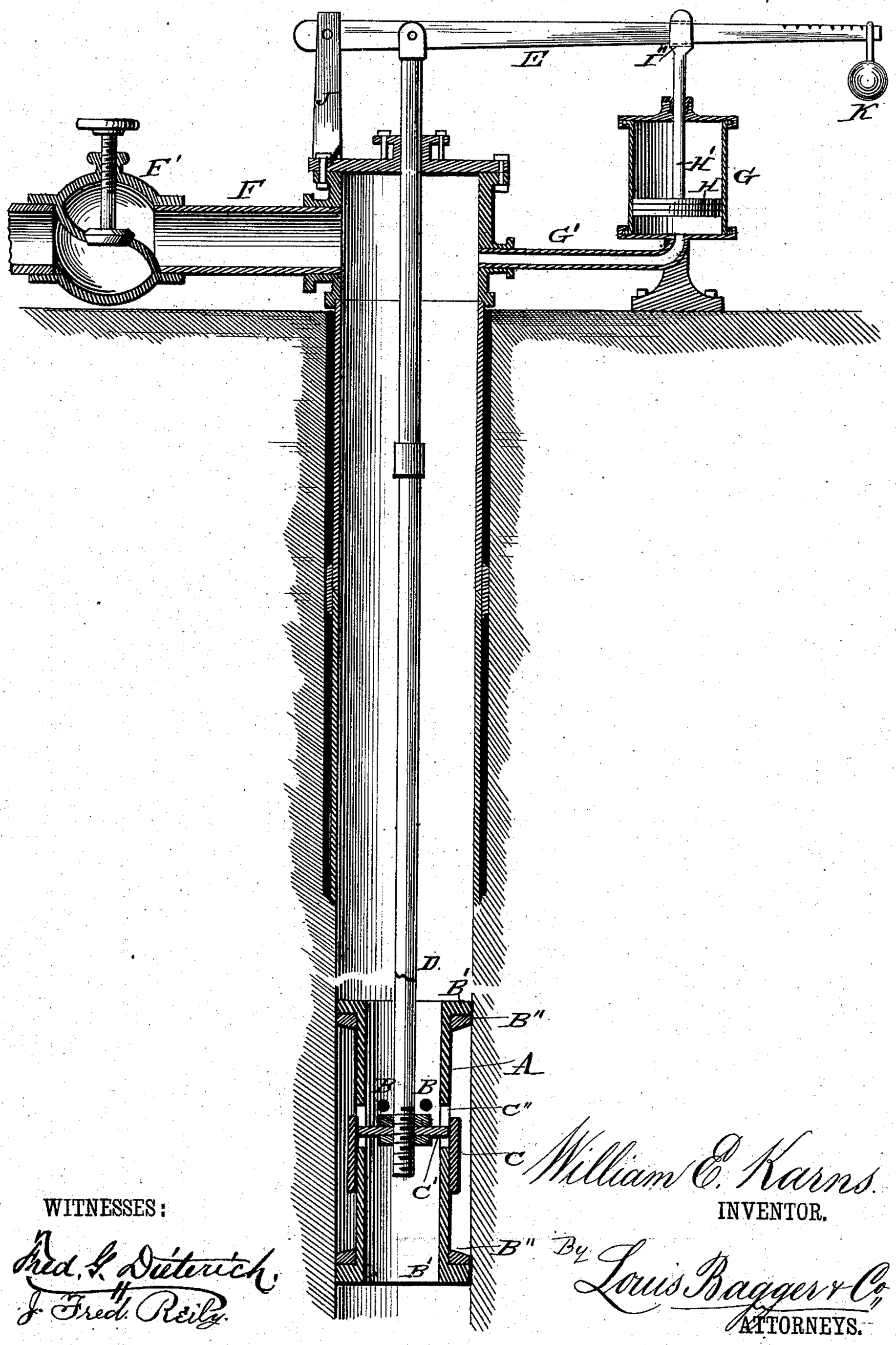
(No Model.)

W. E. KARNS.

APPARATUS FOR REGULATING THE FLOW AND PRESSURE OF GAS IN GAS WELLS.

No. 288,446. Patented Nov. 13, 1883.



WITNESSES:

Fred. L. Dieterich.

J. Fred. Reily.

William E. Karns.

INVENTOR.

By Louis Bagger & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM E. KARNS, OF PARKER'S LANDING, PENNSYLVANIA.

APPARATUS FOR REGULATING THE FLOW AND PRESSURE OF GAS IN GAS-WELLS.

SPECIFICATION forming part of Letters Patent No. 288,446, dated November 13, 1883.

Application filed August 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. KARNS, a citizen of the United States, and a resident of Parker's Landing, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Regulating the Flow and Pressure of Gas in Natural Gas-Wells; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which the figure is a vertical sectional view of a gas-well, showing my improved apparatus for regulating the flow and pressure of gas in natural gas-wells in operative position.

My invention has relation to apparatus for regulating the flow and pressure of gas in natural gas-wells; and it consists in the improved construction and combination of parts of the same, as will be hereinafter more fully described and claimed.

