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(54) **Fire damper**

(57) A Fire damper composed of the body where division is self-aligning fixed against the axis division of the closing spring device (2) and releasing fuse link element (3) are placed inside the body (5) in the plane perpendicular to the axis (1) where the division is fixed on (6), and besides, there is a flexible sealing ring (11) fixed on the notch made in the circumference of the division (6) that works closely with thermal expanding gasket (12) located inside on the body wall (5) in lateral plane corre-

sponding to the position of the division (6) in the closed position. There can also be at least two rows of length-wise holes (13) on the body wall (5) in lateral plane corresponding to the position of the division (6) in the closed position, protecting against heat conduction along the vent duct walls. Additional feature is the fact that there are limit switches (8) and (9) placed inside the body (5), monitoring division's position (6). The nipple or sleeve make allows for easier cut off flap valve mounting in the vent or air-conditioning installation.

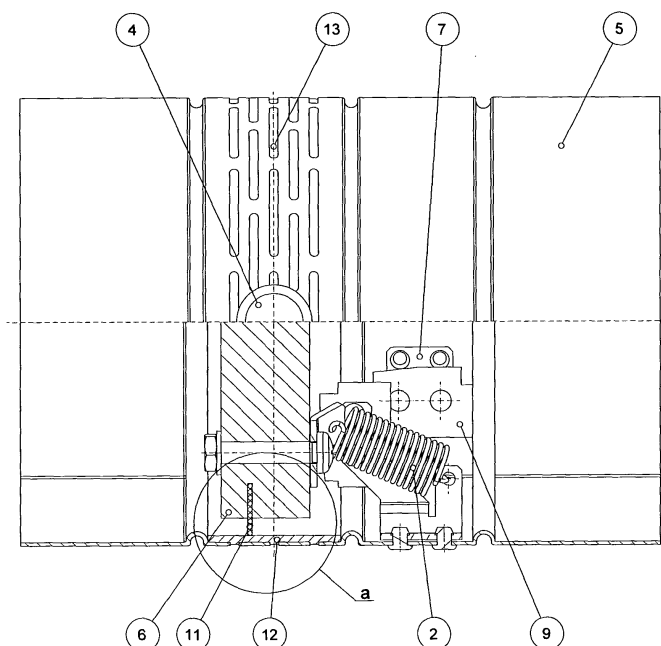


Fig. 1.

Description

[0001] Fire damper is the subject of the invention. One of the problems that needs to be solved for making ventilation and air-conditioning installation is fire protection for vented or air-conditioned object. Unprotected ventilation and air-conditioning ducts and pipes running through the elements of fire division are the way where fire is spread through that decrease fire protection level. The solution for this problem is fitting inside those installations cut off elements that allow for walls, ceiling and floor structural fire protection integrity where the ventilation and/or air-conditioning ducts and pipes are run through. This way they protect other areas against hot smoke and gas and allow for regular installation operation. Those elements are fire cut off flap valves that are elements of fire safety installed in the ventilation and/or air-conditioning ducts and pipes passages through the walls, ceiling and floors.

[0002] Patent literature offers various cut off flap valves solutions working in auto and controlled mode. British patent claim nr GB 2 399 497 presents a cut off flap valve, placed outside the vent duct, equipped with spring tightening device. The flap is kept in open position by the outer wall of the vent duct. Duct closing results from losing stiffness by the heated vent duct. Flap thrust effected by the spring device on the wall of the vent duct results in progressing wall of the vent duct denting as long as the flow is completely cut off.

[0003] European patent claim nr EP 0 829 689 presents a flap valve fitted axially in the narrowing place inside the vent duct. The narrow place it is a ring fixed in horizontal plane with flap rotation axis. Both the ring and the flap are formed in such a way that the flap rotating 90° rests against the pitch / thread made in the ring. Additionally, flexible plates are fitted on the flap and the ring, sealing the flap in the position closed.

