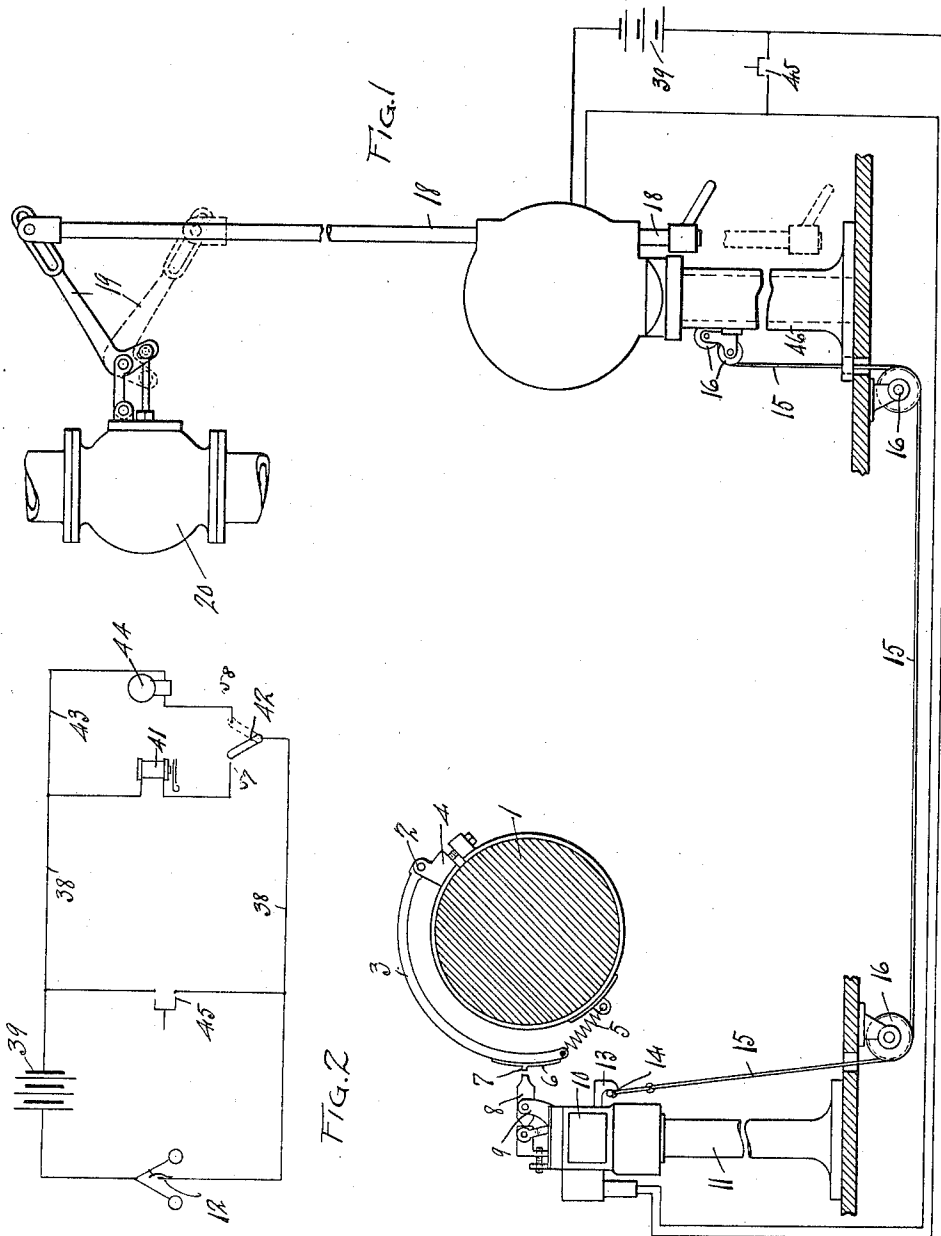


L. P. STRONG.
AUTOMATIC ENGINE STOP.
APPLICATION FILED JULY 19, 1911.

1,036,742.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 1.



WITNESSES:

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Horace B. Fay

INVENTOR
Leslie C. Strong
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ATTORNEY

1,036,742.

