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(54) **DEVICE FOR DIRECTING RAIN WATER**

(57) The invention concerns a device (1) in an installation for the receipt of rainwater (2) from roofs (3) and similar places at buildings (4) provided with rainwater pipes (16, 20) and provided with a mechanism (7) which limits water drainage (I; II) of the water to a certain location

(8 and 9, respectively).

According to the invention, a thermally operated restrictor valve (10) is arranged to direct an incoming water current (11) between at least two selectable reception spaces (8, 9) for water reception.

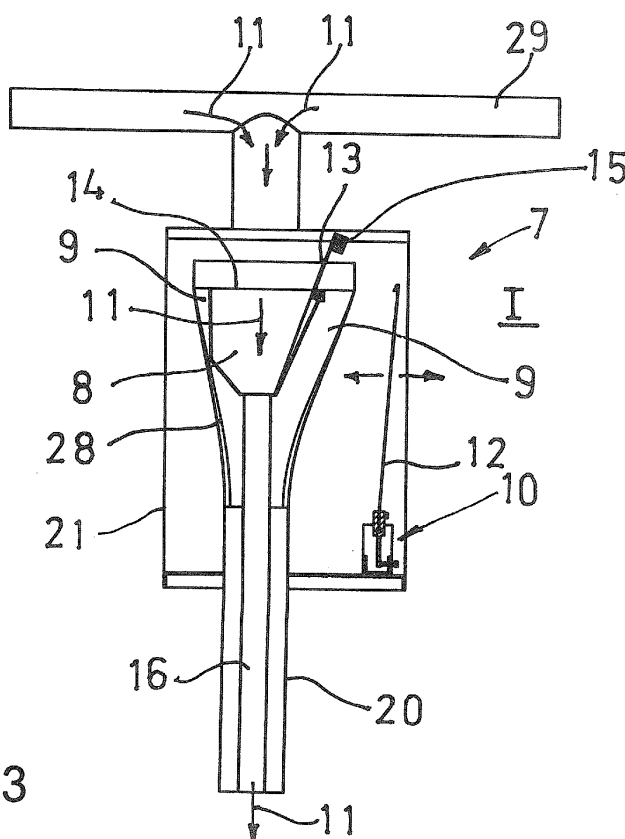


Fig. 3

Description

[0001] The present invention concerns a device in an installation for the receipt of rainwater from roofs and similar places at buildings provided with rainwater pipes and provided with a mechanism which limits drainage of the water to a certain location.

[0002] There are a number of solutions to facilitate the use of water from gutters via double rainwater pipes wherein the water flows over from an overflown rainwater pipe to another connecting rainwater pipe or adjacent rainwater pipe. Refer to, for instance, GB 2327453A, DE 19647351A1, EP 1002905A2, and AU 2007100365A4.

[0003] An installation known by GB 2270949 A concerns enabling the conveyance rainwater to a watering barrel (16), by manually actuatable valve handles (12), which regulates a turnable valve baffle (36) in a rainwater pipe (6), when it is not desired that the rainwater just should run away through the rainwater pipe (8). Thus, the valve (36) is manually actuatable by means of the handle (12) and in all weather the valve is set in the position shown in Fig. 3 so that the frost does not burst the watering barrel (16) and neither a subjacent drainage pipe (22, 24).

[0004] Further, GB 2435490 A concerns a control for water conveyed from a water tank (8) and which has been heated up and conveyed to the intended location of consumption at the right temperature. By means of a bimetallic strip and a plug (2), an outgoing outlet (5) is closed at the right temperature and allows the water passing through another outlet (4) to the intended location of consumption, e.g. a basin. This takes place when the water temperature is correct. Otherwise, the water is conveyed through the outlet (5) to, e.g., a flushing cistern in a water closet (10) when the water temperature is too low.

[0005] SE 531 721 C2 shows the applicant's own invention in order to, among other things, convey water by means of wicks between cistern spaces, and

[0006] JP 2008-208668 A concerns a valve in rainwater pipes wherein valves are manually actuatable by means of a handle to direct the water flow between different outlets (21 and 18a, respectively).

[0007] It is desirable to be able to direct the water flow to a certain reception space of more than one such selectable reception space. For this purpose, a valve of some kind is required. Wiring electricity to gutters and rainwater pipes is not an accepted solution and in addition it is neither entirely safe using electricity and water, and moreover outdoors. In the winter, when the temperature is low, it is, e.g., not desired to let rainwater to be conveyed to irrigation systems for plants, since plants are resting in winter at all events in locations where the temperature falls below about +5 to +8 °C. Therefore, it is desired to solve said problems by suitable, safe means therefor.

[0008] Hence, the main object of the present invention is primarily to solve, by simple and well working means, among other things, said problems of a device that func-

tions without requirements of service, that operates efficiently without requirements of electrical connection, that operates at low temperatures, that is not affectable by dirt or bad weather, and that in addition is worth its price.