[0004] Another solution was given for the cut off flap valves construction described in Swedish patent claim nr SE 9003794. Flap placed inside the body is fixed in the axis that as soon as leaves the body is bent at the right angle. Leaving outside bent end of the axis rests against fuse - link element that melts at high temperature releases it allowing spiral spring, placed in the axis of flap rotation to act. That makes flap rotate and closing gas flow.

[0005] The subject of his invention is the fire damper composed of the body where division is self-aligning fixed against the axis division of the closing spring device and releasing fuse link element; featured by the fact that the spring closing device and releasing fuse link element are placed inside the body in the plane perpendicular to the axis where the division is fixed on, and besides, there is a flexible sealing ring on the notch made in the circumference of the division that works closely with thermal expanding gasket located inside on the body wall in lateral plane corresponding to the position of the division in the closed position. It is also important that there are at

least two rows of lengthwise holes on the body wall in lateral plane corresponding to the position of the division in the closed position, protecting against heat conduction along the vent duct walls. Apart from its typical feature is the fact of fixing switch limits installation inside the body monitoring division position. Fire damper's body is made in such a way its diameter equals the diameter of vent ducts.

[0006] The subject of his invention is displayed in fig. 1 presenting longitudinal semi-view and semi-section of the fire damper in nipple make for closed position, while fig. 2 presents longitudinal semi-view and semi-section of the cut off flap valve in sleeve make for closed position open, however, fig. 3 presents longitudinal view of the cut off flap valve with limit switches for position closed. Fig. 4 presents the detail of division execution in the sectional view.

[0007] Division 6, made of high temperature resistant metal was fixed diagonally in the pipe body 5 on bearings 4 axis 1 of division 6, kept in open position with fuse - link releasing device 3. Additionally division 6 is connected to body 5 with spring 2. Spring closing device 2 and fuse - link releasing element 3 are fitted inside the body 5 in the plane perpendicular to axis 1, where division 6 has been fixed. The division 6 has a notch 10 in the circumference, where flexible sealing ring 11 has been mounted that works closely with thermal expanding gasket 12 located inside on the body wall 5 in lateral plane corresponding to the position of the division 6 in the closed position. Besides, in order to protect against heat conduction along the body 5 there are at least two rows of lengthwise holes 13 on the body wall in lateral plane corresponding to the position of the division in the closed position 6, and the holes are displaced one against another. Division position 6 monitoring is guaranteed by employing limit switches, placed inside the body 5. Bracket 7 has the switch limit installed 9 monitoring division 6 position for open position. Limit switch 8 monitors division 6 position for closed position.

[0008] Body 5 of the valve has diameter similar to that for vent duct that makes installation fitting easier. The valve can be made in two body 5 alternatives. Nipple version for the body 5 has vent ducts' faucets put on the body ends; while sleeve alternative has vent ducts ends inserted into the body's interior 5. During regular vent installation operation flap valve is open. Area where the fire outbreak, is self-separated by closing the fire resisting division 6 due to temperature increase in the vent duct and releasing fuse switching 3 that results in potential energy release concentrated in the tightened spring of the closing device 2. Optionally there is a possibility of adding in row to the release fuse device 3 an electromagnet that allows for division 6 position remote control.

Claims

1. The fire damper, composed of the body where divi-

sion is self-aligning fixed against the axis division of the closing spring device (2) and releasing fuse link element (3) are placed inside the body (5) in the plane perpendicular to the axis (1) where the division is fixed on (6), and besides, there is a flexible sealing ring (11) fixed on the notch made in the circumference of the division (6) that works closely with thermal expanding gasket (12) located inside on the body wall (5) in lateral plane corresponding to the position of the division (6) in the closed position. 5 10

