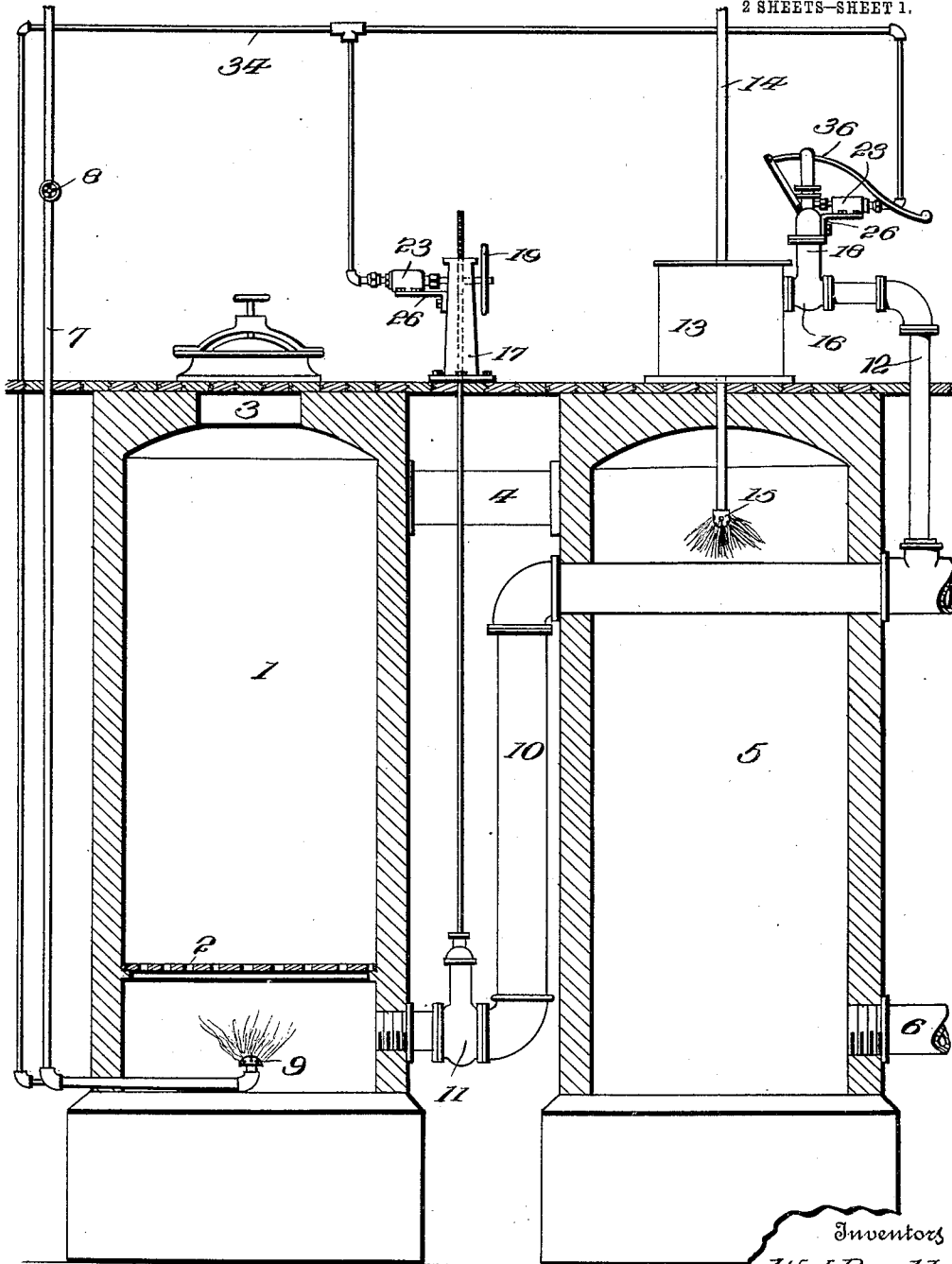


W. M. KILEY & W. J. BURTLE.
SAFETY DEVICE FOR WATER GAS APPARATUS.
APPLICATION FILED FEB. 17, 1912.

1,065,254.

Patented June 17, 1913.

2 SHEETS—SHEET 1.



Witnesses
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Fig. 1.

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Fig. 2.