[0009] Said object is achieved by means of a device according to the present invention of the kind mentioned above and which essentially is characterized in that a thermally operated restrictor valve is arranged to direct an incoming water current between at least two selectable reception spaces for water reception, a first selectable reception space being formed of a funnel on an inner rainwater pipe, which conveys the water to an irrigation system situated on a level that exceeds the foundation work of a building in question, and that a second one of said reception spaces is formed of an outer rainwater pipe which preferably surrounds said inner rainwater pipe and which conveys the water in the active state of the restrictor valve and the first selectable state closing the reception space to surface water conduit or another water conduit, and that said thermally operated restrictor valve is actuatable by a bimetallic member, which preferably is arranged to at least considerably limit or entirely shut off the water flow below approx. 5-8 °C to one of said reception spaces.

[0010] The invention is described below in the form of a preferred embodiment example, reference being made to the accompanying drawings, in which

Fig. 1 schematically shows an installation and device for the watering and drainage of rainwater from the roof of a building,

Fig. 2 schematically shows a said device in exploded view,

Fig. 3 shows a section view along the line III-III in Fig. 3A of a device according to the invention and in an opened "summer watering state",

Fig. 3A shows a side view of a said device at the upper portion of a rainwater pipe in a gutter,

Fig. 3B shows the same as is shown in Fig. 3 and along the line IIIB-IIIB in Fig. 3C but in closed "winter water state",

Fig. 3C shows a side view similar to the one in Fig. 3A, and

Fig. 4 and Fig. 5 show enlargements of the devices shown in Fig. 3 and Fig. 3B, respectively.

[0011] The invention primarily concerns a device in an installation for the receipt of rainwater from roofs in rainwater pipes having a thermally operated restrictor valve, which is affectable by a bimetallic member and which installation is formed of inner and outer, respectively, rainwater pipes, which convey the rainwater to an irrigation system, situated above the foundation work of a building in question and an outer rainwater pipe which conveys water to a surface water conduit, etc., upon actuation of the restrictor valve according to the temperature prevailing outdoors.

[0012] Thereby, it is enabled to automatically direct the

rainwater to the desired locations. Namely, to plants for watering purposes when the temperature outside allows the watering of plants but to a surface water conduit or another water conduit when the temperature is not suitable for watering the plants, especially in winter. Particularly when the temperature is below about 5-8 °C.

[0013] A device 1 in an installation for the receipt of rainwater 2 coming from roofs 3 and similar places at buildings 4 that are provided with rainwater pipes 16, 20 and which is provided with a mechanism 7 which limits water drainage I, II of the water to a certain location 8 and 9, respectively, comprises according to the present invention a thermally operated restrictor valve 10, which is arranged to direct an incoming water current 11 between at least two selectable reception spaces 8, 9, which are suitable for water reception.

[0014] According to a preferred embodiment example, which is shown in the drawings, a said thermally operated restrictor valve 10 is arranged to be actuable by a bimetallic member 12, which preferably is arranged to at least considerably limit or entirely shut off the water flow when the outdoor temperature reaches below about 5-8 °C, to one 8 of said reception spaces 8, 9.

[0015] A said bimetallic member 12 may be formed of a bimetallic spring in the form of a tongue, a wire, or in the form of a helical spring.

[0016] In the embodiment example shown in Fig. 2 of the bimetallic member 12, such a one is formed of an about 400 mm long tongue which, in the free end 12A has a ratchet 6, which can be received in an opening 31 of the rear end portion 13A of a cover 13.

[0017] Fig. 5 shows a ratchet 6, which in a locking position is arranged to grasp the edge of the rear end edge 13A of a cover 13 when the cover 13 is situated in horizontal position and the bimetallic member 12 has been affected by the temperature to move into co-operation with said cover 13 and the rear end edge thereof and prevent the cover 13 from being turned down in the reception space 8.

[0018] A said turnably journaled cover 13, which is journaled to be able to turn around a pivot joint 26 situated at the edge 27 of an inner funnel 28 of the first selectable reception space 8, forms a closing means of a first one 8 of said reception spaces 8, 9. Said cover 13 is arranged to allow, on desired occasions I, incoming water current 11 to be received in a first reception space 8 and on desired occasions II at least essentially close the inlet 14 of said first reception space 8. The cover 13 is suitably provided with a counterweight 15, which is arranged so that it compulsorily can bring the cover 13 to a closing state of said one reception space 8, and be turned down, respectively, in said first reception space 8 after actuation by water 11 supplied to said cover 13.

[0019] A second reception space 9 of said reception spaces 8, 9, which is situated so that it borders on said first reception space 8, is arranged to receive essentially the entire amount of incoming water 11, thanks to the control actuation of the flow control valve.

[0020] The restrictor valve 10 comprises an adjustment part 30 by means of which the actuation sensitivity of the valve is set. It may, for instance, be arranged in the form of a screw that limits the movement actuation of a valve part.

[0021] A first selectable reception space 8 is suitably formed of a funnel 28 on an inner rainwater pipe 16, which is arranged to convey the water to an irrigation system 17 situated on a level 18 that exceeds the foundation work 19 of a building in question. A second one 9 of said reception spaces 8, 9 is formed of an outer rainwater pipe 20, which preferably surrounds said inner rainwater pipe 16 and which conveys the water to a surface water conduit 31 or to another water conduit in the active state II of the restrictor valve and, in that connection, the state essentially closing the first selectable reception space 8. See Fig. 4.

