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DESCRIPTION

[0001] The present invention relates to a device for securing a road entry.

[0002] It is known to temporarily secure public places for certain occasions where a lot of people come together with heavy concrete blocks that block the road entries and thus avoid that lorries or other vehicles can drive into the crowd.

[0003] The disadvantages of this are that the concrete blocks are very heavy and placing these blocks requires heavy equipment and time. Another disadvantage is that these blocks cannot be removed quickly in emergency situations, when urgent access to the public place is required.

[0004] Other temporary systems for securing a road entry mainly consist of barricading road entries, such as with barbed wire or other material.

[0005] These security measures are usually very cumbersome and also require a lot of time to open the road again.

[0006] Also known from JP H06 71515 U are road barriers including concrete elements having horizontally extending through holes fitted with detachable poles.

[0007] Further, GB 2 434 393 A shows a barrier system for restricting vehicular access consisting of a support with an elongate hollow arm mounted on it to enable linear reciprocal movement by means of a motor.

[0008] The purpose of the present invention is to provide a solution to at least one of the aforementioned and other disadvantages.

[0009] To this end, the invention relates to a device for securing a road entry as defined in claim 1. Also a set of such devices is defined in claims 12 and 13.

[0010] The advantages are that the profile can be simply and quickly extended out of the concrete block to block the road entry. To clear the road entry again the profile is retracted in the other direction (toward the concrete block). Preferably this extending or retracting can be done by one person, manually, without extra help.

[0011] The device for securing a road entry can be temporary or permanent. The concrete blocks are movable using any transport.

[0012] The concrete block can already be placed beforehand while the road entry is still open. Once the road entry needs to be blocked, only the profile needs to be extended over the road entry.

[0013] Both when extending or retracting, the profile is supported by the concrete block.

[0014] The profile is positioned horizontally extendable in the longitudinal direction 1 of the concrete block.

[0015] Preferably, the profile is extendable on two roller bearers that are positioned in the longitudinal direction of the concrete block.

[0016] In a preferred embodiment of a device according to the invention the profile is extendable on both sides of the concrete block.

[0017] The profile is extendable through the concrete block both on the left and the right. In this way the concrete block can be placed both on the left and right of the road entry. The profile is extendable from the concrete block with a free end over a maximum length $L-l$. L is the total length of the profile and l the length of the concrete block in the direction in which the profile extends.

[0018] Preferably, the profile is extended to its maximum when the one end touches the concrete such that the profile is always supported by two roller bearers.

[0019] The concrete block is made of reinforced concrete. This strengthens the device for securing a road entry and prevents the concrete block from shattering or the profiles from coming loose in case of impact.

[0020] The reinforced concrete block is provided with a housing in the form of a steel bar in which the extendable profile is mounted. Preferably, the concrete block has a broadened base and can be narrower at the top.

[0021] In a preferred embodiment of a device according to the invention the profile is made of steel.

[0022] Steel is very strong and offers sufficient resistance in case of a possible crash impact with the profile. The concrete block must have sufficient mass to be able to offer resistance against a crash impact on the profile.

[0023] In a device according to the invention the profile is an I-profile that is positioned extendably via roller bearers. Preferably, the middle leg of the I-profile is hereby positioned horizontally, whereby the two end legs are positioned vertically. The letter I of the profile is thus 90 degrees turned in cross-section.

[0024] In this way the profile is self-supporting on the roller bearers. The I-profile is also very strong in terms of construction and offers the most efficient security against bending or breaking.

[0025] The free end of the profile is fitted with an interlocking.

[0026] In a certain embodiment the interlocking ensures that the free ends of two extended profiles are interlocked with each other such that they will not come loose in case of a possible impact or cannot be retracted. In this way a road entry is interlocked by two concrete blocks, one on each side of the road, and two extended profiles.

[0027] In another embodiment the free end of one profile is interlocked with another concrete block. In this way a road entry is secured by only one concrete block with an extendable profile.

[0028] Other embodiments are also possible where two concrete blocks are placed next to each other each with the profile extended in another direction. Many other installations are also possible with several concrete blocks.

[0029] In a preferred embodiment of a device according to the invention two concrete blocks are provided, each on one side of the road entry, whereby each concrete block is provided with a profile that is extendable toward the other.

[0030] Preferably, in the device with two concrete blocks, the free ends of the profiles that extend toward each other are provided with means that interlock with each other.

