No. 686,168. Patented Nov. 5, 1901.

H. J. TEIPER.

AUTOMATIC STOP AND EMERGENCY GEAR FOR MARINE AND STATIONARY ENGINES.

(Application filed June 5, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

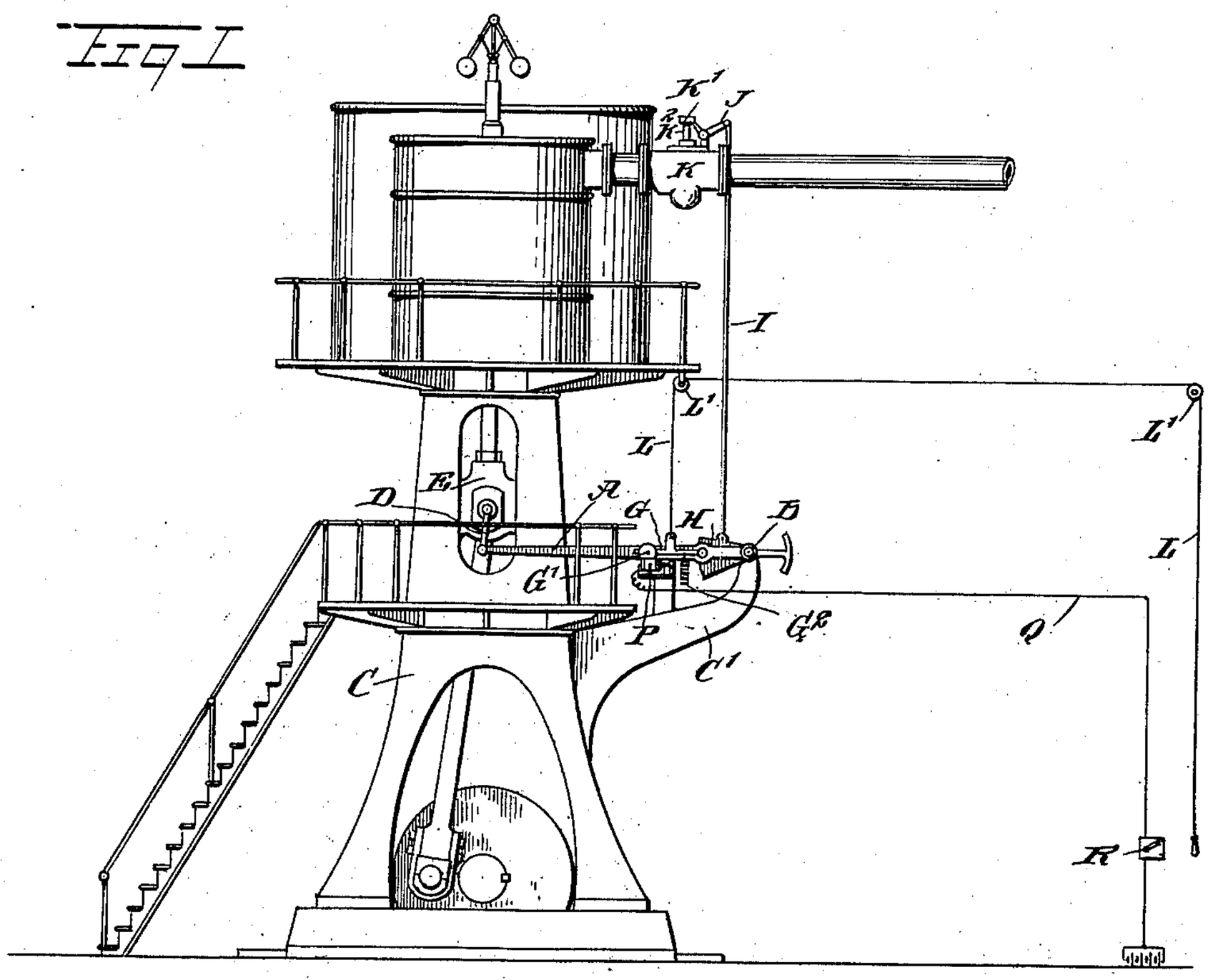

Fig 2

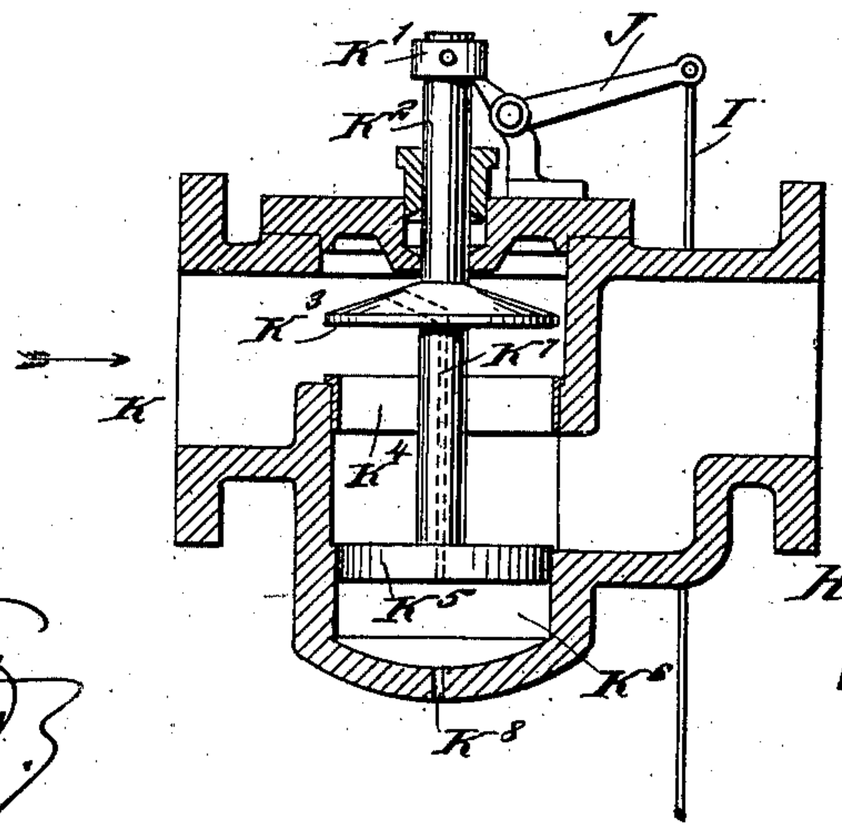

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Fig 3

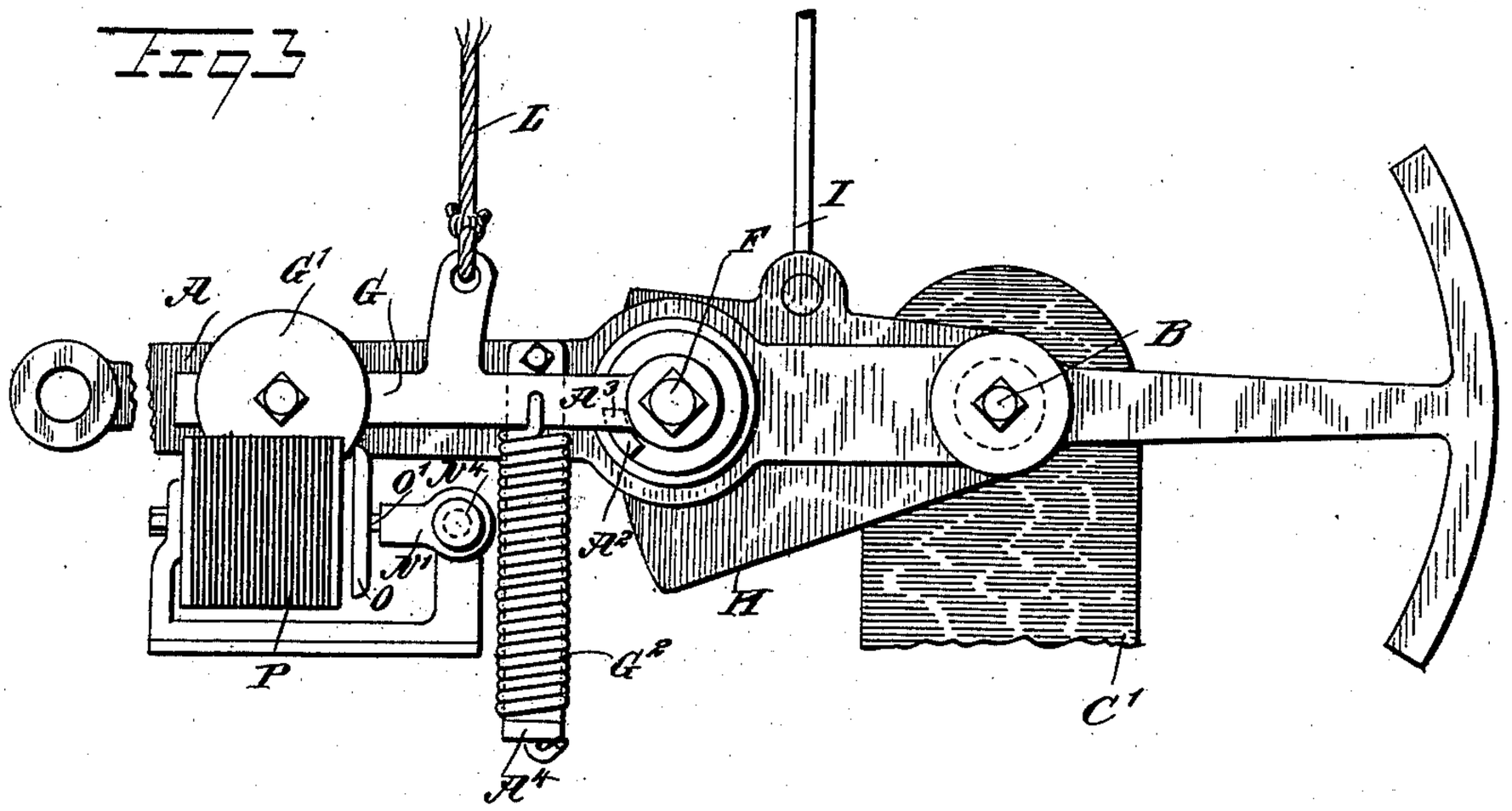


Fig 4

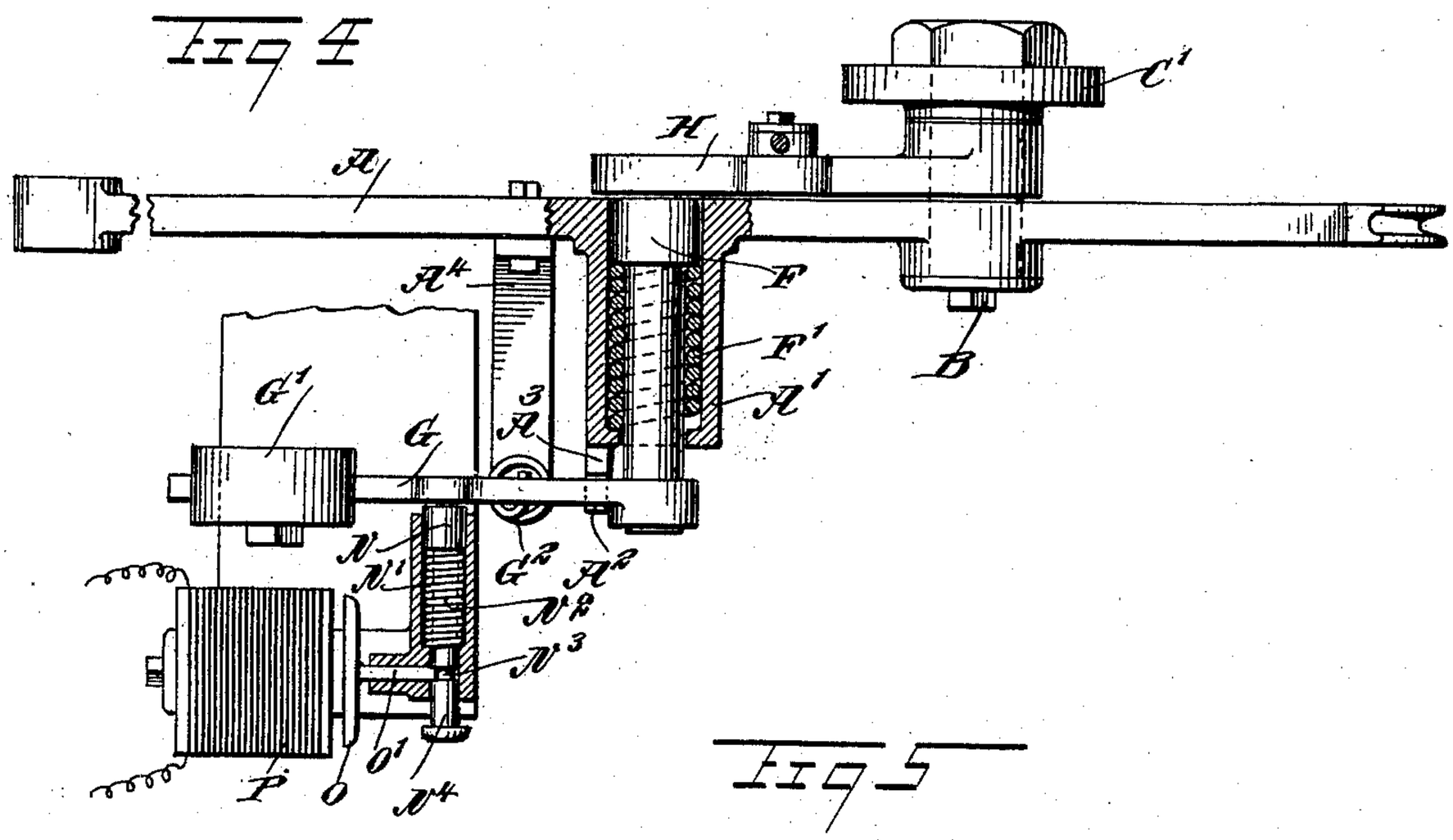
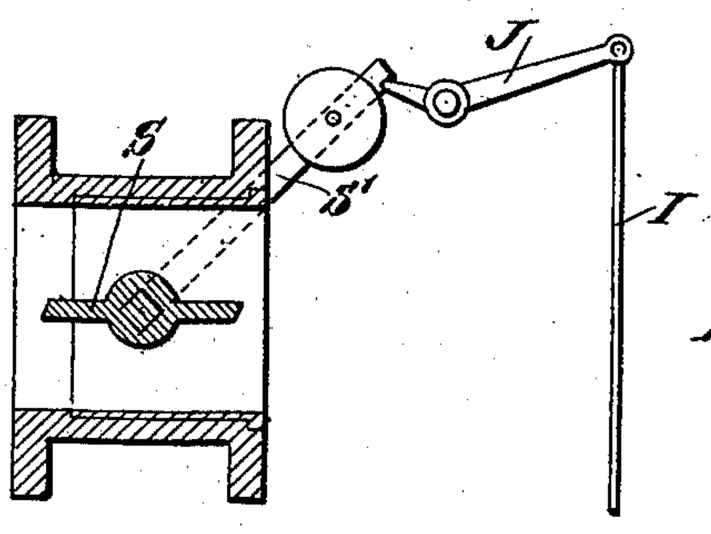


Fig 5



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AUTOMATIC STOP AND EMERGENCY GEAR FOR MARINE AND STATIONARY ENGINES.

SPECIFICATION forming part of Letters Patent No. 686,168, dated November 5, 1901.

Application filed June 5, 1901. Serial No. 63,217. (No model.)

To all whom it may concern:

Be it known that I, HENRY JOHN TEIPER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Automatic Stop and Emergency Gear for Marine and Stationary Engines, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved automatic stop and emergency gear for marine and stationary engines arranged to permit the operator to immediately close the motive-agent throttle-valve from any part of the engine-room, building, or vessel and to automatically close said valve in case the engine starts to run at a speed exceeding a normal rate as the result of the breaking of a shaft, propeller, driving-wheel, belt, or from other cause, such as the governor-belt breaking or slipping off the pulley or the regulating-gear not acting quickly, to prevent the engine from racing when the load is suddenly thrown off.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied to a vertical engine. Fig. 2 is an enlarged sectional side elevation of the throttle-valve and connected parts. Fig. 3 is an enlarged side elevation of the improvement. Fig. 4 is a plan view of the same with parts in section, and Fig. 5 is a sectional side elevation of a modified form of throttle-valve.