A detailed technical drawing of a mechanical device, likely a pump or valve assembly. The device features a central vertical shaft (18) passing through a housing. The shaft has a threaded section (17) and a flange (16) at the bottom. A handle (36) is attached to the side of the shaft, and a cross-section (46) is shown at the bottom left.

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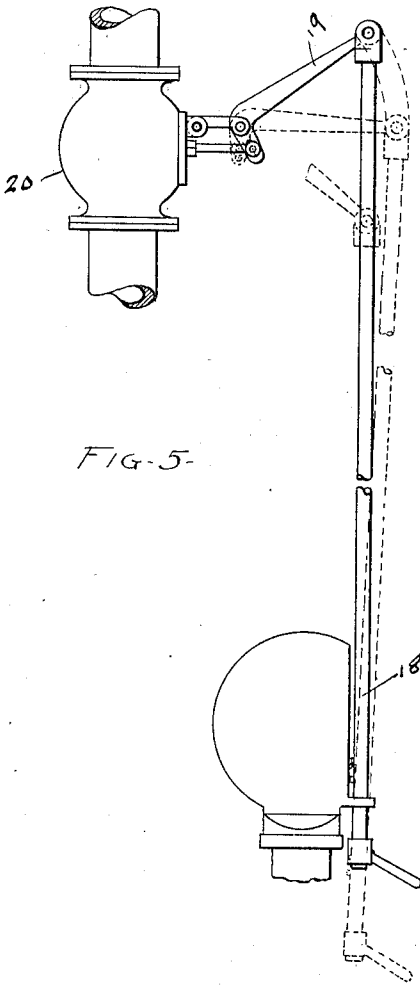


FIG-5-

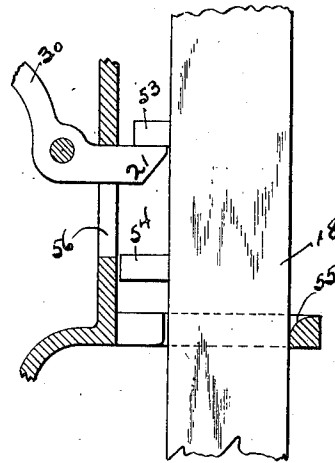


FIG-7

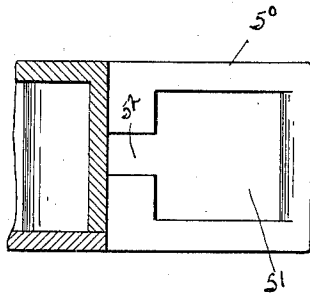


FIG-6

WITNESSES:

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UNITED STATES PATENT OFFICE.

LESLIE P. STRONG, OF CLEVELAND, OHIO, ASSIGNOR TO THE CLARK MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

AUTOMATIC ENGINE-STOP.

1,036,742.

Specification of Letters Patent.

Patented Aug. 27, 1912.

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To all whom it may concern:

Be it known that I, LESLIE P. STRONG, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Automatic Engine-Stops, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention consists of an engine stop of new, and improved, design adapted to be operated either automatically upon the engine speed surpassing a predetermined limit, or manually, by throwing the controlling lever, or in the case of a steam engine, a valve, or by closing an electrical circuit thereby actuating certain mechanism which operate the valve.

In order to adapt my engine stop to service under all sorts of conditions I here illustrate in the apparatus two complete methods of operation, one electrical, and the other mechanical. It will be understood, of course, that while both operating systems may if desired be used together, one only is necessary. The electrical system will be most commonly used, conditions permitting, by reason of the ease of operation from several points by means of independent switches. Both of the systems are adapted to actuate a single member which permits the positioning of the controlling member.

The engine stop here shown has several advantages over those now in general use by reason of its simplicity and sureness of operation. These features and particular construction and disposition of the parts are what I regard as comprising the novelty of the device.

To the accomplishment of the aforesaid and related ends, said invention, then consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings: Figure 1 is a

side elevation of my improved engine stop with the operating mechanism and the engine shaft carrying a governing device; Fig. 2 is a diagrammatic plan view of the electrical connections in use with the device; Fig. 3 is a detailed side elevation of the mechanism for operating the controlling lever; Fig. 4 is an end view of the casing; and Figs. 5, 6, and 7 are various views of a modification of my device.

