

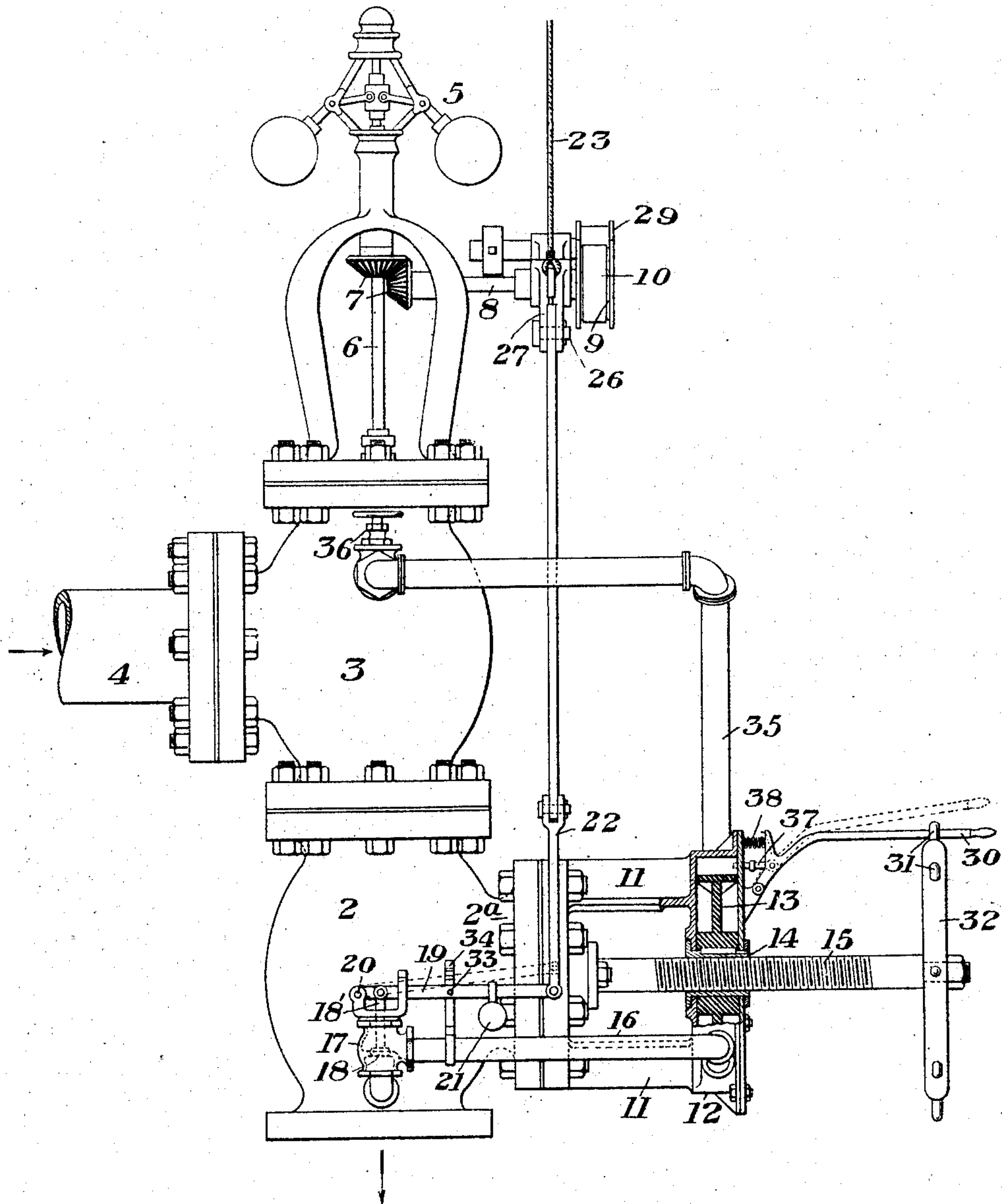
E. J. O'MALLEY.  
 DEVICE FOR SHUTTING OFF FLUID PRESSURE.  
 APPLICATION FILED APR. 1, 1908.

909,016.

Patented Jan. 5, 1909.

