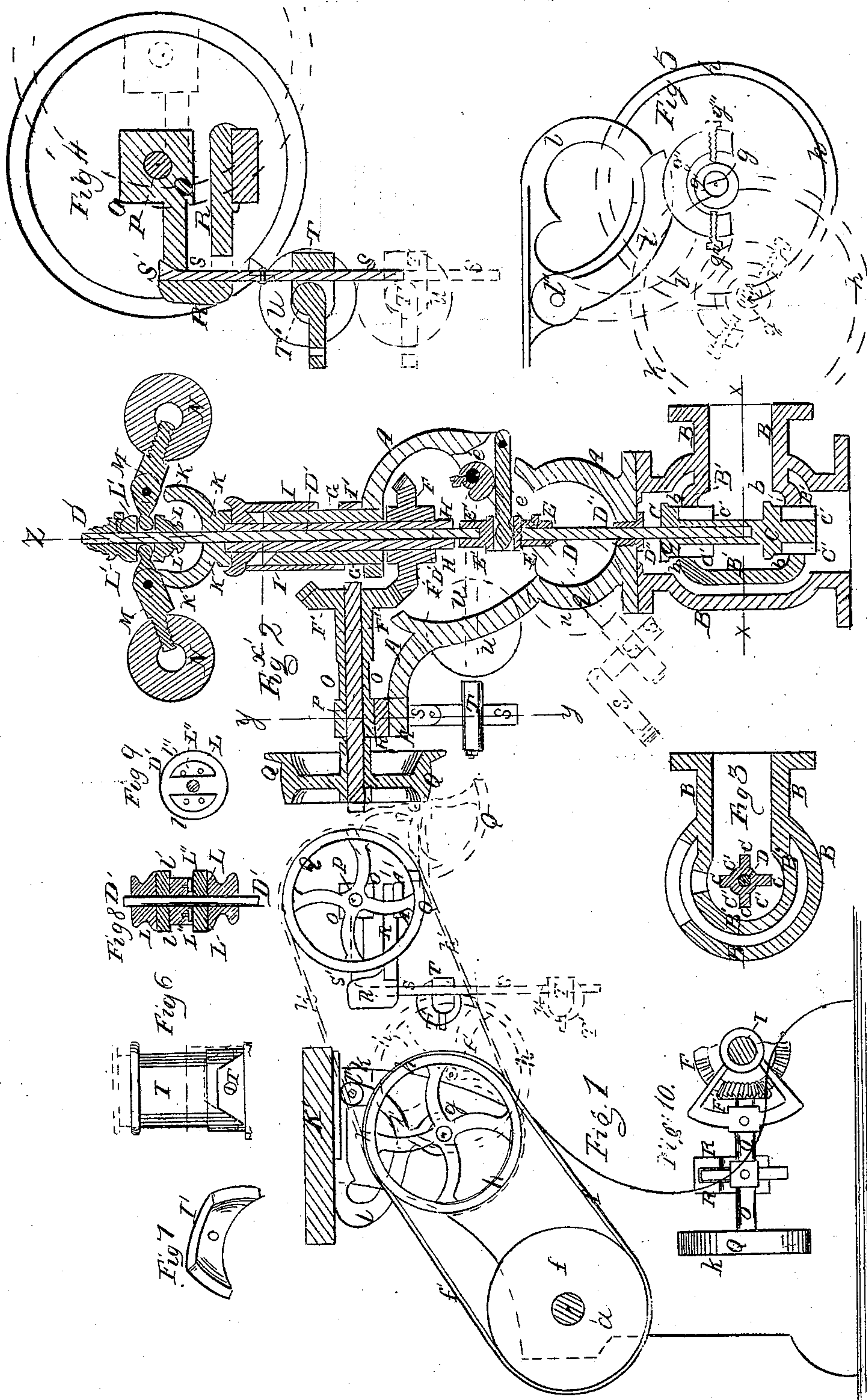


J. A. Letellier,

Gouverneur.

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Letters Patent No. 92,848, dated July 20, 1869.

IMPROVEMENT IN STEAM-ENGINE GOVERNOR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOSEPH F. LETELLIER, of Grand Rapids, Kent county, State of Michigan, have invented a new and useful Improvement in Governors for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation of the hangers, and of the pulleys which drive the governor, and also of a portion of the mechanism which releases the governor-valve, when the belt breaks or runs off from the pulley, and permits the same to close instantly;

Figure 2 is a vertical sectional elevation of the governor and its valve, showing the detaching-mechanism in position for use, and also, in red lines, the position which it assumes when it is released from the control of the governor, and has closed the valve;

Figure 3 is a transverse section on line *x x* of fig. 2;

Figure 4 is a transverse vertical section on line *y y* of fig. 1, showing the devices for holding the valve in position, when the engine is in operation;

Figure 5 is a side view of the hangers in which the countershaft, which may be used for driving the governor, are placed, showing, in black lines, the position they assume when in the proper position for operating the governor, and, in red lines, the position which they assume when the belt breaks or runs off from the pulley;

Figure 6 is an elevation of the sleeve, which slides vertically upon the spindle of the governor, and which has, upon its lower end, the inclined surfaces, for allowing it to drop down, in the event of the breakage or displacement of the belt;

Figure 7 is a perspective view of the stationary cam, or inclined plane, which is attached to the frame of the governor, and upon which the governor rises and falls;

Figure 8 is a vertical section through the cap upon the top of the spindle, on the line *z z*, showing the pins for uniting the parts thereof together;

Figure 9 is a transverse section of the same; and

Figure 10 is a sectional view of the governor, on line *x' x'* of fig. 2.