2. The fire damper according to claim 1 is featured by the fact that there are at least two rows of lengthwise holes (13) on the body wall (5) in lateral plane corresponding to the position of the division (6) in the closed position, protecting against heat conduction along the vent duct walls. 15
3. The fire damper according to claim 1 is featured by the fact that there are limit switches (8) and (9) placed inside the body (5), monitoring division's position (6). 20
4. The fire damper according to claim 1 is featured by the fact that adding to the releasing fuse link device (3) an electromagnet in rows remote control for the division (6) is enabled. 25

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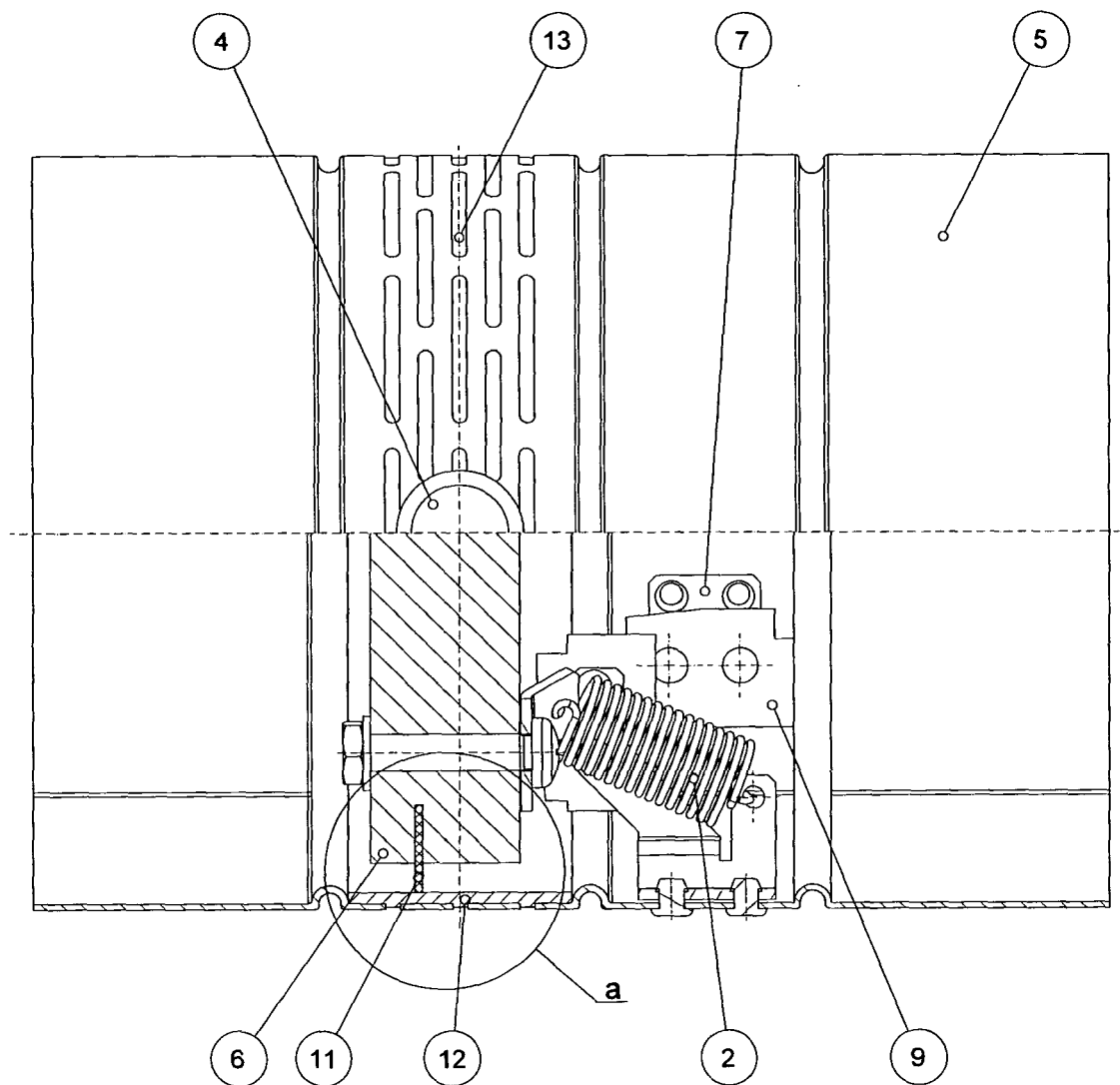


Fig. 1.