In Fig. 1 the engine shaft 1 is shown carrying an inertia governor 2, comprising a bar 3 pivotally connected at one end to the shaft by suitable means 4 and being connected at its other end to the shaft by a spring 5 which tends to retain it at its normal distance from the shaft. On the outer side of the last named end of the bar is a strip 6 having a projection 7, adapted, when the bar is forced outwardly by the centrifugal force due to the rotation of the shaft, to contact and move the bar 8, fixedly mounted in a yoke 9, which is pivoted within a casing 10 mounted on a standard 11. Such action of the bar and yoke closes the electrical circuit at a point 12, diagrammatically shown in Fig. 2, and simultaneously actuates a hook 13, so that it releases a handle 14, connected to a cable 15, which leads over pulleys 16 to a weight 17. The closing of the electrical circuit and the falling of the weight simultaneously cause the operation of a controlling lever 18 connected in the present drawing, for illustrative purposes only, to a second lever 19 which when thus operated closes a valve 20, thus cutting off the supply of steam to the engine. The controlling lever 18 is operated by its own weight; that is to say, when the valve is open, the lever is held in the position shown in Fig. 3 by means of a detent 21 but upon release by the latch the lever 18 falls of its own weight closing the valve as described.

Referring to Fig. 1, it will be seen that the cable 15 leading over the pulleys 16 is attached to the weight 17 (see Fig. 3). The last pulley over which the wire leads before the connection to the weight has a cam plate 22 integral therewith. The wire as it is drawn over the pulley by the weight rotates the cam 22 which forces up a member 23 pivotally mounted at 24. The member 23 thus actuated, operates a reciprocable, vertically disposed rod 25, which in turn

oscillates a member 26 about its point of attachment 27. One end of the member 26 is formed into a latch 28 which normally engages the end 29 of the member 30 pivotally mounted on the pin 31 and having its other end 32 formed into a detent 21 which in the normal position of the member 30 engages the upper edge of a slot 34 in the controlling lever 18. When the member 26 is oscillated, however, the member 30 is caused to pivot about the pin 31 by the weight of the lever 18 bearing upon the slanting surface 35 of the detent 21. When so pivotally actuated the member 30 is moved into the position indicated by the dotted lines in Fig. 3.

In order to reset the controlling lever the weight 17 is vertically raised by a handle 36 and the handle 14 reengaged with the hook 13 which is first forced into the casing 10 thus returning the bar and yoke 9 to their normal position. The controlling lever can easily be latched again with the member 30 by simply raising the latter until the lower edge of slot 34 engages said lever, which operation causes the reengagement of the latching ends of the members 30 and 25 thus setting the whole train of mechanism.

The electrical mechanism for causing the operation of the stop includes a circuit 38, comprising a battery, or other source of current, here illustrated as the former 39, a normally open switch 12 adapted to be closed by the moving of the yoke 10 as already described, an electro-magnet 41 and a two way switch 42.

The latter is normally in the position shown in Fig. 2 closing the operating circuit, but upon the release of the member 30, the switch is forced into the position illustrated by dotted lines (Fig. 2) by the spring 47, which is normally prevented from acting by the projection 48 on member 30. In the latter's normal position the projection 48 contacts the switch (see Fig. 3) holding it in the normal position against the spring pressure.

The closing of the circuit causes the attraction toward the magnet of the armature 23 thus actuating the several members, 25, 26 and 30, as already described, the mechanism from this point on being the same that is used when the stop is actuated by means of the weight.

Various switches may be disposed along the line as is the switch 45 in Fig. 2 thus permitting operation of the device from any one of several points in the engine room or even at some distance therefrom.

It will be understood that I lay no claim to the particular construction of the governor or the precise mechanism here shown for causing the automatic operation of the engine stop. The governor and the adjacent mechanism held in the standard 11 are

here shown for illustrative purposes only, and are not a disclosure of specific mechanism and therefore constitute no part of this invention. Any suitable means for actuating the mechanism directly connected with the controlling member may be employed.