[0031] Preferably, such means consist of on the one hand a V-shaped receiving piece and on the other hand a straight piece that is received between the legs of the V-piece whereby both are interlocked by a locking pin.

[0032] The interlocking needs to meet one important requirement: not tear or come loose in case of a collision impact. Furthermore, the interlocking must not be manipulatable.

[0033] In a special preferred embodiment of a device according to the invention, the V-shaped part on the first profile comprises two plates provided on the middle bar of the I-profile, whereby the plates are provided with a tip on their end that is bending away from the other one, whereby the first plate is welded on top of the middle bar and the second plate is welded underneath the middle bar and whereby the other I-profile is placeable with the end of the middle bar between both plates.

[0034] In another special preferred embodiment of a device according to the invention, the means that interlock into each other comprise the following parts: a locking pin and corresponding openings for the locking pin in both V-shaped parts of the first profile and in the end of the second profile; whereby the locking pin is provided at the top with an interlocking part A comprising a flat plate provided with a welded part; and the profile with V-shaped part is provided with a complementary interlocking part B comprising a flat plate provided with a welded part; and the flat plate is provided with an opening for the locking pin, which on locking aligns with the openings;

[0035] Preferably, both interlocking parts are provided with an upstanding edge in the form of a semicircle and together form an upstanding edge in the form of a circle; and both interlocking parts are provided with a vertical upstanding edge in the middle of the virtual circle, whereby the upstanding edges lie against each other on interlocking.

[0036] Preferably, the device is also provided with a circular caplock provided within the circumference of the upstanding edge of the circle that is formed by both interlocking parts when the locking pin is mounted in the corresponding openings of the closed profiles. A groove is provided centrally in the caplock to receive the vertical upstanding edges. The caplock is optionally provided with a lock.

[0037] The profile is provided with a stop at the other end of the concrete block.

[0038] The stop prevents the profile from sliding through the concrete block such that the profile would come loose from the concrete block.

[0039] In a certain embodiment of a device according to the invention the free end of the profile is supported on a support block.

[0040] Such support block can be a slightly lighter concrete block on which the profile can support and be interlocked. Such support block can be used to support one or two profile ends.

[0041] In a preferred embodiment of a device according to the invention the concrete block is provided with two recesses on the bottom for a lift fork.

[0042] The teeth of the lift fork fit in these recesses such that the concrete block can be safely put in its place and removed again.

[0043] In another preferred embodiment of a device according to the invention the concrete block is provided with a central recess on the bottom to anchor it to a post or vertically to the ground.

[0044] The concrete block is then put on the post or another vertical solid structure, such that the concrete block certainly cannot move. That offers an extra security. The post can also be used to safeguard the correct positioning of the concrete block.

[0045] For even greater security, several devices according to the invention can be placed behind each other. Thus, a second set of concrete blocks with interlocked profiles can be provided immediately behind or at a distance of, for example, 5, 10 or 20m from a first set of concrete blocks with interlocked profiles. The concrete blocks and/or profiles positioned behind each other can possibly be interlocked with each other.

[0046] In another alternative execution two concrete blocks can be used for one profile, whereby the profile can extend through both concrete blocks and be supported. To this end the

concrete block is provided on its side (underneath where the profile extends) with a coupler, i.e. a cylindrical recess with internal thread to connect the concrete blocks to each other in a fixed way.

[0047] In yet another execution several extendable profiles per concrete block can be provided, e.g. at the same height behind each other, seen from the perspective of an incoming vehicle, and/or at different heights.

[0048] A method for securing a road entry via a device according to the invention comprises the following steps:

1. a) The placing of two concrete blocks with extendable profiles on the side of the road entry,
2. b) The extending of the profiles over the road entry,
3. c) The optional interlocking of the free ends of the profiles.

[0049] A method for quickly clearing a secure road entry via a device according to the invention comprises the following steps:

1. a) The optional unlocking of the free ends of the profiles,
2. b) The retracting of the profiles through the concrete block.

[0050] With the intention of better showing the characteristics of the invention, a preferred embodiment of a device for securing a road entry according to the invention is described hereinafter, by way of an example without any limiting nature, with reference to the accompanying drawings, wherein:

figure 1 schematically shows a preferred execution with two concrete blocks of a device according to the invention;

figure 2 shows a cross-section in a longitudinal direction of the concrete block according to line II-II of figure 1;

figure 3 shows a cross-section in transversal direction of the concrete block according to line III-III of figure 1;

figure 4 schematically shows a preferred execution of an interlocking of the profile ends;

figure 5 schematically shows a preferred execution of a support block for support of the profile ends; and

figure 6 schematically shows a preferred execution of an interlocking according to figure 4.

