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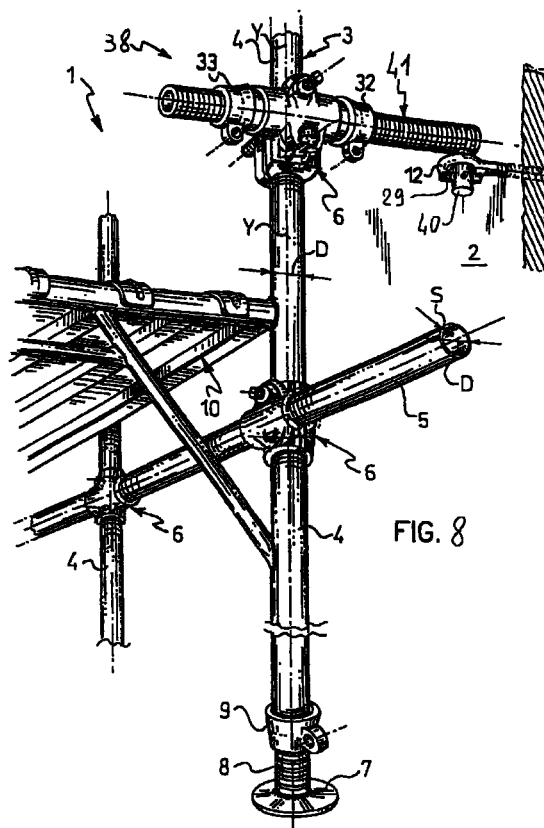
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(54) **A device for anchoring scaffolding to a face of a building**

(57) A device (38) for anchoring scaffolding (1) quickly and accurately to a face (2) of a building comprises a spacer rod (39) to be fixed to a tube (4, 5) of a tubular structure (3) of the scaffolding by means of a fitting (6), and a slider (41) fitted coaxially for sliding in the spacer rod (39), the slider (41) having an end which is fixed to a pin (40) for engagement in an eye (12) fixed to the face (2), and having screw means (31) for adjustable movement of the slider (41) in the spacer rod (39).



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Description

[0001] The present invention relates to a device for anchoring scaffolding to a face of a building or the like, of the type comprising a spacer rod to be fixed to a tube of a tubular structure of the scaffolding by means of a fitting, and a pin associated with the spacer rod for engagement in an eye fixed to the face.

[0002] It is known that, when a face of a building is repaired, it is necessary to erect suitable scaffolding in front of the face and to anchor the scaffolding to the face.

[0003] To satisfy this requirement, a currently known anchoring device comprises a spacer rod, otherwise known as a pole or locator, which is fixed, by means of a fitting, to a tube of the tubular scaffolding structure, for example, to a standard or a ledger, and is in engagement with an eye provided in the face.

[0004] Although this method is satisfactory from various points of view and is widely used, it leaves something to be desired from the point of view of the accuracy and reliability of the anchorage which can be achieved, as well as of fitting speed.

[0005] In fact when the anchoring device is installed, it is necessary to make sure that the tube (for example, a standard) of the scaffolding at the point in question is the correct distance from the face of the building. When, as often occurs, the standard is not the correct distance from the face, it is then necessary to move the standard away from or towards the face. At the moment, this operation is performed manually by pushing the standard outwards or inwards whilst the fitting is loosened until the standard reaches the correct distance. At this point, the fitting is tightened, fixing the spacer rod to the standard and, in short, anchoring the scaffolding to the face at that point.

[0006] However, this method is lengthy and laborious and, particularly if it is performed by one person alone, usually leads to the standard being anchored in an imprecise position.

[0007] Moreover, it should be borne in mind that scaffolding anchored in the manner indicated above is subject to undesired movements to and fro, owing to the play of the pin in the eye and owing to the resilient compliance of the eye in the face.

[0008] To prevent this problem, anchoring devices which make use of iron wires by which a tube of the tubular scaffolding structure is tied to an eye have been proposed. After tying, a twist is applied to the iron wire so as to keep the tubular scaffolding structure in contact with the face.

[0009] However, as well as being rudimentary and imprecise, this method also clearly leaves something to be desired from the point of view of strength and reliability. In fact, the anchorage which can be achieved by iron wire is clearly insecure and does not give the necessary guarantee of safety, to the extent that the scaffolding remains without approval. Moreover, as a result of the

stresses to which the iron wire is subjected, the iron wire is liable to lengthen which leads to a slackening of the anchorage of the scaffolding, thus reintroducing the above-mentioned disadvantage of movements to and fro.

[0010] The problem upon which the present invention is based is that of designing an anchoring device of the type specified which has structural and functional characteristics such as to overcome the disadvantages mentioned with reference to the prior art.

[0011] This problem is solved by an anchoring device according to Claim 1.

[0012] Further characteristics and the advantages of the anchoring device according to the present invention will become clear from the description given below of two preferred embodiments thereof, provided by way of non-limiting example, with reference to the appended drawings, in which:

Figure 1 is a perspective view of scaffolding incorporating an anchoring device according to the present invention,

Figure 2 is a partially-sectioned side view of the anchoring device of Figure 1,

Figure 3 is a rear view taken on the arrow III of Figure 2, showing the anchoring device of Figure 1,

Figure 4 is a view taken on the arrow IV of Figure 2, showing the anchoring device of Figure 2 from below,

Figure 5 is a view showing a detail of the anchoring device of Figure 2, in section and on an enlarged scale,

Figures 6a, 6b and 6c are schematic views of the anchoring device of Figure 2 in successive stages of a method of operation,

Figures 7a, 7b and 7c are schematic views of the anchoring device of Figure 2 taken at successive stages of a different configuration of operation,

Figure 8 is a perspective view of scaffolding incorporating a different embodiment of the anchoring device according to the present invention,

Figure 9 is a partially-sectioned side view of the anchoring device of Figure 8,

Figure 10 is a rear view taken on the arrow A1 of Figure 9, showing the anchoring device of Figure 8,

Figure 11 is a view taken on the arrow A2 of Figure 9, showing the anchoring device of Figure 9 from below,

Figure 12 is a view showing a detail of the anchoring device of Figure 9, in section and on an enlarged scale, and

Figures 13a, 13b and 13c are schematic views of the anchoring device of Figure 9 at successive stages of its operation.

[0013] With reference to Figures 1 to 7, scaffolding, generally indicated 1, is installed in front of a face 2 of a building to be repaired.

[0014] The scaffolding 1 comprises a load-bearing, tubular structure 3 in turn comprising tubular elements acting as standards 4 and ledgers 5. All of the standards 4 and ledgers 5 are constituted by well-known steel scaffolding tubes generally having an outside diameter D of 48 mm and a thickness S of 2 mm. The standards 4 and the ledgers 5 are fixed together by conventional fittings 6.