3 SHEETS—SHEET 1.

*Fig. 1.*



WITNESSES

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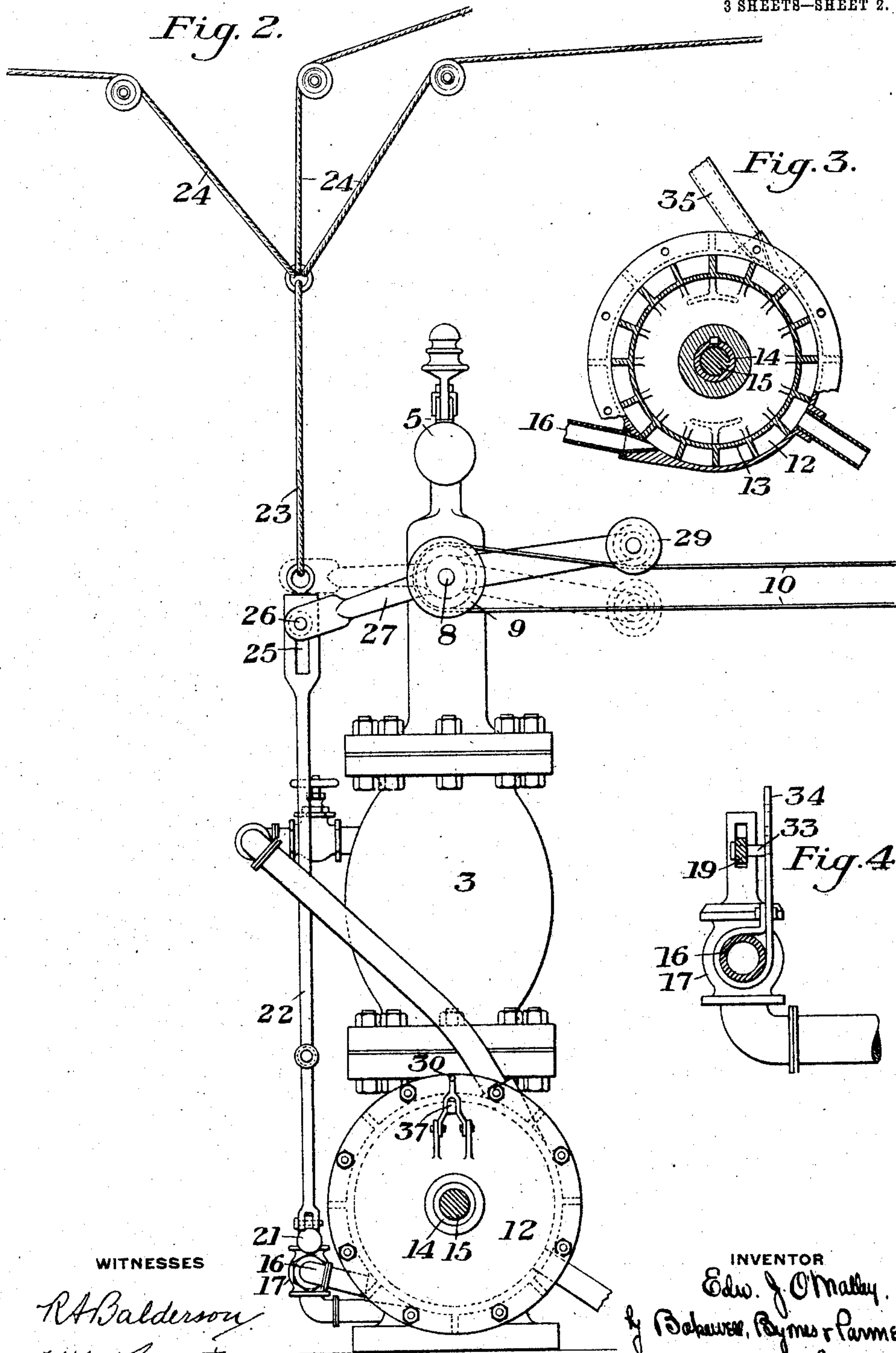
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3 SHEETS—SHEET 2.

*Fig. 2.*

*Fig. 3.*

*Fig. 4.*



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3 SHEETS—SHEET 3.

Fig. 5.