[0051] Figure 1 shows a preferred execution with two concrete blocks 2 of a device 1 according to the invention. Each concrete block 2 is placed on the side of the road entry. Each concrete block 2 comprises a (partly) extended profile 3.

[0052] A concrete block weighs for example 3,500kg and comprises 1,438m³ of concrete.

[0053] The free extended ends 4' of each profile contain interlocking means 6, one in the form of a V-shaped receiving piece and the other in the form of a straight piece that can slide between the legs of the V in the receiving piece when the profiles 3 are extended against each other.

[0054] The other end 4" of the profile 3 is fitted with a stop 5 such that the profile end 4" is stopped at the concrete block when extending.

[0055] Figure 2 shows a cross-section in a longitudinal direction of the concrete block 2 according to line II-II of figure 1. This shows how an I-profile 3 is positioned extendably via two roller bearers 7 provided at the ends of the concrete block 2. The roller bearers are provided with rollers that run directly on the centre piece of the profile 3.

[0056] The concrete block 2 contains two recesses 8 at the bottom of the concrete block for the teeth of a lift fork. A recess 10 is also provided in the bottom centre of the concrete block to place the concrete block 2 over a post or for vertical anchoring 9. The post is anchored in the ground 11.

[0057] Figure 3 shows a cross-section in transversal direction of the concrete block 2 according to line III-III of figure 1. The profile 3 is supported by the roller bearers 7.

[0058] The concrete block 2 is provided with a recess 10 for a post 9 or vertical anchoring with the ground 11.

[0059] Figure 4 schematically shows a preferred embodiment of an interlocking mechanism 6 of two profile ends 4'. The interlocking comprises a V-shaped receiving piece on the first profile end and a straight piece on the second profile end that can slide between the legs of the V-shaped receiving piece when the profiles 3 are extended against each other. The interlock is such that the holes 12 have to be aligned opposite each other such that the locking pin 13 fits in the holes and thus interlocks both profiles.

[0060] Figure 5 schematically shows an execution of an alternative support block 14 for support of the profile ends 4'. The free ends are thus extra supported.

[0061] Figure 6 schematically shows a preferred embodiment of an interlocking 6 of two I-profiles 3 according to figure 4.

[0062] The one I-profile 3 (left profile in this example) is provided with a V-shaped part 15, 16. To this end two plates are 15, 16 provided on the middle bar 17 of the I-profile 3. The two plates 15, 16 have a tip 18 on their end that is bending away from the other one which increases the space between the plates toward the end of the plates. Plate 15 is welded on top of the middle bar 17, plate 16 at the bottom of the middle bar 17.

[0063] Optionally, via welded plates 19 provided on the middle bar an extra distance is created between both plates 15, 16 such that the V-shaped part has the necessary width to receive the end 4' of the other profile 3 that is also interlocked. Both plates 15,16 are attached and reinforced to the middle bar 17 via two bolts/nuts 20 in the provided openings 21. Consequently, the attachment is prevented from tearing in case of a possible impact.

[0064] The other I-profile 3 (right profile in this example) extends with the end 4' of the middle bar 22 in or between the V-shaped part 15, 16. To compensate the width between both V-parts 15, 16, and as extra reinforcement against tears on impact, the end 4' of the middle bar 22 is provided with a welded plate 23.

[0065] Both in the two V-shaped parts 15, 16 of the one profile 3, and in the end 4' of the other profile 3 (as well as in the welded plate 23) a corresponding opening 24 is provided for a locking pin 25. When both profile ends 4' are extended into each other, until both I-profiles touch or almost touch each other, the openings 24 fit into each other and the locking pin 25 can be put through.

[0066] The locking pin 25 is provided at the top with an extra interlocking part A consisting of a flat plate 28 provided with a welded part 26, 27. The profile 3 with V-shaped part 15, 16 is provided with a complementary interlocking part B that is welded on the profile 3 via a flat plate 31. The flat plate 31 is provided with a welded part 29, 30. The flat plate 31 is also provided with an opening 32 for the locking pin 25. On locking, the opening 32 is aligned with the openings 24.

[0067] Both interlocking parts A, B comprise an upstanding edge 26, 29 in the form of a semicircle and together form an upstanding edge in the form of a circle. In the one part the semicircle is interrupted to make room for a lock 35. Both interlocking parts are also provided with a vertical upstanding edge 27, 30 in the centre of the virtual circle. These upstanding edges 27,30 lie next to each other on interlocking.