[0015] In wholly conventional manner, the load-bearing structure 3 bears on the ground by means of the standards 4 which have feet 7 for this purpose.

[0016] Each foot 7 has a thread 8 and an operating ring nut 9 which is engaged for screwing on the thread 8 to adjust the height of the standard 4 and hence of the scaffolding 1, according to need.

[0017] The scaffolding 1 is completed by boards 10 which constitute a walking surface for the people employed in repairing the face 2, and which are supported on the tubular structure 3.

[0018] An anchoring device according to the invention for anchoring the tubular structure 3 of the scaffolding 1 to the face 2 of the building is indicated 11.

[0019] It should be pointed out that, for this purpose, the face 2 of the building has suitable eyes 12 fitted in the face and projecting therefrom.

[0020] The anchoring device 11 comprises a spacer rod 13 which is preferably made from a straight portion of scaffolding tube of the same type which is used for the standards 4 and for the ledgers 5 and having a predetermined length L. In the embodiment shown, the spacer rod 13 has a length L of 400 mm.

[0021] The spacer rod 13 extends along a horizontal axis X-X and is connected, by means of a fitting 6, to a standard 4 extending along a vertical axis Y-Y. The fitting 6 comprises a core 6a and two opposed caps 6b which can be clamped onto the core by means of bolts 6c in order to fix the spacer rod 13 and the standard 4 to the core 6a and thus to fix the spacer rod 13 to the standard 4.

[0022] A radially-extending pin 14 for engaging the eye 12 is associated with the spacer rod 13.

[0023] A safety tab 27 is preferably associated with the pin 14 to prevent the pin from coming out of the eye 12. In the embodiment shown, the safety tab 27 is pivoted in an axial slot formed at a free end of the pin 14. The safety tab 27 is free to pivot between a position in which it is aligned with the pin 14 so as to allow the free end of the pin 14 to be inserted in the eye 12, and a stable position in which it is arranged transversely relative to the pin 14 so as to project from the pin in order to be able to interfere with the eye 12.

[0024] A straight, tubular slider 15 of predetermined outside diameter D1 is fitted coaxially for sliding in the spacer rod 13. In the embodiment shown, the slider 15 has an outside diameter D1 of 38 mm and a thickness S of 3.5 mm.

[0025] The slider 15 has a first end 16 facing towards the face 2 and an opposite, second end 17.

[0026] The slider 15 has a length L1 slightly greater than the length L of the spacer rod 13. In the embodiment shown, the length L1 is 450 mm. The second end 17 of the slider 15 thus projects from the spacer rod 13.

[0027] The pin 14 is fixed to the slider 15 in the region of the first end 16 thereof. It should be noted that a slot 18, through which the pin 14 can extend, is formed in the spacer rod 13 at the level of the first end 16 of the slider 15, and extends longitudinally in the direction of the axis X-X.

[0028] In the region of the second end 17, the slider 15 has screw means 19 for urging the spacer rod 13 against the face 2, as will be explained in the following part of the description.

[0029] In particular, the screw means 19 comprise a thread 20 formed on the second end 17 of the slider 15, and a ring nut 21 which is engaged by screwing on the thread 20 and which is intended to abut the spacer rod 13. For convenience, the ring nut 21 has a ring-shaped appendage 21a which can be acted on in order to rotate the ring nut.

[0030] The thread 20 is preferably of the same type as the thread of the feet 7. In the embodiment shown, the thread 20 is a strong trapezoidal thread with a pitch P of 7 mm.

[0031] The ring nut 21 is preferably identical to the ring nut 9 of the foot 7.

[0032] The anchoring device 11 is completed by locking means 22 for preventing the slider 15 from sliding in the spacer rod 13, that is, for fixing the slider 15 and the spacer rod 13 relative to one another. The locking means 22 comprise a bolt 23 which extends removably through two aligned holes 24 formed transversely in the spacer rod 13, and two aligned holes 25 formed transversely in the slider 15.

[0033] The bolt 23 has a head 26 which constitutes both a stop abutment and a grip for the bolt.

[0034] In the method of operation relating to the installation of the anchoring device it is necessary, first of all, to arrange for the spacer 13 to project by a predetermined distance, indicated B in Figure 6a, from the fitting 6. For example, the distance B may be 20 cm. The distance B is such that the spacer rod is in contact with the face 2 to be repaired when the scaffolding 1 is in the desired position relative to the face 2.

[0035] After the pin 14 has been inserted in the eye 12, the fitting 6 is tightened so as to fix the spacer rod 13 to the standard 4 and hence to the scaffolding 1. After the spacer rod 13 has been fixed to the standard 4, the ring nut 21 is screwed on the thread 20 so as to urge the spacer rod 13 toward the face 2 (see Figure 6b) and to react against the slider 15, the pin 14 of which engages the eye 12. The ring nut 21 is screwed until the spacer rod abuts against the face 2 (see Figure 6c). In this condition, the standard 4, and hence the tubular structure 3, that is, the scaffolding 1, are firmly anchored in the desired relative position by reaction against the face 2.

[0036] According to another method of operation,

when, upon completion of the repair of the face 2, it is desirable also to carry out the repair at the point at which the anchoring device 11 was fitted, it suffices to provide the bolt 23 (see Figure 7a), to slacken the ring nut 21, and then to slacken the fitting 6 so as to render the spacer rod 13 slidable relative to the fitting 6, to retract the spacer rod 13 until the transverse holes 24 and 25 formed in the spacer rod 13 and in the slider 15, respectively, are aligned with one another and, finally, to insert the bolt 23 (see Figure 7b). At this point, it suffices to tighten the fitting 6 onto the spacer rod 13 and then to tighten the ring nut 21 until the bolt 23 is confined between the spacer rod 13 and the slider 15, fixing the latter together. In these conditions, the spacer rod 13 is spaced from the face 2, which can thus also be repaired at the point previously occupied by the end of the spacer rod 13. It should be stressed that, even in these conditions, the scaffolding 1 nevertheless remains anchored to the face.

[0037] With reference now to Figures 8 to 13, a different embodiment of the anchoring device according to the invention for anchoring the tubular structure 3 of the scaffolding 1 to the face 2 of the building is indicated 38. The parts of the scaffolding 1 are identical to those described above and are indicated by the same reference numerals.

[0038] In this embodiment also, the face 2 of the building has suitable eyes 12 fitted in the face and projecting therefrom.

[0039] The anchoring device 38 comprises a spacer rod 39 which is preferably made from a straight portion of scaffolding tube of the same type which is used for the standards 4 and for the ledgers 5 and having a predetermined length L2. In the embodiment shown, the spacer 39 has a length L2 of 120 mm.

