

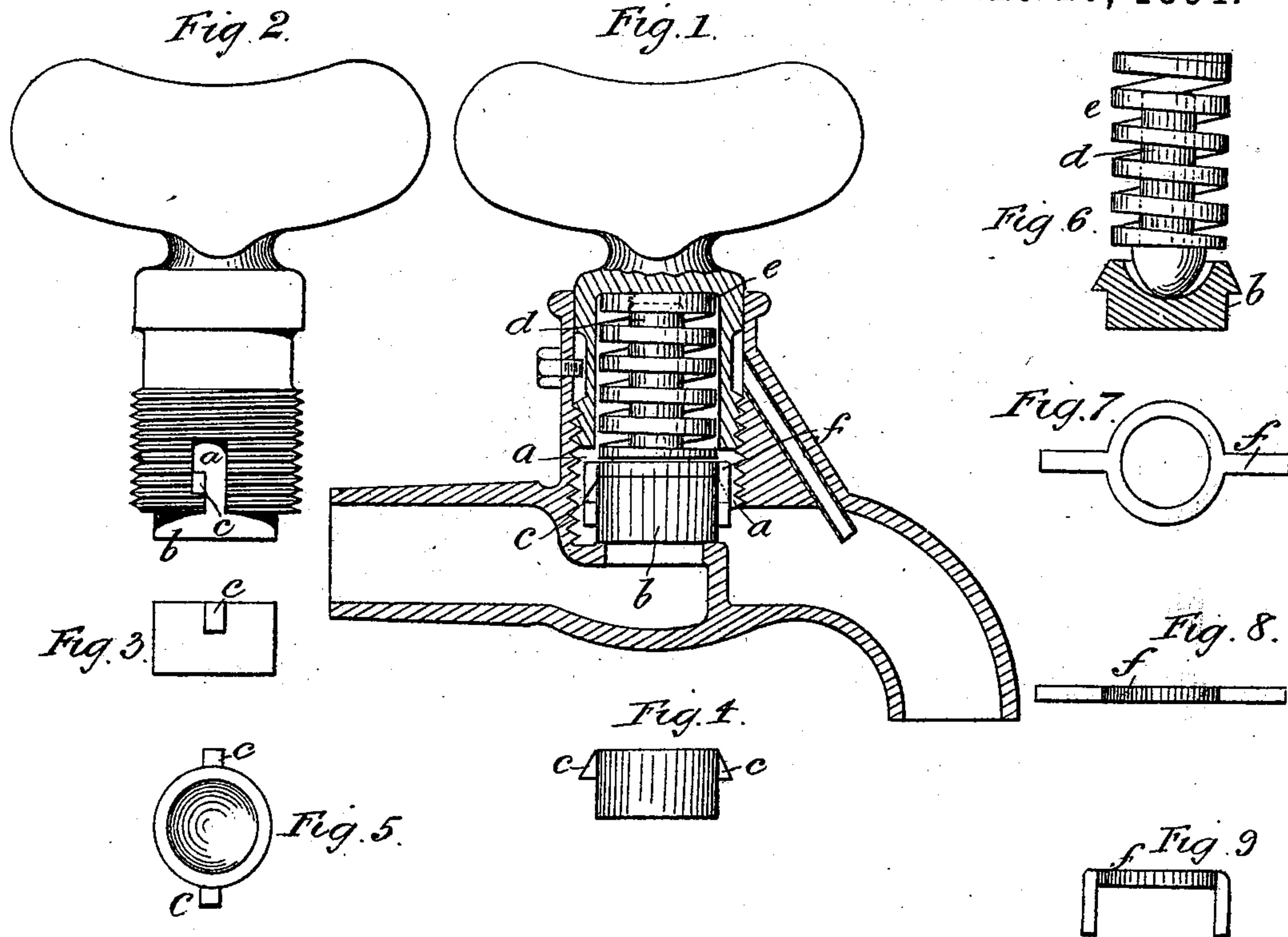
(No Model.)

W. THOMSON.

VALVE FOR WATER, STEAM, OR OTHER LIQUIDS OR GASES.

No. 522,170.

Patented June 26, 1894.



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UNITED STATES PATENT OFFICE.

WILLIAM THOMSON, OF GLASGOW, SCOTLAND.

VALVE FOR WATER, STEAM, OR OTHER LIQUIDS OR GASES.

SPECIFICATION forming part of Letters Patent No. 522,170, dated June 26, 1894.

Application filed June 2, 1892. Serial No. 435,304. (No model.) Patented in England March 4, 1891, No. 3,864; in France December 22, 1891, No. 218,213; in Belgium December 31, 1891, No. 97,775; in Sweden January 19, 1892, No. 3,889; in Norway January 25, 1892, No. 2,606; in Italy May 11, 1892, No. 134, and in Denmark August 29, 1892, No. 927.

