(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 550 078 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
09.10.2019 Bulletin 2019/41

(51) Int Cl.:
E01F 13/02 *(2006.01)*

(21) Application number: **19167537.0**

(22) Date of filing: **05.04.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **06.04.2018 NL 2020726**

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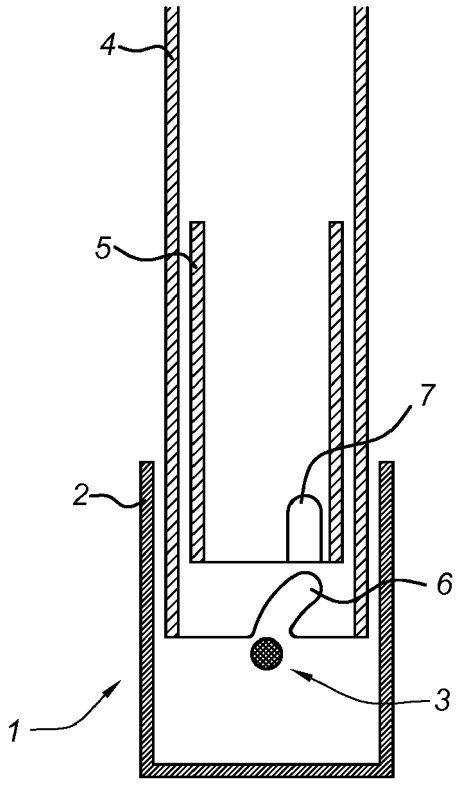
(54) **REMOVABLE POLE**

(57) The invention relates to a removable pole (1) for blocking a road. The removable pole comprises a base tube (2) provided with a lock pin (3) inside the base tube, wherein the lock pin is positioned in a radial direction of the base tube (2); a first tube (4) releasably mountable inside the base tube and a latch (5) axially moveable inside the first tube. A first end of the first tube (4) is provided with two first recesses (6) for engaging with the lock pin, wherein the first recesses (6) are curved recesses opposite to each other in the first tube (4). Furthermore, the first recesses and the latch are configured to interlock the lock pin in a locked state and the first recesses and the latch are configured to release the lock pin in an unlocked state such that the first tube and the latch can be moved along the lock pin.

Fig. 1



EP 3 550 078 A1

Description

Field of the invention

[0001] The present invention relates to a removable pole for blocking a road.

Background art

[0002] A removable pole can be used to block a certain area, for example, a parking area or part of a road. A conventional removable pole comprises a base tube provided with a lock pin inside the base tube and a tube releasably mountable inside the base tube, wherein one end of the tube is provided with two longitudinal recesses in an axial direction of the tube to guide the tube along the lock pin in the base tube. Furthermore, the conventional removable pole is provided with a hook rotatably mounted near the one end on the tube, wherein in a locked state the hook is engaging the lock pin and in an unlocked state the hook is released from the lock pin. A drawback of the known device is that manufacturing of the removable pole is complex.

Summary of the invention

[0003] The present invention seeks to provide a removable pole for blocking a road that is less complex to manufacture and improves user convenience.

[0004] According to an aspect of the present invention this object is achieved by a removable pole for blocking a road, comprising a base tube provided with a lock pin inside the base tube wherein the lock pin is positioned in a radial direction of the base tube; a first tube releasably mountable inside the base tube and a latch axially moveable inside the first tube, wherein a first end of the first tube is provided with two first recesses for engaging the lock pin, wherein the first recesses (6) are curved recesses opposite to each other in the first tube (4); wherein the first recesses and the latch are configured to interlock the lock pin in a locked state and the first recesses and the latch are configured to release the lock pin in an unlocked state.

[0005] In this arrangement, when the removable pole is in the unlocked state, the first tube and the latch can be placed in or removed from the base tube. In the unlocked state, the first tube and the latch can be placed in the base tube and the removable pole can be set in a locked state, wherein the removable pole cannot be removed from the base tube. To enter the locked state the first tube and the latch are turned around its central axis in a first direction such that the first recesses engage with the lock pin of the base tube, by continuing the rotation of the first tube, the first tube moves in a combined radial and axial direction and the latch will engage with the lock pin due to the weight of the latch, and the removable pole enters into the locked state, wherein the first recesses and the latch are interlocking the lock pin. In this locked state, the first tube and the latch cannot be removed from the base tube. In order to remove the removable pole, the latch is lifted in the first tube such that the latch is released from the lock pin. By rotating the first tube and the latch in a reverse direction as with respect to the first direction and simultaneously lifting the first tube and the latch, the first tube and latch are removed from the base tube.

[0006] In the unlocked position, of the removable pole the latch can be released from the lock pin such that the first tube can rotate and move along the curved recesses. The curved recesses can have a helix or curved shape starting at the end of the first tube in the axial direction in the wall of the first tube. The curved recesses in the first tube transform an axial movement of the first tube into a rotation of the first tube.

[0007] The base tube can be a cylindrical tube or a multiple sided tube and the first tube may tightly fit in the base tube. Furthermore, the latch may tightly fit in the first tube, so that the first tube and the latch can be easily be moved to each other in an axial direction. The first tube can be a cylindrical or multiple sided tube. The latch can also be cylindrical or multiple sided tube. A removable pole according to this arrangement can be manufactured in a simple way because tubes having standardized dimensions can be used. The first recesses can be obtained by laser cutting.

[0008] In a preferred embodiment, the removable pole is provided with a guide configured to move the latch in the axial direction inside the first tube. In this arrangement, the latch can be moved substantially in the axial direction inside the first tube between the unlocked state, wherein the latch is released from the lock pin and a locked state, wherein the first recesses and the latch interlock the lock pin and vice versa and the latch cannot be rotated inside the first tube.