[0040] The spacer rod 39 extends along a horizontal axis X-X and is connected, by means of a fitting 6, to a standard 4 extending along a vertical axis Y-Y. The fitting 6 comprises a core 6a and two opposed caps 6b which can be clamped onto the core by means of bolts 6c in order to fix the spacer rod 39 and the standard 4 to the core 6a and thus to fix the spacer rod 39 to the standard 4.

[0041] A radially-extending pin 40 for engaging the eye 12 is associated with the spacer rod 39.

[0042] A safety tab 29 is preferably associated with the pin 40 to prevent the pin from coming out of the eye 12. In the embodiment shown, the safety tab 29 is pivoted in an axial slot formed in a free end of the pin 40. The safety tab 29 is free to pivot between a position in which it is aligned with the pin 40 to allow the free end of the pin 40 to be inserted in the eye 12, and a stable position in which it is arranged transversely relative to the pin 40 so as to project from the pin and to interfere with the eye 12.

[0043] A straight, tubular slider 41 of predetermined outside diameter D3 is fitted coaxially for sliding in the spacer rod 39. In the embodiment shown, the slider 41

has an outside diameter D3 of 38 mm and a thickness S3 of 6 mm.

[0044] The slider 41 has an external thread 30 which is preferably of the same type as the thread of the foot 7. In the embodiment shown, the thread 30 is a strong trapezoidal thread with a pitch P1 of 7 mm.

[0045] The slider 41 has a first end 42 facing towards the face 2 and an opposite, second end 43.

[0046] The slider 41 has a length L3 greater than the length L2 of the spacer rod 39. In the embodiment shown, the length L3 of the slider 41 is 450 mm. The slider 41 thus projects from the spacer rod 39.

[0047] The pin 40 is fixed to the slider 41 in the region of the first end 42.

[0048] The slider 41 has screw means 31 for the adjustable movement of the slider 41 relative to the spacer rod 39, that is, along the spacer rod.

[0049] In particular, the screw means 31 comprise a first ring nut 32 and a second ring nut 33 engaged by screwing on respective threads 34 and 35 formed on respective end portions 36 and 37 of the slider 41 facing towards the face 2 and in the opposite direction, respectively.

[0050] The threads 34 and 35 are portions of the thread 30.

[0051] The ring nuts 32 and 33 are preferably identical to one another and to the ring nut 9 of the foot 7.

[0052] The ring nuts 32 and 33 have annular appendages, indicated 32a and 33a, respectively, which can be acted on in order to rotate the ring nuts.

[0053] In operation and, more precisely, during the installation of the anchoring device 38, the anchoring device 38 is connected to the standard 4 of the scaffolding 1 in a manner such that the two ring nuts 32 and 33 are kept spaced from the spacer rod 39. After the pin 40 has been inserted in the eye 12, the fitting 6 is tightened so as to fix the spacer rod 39 to the standard 4 and hence to the scaffolding 1.

[0054] At this point, if the distance of the standard 4 from the face 2 is measured and it is found, for example, that the distance measured is less than the correct distance, it is necessary to move the standard 4 away from the face 2. At this point, it suffices to act on the first ring nut 32, rotating it towards the spacer rod 39 until it is brought into contact with the spacer rod 39. If the rotation of the ring nut 32 is continued, the spacer rod 39, and hence the standard 4, are moved away from the face 2. The rotation of the ring nut 32 is stopped as soon as the standard 4 has reached the correct distance from the face 2.

[0055] At this point, the second ring nut 33 is rotated towards the spacer rod 39 until it is tightened against the spacer rod, that is, against the opposite end of the spacer rod to the first ring nut 32.

[0056] The spacer rod 39 is thus locked between the two ring nuts 32 and 33 and the anchoring device 38 is finally positioned.

[0057] The main advantage of the anchoring device

according to the present invention is that it achieves an anchorage of unusual strength and unusual reliability. In fact, any to-and-fro movement of the scaffolding is completely eliminated; the spacer rod and the slider are kept reacting against one another so that the pin is engaged in the eye without play, and the eye itself is kept under tension and cannot move to and fro resiliently.

[0058] Moreover, it should be noted that the anchoring device according to the present invention can anchor the scaffolding to the face even during the repair of the points of the face at which the anchoring device is fitted.

[0059] A further advantage of the anchoring device according to the present invention is that it enables the scaffolding to be anchored to the face quickly and accurately even by one person alone.

[0060] A further advantage of the anchoring device according to the present invention is that it is perfectly compatible with the tubular structures of existing scaffolding.

[0061] Naturally, in order to satisfy contingent and specific requirements, an expert in the art may apply to the above-described anchoring device according to the invention many modifications and variations all of which, however, are included within the scope of protection of the invention as defined by the following claims.

Claims

1. A device (11, 38) for anchoring scaffolding (1) to a face (2) of a building or the like, of the type comprising a spacer rod (13; 39) to be fixed to a tube (4, 5) of a tubular structure (3) of the scaffolding (1) by means of a fitting (6), and a pin (14; 40) associated with the spacer rod (13; 39) for engagement in an eye (12) fixed to the face (2), characterised in that it comprises a slider (15; 41) fitted coaxially for sliding in the spacer rod (13; 39), the slider (15; 41) having a first end (16; 42) fixed to the pin (14; 40) and having screw means (19; 31) for adjustable movement of the slider (15; 41) along the spacer rod (13; 39).
2. An anchoring device (11) according to Claim 1, in which the screw means (19) are formed at a second end (17) of the slider (15) and in which the spacer rod (13) comprises a slot (18) which extends along a longitudinal axis (X-X) and through which the pin (14) can extend, to allow the screw means (19) to urge the spacer rod (13) against the face (2).
3. An anchoring device (11) according to Claim 2, in which the screw means (19) comprise a ring nut (21) engaged by screwing on a thread (20) formed on the second end (17) of the slider (15).
4. An anchoring device (11) according to Claim 3, in which the thread (20) is of the same type as a thread (8) of a foot (7) of the scaffolding.
5. An anchoring device (11) according to Claim 3, in which the ring nut (21) is identical to a ring nut (9) of a foot (7) of the scaffolding.
6. An anchoring device (11) according to Claim 2, characterised in that it comprises locking means (22) between the slider (15) and the spacer rod (13) for preventing the slider (15) from sliding relative to the spacer rod (13).
7. An anchoring device (11) according to Claim 6, in which the locking means (22) comprise a bolt (23) extending removably through holes (24, 25) formed transversely in the spacer rod (13) and in the slider (15), respectively.
8. An anchoring device (38) according to Claim 1, in which the screw means (31) comprise two ring nuts (32, 33) engaged by screwing on threads (34, 35) formed on end portions (36, 37) of the slider (41).
9. An anchoring device (38) according to Claim 8, in which the threads (34, 35) are of the same type as a thread (8) of a foot (7) of the scaffolding.
10. An anchoring device (38) according to Claim 8, in which the ring nuts (32, 33) are identical to a ring nut (9) of a foot (7) of the scaffolding.
11. An anchoring device (38) according to Claim 3, in which the threads (34, 35) are portions of a single thread (30) formed externally on the slider (41).
12. An anchoring device (11; 38) according to Claim 1, in which the slider (15; 41) is tubular.
13. An anchoring device (11; 38) according to Claim 1, in which the pin (14; 40) comprises a safety tab (27; 29) for preventing the pin (14; 40) from coming out of the eye (12).
14. An anchoring device (11; 38) according to Claim 13, in which the safety tab (17; 29) is pivoted to a free end of the pin (14; 40).

