

A. C. NELSON.
 DEVICE FOR CONTROLLING FLUIDS.
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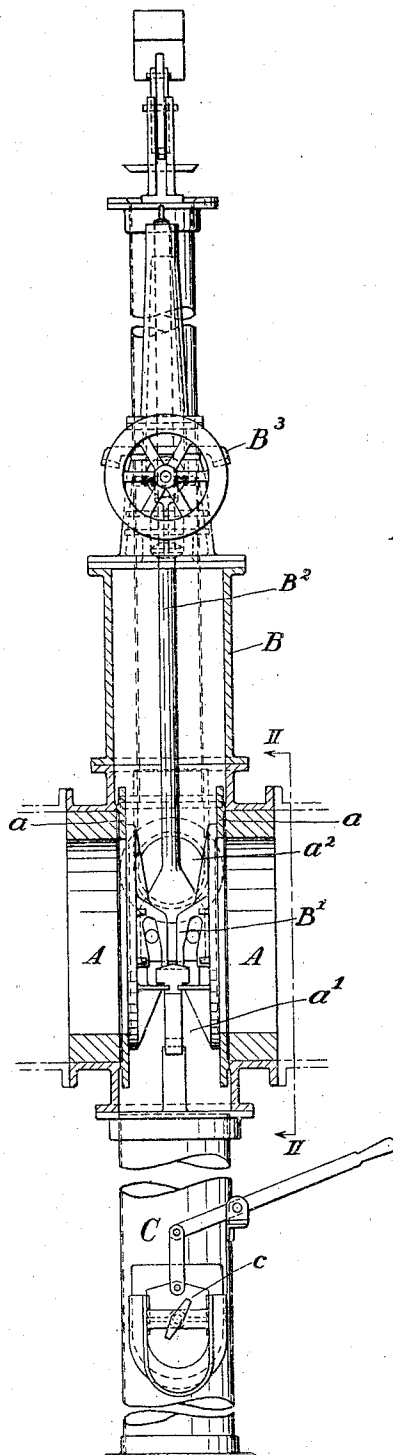


Fig. 1.