To all whom it may concern:

Be it known that I, WILLIAM THOMSON, Baron Kelvin, professor of natural philosophy in the University of Glasgow, Glasgow, in the county of Lanark, Scotland, have invented Improvements in Valves for Water, Steam, or other Liquids or Gases, (for which I have obtained patents in Great Britain, dated March 4, 1891, No. 3,864; in France December 22, 1891, No. 218,213; in Belgium December 31, 1891, No. 97,775; in Sweden, No. 3,889, dated January 19, 1892; in Norway January 25, 1892, No. 2,606; in Italy, No. 134, Vol. 63, R^a. A^a., dated May 11, 1892, and in Denmark August 29, 1892, No. 927,) of which the following is a specification.

My present invention relates to improvements in detail and extended application of the invention for which Letters Patent were granted to me in the United States, No. 447,211, and dated February 24, 1891, and in Denmark, No. 927, dated August 29, 1892.

In draw-off taps, stop-cocks, stop-cock check valves, or ball cocks, instead of the pin through the valve working in closed ended slots in the plug which is difficult to remove and replace and may under certain circumstances become loose I form upon the side of the valves solid gudgeons. These gudgeons work in slots in the plug each of which may consist of an upward slot from the lower edge of the plug, a horizontal slot from the upper end of the upward slot and a downward slot to permit of the required travel of the gudgeons and valve. Or I may omit the downward slot, and use only the vertical slot for the introduction of the gudgeons and the horizontal slot made of sufficient depth to allow the necessary vertical motion relatively to the plug of the gudgeons and valve. For the purpose of preventing the gudgeons from working out by the downward slot I place a key of wire or other material in such a position as to close the latter slot. The valves and gudgeons may be made in one piece by casting, drawing or stamping. To produce pressure upon the valve while the latter is being ground at every operation of closing and opening upon its seat, a spiral spring is used, having within it the shank of a rivet-shaped piece of metal

the head of which is rounded and bears centrally upon the back of the valve. The spring bears on the step of the rivet head, and as the shank is guided by the spring, the pressure of the rivet-head notwithstanding the tendency of the spring to produce greater pressure at one side than at another, is always central and vertical. An additional use of the rivet is to limit the compression of the spring as may be desired.

In the drawings—Figure 1 is a section of a draw off tap. Fig. 2 is an elevation of the handle and outside screwed plug of the tap. Figs. 3 and 4 are elevations, and Fig. 5 a plan of the valve showing its gudgeons. Fig. 6 shows the valve with rivet stop and spiral spring surrounding the shank of the rivet. In this case the valve is hollowed out so that the rivet head may bear at a point nearer to the plane of contact between the valve and its seat than would be the case if the valve were flat. Fig. 7 is a plan, and Figs. 8 and 9 are elevations of the key for preventing the valve coming out of the plug.

In Fig. 2, *a* is the slot formed in both sides of the plug, consisting in this case of an upward slot and a horizontal slot. In this figure the valve *b* is shown in position with its gudgeons *c*, resting upon the horizontal part or shoulder of the slot.

In Fig. 1 the valve is shown in position with the rivet-shaped stop *d* and spiral spring *e*. The under side of the spring *e* rests upon the shoulder of the rivet-head as shown at Fig. 6; the upper side bears against the top of the plug as shown in Fig. 1.

By turning the handle and plug the valve is first screwed down to its seat; by continuing the turning the spring is compressed and the valve pressed upon its seat by the central pressure of the rivet-head. The turning is arrested by the top of the plug coming against the end of the shank of the rivet. During the process of turning and compressing the spring the side of the slot comes in contact with the gudgeons and causes the valve to turn while being pressed upon its seat. In order to cause this turning to commence immediately the valve reaches its seat, and to prevent the gudgeons getting into the lower part of the

slot, the key *f*, Figs. 1, 7, 8, and 9 is used. It is formed from a flat piece of metal as shown in Figs. 7 and 8, and its use will be understood by the following description of the method of setting up the valve in the plug.

The spring is first placed in the plug; the rivet follows; then the key, as in Fig. 8. Next the valve is inserted, pressed in, and turned until its gudgeons rest on the horizontal portions or shoulders of the slots. Lastly the arms of the key are bent down as in Figs. 1 and 9 so as to lie in the slots. The valve is now perfectly keyed but may be withdrawn at any time by slightly raising the arms of the key to allow the gudgeons to pass them.

I claim—

1. In a stop-cock, the combination with a housing, a plug provided with slots and a horizontal shoulder, a valve provided with gudgeons working in said slots, and the rivet-shaped piece of metal resting on the valve and provided with a shank, and a spiral spring surrounding said shank for pressing the valve upon its seat, substantially as set forth.

2. The combination, with the housing having inlet and outlet ports and the valve-seat, of the valve-stem having a cup or cavity at its lower end, a valve arranged in said cup and having slot-and-pin connection with said stem, and the pressure spring arranged in said cup, and having the central boss *e* bearing upon said valve, substantially as set forth.

3. In a stop-cock, the combination with a housing, a plug working in said housing, a valve working in said plug, a rivet-shaped piece of metal, having its shank surrounded by a spiral spring resting on said valve, and a metal key, all substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

WILLIAM THOMSON.

Witnesses:

JOHN LIDDLE,

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