[0009] In a further embodiment the latch comprises a second tube coaxially movable in the first tube, wherein the second tube is provided with two elongated recesses in an axial direction and opposite to each other in the second tube for engaging the lock pin.

[0010] In this arrangement, in the unlocked position, of the removable pole the second recesses of the second tube can be released from the lock pin such that the first tube can rotate and move along the curved recesses.

[0011] In a further embodiment, the removable pole is provided with a guide configured to move the second tube in the axial direction inside the first tube.

[0012] In a further embodiment, the guide is provided with two slits in the axial direction opposite to each other in the first tube and provided with two radial pins positioned opposite to each other outside the second tube, and wherein the two slits and the radial pins are configured to guide the second tube in the axial direction in the first tube. For example, the two radial pins can be opposite to each other positioned on the outside of the second tube and the two slits can be opposite to each other in the wall of the first tube.

[0013] In a still further embodiment, in the first tube, a first hypothetical line through the openings of the two first recesses is transverse to a second hypothetical line through the two slits and, in the second tube, a third hypothetical line through the radial pins is transverse to the a fourth hypothetical line through the second recesses. In this configuration the first and second tubes are mutually aligned.

[0014] In a further embodiment of the removable pole, the second tube comprises a first strip positioned in a radial direction in second tube.

[0015] In a still further embodiment of the removable pole, the first strip is integrated with the radial pins.

[0016] In a different embodiment, the guide is provided with two radial pins opposite to each other inside the first tube and with two slits in an axial direction opposite to each other in the second tube wherein the two radial pins and the two slits are configured to guide the second tube in the axial direction in the first tube. An advantage of this configuration is that no sand or dirt can be collected in the slits, because the two slits in the second tube are inside the first tube and shielded from the outside. In this arrangement the radial pins and the slits are exchanged compared to the arrangement of the first embodiment.

[0017] In a further embodiment, in the first tube a first hypothetical line through the openings of the two first recesses is transverse a hypothetical line through the radial pins and, in the second tube, a hypothetical line through the slits is transverse to a hypothetical line through the recesses. In this arrangement the first and second tube are mutually aligned with each other.

[0018] In a further embodiment, the first tube comprises a second trip positioned in a radial direction inside the first tube.

[0019] In a still further embodiment, the second strip is integrated with the radial pins.

[0020] In a different embodiment, the latch comprises a first bar extending in an axial direction of the first tube. In this arrangement the bar can be moveable in a first direction when the first tube is rotated and moved such that the lock pin is at the end of the first recesses and the bar interlocks the lock pin and the bar can be moved in a reverse direction to release the lock pin. Alternatevily the latch may comprises a fork configured to enclose the lock pin. In this arrangement the latch can is moveable in a first direction when the first tube is rotated and moved such that the lock pin is at the end of the first recesses and opposite to an opening in the fork and the fork interlocks the lock pin and the latch can be moved in a reverse direction to release fork from the lock pin.

[0021] In a different embodiment, the removable pole is provided with a rod inside the first tube, wherein a first end of the rod is connected to the latch via a hinge and the other end of the rod is hingebly connected via a lever to a second end of the first tube opposite to first end. In this arrangement, the latch can be moved in the first tube so that the latch can release or interlock the lock pin. For example, by rotating the lever.

[0022] The invention also relates to street furniture provided with a removable pole as defined in any of the claims 1-14.

Short description of drawings

[0023] The present invention will be discussed in more detail below, with reference to the attached drawings, in which

Fig. 1 schematically shows a view of the removable pole in the unlocked state according to a first embodiment of the removable pole;

Fig. 2 schematically shows a view of the removable pole in the unlocked state, rotated about an angle of 90° with respect to the first view;

Fig. 3 schematically shows a view of the removable pole the locked state according to the first embodiment;

Fig. 4 schematically shows a view of the removable pole in the locked state, rotated about an angle of 90° with respect to the view in Fig. 3;

Fig. 5 schematically shows a view of first tube provided with the curved recesses according to the first embodiment;

Fig. 6 schematically shows a view of first tube provided with the curved recesses according to the first embodiment, rotated about an angle of 90° around its longitudinal axis compared to Fig. 5;

Fig. 7 schematically shows a view of the second tube with the second recesses according to the first embodiment;

Fig. 8 schematically shows a view of the second tube with the second recesses according to the first embodiment, rotated about an angle of 90° around its longitudinal axis with respect to Fig. 7;

Fig. 9 shows a view of the second tube and the first strip according to the first embodiment;

Fig. 10 shows a view of the first tube 4 according to a second embodiment of the removable pole;

Fig. 11 shows a view of the second tube provided with two longitudinal slits according to the second embodiment;

Fig. 12 shows a view of the first tube and the second strip according to a further embodiment;

Fig. 13 shows a view of the first tube and the latch of the removeable pole according to a further embodiment according to the invention; and

Fig. 14 shows a view of the removable pole according to one of the described embodiments wherein the removable pole is outside the base tube.

Description of embodiments

[0024] The invention relates to a removable pole for blocking an entrance to a road or public or private area. The removable pole can be used to block the entrance to for example public area for vehicles or a dangerous

area for pedestrians. However, it can be convenient that the public area can occasionally be accessed by vehicles for example for cleaning or delivery of goods. Thereto the removable pole can be removed by releasing a lock in the removable pool and lifting the removable pole out a base. In this description the removable pole can also be red as a removable post.

[0025] The invention is explained with reference to figs. 1 - 14. In the figures like numbers indicate like items.

