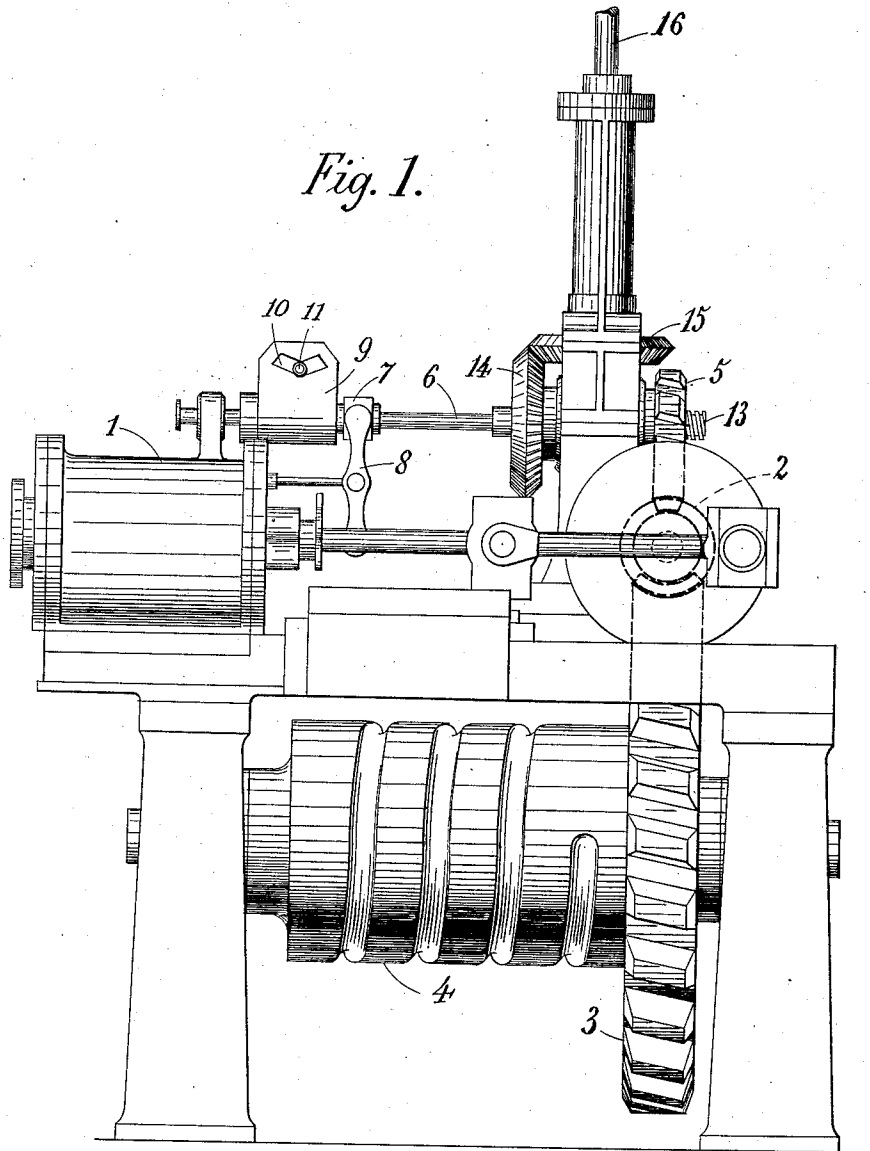


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CONTROL DEVICE FOR STEAM ENGINES.
APPLICATION FILED SEPT. 20, 1911.

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Patented May 13, 1913.
2 SHEETS—SHEET 1.