[0022] A wick 22, 23 of, e.g., cotton thread, fabric, etc., is arranged on an inflow line 24 and a storage container 25, respectively, of said irrigation system 17 in order to allow being able to slowly drain said inflow line 24 as well as a said storage container 25 of the water.

[0023] An extension 21 of an outer rainwater pipe 20 up at a gutter of a building 4 in question or a box fastened to a wall 4A of said building 29 forms reception box for said mechanism 7, the restrictor valve 10, and said reception spaces 8, 9.

[0024] A said device 1 is arranged so that it also easily is allowed to be adapted to existing gutters and rainwater pipes of buildings. It should furthermore be reliable in all types of weather and be insensitive to dirt and other pollutions.

[0025] It should also, by means of communicating vessels, be able to move water to higher situated places than where the foundation work of the building in question is situated and with surface water flows following therewith. By the use of a double piping system, this is accomplished thanks to the creation of a water column that provides pressure in order to, without requirements of pump, be able to lift the water to watering locations situated higher. Slow after draining of the flow system is allowed thanks to the presence of hole at the lowest point provided with cotton wick or another fabric.

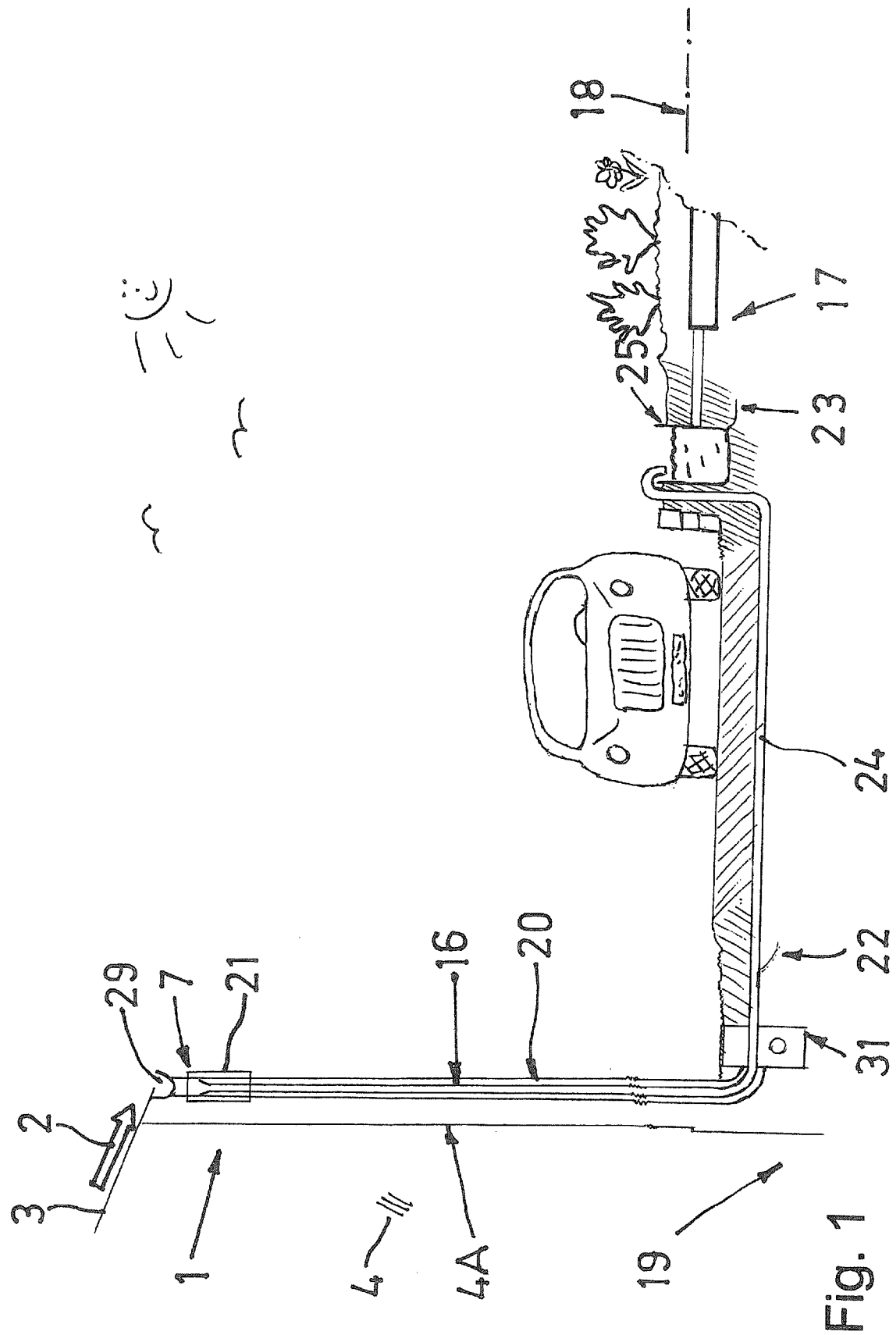
[0026] The water 11 flowing down into the pipe 20 from the roof 3 and the gutter 23 presses down the cover 13, which turns around the pivot mounting 26 of the cover 13. A ratchet 6 of the valve 10 and the arm 12 thereof and which can grasp the rear end portion 13A of the cover in the area of the weight 15 is in this position detached from the cover 13. When the water flow from above decreases, the weight 15 weighs down the rear end portion of the cover so that the cover 13 essentially up to 98-99 % closes the opening 14 of the inlet 8.