[0026] Fig. 1 schematically shows a view of the removable pole in the unlocked state according to a first embodiment. The removable pole 1 may comprise a base tube 2 provided with a lock pin 3 inside the base tube. The cross-section of the base tube can be circular or multi-sided. In this embodiment the lock pin 3 is positioned in a radial direction of the base tube. Furthermore, the removable pole comprises a first tube 4 releasably mountable inside the base tube 2 and a latch. In this embodiment the latch comprises a second tube 5 coaxially moveable inside the first tube 4. The first tube 4 can be tightly fit in the base tube, also the second tube may tightly fit in the first tube. However, some tolerances are preferable so that the tubes (2, 4, and 5) can be conveniently be moved with respect to each other. For example, the dimension of the base tube are 300x100x3 mm, the dimensions of the first tube are 1000x90x3 mm and the dimension of the second tube 5 are 250x80x3 mm. The dimensions of the base tube are selected such that the cross-section of the base tube is larger than the outer diameter of the first tube and the dimensions of the first tube are selected such that the cross-section of the first tube 4 is larger than the outer diameter of the second tube 5. The first and second tubes can be cylindrical or multisided. The tubes can be made of steel, stainless steel or aluminium.

[0027] In this embodiment, a first end of the first tube 4 is provided with two first recesses 6 for engaging with the lock pin 3 and a first end of the second tube 5 is provided with two second recesses 7 for engaging the lock pin 3. In the unlocked state of the removable pole, the first recesses 6 and second recesses 7 are configured to release the second recesses 7 from the lock pin and to move the first tube along the lock pin. Furthermore, in this embodiment the first recesses 6 are curved recesses provided opposite to each other at the first end of the first tube 4 and the second recesses 7 are two elongated recesses provided in an axial direction and opposite to each other at the first end in the second tube 5. The curved first recesses 6 in the first tube transform an axial movement of the first tube into a rotation of the first tube. In an embodiment the curved first recesses 6 can be helical shaped or curve-shaped.

[0028] The first and second recesses 6, 7 can be provided by laser-cutting the first and second tubes.

[0029] Furthermore, in this first embodiment the removable pole 1 is provided with a guide configured to move the second tube 5 in a substantially axial direction inside the first tube 4. In this arrangement the second tube 5 cannot rotate in the first tube 4 and both the first and the second tube can be rotated together for handling of the removable pole. In the first embodiment the guide is provided with two first slits in the first tube and two radial first pins in the second tube.

[0030] Fig. 2 schematically shows a view of the removable pole 1 in the unlocked state according to the first embodiment, wherein the first tube 4 and the second tube 5 are rotated about an angle of 90° about its central axis with respect to the view of the first and second tubes in Fig. 1. Fig. 2 shows the guide provided with the two first slits 8 in an axial direction opposite to each other in the first tube 4 and the two first radial pins 9 in the second tube 5.

[0031] Fig. 3 shows a view of the removable pole 1 wherein the first tube 4 and the second tube 5 are entered in the locked state according to the first embodiment in the same orientation as with respect to fig. 1. Fig. 3 shows that in the locked state the first curved recesses 6 and the longitudinal second recesses 7 are configured to interlock the lock pin 3.

[0032] Fig. 4 shows a view of the removable pole 1 in the locked state according to the first embodiment, wherein the first and second tubes 4 and 5 are rotated about an angle of 90° about is central axis with respect to the view of the first and second tubes in Fig. 3 and are provided with the two first radial pins 9 opposite to each other extending from the second tube 5, and wherein the two first slits 8 and the two first radial pins 9 are configured to guide the second tube 5 in the axial direction in the first tube 4.

[0033] Fig. 5 shows a view of the first tube 4 provided with the curved first recesses 6. In the first embodiment in the tube 4 the curved first recesses 6 can be curved at an initial angle of 45° with respect to the central axis.

[0034] Fig. 6 shows a view of the first tube 4 according to the first embodiment of the removable pole rotated about an angle of 90° round its longitudinal axis. Fig 6 shows the first tube 4 provided with the two first slits 8 in the first tube 4. In this first embodiment the curved first recesses 6 and the first slits 8 are positioned such that a first hypothetical line through the openings of the two curved first recesses 6 is perpendicular to a second hypothetical line through the two first slits 8.

[0035] Fig. 7 shows a view of the second tube 5 provided with the longitudinal second recesses 7 according to the first embodiment of the removable pole. In the first embodiment the second longitudinal recesses 7 are directed in in axial direction of the second tube. Furthermore, in the first embodiment the second tube 5 is provided with two first radial pins 9 positioned opposite to each other and extending on both sides outside the second tube 5. The first radial pins 9 can extend outside the second tube 5 up to the outside surface of the first tube 4.

[0036] Fig. 8 shows a view of the second tube 5 according the first embodiment rotated about an angle of 90° around its central axis and the first radial pins 9. In a mounted state the second tube 5 is moveable in the

first tube 4. In the embodiment, the two first slits 8 and the first radial pins 9 are configured to guide the second tube 5 substantially in the axial direction in the first tube 4. In the second tube a hypothetical line through the first radial pins 9 is perpendicular to a hypothetical line through the longitudinal second recesses 7.

[0037] In an embodiment the second tube 5 may be provided with a first strip 10 positioned near the second recesses 7 in the second tube and the first radial pins are integrated with the respective ends of the first strip 10 that extend outside of the second tube 5. For example, the ends of the first strip 10 can extend outside the second tube up to the outside surface of the first tube 4.The first strip can be made of steel of 3 mm thickness.

[0038] Fig. 9 shows a view of the second tube 5 and the first strip 10 according this embodiment.

