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(54) Dashpot for use in a pressure gas line

(57) A dashpot is provided in a pressure gas line, between the pressure gas cylinder (2) and the sealing valve (6), to prevent a pressure surge to a downstream fitting (25). The dashpot contains, in a housing (8), a valve body (20) which, normally, under spring (23) pressure, cuts off the pressure gas line by a closure cone (21) and a conical valve seat (15). By means of a by-pass (17), in the form of one or more bones in a chamber member (11) forming a chamber (13) the cylinder pressure can build up above the valve body (20), after the sealing valve has been opened, which cylinder pressure then, at the same time, lifts the valve body (20) from the conical valve seat (15) and thus allows a slow release of the gas via the sealing valve. Chamber (13) is connected to the outlet bore (14) around the seat (15) by a central bore (22) in the valve body (20), and to the inlet bore via a choke (18).

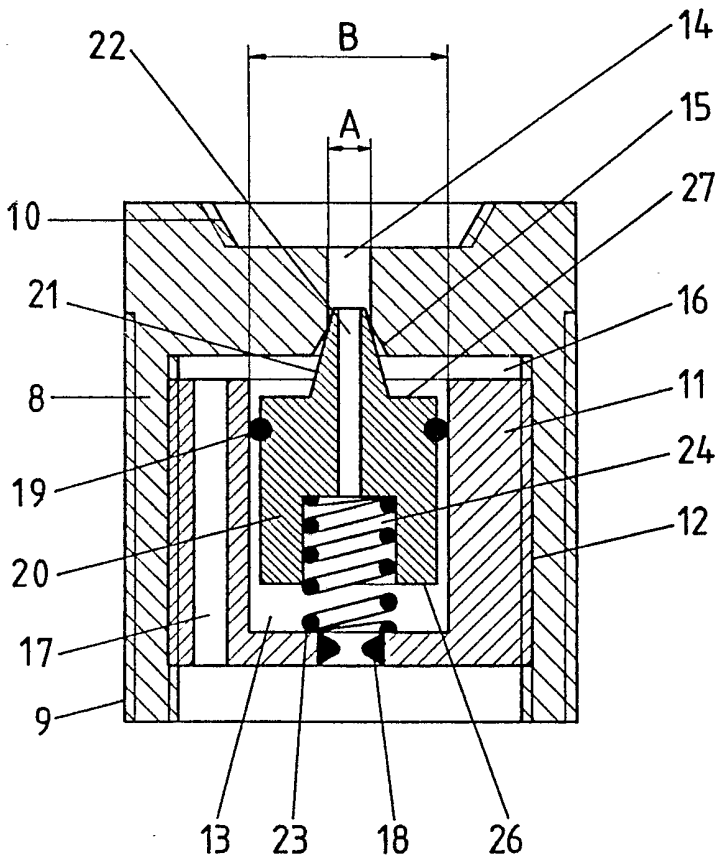


Fig. 2

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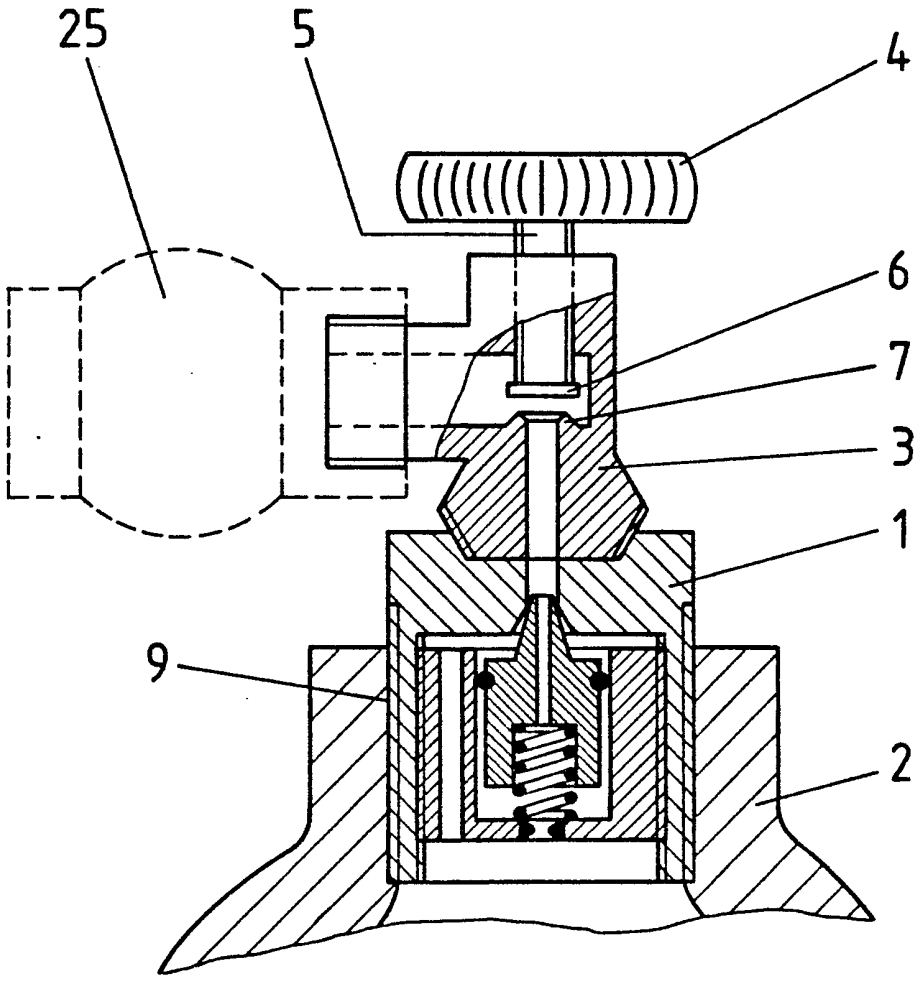


Fig. 1

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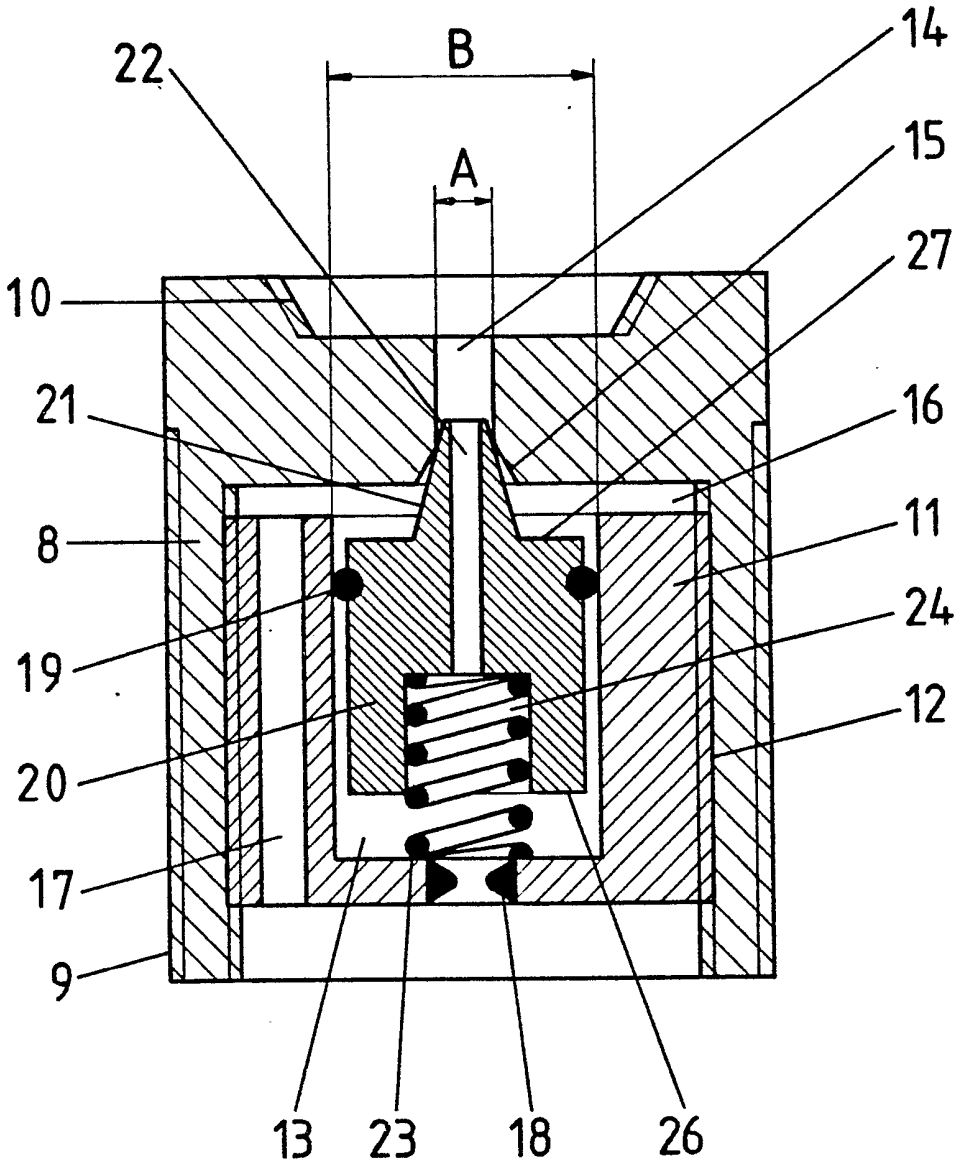