Witnesses:
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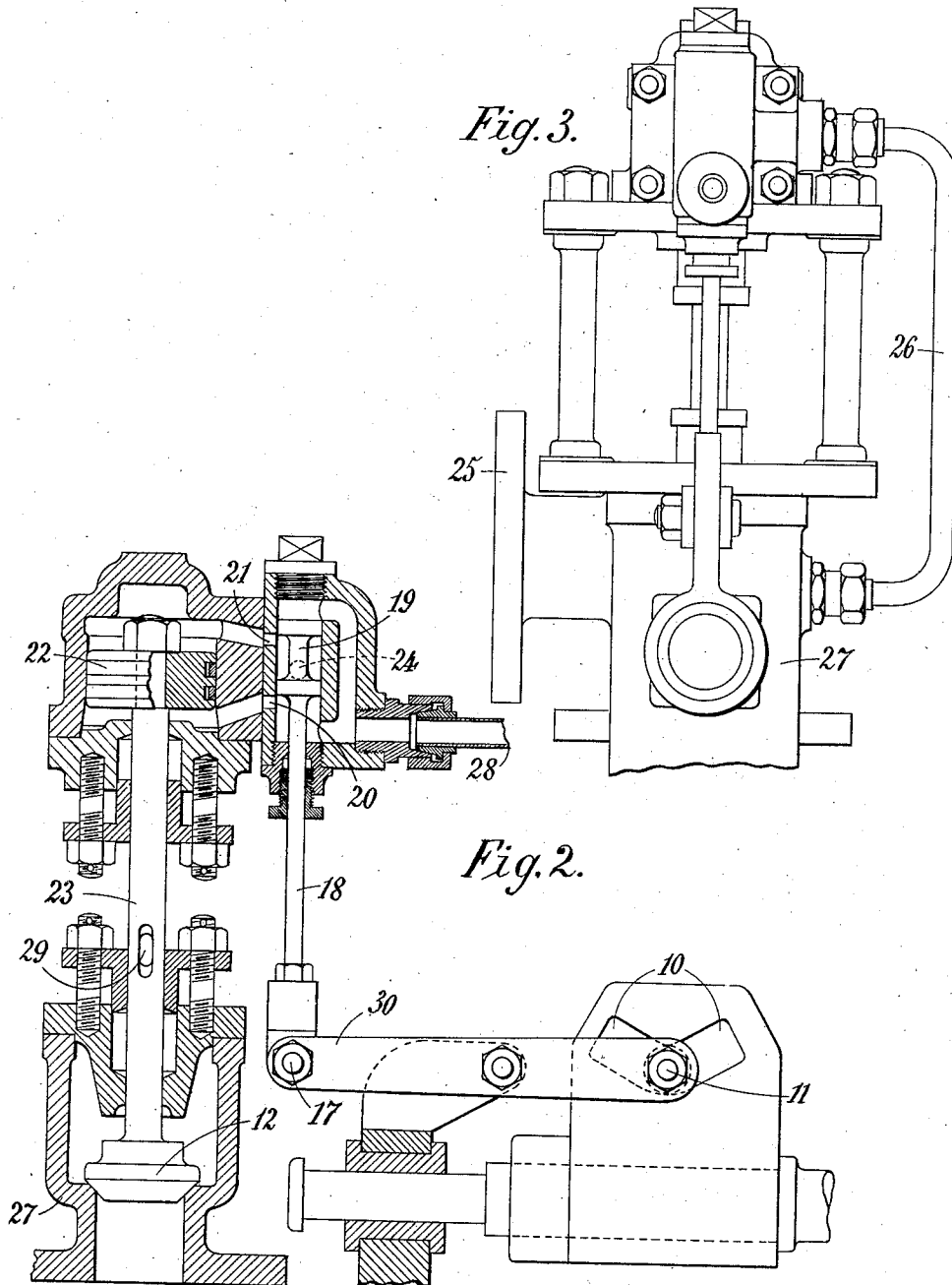
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John Wigham
John R. Wigham
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att'y

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UNITED STATES PATENT OFFICE.

JOHN WIGHAM AND JOHN RODHAM WIGHAM, OF SOUTH HYLTON, SUNDERLAND,
ENGLAND.

CONTROL DEVICE FOR STEAM-ENGINES.

1,061,932.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed September 20, 1911. Serial No. 650,348.

To all whom it may concern:

Be it known that we, JOHN WIGHAM and JOHN RODHAM WIGHAM, subjects of the King of Great Britain and Ireland, both residing at South Hylton, Sunderland, in the county of Northumberland, England, have invented certain new and useful Improvements in Control Devices for Steam-Engines, of which the following is a specification.