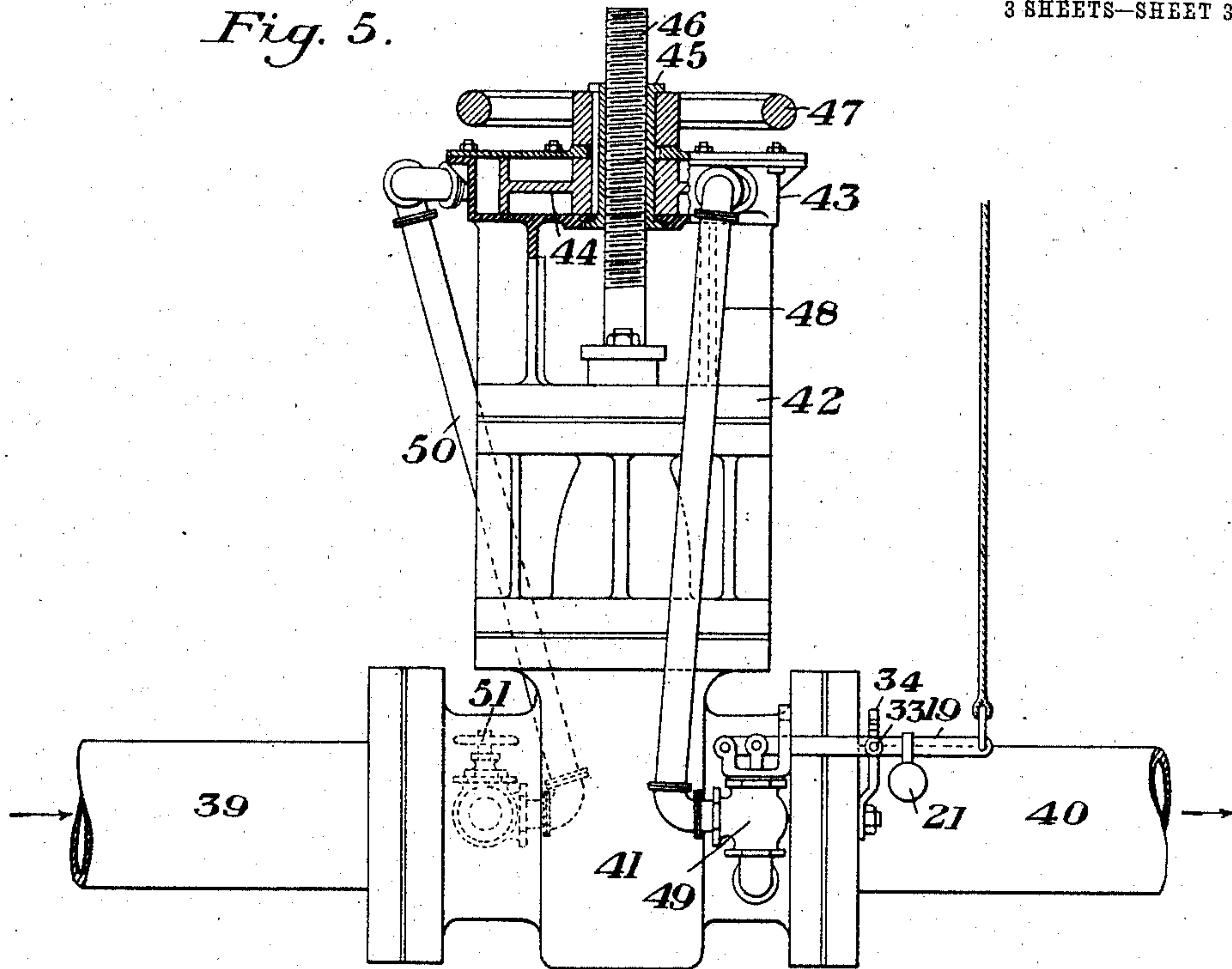