Corresponding letters refer to corresponding parts in the several figures.

This invention relates to that class of governors for steam-engines which is designed to automatically and instantly close the valve thereof, in the event of the breaking or displacement of the belt which drives the same; and

It consists in the construction, combination, and arrangement of its parts, as will be more fully described hereinafter.

A, in the drawings, represents the frame-work of the governor, the construction of which is clearly

shown in fig. 2 of the drawings, it being arranged upon the top of the case of the governor-valve.

B represents the case of the governor-valve, which may be placed upon the steam-chest, or in any other suitable position.

The construction and arrangement of this case are clearly shown in figs. 2 and 3.

C represents the double-seated valve, which is to be placed in the case B, and so arranged as to admit steam below both its faces into an outlet common to both.

D represents the spindle, or stem of the valve, which passes up through a stuffing or packing-box, D', in the lower end of the frame, and into the socket-joint, or connection E, to which it is secured by means of a set-screw.

D' represents the spindle of the governor, which is a rod of metal secured to the upper end, E', of the socket-joint E, by means of a pin passing through such socket, and into or through the spindle.

E E' represent the socket-joint, or connection above referred to, its construction and arrangement being clearly shown in fig. 2.

F represents a bevelled-gear wheel, which is to be secured to the revolving sleeve, or spindle H, and is to receive its motion from the bevelled wheel F', which wheel is to be secured to the shaft P.

G represents a socket-projection, which is formed upon the frame A, through which the revolving sleeve, or spindle H and the vertically-moving spindle D' pass.

H represents the revolving spindle, to which the gear-wheel F is attached, which gives motion to the arms and balls of the governor, and through them to the valve.

I represents a sleeve, which is open at its lower end, and has a chamber formed therein of sufficient diameter and length to receive the socket-projection G, formed upon the frame A.

This sleeve also has an arm, O, projecting from it, the inner end of which has a yoke formed upon or within it, to receive the wheel F', while its outer end O has a hole bored through it, for the passage of the shaft P, as shown in figs. 2 and 10.

Upon the lower surface of this sleeve there are formed two inclined planes, as shown in fig. 6, they being so arranged that when the arm is turned in the direction of the stop R, the sleeve and the parts connected therewith will be raised, in consequence of the inclined planes, or one of them, coming in contact with the stationary incline I'.

When the arm is in this position, it being the one indicated in figs. 1 and 4, the governor-valve will be kept open by means hereinafter to be described, but should the belt which passes over the pulley Q break or run off from such pulley, the arm will swing in the opposite direction, or away from the stop R, and, in

consequence of the gravity of the sleeve I, and the parts connected therewith, it will slide downward upon the inclined plane, and the valve will be closed.

I represents a stationary inclined plane, which is to be secured to the socket-projection G, upon frame A, as shown in fig. 2.

This incline being stationary, it follows that as the sleeve I partially rotates upon the projection G, it will be raised and lowered, as above described.

K K represent a revolving socket, which rests and revolves upon the upper end of the sleeve I, its upper end being provided with branching arms, to receive the levers, which carry the balls N N of the governor.

L represents the cup, which is secured to the upper end of the spindle, or rod D', into an aperture or groove, in which the inner short arms of levers M M pass.

This cup is composed of two parts or sections, the lower one consisting of a disk of brass or other suitable metal, smooth upon its upper surface, but having upon its lower surface a hub, through which a set-screw passes, for the purpose of securing the same to the spindle D'.

Upon the top of this disk there is to be secured a plate, or plates of steel, or other suitable metal, which are to be held in position by means of pins, as shown in figs. 8 and 9, the object being to provide the means of taking up any lost motion which may occur at this point, in consequence of the wearing away of the arms M M, or of such plates.

L' represents the upper portion of the cap, which is a disk, of any suitable metal, having upon its upper surface a projecting hub, and in the upper surface of such hub an annular groove, or chamber, for the purpose of forming a lubricator, by providing a suitable receptacle for lubricating-material.

This disk is to be confined to the spindle D', by means of a set-screw, and, further, by a nut upon the end of spindle D', so that it may, at any time, be set down upon the ends of levers M M, for the purpose of taking up any lost motion consequent upon the wear of the parts.

M M represent the levers, to which the balls N N are attached.

