

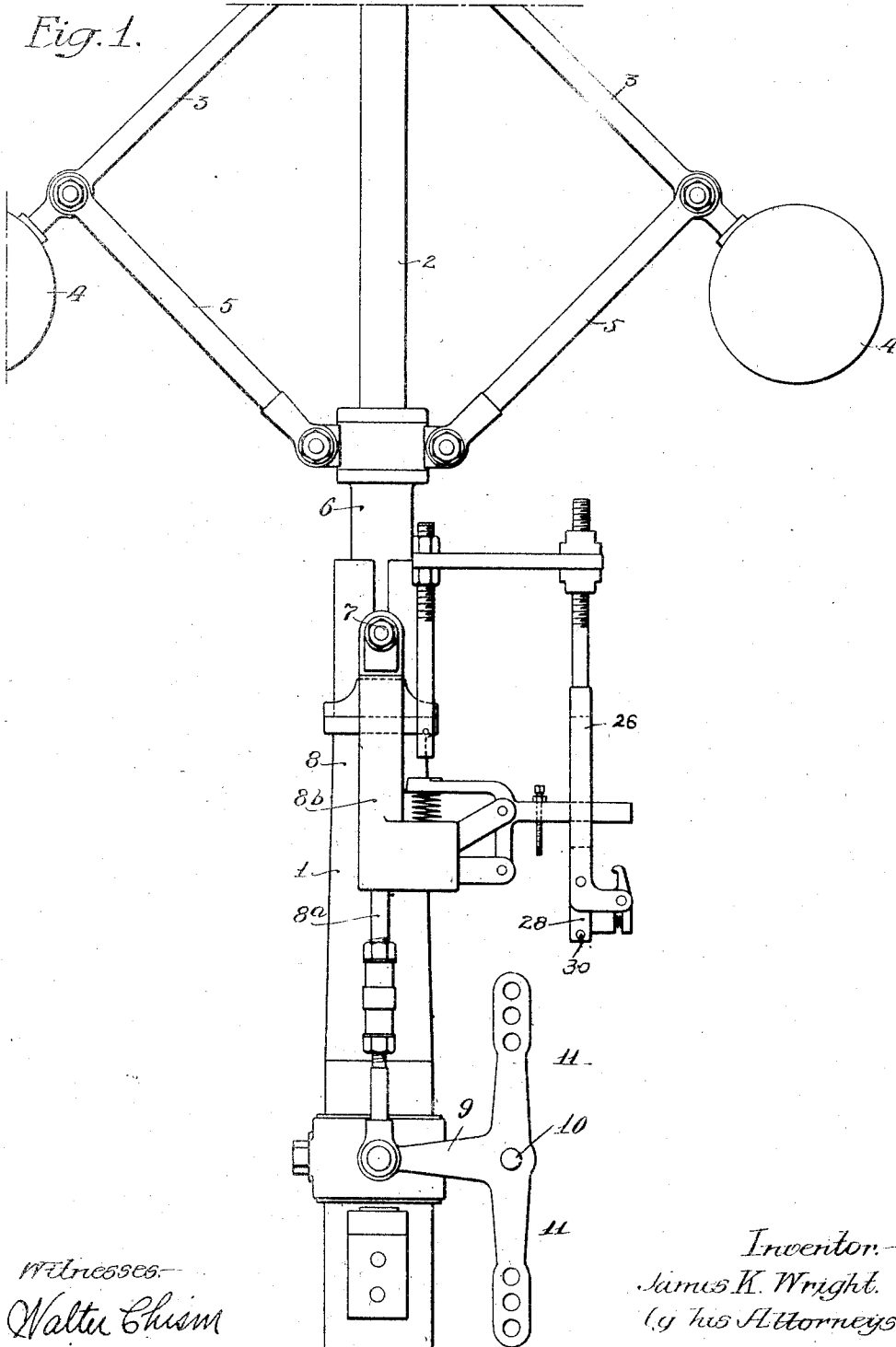
J. K. WRIGHT.
 AUTOMATIC ENGINE STOP.
 APPLICATION FILED AUG. 21, 1911.