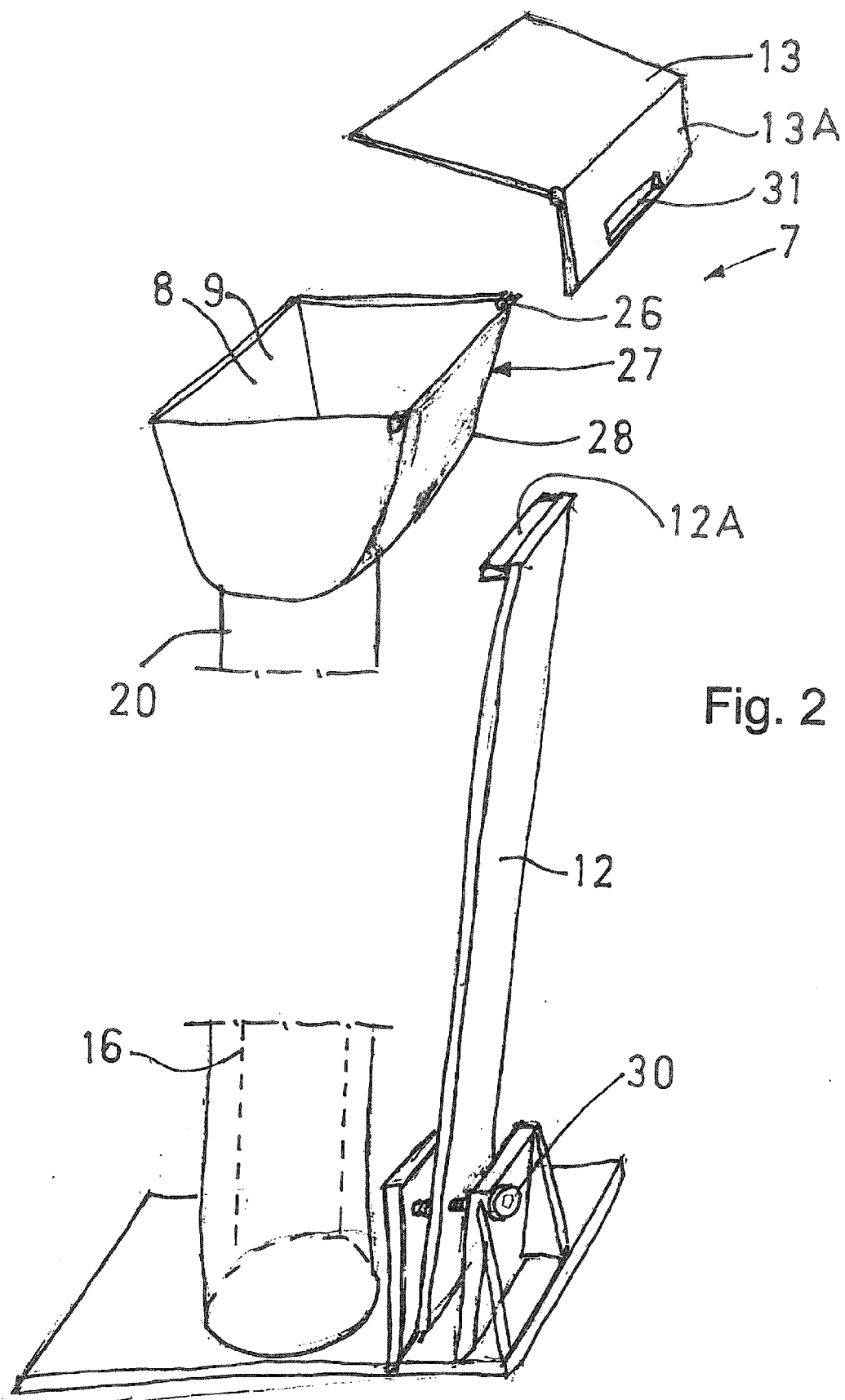
[0027] When the temperature falls, the valve 10 is activated by the bimetal so that said inlet 5 is permanently closed by the cover 13 as long as the temperature is below about + 5 °C. Precipitation 11 then ends up in the inlet 9 and the coarser external rainwater pipe 20.

[0028] The function and nature of the invention should have been clearly understood from the above-mentioned and also with knowledge of what is shown in the drawings but the invention is naturally not limited to the embodiments described above and shown in the accompanying drawings. Modifications are feasible, particularly as for the nature of the different parts, or by using an equivalent technique, without departing from the protection area of the invention, such as it is defined in the claims.