[0039] Fig. 10 shows a view of the first tube 4 of the removable pole according to a second embodiment. In the second embodiment the guide of the removable pole 1 comprises two second radial pins or notches 11 opposite to each other and directed towards the central axis inside the first tube 4 and two second slits 12 opposite to each other in the second tube 5 and directed in an axial direction. The configuration of the guide in the second embodiment is mechanical equivalent with the configuration of the guide of the first embodiment. Fig. 10 shows the first tube 4 provided with second radial pins 11 inside the first tube 4. The second radial pins 11 are positioned opposite to each other and a hypothetical line through the second radial pins 11 is perpendicular to a hypothetical line through the openings of the curved first recesses 6.

[0040] Fig. 11 shows a view of the second tube 5 of the removable pole according to the second embodiment. The second tube is provided with the second slits 12 opposite to each other in an axial direction in the second tube 5. Furthermore, the second slits 12 are positioned such that a hypothetical line through the second slits 12 is perpendicular with a hypothetical line through the longitudinal second recesses 7. In the removable pole according to the second embodiment the two second radial pins 11 and the second slits 12 are configured to guide the second tube 5 in the axial direction in the first tube 4. An advantage of this second embodiment is that dirt can be kept substantially outside the space between the first and second tube because the longitudinal slits are in the inner second tube 5.

[0041] In a further embodiment the first tube 4 may be provided with a second strip 13 on an end of the first tube 4 near the curved first recesses 6, the second strip 13 is mounted in a radial direction inside the first tube 4 and the second radial pins 11 are integrated with the end portions of the second strip 13 near the wall of the first tube 4.

[0042] Fig. 12 shows a view of the first tube 4 according to the third embodiment provided with the second strip 13 positioned in the radial direction inside the first tube 4. The end portions of the second strip 13 can be used to form the second radial pins.

[0043] The removable pole 1 can be used to block a road, a public or private area, for example a parking area or pedestrian area from access by vehicles.

[0044] In a different embodiment the removable pole comprises a base and first tube 4 as described with respect to Fig. 1 and the latch may comprise the fork.

[0045] Fig. 13. schematically shows a first side view 20 of a first tube 4 which can be releasably mounted inside the base tube 2, the first curved recesses 6 and the guide comprising for example the second radial pins or notches 11 for guiding the latch and a second side view 25 showing the first tube 4 rotated 90° about the longitudinal axis of the first tube. A third side view 26 showing the first tube and the latch. In this embodiment the latch comprises a bar 27 axially moveable inside the first tube 4. The dimensions of the first tube 4 are selected such that the cross-section of the first tube 4 is larger than the width of the bar 21. The bar 27 can be made of steel, stainless steel or aluminium. In this arrangement, in the unlocked state of the removable pole, the first recesses 6 and the bar 27 are configured to release the bar 20 from the lock pin and to move the first tube 4 along the lock pin. Furthermore, in this embodiment the first recesses 6 are curved recesses provided opposite to each other at the first end of the first tube 4. The curved first recesses 6 in the first tube transform an axial movement of the first tube into a rotation of the first tube. The guide 11 provides that the bar 27 cannot rotate in the first tube 4 and both the first tube and the bar 27 can be rotated together for handling of the removable pole.

[0046] A fourth side view 29 shows also a further embodiment of the latch, wherein the latch is provided with a second bar 28 parallel to the first bar 27 and forming a fork when connected with the first bar. So, in this arrangement the latch comprises the fork. The distance d between the first and second bar of the fork is dimensioned slightly larger than the diameter of the lock pin 3 and the lock pin can slide in the opening of the fork and the diameter of the second radial pins or the notches 11.

[0047] Fig. 14 shows a view of the removable pole according to one of the described embodiments wherein the removable pole 1 is outside the base tube 2. In this embodiment the configuration of the removable pole 1 and the guide can be as described as with respect to embodiments of the removable pole in this description. Furthermore, in this embodiment the removable pole 1 is provided with a rod 101 and a first end of the rod is connected to the latch, for example, the second tube 5 via a hinge 103 and the other end of the rod 101 is hingebly connected via a lever 104 to a second end of the first tube 4 opposite to first end. The lever 104 is rotatably connected to the other end of the first tube 4 via a lever axis 105. A removable wrench 106 can be releasably connected to the lever axis 105. The removable wrench 106 can be used to rotate the lever conveniently to convert the removable pole between an unlocked state and a locked state and vice versa. The wrench can be re-

moved after its use. In an embodiment the latch 5 may comprise a further strip 107 in a radial direction configured to connect the first end of the rod 101 via the hinge 103. In this embodiment the latch can be alternatively comprise a bar 27, 28 or the fork.

[0048] In another embodiment the removable pole can be integrated in street furniture. For example, park banks or benches in the public are. In another embodiment the removable pole can be integrated in removable bollards for marinas.

[0049] In another embodiment the removable pole can be integrated in high security poles and bollards, designed to mitigate a vehicle attack.

[0050] The present invention has been described above with reference to a number of exemplary embodiments as shown in the drawings. Modifications and alternative implementations of some parts or elements are possible, and are included in the scope of protection as defined in the appended claims.

Claims

1. A removable pole (1) for blocking a road, comprising a base tube (2) provided with a lock pin (3) inside the base tube, wherein the lock pin is positioned in a radial direction of the base tube (2);
   a first tube (4) releasably mountable inside the base tube and a latch (5) axially moveable inside the first tube, wherein a first end of the first tube (4) is provided with two first recesses (6) for engaging with the lock pin, wherein the first recesses (6) are curved recesses opposite to each other in the first tube (4), wherein the first recesses and the latch are configured to interlock the lock pin in a locked state and the first recesses and the latch are configured to release the lock pin in an unlocked state such that the first tube and the latch can be moved along the lock pin.