Fig. 2

SPECIFICATION

Dashpot for use in a pressure gas line

The present invention relates to a dashpot for use in a pressure gas line.

A dashpot for use in a pressure gas line is disclosed, as an element of a connection member for a gas supply line, in DE-A-1429066 (equivalent to GB-A-1019524. In practice, this connection member comprises, in a combination, the sealing valve body of the necessary sealing valve in the pressure gas line, and a safety valve mechanically connected therewith. The safety valve opens after the sealing valve body has been actuated, e.g. in a delayed manner by an exterior tappet, so that a pressure surge from the pressure gas line does not place too much strain on the often sensitive fittings connected downstream. The dashpot according to the present invention can be inserted in a simple manner, its action being mechanically independent of the sealing valve, at random into a pressure gas line, between the sealing valve and the pressure gas source.

In more detail, there is known from DE-A-1429066 a connection member for gas supply lines, which contains, inside a housing, two coaxial valve seats. They respectively form, with a movable sealing body, a sealing valve and a safety valve arranged upstream thereof. Both close, in the direction of flow, under spring pressure. The valve body for the sealing valve is provided with a stepped stem. The sealing body for the safety valve is movably guided over the first step, adjacent to the valve body, of the stem. The clearance between the sealing body and the stem forms a calibrated gas passage. There is arranged between the valve body and the sealing body a distance between these bodies. There are arranged about the end of the stem two springs, lying one inside the other, which are supported with one end, towards the housing end, against the housing. With the other end, the outer spring slides with a spring plate over a second step of the stem and, according to the position of the valve body of its stem, is supported on the sealing body or against the end of the first step of the stem. The inner spring is supported against the end of the second step of the stem and closes the valve body.

In order to release the gas, the valve body is opened against the inner spring by means of a tappet which is actuated from outside and which is located in a detachable relief valve or in another device. At the same time, the outer spring is lifted from the sealing body by means of the stem with its first step. With the resulting difference in pressure, however, this sealing body still remains on its seat until the pressure clearance has been equalized by the calibrated clearance between the sealing body and stem. The sealing body is then lifted by the action of the distance spring and allows a slow release of the gas.

The object of the present invention is to improve a dashpot in pressure gas lines from a connection member for gas supply lines, in such a way that it can be used, as individual structural element, at any position in the pressure gas line between the sealing valve and the pressure gas source, so that, when the sealing valve opens, its action prevents the formation upstream thereof of pressure surges which place a strain on fittings connected downstream.