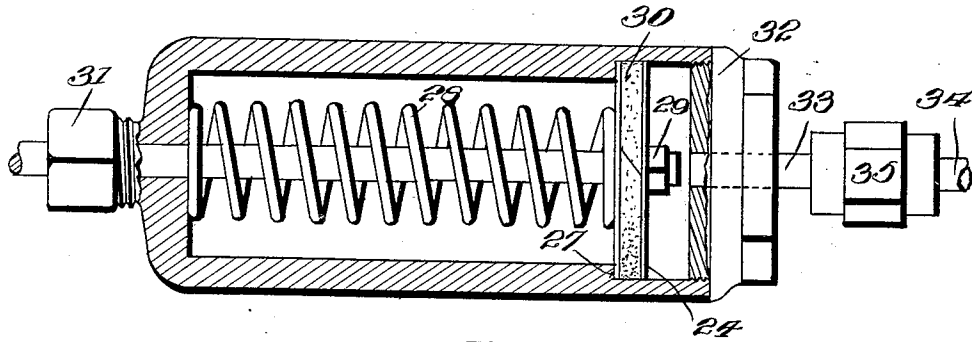
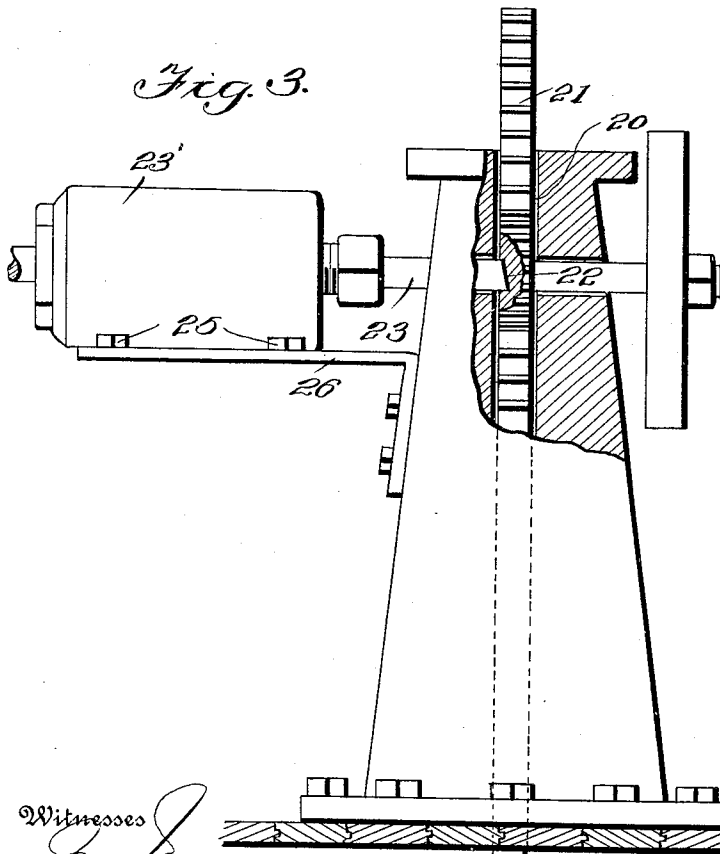


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM M. KILEY AND WILLIAM J. BURTLE, OF GRAND RAPIDS, MICHIGAN.

SAFETY DEVICE FOR WATER-GAS APPARATUS.

1,065,254.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed February 17, 1912. Serial No. 678,197.

To all whom it may concern:

Be it known that we, WILLIAM M. KILEY and WILLIAM J. BURTLE, citizens of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Safety Devices for Water-Gas Apparatus, of which the following is a specification.

This invention is a safety device for water gas machines.

In the manufacture of water gas, steam under a pressure of approximately thirty pounds is admitted to the generating chamber below the grate therein and passes up into the incandescent body of fuel upon the grate where it is decomposed. When the supply of steam is cut off an air blast is admitted to the generating chamber below the grate bars, but this air blast has a pressure considerably less than the steam pressure, it being ordinarily about eight pounds. Should the valve controlling the air blast be opened before the steam is cut off, the higher pressure of the steam overcomes the pressure of the air, causing back pressure in the air supply pipe which is liable to result in an explosion.

It is the object of our invention to provide means for preventing the air blast being opened before the steam supply is cut off and this object is accomplished by such a device as is illustrated in the accompanying drawings.

The invention will be hereinafter fully described and consists in certain novel features which will be particularly pointed out in the claims.

In the accompanying drawings, which are to be taken as a part hereof: Figure 1 is a diagrammatic sectional elevation of so much of a generating plant as is necessary to illustrate the application of our invention; Fig. 2 is a longitudinal section of the improved safety device on a larger scale; Fig. 3 is an elevation, partly broken away, showing the safety device in engagement with the stem of the air blast valve.

The gas plant comprises a generating chamber 1 having grate bars 2 therein and a man hole or feed opening 3 at its upper end. The upper portion of the generating chamber communicates through a conduit 4 with the carbureting chamber 5 from which the outlet pipe 6 leads to a superheater or other mechanism. The steam supply pipe 7 equipped with a cut-off valve 8 leads from

a steam boiler to the bottom of the generating chamber and enters the same below the grate bars, its extremity being equipped with a blast nozzle 9 whereby the steam will be directed upwardly to and through the grate to pass through the fuel. The air supply pipe 10 enters the generating chamber below the grate 2 and is equipped with a cut-off valve indicated at 11, whereby the passage of air into the generating chamber may be controlled. The air supply pipe passes through or around the carbureter to an ordinary fan or blower (not shown) and a branch 12 leads from the said pipe 10 to the tank 13 in which the air may mingle with the hydrocarbon supplied through a pipe 14, the mingled air and hydrocarbon issuing from a jet 15 at the top of the carbureter in a fine spray to mingle with the gas issuing from the conduit 4 whereby the gas will be carbureted before passing through the outlet 6 to the superheaters, driers or other mechanism. The branch 12 is equipped with a cut-off valve indicated at 16.

