

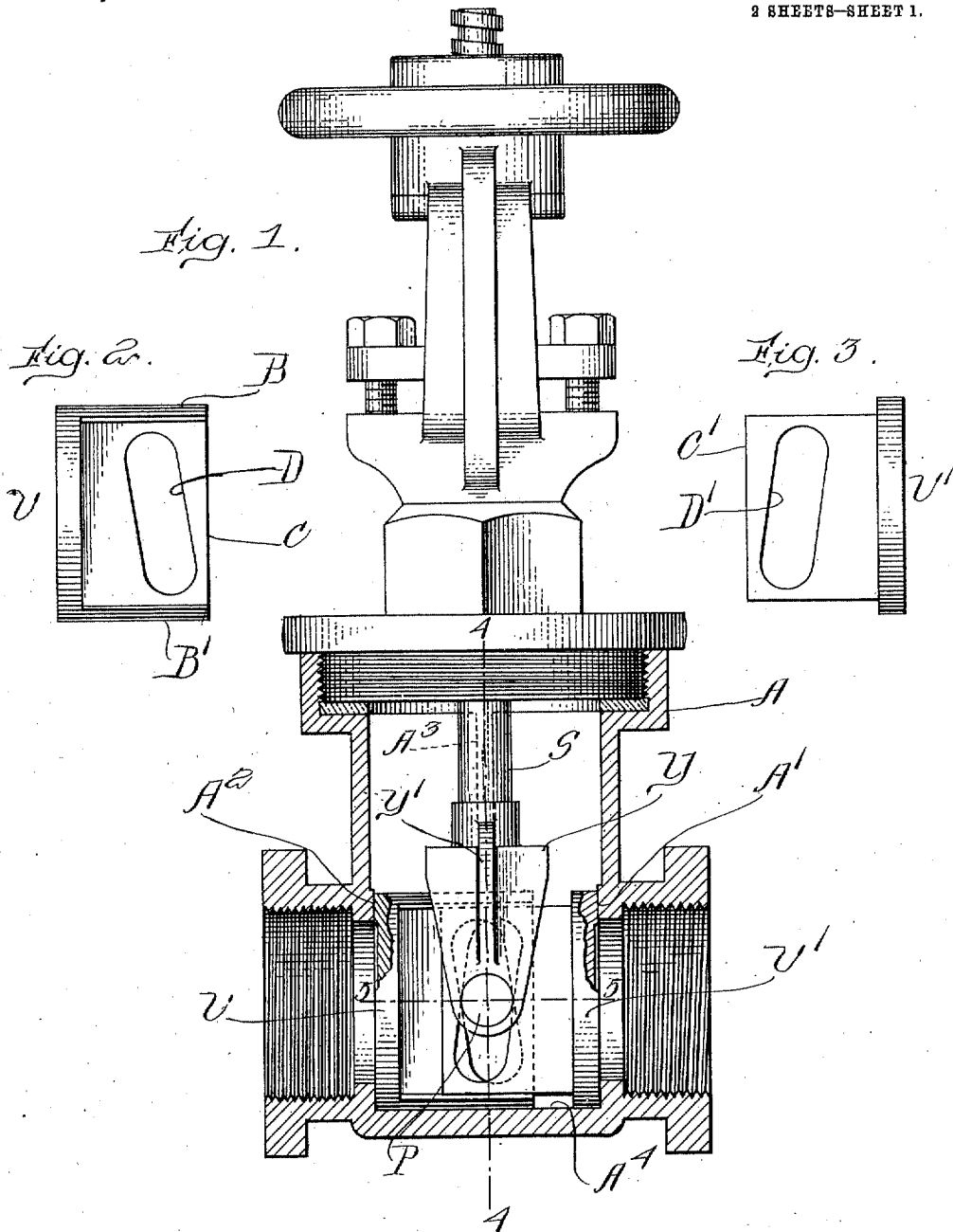
A. WATSON.
VALVE.

APPLICATION FILED SEPT. 16, 1910.

983,960.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.



Witnesses:

Charles J. Wacker
Josephine A. Ryan

Inventor:

Alexander Watson
By *Wm. Robert Christman*
Attys.

A. WATSON.
VALVE.

APPLICATION FILED SEPT. 16, 1910.

983,960.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 2.

Fig. 4.