The mechanism for operating the controlling lever 18 and the casing in which it is carried are mounted on the standard 46 which may be at any desirable distance from the engine but is preferably adjacent thereto in order to shut off the steam close up to the engine cylinder thereby securing quicker action. The mechanism heretofore described may of course be used in conjunction with other than steam driven engines and may be used to perform other functions than that of throwing a controlling valve without in any sense departing from the spirit of the invention. Also, changes in the structure or disposition of the several members may be made without departing from the invention so long as the principle of my invention be embodied therein. Thus, the member 18 may be directly connected to the lever 19 by a plain link as in Fig. 5, in which case the upper end of the member 18 will describe an arc (shown in dotted lines) in dropping to the lower position indicated in Fig. 1. The member 18 cannot in this case be mounted in a close fitting straight-sided guide and accordingly I adopt the apparatus shown in Fig. 5 and the form of guide shown in Figs. 6 and 7. With the exception of the form of the casing, the guide, and the position of the engaging faces on the member 18, the mechanism of my modified device is identical with that already illustrated and described.

In Fig. 6 I show a plan view of the guide 50, used with the casing illustrated in Fig. 5, which extends out from the vertically straight side wall of the casing and has a square aperture 57, adapted to receive a square controlling member 18, and having an extension 52 to permit passage of the two lugs 53 and 54 on the controlling member. Of the two lugs, the upper one 53 is the smaller and the lower one 54 serves the same purpose as the lower face of the notch 34, in the resetting of the device.

As will be seen from Fig. 7, which is a side elevation of the guide 50, one side 55 of the guide is rounded to allow for the slight rotary motion of the member 18 when dropping, caused by the plain link connection to the lever 19.

Above the guide 50 there is an aperture 56 in the wall of the casing through which the detent 21 on the latch member 30 may engage the two lugs on the controlling member. It will be noticed that except in construction this form of my device is identical with that already described. The operation is no different.

The modification described above is preferred for certain purposes and has the further advantage of being simpler to construct.

As will be seen in Fig. 3, the electrical circuit shown diagrammatically in Fig. 2 includes the switch 42 which is normally pressed against the contact 57 by the projection 48 on the member 30, but is adapted upon the rotation of the latter to be forced against the contact 58 thus operating the alarm.

With either of the foregoing described forms of mechanism, I secure the important result that the engine cannot be run without setting the automatic stop. In other words the quick-closing valve cannot be held open without latching member 18 in its raised position. At the same time the simple raising of this member serves thus to relatch it, where only the electro-magnet is employed to release the latch. Where the cable 15 and weight 17 are used, the latter requires to be raised and handle 14 secured to hook 13, before the latch can operate.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the class described, the combination of a controlling member having two transversely disposed faces thereon; latch means adapted to engage one of said transverse faces, thereby retaining said member in normal position; other means adapted to release said latch means, thereby permitting movement of said member out of normal position; said latch means when released being adapted to be engaged by said other transverse face upon return of said member to normal position, thereby resetting said latch means.

2. In mechanism of the class described, the combination of a substantially vertically disposed, reciprocably mounted controlling member having two transversely disposed faces thereon, a guide for said member; latch means adapted to engage one of said transverse faces thereby retaining said member in normal position; other means adapted to release said latch means, thereby permitting movement of said member out of normal position; said latch means when released projecting into the path of said other transverse face during return movement of said controlling member; said other face being adapted to engage said latch means and reset the same upon return of said controlling member to its normal position.

3. In mechanism of the class described, the combination with a substantially vertically disposed, reciprocable, controlling member having two transversely disposed engaging faces spaced from each other, and a guide for said member; of a pivotally mounted latch member having one end adapted to engage said transverse engaging faces, thereby retaining said controlling member in one position; other means adapted to normally retain said latch member in engagement with said controlling member, said other means comprising an oscillatorily mounted member adapted to engage the other end of said latch member, a reciprocably mounted member adapted to release said latch member and said oscillatorily mounted member from engagement, and a rotatably mounted member adapted to actuate said reciprocably mounted member; and means adapted to actuate said rotatably mounted member.