[0068] When the locking pin 25 is mounted in the corresponding openings 24, 32 of the extended profiles 3, a circular caplock 33 is provided within the circumference of the upstanding edge 26, 29 of the circle formed by both interlocking parts A, B. A groove 34 is provided centrally in the caplock 33 which is slid over the vertical upstanding edges 27, 30. Subsequently the caplock 33 is locked with a lock 35, such that the lock cannot be opened without a key or code.

[0069] The locking pin 25 can be attached via a welded ring 36 and chain to a welded ring 36

of a profile 3. Indeed, the pin 25 is the only loose part in the whole.

[0070] Both profile ends 4' are provided with a handle in the form of a cylindrical rod to extend or retract the profiles. This is done manually and can easily be done by one person.

[0071] On the right profile end 4', where the end extends into the V-shaped part of the other profile 3, a bump stop 5 is provided to cushion the impact of the extension.

[0072] In case of a possible impact of a vehicle on the device for securing a road entry the interlocking will not break or tear open. The profiles and the interlocking may deform somewhat but not break. The concrete blocks may shift somewhat if they are not anchored to the ground.

[0073] A crash test was carried out on a device for securing a road entry consisting of two concrete blocks with a distance of 11m between each other and two interlocked steel I-profiles of 140x140. Each concrete block had a size of 2.18m by 1.10m by 1.10m and weighed 4 tonnes. The lorry weighed 7.5 tonnes and drove at an incoming speed of 48 kph on the device for securing a road entry. 2 seconds after impact the lorry came to a standstill 13m behind the device for securing a road entry. The interlocking of the profiles remained intact. The profiles were bent around the lorry and the concrete blocks had moved to each other slightly.

[0074] The present invention is by no means limited to the embodiments described as an example and shown in the drawings, but a device according to the invention as defined by the claims can be realised in all kinds of variants without departing from the scope of the invention.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patent documents cited in the description

- [JPH0671515U](#) **[0006]**
- [GB2434393A](#) **[0007]**

Patentkrav

1. Indretning (1) til sikring af en vejindkørsel bestående af en betonblok (2), der er forsynet med en udtrækkelig I-profil (3) med en vis længde L, positioneret i en vis højde h, hvor profilen (3) understøttes af betonblokken (2), hvor profilen både ved udtrækning og tilbagetrækning understøttes af betonblokken, hvor I-profilen (3) er positioneret horisontalt udtrækkelig i længderetningen 1 af betonblokken (2), hvor den armerede betonblok (2) er forsynet med et hus i form af en stålstang, i hvilken den udtrækkelige profil (3) er monteret, hvor I-profilen (3) er positioneret udtrækkeligt på rullelejer (7), som er positioneret i betonblokkens længderetning, idet den frie ende (4') af profilen (3) er forsynet med sammenlåsningmidler (6), hvor sammenlåsningmidlerne (6) er af en type, der ikke rives itu eller løsner sig i tilfælde af en kollisionspåvirkning og ikke kan manipuleres, og den anden ende (4'') er forsynet med et anslag (5) for at forhindre profilen i at glide gennem betonblokken, således at profilen ville løsne sig fra betonblokken.

2. Indretning ifølge krav 1, **kendetegnet ved, at** profilen er positioneret udtrækkeligt via to rullelejer (7), der er anbragt ved enderne af betonblokken (2).

3. Indretning ifølge krav 1 eller 2, **kendetegnet ved, at** I-profilens (3) midterben er positioneret horisontalt, hvor I-profilens (3) to endeben er positioneret vertikalt, således at profilen (3) er selvbærende på rullelejerne (7).

4. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** profilen (3) kan udtrækkes på begge sider af betonblokken (2), hvor profilen kan udtrækkes gennem betonblokken (2) både til venstre og højre.

5. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** profilen (3) kan udtrækkes fra betonblokken (2) med en fri ende (4') over en maksimal længde L-1, hvor L er profilens (3) samlede længde, og 1 er betonblokkens (2) længde i den retning, i hvilken profilen strækker sig.

6. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** betonblokken (2) er fremstillet af armeret beton, og I-profilen (3) er fremstillet af stål, hvor

betonblokken har tilstrækkelig masse til at kunne yde modstand mod en sammenstødspåvirkning på profilen (3).

7. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** udtrækningen eller tilbagetrækningen af profilen (3) kan foretages af én person, manuelt, uden ekstra hjælp.

8. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** profilens (3) frie ende er sammenlåst med en støtteblok (14) på en sådan måde, at en vejindkørsel er sikret med kun én indretning.

9. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** betonblokken (2) er forsynet med to recesser (8) på undersiden til tænderne på en løftegaffel.

10. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** betonblokken (2) er forsynet med en midterreces (10) på undersiden med henblik på at forankre den til en stolpe eller vertikal forankring (9) til jorden (11).

11. Indretning ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** der er anbragt adskillige udtrækkelige profiler (3) pr. betonblok (2), i samme højde bag hinanden, set fra et indkommende køretøjs perspektiv, og/eller i forskellige højder.

12. Sæt af to indretninger ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** der tilvejebringes to betonblokke (2), hvor hver betonblok (2) er forsynet med en I-profil (3), der kan udtrækkes hen imod den anden, og de frie ender (4') af begge I-profiler (3) er forsynet med sammenlåsningsmidler (6), som sammenlåser hinanden.

13. Sæt af indretninger ifølge et hvilket som helst af de foregående krav, **kendetegnet ved, at** der er placeret adskillige indretninger bag hinanden, for eksempel kan et andet sæt betonblokke med sammenlåste profiler anbringes umiddelbart bag ved eller i en afstand fra et første sæt betonblokke med sammenlåste profiler, hvor betonblokkene og/eller profilerne, som er er positioneret bag ved hinanden, eventuelt kan sammenlåses med hinanden.

14. Indretning ifølge foregående krav 12 eller 13, **kendetegnet ved, at** sådanne sammenlåsningmidler (6) på den ene side består af et V-formet modtagestykke (6) og på den anden side et lige stykke (6), der kan glide mellem V-formens ben, hvor begge er sammenlåst ved hjælp af en fastlåsningstap (13).

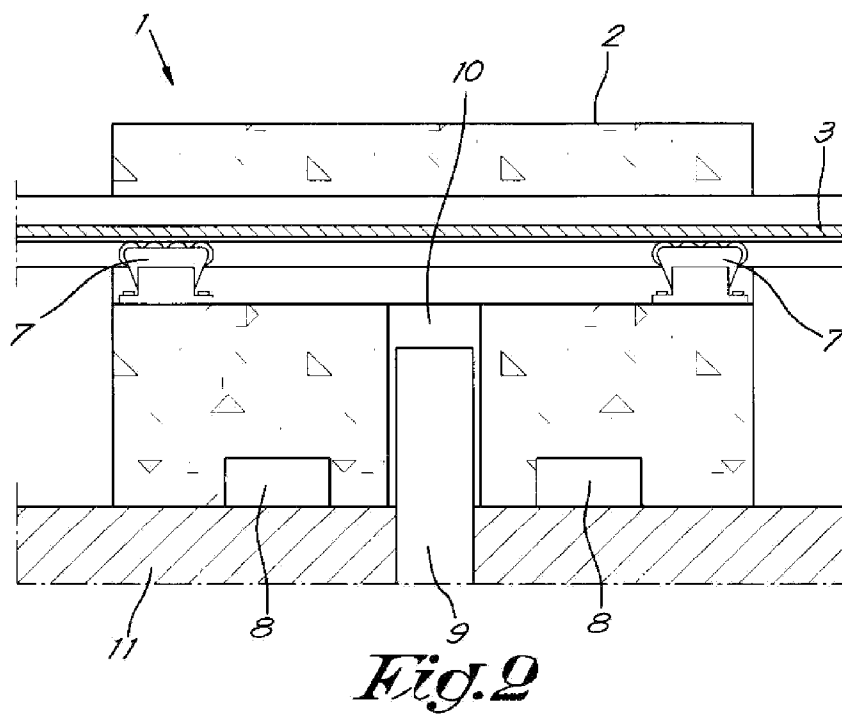
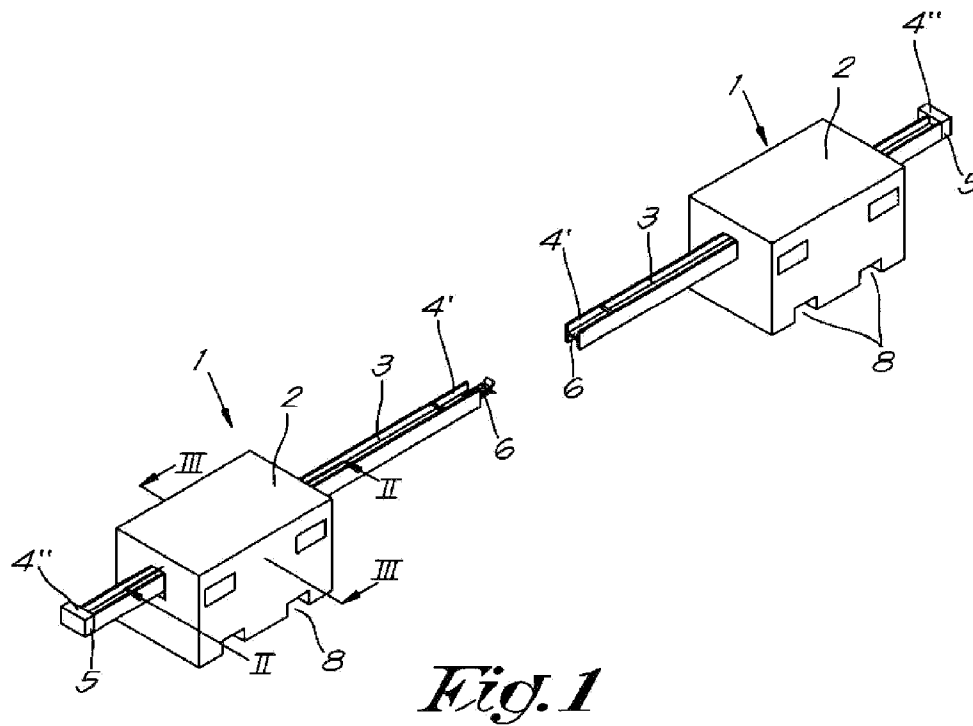
15. Indretning ifølge krav 14, **kendetegnet ved, at** den V-formede del på den første profil (3) omfatter to plader (15, 16), der er anbragt på I-profilens (3) midterstang (17), hvor pladerne (15, 16) er forsynet med en spids (18) på den ende, som bøjer væk fra den anden, hvor den første plade (15) er påsvejset oven på midterstangen (17), og den anden plade er (16) påsvejset nedenunder midterstangen (17), og hvor den anden I-profil (3) kan placeres med enden (4') af midterstangen (22) mellem begge plader (15, 16).

