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(54) Device for the automatic actuation particularly of ventilation flaps.

(57) The device (1) has a locking unit (4) which holds a piercing piston (3) for a compressed air cartridge (6) in its locked position. The device comprises a thermo fuse (8) which breaks when a critical temperature is exceeded and which is supported, at one end, on a longitudinally movable locking rod member (5) which is in operational communication with the piercing piston (3). An L-shaped clamp (11) which engages with an arm (13) opening (19) over the fuse (8) has a central longitudinal plane inclined to the vertical (18) and supports the other end of the fuse (8). The arm (13) is provided with a predetermined bending point (21) in the region of its connection (20) to the housing (7) of the locking unit (4) to allow the arm to bend or shear off if the cartridge (6) happens to be heated sufficiently due to failure of the fuse, to break its rupture disc and exert a force on the locking rod member (5), thus enabling the piercing piston (3) to be activated.

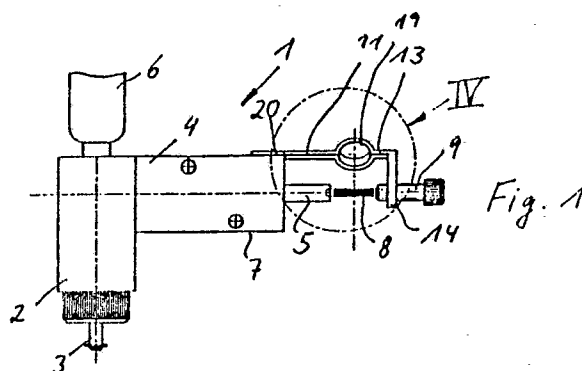


Fig. 1

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DEVICE FOR THE AUTOMATIC ACTUATION PARTICULARLY OF VENTILATION FLAPS

The invention relates to a device for the preferably pneumatic automatic actuation particularly of ventilation flaps, ventilation louvres and the like in smoke and heat offtake installations, in a construction in accordance with the preamble to claim 1.

A device of this kind is known from DE-OS 36 06 560. In this device, a glass fuse element is disposed inside a housing receiving a locking rod member, which housing is open at the bottom and top in the region of the glass element and so has inflow and outflow openings but bounds the glass bulb element laterally, which may lead to a delayed response behaviour of the fuse particularly if it is disposed in the roof region of a building.

It is the object of the present invention to provide, with structurally simple means, a device of the kind mentioned at the beginning having optimized response behaviour of the fuse element. For the solution to this problem, reference should be made to the features given in the characterising part of claim 1. With regard to further developments, reference should be made to claims 2 to 5 and also to claims 6 and 7. As a result of the supporting of the other end of the fuse by a U-shaped or L-shaped clamp having a longitudinal central plane inclined to the vertical and preferably formed by narrow square sections, the fuse can be blown against almost unhindered from all sides even in devices installed in the roof region of buildings so that transverse streams of air occurring particularly in the roof region are in a position to contribute to heating of the fuse element and to ensure the response necessary for fire protection.

In order to optimize the response behaviour further, particularly also for the case where a fuse element does not respond, for example as a result of the destruction of the capillary tube of a glass bulb, a predetermined bending point may be formed in the L-clamp, which predetermined bending point offers the device additional operational reliability.

On rising temperature in the event of fire and rising pressure in a conventional CO₂ compressed-air cartridge as an energy-carrying unit, the rupture disc usually provided in this cartridge breaks at a pressure which can be preset. This pressure acts, via the locking rod member and the fuse element, on the clamp so that, when a loading which can be predetermined is exceeded, the clamp bends or shears off at the predetermined bending point so that the piercing piston can be activated.

Some ways of carrying out the present invention will now be described in detail by way of example with reference to drawings showing specific embodiments of the present invention. In the

drawings:

Figure 1 is a side view device according to the invention having an L-shaped clamp;

Figure 2 is a front view of the device of Figure 1;

Figure 3 is a plan view of the device of Figure 1;

Figure 4 is a side view to a larger size of the L-shaped clamp of the device of Figure 1;

Figure 5 is an enlarged view of the region of the clamp shown in Figure 4 which is provided with the predetermined bending point;

Figure 6 is a side view similar to Figure 1, showing an alternative device according to the invention having a U-shaped clamp;

Figure 7 is a front view of the device of Figure 6, and

Figure 8 is a plan view of the device of Figure 6.