Heretofore in striking natural gas-wells there has been no way of controlling the flow of gas, so that what was not consumed was allowed to go to waste.

The object of my invention is to confine the gas in the rock from whence it comes, except as it is actually required for use.

I am aware that oil-well tubes and tubing have been heretofore constructed provided with an automatic check-valve having weights or a spring and screw for regulating the degree of pressure that must be exerted before the valve will open.

In the accompanying drawing, A represents a metal cylinder, open at each end, and provided at either end with flanges B′ and packing-rings B″, of any suitable material, a series of apertures, B, extending around the cylinder A at a point midway between its extremities.

C indicates a circular valve fitting upon the outside of the cylinder A, and provided with a cross-bar, C′, which slides in longitudinal slots C″ in opposite sides of the cylinder A.

D represents the rod by which the valve C is actuated, and which may be made either solid, or can be conveniently made of sections of ordinary gas-pipe suitably fastened together. The lower end of the rod D is secured to the center of the cross-bar C′, while its upper end passes through the cap which covers the well to prevent the escape of gas, and is pivoted to the lever E.

F represents the distributing-pipe, having a valve, F′, by which the amount of gas passing through the said pipe is regulated.

G represents a metal cylinder, which is closed at either end, and is connected to the cap covering the mouth of the well by a pipe, G′, extending from the bottom of the cylinder G to the side of the said cap. Inside of the cylinder G works the piston H, the piston-rod H′ having its free end enlarged and provided with a slot, I″, through which the lever E passes. The lever E is pivoted at one end to a post or standard, J, the free end of the lever passing through the slotted end of the piston-rod H′, and having upon its extremity a weight, K, for the purpose hereinafter described.

I am aware that oil-well tubes and tubing have been heretofore constructed provided with an automatic check-valve and means or mechanism for regulating the degree of pressure that must be exerted before the said valve will open. I therefore do not claim, broadly, an automatic check-valve; neither do I claim, broadly, a check-valve provided with means or mechanism for regulating the amount of pressure which must be exerted before the said valve will open.

The manner of operating my improved apparatus for regulating the flow and pressure of gas in natural gas-wells is as follows: The hollow cylinder A is attached to the lower end of the pipe or rod D and lowered into the well until its lower flange and packing-ring pass below the gas-vein, its upper flange and packing-ring being above the gas-vein. The pressure of the gas on the two packing-rings forms tight joints and confines the gas in the rock and around the cylinder A. The valve C can now be adjusted by raising or lowering the rod D, so as to open the apertures B to any desired width. When the desired pressure is acquired, the rod D is attached to the lever E, which in turn is connected with the piston-rod H′. The valve C is adjusted so that the amount of gas flowing into the well will be equal to the utmost capacity of the distributing-pipe F. If at any time the valve F′ is

partially shut, so as to lessen the amount of gas passing through the distributing-pipe, the undue pressure of the overplus of gas thus confined in the well will force a portion of the gas through the pipe G′ into the lower end of the cylinder G. The pressure of the gas thus admitted raises the piston H, which in turn elevates the free end of the lever E, thereby, by means of the rod D, raising the circular valve C, so as to still further close the apertures B and lessen the amount of gas admitted into the well. When the valve F′ is again opened so as to allow the gas to pass freely through the distributing-pipe F, and thereby relieve the gas in the well from all undue pressure, the weight K on the extremity of the free end of the lever E will force the piston H down to the bottom of the cylinder G, thereby lowering the rod D and circular valve C into their former working position.

From the foregoing description, taken in connection with the accompanying drawing, the construction and operation of my improved apparatus for regulating the flow and pressure of gas in natural gas-wells will readily be understood without requiring further explanation.

It will be seen that my improved apparatus is simple in construction, and, being devoid of all complicated parts, is not liable to break at any point or to get out of working order, while by its use all waste of gas is prevented.

It is obvious that the valve C may slide inside of the cylinder A instead of outside, as the result would be precisely the same.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In an apparatus for regulating the flow and pressure of gas in natural gas-wells of substantially the described construction, the combination of the cylinder A, open at either end, having a flange, B′, and packing-ring B″ at either end, and provided with a series of apertures, B, extending around it centrally, circular valve C, having cross-bar C′, sliding in longitudinal slots C″ in opposite sides of the cylinder A, and means by which the said valve may be raised or lowered, as and for the purpose shown and set forth.

2. In an apparatus for regulating the flow and pressure of gas in natural gas-wells of substantially the described construction, the combination of the cylinder A, open at either end, having a flange, B′, and packing-ring B″ at either end, and provided with a series of apertures, B, extending around it centrally, circular valve C, having cross-bar C′, sliding in longitudinal slots C″ in opposite sides of the cylinder A, rod D, lever E, having weight K, cylinder G, having piston H and piston-rod H′, pipe G′, extending from the bottom of the cylinder G to the well-cap, and distributing-pipe F, having valve F′, all constructed and arranged to operate substantially in the manner and for the purpose shown and described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM E. KARNS.

Witnesses:
SAMUEL J. FRYER,
W. W. S. GEPHARD.