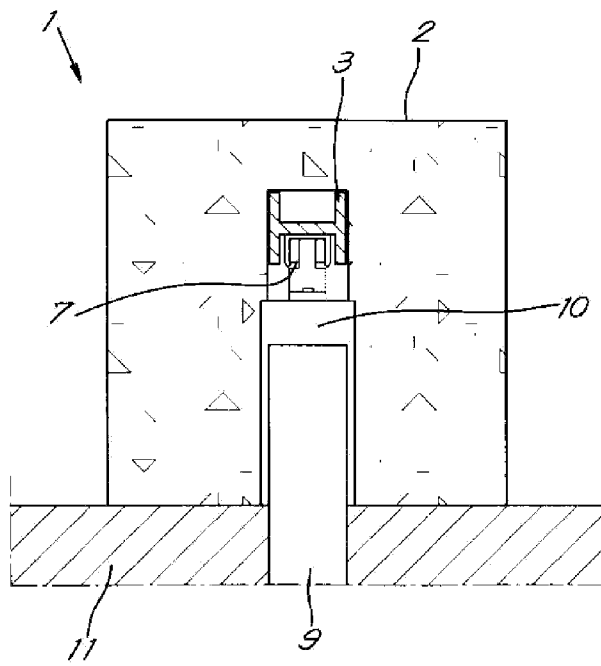
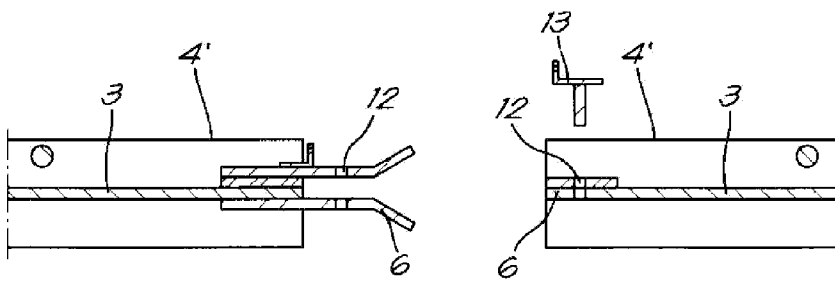
16. Indretning ifølge krav 14 eller 15, **kendetegnet ved, at** de midler (6), der sammenlåser hinanden, omfatter følgende dele:

- a) fastlåsningstappen (25);
- b) tilsvarende åbninger (24) til fastlåsningstappen (25) i begge V-formede dele (15, 16) af den første profil (3) som i enden (4') af den anden profil (3); hvor
- c) fastlåsningstappen (25) på oversiden er forsynet med en sammenlåsningssdel (A), der omfatter en flad plade (28), som er forsynet med en påsvejset del (26, 27); og
- d) profilen (3) med den V-formede del (15, 16) er forsynet med en komplementær sammenlåsningssdel (B), der omfatter en flad plade (31), som er forsynet med en påsvejset del (29, 30); og
- e) den flade plade (31) på den komplementære sammenlåsningssdel (B) er forsynet med en åbning (32) til fastlåsningstappen (25), som ved sammenlåsning flugter med åbningerne (24) i de V-formede dele (15, 16); og
- f) begge sammenlåsningssdele (A, B) er forsynet med en opretstående kant (26, 29) i form af en halvcirkel og danner tilsammen en opretstående kant i form af en cirkel; og
- g) begge sammenlåsningssdele (A, B) er forsynet med en vertikal opretstående kant (27, 30) i midten af den virtuelle cirkel, hvor de opretstående kanter (27, 30) ved sammenlåsning ligger an mod hinanden; yderligere forsynet med
- h) en cirkulær kappelås (33), der er anbragt inden i periferien af den opretstående kant (26, 29) af den cirkel, som dannes af begge sammenlåsningssdele (A, B), når fastlåsningstappen (25) er monteret i de tilsvarende åbninger (24, 32) i de udtrukne profiler (3);

- i) en rille (34), der er anbragt centralt i kappelåsen (33), til modtagelse af de vertikale opretstående kanter (27, 30);
- j) kappelåsen (33) er eventuelt forsynet med en lås (35).