The present invention relates to improvements in or relating to control devices for steam engines and is particularly applicable to the controlling mechanism of steam steering gears.

The invention will be described in connection with the engine for operating the steering gear of a vessel, although it is, of course, also applicable to winding and other engines, where it may be desirable to control the engine from a distance.

The object of the invention is to provide means whereby loss of steam is prevented when the steering engine is not actually in motion, and to insure a reliable closing of the steam admission valve at that time.

A common fault in such gears is that which is known as "blowing through", which is occasioned by the engine stopping before the steam controlling valve becomes seated or moves to close the steam ports, whereby the steam can blow straight through to exhaust. This is prevented, according to the present invention, by providing means whereby on the steersman moving the wheel to put the steering engine into or out of action, a valve for admitting or cutting off steam is simultaneously operated to effect a positive opening or closing motion of the steam valve to the engine. These means comprise a longitudinally movable member having a double incline or V trackway or gradient and a roller or member engaging in said trackway and connected through levers with a piston valve for controlling the steam supply for the operation of the steam admission valve to the engine, the means being such that steam is cut off from the engine when the reciprocatory control member is brought approximately to mid-position.

The invention will now be described as applied to a ship's steering gear, Figure 1 showing the general arrangement of such a gear, with the movable trackway for the

roller secured to the control shaft. Fig. 2 is a detail view in part section of a convenient form of the steam admission control devices, operated by the movable trackway, and Fig. 3 is an end elevation of Fig. 2.

In the embodiment of our invention now to be described the engine 1 drives a crank shaft 2, provided with a worm or other form of gearing which drives a worm wheel 3, on the drum 4 on which the steering chain is wound. This worm also engages and drives a worm wheel 5 mounted on a horizontal shaft 6 carried in suitable bearings. This shaft, which may be called the control shaft, is provided with means, such as a flanged collar 7, for rocking a lever 8 for operating the slide valve or steam admission device in the cylinder 1. Upon this shaft 6 is rigidly mounted a slotted forging, yoke or bracket 9, having a V slot or slots or guides 10 for a roller 11, the motion of which causes the actuation of the admission valve 12 in the steam conduit to the engine. The other end of this horizontal shaft has a screw thread 13 engaging the correspondingly threaded hub or bore of the worm wheel 5. This shaft also carries a bevel wheel 14 feathered on it, so that the shaft can move longitudinally therein, but must rotate with it. This wheel 14 engages a second bevel wheel 15, mounted on a rod or shaft 16, which can be turned in or from the wheel house.

The action of the mechanism above described is as follows: When the bevel wheels 15, 14, are turned by the shaft 16, they move the shaft 6 horizontally—say to the left—(owing to the screwed part 13 turning in the worm wheel) and this horizontal movement effects the opening of the engine valve by the lever 8, and the roller 11 traveling up the gradient in the slot 10 causes the steam admission and cut off valve 19—through lever 30 and valve rod 18 pivoted thereto at 17—to be operated to admit steam to the engine, this valve 19 moving down and bringing the port 20 into communication with the steam inlet 24 which opens into the space between the two disk ends of the piston 19. Steam then passes from the supply pipe 24, to the under side of and raises a piston 22, the rod 23 of which carries the valve 12 for controlling the inlet of steam to the engine 1. As soon as the engine starts it turns the worm wheel which, by means of

the screw 13, moves the horizontal shaft 6 in the opposite direction, and so closes the engine valve and also the cut off valve, by causing the roller 11 to travel down the slot 10.

5 When the bevel wheels are turned in the opposite direction the shaft 6, is moved to the right, and the roller rides up the left hand slot, the engine being thus reversed while the control valve is operated in the same way as already described. It will be
10 seen that when the roller is in the lowest position, *i. e.* at the bottom of the V, the control piston valve 19 is in its highest position, and the steam inlet 24 is in communication with the port 21, the steam thus act-
15 ing upon the top of the piston 22 and keeping the valve 12 closed on its seat. The main steam supply is at 25, a branch 26 leading from the steam chest 27 to the steam inlet
20 24 to provide the steam necessary for the operation of the control device.