Claims

1. Device (1) in an installation for the receipt of rainwater (2) from roofs (3) and similar places at buildings (4) provided with rainwater pipes (16, 20) and provided with a mechanism (7) which limits drainage (I; II) of the water to a certain location (8 and 9, respectively), **characterized in that** a thermally operated restrictor valve (10) is arranged to direct an incoming water current (11) between at least two selectable reception spaces (8, 9) for water reception, a first selectable reception space (8) being formed of a funnel (27) on an inner rainwater pipe (16), which conveys the water to an irrigation system (17) situated on a level (18) that exceeds the foundation work (19) of a building in question, and that a second one (9) of said reception spaces (8, 9) is formed of an outer rainwater pipe (20) which preferably surrounds said inner rainwater pipe (16) and which conveys the water in the active state (II) of the restrictor valve and the first selectable state closing the reception space (8) to surface water conduit (21) or another water conduit, and that said thermally operated restrictor valve (10) is actuatable by a bimetallic member (12), which preferably is arranged to at least considerably limit or entirely shut off the water flow below approx. 5-8 °C to one (8) of said reception spaces (8, 9).
2. Device according to claim 1, **characterized in that** said bimetallic member (12) is formed of a bimetallic spring, which is in the form of a tongue, wire, or a helical spring.
3. Device according to any one of the above claims, **characterized in that** a turnably journaled cover (13) forms closing means of a first one (8) of said reception spaces (8, 9), and that the cover (13) is arranged to, on desired occasions (I), allow incoming water current (11) to be received in a first reception space (8) and on desired occasions (II) at least essentially close the inlet (14) of said first reception space (8).
4. Device according to claim 3, **characterized in that** said cover (13) is provided with a counterweight (15) that compulsorily can bring the cover (13) to a closing state (II) of a first one (8) of said reception spaces (8, 9) and to be allowed to be turned down, respectively, in said first reception space (8) after actuation by water (11) supplied to said cover (13).
5. Device according to any one of claims 3-4, **characterized in that** a second reception space (9), which borders on said first reception space (8), is arranged to receive essentially the entire amount of incoming water (11) by the control actuation of the flow control valve (10).
6. Device according to any one of the above claims, **characterized in that** the restrictor valve (10) comprises an adjustment part (30), which sets the actuation sensitivity of the valve, for instance in the form of a screw limiting the movement actuation of a valve part.
7. Device according to claim 1, **characterized in that** a wick (22, 23) is arranged on an inflow line (24) and a storage container (25), respectively, of said irrigation system (17) in order to allow draining said inflow line (24) as well as a storage container (25).
8. Device according to any one of claims 1-7, **characterized in that** an extension (21) of a rainwater pipe (20) up at a gutter (29) on a building (4) in question or a box fastened on the wall (4A) of said building forms a reception box for said mechanism (7), the restrictor valve (10), and reception spaces (8, 9).