2. The removable pole according claim 1, wherein the removable pole is provided with a guide (10, 11) configured to move the latch (5) in the axial direction inside the first tube (4).

3. The removable pole according to claim 1 or 2, wherein the latch comprises a second tube (5) coaxially movable in the first tube, wherein the second tube (5) is provided with two elongated recesses (7) in an axial direction and opposite to each other in the second tube (5) for engaging the lock pin.

4. The removable pole according to claim 3, wherein the guide (8, 9) is provided with two slits (8) in the axial direction opposite to each other in the first tube (4) and provided with two radial pins (9) opposite to each other on the outside of the second tube (5), and wherein the two slits and the radial pins are configured to guide the second tube in the axial direction in the first tube.

5. The removable pole according to claim 4, wherein in the first tube a first hypothetical line through the openings of the two first recesses (6) is transverse to a second hypothetical line through the two slits (8) and wherein in the second tube a hypothetical line through the radial pins 9 is transverse to a hypothetical line through the second recesses (7).

6. The removable pole according to claim 4 or 5, wherein the second tube comprises a first strip (10) positioned in a radial direction in second tube (5).

7. The removable pole according to claim 6, wherein the first strip (10) is integrated with the radial pins.

8. The removable pole according to claim 4, wherein the guide is provided with two radial pins (11) opposite to each other inside the first tube (4) and with two slits (12) in an axial direction opposite to each other in the second tube 5) wherein the two radial pins (11) and the two slits (12) are configured to guide the second tube in the axial direction in the first tube.

9. The removable pole according to claim 8, wherein in the first tube a first hypothetical line through the openings of the two first recesses (6) is transverse to a second hypothetical line through the two radial pins (11) and wherein in the second tube a hypothetical line through the slits 12 is transverse to a hypothetical line through the second recesses 7.

10. The removable pole according to claim 9, wherein the first tube comprises a second strip (13) positioned in a radial direction inside the first tube (4).

11. The removable pole according to claim 10, wherein the second strip is integrated with the radial pins.

12. The removable pole according to any of the preceding claims, wherein the base tube is cylindrical or multi-sided.

13. The removable pole according to claim 1 or 2, wherein the latch comprises a first bar extending in an axial direction of the first tube; or a fork configured to enclose the lock pin.

14. The removable pole (1) according to any one of the preceding claims provided with a rod (101) inside the first tube, wherein a first end of the rod (101) is connected to the latch via a hinge (103) and the other end of the rod is hingebly connected via a lever 104 to a second end of the first tube (4) opposite to first end.