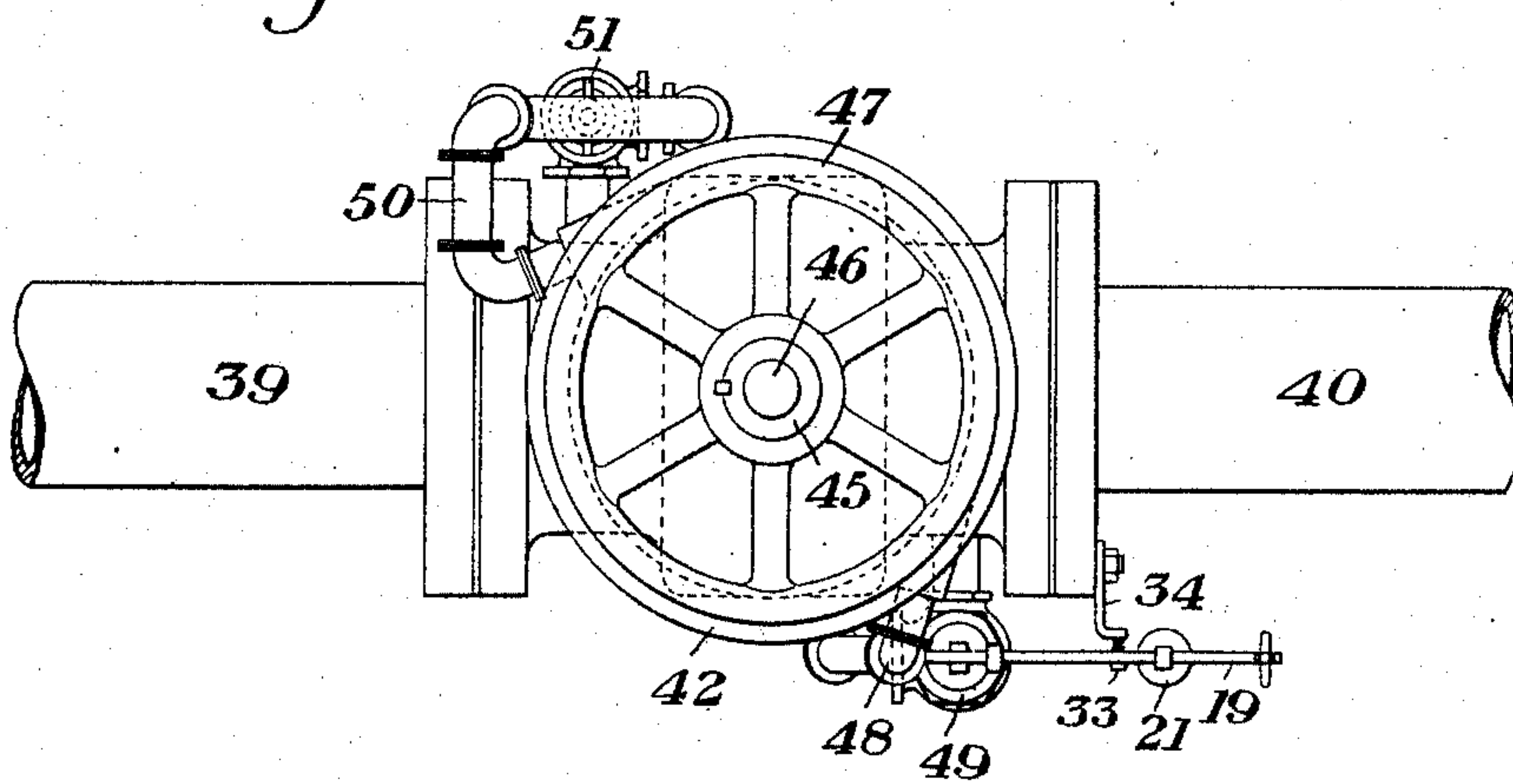