Witnesses
K. F. Gruening
Winifred Waltz

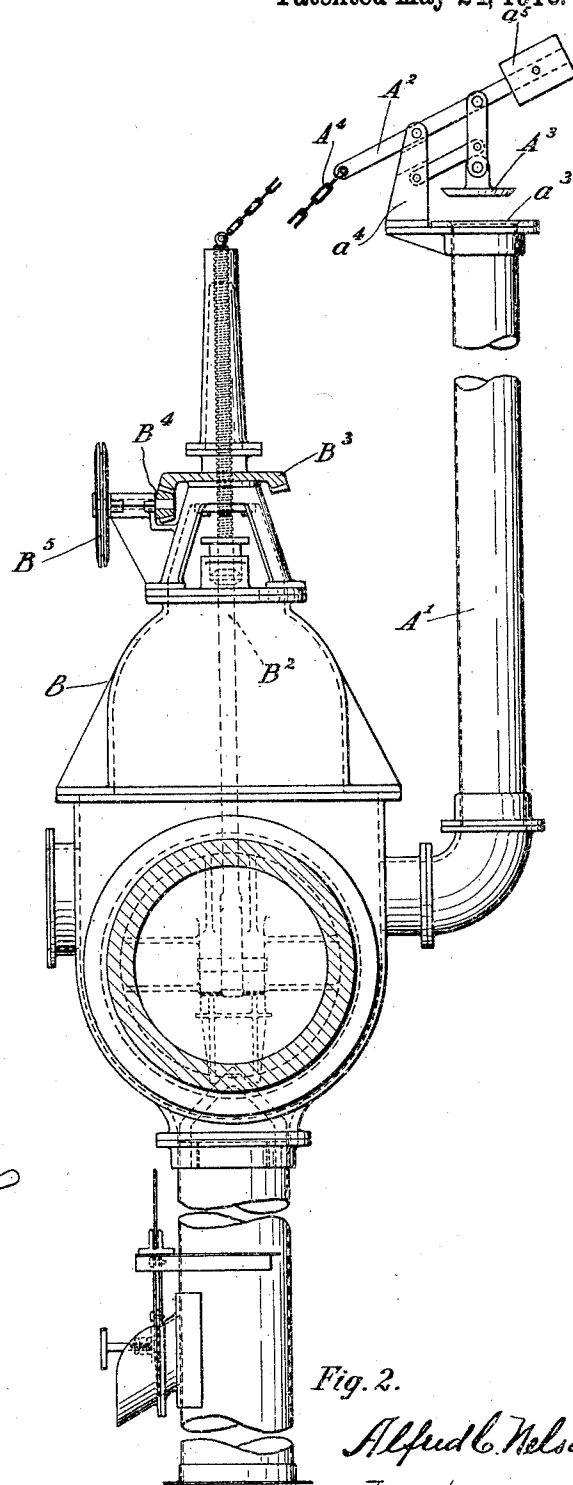


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALFRED C. NELSON, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-THIRD TO ARTHUR G. McKEE AND ONE-THIRD TO DAVID T. CROXTON, OF CLEVELAND, OHIO.

DEVICE FOR CONTROLLING FLUIDS.

959,025.

Specification of Letters Patent. Patented May 24, 1910.

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To all whom it may concern:

Be it known that I, ALFRED C. NELSON, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Devices for Controlling Fluids, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to devices for controlling fluids.

The object of my invention is to eliminate the transmission of pressure from one part of a valve-controlled fluid duct to another part thereof as a result of leakage through the valve.

A particular object of the invention is to eliminate the danger to workmen while making repairs, arising from the leakage in the gas-main of a blast furnace stove while such repairs are being made. The principle of the invention may, however, be applied to high-pressure water mains, as I shall hereinafter explain.

The said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawing and the following description set forth in detail certain means embodying my invention, the disclosed means constituting but one of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—Figure 1 is a vertical axial section of a device embodying my invention, as applied to the gas-main of a blast furnace stove, and illustrating a portion of such gas main including two opposing main-sections forming an intermediate valve-space, together with a section of the valve casing, and a broken elevation of the attached parts. Fig. 2 is an elevation of the mechanism shown in Fig. 1, viewed from the plane indicated by line II—II in Fig. 1.

The two sections A A of the gas main are provided with two opposing valve seats a , which form between them the valve-space a' . Above this space is a valve-casing B into which the double gate-valve B' may be raised when it is desired to permit the gas to flow from one section into the other. This gate-valve is of any well known con-

struction, whereby the valve-openings surrounded by the valve-seats a may be simultaneously closed or opened.

The valve-stem B² projects upwardly through the casing B and is suitably packed in the usual manner to prevent leakage of the gas through said casing and around said stem. That portion of the stem projecting upwardly from the casing is threaded as shown. A bevel-gear B³ engages the said threaded portion as a nut. A second bevel-gear B⁴ mounted upon a suitable spindle engages the gear B³. An operating-wheel B⁵ is secured to the said spindle and by means of its rotation the valve may be raised or lowered, as will be readily understood.

The valve-space a' is provided with an opening a^2 , to which is connected a duct A'. This duct extends upwardly and terminates in a valve-seat a^3 , Fig. 2. Fulcrumed in a suitable standard a^4 is a lever A². One arm of this lever is provided with a counterweight a^5 and adjacent to this weight is hung a valve A³ which is adapted to engage the valve-seat a^3 and open or close the end of the duct A'. The other arm of the lever A² has secured to it one end of the chain A⁴, whose other end is secured to the extremity of the valve-stem B², as shown in Fig. 2. The length of this chain is made such that valve A³ would be raised off of the seat a^3 when the valve is lowered and the duct A' will therefore be open to atmospheric communication.