15. Street furniture provided with a removable pole as claimed in any of the preceding claims.

Fig. 3

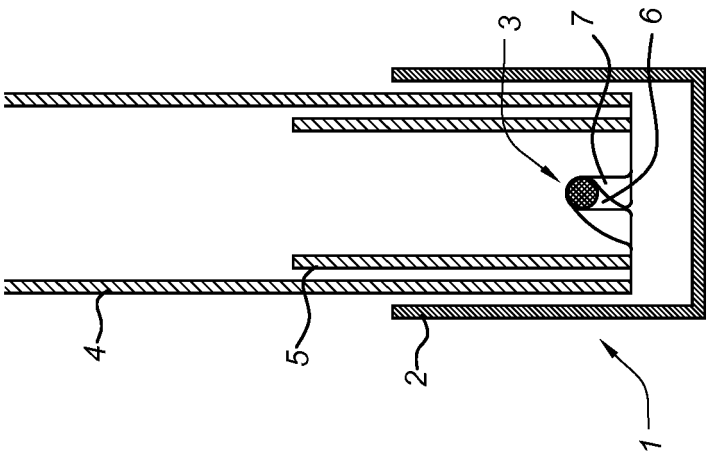


Fig. 2

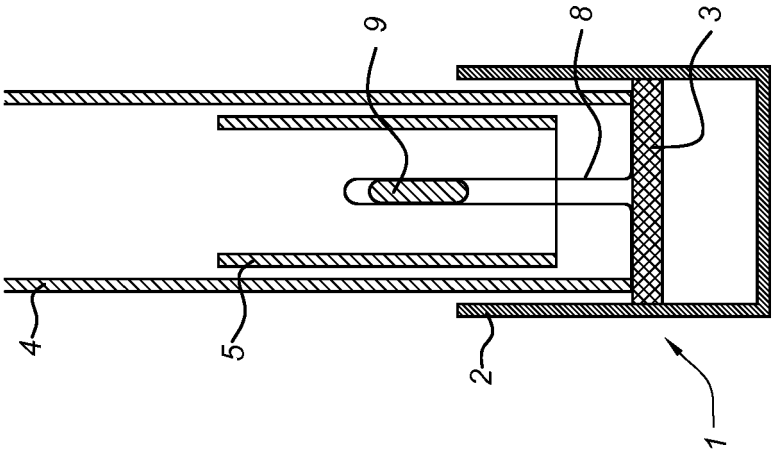


Fig. 1

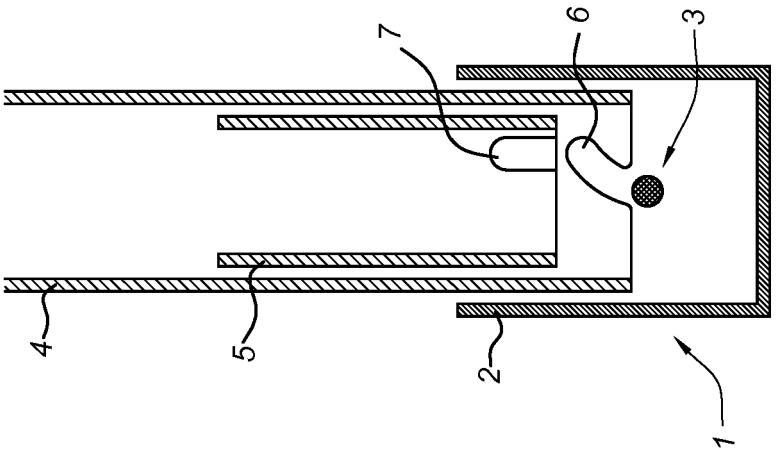


Fig. 6

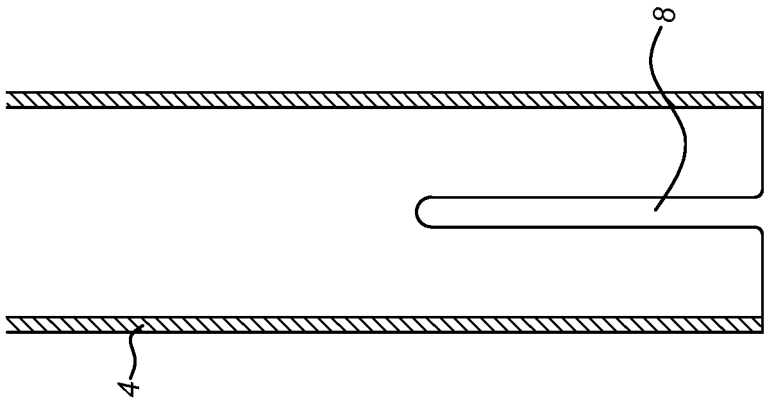


Fig. 5

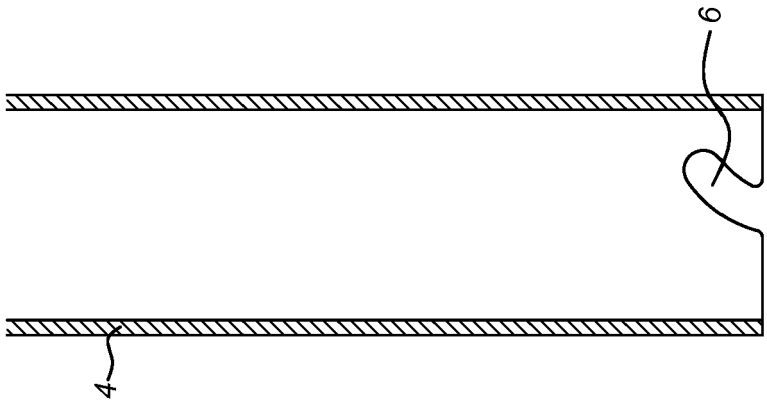


Fig. 4