DRAWINGS



*Fig. 3**Fig. 4*

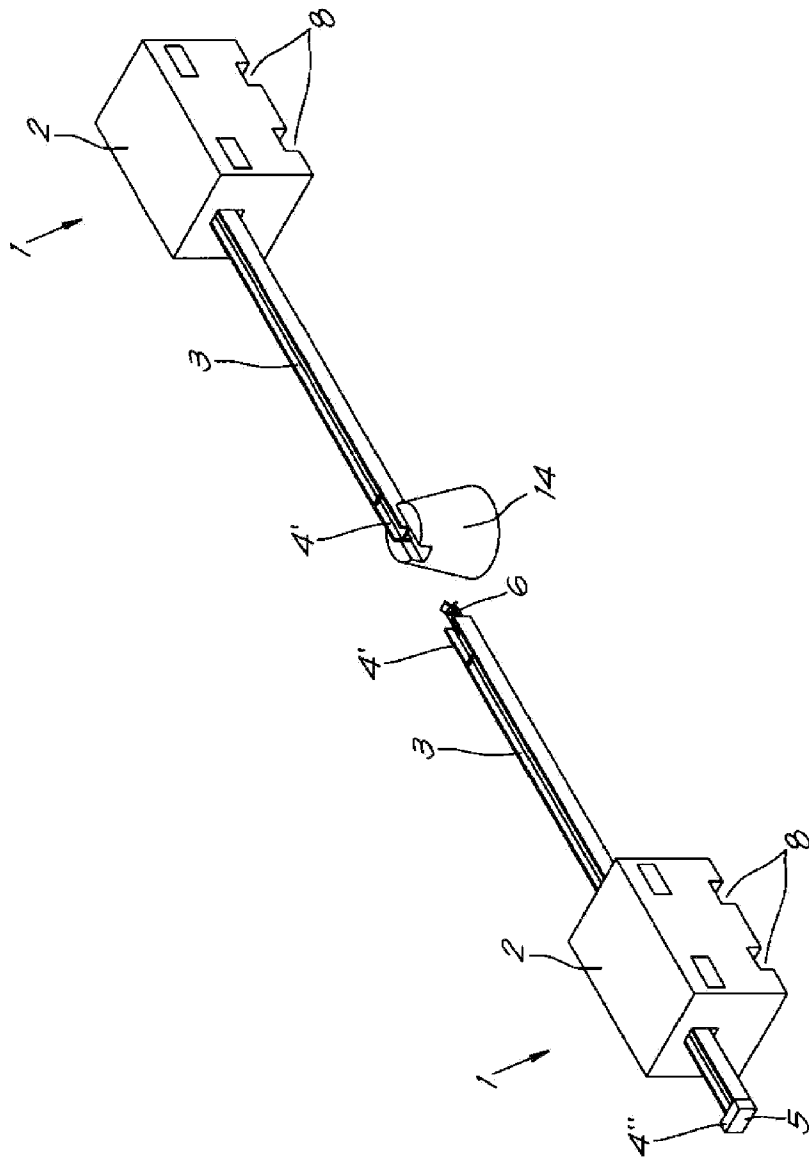
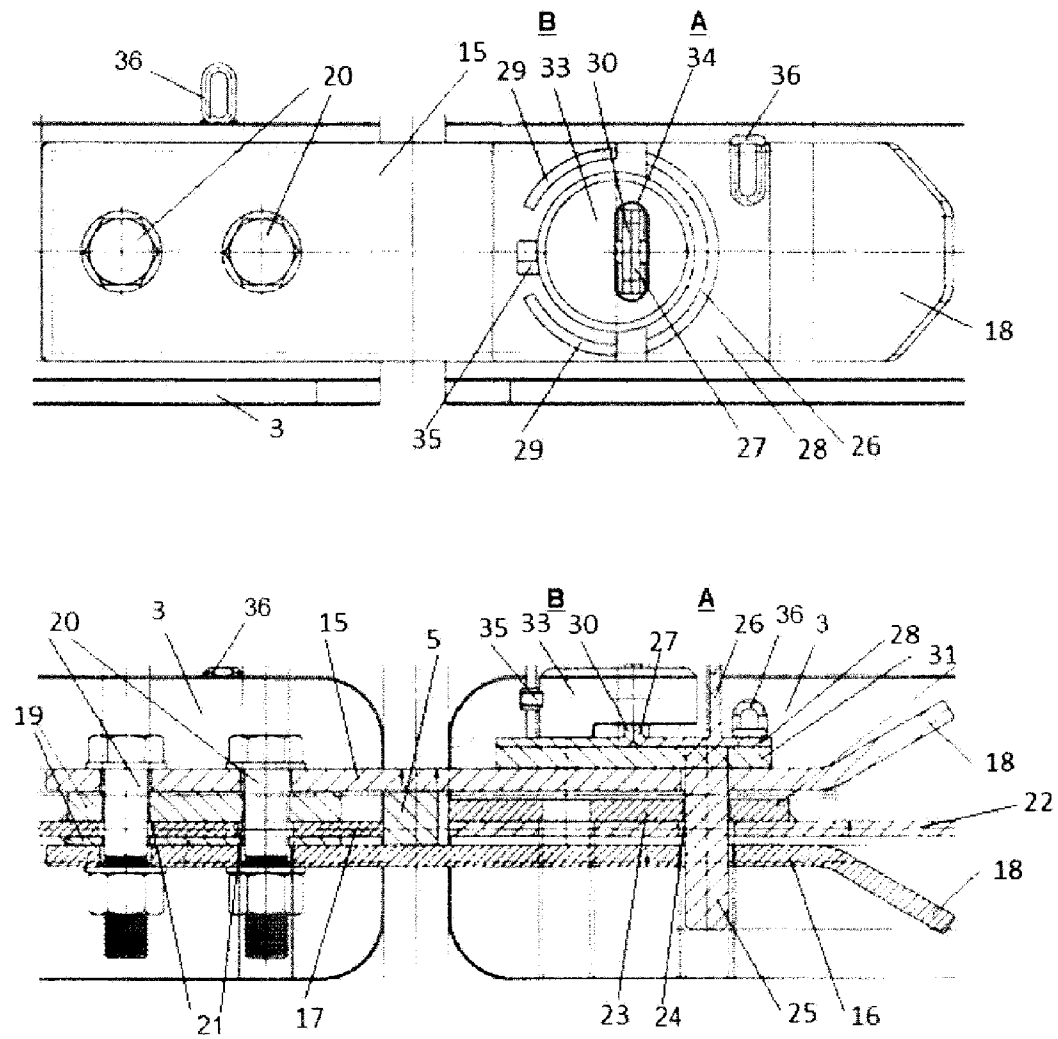


Fig. 5

*Fig. 6*