1,020,940.

Patented Mar. 19, 1912.

3 SHEETS-SHEET 1.

Fig. 1.



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3 SHEETS-SHEET 2.

Fig. 3.

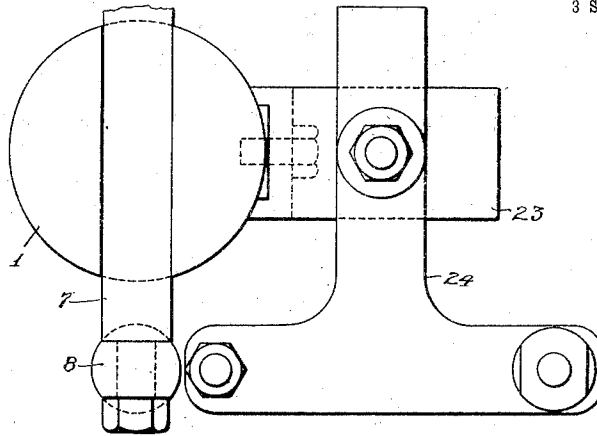
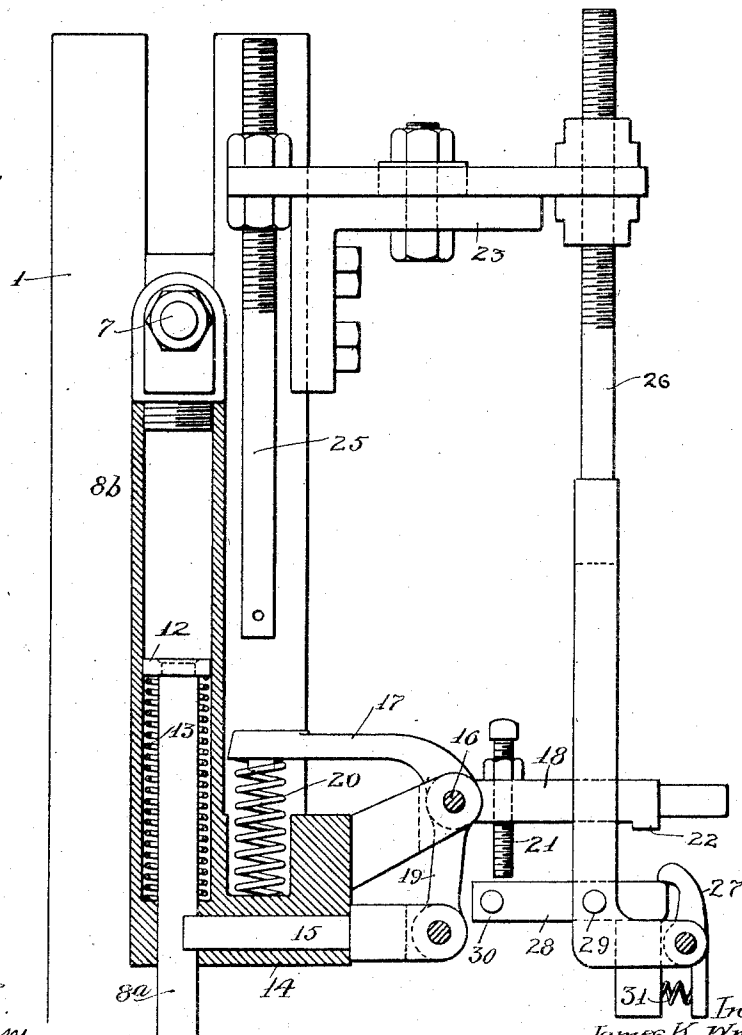