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## DEVICE FOR SHUTTING OFF FLUID-PRESSURE.

No. 909,016.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed April 1, 1908. Serial No. 424,606.

*To all whom it may concern:*

Be it known that I, EDWARD J. O'MALLEY, of McMechen, in the county of Marshall and State of West Virginia, have invented an Improvement in Devices for Shutting Off Fluid-Pressure, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation showing one form of my invention as applied to the throttle valve of a steam engine, a portion of the figure being shown in section; Fig. 2 is an end view of the same; Fig. 3 is a sectional view of the turbine wheel; Fig. 4 is a detail view hereinafter referred to; Fig. 5 is a side elevation partly broken away of a modification; and Fig. 6 is a plan view of the same.

My invention has relation to an emergency device for cutting off fluid pressure either automatically or manually and is designed to provide simple and efficient means of this character by means of which the supply of fluid pressure in a conduit of any kind can be quickly shut off when necessary.

In the drawings, I show the invention as applied to the throttle valve of a steam engine, but it will be understood that it may be applied with equal advantage for various other purposes.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown two embodiments thereof and which will now be described, it being premised, however, that various changes may be made therein by those skilled in the art without departing from my invention as defined in the appended claims.

Referring first to the form of my invention which is shown in Figs. 1 to 4, inclusive, the numeral 2 designates the valve casing which contains a cut-off valve, which, in the present instance, may be an ordinary globe valve. Secured to the casing 2 is a throttle valve casing 3, into which leads the steam supply pipe 4.

5 designates the ordinary centrifugal governor which is attached to the stem 6 of the throttle valve 3, and which is driven by a bevel gear connection 7, with a shaft 8, having a pulley 9, rotated by a belt 10 from any rotating part of the engine. Bolted or otherwise secured to the arm 2<sup>a</sup> of the valve casing 2 is a yoke 11, carrying at its outer end a

chamber 12, in which is mounted a rotary turbine wheel 13. This turbine wheel is secured to a sleeve 14, which is interiorly threaded to engage the threads of the stem 15, of the cut-off valve 2. The steam is admitted to the chamber 12 to actuate the turbine wheel in one direction through a pipe 16, which leads from a valve chamber 17, communicating with the interior of the valve casing 2 and normally closed by a valve 18. Connected to the stem of this valve is a lever 19, pivoted at 20, and adjustably weighted at 21. To the free end of this lever is connected a jointed link 22, to the upper end of which is connected a cord or cable 23, having branches 24, leading to any desired part of the building. The upper end portion of the link 22 is also provided with an oblong slot 25, which is loosely engaged by a pin 26, on one arm of a lever 27, which is fulcrumed to the governor operating shaft 8 at 28, and whose other arm is provided with a weighted roller 29, which normally rests on the upper branch of the governor-driving belt 10.

By pulling on any one of the branches 24 of the rope or cord 23, the link 22 will be raised, thereby actuating the lever 19, to open the valve 18, and admit pressure to the pipe 15, and therethrough to the turbine wheel. The rotation of the turbine wheel will effect an endwise movement of the valve stem 15, the latter being held against turning by a locking lever 30, which engages pins or locking projections 31 on the periphery of a hand-wheel 32, secured to the shaft 15. In this manner, the valve is closed to shut off the passage from the supply pipe 4 to the engine. For the purpose of holding the valve 18 in its open position, the lever 19 is provided with a locking pin 33, see Fig. 4, which is arranged to engage an arm 34, and thus hold the lever raised and the valve in open position.

In case governor belt 10 should break, the weighted roller 29 will change to the position shown in dotted lines in Fig. 2, thereby raising the link 22 and opening the valve 18 in the same manner and with the same effect as when the cord or cable 23 is operated. By reason of the oblong slot 25, it will be seen that the cord 23 can be operated without in any way affecting the governor, while the breaking of the governor belt will automatically close the shut-off valve.



The direction of rotation of the turbine wheel may be reversed to effect the closing of the valve. To this end the chamber 12 is provided with an inlet pipe 35, which is directed oppositely to the inlet of the pipe 16, and which is connected to the throttle valve chamber through a normally closed hand valve 36. By opening the valve 36, pressure will be admitted to the turbine wheel to rotate the valve stem 15, in a direction to open the valve 2.

When it is desired to actuate valve 2, by the manual operation of the hand wheel 32, the locking lever 30 is raised to the position shown in dotted lines in Fig. 1, which releases the hand-wheel 32 and permits it and the shaft 15 to be rotated at the same time a pin 37, attached to said lever, will be projected into the turbine chamber 12, to prevent rotation of the turbine wheel. A spring 38 is arranged to return the lever 30 to its locking engagement with the wheel 32 as soon as the lever is released.

The modification shown in Figs. 5 and 6 shows the adaptation of my invention to the closing of a gate valve which must be closed and opened by direct rectilinear movement. In this form of my invention, 39 designates the steam inlet pipe, 40 the supply pipe leading to the inlet or other point of consumption, and 41 the interposed valve casing containing the shut-off gate valve. The casing of this valve has secured thereto a yoke 42, provided with a turbine chamber 43, similar to the chamber 12 of the form first described and containing a turbine wheel 44. This turbine wheel is keyed about a sleeve 45, which has a threaded engagement with the shaft or stem 46 of the gate valve, and to which is also keyed the hand-wheel 47.

48 designates the admission pipe for actuating the turbine in a direction to close the valve 41, said pipe being connected to the chamber of said valve through a valve 49, which is similar in all respects to the valve 18 and is actuated in the same manner.