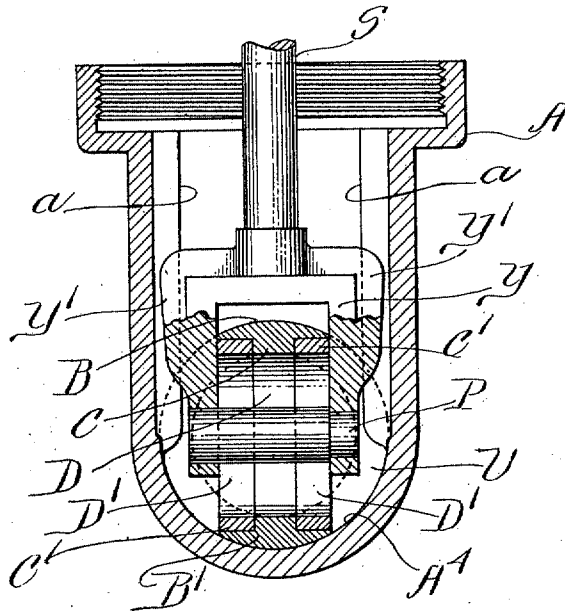
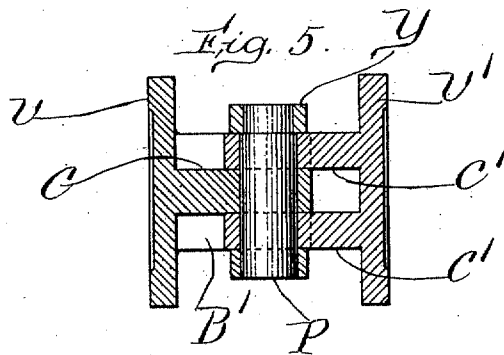


Fig. 5.



Witnesses:
Charles D. Woodbury
Josephine H. Ryan

Inventor:
Alexander Watson
By [Signature] Attys.

UNITED STATES PATENT OFFICE.

ALEXANDER WATSON, OF BEACHMONT, MASSACHUSETTS, ASSIGNOR TO BYRON C. LEAVITT, TRUSTEE, OF DUXBURY, MASSACHUSETTS.

VALVE.

983,960.

Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed September 16, 1910. Serial No. 582,287.

To all whom it may concern:

Be it known that I, ALEXANDER WATSON, a citizen of the United States, and resident of Beachmont, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Valves, of which the following is a specification.

My invention relates to gate valves of the type wherein the valves are seated and unseated by a translating or sliding movement substantially normal to the valve seats, and in which when the valves are unseated, their movement changes from one of translation substantially normal to the seats to one substantially parallel thereto, so that the valves are at first moved from the seats without sliding and then withdrawn to leave an unobstructed passage for fluids through the valve casing.

The objects of my invention herein described are to provide a valve of this character which may be accurately and yet economically manufactured and be so proportioned and constructed that heavy closing pressure can be applied to the valves uniformly all over the seats, and leakage due to slight tipping or inclination of the valves, may be avoided.

Referring to the drawings hereto annexed which illustrate an example of my invention,—Figure 1 shows a valve casing and valve stem operating device, the casing being shown in vertical section; Fig. 2 is a side elevation of one of the valves; Fig. 3 is a side elevation of the opposite valve; Fig. 4 is a vertical section on the line 4 Fig. 1 viewed in the direction of the arrow; and Fig. 5 is a horizontal section of the telescopically related valves taken through the line 5—5, Fig. 4.

The valve casing is marked A and is provided with two oppositely facing valve seats, A¹, A². The bottom of the casing is machined to a smooth finish at A⁴, preferably entirely across the casing from valve seat to valve seat, so as to afford a broad bearing for the mutually fitting and telescopically related valves.

The valves V, V' are seated in opposite directions against the seats A², A¹ respectively and are shaped as follows: The valve V (see Figs. 2 and 4) is provided with an

integral extension on the side away from its seating surface, this extension comprising the web C and marginal flanges B, B', a section taken through the extension showing the I form. The sides of the web C and the inner surfaces of the flanges B and B' are shaped so as to present smooth, plane surfaces and the outside portions of the flanges B, B' are turned so as to form a continuation of the cylindrical surface of the valve proper V. An oblique slot D is milled through the web C. The valve V', which is the complement of the valve V, has an integral extension which comprises two parallel webs C' which are separated by a distance substantially equal to the transverse thickness of the web C which forms part of the extension of the valve V. The edges of the parallel webs C' also make a sliding fit with the inner surfaces of the flanges B, B' of the valve V and these parallel webs C' are obliquely slotted at D'. When the extensions of these two valves V, V' are fitted together in telescoping relation, the two oppositely inclined oblique slots D, D' stand in the relation shown in Fig. 1, registering with each other at the points where the planes of their inclined sides coincide.

The cylindrical outer surfaces of the two valves V, V' are preferably coincident and also coincident with the machined inner surface A⁴ in the valve casing, so that both valves find a bearing surface in the casing on which to slide, this bearing surface, as well as the mutually bearing surfaces of the telescoping extensions, insuring a true rectilinear movement and preventing tipping of the valves with relation to their respective seats.