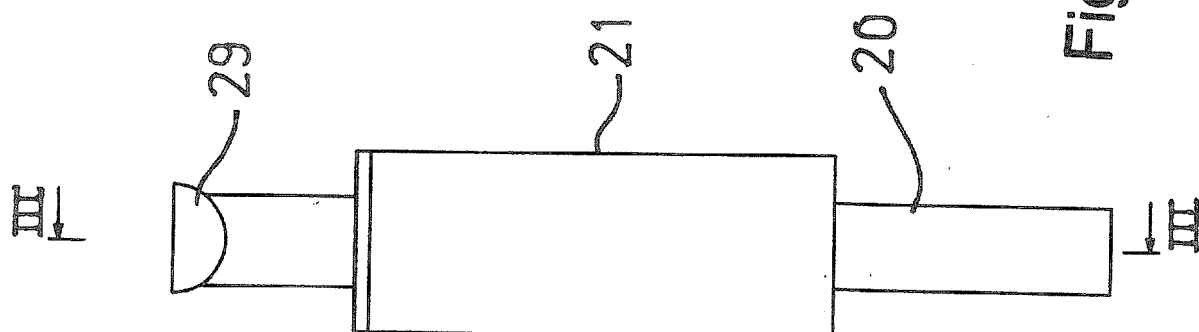


Fig. 3A

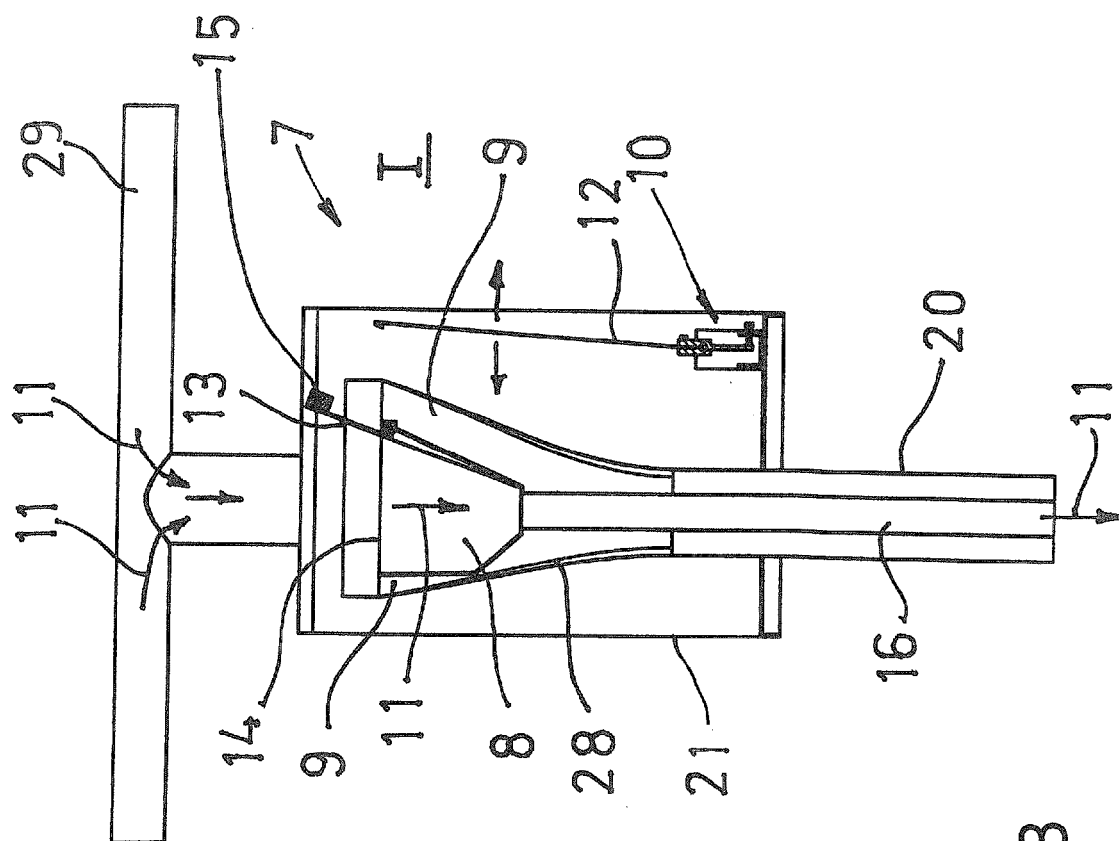