With reference now to the drawings, the device 1, for the automatic actuation of ventilation flaps for example, has a piercing piston unit 2 with a piercing piston 3 which has to be kept in a safety position through a locking unit 4 and has a locking rod member 5. In the event of fire, a compressed air cartridge 6 has to be pierced by the piercing piston 3 and caused to discharge. Supported on the end of the locking rod member 5 projecting out of the housing 7 of the locking unit is one end of a thermal glass-bulb element 8. The other end of this thermal glass-bulb element 8 is supported, via a screw element 9, against an L-shaped clamp 11 in Figure 1 and against a U-shaped clamp 12 in Figures 6 to 8. The arms 13 and 14 of the L-shaped clamp 11 or 15, 16, 17 of the U-shaped clamp 12 are formed by relatively narrow square sections. The clamps 11 and 12 have a longitudinal central plane which is arranged inclined at about 45° to the vertical 18 so that the glass-bulb fuse element can be blown against laterally from below and obliquely from above and hence freely altogether. In the longitudinal region of the arm 13 or 15 engaging over the thermal glass-bulb fuse element 8, the arm is made circular with a flow space 19 so that the inflowing air can emerge unhindered through the flow space 19.

As can be seen in particular in the illustrations shown in Figures 4 and 5, the L-shaped clamp 11 has a predetermined bending point 21 in the region of its connection 20 to the housing, which predetermined bending point ensures that the device is in a position to work in an operationally reliable manner in the way already outlined, for example in the case where the capillary tube 22 of the thermal

glass-bulb element has been damaged, for example during insertion, and the liquid 23 with which the thermal glass-bulb element is filled has emerged.

7. A device according to claim 6, characterised in that the predetermined bending point (21) in the arm (13) engaging over the fuse (8) is provided in a region close to its connection (20) to the housing.

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Claims

1. A device for the preferably pneumatic automatic actuation particularly of ventilation flaps, ventilation louvres and the like in smoke and heat
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offtake installations, having a locking unit which holds one or more piercing pistons of an energy-carrying unit in their locked position, which comprises a fuse responding depending on temperature,
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particularly a thermal fuse element which bursts when a critical temperature is exceeded, which fuse can be supported at one end on a longitudinally movable locking rod member which is in operational communication with the piercing
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piston, or pistons, characterised in that a U-shaped or L-shaped clamp (11, 12), which engages over the fuse and has a central longitudinal plane inclined to the vertical (18), is provided to support
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the other end of the fuse (8).

2. A device according to claim 1, characterised in that the longitudinal central plane of the clamp (11, 12) is inclined at about 45° to the vertical (18).

3. A device according to claim 1 or 2, characterised in that the clamp (11, 12) is held on one or
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two lateral outer edge region(s) of a housing member (7) receiving the locking rod member (5).

4. A device according to any one of the claims 1 to 3, characterised in that the arms (13, 14, 15, 16, 17) of the clamp are substantially formed by
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narrow square sections.

5. A device according to any one of the claims 1 to 4, characterised in that the arm (13) of the clamp (11) engaging over the fuse (7) is made substantially circular with a flow space (19), in its
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longitudinal region bounding the fuse (8).

6. A device for the preferably pneumatic automatic actuation particularly of ventilation flaps, ventilation louvres and the like in smoke and heat
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offtake installations having a locking unit holding one or more piercing pistons of an energy-carrying unit in their locked position, which comprises a fuse responding depending on temperature, particularly a thermal fuse element which bursts when
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a critical temperature is exceeded, which fuse can be supported, at one end, on a longitudinally movable locking rod member which is in operational communication with the piercing piston, preferably with an L-shaped clamp in arrangement in accordance with any one of the claims 1 to 5, characterised
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in that at least one arm (13) of the L-shaped clamp (11) engaging over the fuse (8) is provided with a predetermined bending point (21).