A lever A is fulcrumed on a stud B, secured to a column or bracket C′ of an engine C of any approved construction, and the free end of said lever A has a connection D with an operating part of the engine—for instance, as shown, with the cross-head E—so that when the engine is running a continuous swinging motion will be given to the lever A. The lever A is preferably one of the indicator motion, but may be a separate one, if desired. When the two pumps are worked from the main engine, the pump-line may be used.

On the lever A, near the fulcrum thereof, is arranged a transversely-extending casing A′, in which is mounted to slide a bolt F, pressed on by a spring F′ and carrying at one outer end an arm G, carrying an adjustable weight G′. The arm G is normally seated on a seat A^2, formed on the casing A′, the arm abutting against a shoulder A^3 on the casing. The arm G is held to its seat by the tension of a spring G^2, attached to a bracket A^4, carried by the lever A. When the arm G is on the seat A^2 and abuts against the shoulder A^3, then the bolt F is in a locked position against the tension of its spring F′ and its rear end is flush with the rear face of the lever A, as is plainly indicated in Fig. 4. If the gear is placed in a vertical position, as when attached to a horizontal engine, then the arm G would be held to its seat by the spring only. Now when the engine runs beyond a normal rate of speed then the weighted arm G overcomes the spring G^2, and consequently swings outward by inertia force from the seat A^2 and over the shoulder A^3, so that the spring F′ causes the bolt F to slide transversely, the rear end of the bolt moving into the path of an arm H, mounted to turn loosely on the stud B as the fulcrum. The arm H is connected by a link I with a bell-crank lever J, engaging the head K′ of the valve-stem K^2 of a valve K, normally held in an open position by said bell-crank lever and adapted to move into a closed position by its own weight as soon as the bell-crank lever J receives a swinging motion and disengages the head K′. Now it is evident that when the bolt F is released, as above described, at the time the engine runs beyond a normal rate of speed and the bolt F moves into the path of the arm H then the swinging motion of the lever A causes the bolt F to impart a swinging motion to the arm H in a downward direction, whereby the link I imparts a swinging motion to the bell-crank lever J, and the valve K is released, and the steam or other motive agent is shut off from the engine to stop the latter.

The arm G may be actuated directly by the operator by the use of a line L, passing over pulleys L′ and connected with said arm,

as indicated in Fig. 1. When the operator pulls the rope L, the arm G is caused to swing upward against the tension of its spring G^2 and away from the seat A^2 and the shoulder A^3 to cause the spring F′ to shoot the bolt F outward, and thereby actuate the arm H to release the throttle-valve K, as above described.

The arm G may be caused to swing into a released position by a device electrically controlled, and for this purpose a bolt N is mounted to slide in a casing N′ and is pressed on by a spring N^2 and normally locked in a withdrawn position by a pin O′ engaging an annular notch N^3 in the stem N^4 of the pin, as is plainly shown in Fig. 4. The pin O′ is secured to an armature O for an electromagnet P, containing in its circuit Q a switch R, located at any desired point in a building or ship, so that when the switch R is closed the electromagnet P is energized and attracts the armature O to withdraw the pin O′ from the notch N^3. When this takes place, the spring N^2 shoots the bolt N outward into the path of the arm G, so that when the lever A swings toward the arm G and carries the same along then the arm finally moves in contact with the bolt N, and upon further movement of the lever A toward the arm said lever is held stationary, and consequently becomes disengaged from the seat A^2 and shoulder A^3 to allow the spring N^2 to shoot the bolt outward into the path of the arm H and actuate the same, as previously explained.