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

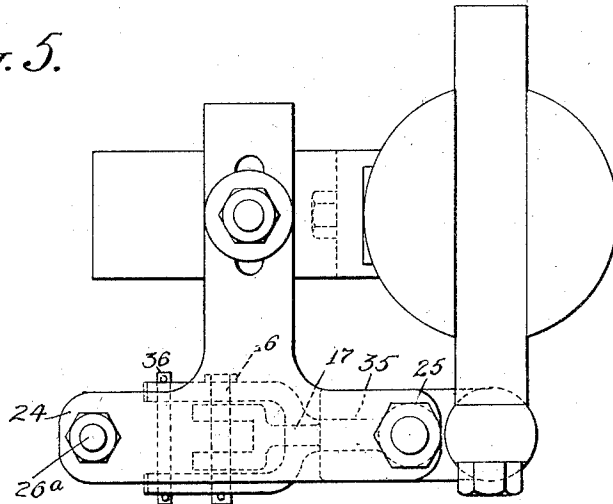
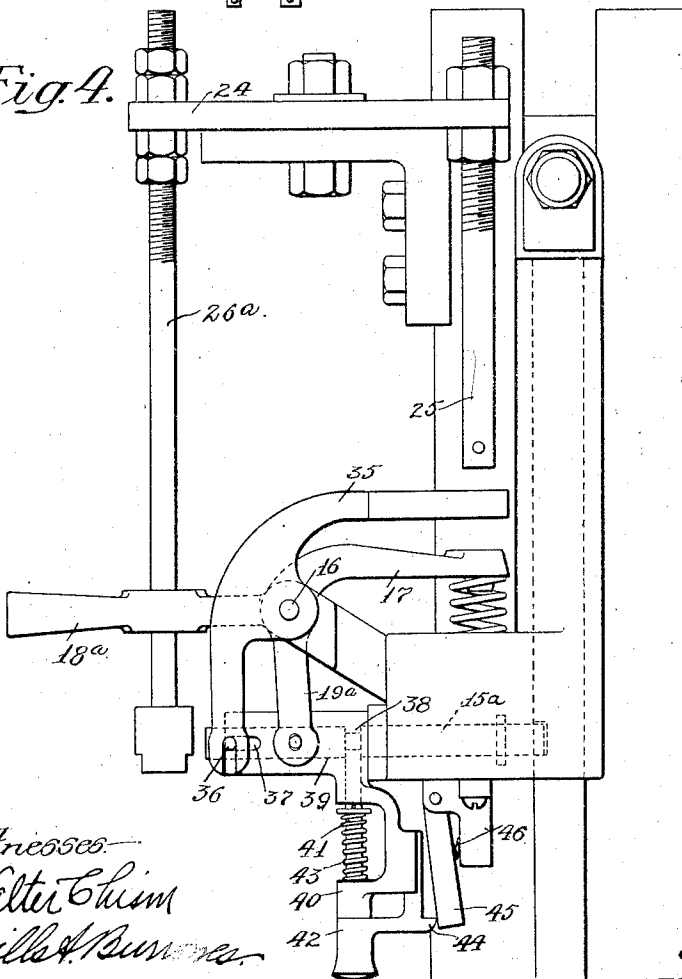


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES K. WRIGHT, OF NEW YORK, N. Y.

AUTOMATIC ENGINE-STOP.

1,020,940.

Specification of Letters Patent. Patented Mar. 19, 1912.

Application filed August 21, 1911. Serial No. 645,256.

To all whom it may concern:

Be it known that I, JAMES K. WRIGHT, a citizen of the United States, and a resident of the city of New York, State of New York, have invented certain Improvements in Automatic Engine-Stops, of which the following is a specification.

My invention relates to that class of mechanism particularly designed to automatically cut off the steam from an engine whenever the engine speed is above or below predetermined limits and more particularly has to do with improvements to the automatic safety stop device described and claimed in my Patent No. 602,384, granted April 12, 1898.

One object of the present invention is to so construct and arrange the various parts of an engine stop of the general type above noted that it shall at all times be in condition for automatic operation, in order to prevent the engine speed departing from the predetermined limits even though the operator should, while the engine was running, set the mechanism so that the two parts of the governor rod would not be disconnected when the engine was shut down by hand.