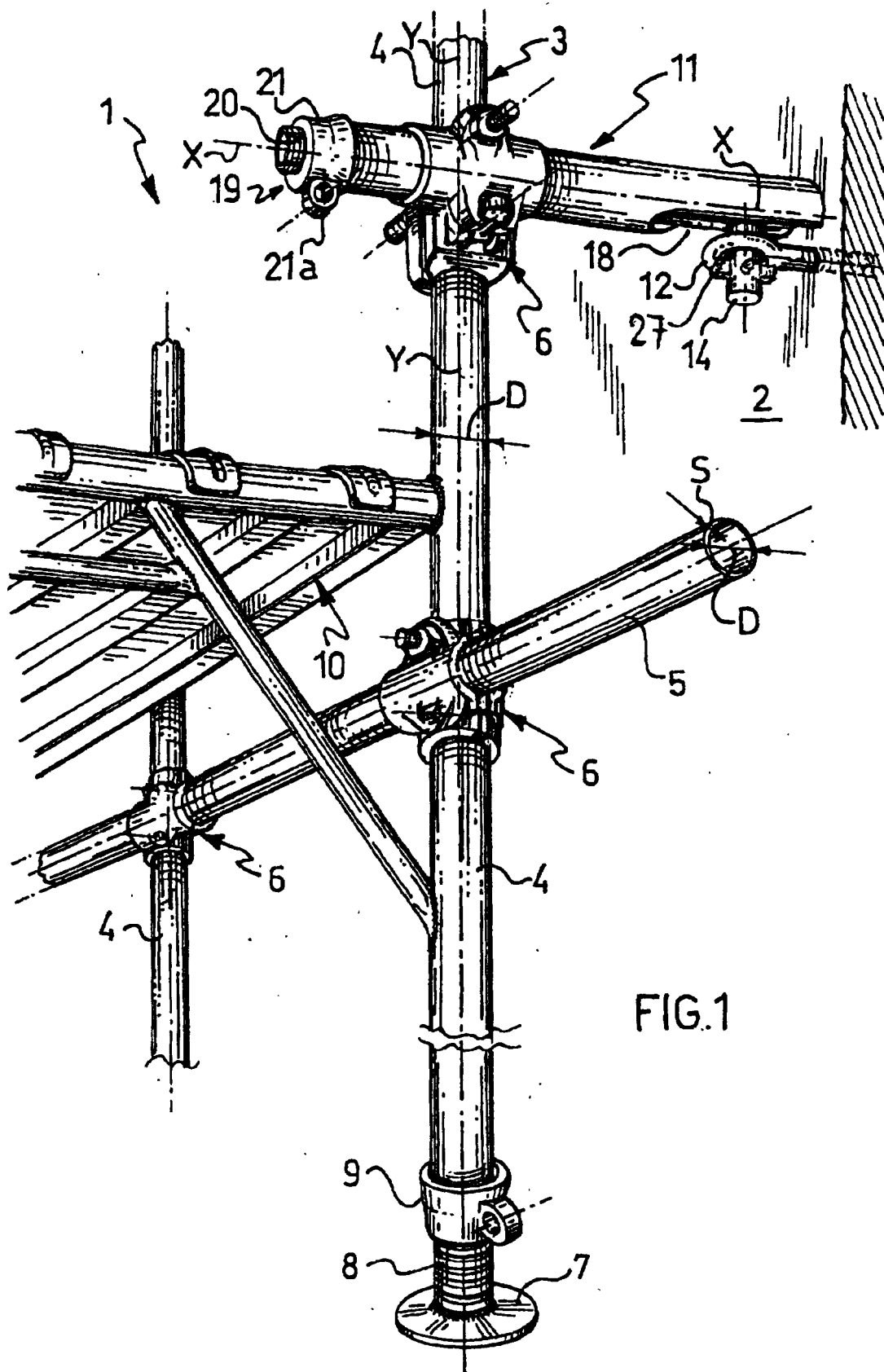
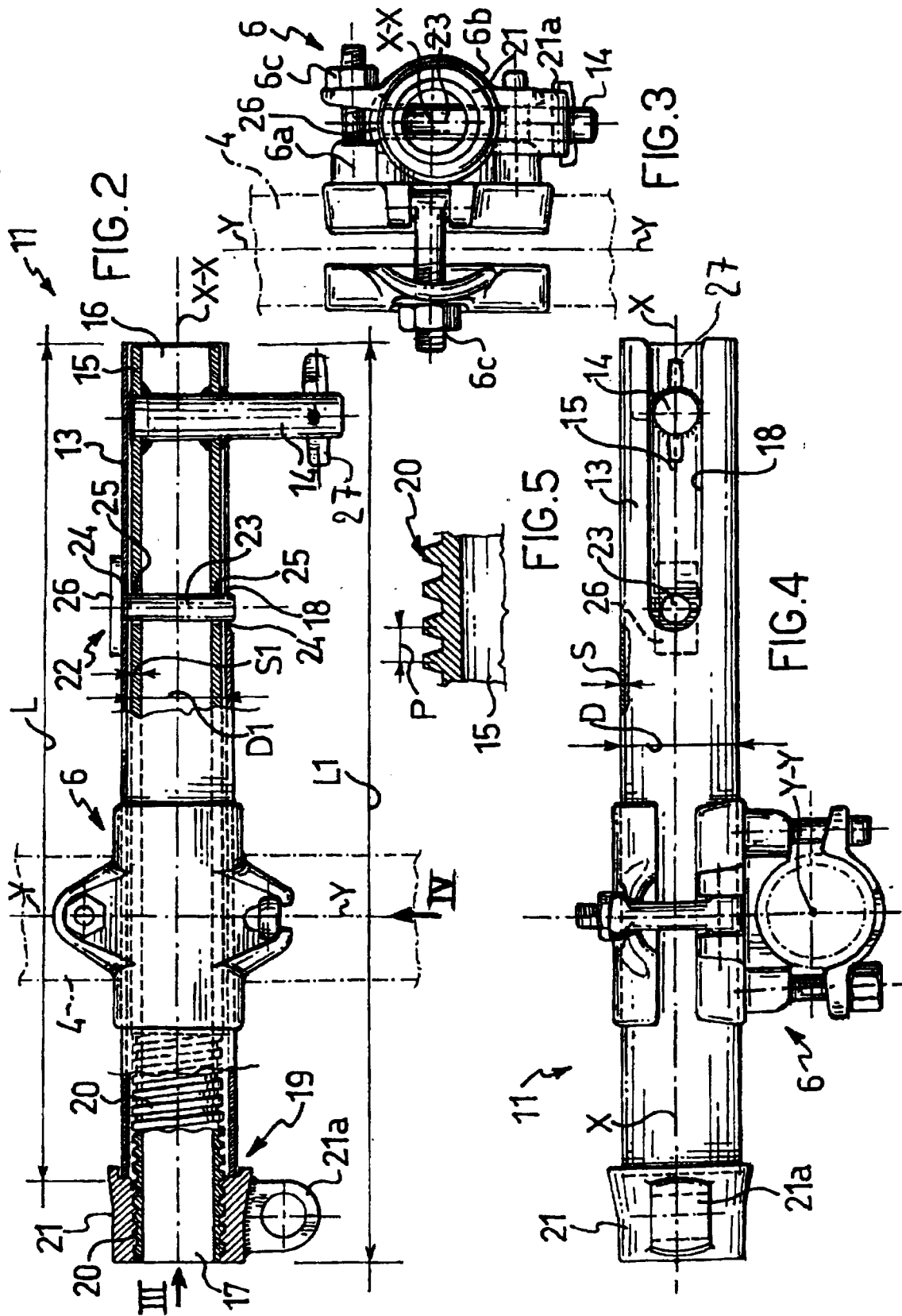
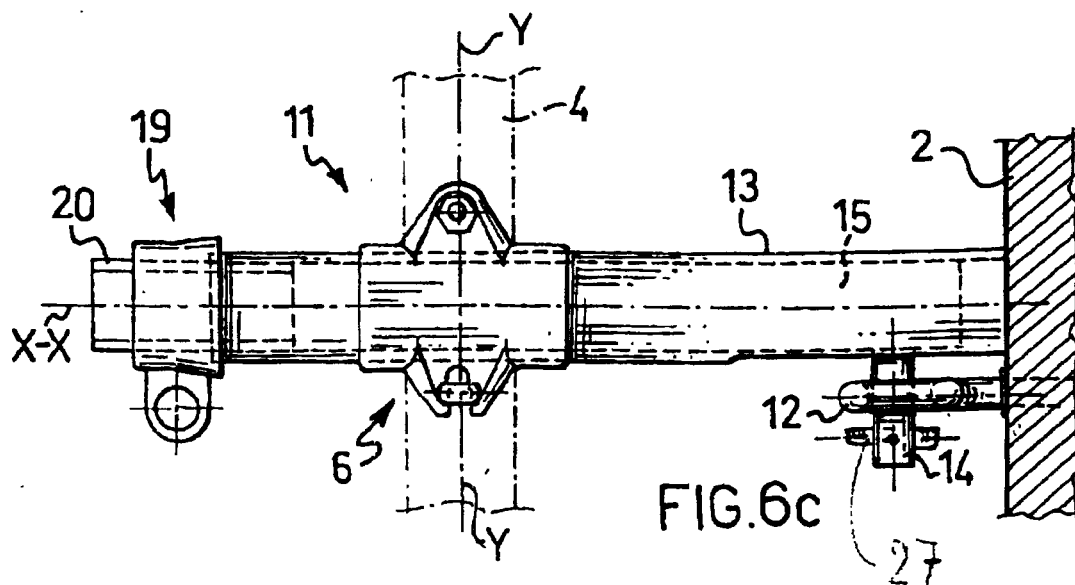