They are to be pivoted to the socket K, as shown in fig. 2, and so arranged that their inner short arms shall enter the space between the two disks of cup L L', for the purpose of raising and lowering the same.

N N represent the balls, or weights which are to be secured to the outer ends of the levers M M, as shown in fig. 2.

O represents the socket-arm, which is attached to the sleeve I, and through which the shaft P passes.

P represents the shaft, which passes through the socket O, and upon the inner end of which the bevelled-gear wheel F' is secured, while its outer end carries the driving-pulley Q.

Q represents the driving-pulley, which is to be provided with a flange upon one or both of its edges, to prevent the displacement of the belt.

R represents a stop, which is formed upon, or may be attached to an arm, which projects from the frame A, in such a position, that as the socket-arm O is swung to the position shown in fig. 10, the projection thereon will enter a recess formed in such arm, for a purpose soon to be described.

The object of this stop is to prevent the arm O from swinging past a certain point in one direction, and so that the belt may hold the arm in a fixed position, when the engine is running properly.

S represents a jointed bar of metal, having upon its upper end a hook-formation, which is designed to pass vertically through a slot formed in the end of the stop R, so that as the projection upon arm O is brought

into contact with this hook, it shall retain the same in said slot, but, in the event of the breaking or displacement of the belt, and the swinging of the arm away from the stop, the bar S will be liberated and fall down, thus permitting the weight upon the arm U, to aid in closing the valve.

The lower hinged portion of this bar is to be reduced in thickness, to enable it to enter clamp T T', as shown in fig. 4.

T represents a clamp, which is to be secured to the outer end of arm U, it having holes through its projecting ends for that purpose.

This clamp consists, in part, of a flat bar of metal, having upon each of its ends, and upon one of its sides, arms projecting at a right angle, and leaving between them a space sufficient to admit of the passage of the bar S.

T' represents a lever, having upon its inner end an eccentric formation, through which the arm U passes.

Upon the opposite end of this lever is an arm, which may extend outward for any suitable distance, and be provided with the means of attaching a cord thereto, over a pulley, so that as the outer end of the lever is raised, the eccentric will be brought in contact with the bar S, and thus the weighted arm U will be held suspended, and the eccentric e' be removed from the lever e, thus permitting the valve to be controlled entirely by the governor-balls.

Should it become desirable, at any time, to close the valve, when the arm O, or the projection thereon, is in contact with the hook upon the bar S, it can be done by lowering the outer end of the lever T', thus releasing the hold of the eccentric upon its end, from its contact with bar S, when the weighted arm U will drop, and bring the eccentric e' into contact with lever e, which enters a slot in the coupling F F' of the valve-spindle, and thus the desired result will be accomplished.

U represents an arm, which is to be secured to a shaft, which has its bearings in projections formed upon frame A, as shown in fig. 2, in which figure the different positions which this arm assumes are shown.

u represents a weight, which is to be attached to the arm U.

e represents a lever, which is to be pivoted to the frame A, as shown in fig. 2, and is to be used in closing the valve, as above described.

e' represents an eccentric, which is to be secured to the shaft, to which the arm U is attached.

It is to be arranged immediately above the lever e, and so as to press down upon such lever, when occasion requires.

Figs. 1 and 6 show an arrangement of hangers, which may be used in connection with the governor herein described, k' showing a plank, to which such hangers k may be attached, l' showing the point to which a swinging arm is attached, to the lower end of which the journal-box g' is attached.

Within these boxes the shaft g, to which the pulleys h are attached, rotates.

The arrangement of the belts which are to drive the pulleys, is shown at h' and f', it being such, that as the belt f' passes from pulley f' to h, it will, so long as it is in order and remains upon the pulleys, retain the hangers in the position shown in dark lines in fig. 1, but should the belt break or run off from its pulley, or either of them, the arm l' will swing into the position shown in red lines in fig. 4, and thus bring the pulleys h into the position shown in fig. 1, which will allow the arm O, and its socket I, of the governor, to swing around, as before described, and thus the valve will be closed, in the same manner that it would have been done had the belt k' broken or slipped from its pulley.

It is apparent that both of these devices may be

used in connection, or that the governor may be driven with a belt direct from the engine-shaft, as is preferred.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The construction of the sleeve I, with its projecting arm, or socket O, for the reception of the shaft P, and the inclined planes upon its lower surface, substantially as set forth.

2. The construction of the cap L L', upon the upper end of the spindle D', substantially as shown and described.

3. The combination of the stationary inclined plane I', or its equivalent, with the movable inclines upon

the socket I, substantially as and for the purpose set forth.

4. The stop R, when constructed and arranged substantially as set forth.

5. The construction of the hangers k, having the swinging arms l, substantially as shown and described.

6. The arrangement of the hangers k and pulleys h, with reference to the pulley Q of the governor, substantially as set forth.

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

Witnesses: JOSEPH F. LETELLIER.

J. W. PEIRCE,

A. L. G. PEIRCE.