I further desire to provide an engine stop which shall at all times be in condition to automatically cause shutting down of the engine whenever the speed thereof exceeds a predetermined maximum, but which shall notwithstanding be possessed of independent means for likewise shutting down the engine when its speed falls below a predetermined minimum; it being desired that the latter part of the apparatus shall be capable of being set to operate or not as desired when the engine is being shut down, as heretofore noted.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which;—

Figure 1 is a side elevation of a portion of an engine governor having my invention applied thereto; Fig. 2, is an enlarged elevation, partly in section, further illustrating the apparatus shown in Fig. 1; Fig. 3, is a plan of the apparatus shown in Fig. 2, and Figs. 4 and 5 are respectively a side elevation and a plan illustrating my invention as slightly modified to adapt it for use in connection with the apparatus described and claimed in my patent aforesaid.

Referring to Fig. 1 of the above drawings, 1 represents the vertical column or bracket in which is mounted a spindle 2 forming part of the governor mechanism of an engine. This mechanism includes the customary arms, of which one is indicated at 3, having ball weights 4 at their ends and connected by links 5 to a sleeve 6 slidably mounted on the governor spindle 2. This form of governor being old and well known, is not illustrated or described in detail and it is to be understood that my apparatus may be used with equal advantage on other forms of engine governors without departing from my invention. The sleeve 6 is connected through a bolt or pin 7 with a vertically movable governor rod 8 attached to an arm 9 fixed to a rocker shaft 10; there being other arms 11, in the present instance integral with this arm 9 connected to the movable cams which control the operation of the steam valves of the engine.

As best shown in Fig. 2, the governor rod 8 is formed in two parts 8^a and 8^b, of which the latter is tubular and contains the upper end of the former, there being a head 12 on said part 8^a and a spring 13 confined between said head and the bottom of the tubular recess in the part 8^b. Said latter part of the governor rod is provided with a laterally extending lug or bracket 14 in which is slidably mounted a locking bolt 15 capable of entering a recess in the part 8^a of the governor rod so as to couple this to the part 8^b. The bracket 14 also provides a bearing for the pivot pin or fulcrum 16 of a lever having three arms 17, 18, and 19 of which the latter arm is pivotally connected to the locking bolt 15. The arm 17 of the lever is acted on by a spring 20 so as to at all times tend to force the locking bolt 15 toward the part 8^a of the governor rod, while the arm 18 has mounted in it an adjustable abutment 21 in the form of a set screw and is provided adjacent its outer end with a short downward extension and enlargement 22.

Fixed to the column or bracket 1 of the governor is an angle iron 23 to which is fixed a T-shaped plate 24 and from this latter depend a pair of rods 25 and 26 forming abutments both of which are adjustably mounted in said plate 24 by means of holding nuts threaded upon them as shown. The rod or abutment 25 extends downward immediately above and in line with the outer end of the lever arm 17 so that when this

latter is raised a predetermined distance it is engaged by said abutment and caused to turn on its pivot. The lower end of the rod or abutment 26 is turned at right angles to its length and has pivotally mounted on this lateral extension a latch 27 designed to engage and hold one end of a bar 28 pivoted at 29 to said abutment 26. Said bar 28 is so placed that its end farthest from the latch 27 extends under and may, under certain conditions, be engaged by the lower end of the abutment 21; there being in said end of the bar a transverse extension 30 to permit of its manipulation by hand. A spring 31 acts on the latch 27 to press its hooked upper end toward the adjacent end of the bar 28.

With this arrangement of parts it will be understood that as long as the locking bolt 15 is in the position shown in Fig. 2, the two parts 8^a and 8^b of the governor rod are operatively connected and the rising and falling of the governor balls exert the customary effect on the controlling mechanism of the steam admission valves of the engine. If, however, for any reason the speed of the engine exceeds a predetermined maximum, the governor balls fly out, thereby raising the governor rod 8 with its attached mechanism and bringing the end of the arm 17 into engagement with the lower end of the rod or abutment 25. As a consequence the three-armed lever is turned on its pivot against the action of the spring 20 and is drawn out of engagement with the part 8^a of the governor rod. The spring 13, being normally maintained under compression, now moves this part 8^a of the governor rod toward and into the cavity of the part 8^b thereof and so actuates the valve controlling mechanism of the engine as to cut off all steam to said engine and shut down the same. It is thereafter necessary in order to again start the engine, that the part 8^b be moved away from the part 8^a of the governor rod against the action of the spring 13 until, under the action of the spring 20, the locking bolt 15 is caused to enter its recess in the part 8^a of said rod.