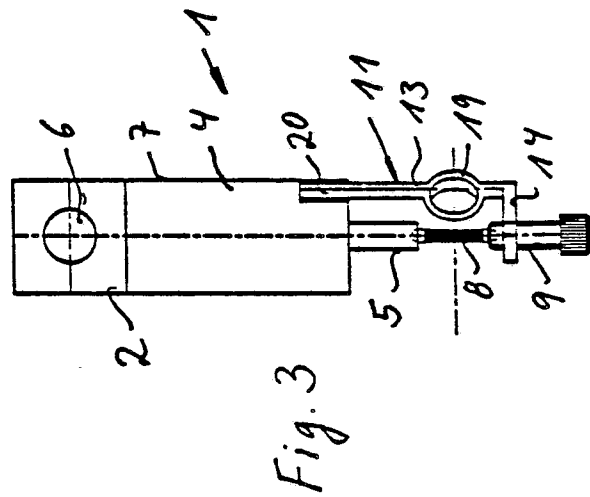
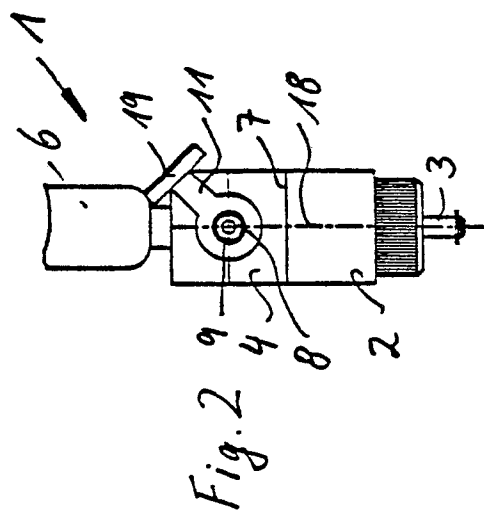
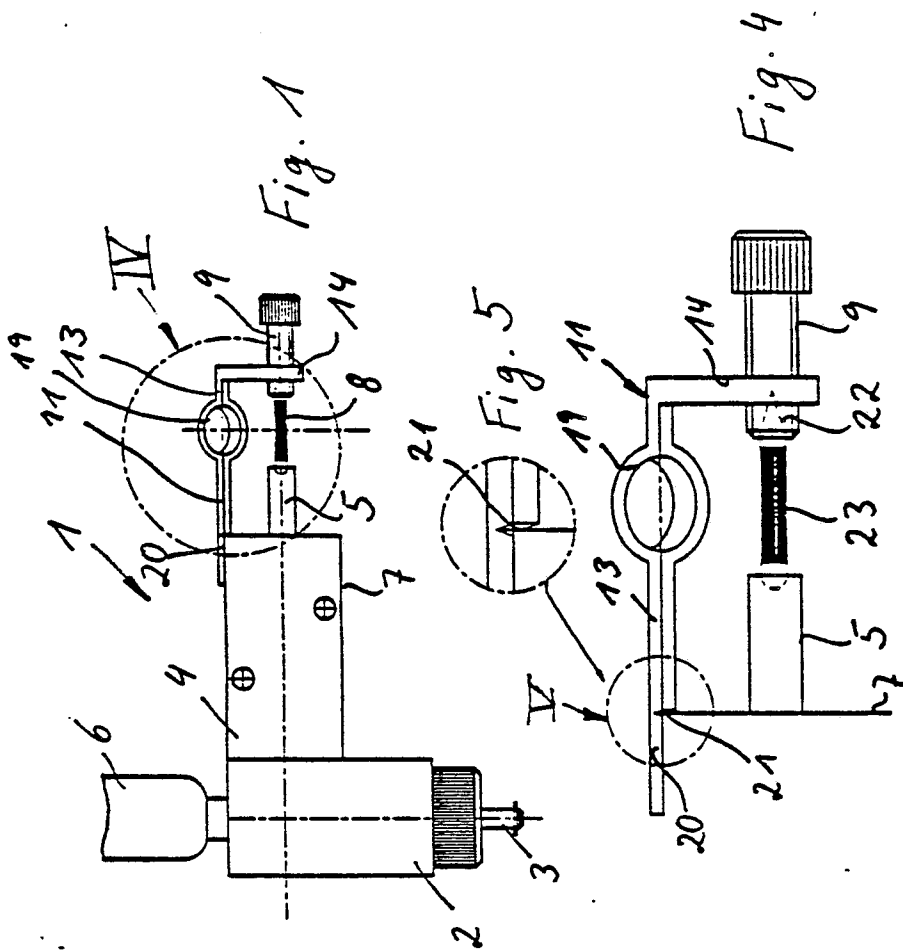


