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STOP FOR ENGINES.

APPLICATION FILED AUG. 14, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

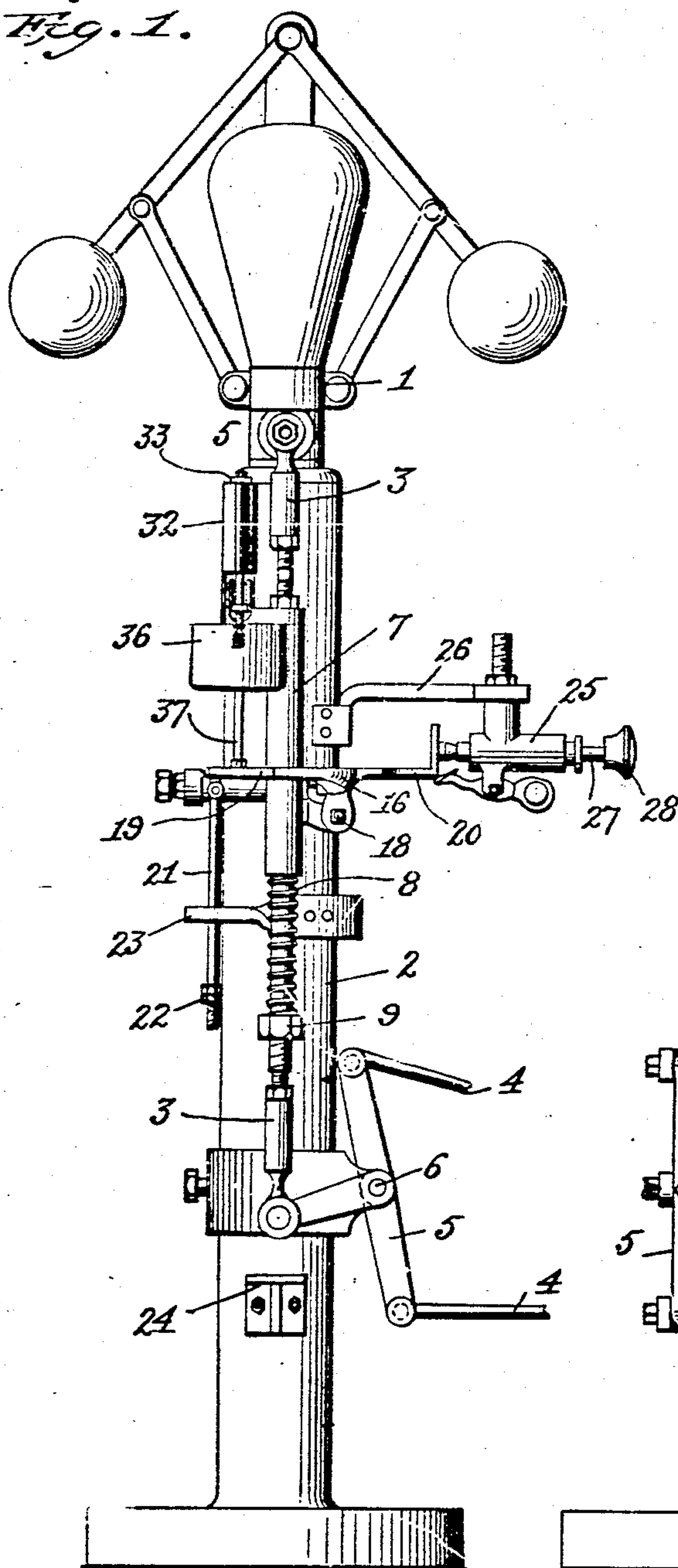
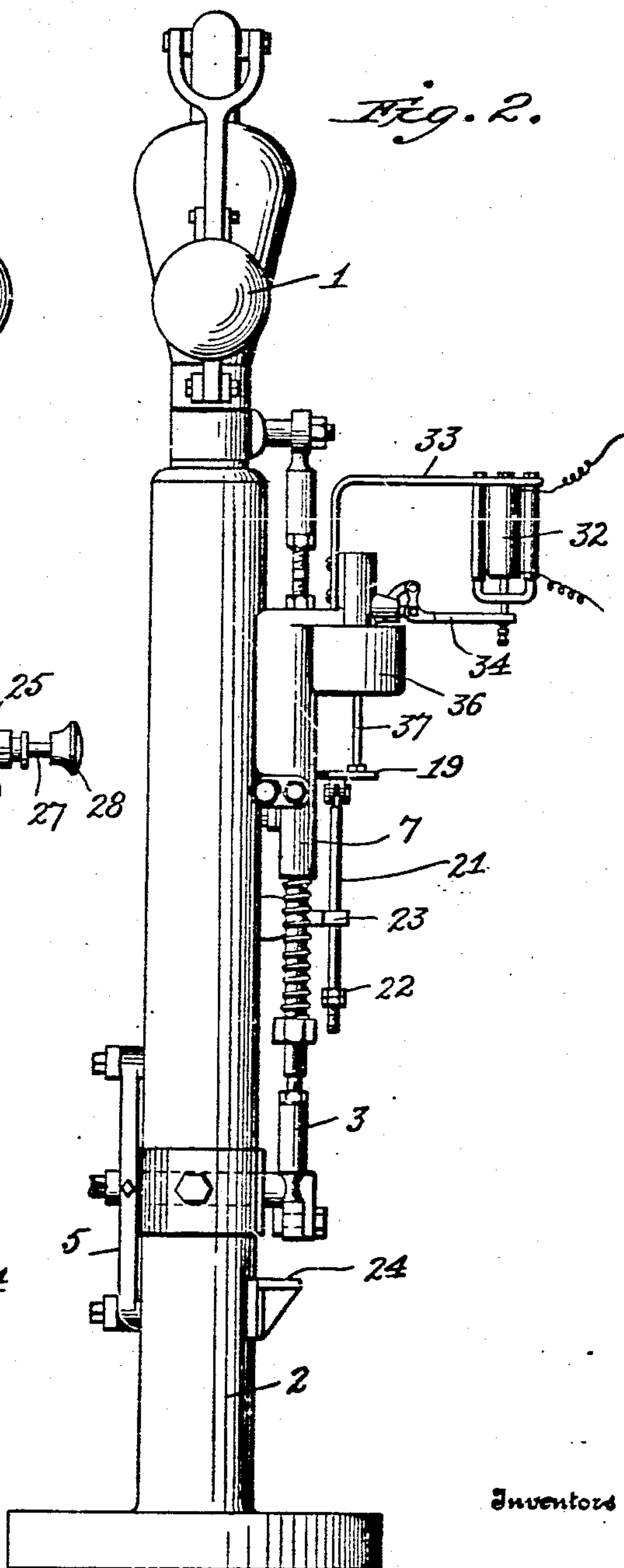