50 designates the admission pipe for actuating the turbine wheel in a direction to close the valve 41 when the hand valve 51 is open.

The operation is in all respects similar to that of the form first described, except that the hand-wheel 47 will rotate with the turbine when the valve stem 46 is actuated by such wheel, so that in both cases, said shaft or stem will be moved endwise without being rotated.

The advantages of my invention will be apparent to those skilled in the art. It provides a simple and effective means by which the supply of pressure in any conduit can be quickly shut off either manually or automatically, as in the case of the breaking of a governor belt.

It will be noted that in both forms of my

invention, the shafts or stems of the cut-off valves are free from threads, where they enter the valve chambers. Inasmuch as devices of this kind may be used only at infrequent intervals, threaded parts which are subject to the action of the steam are liable to become corroded, and thus, interfere with their proper operation in case of an emergency. In the device described, all threaded parts are located exteriorly of the valve chambers where they can be inspected and kept in proper condition, and where they are not likely to become corroded.

A further advantage of my invention is that the valve may be closed by power, by the simple opening of a hand valve which will admit pressure to the turbines to actuate them in a direction to close the valves. At the same time, the valves can be readily actuated by hand, when desired, since there is little friction of the parts and but few parts to move, particularly in the form shown in Fig. 1, in which the turbine remains stationary when the valve stem is actuated by hand.

It will be apparent that various changes may be made in my invention. Thus, any desired form of turbine wheel may be employed; the chamber therefor and the actuating connections may be variously arranged; various forms of connections may be provided for actuating the valves 18 and 49, and various changes may be made in the details of the parts, without departing from my invention.

I claim:

1. In a device of the character described, a valve-casing, a shut-off valve therein having an outwardly projecting stem, a motor chamber, a motor wheel in said chamber and operatively connected to said stem, supply connections leading to the motor chamber from opposite sides of the shut-off valve, control valves in said supply connections, and connections for operating one of the last named valves from a distance; substantially as described.

2. In a device of the character described, a valve casing, a shut-off valve therein having a stem projecting through the valve casing and unthreaded except at the portion thereof exterior to the casing, a motor-chamber, a motor wheel therein and connected to the threaded portion of said stem to effect an endwise movement thereof, supply connections leading to said chamber from opposite sides of the shut-off valve, valves controlling said connections, and means for operating one of said valves from a distance; substantially as described.

3. In a device of the character described, a valve casing, a shut-off valve therein and having an outwardly projecting stem, a yoke secured to said casing and carrying a motor chamber, a motor wheel in said chamber and connected to said stem to effect an endwise



movement thereof, supply connections leading to said chamber from opposite sides of the said valve and arranged to admit pressure to said chamber to effect the reverse rotation of the motor wheel, valves controlling said connections, and means for operating said valve either manually or automatically, substantially as described.

4. In a device of the character described, a valve casing having a shut-off valve therein, said valve having an outwardly projecting stem, a sleeve held against endwise movement and having a threaded engagement with said stem, a motor wheel secured to said sleeve, means for manually rotating said stem, and a locking device having one position in which the shaft is locked against rotation and another position in which the shaft is free to rotate and the motor wheel is locked, together with means for controlling the supply of operating fluid to the motor, substantially as described.

5. In a device of the character described, a valve casing, a shut-off valve therein having a stem projecting through the valve casing and unthreaded except at the portion thereof exterior to the valve casing, a sleeve held against endwise movement and engaging the threaded portion of the stem, a motor chamber, a motor wheel in said chamber and secured to said sleeve, a supply connection for

said chamber, a valve controlling such connection, and means whereby said valve may be opened from a distance; substantially as described.

6. In a device of the character described, a shut-off valve, a motor wheel for actuating said valve, means for manually actuating the valve independently of the motor wheel, and a locking device arranged to lock either the manually operated means or the motor, substantially as described.

7. In a device of the character described, a valve-casing, a shut-off valve therein having an outwardly projecting stem, a motor chamber, a motor wheel in said chamber and operatively connected to said stem, supply connections leading to the motor chamber from opposite sides of the shut-off valve, control valves in said supply connections, link and lever connections attached to the stem of one of the last named valves, means for actuating the link and lever connections from different points, and a device engaging said connections and operated by the breaking of a governor belt; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDWARD J. O'MALLEY.

Witnesses:

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M. P. GARVEY.