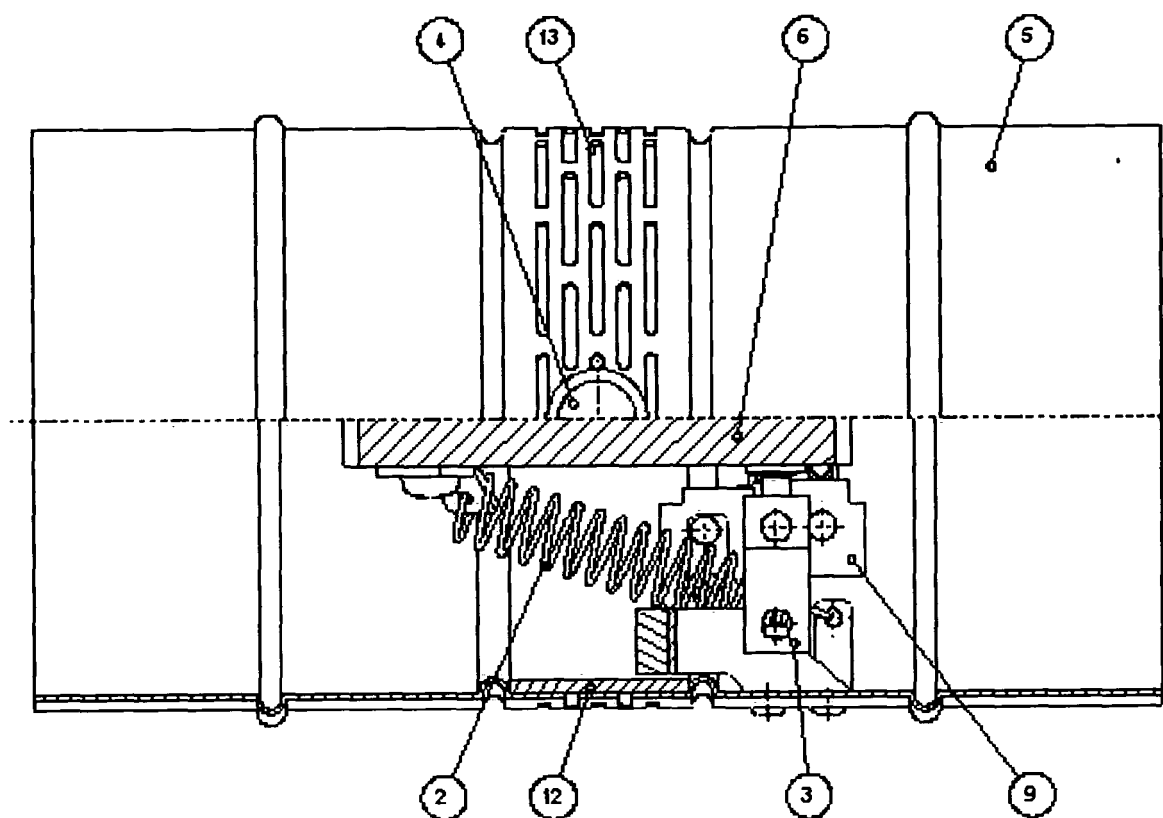


Fig. 2

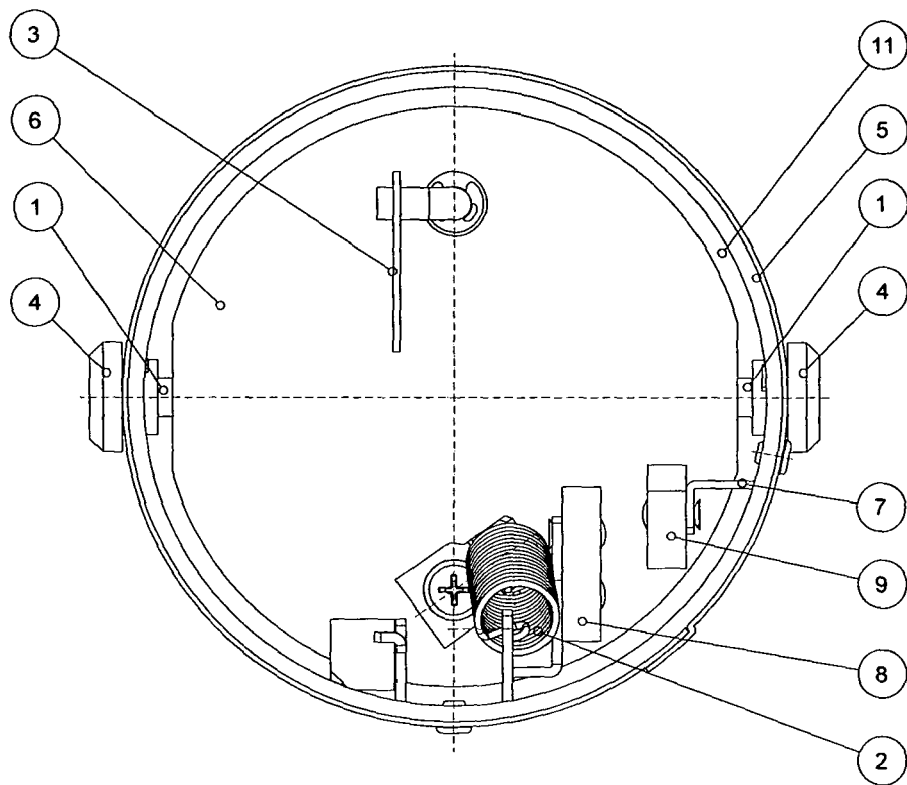


Fig. 3.

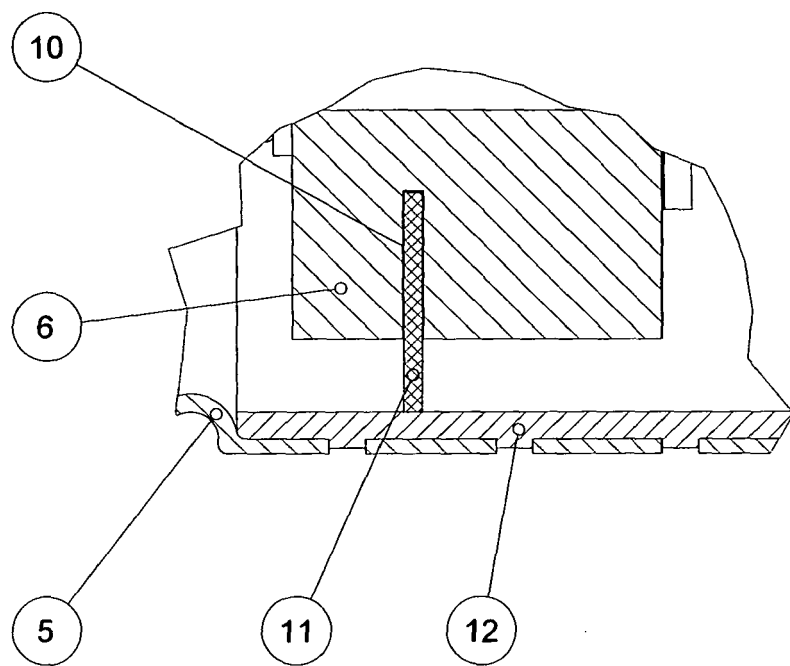


Fig. 4.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2399497 A [0002]
- EP 0829689 A [0003]
- SE 9003794 [0004]