Fig. 2.



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STOP FOR ENGINES.

No. 889,459.

Specification of Letters Patent.

Patented June 2, 1908.

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To all whom it may concern:

Be it known that we, THOMAS GRIEVE and JAMES MORRISSEY, citizens of the United States, residing at Perth Amboy, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Automatic Stops for Engines and the Like, of which the following is a specification.

Our invention relates to a certain new and useful automatic engine stop, especially designed to form a part of the equipment of the flyball governor of a Corliss engine. It will be apparent that the stop can be arranged, with slight modifications, for other types of engines, if desired, or any other piece of mechanism where an automatic or quick cut out is required.

As is well known, by the raising of the balls of the governor above a certain plane, or the lowering of the same to a certain extent, on a Corliss engine valve motion, the blades of the steam admission valves are caused to cover the ports completely, so as to cut off entirely the admission of steam to the cylinder. Advantage is taken of this fact in the engine stop of the present invention which accomplishes the same end as lowering the governor balls, and their connections, below a plane where the valves would operate; that is the steam admission valves are positioned so as to cut off entirely steam to the engine when the stop is operated.

The attachment constituting the invention may be readily applied to the ordinary governor mechanism of a Corliss engine, it being only necessary to cut the main side rod of the governor and apply the necessary supporting brackets to the governor post.

Our invention, as will more fully appear hereinafter contemplates the operation of the stop mechanism effectively and certainly; (1) when the speed tends to increase to a dangerous degree; (2) should the governor belt break or too heavy a load be suddenly thrown upon the engine; or (3) from any distant point at the will of the operator.

The structural features of the invention will be set forth more fully in the following detailed description taken in connection with the accompanying drawing wherein like parts are designated by like reference characters.

Referring to the drawings, Figure 1, is a

front elevation of a Corliss engine governor provided with our improved attachment; Fig. 2, is a side view thereof, Fig. 3, is a plan view and horizontal section; Fig. 4, is a detail vertical section on line 4—4 of Fig. 3; Fig. 5, is a detail vertical section, and Fig. 6, is a fragmentary and detail vertical section.

The usual flyball governor parts 1, are mounted upon the governor post 2 in the usual manner and connection is made by side rod 3 with the regulator rods 4, 4 by means of lever system 5, pivoted at 6, as is common in the art. When the governor is performing its customary function the rod 3 acts precisely like the ordinary side rod in the conventional governor of this type. For the purposes of our invention, however, said rod 3 intermediate its ends and the end adjacent the governor balls has adjustably secured thereto by threaded engagement or otherwise a hollow cylinder 7, which cylinder carries certain other elements hereinafter referred to.

The lower section of rod 3 is guided to telescope within cylinder 7 and a compression spring 8 is mounted on said rod section between the end of said cylinder and an adjustable stop 9 shown as threaded on the rod. The said lower rod section is normally held within the cylinder 7 to an extent to make the entire rod 3 of the proper working length and maintain spring 8 under tension, by means of a pin 10 slidingly mounted in an extension of said cylinder and arranged to engage a peripheral groove 11 formed in the lower rod section. Said pin 10 (see Fig. 3) is yieldingly urged into engagement with said groove by a spring 12 which has an abutment against an adjusting screw 13 carried by a lug 14 projecting from cylinder 7. Means are provided to disengage the said pin 10 from groove 11, and as shown such means consists of a rod 15 rigid with the pin and pivotally connected at 17 to a trip lever 16. Said trip lever 16 is fulcrumed at 18 to a lug secured to cylinder 7 and has arms 19, 20, projecting laterally to either side of said cylinder.

Secured to arm 19 is a downwardly projecting rod 21 having thereon an adjustable stop 22. The rod 21 passes through an opening in a fixed bracket 23 secured to the governor post 2 and the stop 22 is adapted to contact with said bracket upon the extreme

movement of rod 21 and cylinder 7, caused by excessive action of the governor balls. It will be apparent that this will cause the trip lever 16 to withdraw the pin 10 from groove 11 and that thereupon the spring 8 will be free to act to throw the lower section of rod 3 downward thus causing the regulator rods 4—4 to render the inlet valves inoperative, the same as though the balls of the governor had suddenly dropped. A bracket 24 is provided to limit the downward movement of the lower rod section as described.

We will now describe our improved devices whereby the trip lever 16 and hence the stop device will be caused to operate should the governor belt break or too heavy a load be suddenly thrown upon the engine.