When the gate-valve B' is in its raised position wherein the gas may pass from one main-section to the other, valve A³ is in its closed position and atmospheric communication with duct A' is cut off. When it is desired to repair any part of the blast furnace which is in communication with the gas-main, the gate-valve B' is lowered and the ends of the main-sections closed so as to intercept the flow of gas through such main. It has been found however, in the past that when these gate valves are in this closed position, gas oftentimes leaks between the valve-disks and thus gains access to that part of the blast furnace in which the workmen are making the repairs. This has often endangered the lives and health of such workmen. By providing the opening a^2 and the duct A' which communicates with the valve-seats, and arranging the parts so that the valve A³ is open and the valve B' 110

is closed, all such leaking gas is permitted to escape into the atmosphere through said duct A', and is thereby prevented from reaching the part of the furnace which is
5 being repaired.

Secured to the main and communicating with the bottom of the valve space a' , is a receptacle C whose shell is provided with an opening in its side controlled by a manu-
10 ally operable slide c . By means of this receptacle all dirt, cinders or other substances carried by the gas, which tend to accumulate in the space a' and interfere with the proper operation of the valve, is deposited
15 so as to completely eliminate such interference, and may be removed through the slide-controlled opening.

When the device is applied in connection with a high-pressure water-main, a screw or
20 other suitable valve (not shown) is substituted at a suitable place in duct A' by means of which atmospheric communication may be positively shut off, as will be readily understood. In this case, the action is the
25 same as described in connection with the gas main, excepting that the duct valve is manually instead of automatically actuated.

Having fully described my invention, what I claim therefore and desire to secure
30 by Letters Patent is:—

1. In a device of the class described, the combination of a fluid main intersected by a valve-space; a valve operating in said space, and adapted to control the flow
35 through said main; the latter being provided with an outlet communicating with the said valve-space, independently of the fluid duct in said main; an inclosed receptacle below said valve-space and communicating therewith, such receptacle being provided with an opening; and means for opening and closing such opening.

2. In a device of the class described, the combination of a fluid main intersected by
45 a valve-space; a valve operating in said space adapted to be moved upwardly so as to permit of the flow of fluid through the main, the downward movement of such valve intercepting such flow; a duct communicating with said valve-space and the atmosphere independently of the main; an inclosed receptacle beneath the valve-space provided with an opening; and means for controlling said opening.

3. In a device of the class described, the combination of a fluid-main intersected by
55 a valve-space; a valve operating in said

space and adapted to intercept the flow of fluid through said main; a duct communicating with said valve-space; and a valve for controlling the flow of fluid through said duct; said main-valve and duct-valve being operatively connected with each other, whereby the position of the former will determine the position of the latter.

4. In a device of the class described, the combination of a fluid-main intersected by a valve-space; a valve operating in said space and adapted to intercept the flow of fluid through said main; a duct communicating with said valve-space; and a valve for controlling the flow of fluid through the latter; said main-valve and duct-valve being operatively connected whereby the duct-valve is caused to assume an open position when the main-valve is in its closing position.

5. In a device of the class described, the combination with two main-sections provided with opposing valve-seats and forming a valve-space between such seats; a double gate-valve movable in said space and adapted to engage said seats to close the opposing main-sections; a stem connected with said gate-valve; a duct communicating with said valve-space; a lever mounted upon said duct; a valve on one arm of said lever adapted to open and close said duct; a chain having one end connected with the other arm of said lever and the other end connected with
90 said valve-stem.

6. In a device of the class described, the combination of a fluid main intersected by a valve-space; a valve adapted to move in a direction transverse with respect to the axis of the main, and also arranged to have a movement in the direction of such axis to close the valve-seat in said main; an outlet affording communication between such valve-space and the atmosphere independently of said main; an inclosed receptacle below said valve-space communicating therewith, for receiving the solid matter carried by the fluid in the duct, said receptacle being provided with an opening in its wall; and a door for controlling said receptacle opening.

Signed by me, this 31st day of March, 1909.

ALFRED C. NELSON.

Attested by—

WINIFRED WALTZ,
WM. R. MILLER.