4. In mechanism of the class described, the combination with a substantially vertically disposed, reciprocable, controlling member having two transversely disposed engaging faces, spaced from each other and a guide for said member; of a pivotally mounted latch member having one end adapted to engage said transverse faces, thereby retaining said controlling member in one position; other means adapted to normally retain said latch member in engagement with said controlling member, said other means comprising an oscillatorily mounted member adapted to engage the other end of said latch member, a reciprocably mounted member adapted to release said latch member and said oscillatorily mounted member from engagement, and a rotatably mounted member adapted to actuate said reciprocably mounted member; and means adapted to actuate said rotatably mounted member; said means including a normally open electrical circuit.

5. In mechanism of the class described, the combination with a substantially vertically disposed, reciprocable, controlling member having a lug projecting therefrom, and a guide for said member; of a pivotally mounted latch member having one end adapted to engage said lug, thereby retaining said controlling member in one position; other means, adapted to normally retain said latch member in engagement with said controlling member, said other means comprising an oscillatorily mounted member adapted to engage the other end of said latch member, a reciprocably mounted member adapted to release said latch member and said oscillatorily mounted member from engagement, and a rotatably mounted member adapted to actuate said reciprocably mounted member; and means adapted to actuate said rotatably mounted member;

said means including a normally open electrical circuit.

6. In mechanism of the class described, the combination with a substantially vertically disposed, reciprocable, controlling member having a plurality of lugs projecting therefrom, and a guide for said member; of a pivotally mounted latch member having one end adapted to engage one of said lugs, thereby retaining said controlling member in one position; other means adapted to normally retain said latch member in engagement with said controlling member, said said latch member and said oscillatorily mounted member adapted to engage the other end of said latch member, a reciprocably mounted member adapted to release said latch member and said oscillatorily mounted member from engagement, and a rotatably mounted member adapted to actuate said reciprocably mounted member; and means adapted to actuate said rotatably mounted member; said means including a normally open electrical circuit; said other lug being adapted to reset said latch member after disengagement of the latter and said controlling member.

7. In mechanism of the class described, the combination with a substantially vertically disposed, reciprocable, controlling member having two transversely disposed engaging faces spaced from each other, and a guide for said member; of a pivotally mounted latch member having one end adapted to engage said transverse faces, thereby retaining said controlling member in one position; other means, adapted to normally retain said latch member in engagement with said controlling member, said other means comprising, an oscillatorily mounted member adapted to engage the other end of said latch member, a reciprocably mounted member adapted to release said latch member and said oscillatory member from engagement, and a rotatably mounted member adapted to actuate said reciprocably mounted member; and means adapted to actuate said rotatably mounted member; and means including a normally open electrical circuit;

and a cam, adapted to be operated by means independent of said electrical circuit and to actuate said reciprocable member.

8. In mechanism of the character described, the combination with a controlling member having two transversely disposed engaging faces spaced from each other; of means adapted to engage one of said engaging faces, thereby retaining said controlling member in a fixed position; said other engaging face being adapted to contact said latch means, when the latter are not in engagement with said first named transverse face, thereby forcing said controlling member into its normal position in engagement with said latch means.

9. In mechanism of the class described, the combination with a valve having an operating lever; of a controlling member pivotally connected to said lever, a guide for said member, the latter having both reciprocating and oscillatory motion in said guide.

10. In mechanism of the class described, the combination with a valve having an operating lever; of a controlling member pivotally connected to said lever; a guide for said member, the latter having both reciprocating and oscillatory motion in said guide; and means adapted to engage said controlling member and retain the same in a fixed position.

11. In mechanism of the class described, the combination with a valve having an operating lever; of a controlling member pivotally connected to said lever; a guide for said member, the latter having both reciprocating and oscillatory motion in said guide; latch means adapted to engage said controlling member and retain the same in a fixed position; and a normally open electrical circuit adapted when closed to cause said latch means to release said controlling member.

Signed by me this 17 day of July, 1911.

LESLIE P. STRONG.

Attested by—

HORACE B. FAY,
JNO. F. OBERLEIN.