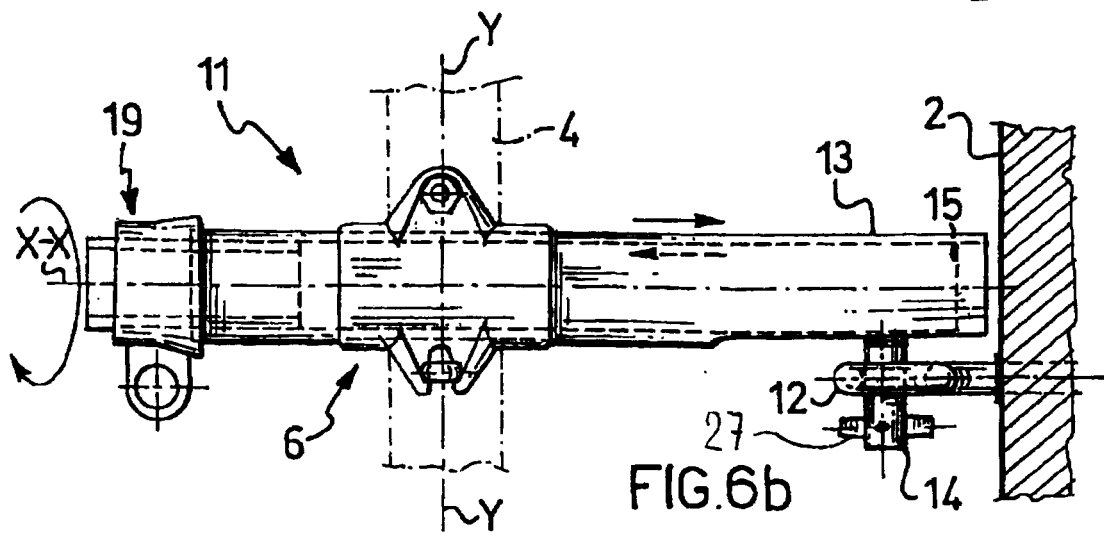
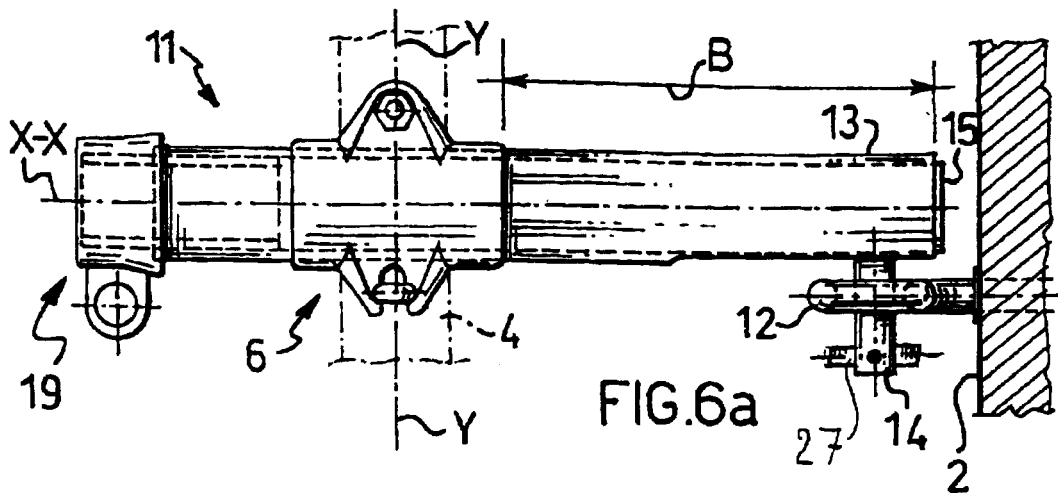