The generator, the carbureter, and the other parts, thus far described, may be of any preferred construction and their operation is well known to workers in the art. No attempt is made herein to disclose the details of the construction and operation of these elements as they form no part of our invention and are shown only in a diagrammatic manner and merely in order that the particular application of our invention may be easily and fully understood.

The stems of the valves 11 and 16 rise through casings or other supports indicated at 17 and 18, and in the illustrated forms the valve 11 is operated by a wheel 19 and a pinion 20 on the shaft of said wheel meshing with a rack bar 21 formed on the upper end of the valve stem. In one edge or side of the rack bar 21 we form a socket or recess which is adapted to be engaged by the end of a locking bar 23 which is extended into a cylinder 23' and constitutes a piston rod on the inner end of which is secured a piston 24. The cylinder 23' is provided with lateral lugs through which securing bolts are passed into a shelf or bracket 26 which is bolted to the casing or guiding support of the valve stem as clearly shown, whereby the cylinder will be supported in proper operative position. The end of the cylinder distant from the valve stem has its bore enlarged for a short distance to provide a shoulder or stop

27 whereby the inward movement of the piston will be limited. A spring 28 is coiled around the piston rod 23 between the piston and the end of the cylinder and tends normally to hold the piston away from the stop or shoulder 27.

The piston is secured firmly upon the piston rod by a clamping nut 29, as will be readily understood, and a split packing ring 30 is seated in an annular groove in the periphery of the piston to form packing between the piston and the cylinder so as to prevent leakage of steam without interfering with the movement of the piston. A stuffing box 31 is provided on the closed end of the cylinder around the piston rod or locking bar so that leakage of steam at this point will be prevented. A plug or cap 32 is fitted in the open end of the cylinder and a hollow stem 33 projects outwardly from the said plug or cap and is coupled to the steam pipe 34 by a union 35, as shown and as will be readily understood.

The safety device applied to the stem of the valve 16 is the same as that just described and engages the valve stem in the same manner, the only difference being that the stem is operated by a hand lever 36 instead of a rack and pinion.

The operation of the device will, it is thought, be readily understood.

When the plant is making gas, the steam supplied through the pipe 7 will also fill the pipe 34 and consequently act upon the piston 24 so as to hold the same against the shoulder 27 thereby compressing the spring 28 and throwing the piston rod or locking bar 23 into engagement with the socket 22 in the valve stem and consequently holding the valve in its closed position so that the air blast will be cut off. It will consequently be impossible to open the air blast without first disengaging the locking bar from the valve stem and this can not be accomplished without cutting off the supply of steam. When the steam is shut off, the pressure on the piston 24 will be reduced so that the spring 28 will at once expand and withdraw the locking bar from its engagement with the valve stem to permit said stem to be raised and the valve to be opened. When the valve is again lowered to cut off the air blast the socket 22 will be brought into alinement with the end of the locking bar so that when the steam is again turned on the locking bar will be drawn into engagement with the socket and the air blast valve again locked in its closed position.

Our improved device is obviously simple in its construction and the arrangement of its parts, and will efficiently perform the functions for which it is intended. It may be readily applied to any form of valve stem

and may be secured in place without necessitating any rearrangement of any operating parts so that the cost of installation will be very slight.

Having thus described our invention, what is claimed as new is:

1. In a device for the purpose set forth, the combination with a valve stem, of a locking bar, means tending to hold the said locking bar normally out of engagement with the valve stem, and means acting in opposition thereto to hold the locking bar in engagement with the valve stem.

2. The combination with an air blast pipe, of a valve in the air blast pipe having a stem rising therefrom, a locking bar arranged to engage the said stem, means for supplying steam pressure to said bar to hold it in engagement with the valve stem, and means for withdrawing the locking bar from said engagement when the steam pressure is withdrawn.

3. The combination of a steam supply pipe, an air blast pipe, a cut-off valve in the air blast pipe, and means controlled by the steam pressure to prevent opening of said valve until the steam pressure is cut off.

4. The combination with a valve stem, of a locking bar arranged to engage the same, a piston on the said bar, means for supplying fluid pressure to said system, and a spring acting on said piston in opposition to the fluid pressure.

5. The combination with a valve stem support, of a bracket secured thereto, a cylinder secured upon said bracket, a valve stem rising through the said support, a piston rod mounted within the cylinder and projecting through the same to engage the valve stem, a piston on said rod, means to supply fluid pressure to the piston, and a spring coiled around the rod between the piston and the end of the cylinder to act on the piston in opposition to the fluid pressure.

6. A device for the purpose set forth comprising a cylinder having one open end with an enlarged bore at said end, a piston rod projecting through the closed end of the cylinder, a piston on the said rod playing within the enlarged portion of the cylinder, a plug closing the open end of the cylinder and adapted to be coupled to a steam pipe, and a spring coiled around the piston rod between the piston and the closed end of the cylinder.

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

WILLIAM M. KILEY. [L. S.]

WILLIAM J. BURTLE. [L. S.]

Witnesses:

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