A cylinder 25 is secured to a stationary bracket 26 on the post 2, and holds for sliding movement a pin 27. This pin is normally forced outwardly into the path of arm 20 by a spring 29 and has a knob 28 whereby it may be manually retracted. As will be seen at 30 the outer end of the pin 27 has a conical or cup-shaped depression, and a suitable counterweighted hook 31 is pivoted so as to swing into engagement with said depression and lock the pin 27 in a position as shown in full lines in Fig. 6 and from passing to its extreme outer position as indicated in Fig. 1. When this part of the apparatus is in operative position, as shown in Fig. 1, the pin 27 is held projected by spring 29 and on downward movement of the trip lever 16, as would be caused by the sudden dropping of the governor balls in one of the events supposed, the trip lever would engage said pin 27, causing the withdrawal of pin 10 and the operation of the stop device in the manner before explained. In case it be desired to close down the engine by shutting the throttle valve without having the last described stop mechanism come into action and break the divided side rod 3, which would be the case under ordinary conditions, the attendant pulls in pin 27 against the action of spring 29; thereupon the hook 31 engages the cupped end of said pin, thus holding it inward. The lever arm 20 may now pass downward clear of the pin 27 and hence without tripping out pin 10 and operating the stop. As the arm 20 continues to pass downward it makes contact with a projection on hook 31 which releases the hook from the cupped end of the pin and hence said pin will be at once again forced outward by its spring against the face of lever arm 20, as shown in Fig. 1. When the engine is again started up, no further attention is necessary on the part of the attendant, as the lever arm 20 is arranged to slip upward past the pin 27, which is again projected outward beneath it and is again set in position to take care of the low speed limit.

As heretofore indicated, mechanism is provided for operating the trip lever of the stop device from a distance. This comprises any form of solenoid or electro-magnet 32 having connection to be energized from any desired distant point, said magnet being supported from a fixed bracket 33. This magnet is arranged to pull up a lever arm 34 and as shown clearly in Fig. 5, to so withdraw a trip pin 35 connected thereto from an engaging groove 35' therefor on a vertically slidable weight 36. Said weight is then free to slide upon its guide rod 37 and being disposed directly over the lever arm 19, will upon its drop operate the said arm to trip the pin 10 and operate the stop device as heretofore explained.

It will thus be seen that we provide a simple and efficient stop device, which has few parts liable to get out of order and is at the same time certain and positive in action.

Having now fully described our said invention, what we claim as new and desire to secure by Letters Patent is as follows:—

1. An automatic stop device comprising a governor, a valve mechanism, a connecting rod therebetween, in two sections, means for normally causing said sections to act in unison, adjustable spring means tending to operate the valve section of said rod independently, and means for tripping the connection between said rod sections, said means consisting of an operator carried by the rod, a member carrying an adjustable stop depending therefrom, and a bracket fixed to the governor post, in the path of said stop to cooperate therewith.

2. An automatic stop device comprising a governor, a valve mechanism, a connecting rod therebetween in two sections, means for normally causing said sections to act in unison, adjustable spring means tending to operate the valve section of said rod independently, and means for tripping the connection between said rod sections, said means consisting of a lever movable with the rod, an adjustable abutment depending therefrom and a fixed stop arranged in the path of said abutment.

3. An automatic stop attachment for Corliss engines and the like, comprising a sectional connecting rod between the governor and valve mechanism, a hollow cylinder adapted to be adjusted upon one section of said rod and to have telescopic engagement with the other section, an adjustable abutment on the second section of said rod, a spring on said latter section arranged to be compressed between an end of said cylinder and said abutment, a device to normally hold the rod sections locked together and means to trip said holding device upon excessive longitudinal movement of the rod.

4. An automatic stop device for Corliss

engines and the like, comprising a sectional connecting rod between the governor and valve mechanism, means tending to move the valve section of said rod independently, 5 a lock for normally causing the movement of the rod sections together and a trip for said lock arranged to be operated by excessive movement of said rod, said trip consisting of a projecting lever, a pin normally 10 spring pressed into the path of said lever, and means to hold said pin retracted at option.

5. An automatic stop device for Corliss engines and the like, comprising a sectional connecting rod between the governor and 15 valve mechanism, means tending to move the valve section of said rod independently, a lock for normally causing the movement of the rod sections together and a trip for said lock arranged to be operated by excessive 20 movement of said rod, said trip consisting of a projecting lever, a stop normally held in the path of said lever, but arranged to be retracted at option, a device to hold said stop when in retracted position, said device ar- 25 ranged to be disengaged by contact with said lever to again allow said stop to assume its operative position.