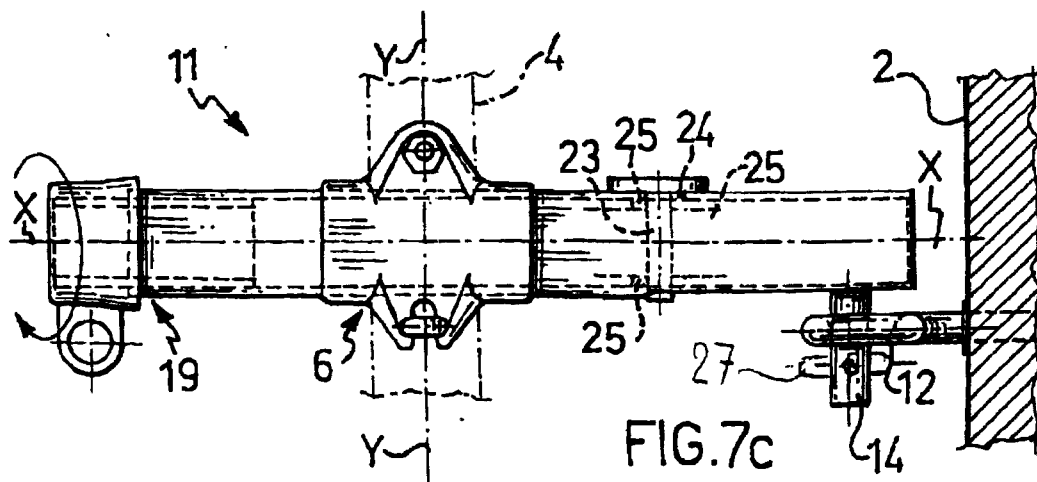
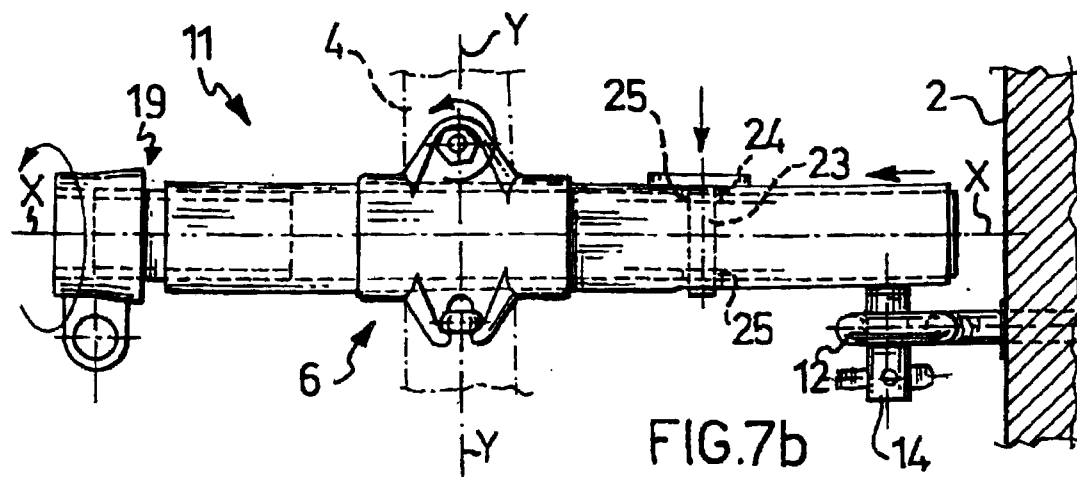
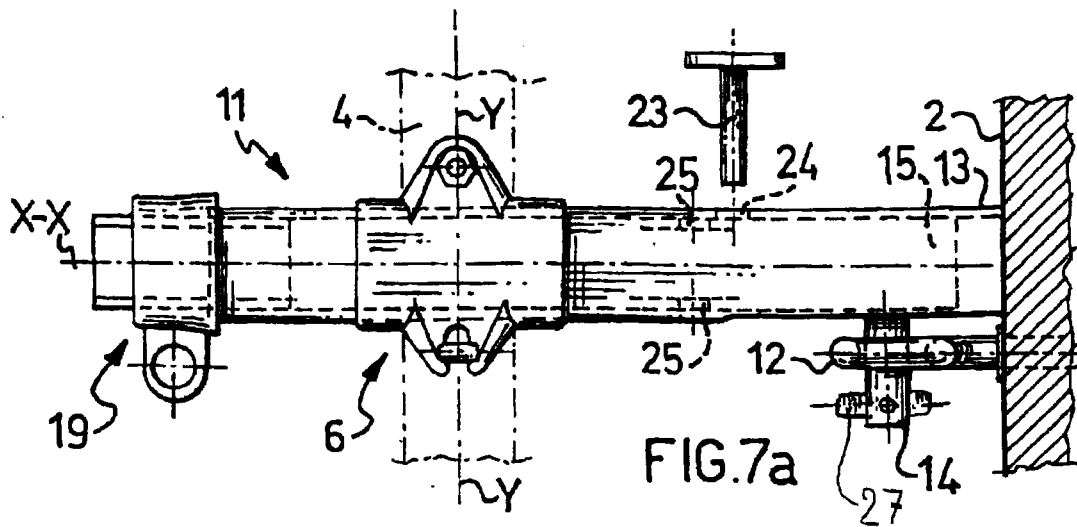