According to the present invention, there is provided a dashpot for use in a pressure gas line, comprising a valve body adapted to close under spring pressure in the direction of flow, wherein, in a housing, a chamber member provided with one or more bores forms a chamber which is open to the outlet side via an outlet bore having a conical valve seat and which is open to the inlet side via a choke; and wherein the valve body, movably guided in a sealed manner in the chamber, ends in a closure cone facing the conical valve seat and urged against the concical valve seat by a closure spring, the valve body having a central bore connecting the chamber to the outlet bore.

Preferably, the valve body is movably guided by an annular seal.

Preferably, the closure spring is guided in a recess of the valve body.

The advantages obtained by means of the invention consists more particularly in the fact that, in place of the former multiple arrangement of surge safety devices in conjunction with sealing valves on pressure gas cylinders, which arrangement requires a mechanical connection between the sealing valves and the surge safety device, there is provided according to the invention a dashpot which has only to be controlled by the gas pressure and which can therefore be a separate structural element. It may be installed in a simple manner at any point (even at a later stage as a supplementary element) in the pressure gas line, between the pressure gas source and the sealing valve.

An exemplary embodiment of the invention is represented in the drawings in which:

Figure 1 shows a dashpot of the invention installed between a gas cylinder and a sealing valve; and

Figure 2 shows a cross section through the dashpot of Figure 1.

Referring to the drawings, a dashpot 1 is connected, in the usual manner, to a gas cylinder 2 by a threaded connection. A hand-operated sealing valve 3 is connected downstream of the dashpot 1, by a threaded connection. The valve 3 has a handwheel 4 and a spindle 5, which move a valve member 6 against a valve seat 7.

The dashpot 1 contains, in a housing 8 having an outer connection thread 9 on the gas inlet side and an inner connection thread 10 on the gas outlet side, a chamber member 11 which is held by means of a thread 12. The chamber member 11 forms, in the housing 8, a chamber 13 which is open towards the inner connection thread 10, i.e. towards the outlet side, via an outlet bore 14 beginning in a conical valve seat 15. The chamber member 11 has bores 17 for the gas to enter an intermediate space 16. The chamber 13 is connected

directly to the high-pressure side, via a choke 18.

The chamber 13 contains a movable valve body 20 which is guided and sealed by an annular seal 19. The valve body 20 has, facing the conical valve seat 15, a matching closure cone 21. A central bore 22 connects the chamber 13 to the outlet bore 14. A spring 23 holds the closure cone 21 of the valve body 20 against the conical valve seat 15. The spring 23 is held in a recess 24 of the valve body 20.

When the sealing valve 3 is closed, the pressure in the vicinity of the valve member 6 is equal to that insise of the gas cylinder 2. When the sealing valve 3 is opened, the pressure in the outlet bore 14 falls. However, only a small volume of gas is pressure-relieved. Thus, in any fitting 25 possibly connected downstream of the sealing valve 3, the small volume is unable to produce a dangerous pressure surge. At the same time, gas begins to flow through the choke 18 into the chamber 13. The pressure drops to a harmless level, and the same (relieved) gas pressure then prevails on the circular section A of the closure cone 21 as on the bottom face 26 of the valve body 20. However, the higher gas pressure in the intermediate space 16 acts on the annular section B minus A of the top face 27 of the valve body 20.This gas pressure causes the valve body 20 to move towards the spring 23 and the closure cone 21 to open from the conical valve seat 25. After this opening operation (which is delayed relative to the opening of the sealing valve 3), the high-pressure gas begins to flow, without surging, to the fitting 25.

CLAIMS

1. A dashpot for use in a pressure gas line, comprising a valve body adapted to close under spring pressure in the direction of flow, wherein, in a housing, a chamber member provided with one or more bores forms a chamber which is open to the outlet side via an outlet bore having a conical valve seat and which is open to the inlet side via a choke; and wherein the valve body, movably guided in a sealed manner in the chamber, ends in a closure cone facing the conical valve seat and urged against the conical valve seat by a closure spring, the valve body having a central bore connecting the chamber to the outlet bore.

2. A dashpot according to claim 1, wherein the valve body is movable guided by an annular seal.

3. A dashpot according to claim 1 or 2, wherein the closure spring is guided in a recess of the valve body.

4. A dashpot for use in a pressure gas line, substantially as hereinbefore described with reference to, and as shown in, the drawings.

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