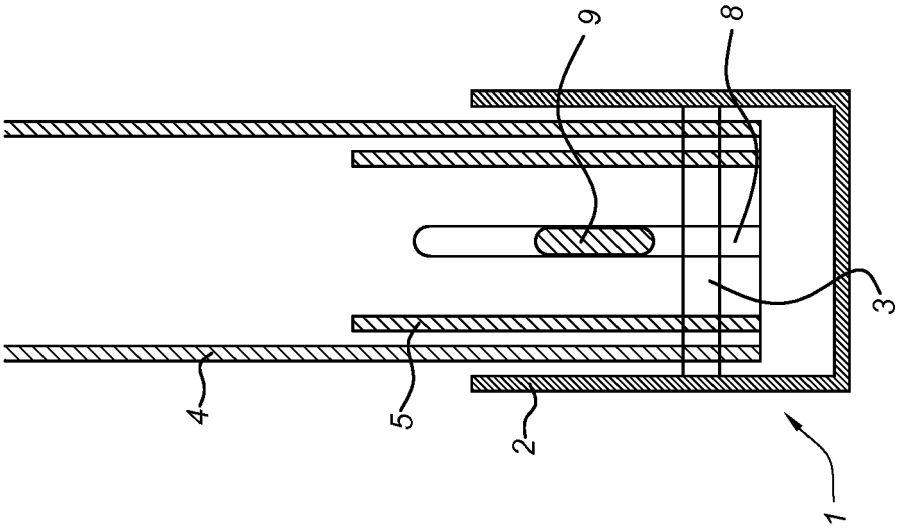


Fig. 9

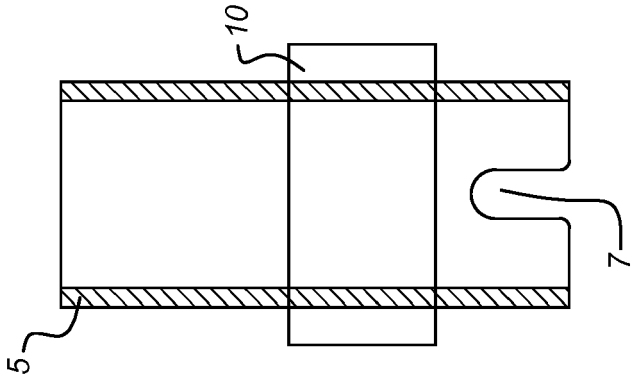


Fig. 8

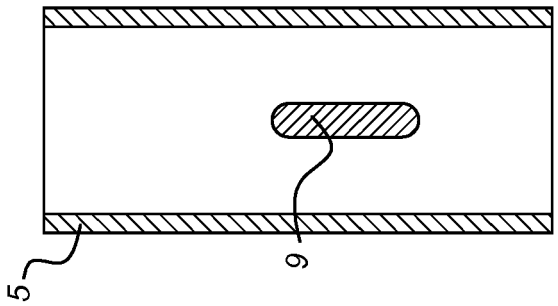


Fig. 7

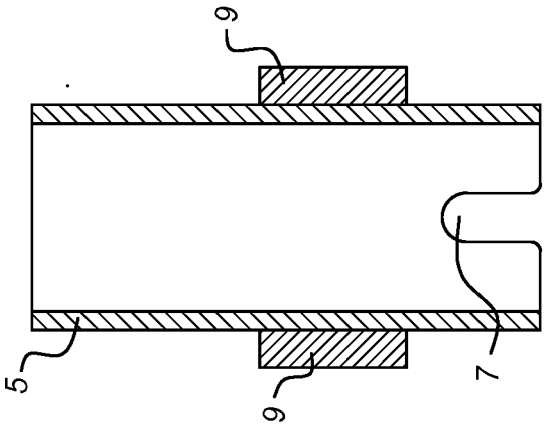


Fig. 12

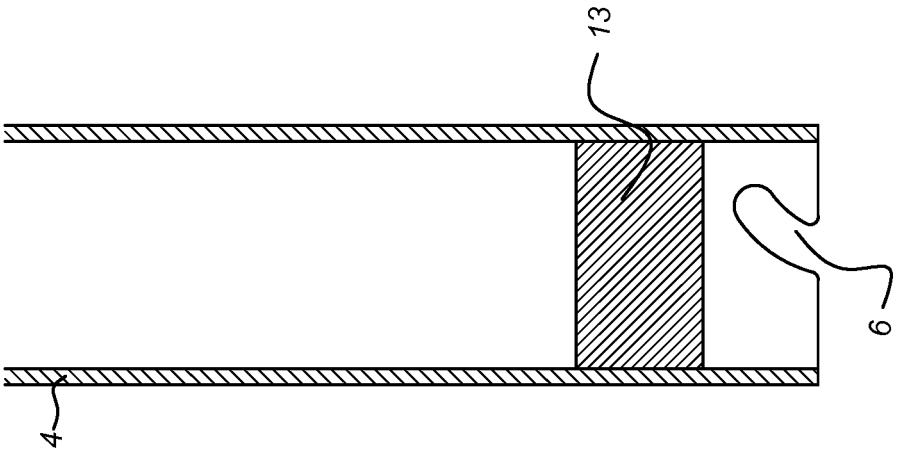


Fig. 11

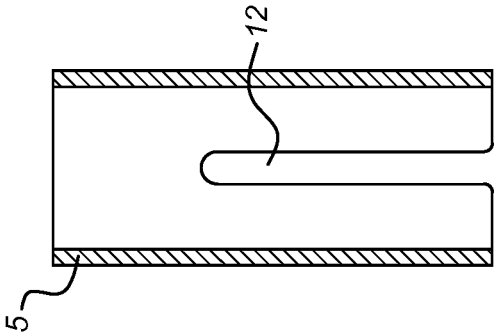


Fig. 10

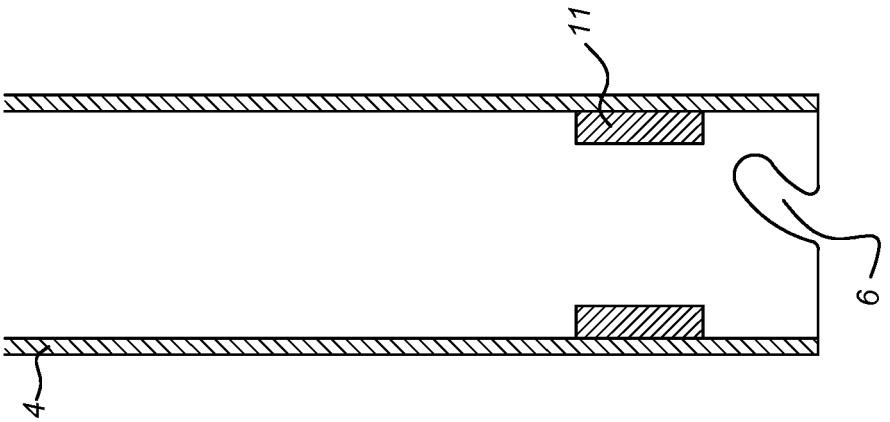


Fig. 13

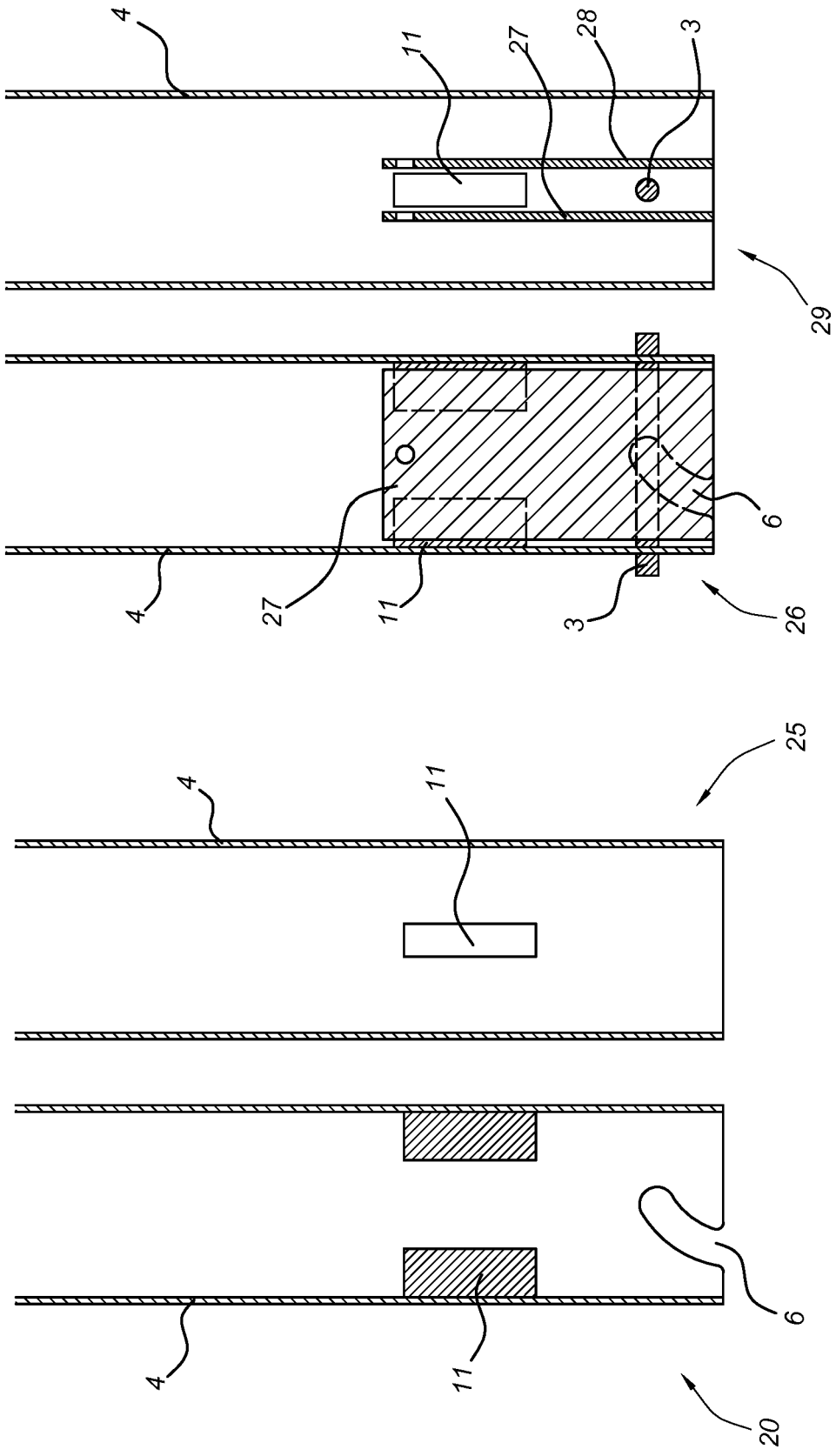