Fig. 4

Fig. 6

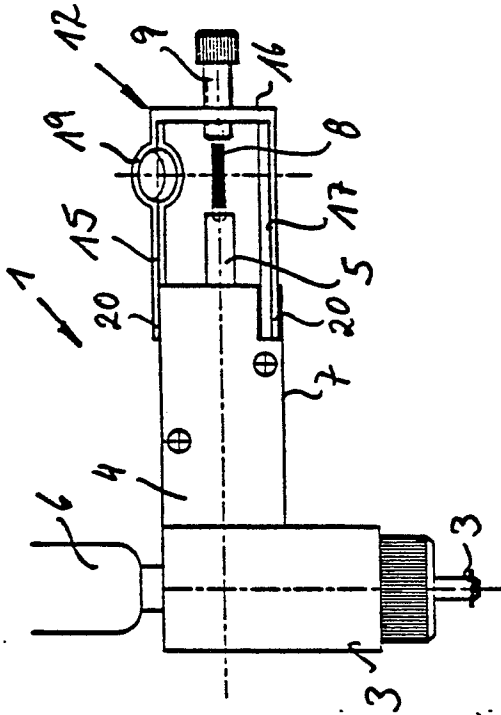


Fig. 7

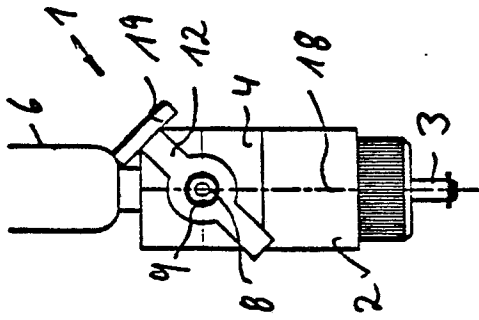
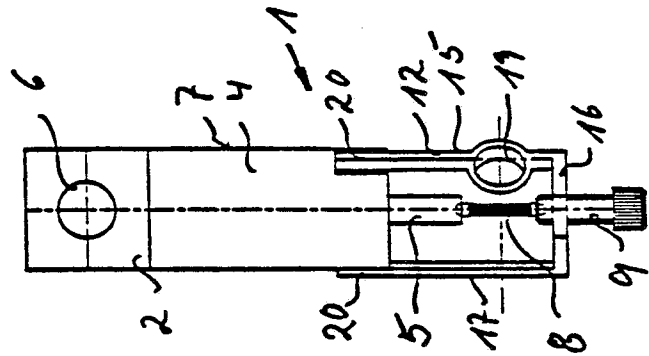


Fig. 8





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A,D	DE-A-3 606 560 (COLT INTERNATIONAL HOLDINGS) * Abstract; figure 1 * ---	1,6	A 62 C 3/14
A	GB-A-2 040 401 (HOLDFIRE OFFSHORE LTD) * Page 1, lines 76-114; figures 1-3 * ---	1,3,4,6	
A	DE-A-3 429 178 (FORTMEIER) * Abstract; figures 1,2 * -----	1,3,4,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A 62 C F 17 C F 16 K E 05 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 04-08-1989	Examiner DIMITROULAS P.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	