As shown in dotted lines in Fig. 1, the trip bar 28 is so pivoted to the rod or abutment 26 that it normally occupies a substantially vertical position so that in case the engine speed falls below a predetermined minimum, the governor rod 8 with its attached mechanism moves downwardly until the arm 18 of the three-arm lever strikes said trip bar and being turned thereby on its pivot 16, is caused to so move the locking bolt 15 as to draw this out of engagement with the part 8^a of the governor rod. As before, this so actuates the valve controlling mechanism of the engine as to shut down the latter. It is obvious that when the engine is being shut down by hand, the trip bar 28 would ordi-

narly operate the locking bolt 15 as above described and render it necessary for the parts 8^a and 8^b to be connected before the engine could be again started up. In order to prevent this, therefore, the trip bar 28 may at any time be moved to the position shown in Fig. 2, with one of its ends in engagement with the latch 27, in which position the engine may be shut down by hand without causing a disconnection of the two parts 8^a and 8^b of the governor rod. It is noted, however, that before the governor balls have dropped to their lowest positions, the set screw abutment 21 strikes the trip bar 28 and turns it on its fulcrum pivot 29 sufficiently to disengage its opposite end from the latch 27 without, however, causing such a turning of the lever on its pivot 16 as will move the locking bolt 15 out of engagement with the governor rod. As soon, however, as the engine is again set in operation the governor balls fly outward and cause raising of the governor rod, thus moving the set screw abutment 21 away from the trip bar 28, which is thus free to assume its vertical position ready for operation.

From the above it will be noted that even with the most careless handling the apparatus is at all times ready to properly perform its functions whenever the speed of the engine rises or falls below the predetermined limits. It will further be seen that the two abutments 25 and 26 are operatively independent of each other; that is to say, either of them is at all times in condition to operate in the manner for which it is designed regardless of the condition or adjustment of the other, so that the apparatus is by my improvement rendered certain in its operation while at the same time the possibility of its becoming disordered is reduced to a minimum.

If it be desired to equip an engine stop made according to my patent above noted with the improvements forming the subject of my present application for patent, this may be accomplished by means illustrated in Figs. 4 and 5. When this idea in view the bar or abutment 26 is replaced by an abutment 26^a in the form of a rod rigidly mounted in the plate 24 and extended through a suitable opening in the arm 18^a of the three-armed lever; there being a head 27^a on said rod. In addition to this three-armed lever there is mounted on the pivot pin 16 a second lever 35 having one arm placed to extend immediately above the arm 17 in such position as to be engaged by the abutment rod 25 when this has been moved upwardly a sufficient distance. The opposite end of this second lever is formed to extend in a line substantially at right angles to the line of its first arm and is pivoted to the locking bolt 15^a by a pin 36; its lower end being slotted to accommodate said pin.