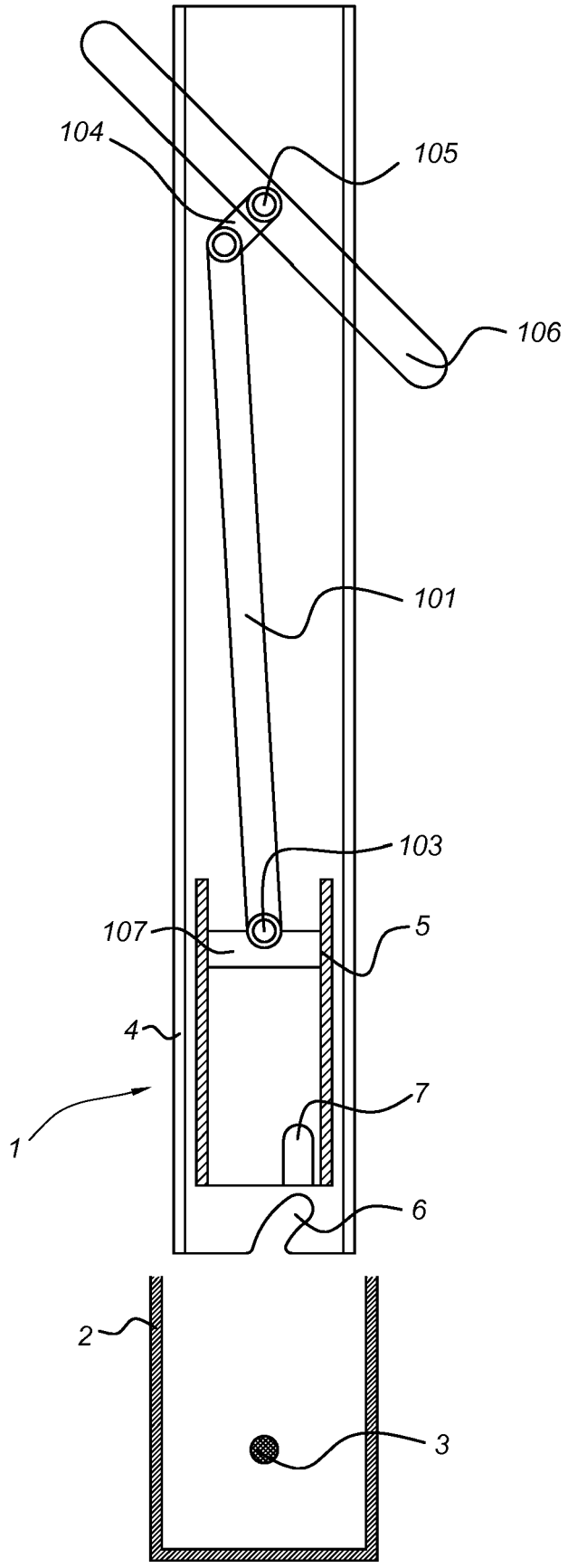


Fig. 14



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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 7537

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E04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 August 2019	Flores Hokkanen, P

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