electrically and mechanically operated stop device which is reliable and efficient in its action and will positively stop the operation of the engine when the same attains an abnormal speed.

Another object of the invention is to provide improved stop mechanism normally held against operation by an armature adapted to be attracted by suitable electro-magnets included in an electric circuit whereby they may be energized from any distant point, and additional mechanical means automatically actuated to move said armature and release the stop mechanism upon excessive speed of the engine.

A still further object of the invention is to provide a mechanism of the above character consisting of comparatively few elements which may be manufactured at a nominal cost, are not liable to become easily deranged and may be readily assembled in operative position.

With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation showing a governor column having my improved stop mechanism arranged thereon; Fig. 2 is an elevation looking at right angles to Fig. 1; Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a detail section taken on the line 4—4 of Fig. 1; Fig. 5 is a detail vertical section taken on the line 5—5 of Fig. 2. Fig. 6 is a detail section taken on the line 6—6 of Fig. 2.

The present invention is devised with a view to providing suitable stop mechanism for application to steam, gas or gasolene engines which is at all times under the control of the operator and may be operated from any distant point in the building and in addition to such manually controlled operating means I also provide mechanical means which is automatically actuated when the engine attains an excessive speed to effect the operation of such stop mechanism and stop the engine whereby injury thereto may be prevented.

With the above end in view, I have illustrated the preferred embodiment of my invention in the accompanying drawings wherein—

5 designates the governor column to which a casting 6 is bolted or otherwise rigidly secured. Upon this casting and suitably insulated therefrom the electro-magnets 7 are arranged, and adjacent to the magnet poles an armature plate 8 is pivotally mounted upon the casting as indicated at 9. The upper end of this armature plate is deflected or angularly disposed as indicated at 8′ for a purpose which will be hereinafter made apparent. The armature plate is also provided with a depending portion which extends below the pivot 9 and to which a short rod 10 is fixed. A similar rod 11 is rigidly secured in a lug formed upon the casting 6 and a spring 12 connects the opposed ends of the rods 10 and 11. This spring normally acts to move the armature plate 8 away from the bolts of the magnet.

The governor 13 carries a link 14 which is mounted upon a stud movable in the longitudinal slot 15 of the governor column. A collar 16 is secured upon the column 5 and limits the downward movement of the governor bolts and prevents them from dropping below the lowest working point. This collar 16 is provided at diametrically opposite points with the inwardly extending lugs 16′, which are disposed in the lower ends of the slots 15 in the upper end of the governor column, and prevent said collar from moving downwardly on the column. To the lower end of the link 14 the upper end of a vertically disposed cylindrical rod 17 is rigidly secured. A nut 18 is threaded upon the upper end of said rod and between the nut and the link 14 a plate 19 is rigidly clamped. This plate extends laterally beyond one side of the link and has fixed thereto a depending rod 20, the lower end of which is curved or bent at right angles and extends beneath the upper angularly disposed end 8′ of the armature plate 8. A tubular rod 21 surrounds the rod 17 which is loosely disposed within said tube. The tubular rod 21 at its lower end is

threaded in the upper end of an arm 22, the lower end of which is pivotally connected to the lever 23 which is fixed to a shaft 24 mounted in a suitable bearing 25 which is arranged upon the governor column. A link 26 is also fixed to the shaft 24 intermediate of its ends and to the ends of the link the valve controlling rods 27 are connected.

Upon the vertical arm 22 a vertically disposed latch bar 28 is pivotally mounted at its lower end between the ears 29. The upper end of this latch bar has formed thereon a laterally extending lug 30 and above said lug the bar is provided with the inclined face 31. The lug 30 extends through a rectangular opening 32 provided in the lower end of the tubular rod 21 and is adapted to be received in an annular groove or channel 33 formed in the lower end of the rod 17. A weight 34 is slidably arranged upon the tubular rod 21 and this weight is provided on its upper end with an annular flange 35 with which the extremity of the end portion 8′ of the armature plate is adapted to be engaged. This sliding weight is of sufficient diameter so that it will strike upon the inclined face 31 of the latch bar 28 and force the same outwardly to disengage the lug 30 thereon from the opening 32 in the tubular rod 21. A lug 36 is formed on the lower end of the arm 22 and with this lug the free end of a leaf spring 37 engages, the other end of said spring being fixed to the latch bar 28. This leaf spring acts to retain the latch bar in its operative position and prevents any inadvertent or accidental outward movement of said bar.