Also mounted on the locking bolt is a cylindrical sleeve 39 which is free to slide and is provided with a slot 37 so that such sliding is not interfered with by the pin 36; the arm 19^a of the three-armed lever being suitably slotted and pivoted to said sleeve. This latter has attached to it, in the present instance integrally, a bracket 40, having suitable bearings for a longitudinally movable auxiliary locking bolt 41 which extends in a line at right angles to the locking bolt 15^a and is capable of engaging an annular recess therein when said bolt is in a predetermined position. The auxiliary locking bolt is at all times pressed toward the locking bolt 15^a by means of a spring 43 suitably mounted in the bracket 40 and has fixed to it an operating handle 42 provided with a trigger 44 placed to engage a latch 45 which is pressed toward it by a suitable spring 46 and is pivotally mounted on a portion of the tubular element of the governor rod. In this case, as before, the apparatus may be so set that when the engine is shut down there will be no disconnection of the two members or parts of the governor rod and for this purpose the handle 42 would be pushed down so as to withdraw the auxiliary locking bolt 41 from the annular recess 38 of the locking bolt 15^a; being held in this position by the latch 45 and trigger 44. While in this case the latch 45 is not automatically released so as to again lock the sleeve 39 and the locking bolt 15^a when the engine is started up, the apparatus is none the less at all times in condition to cause the automatic separation of the two parts of the governor rod when the speed exceeds a predetermined maximum, since as soon as this condition exists, the upper arm of the second lever 35 is brought into engagement with the lower end of the abutment 25, thereby moving the locking bolt 15^a out of engagement with the recess in the governor rod and permitting the two parts of this latter to separate with the results above noted.

I claim:—

1. The combination with a governor rod made in two sections, of a member for connecting said sections; a lever connected to said member; and two stops for actuating the lever to operate said member when the governor balls move from their normal paths of operation, one of the stops including means whereby it may be made temporarily inoperative to actuate the lever.
2. The combination with a governor rod made in two sections, of a member for connecting said sections; a lever connected to said member; and two stops for actuating the lever to operate the member when the governor balls move from their normal paths of operation; with a device interposed between one of the stops and the lever for

rendering said stop inoperative under predetermined conditions.

3. The combination with a governor rod made in two sections, of a member for connecting said sections; a lever connected to said member; and two stops for actuating the lever to operate the member when the governor balls move from their normal paths of operation; a device interposed between one of the stops and the lever and adjustable to render said stop inoperative under predetermined conditions; and means for automatically re-setting said device after it has once prevented actuation of the lever.

4. The combination with a governor rod made in two sections of a member for connecting said sections; a lever connected to said member; and two stops independently operative on the lever for actuating the member; one of the stops including a latch adjustable at will to cause the lever to be operated or not by said stop as may be desired.

5. The combination with a governor rod made in two sections, of a member for connecting said sections; a lever connected to said member; two stops independently operative on the lever for actuating the member; one of the stops including a latch adjustable at will to cause the lever to be operated or not by said stop as may be desired; with means on the lever for automatically re-setting the latch after it has been placed in position to prevent actuation of the lever.

6. The combination with a governor rod made in two sections, of a pin for connecting said sections; a three-armed lever having one arm connected to said pin; two stops mounted to respectively engage the other two arms of the lever; a latch on one of the stops movable into and out of a position in which it is capable of actuating the lever to operate the pin; and means for holding said latch in its inoperative position.

7. The combination with a governor rod made in two sections; of a pin for connecting said sections; a three-armed lever having one arm connected to said pin; two stops mounted to respectively engage the other two arms of the lever; a latch on one of the stops movable into and out of a position in which it is capable of actuating the lever to operate the pin; means for holding said latch in its in-operative position; and a device on the lever for tripping the latch under predetermined conditions.

8. The combination with a governor rod made in two sections of a member connecting said sections; a lever connected to said member; and a stop for actuating the lever including a latch movable into and out of a position in which it is capable of actuating the lever to move the member attached thereto.

9. The combination with a governor rod

made in two sections, of a member connecting said sections; a lever connected to said member; a stop for actuating the lever including a latch movable into and out of a position in which it is capable of actuating the lever to move the member attached thereto; with a spring catch for holding said latch in an inoperative position.

10 10. The combination with a governor rod made in two sections, of a member connecting said sections; a lever connected to said member; a stop for the lever including a latch movable into and out of a position in

which it is capable of actuating the lever to move the member attached thereto; a spring catch for holding said latch in an inoperative position; and an abutment on the lever for releasing said latch from the spring catch.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAMES K. WRIGHT.

Witnesses:

LAURA E. SMITH,
AMY P. SIMPSON.

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