To provide for the escape of steam from above or below the piston 22 a pipe 28 is provided leading to the condenser, so that
25 there is never any counter pressure against the movement of the piston 22 in either direction. Hence within a very short time of the stopping of the turning of the steering wheel the engine comes to rest, through
30 the steam being cut off entirely.

While we have described the double-incline member as being directly mounted upon the control shaft 6, it may be mounted on a tube or sleeve which is keyed on the
35 shaft, or it may be indirectly connected to the shaft in such manner as to be moved to and fro with it, or it might even be quite independent of the shaft, but so mounted as to be moved by an abutment or projection
40 from the shaft, a spring or springs being employed to assist the movement where necessary, provided the member is so arranged and mounted as to move to and fro
45 in accordance with the movements of the control shaft. Further while we have found the V slot construction to be a very suitable form, the motion of the piston valve can be obtained by the reciprocating member on or
50 operated by the control shaft being in the form of a cam, or the end of the lever arm 30 could be connected to the reciprocating member or shaft by means of a link, this link being vertical and the rocking lever
55 horizontal when the piston valve is in the position corresponding to the closing of the steam admission valve to the engine. Whatever construction is employed it is essential that the cut off valve, such as 12, shall be
60 operated as to bring about a reliable opening and closing of the steam admission valve when the control shaft is operated.

It may sometimes be desirable or necessary in an emergency to fix the steam admission valve 12 open or out of action, and
65 for this purpose we may provide the spin-

dle 23 with a slot 29, or fixed collar, and a corresponding tapered key or distance piece which when inserted will hold the valve in position off its seat.

It is to be understood that the invention is capable of modifications in various ways, provided that the movable double-incline principle is maintained with the operation thereby of the steam admission to the engine in such a way that steam is cut off
70 from the engine when the reciprocatory control member returns approximately to mid position.

What we claim and desire to procure by Letters Patent is:

1. A control device for steam engines comprising a reciprocatory control member, a double-incline trackway moved by said control member, a lever one end of which is adapted to be rocked by said trackway, and means operated by said lever for cutting
80 off steam from the engine when the control member is brought approximately to mid-position.

2. A control device for the admission valve of a steam engine comprising an operating piston for the admission valve, a reciprocatory control member, a double-incline trackway moved by said control member, a pivoted lever adapted to be
85 rocked by said trackway, a piston valve connected to said pivoted lever for controlling the admission and cut off of steam to the operating piston of the steam admission valve, substantially as set forth.

3. A control device for steam engines comprising a reciprocatory control member, a pivoted lever adapted to be rocked by said reciprocatory member and a piston valve reciprocated by the movements of said rocking lever to cause steam to be cut off from
90 the engine when the control member is in its mid-position.

4. A control device for steam engines comprising a reciprocatory control member, a V-shaped trackway on said member, a rocking lever engaging at one end of the V-shaped guideway and means operated by said rocking lever for causing steam to be
95 cut off from the engine when the control member is in its mid-position.

5. A control device for steam steering engines comprising a steam chest, a steam control valve therein, a piston connected to said valve, a piston valve controlling admission of steam to said piston, a piston valve rod, a rocking member attached to said rod, a V-shaped trackway engaging the other end of said rocking member and a reciprocatory control member carrying said V-shaped
100 trackway substantially as set forth.

6. In a control device for steam engines of the kind described, a reciprocatory control member, a V-shaped trackway thereon, a pivoted lever rocked by the movement
105 130

of said trackway and a steam controlling piston valve operated by said rocking lever in combination with a cylinder in communication with the casing of said piston valve, a piston in said cylinder, a valve chest and a steam admission valve connected to said piston, substantially as described.

7. In a control device for steam engines, the combination of a reciprocatory control shaft and a V-shaped trackway mounted thereon, and means operated by the move-

ment of said trackway for controlling the admission of steam to the engine, substantially as set forth.

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

JOHN WIGHAM.

JOHN RODHAM WIGHAM.

Witnesses:

JAMES WHITELAW,

FREDERICK PIATT.

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