Upon the supporting base or bed 38 in which the governor column 5 is mounted a projection is formed in which a vertical stop rod 39 is threaded. This stop rod may be readily adjusted vertically by means of the nut 40 to regulate the extent of downward movement of the tube 21. A coiled spring 41 is also fixed at its lower end to an eye secured in the projection on the supporting base and at its upper end is engaged in a similar eye fixed in the lug 36 on the arm 22.

Having thus described the various elements comprising my improved stop mechanism, the operation thereof may be set forth as follows. Assuming that the parts are in the position illustrated in Fig. 1, it will be evident that upon the engine attaining an excessive or abnormal speed, the outward movement of the governor balls will elevate the link 14 which is carried by the governor and thereby cause the lower hooked end of the rod 21 to engage beneath the angularly disposed upper end 8′ of the armature plate 8. The plate 8 will thereby be forced outwardly and its extremity disengaged from the flange 35 of the weight 34. Thereupon the weight will gravitate downwardly upon the tubular rod 21 and the lower end thereof will engage with the inclined face 31 of the upper end of the latch bar 28. The latch bar is thus moved outwardly against the tension of the spring 37 and the lug 30 thereon disengaged from the opening 32 in the rod 21. The spring 41 will thereupon contract and draw the arm 22 and rod 21 which is connected thereto downwardly until the lower end of said rod engages the upper end of the stop 39. This movement of said arm rocks the shaft 24 in its bearing and oscillates the link 26 so that the rods 27 are moved to close the valves of the engine so that the steam supply to the cylinder is shut off and the engine is stopped. The foregoing describes the mechanical operation of the stop mechanism which it will be readily seen is entirely automatic in its action. The armature plate 8 is also adapted to be electrically attracted or withdrawn from engagement with the weight 34 and in order to permit the operator to control the engine from a number of points through the building, the electro-magnets are wired to an electric circuit and suitable push buttons are provided in the circuit at a number of points throughout the building so that the circuit may be readily closed and the electro-magnets energized to attract the armature plate and thereby effect the operation of the stop mechanism in the manner previously described.

From the foregoing it is believed that the construction and operation of my improved engine stop mechanism will be readily understood.

The device is extremely simple in its construction and therefore highly durable in practical use. It may also be manufactured at a small cost and easily and quickly installed in operative position.

It will be at once apparent that by means of my improved device, liability of injury to the engine by the breakage of drive belts or in the event that the engine is suddenly released of its load, is practically eliminated.

While I have shown and described the preferred form and construction of the various elements, it will be understood that the invention is susceptible of considerable modification without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. In a stop device for engines, a governor, valve controlling mechanism, a rod connecting said valve mechanism to the governor and consisting of two relatively movable sections, a pivoted latch member nor-

mally connecting the rod sections, a gravity member longitudinally movable upon one of said sections, a pivotally mounted spring held plate engaging said gravity member to support the same, a spring normally acting to operate the valve mechanism and close the valves, and means carried by the governor to engage said spring held plate and release the gravity member, said gravity member co-acting with the latch device in its movement to disconnect the rod sections and permit of the movement of one of said sections with relation to the other.

2. In an engine stop device, the combination of a governor, valve controlling mechanism, means connecting said mechanism to the governor including a tubular rod connected to the valve controlling mechanism, a rod connected to the governor and telescopically engaged in said tubular rod, said tubular rod being provided with an opening in its wall, a spring held latch bar having a detent disposed through said opening and engaging said rod to normally cause the rods to move in unison, said latch member also having a beveled face, a weight movable upon the tubular rod, a spring held plate having an angularly disposed portion to engage and support the weight, a trip member carried by the governor to engage the angularly disposed end of said plate and release the weight, said weight moving downwardly upon the tubular rod and engaging the beveled face of the latch bar to release the rods for relative movement, and a contractile spring to actuate the valve mechanism and close the valves when the rods are disconnected.

3. In a stop device for engines, a governor, valve controlling mechanism, a connecting rod between said mechanism and the governor consisting of two relatively movable sections, a pivoted latch member normally connecting said rod sections to cause the same to move in unison, a contractile spring tending to move one of said rod sections with relation to the other and operate the valve mechanism to close the valve and stop the engine, a gravity member longitudinally movable upon the other of said rod sections provided with a flange on one end, a spring held plate having one of its ends angularly disposed for engagement with said flange to support the weight, and a depending rod connected to the governor and having a hook on its lower end disposed beneath the angularly disposed end of said plate to move said plate when the engine attains an excessive speed and release the gravity member, said gravity member engaging the latch bar to disconnect the rod sections whereby the valve mechanism is actuated to close the valves and stop the engine.

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

ANSON GALE.

Witnesses:
J. H. BISHOP,
M. R. ALLEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."