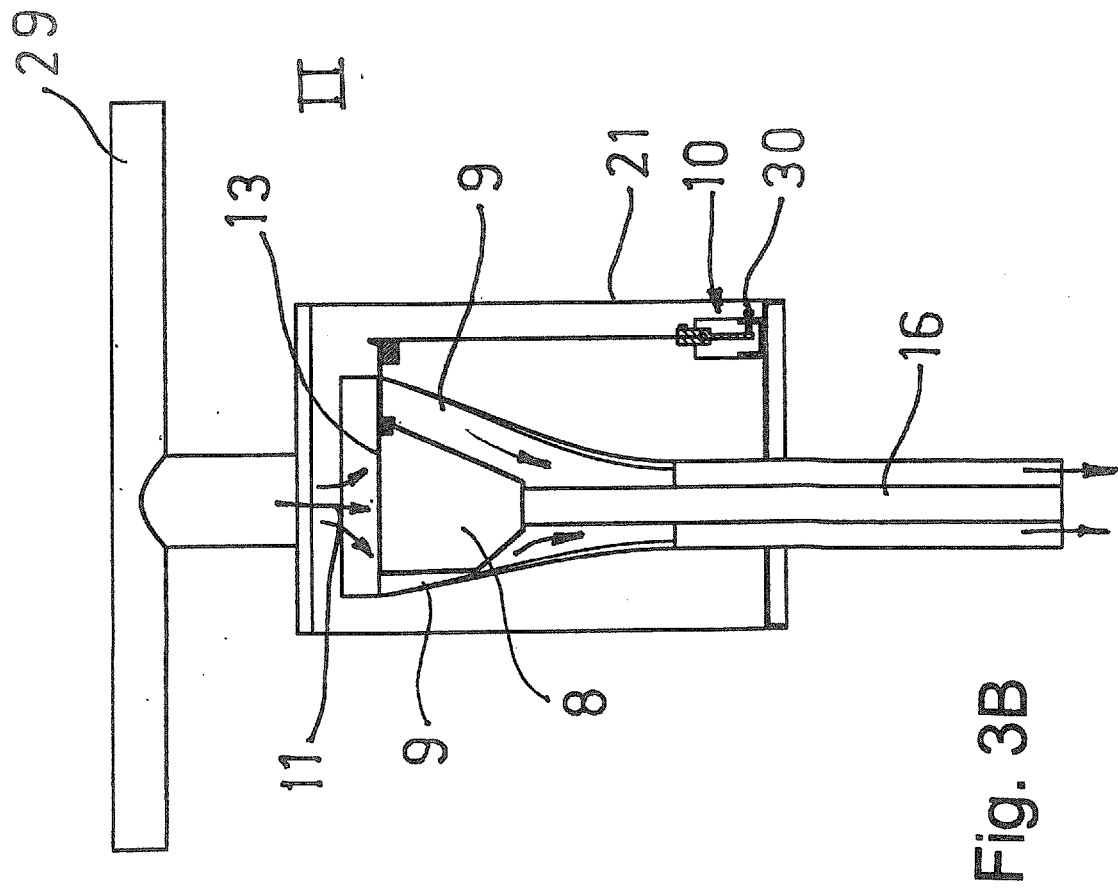
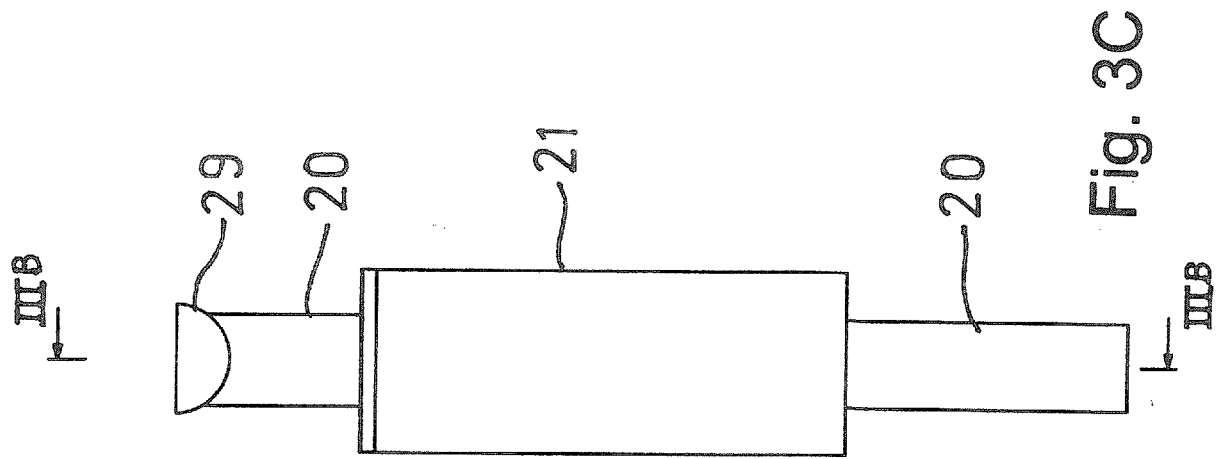