The valve stem S which is operated in the usual manner passes into what is shown in Fig. 1 as the upper portion of the valve casing A, this upper portion constituting a retiring chamber for the valves. The valve lifter Y is attached to the lower end of the valve stem S and is formed in the shape of a yoke or fork, shown distinctly in Fig. 4, of which the two arms embrace one of the flanges (B) of the valve and also the web extensions C' of the valve V'. Near the lower end of the two members of the yoke or fork, apertures are provided in which

the pin P is secured, this pin being of such size as to pass through the slots D, D', as shown in Figs. 1 and 4. The casing has formed within it guides *a* which are arranged in pairs on either side of the casing so as to form guide grooves, such as shown in dotted lines at A³ in Fig. 1, and the lateral extensions Y' of the lifter Y slide between and are guided by these guides *a*.

- 10 The valves V and V' and their telescopically related extensions are preferably so proportioned that when the two valves bear on their respective seats, the pin P shall be at or near the common axis of the two valves.

15 The operation of the above described valve mechanism is as follows: When the above described parts are assembled in relations shown in Fig. 1, and the valves V, V' are seated, seating pressure is brought to bear by moving the valve stem S, lifter Y and pin P downward, when, by the mutual action of the pin P and the sides of the oppositely inclined oblique slots D, D', the two valves are firmly pressed against their respective seats; this pressure is evenly distributed around and over the extent of the valve seats, since the opposite thrusts are applied in substantial coincidence with the common axis of the two valves. Even if the position of the pin P is below or above the axis of the valves when they are closed, the ample bearings provided in the base of the casing at A⁴, and between the telescoping extensions of the valves, will insure effective seating of the valves. To open the valves, raise the lifter Y by means of the stem S and its operated mechanism. The first effect is to relieve the pressure between the valves and valve seats, then the valves are withdrawn from the valve seats, the valve extensions sliding telescopically until the pin P comes to a bearing on the upper ends of the two slots D, D' which will then be in register, then the two valves are lifted together into the retiring chamber leaving the fluid passage in the casing entirely clear for the passage of fluid. To close the valve, the above described movements are reversed, the valves first descend with the lifter Y, when the valves bear upon the bearing surface A⁴ and the lifter continues to descend, the downward movement of the pin P in the slots D, D' moves the valves outward in both directions until they find their seats. When they are seated the final pressure exerted by the pin P insures a firm bearing of the valves upon the valve seats.

Where the term "telescopically related" is used herein, it is intended to mean and imply a mutual sliding relation, not necessarily qualified by the inclusion of one sliding member within another, although it is

believed that telescopic relation in this stricter sense, as illustrated by the I section 65 extension and the embraced forked extension, is definitive of preferred construction.

What I claim and desire to secure by Letters Patent is:

1. In a valve of the character described, 70 a casing with opposite valve seats, a pair of oppositely facing valves, provided with telescoping extensions, one comprising a web and flanges, the other making a sliding fit with said web and flanges, each extension 75 provided with an oblique slot, the two slots oppositely inclined, a valve-stem, a lifter operated thereby and provided with a pin passing through both oblique slots.

2. In a valve of the character described, 80 a casing with opposite valve seats, a pair of oppositely facing valves, provided with telescoping extensions, one comprising a web and flanges, the other making a sliding fit with said web and flanges, each extension 85 provided with an oblique slot, the two slots oppositely inclined, a valve-stem, a lifter operated thereby and provided with a pin passing through both oblique slots, the said related members being so proportioned that 90 the pin stands substantially at the common axis of the two valves when the valves are seated.

3. In a valve of the character described, a casing with opposite valve seats, a pair 95 of oppositely facing valves, provided with two telescoping sections, one comprising a central web and flanges, the other a pair of webs embracing the central slot of the former, and sliding between the flanges, each 100 extension obliquely slotted through the webs, the slots oppositely inclined, a valve-stem, a lifter operated thereby, and provided with a pin passing through both oblique slots, the casing having a seat on which the 105 flanged valve-extension slides.

4. In a valve of the character described, a casing with opposite valve seats, a pair of oppositely facing valves, provided with two telescoping sections, one comprising a central 110 web and flanges, the other a pair of webs embracing the central slot of the former, and sliding between the flanges, each extension obliquely slotted through the webs, the slots 115 oppositely inclined, a valve-stem, a lifter operated thereby, and provided with a pin passing through both oblique slots, the casing having a seat on which the flanged valve-extension slides, the said related members being so proportioned that the pin 120 stands substantially at the common axis of the two valves when the valves are seated.

5. In a valve of the character described, a casing with opposite valve seats, a pair of oppositely facing valves, provided with 125 two telescoping sections, one comprising a

central web and flanges, the other a pair of webs embracing the central slot of the former, and sliding between the flanges, each extension obliquely slotted through the webs, 5 the slots oppositely inclined, a valve-stem, a lifter operated thereby, forked to make a sliding fit with the telescopic extensions, and provided with a pin passing through both

oblique slots, the casing having a seat on which the flanged valve-extension slides. 10

Signed by me at Boston, Massachusetts, this 13th day of September, 1910.

ALEXANDER WATSON.

Witnesses:

WILLIAM G. MITCHELL,
ODIN ROBERTS.