6. An automatic stop device for Corliss engines and the like, comprising a sectional 30 connecting rod between the governor and valve mechanism, means tending to move the valve section of said rod independently, a lock for normally causing the movement of the rod sections together and a trip for said 35 lock arranged to be operated by excessive movement of said rod, said trip consisting of a two armed lever, means adapted to contact with one arm of said lever to operate the trip on excessive movement of the rod in one di- 40 rection and retractile means adapted to engage the other arm of said lever on excessive movement of the rod in the opposite direction or be out of the path of the lever.

7. An automatic stop device for Corliss 45 engines and the like, comprising a sectional connecting rod between the governor and valve mechanism, means tending to move the valve section of said rod independently, a lock for normally causing the movement of 50 the rod sections together and a trip for said lock arranged to be operated by excessive movement of said rod, said trip consisting of two armed lever, means adapted to contact with one arm of said lever to operate the trip 55 on excessive movement of the rod in one direction and means adapted to engage the other arm of said lever on excessive movement of the rod in the opposite direction, said latter means having provision for ren- 60 dering the same inoperative at option.

8. An automatic stop for governor mechanism comprising a sectional rod connecting the governor and valve devices, a tension device tending to move the valve section of

said rod separately, a lock to normally hold 65 the rod sections together, and means for tripping said lock, said means consisting of a trip lever on the rod, a spring pin normally in the path of said lever, and a counterweight piv- 70 oted hook arranged to engage said spring pin when the same is retracted, said hook having a part adapted to be engaged by the trip lever to release said spring pin and allow the same to reset.

9. A stop device for governor mechanisms 75 comprising a sectional rod connecting the governor and valve devices, a tension device tending to move the valve section of said rod separately, a lock to normally hold the rod 80 sections together, and means for tripping said lock, said means consisting of a normally suspended weight carried by and movable with the governor parts, electro-magnetic 85 means to loose said weight and allow it to drop, and a lever in the path of drop of said weight arranged to disengage said lock for the rod sections.

10. A stop device for governor mechanisms comprising a sectional rod connecting the governor and valve devices, a tension device 90 tending to move the valve section of said rod separately, a lock to normally hold the rod sections together, and means for tripping the said lock, said means consisting of a lever arm movable with said rod, a depending 95 adjustable stop carried by said lever arm, a fixed stop in the path of excess movement of said adjustable stop, a weight also movable with said rod and normally held suspended above said lever arm and means to release 100 said weight at will from a distant point.

11. An automatic stop for governor mechanisms comprising a sectional rod connecting the governor and valve devices, a tension 105 device tending to move the valve section of said rod separately, a lock to normally hold the rod sections together, and means for tripping said lock, said means consisting of a trip lever on the rod, a spring pin normally 110 in the path of said lever, said pin having a conical depression in its outer end, and a hook arranged to engage said conical depression when the spring pin is retracted, said hook having connections operated as the trip 115 lever passes the spring pin to allow the same to reset.

12. An automatic stop device for Corliss engine governors and the like, comprising a governor, valve devices, a sectional rod to 120 connect the same, a spring tending to operate the valve section of said rod separately, a lock for normally holding the rod sections for movement together, and means for tripping said lock said means consisting of a 125 lever having oppositely extending arms, and carried with said rod, a depending adjustable stop carried by one of said arms, a fixed stop arranged to engage said adjustable stop from

excess movement of the rod in one direction,
a spring pin normally in the path of the other
of said arms upon excess movement of the
rod in the opposite direction, said pin being
5 adapted to be normally retracted, and means
to hold said pin retracted until passed by
said lever arm and arranged to then release
the pin and allow the same to reset.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS GRIEVE.
JAMES MORRISSEY.

Witnesses:

JOHN T. PHILLIPS,
GEO. H. COATES.