Fig. 3



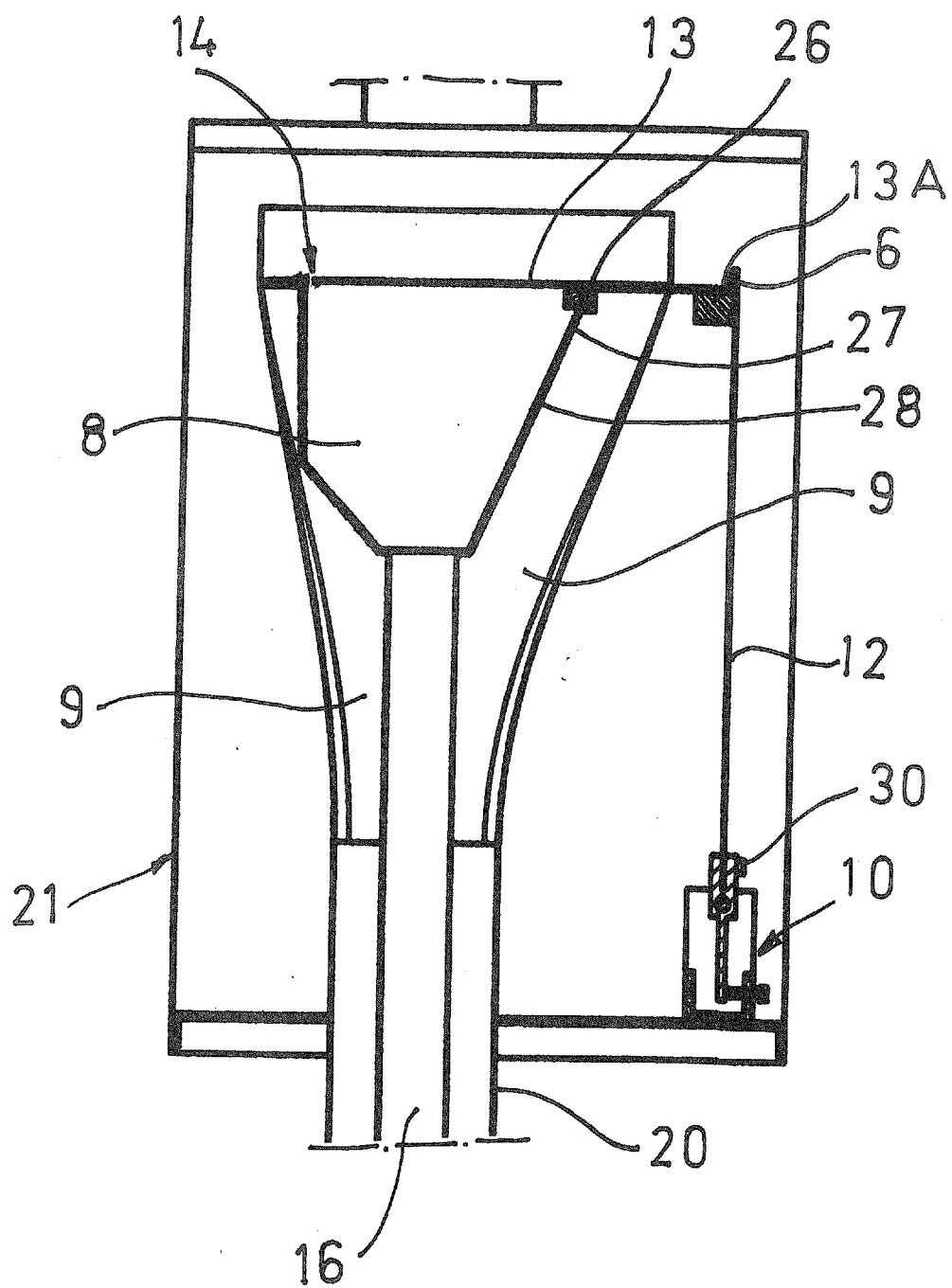
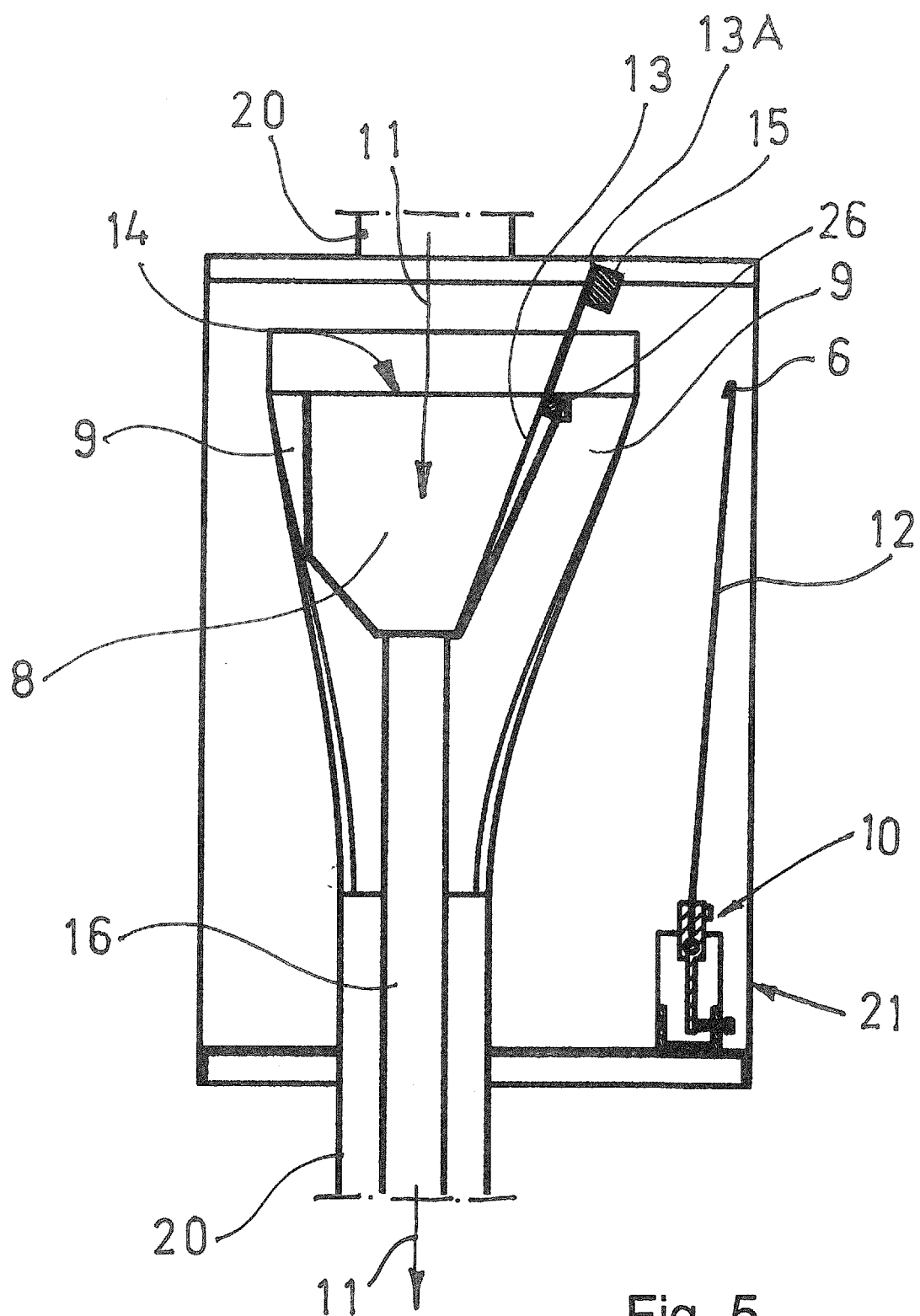


Fig. 4





EUROPEAN SEARCH REPORT

Application Number
EP 16 16 3747

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 19 July 2016	Examiner Horst, Werner
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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