FIG.1







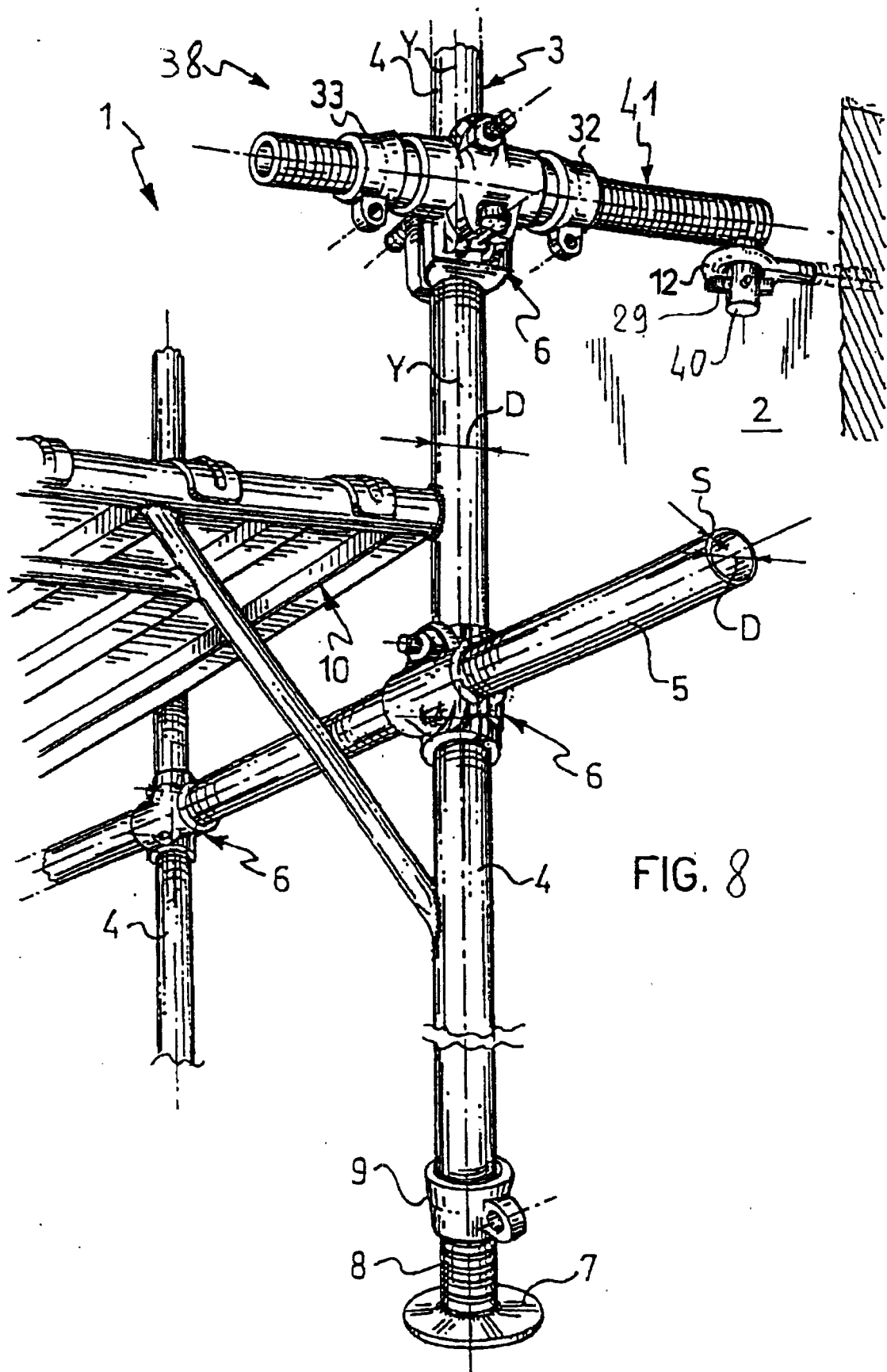
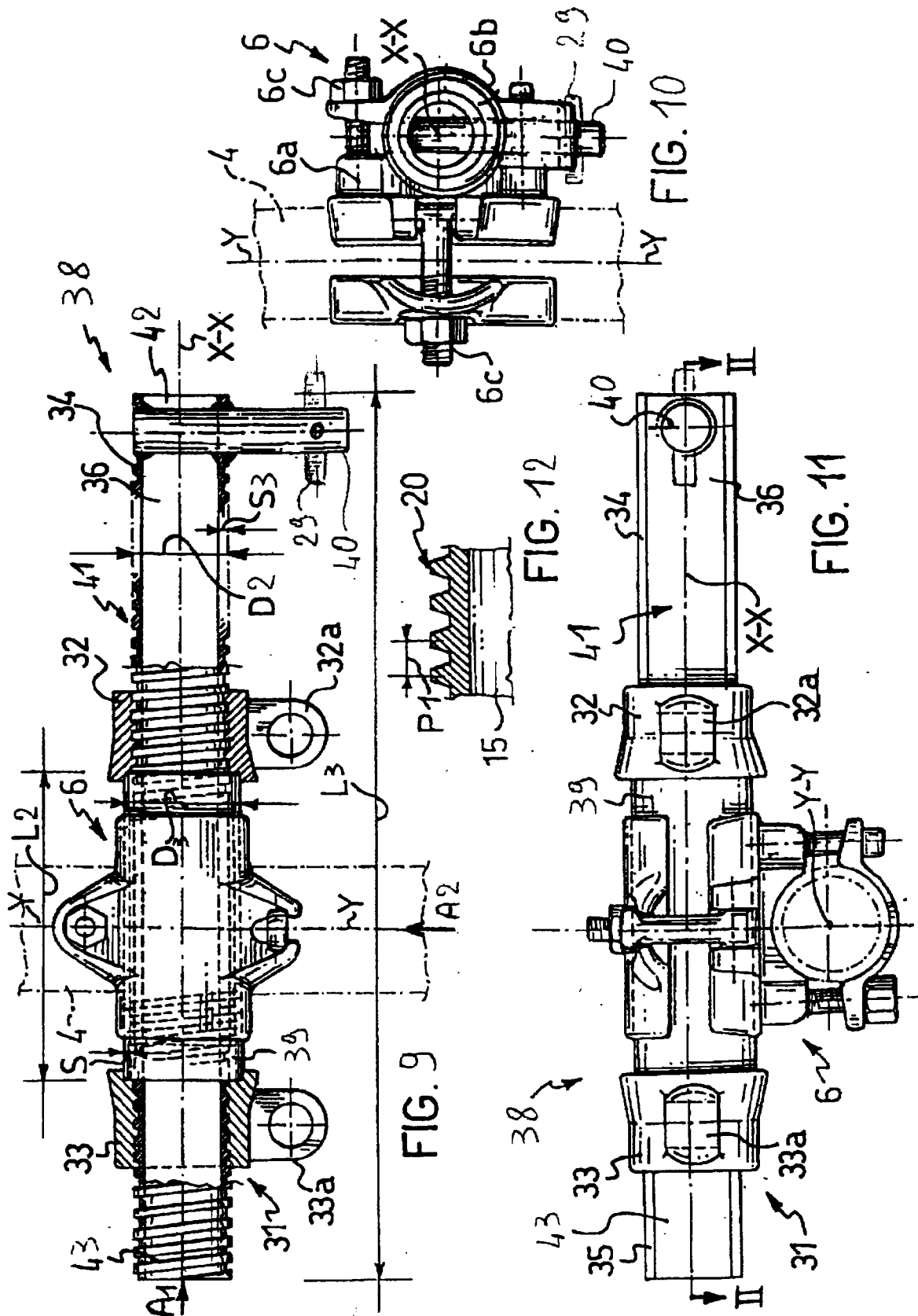
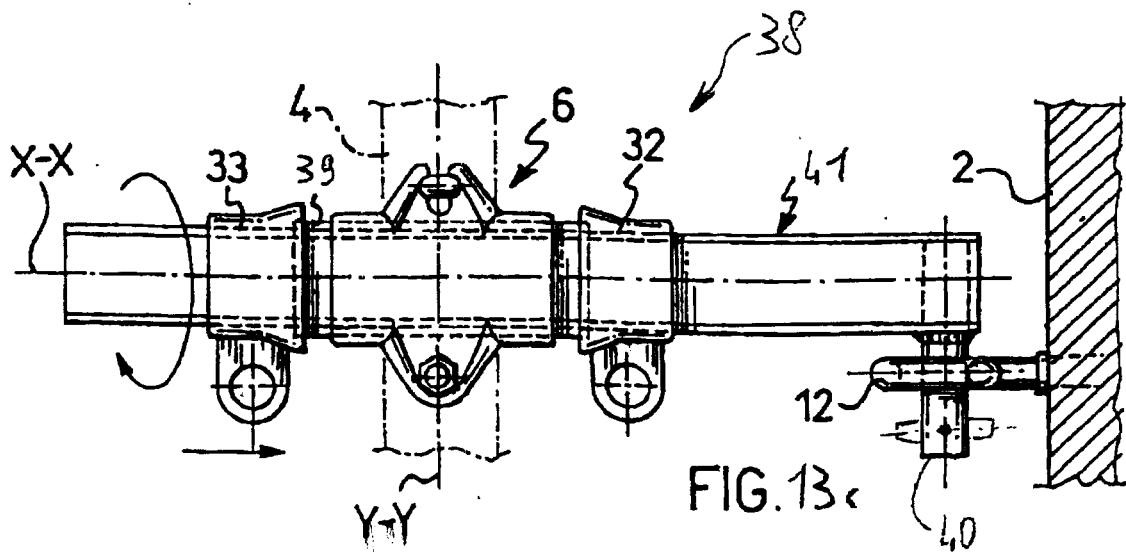
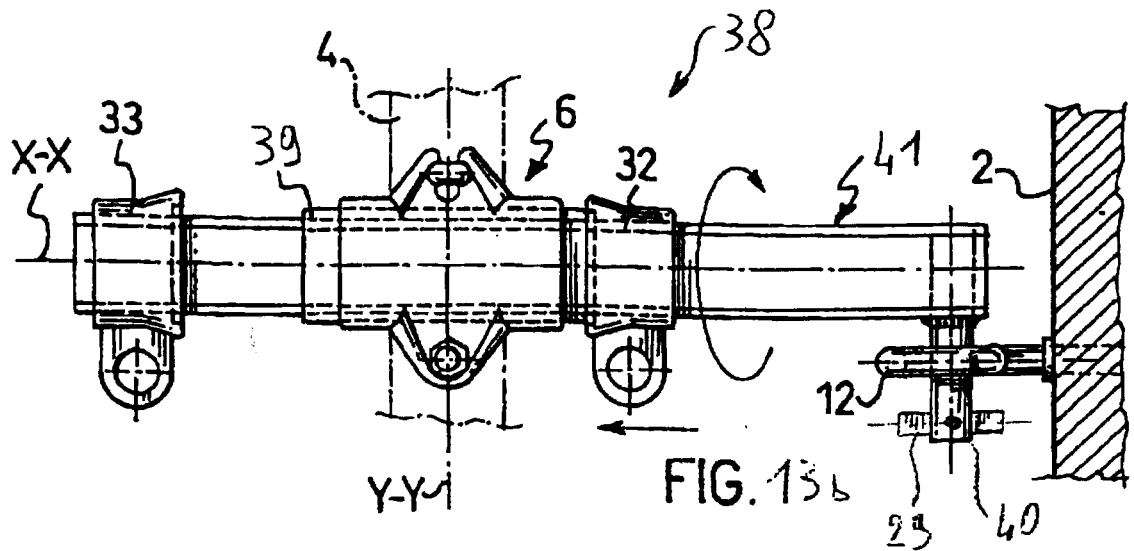
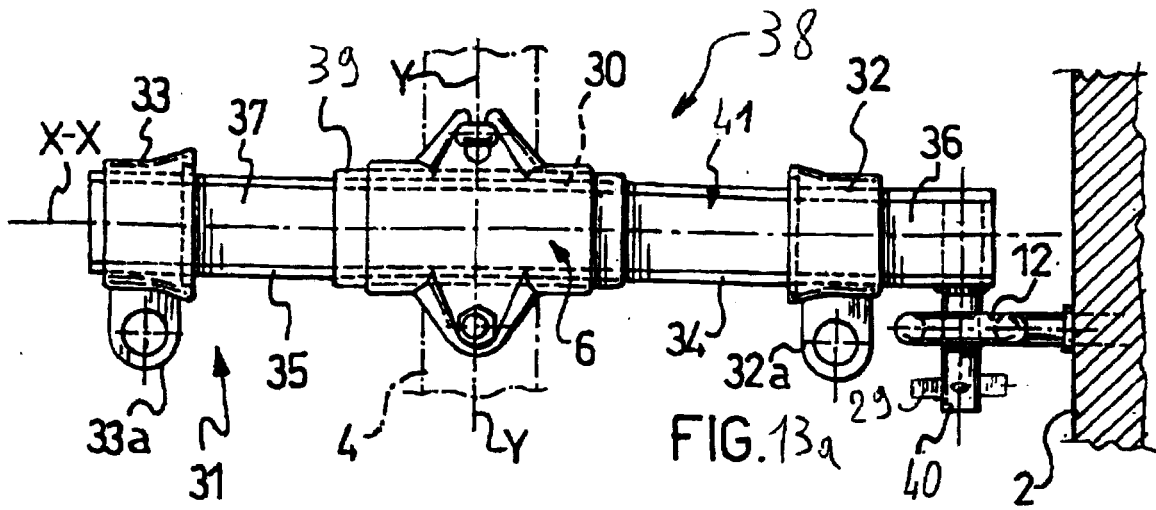


FIG. 8







European Patent
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EUROPEAN SEARCH REPORT

Application Number
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Place of search THE HAGUE		Date of completion of the search 26 January 2000	Examiner Andlauer, D
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			

EPO FORM 1503 03/82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 99 20 3441

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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