The throttle-valve K, previously referred to, is preferably of the construction shown in detail in Fig. 2—that is, the stem K^2 carries a valve-disk K^3, adapted to be seated on a valve-seat K^4, but normally held in an open position by the bell-crank lever J engaging the head K′ of the valve-stem K^2 of the valve K. On the lower end of the valve-stem K^2 is secured a piston K^5, reciprocating in a cylinder K^6, forming part of the valve-casing and located on the discharge side of the valve. A port K^7 extends from the top of the valve-disk K^3 through the valve-stem K^2 to allow the steam to reach the cylinder K^6 and place the valve in equilibrium. The opening K^8 at the bottom of the cylinder K^6 is simply for a drain-pipe or cock to drain off any water that may accumulate under the piston. By the arrangement described the valve-disk K^3 and stem K^2 can be readily moved into an open position by the operator pulling on the head K′ or on an eyebolt in the top of the valve-stem in an upward direction, as the steam-pressure on the bottom of the piston K^5 counterbalances the pressure on the top of the valve-disk K^3, so that the latter readily moves off its seat for setting the valve in an open position. I do not limit myself, however, to the particular construction of the valve described, as it is evident that the device may be connected with any kind of a valve not working with a screw—for instance, as shown in Fig. 5, with a butterfly-valve S, carrying on its stem a weighted arm S′, normally held in a raised position by the bell-crank lever J. When the latter receives a swinging motion, as previously explained, then the weighted arm S′ is released and the valve is closed to shut off the motive agent.

The speed limit for the engine may be regulated by shifting the weight G′ on the lever G or by increasing or decreasing the tension of the spring G^2.

On a reversible engine the device may be connected to the reversing-gear, so as to throw the main valves into their central position, in which they will not admit steam to the cylinder, thus stopping the engine immediately.

I do not limit myself to the particular connection shown between the arm H and the throttle-valve, as the same may be varied. A combination of arms, shafts, and rods may be used.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An automatic stop and emergency gear for marine and stationary engines, comprising a lever receiving a continuous swinging motion from an operating part of the engine, a connection with the throttle-valve of the engine, to normally hold the valve open, an actuating device on said lever, and normally locked in a dormant position, a spring for moving said device to actuating position and a releasing device for unlocking said actuating device and engaging the latter with said connection, to actuate the connection upon a further movement of the lever, and to release the throttle-valve, as set forth.

2. An automatic stop and emergency gear for marine and stationary engines, comprising an arm connected with the throttle-valve to hold the latter normally in an open position, a lever connected with and receiving a swinging motion from an operating part of the engine, a spring-pressed bolt on said lever and arranged to engage said arm when the bolt is released, to impart movement to the arm from said lever, and a releasing device for said bolt, as set forth.

3. An automatic stop and emergency gear for marine and stationary engines, comprising an arm connected with the throttle-valve of the engine, to hold the valve normally in an open position, a lever connected with and actuated by a working part of the engine, a spring-pressed bolt carried by said lever and adapted to extend into the path of the said arm when released, and a weighted and spring-pressed arm on said bolt and engaging a rest or shoulder on the casing for the bolt, to hold the latter normally in a withdrawn position, as set forth.

4. An automatic stop and emergency gear for marine and stationary engines, comprising an arm connected with the throttle-valve of the engine, to hold the valve normally in an open position, a lever connected with and

actuated by a working part of the engine, a spring-pressed bolt carried by said lever and adapted to extend into the path of the said arm when released, a weighted and spring-pressed arm on said bolt and engaging a rest or shoulder on the casing for the bolt, to hold the latter normally in a withdrawn position, and means under the control of the operator, for imparting a swinging motion to said weighted and spring-pressed arm, to release the said bolt, as set forth.

5. An automatic stop and emergency gear for marine and stationary engines, comprising an arm connected with the throttle-valve of the engine, to hold the valve normally in an open position, a lever connected with and actuated by a working part of the engine, a spring-pressed bolt carried by said lever and adapted to extend into the path of said arm when released, a weighted and spring-pressed arm on said bolt and engaging a rest or shoulder on the casing for the bolt, to hold the latter normally in a withdrawn position, and means under the control of the operator, for imparting a swinging motion to said weighted and spring-pressed arm, to release the said bolt, said means comprising a second spring-bolt for engaging said arm, an armature for normally locking said second bolt in position against the tension of its spring, an electro-magnet for said armature, and a circuit having a switch and connected with said electro-magnet, as set forth.

6. An automatic stop and emergency gear for marine and stationary engines, comprising an arm connected with the throttle-valve to hold the latter normally in an open position, a lever connected with and receiving a swinging motion from an operating part of the engine, a spring-pressed bolt on said lever and arranged to engage said arm when the bolt is released, to impart movement to the arm from said lever, a releasing device for said bolt, and a connection between said arm and the throttle-valve, the connection comprising a link and a bell-crank lever, as set forth.

HENRY JOHN TEIPER.

Witnesses:
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